Forest Management Plan 2020-2029
Peterborough County Forest

Prepared for:

County of Peterborough
470 Water Street
Peterborough, ON
K9H 3M3

Prepared by:

Silv-Econ Ltd.
913 Southwind Court
Newmarket, ON
L3Y 6J1

June 3, 2020

Peterborough County
Our History. Your Future

TITLE, CERTIFICATION AND APPROVAL PAGE

FOREST MANAGEMENT PLAN
for the
PETERBOROUGH COUNTY FOREST

for the Ten-year period
from January 1, 2020 to December 31, 2029

Renewal Date December 31, 2029

I hereby certify that this plan has been prepared under my personal supervision and that all fieldwork and calculations have been carried out with professional skill and judgement in accordance with the good forestry practices.

Prepared By:

David Puttock, R.P.F.		November 3, 2019
Silv-Econ Ltd.	Signature	Date

I have read this Forest Management Plan and found it satisfactory and consistent with other resource management plans, land-use guidelines and/or policies for the County of Peterborough.

I recommend that the operating plan be approved for implementation.

Bryan Weir		
Director of Planning	Signature	Date

Approved By:

County Council		
	Resolution and By-law Number	Date

PREFACE

The County of Peterborough respectfully acknowledges that the County Forest is situated in the treaty and traditional territory of the Mississauga Anishnaabeg nation. The County offers its gratitude to our First Nation peoples for their care for, and teachings about, our earth and our relations. May we continue to honour those teachings.

The Peterborough County Forest occupies a total of approximately 2,108 hectares and is comprised of three separate and distinct parcels referred to as the Belmont-Dummer Block, Havelock Depot Block and the Cavan Block. Management activities in the County Forest are the responsibility of the County.

This Forest Management Plan describes the resource management and forestry activities that are scheduled to take place within the County Forest over the next ten-year period. It is recommended that the plan be reviewed in 2024 and renewed in 2029.

An overall goal of this plan is to contribute to the environment, social and economic well-being of the residents of Peterborough County and the people of Ontario through the sustainable development of the natural resources within the County Forest.

The Forest Management Plan establishes longer-term (10+ years) resource management objectives while identifying specific areas where active management will take place within the 2020-2029 operating period. The Plan also identifies objections and actions for Recreational Use of the County Forest over the next 10 years.

During the implementation of this plan there may be circumstances that arise where a change to the plan may be necessary. Any alteration will be consistent with the principles of sustainable forestry, should be minor and reflect good forestry and resource management practices.

Annual Work Plans and Annual Work Reports will be produced outlining the scheduling and implementation of management activities. These work plans and reports will provide the necessary linkage between the work proposed in the Forest Management Plan, management accomplishments, the financial resources allocated through annual budgeting process and revenues secured.

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1.0 PURPOSE AND SCOPE

Peterborough County is responsible for the management of natural resources in the County Forest. This Forest Management Plan has been prepared to ensure that the forest resources are managed in a sustainable and responsible manner.

This forest management plan is a detailed technical document having a primary objective of organizing sustainable resource management activities. This document states how the forest resources will be managed and shows where the activities will occur during the operating period. This plan also identifies where forest management operations have occurred in the County Forest in the recent past. The management of the County Forests will be planned and implemented with an emphasis on sound resource management recognizing that this area provides for other uses.

All forest management activities for the 2020 to 2029 operating period will be guided by the principles of sustainable forestry. The management plan will be reviewed every five years and renewed every ten years to ensure that management objectives and strategies are both appropriate and obtainable. Annual Work Plans will be prepared to guide specific property and stand-level management activities.

This plan was prepared using the most current resource information available. However, the plan also identifies the need for updated resource inventories in the Belmont-Dummer and Havelock Depot blocks.

2.0 DESCRIPTION OF THE PETERBOROUGH COUNTY FOREST

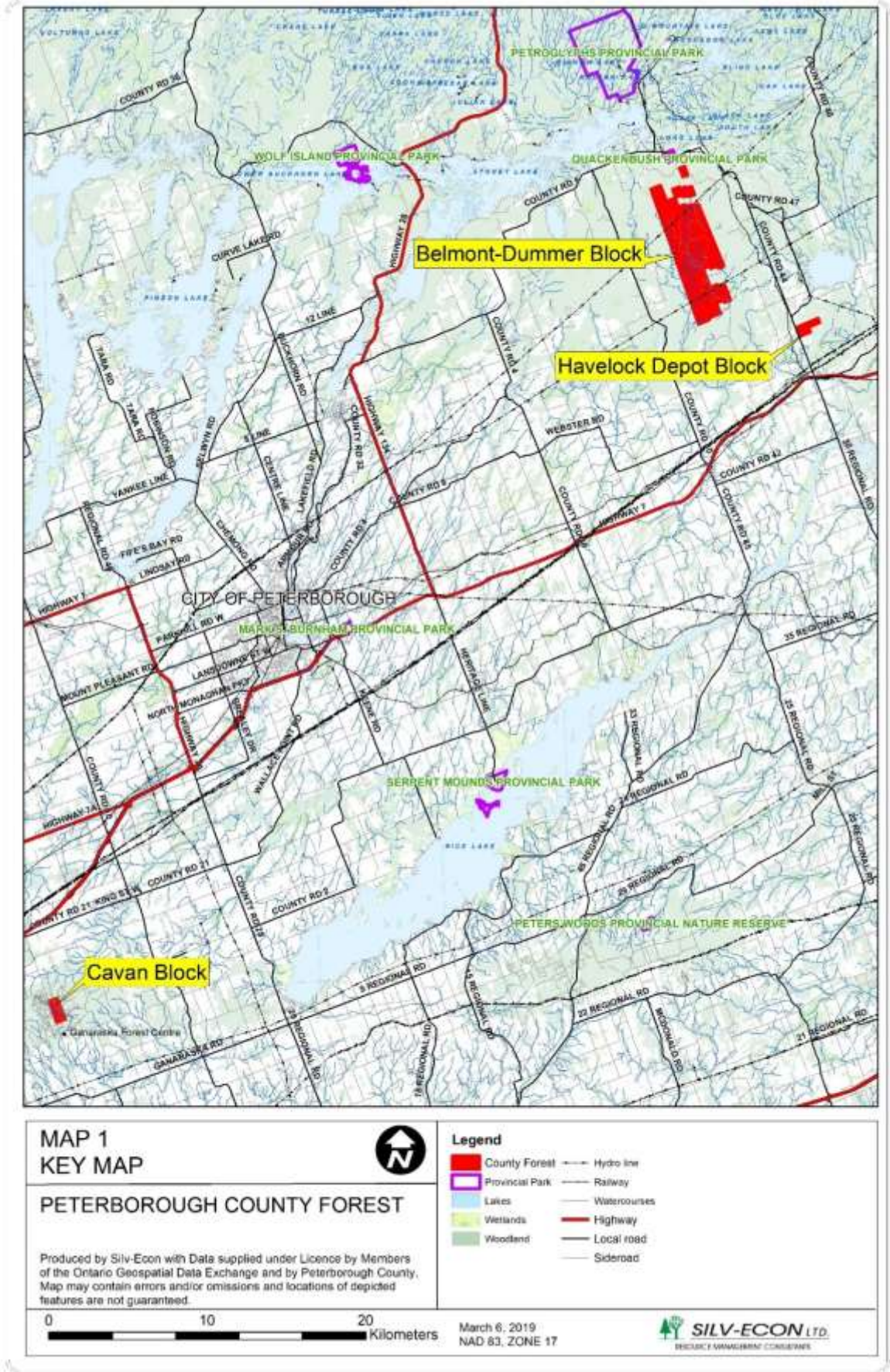
2.1 Geographic Location and Area

The Peterborough County Forest falls within the Great Lakes-St Lawrence Forest Region, which lies between the deciduous Carolinian Forest to the south and the coniferous Boreal Forest to the north. The Forest occupies a total of approximately 2,108 hectares and is comprised of three separate and distinct blocks. On their own they are relatively contiguous, self-contained forest areas. Map 1- Key Map shows the location of the blocks in a regional context while Maps 2 & 3 Base Maps identify the County Forest boundary on a more localized level. Table 1 provides a listing and the approximate size of the blocks. The County Forest is treated as a single unit. Individual distinction of the blocks is noted when necessary.

Table 1 Peterborough County Forest

Block	Area (ha)
Belmont-Dummer	1,945
Havelock Depot	76
Cavan	90
Total	**2,108**

Hectares based on GIS database.



MAP 1
KEY MAP

PETERBOROUGH COUNTY FOREST

Produced by Silv-Econ with Data supplied under Licence by Members of the Ontario Geospatial Data Exchange and by Peterborough County. Map may contain errors and/or omissions and locations of depicted features are not guaranteed.

Legend

- County Forest
- Provincial Park
- Lakes
- Wetlands
- Woodland
- Hydro line
- Railway
- Watercourses
- Highway
- Local road
- Sideroad

0 10 20 Kilometers

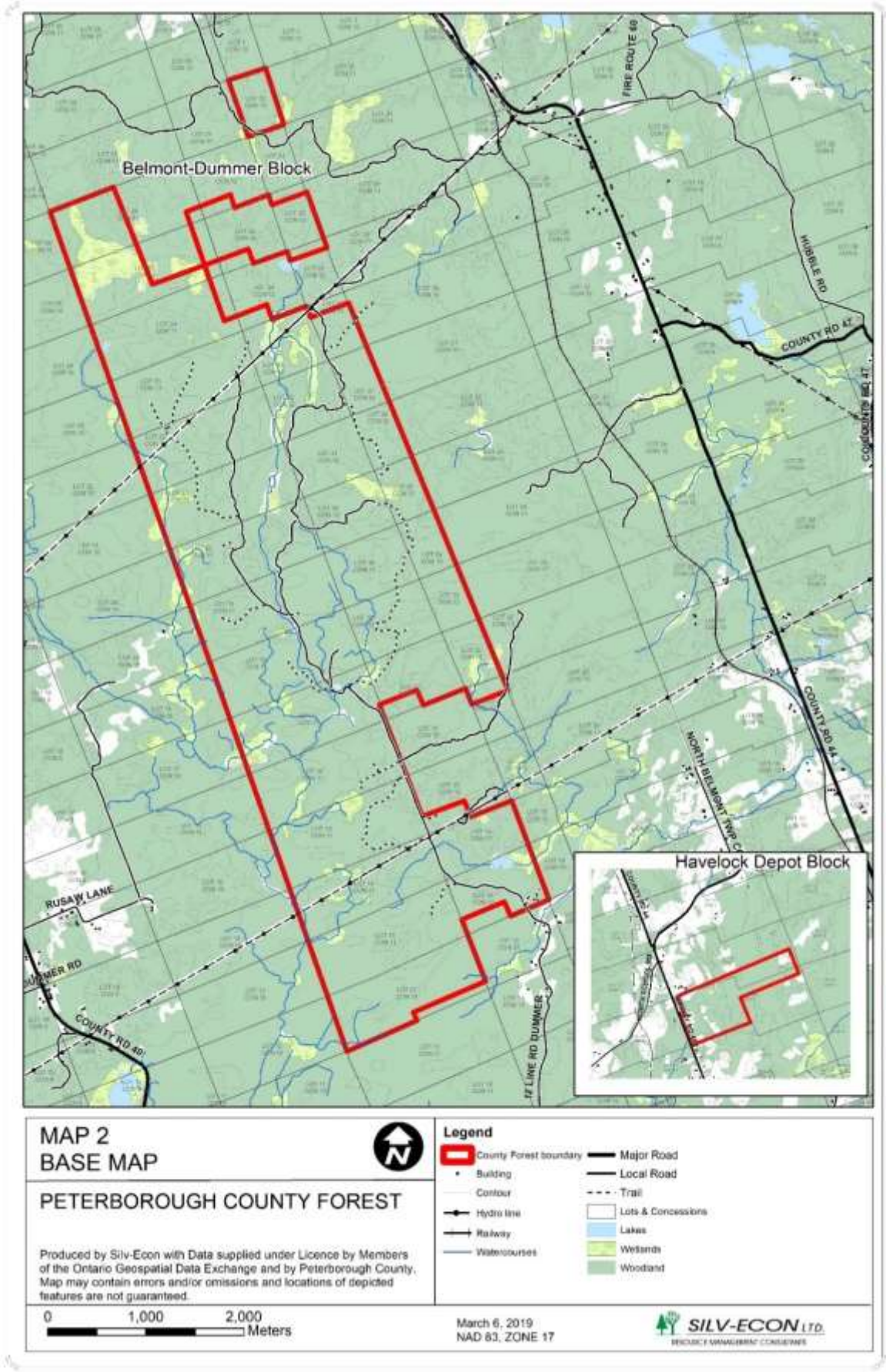
March 6, 2019
NAD 83, ZONE 17

SILV-ECON LTD.

Belmont-Dummer Block (Map 2)
This is the main parcel and it is located on part Lot(s) 12 – 26, Concession(s) XI - XII in Dummer Ward in Douro-Dummer Township and part Lot(s) 21 – 28, 30, 32 Concession(s) XII of Belmont Ward in the Township of Havelock-Belmont-Methuen. The parcel is accessed from the 12th Line Road of Dummer Township which runs through the center of the parcel. There is a gate at the south end (entrance) of the County Forest. The road is not normally maintained on a regular basis beyond this point. The forest is surrounded by private lands and it shares common boundaries with the Otonabee Region Conservation Authority in a few locations (part Lots 22,23 Con XI, 25-26 Con XI). This block is contiguous with the exception of two small parcels at the north-east corner. The block is completely forested and has been used for forestry and recreational purposes.

Havelock Depot Block (Map 2)
This parcel is situated in the Township of Havelock-Belmont-Methuen on part Lots 12 Concession 9. It is located north of Havelock on County Road 44 behind the Works Department site and is surrounded by private lands. This is a small contiguous parcel approximately 73 hectares in size and is completely forested and has been used for forestry and limited recreational purposes.

Cavan Block (Map 3)
This parcel is located on Lot 1 Concession 1 in Cavan Ward, Township of Cavan Monaghan and is adjacent to properties owned and managed by the Ganaraska Region Conservation Authority. The property is accessed from the Cold Springs Road from the south, Glamorgan Road from the north and the Carmel Line from the east. This parcel is completely forested and almost exclusively pine plantations that have been thinned several times. The forest is used for forestry and limited recreational activities. It contributes towards the extensive trail network of the Ganaraska Forest.



MAP 2
BASE MAP

PETERBOROUGH COUNTY FOREST

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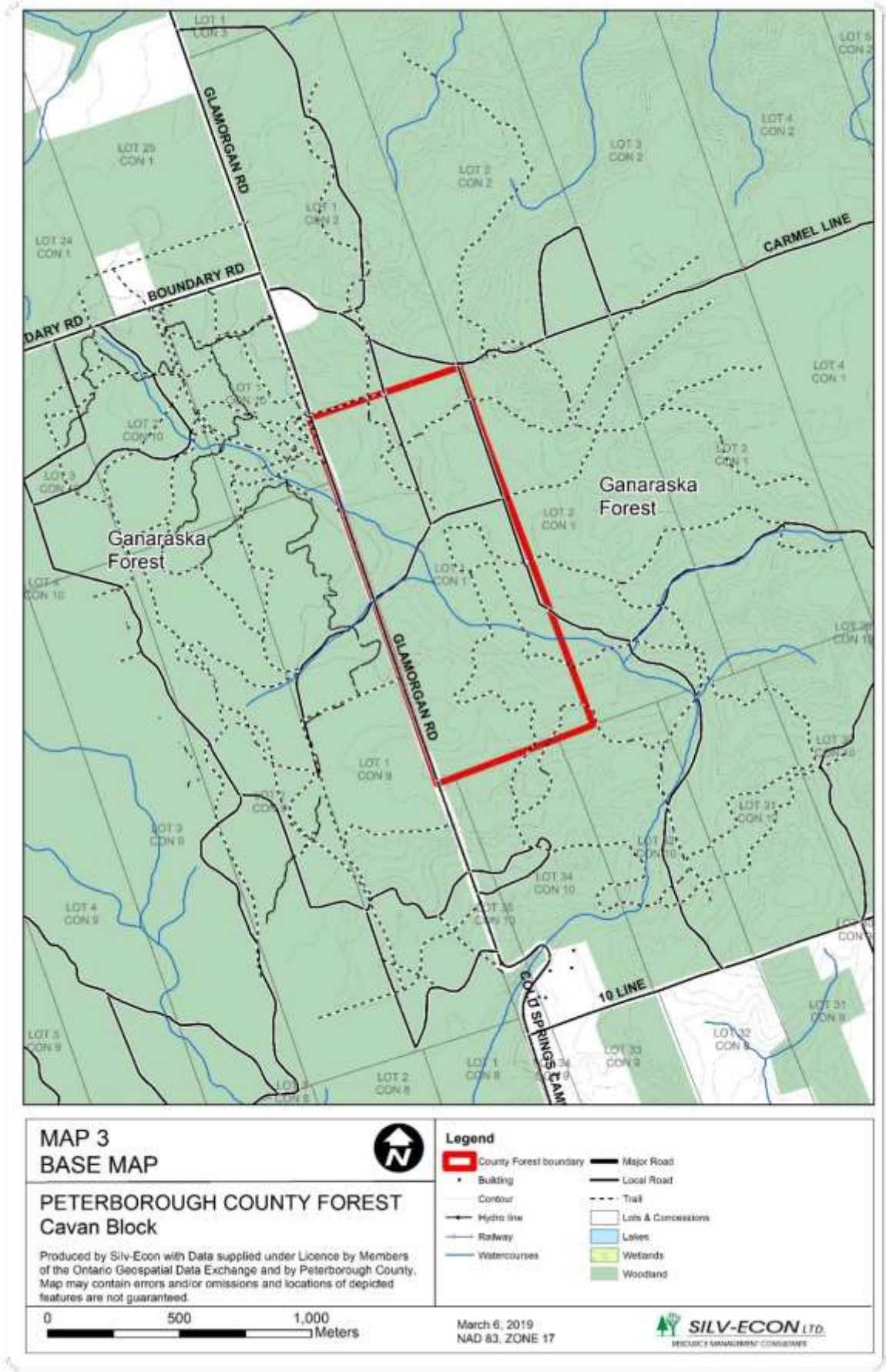
Legend

- County Forest boundary
- Building
- Contour
- Hydro line
- Railway
- Watercourses
- Major Road
- Local Road
- Trail
- Lots & Concessions
- Lakes
- Wetlands
- Woodland

0 1,000 2,000 Meters

March 6, 2019
NAD 83, ZONE 17

SILV-ECON LTD.



MAP 3
BASE MAP

PETERBOROUGH COUNTY FOREST
Cavan Block

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Legend

- County Forest boundary
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- Local Road
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- Lakes
- Wetlands
- Woodland

0 500 1,000 Meters

March 6, 2019
NAD 83, ZONE 17

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2.2 History

The origin of the Peterborough County Forest stretches back to 1938 when the County acquired a lease from the Crown for 1,127 hectares (2,785 acres) of the present forest for a ten-year period. During this period the County agreed to spend $1000 annually on the forest for such items as survey work, maintenance, construction of fire breaks, fences and forest management. In addition, 2,500 trees were to be planted each year. Many County or Regional Forests were established to combat soil erosion resulting from improper land use practices in the past and the inclusion of tree planting as part of the lease agreement was common practice at the time.

In 1949 the County obtained a patent on the land after satisfying the Crown that the terms and conditions of the lease had been met. A total of 121,000 trees had been planted and survey, road construction and fireguards had been completed.

During the lease period and since the issue of the patent, the County has acquired additional properties bringing the total area to 2,108 hectares (5265 acres).

The Cavan Block was managed by the Ministry of Natural Resources (MNR) under the Agreement Forest program which terminated in 2001. The County has been fully responsible for management on this parcel since that time.

Since 2001 the County Forest has been certified under the Forest Stewardship Council (FSC) standards demonstrating the commitment the County and its consulting partners have in sustainable forestry.

2.3 Administration and Planning

Peterborough County is responsible for the management and administration of the County Forest and this currently rests with the Director of Planning. The County does not have staff dedicated to the County Forest and seeks assistance from consultants and external resource managers.

From 1990 - 2011, implementation of the management plans was carried out by Domtar-Trenton under its Woodlot Management Program (WMP). Since 2011, when Domtar terminated its WMP, the County has partnered with Silv-Econ Ltd. (Silv-Econ), to plan, implement, monitor and report on management activities in the County Forest and to ensure that the forest resources are managed in a sustainable and responsible manner. Silv-Econ is certified under Forest Stewardship Council (FSC) standards. Timber products from Silv-Econ's certified group members, including the Peterborough County Forest, can be marketed as FSC certified timber.

2.4 Relevant Legislation and Guidelines

Official Plan

The Planning Act requires that each municipality develop an Official Plan to guide municipal development. All municipalities must have regard for the Provincial Policy Statement.

An Official Plan for the County of Peterborough was most recently consolidated in 2017. The other municipalities where the County Forest resides are in the Township of Cavan-Monaghan (Official Plan prepared in 2013), the Township of Havelock-Belmont-Methuen (Official Plan Consolidated 2015) and the Township of Douro-Dummer (Official Plan contained in the County of Peterborough Official Plan 2013).

Implementation of the Official Plan and other development policies are directed by zoning by-laws within the municipalities. Management activities in the County Forest will have regard for these policies and by-laws where they exist.

County Forest Management Plan By-law
The Forest Management Plan will be adopted by County Council through the passing of a By-law under the Municipal Act.

Oak Ridges Moraine Conservation Act and Plan
The Cavan Block is located within the Oak Ridges Moraine. Recent initiatives to conserve and protect the important hydrological and ecological features and functions of the Oak Ridges Moraine led to the introduction of the *Oak Ridges Moraine Conservation Act, 2001* and the development of the Oak Ridges Moraine Conservation Plan 2002. The purpose of the Oak Ridges Moraine Conservation Plan is to provide land-use and resource management planning direction on how to protect the Moraine's hydrological and ecological features and functions. The Peterborough County Forest Management Plan must be consistent with the requirements under the *Oak Ridges Moraine Conservation Act, 2001* and the terms and conditions of the Oak Ridges Moraine Conservation Plan (ORMCP).

The Oak Ridges Moraine Conservation Plan divides the Moraine into four land-use designations: (i) Natural Core Areas, (ii) Natural Linkage Areas, (iii) Countryside Areas, and (iv) Settlement Areas. The Cavan Block is situated within an area designated as a Natural Core Area. Natural Core Areas protect those lands with the greatest concentrations of key natural heritage features that are important to maintaining the integrity of the Moraine as a whole. Only existing uses and very restricted resource management, agricultural, low intensity recreational, home businesses, transportation, and utility uses are allowed in these areas (MMAH 2002).

The Cavan Block has been and will continue to be managed in a manner that is consistent with the ORMCP.

Protection of Critical Habitats and Species At Risk
Management of the County Forest is aligned with federal and provincial regulations for the conservation and protection of critical habitats and species at risk including the federal *Fisheries Act 1985,* federal *Species at Risk Act 2002,* federal *Migratory Birds Convention Act 1918,* provincial *Endangered Species Act 2007* and the provincial *Fish and Wildlife Conservation Act*. 1997.

Provincial Guidelines
Management of the County Forest is also informed by several provincial guidelines including the Silvicultural *Guide to Southern Ontario* (OMNR 2000) and the *Ontario Tree Marking Guide* (OMNR 2004) as well as several guides specific to individual species and forest communities.

2.5 Forest Management Planning History

Management on the County Forest has been guided by a number of planning documents over the years including the most recent 10-year Forest Management Plan 2010-2019. In 2000, the County undertook a Forest Management Study for the County Forest with the overall goal:

To investigate and make recommendations on opportunities to provide for the effective use of forest resources and the utilization of the forest environment for the social, recreational and cultural benefit of the residents and visitors of Peterborough County.

The study led to a number of principles and objectives for sustainable forest management that formed the foundation of the 2010 - 2019 Forest Management Plan. These principles and objectives are still relevant today and will provide direction and guide management activities on the County Forest for the next ten-years covering the period of 2020 - 2029.

3.0 THE FOREST TODAY

3.1 Significant Landforms

There are many different landforms in the province of Ontario. Chapman and Putnam, 1984, identified five natural divisions in southern Ontario that were based on the bedrock. These divisions were further sub-divided into 55 minor physiographic regions. The two most prominent physiological features associated with the County Forest are the Dummer Moraine and the Oak Ridges Moraine.

Dummer Moraine
The Belmont-Dummer and Havelock Depot Blocks lie within the Dummer Moraine. This physiographic region is a narrow band of rough stony lands bordering the Canadian Shield on the north. The Moraine runs eastward from the Kawartha Lakes and extends down to Hwy 41. This region is characterized primarily by till plains and has small sand and limestone plain pockets. Additional information on the Dummer Moraine can be found in the Ontario Ministry of Natural Resources District Land Use Guidelines for the Lindsay District - 1983.

Oak Ridges Moraine
The Cavan Block lies along the edge of the Oak Ridges Moraine. This Moraine runs west-east extending from the Niagara Escarpment to the Trent River and is considered to be one of Ontario's most significant landforms. The Moraine divides the watersheds draining south into Lake Ontario from those draining north into Georgian Bay, Lake Simcoe and the Trent River system. This region is characterized by deep sand, sand-loams and supports a variety of landscape and ecological features.

3.2 Soils and Topography

Most of the Belmont-Dummer and Havelock Depot Blocks are covered by Dummer loam which is primarily a stony loam till. It is well drained, calcareous and is shallow to moderate in depth. In the south-west portion of his block the soils are organic in origin. These are poorly drained and support conifer species such as cedar. Large areas of cedar swamp and muskeg with little or no timber producing capabilities are found in these organic soil types.

The topography of the Belmont-Dummer and Havelock Depot Blocks varies from flat to gently rolling. There are some areas of broken topography however there are no significant variations in elevation on these parcels.

The predominant soil type found in the Cavan Block is the Pontypool and Bridgeman sand. They are characterized by excessive drainage, low fertility and are subject to wind and water erosion. The underlying soils are generally deep and stratified sands of medium-fine texture. These areas experienced severe erosion problems in the early 1900's and the plantations were established to help soil conservation efforts. The Cavan Block is generally flat with no severe hill or rock formations. Elevations range from 290 metres to 300 metres above sea level and generally no surface water present on the block.

3.3 Biological Diversity

An ecologically diverse and healthy County Forest provides critically needed habitat for birds, pollinators and other animals whose continued existence is threatened in Ontario and across

the continent. Conserving and improving the Forest helps to address the impacts of a changing climate, pathogens, and non-native invasive plants and insects.

3.3.1 Critical Habitats For Wildlife

To date, an intensive wildlife and/or habitat inventory has not been completed for the County Forest. Undoubtedly the forest offers good terrestrial and wetland habitats for a variety of mammals, reptiles, amphibians and song birds due to its mosaic of habitats and its diversity of forest cover types and species complexes. The imbalanced age class structure towards the mid-rotation age classes (41-100 year) would imply that habitat requirements for species dependant on younger (1-40 age class) and older forests (> 100 years) are not present or adequate. As management continues on the County Forest a more balanced distribution of age classes will result.

Each of the County Forest blocks contribute to larger forested areas within the County landscape. Large contiguous forested areas such as these are important habitat for a suite of birds such as the Northern Goshawk, Red-shoulder Hawk, Barred Owl, and Wood Thrush as well as large mammals including White-tail Deer, Black Bear, and Grey Wolf.

At the stand level; cavity trees, fallen trees, and snags (dead standing trees) provide shelter and food for forest dwellers. Vegetation that varies in height is also important. The abundance and condition of these features are a useful marker of the quality of wildlife habitat.

Many trees are important sources of edible seeds and nuts for wildlife. The most common species producing larger seeds and nuts that serve as food are black cherry, red oak, white oak, basswood, and American beech, all of which are found throughout the County Forest.

3.3.2 Significant Wetlands

The headwater areas of the Ouse River are located in the northern section of the Belmont-Dummer Block. There are many swamps, small creeks and woodland pools that drain into the Ouse River through this block and flow southward into Rice Lake. The Ouse River has been classified as a coldwater system by the Ontario Ministry of Natural Resources. The Ouse River Wetlands are classed as a Life Science ANSI. Life Science ANSIs are significant representative segments of Ontario's biodiversity and natural landscapes including specific types of forests, valleys, prairies and wetlands, their native plants and animals and their supportive environments. They contain relatively undisturbed vegetation and landforms and their associated species and communities. Forest management operations will recognize this important resource and conduct activities to ensure no negative impacts to water quality and related habitat result.

The Havelock Depot and Cavan Blocks do not contain any significant wetlands.

3.3.3 Species at Risk

More than 175 species of plants and animals are currently designated as 'At Risk' within Ontario by the Ministry of Natural Resources & Forests. A search of the Natural Heritage Information Centre (NHIC) database was carried out in October 2018 to determine if any species at risk have been observed in the geographic area surrounding the properties. The search returned two species of birds, Eastern Wood-Pewee (*Contopus virens*) and Wood Thrush *(Hylocichla mustelina*), in or near the Cavan Block. The status of both species is listed as 'Special concern' in Ontario. Special Concern means the species lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats. Other species at risk that may occur in the vicinity of the

County Forest are noted in Table 2. The species noted with an * are considered most likely to occur in the County Forest.

Table 2 Species at Risk that may occur in the Peterborough County Forest

Status			
Species of Concern		**Threatened**	**Endangered**
• Red-headed* Woodpecker* • Cerulean Warbler* • Bald Eagle • Louisiana Waterthrush • E. Ribbonsnake	• Snapping Turtle* • Five-lined Skink • Common nighthawk	• E. Whip-poor-will* • Blanding's Turtle* • E. Hog-nose Snake* • Flooded Jellyskin (lichen) • Chimney Swift	• Pale-bellied Frost Lichen • Ogden's Pondweed • Butternut*

*Species most likely to occur.
Source: NHIC. Ministry of Natural Resources & Forests. Reviewed October 2018.

3.3.4 Significant Woodlands

When the Peterborough County Forest is evaluated according to the *Natural Heritage Reference Manual* **(**OMNR 2010) much, if not all, of the Belmont-Dummer Block would meet one or more of the significance criteria. However, the County Forest has not been designated as a Significant Woodland either provincially or locally.

3.4 Forest Inventory

A forest inventory is a fundamental tool for assessing the current state of a forest. The forest resources of the County Forest were inventoried on a large scale by the Ontario Ministry of Natural Resources in 1960 and again in 1979. In 1999 new aerial photographs of the Belmont- Dummer Block were taken and interpreted to produce a new Forest Resources Inventory (FRI) for the block while retaining the original stand boundaries. The age, height and stocking attributes were adjusted to reflect the new inventory date. This adjusted 1999 FRI was used in the previous 10-year management plan which expired in 2019.

In 2018 an updated forest inventory was completed for the Cavan Block. This management plan has identified the need for a new forest inventory for the Belmont-Dummer and Havelock Depot Blocks.

The Peterborough County Forest has a total area of approximately 2,108 hectares. Forested lands represent 1,865 hectares while wetlands and other non-forested lands account for the remaining 243 hectares (Table 3).

The forest inventory has identified six distinct types of forest community based on species composition (Table 3, Figure 1, Map 4). Most of these forest types originated naturally following past logging, fire, or other natural disturbances. Two of these forest communities, bottomland conifer and bottomland hardwood/poplar, account for almost half of the forested area. Conifer plantations in the Cavan and Belmont-Dummer Blocks represent approximately 10 per cent of the forested area. These plantations were established to restore forest cover to abandoned agricultural lands during the 1970's and 1980's.

Table 3 Area by Forest Community/Land Class

Forest Community/Land Class	Area (Ha)
Bottomland conifer	580
Bottomland hardwood/Poplar	288
Upland hardwood	339
Red pine	326
White pine	332
Total Forested Area	**1,865**
Wetlands	221
Hydro corridors	20
Landings	2
Total Area	**2,108**

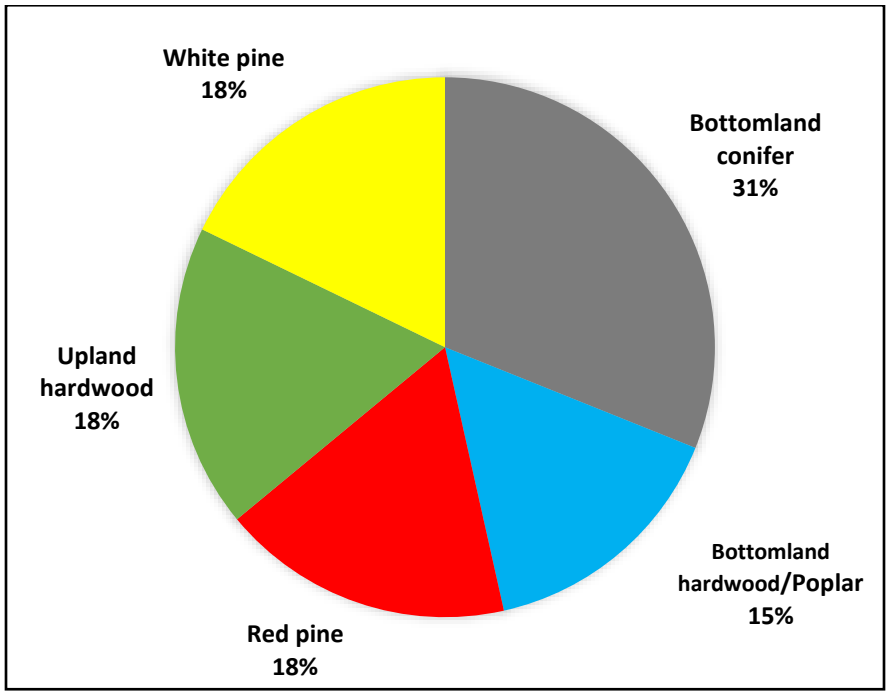


Figure 1 Forest Communities as a Percent of Total Forested Area

The age class distribution of the County Forest is bell-shaped with the majority of area in the 41- 100 year age classes (Figure 2). This is typical of the forest in the Great Lakes-St. Lawrence Forest Region in Ontario and is a function of historical land settlement and logging practices that took place in the late 1800's and early 1900's. The age class distribution has been relatively unchanged over the past 10 years. Over time and through the sustainable management strategies the age class distribution should be more regulated and evenly distributed.

Late Seral Forest

Approximately 453 ha of the County Forest are in the late seral stage of succession (> 90 years old). The stands range in size from <1 ha to 40 ha. Some of these stands exhibit characteristics of old growth forest communities including large diameter trees, coarse woody debris, and snags and are being assessed as potential High Conservation Value Forests (HCVF).

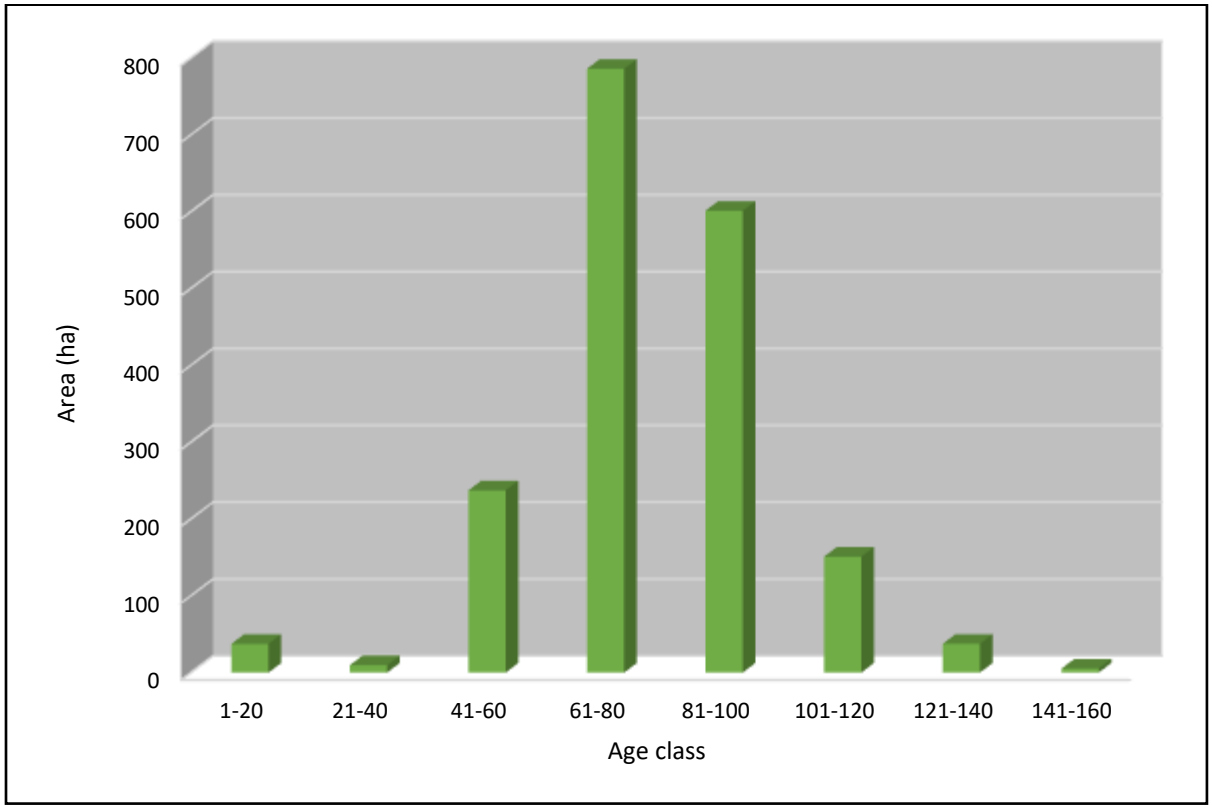
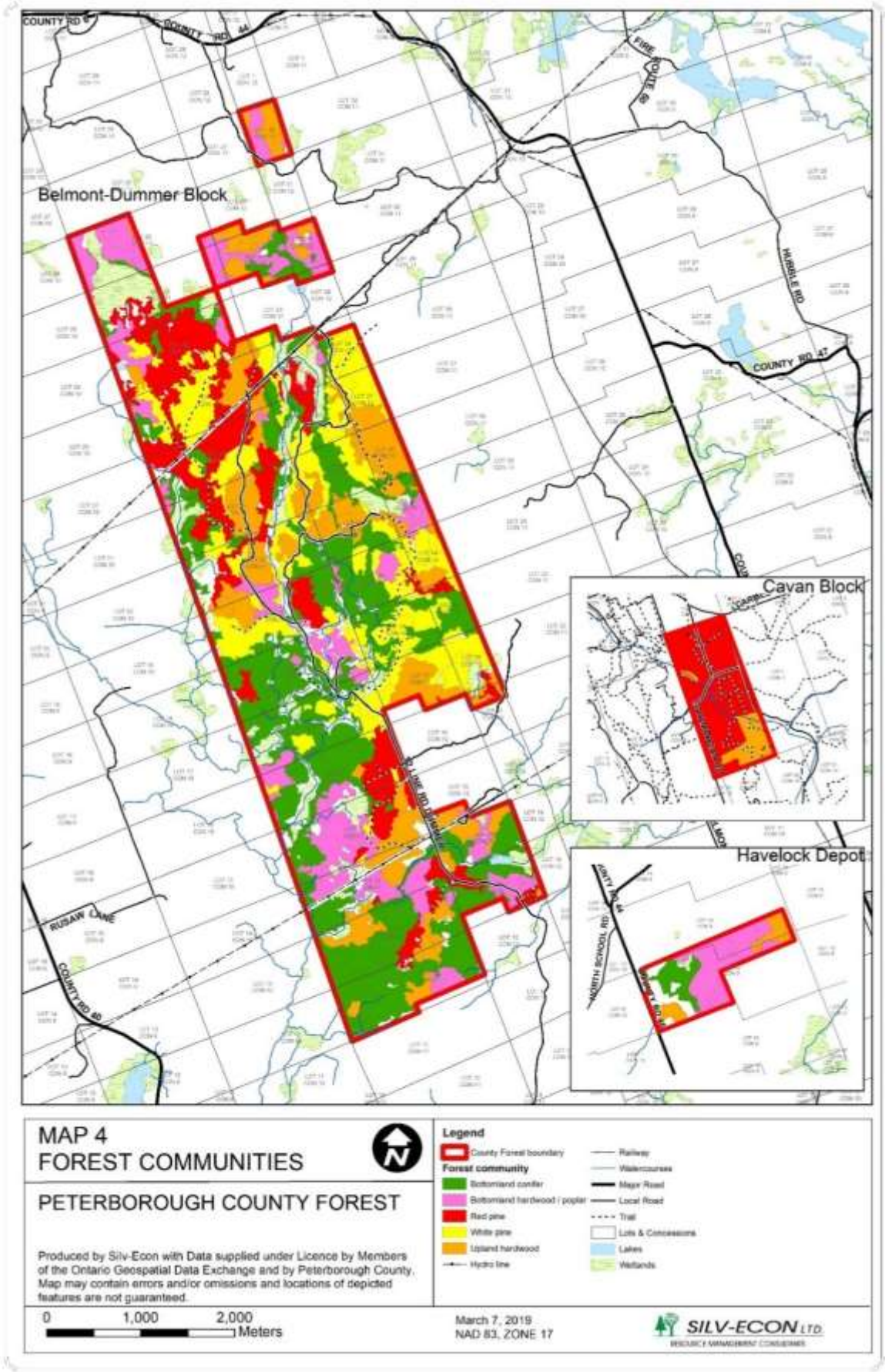


Figure 2 Age Class Distribution of the Forested Area of the Peterborough County Forest


Belmont-Dummer Block
Cavan Block
Havelock Depot
COUNTY RD 44
COUNTY RD 47
HUBBLE RD
RUSAW LANE
COUNTY RD 46
NORTH SCHOOL RD
MAP 4
FOREST COMMUNITIES
PETERBOROUGH COUNTY FOREST
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Legend
County Forest boundary
Forest community
Bottomland conifer
Bottomland hardwood / poplar
Red pine
White pine
Upland hardwood
Hydro line
Railway
Watercourses
Major Road
Local Road
Trail
Lots & Concessions
Lakes
Wetlands
0
1,000
2,000
Meters
March 7, 2019
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3.4 Access Roads

There are approximately 17.4 km of access roads (drivable by a large truck) and 16.9 km of trails (typically drivable by a pickup truck or ATV) in the County Forest (Table 4). Access roads in the County Forest are shown in Map 5. The access roads in the various County Forest blocks are used primarily for forest management activities. However, the roads / trails also provide opportunities for recreational pursuits (hunting, hiking, biking, limited motorized vehicles, x-country skiing etc.). Access roads are maintained on a limited basis and trails are not normally maintained beyond what can be derived from forestry activities.

Table 4 Access Road and Trail Lengths in the Peterborough County Forest

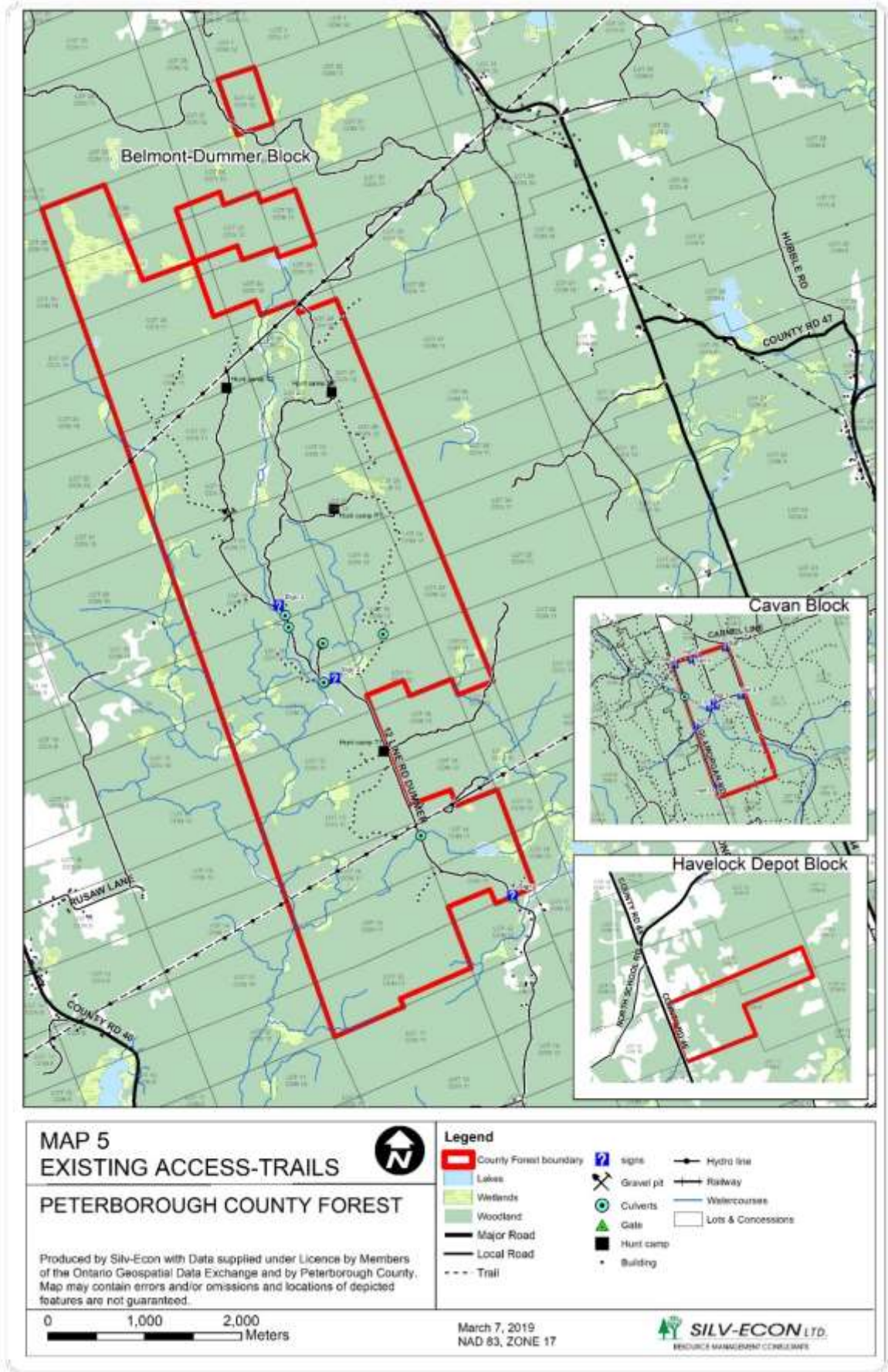
Block	Access Roads (km)	Trails (km)	Total (km)
Cavan	3.7	4.1	7.8
Havelock Depot	0	0	0
Belmont-Dummer	13.7	12.8	26.5
Total	**17.4**	**16.9**	**34.3**

The extensive road network in the vicinity of the Cavan Block is managed by the Ganaraska Region Conservation Authority. The Cavan Block is well accessed for management purposes and no immediate road maintenance or additional development is required. Motorized vehicles are prohibited in this block, save and except the municipal roads that are used quite heavily by ATV's and motor-bikes. Hunting is also prohibited.

The signage around the block appears to be adequate and in reasonable condition to ensure the public is aware of the use restrictions. Additional signage to denote ownership by the County, FSC certification, and contact information is recommended. The block should be monitored on a regular basis and the County should continue to communicate with the staff at the Ganaraska Forest to ensure mutual resource management objectives are met.

The Havelock Depot Block was harvested approximately 25-30 years ago and the extraction-spur road has growing over. Harvesting is scheduled for the Havelock Depot Block during the term of this management plan The extraction road will be re-opened and additional extraction roads may be required. This block has some use restrictions proposed (no hunting, no motorized vehicles, no camping) however, there are no signs (property and/or use restrictions) posted on or around the property. Signage is recommended to denote County ownership, FSC certification, contact information, property boundaries and permitted/ non-permitted uses.

The road network within the Belmont-Dummer Block is limited however, it services the property for its current use. This block has a single entry road at the south-end which subsequently branches into two roads, both of which run to the northern part of the block. The northern limit of the block contains extensive wetlands and access to forest stands for harvesting may be limited. A comprehensive forest inventory is being proposed to the Belmont-Dummer Block during the 2020-2024 operating period. The inventory may identify stands to be managed in future plan periods if access can be established. In this case additional extraction roads may be required.


Belmont-Dummer Block
HUBBLE RD
COUNTY RD 47
Cavan Block
CARMEL LINE
Havelock Depot Block
NORTH SCHOOL RD
COUNTY RD 46
RUSAW LANE
MAP 5
EXISTING ACCESS-TRAILS
PETERBOROUGH COUNTY FOREST
Produced by Silv-Econ with Data supplied under Licence by Members of the Ontario Geospatial Data Exchange and by Peterborough County. Map may contain errors and/or omissions and locations of depicted features are not guaranteed.
Legend
County Forest boundary
Lakes
Wetlands
Woodland
Major Road
Local Road
Trail
signs
Gravel pit
Culverts
Gate
Hunt camp
Building
Hydro line
Railway
Watercourses
Lots & Concessions
0
1,000
2,000
Meters
March 7, 2019
NAD 83, ZONE 17
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4.0 CURRENT USES OF THE COUNTY FOREST

4.1 Overview

The County Forest is used to support a variety of activities. These are at low-level intensities due to the limited size of the blocks. Existing uses of the County Forest can be divided into two broad categories: resource-based and recreational uses. Resource-based uses include activities such as sustainable forestry, habitat and wildlife management including trapping. Recreational uses include activities such as hunting and snowmobiling, cycling, hiking, cross-country skiing and fishing.

4.2 Resource-Based Uses

The County Forest has been managed employing the principles of sustainable forestry and has sought the assistance and expertise of forest professionals. As a result, the County Forest remains healthy, provides habitats for a variety of wildlife, supports recreational activities and generates revenues through the sale of forest products derived from the County's well-managed certified forests. Forestry activities have taken place in all of the County Forest parcels.

The Belmont-Dummer Block is recognized as an important winter concentration area for deer. The white-tailed deer (*Odocoileus virginianus*) occurs throughout the area and is considered to be a provincially featured species for habitat management and forest management planning exercises. Although this species thrives best in young forests with abundant edge and openings normally associated with significant disturbances to the landscape (e.g. fire, forest cutting, wind blowdown, etc.), white-tailed deer also have a specific need for closed canopy conifer (e.g. cedar, hemlock) forests to help shelter them from deep snow and harsh temperature and wind conditions during the winter. The tendency for deer to congregate in traditional yards during the winter demands special attention by forest and wildlife managers to recognize this special habitat type and ensure that optimal conditions are available both currently and in the future.

The Belmont-Dummer Block has been part of a registered trap line for many years confirming that responsible forest management that incorporates a broad range of objectives is successful in meeting wildlife habitat needs to support healthy wildlife populations and should continue to be integrated into forest management activities. Trapping does not occur on the Havelock Depot or Cavan Blocks.

4.3 Recreational Uses

Hunting and snowmobiling are the two most popular recreational activities taking place in the Peterborough County Forest at this time. The Belmont-Dummer Block is the largest of the three parcels and offers the most opportunity for broader uses.

There are several established hunt camps with permanent (P1, P2) or temporary (T1, T2) structures located in the Belmont-Dummer Block (Map 5). Day hunting for deer as well as for upland game is also popular. Hunting is not permitted in the Cavan and Havelock Depot Blocks.

The headwaters of the Ouse River are located at the northern extremity of the Belmont-Dummer Block, with the river continuing south-westerly through the center portion of this parcel. This is an

important coldwater stream with an abundance of Speckled Trout to support fishing activities. The other two blocks do not have water features to support any fishing opportunities.

The main north-south road in the Belmont-Dummer Block is part of the Havelock and District Snowmobile Club route. This trail connects with other trail systems allowing access to a wide variety of destinations. The road-trail network within the County Forest is limited but is also periodically used on a year-round basis. The County assumes no responsibility for its condition and its use is at the sole discretion and risk of the user.

The Cavan Block has access-compartment roads around its perimeter and supports a small trail network inside. This block is adjacent to the Ganaraska Forest and connects into the extensive trail network that is managed by the Ganaraska Region Conservation Authority. The trails in the Cavan block are primarily used for hiking and cross-country skiing.

Camping is not permitted in any of the County Forest parcels with the exception of the portable seasonal hunting camps in the Belmont-Dummer Block.

5.0 PAST FOREST MANAGEMENT OPERATIONS

Forest management embodies a suite of activities including administration and planning, monitoring, forest inventories, and silvicultural management such as stand improvement thinning, tending to control competing vegetation, and underplanting to restore regeneration where it is lacking.

During the two previous plan periods, 1990-1999 and 2000-2009, forest management operations included stand improvement thinning, tending and underplanting. The management focus during the recent plan period 2010-2019 has been on stand improvement thinning on approximately 218 hectares in areas of the Belmont-Dummer block not previously treated, updating the forest inventory in the Cavan Block, and underplanting 5,000 white pine seedlings in the Cavan Block.

The County Forest continues to generate modest revenues from timber sales given the relative size of the property and the scale-intensity of management activities. It is expected that this trend will continue over the next planning period. Table 5 provides a summary of forest management activities over the past 30 years. A map showing the specific areas treated in each of the three previous 10-year planning periods is presented in Appendix 1.

Table 5 Past Forest Management by 10-Year Planning Period

Management Item	Operating Period		
	1990-1999	2000-2009	2010-2019
Total Area Treated (ha)	574.4*	871.6*	262.9
Actual Management Cost	N/A	$ 87,995	$ 66,976
Total Revenue	$ 160,318	$ 437,450	$ 126,423
Revenues Per Hectare	$ 279.10	$ 501.89	$ 580.19

*Total area treated during 1990-1999 and 2000-2009 includes areas that were harvested, marked for thinning, planted, and tended. Some areas received more than one treatment during the period.

!Cost figures for management were not available for the 1990-1999 planning period. Given the forest management partnership that the County had with Domtar-Trenton during that time frame it is quite likely that the costs were covered by Domtar as part of their Woodlot Management Program. Estimated management costs and area treated for 2019 are included in the 2010-2019 operating period column.

Regular monitoring of the state of the Forest helps determine if the County is achieving the objectives set out in the management plan. Monitoring during the 2010-2019 planning period included:

- Annual monitoring for invasive plant species and non-native insects.
- Survival assessments on areas that were planted during the 2000-2009 planning period.
- Regular inspections of harvest operations.
- Inspections of access roads and trails to identify locations where maintenance is required.

6.0 STRATEGIC DIRECTION

6.1 Overall Management Objectives

The 2000 Forest Management Study established a set of principles and several objectives to guide resource management activities on the County Forest. These continue to be relevant today and are summarized below.

The principles represent a philosophy that the health of forest itself is of the utmost importance and that all other uses evolve out of good forest stewardship.

Principles

- *The sustainability of the forest is paramount.*
- *The forestry/resource use is the primary use of the County Forest.*
- *Recreational/cultural uses are secondary derivative uses for the forest.*
- *Forestry activities and uses enhance the forest for recreational and cultural opportunities.*

Management objectives are divided into two broad categories; Resource and Recreational.

Resource Management Objectives

1. *To be responsible stewards of the land through the protection and conservation of the soil, aquatic resources, forest and wildlife resources of the Peterborough County Forest and to respect the natural environment by adopting and implementing an ecosystems-based approach to the management of these lands.*
2. *To maintain the lands in the County Forest as forested lands and actively manage them in a sound environmental manner and in keeping with the principles of sustainability to ensure long-term health of eco-systems and their functions.*
3. *To recognize the social and economic values which are derived from the County Forest.*
4. *To promote healthy wildlife populations through the implementation of natural habitat enhancement programs.*

Recreational Objectives

1. *To increase public awareness of the Peterborough County Forest and the opportunities it provides for people and wildlife including recreation, tourism, hunting, outdoor education, cultural heritage and critical habitat*.
2. *Consider the responsible use of the Peterborough County Forest through increased public involvement in planning and management of the forest.*
3. *To cooperate with agencies that wish to conduct research in the Peterborough County Forest.*
4. *To take reasonable measures to make the Peterborough County Forest safe and accessible for a range of users.*

The relatively small size of the County Forest has placed limitations on the ability of the County to expand its levels of management and contributions to other land use activities.

The County Forest has been financially self-sustaining with revenues derived from the forest being directed into a Forest Reserve Account. The financial resources have been used to support management planning and operational activities on the County Forest. It is recommended that this practice continue, that the account be protected and be used to sustain ongoing management activities on the County Forest.

6.2 Resource Management Strategies

The following strategies will guide resource management activities and operations within the County Forest:

1. The Forest Inventory and associated mapping will be updated and improved on a continual basis to provide for accurate forecasting and decision making.
2. Mapping enhancements will occur on an ongoing basis to improve information on natural heritage features and will consider data from all available sources.
3. Maximum sustainable harvest levels will be determined using the best available science and locally adapted growth and yield data.
4. Silvicultural practices will be implemented to maintain a healthy and sustainable forest, including a predictable supply of forest products, regeneration of native species, diversity of forest communities, age classes, and habitats.
5. Plantations will be managed with the long-term goal of succeeding to mixed native species appropriate to the site.
6. Under-represented forest communities will be maintained or expanded where possible.
7. Forest areas containing or contributing to a range of significant features or functions may be defined as 'High Conservation Value Forests (HCVFs). HCVFs will be identified and mapped using all available data and updated on an ongoing basis. Management activities within HCVFs shall maintain or enhance the attributes which define such forests. Recreational use will be directed away from HCVFs and other significant natural heritage features.
8. Adjustments to annual plans and silvicultural practices may occur in order to optimize value, salvage declining timber, or respond to unforeseen events which may require salvage operations.
9. Silvicultural prescriptions will be prepared by a Registered Professional Forester. Prescriptions will be consistent with accepted forest management guidelines and practices and tailored to local forest conditions.
10. Trees will be marked for harvest by Certified Tree Markers and the marking will be performed in accordance with the silvicultural prescription.
11. Timber will generally be sold through an open bidding and 'upset price' system to ensure maximum and fair prices are attained relative to the current economic conditions.
12. Prior to harvest, a Timber Sale Contract will be signed between the Purchaser and the County to define respective responsibilities, performance standards, and to provide protection to the County in the event of a dispute or accident.

13. Harvesting operations will be regularly inspected to ensure compliance with the Timber Sale Contract Terms and Conditions.
14. Post-harvest monitoring will be conducted to ensure that silvicultural objectives have been met. Where objectives are not met or potential improvements are identified, a modified management approach will ensure continual improvement.
15. Protection of the timber resource will include measures to reduce potential losses from fire and theft. As most losses from insects and disease are part of the natural forest development process, intervention will only occur where the potential exists for significant loss of value and the cost versus benefit has been assessed.
16. Non-commercial operations will be considered where good opportunities exist to improve future commercial values.
17. Annual budgets for the management of the County Forest will be prepared by staff and approved by Council. All revenues generated by the County Forest will be credited to the Forest Reserve Fund; management expenses will be debited.
18. Certification of the County Forest through the Forest Stewardship Council will ensure that the forest continues to be sustainably managed while providing continued access to forest products markets.
19. New access roads will generally be temporary; existing access roads will be maintained and/or rehabilitated to minimize adverse impacts to natural heritage features. Necessary permits will be obtained as required.
20. Forestry operations will be restricted during critical periods to protect road infrastructure (i.e. freeze-up in fall, spring thaw)
21. Specific strategies to limit the impact of invasive exotic plants will be developed and implemented.

6.3 Recreational Use Strategies

1. The County Forest will continue to be available for authorized recreational activities as outlined in this plan and subject to County approval.
2. Hunting is permitted in the Belmont-Dummer Block. Hunting will continue to be prohibited in the Havelock Depot and Cavan Blocks.
3. The safety of all forest users is of utmost priority. The County will request existing hunters to organize themselves as formal legally recognized hunt clubs and enter into an agreement with the County for Right of Use.
4. The County Forest will be available for use as part of a network of recreational trails provided that such activities are consistent with the management principles and objectives set out in this plan.
5. Access points in all parcels will be adequately signed to encourage appropriate public use, to promote safety and to reduce incidents of trespass, vandalism and illegal dumping.
6. Property boundaries will be marked when resources permit to discourage trespass onto adjoining private lands and loss of timber from encroachment.
7. The boundaries of forestry operations will be verified on the ground and adjacent landowners will be notified prior to start up.
8. Management activities will be scheduled to minimize impact to forest users where possible.

9. The County will continue to support use of the County Forest for research which enhances knowledge of the forest and its management. New science and technology will be incorporated into forest management processes as appropriate.
10. The County will work to foster understanding and cooperation amongst users. Communication will include general public outreach and regular contacts with user groups.
11. The County will foster awareness and knowledge of the County Forest, its natural and cultural heritage values, and its sustainable management.
12. Where deemed appropriate and consistent with management resource objectives, Council will authorize the entering into agreements with user groups for the creation and maintenance of multi-use trails throughout the County Forest Blocks with funding for such activities borne by the user groups.

7.0 MANAGING THE COUNTY FOREST 2020-2029

The 2000 Forest Management Study identified four principles and established a number of objectives for sustainable management of the County Forest. These principles and objectives remain relevant today and represent a philosophy that the health of the forest is of utmost importance and that all other uses evolve out of good forest stewardship.

To succeed in the face of constant change, forest management must be adaptive. The County will regularly monitor the state of the Forest and review its management practices to ensure that they are effective in achieving the intended outcomes. The goal is to respond quickly and flexibly as needed while continuing to work toward the established objectives.

7.1 Silvicultural Management

Silvicultural management is the major tool available for enhancing the Forest's ecological integrity and advance its health. The County's major source of guidance for areas of natural origin is *The Silvicultural Guide for Managing Southern Ontario Forests* (MNR 2000).

The Guide sets out recommendations on stand structure and the silviculture systems to support them. Stand structure refers to the combined physical characteristics of all vegetation in a group of trees, while a silvicultural system is a planned series of actions to tend, harvest and re-establish a stand.

The Guide recommends three basic silvicultural systems – selection, shelterwood, and clear-cut - to successfully establish and maintain different forest types. These systems compliment the natural forces of establishment, growth, competition and decline that are at work in the forest, to achieve the desired outcomes. They are flexible and thus allow for protection and enhancement of other forest values and uses. These silvicultural systems are described in detail in Appendix 2.

The Silvicultural Guide does not provide guidance on managing conifer plantations. Best practices for these areas are based on earlier provincial guidelines and technical notes (Woods & Penner 2000, Ministry of Natural Resources 1999, Ministry of Natural Resources 1997, Smith & Woods 1997, Chapeski 1989) and on the collective experience of forest managers across southern Ontario.

7.1.1 Sustainable Harvest Levels

Sustainable forest management is based on a comprehensive forest inventory, expected growth rates, estimates of sustainable harvest levels and best management practices. It is supported by criteria and indicators of forest health and management success.

Estimating sustainable levels of harvesting in the Forest over the long term is based on the approach described in BOREAL: A tactical planning system for forest ecosystem management (Puttock et al. 1998). The system was used to estimate the sustainable timber supply for successive 10-year planning periods beginning with the 2010-2019 period. The system was updated in 2016 with revised growth projections using age data based on core samples collected from living trees during pre-harvest assessments over the 2010-2015 operating period. Table 6 outlines the estimated harvest levels by forest community over the duration of this plan. Assumptions and calculations of sustainable forest management are described in Appendix 3

Timber products from silvicultural management help to support the County's forest industry. The detailed schedule for stand improvement thinning over the 2019-2029 plan period and associated maps appear in Appendices 4.1 & 4.2 respectively.

Table 6 Sustainable Forest Management by 5-Year Operating Period. Based on Stands Proposed

Forest type	Period 1 (2020-2024) (ha)	Period 2 (2025-2029) (ha)	Total (ha)
Red Pine	74	0	74
White Pine	0	37	37
Upland Hardwood	27	103	130
Bottomland Hardwood	0	0	0
Poplar	37	0	37
Bottomland Conifer	12	0	57
Total (ha)	150	140	290

7.2 Managing Threats

Over the next 10 years, the Forest will face numerous threats and challenges. Some of these are well-known today and efforts at managing them are under way. Others are emerging and some lie entirely in the future. All will need to be assessed and mitigated appropriately to the extent possible over the life of this Plan.

7.2.1 A Changing Climate

Forests are dynamic ecosystems subject to the effects of climate and natural disturbances. In future, climate is expected to be warmer and less predictable, with more severe weather and anomalies like sudden heat or frost in the spring as leaves are expanding. These impacts will change the variety of tree species in the Forest, where they grow, their age distribution, and the forest's structure.

Climatically suitable habitats for most species will shift northward and to higher elevations, but the actual movement of the species they support is expected to lag (McKenney et al. 2007). Some scientists propose assisting this migration by moving plants or seeds to emerging habitats sooner than would happen naturally. In the case of the Peterborough Forest, for example, this might mean planting such southerly species as Sycamore (*Platanus occidentalis*), Sassafras (*Sassafras albidum*) and Tulip tree (*Lirodendron tulipifera*) in suitable locations.

As the climate changes, the length, frequency, and severity of droughts will likely increase. This is already affecting red pine in the Cavan Block, which puts down only shallow roots in the alkaline soils and is therefore more stressed in times of drought. Older plantations in particular have become more susceptible as a result to red pine decline, a fungal disease discussed in more detail below.

Forests and the wood they produce trap and store carbon dioxide, a major contributor to climate change. This process, known as carbon sequestration, helps to reduce the impacts of carbon dioxide produced by burning fossil fuels (Colombo 1998). Long-term conversion of the conifer

plantations in the Cavan and Belmont-Dummer Blocks to natural forest communities is restoring natural diversity and further increasing carbon sequestration per hectare (Liao 2010). This conversion often involves thinning which can promote carbon sequestration by giving the remaining trees access to more soil moisture and light and by encouraging natural regeneration of native tree species, both of which improve the resiliency of the forest. The intensity of thinning (as expressed by the difference between pre- and post-thinning basal area) can have a profound effect on the stand's net carbon balance (Magruder et al. 2013).

7.2.2 Non-Native Invasive Plants

Non-native invasive plants can quickly take over a forest site, crowding out native flora and in some cases overtopping small trees and shrubs. Of particular concern are Dog-strangling Vine (DSV) (*Vincetoxicum rossicum*), Garlic Mustard (*Alliaria petiolata*), and two species of Buckthorn (*Rhamnus cathartica, Rhamnus frangula*), all of which are well-established throughout Southern Ontario forests. Giant hogweed (*Heracleum mantegazzianum*) is a possible emerging threat.

Dog-strangling vine is an extremely aggressive member of the milkweed family that is now established throughout southern Ontario. It is perhaps the most significant biological threat to southern Ontario forests since it forms a thick layer, smothering seedlings and strangling saplings, which stops regeneration. It is also a threat to the monarch butterfly because monarchs will lay eggs on it, but monarch caterpillars cannot eat the plant. DSV was noted in the Cavan Block during the 2018 forest inventory. Small colonies of DSV are also present at the entrance to the Belmont-Dummer Block and in the vicinity of temporary Hunt Camp T1 (Map 5).

Figure 3 Heavy Dog-Strangling Vine Near Orono
(Silv-Econ Ltd.)

Common (European) **buckthorn** and **Glossy buckthorn** are exotic shrubs that readily invade natural communities, often aided by birds that disperse their seeds. They have long growing seasons and rapid growth rates, and re-sprout vigorously following removal of aboveground tissues. Buckthorns leave chemicals in the soil that hamper the growth of other plants. Buckthorn was observed in the Cavan Block during the 2018 forest inventory.

Garlic mustard is a biennial herb native to Europe. This species is a serious threat to deciduous forests not just because it forms dense clumps that shade out other plants but, like buckthorn, it secretes chemicals into the soil that prevent their return even after it is removed. It grows in a wide range of habitats and spreads quickly along roadsides and especially recreational trails, its seeds often carried inadvertently by humans, pets and wildlife. When found in manageable populations, it is removed chemically along with other undesirable species. To date, it has not been observed in the County Forest.

Giant Hogweed is native to the Caucasus of Eurasia and is thought to have been deliberately introduced into Canada as an ornamental plant. The plant can form very dense, tall colonies originating from just one seed. A significant concern is human health effects from the toxic sap of the plant that can cause severe skin reactions and burns in susceptible individuals (MacDonald and Anderson 2012). Early detection of this plant, through monitoring along established trails and roadways, might allow the County to control it before it becomes well established. This plant has not been detected in the County Forest.

7.2.3 Pathogens

Healthy ecosystems contain pathogens that are integral to the cycle of growth and decay. However, a number of pathogens are damaging the health of the Forest and, by attacking species that are important food sources for wildlife, potentially threatening the animals within it as well.

Red pine decline, which is caused by root-rotting fungi, is widespread in Southern Ontario and has been observed in both pockets and individual trees in the Cavan Block. As discussed in the section on climate change, this is probably a result of more frequent droughts, which stress shallow rooted trees in particular.

Butternut is now endangered in Ontario owing to a fungus (*Ophiognomonia clavigignenti-juglandacearum*) and is protected under the *Species at Risk Act*. Once a tree is infected by the fungus, halting the spread of the disease is difficult. It is recommended that infected trees be removed, and efforts focus on protecting the remaining healthy trees. This can include removing nearby competing species to provide more sunlight and promote growth. An assessment by a Butternut Health Assessor must be completed before a Butternut tree can be removed.

Butternut occurs naturally in the southern reaches of the Great Lakes-St. Lawrence forest zone. It has not been observed in the Peterborough County Forest and is not known to be in the vicinity of the Belmont-Dummer or Havelock Depot Blocks. but has been observed near the Cavan Block. It may be possible, therefore, to plant healthy, canker-free Butternut in the Belmont-Dummer Block as a means of establishing a population of disease-free Butternut in a location where the disease is not currently present.

Oak wilt is caused by a fungus, *Bretziella fagacearum* (previously called *Ceratocystis fagacearum*), that is spread by natural root grafting of oaks or by nitidulid (sap) beetles. Once the fungus enters the sapwood, initially in the outer growth rings, it stimulates the formation of tyloses (balloon-like structures). This impairs circulation to the crown of the tree and the leaves start to wilt. While red oak is particularly susceptible, all oak species are at risk. There is no cure for oak wilt, which is not yet present in Ontario, but it can be prevented by minimizing tree wounds and refraining from harvesting oaks from April to August during the flight season of the beetles. Mechanical cutting to disrupt grafted root systems can be effective in controlling the expansion of oak wilt pockets. As well, fungicides have been developed that may prevent the disease when injected into trees without active symptoms (O'Brien et al. 2011).

Beech bark disease is caused by a fungus (*Neonectria faginata*), the entry of which is facilitated by an insect, the beech scale (*Cryptococcus fagisuga*) The insect feeds on the American beech, creating holes in the bark that become an entry point for the fungus. The stress of the insect attack also decreases the tree's resistance to the fungal infection. Beech are found on many upland sites in the County Forest. Infected trees should be marked for removal during stand improvement thinning operations.

7.2.4 Non-Native Insect Infestations

Invasive non-native insects often do more damage than native ones because they have fewer or no natural enemies or pathogens to limit their spread, and their host plant may have no natural resistance.

Emerald ash borer (*Agrilus planipennis*) attacks and kills all species of ash. Native to eastern Russia, northern China, Japan, and Korea, it had never been seen in North America before June of 2002. The insect is now widespread across southern Ontario. Ash species (*Fraxinus* species) represent a significant component in the overstory of several stands in the Peterborough County Forest. Several stands in the Belmont-Dummer Block are being monitored for EAB. To date EAB has not been detected in the County Forest.

Gypsy moth (*Lymantria dispar dispar*) is native to Europe, where it feeds on the leaves of a wide variety of tree species. It was first detected in Ontario in 1969, but widespread defoliation did not occur until 1981. Populations are now established throughout southern Ontario where the moth's range coincides with that of oak, its preferred host. The insect overwinters in the egg stage, often on the bark of trees, and in the spring, the larvae emerge to feed on new foliage. Outbreaks occur every seven to ten years. Stands containing oak are particularly vulnerable. Control measures include aerial application of insecticides in June when the insect is actively feeding. Egg masses can also be physically removed and destroyed. Gypsy moth populations have also collapsed from rapid proliferation of the fungus *Entomophaga maimaiga*. Monitoring for egg masses on the bark of trees is done during pre-harvest stand assessments and tree marking.

Asian longhorned beetle (*Anoplophora glabripennis*), which is native to China and the Korean Peninsula, was first discovered in Canada on the boundary between Toronto and Vaughan in 2003, and then again in Mississauga in 2013. The Canadian Food Inspection Agency led a program aimed at eradicating the beetle from the affected areas. It is believed these efforts have been successful, but monitoring continues. Spread of this beetle would be devastating for the Peterborough County Forest and woodlots throughout southern Ontario because of the wide variety of native deciduous tree species that it would attack.

The **hemlock woolly adelgid** (*Adelges tsugae*), which kills its host, represents a potential threat to Ontario forests. Hemlock is present as a minor species in several stands in the Belmont-Dummer Block. The County, through its contract forest managers, participates in a forest managers' working group to share information and be proactive in detecting the threat early, which will be essential to controlling its spread.

Figure 4 Hemlock Woolly Adelgid Egg Masses
(Chris Evans – Bugwood.org)

7.3 Fire Protection

The objective for fire management in the County Forest is to:

> Prevent personal injury or loss of life and minimize damage to the resources of the Peterborough County Forest that may be the result of wildfire.

Recommended Strategies

1. Actively suppress all wildfires.
2. Implementation of management actions such as hazard reduction on an as need basis.
3. Limit or restrict management activities in the County Forest during extremely dry conditions.
4. Incorporate prevention and detection programs delivered by local Municipal Fire Services.
5. Adhere to the provisions of the County's Emergency Plan (March 2007).
6. Provide local emergency services with maps of the County Forest and the necessary contact information.
7. Ensure contractors working in the County Forest have the necessary fire suppression equipment given the size and scope of the operations taking place, contact information for an emergency.

There has not been a wildfire in the County Forest however this does not eliminate the risk of fire (natural, man-made fire). Species composition, canopy cover, ecological moisture regimes (wet, dry sites) and exposure all influence the moisture characteristics of forest fuel complexes and fire behaviour. Other factors that affect fire behaviour are stand age, height, species composition of the understory, In general terms deciduous forests have a low fire risk, conifer dominated forests have a high fire risk while the risk to mixedwood stands is dependant upon the amount and type of coniferous species present (pine vs cedar).

Deciduous stands, lowland cedar areas and swamps may serve as natural firebreaks in a forested landscape. Fields, hydro corridors and roads also serve in this capacity. A fire risk assessment was conducted for the County Forest using the forest community type from the forest inventory data and each stand was assigned a fire risk rating of high, moderate or low. The assignment of risk rating for the forest community types were as follows:

- High Fire Risk: pine, spruce
- Moderate Fire Risk: hemlock, balsam, upland cedar
- Low Fire Risk: all hardwoods, lowland cedar

Areas that are frequented by the public such as hunt camps and recreational trails, were also identified as high risk areas. The results of this assessment are presented on Map 6.

All of the Havelock Depot Block is considered to be low fire risk and this block has limited use and limited access. The Works Department Yard would serve as a good staging area for emergency personnel and equipment.

The Cavan Block is predominately red pine plantations and therefore has a high fire risk. The block is used by hikers and cyclists and the municipal roads are used by ATV's and motor-bikes

which also increases the risk of fire. The roads within the block serve as good firebreaks. There are wider areas along the roads that could be used as staging areas in addition to the Ganaraska Forest Centre. There is limited opportunity to secure water from the small creek-swamp in the north-west part of the parcel, therefore road access for fire suppression is important.

Most of the Belmont-Dummer Block has a low fire risk while there are isolated pockets of forest that have a moderate or high risk. The two main roads and some of the better trails can serve as firebreaks. However, access to the northern-half of this block by emergency vehicles would be limited due to the relatively poor condition of the road. The entrance area and other road intersections could serve as staging areas. There are ample opportunities to secure water from the Ouse River, creeks and swamps in this block.

Fire suppression responsibilities for the Peterborough County Forest resides with various municipal fire services. As the landowner, the County has a responsibility for ensuring reasonable access to the properties and a responsibility for fire prevention. The Township of Douro-Dummer (DD) has an automatic aid agreement with the Township of Havelock-Belmont-Methuen (HBM) such that DD and HBM are dispatched for any incident at the same time to ensure the quickest available response. The aid agreement applies to the area of the Belmont-Dummer Block marked as Automatic Aid on Map 7. The Township pays an annual fee to have the Ministry of Natural Resources & Forests (MNRF) responsible for fire suppression in the north part of the Dummer-Belmont Block County Forest (Marked as MNRF Area on Map 7).

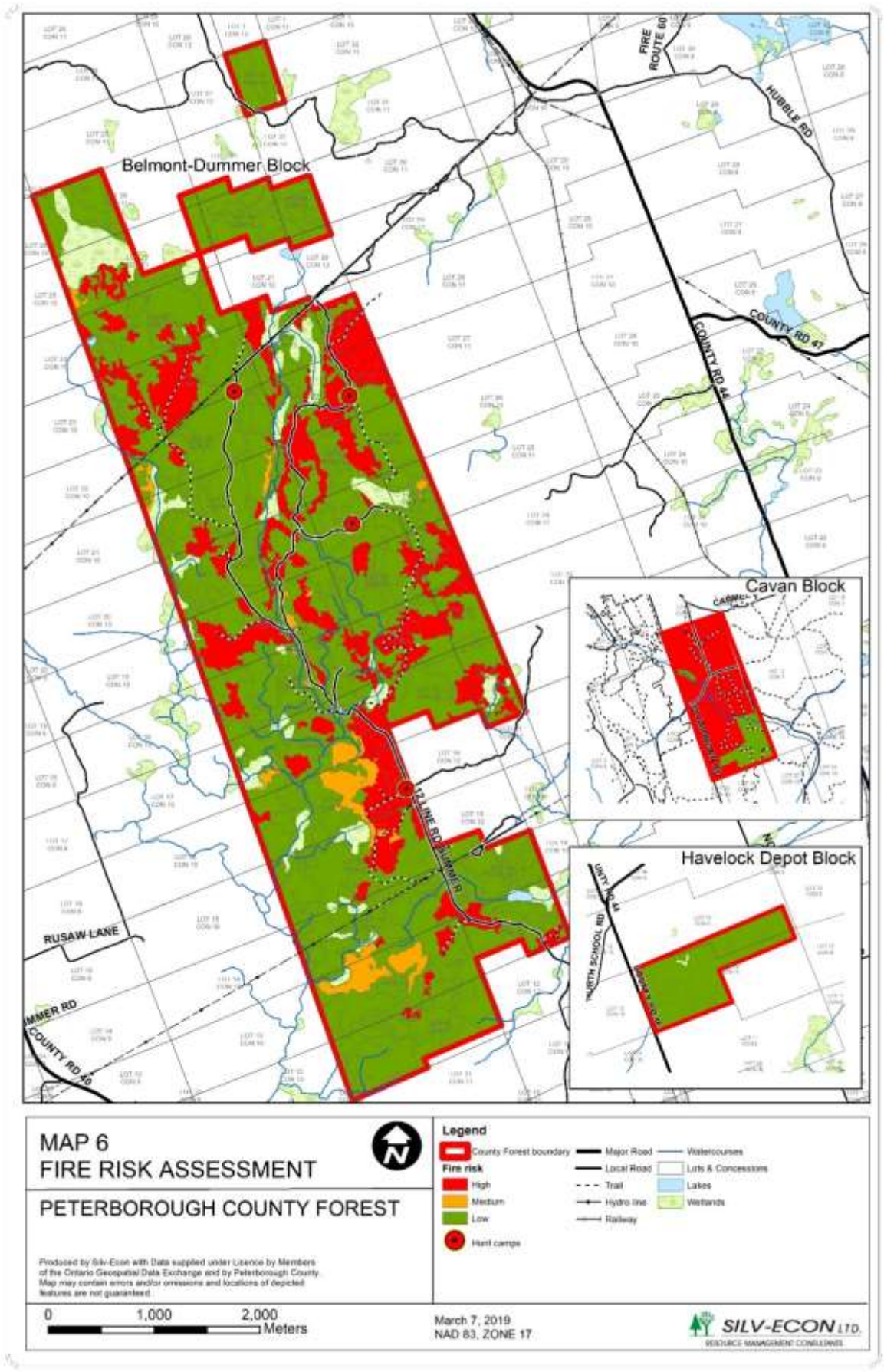
Cavan Monaghan's Fire Department is the responding agency for fire suppression in the Cavan Block. To supplement Cavan Monaghan's efforts in the event of a large-scale forest fire there is an arrangement that calls upon the services of the City of Kawartha Lakes, Port Hope, and Clarington fire departments.

Forest management activities to reduce fire threats or risks within the County Forest may include;

1. Thinning (especially plantations) to reduce stand densities and promote height growth to reduce the risk of crown torching and crown fires.
2. Slash management strategies including the lopping of tops and branches and in some instances distributing the slash over the harvest-thinning site (case by case basis).
3. Stand improvement and sustainable harvesting activities to maintain a healthy, vigorously growing forest.
4. Prescribed burning and in combination with thinning and harvesting could be considered but would not normally be recommended in the County Forest due to high costs and potential risks.

Other actions the County could consider undertaking reduce fire risks and enhance emergency responses may include but not limited to;

1. Brushing the edge of the main roads.
2. Grading and road improvements north of the site of the former County House (building now removed).
3. Posting signs at the entrances to all blocks with contact information.


Belmont-Dummer Block
Cavan Block
Havelock Depot Block
FIRE ROUTE 60
HUBBLE RD
COUNTY RD 47
COUNTY RD 44
12 LINE RD
RUSAW LANE
COUNTY RD 46
MAP 6
FIRE RISK ASSESSMENT
PETERBOROUGH COUNTY FOREST
Legend
County Forest boundary
Major Road
Watercourses
Fire risk
Local Road
Lots & Concessions
High
Trail
Lakes
Medium
Hydro line
Wetlands
Low
Railway
Hunt camps
Produced by Silv-Econ with Data supplied under Licence by Members of the Ontario Geospatial Data Exchange and by Peterborough County. Map may contain errors and/or omissions and locations of depicted features are not guaranteed.
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March 7, 2019
NAD 83, ZONE 17
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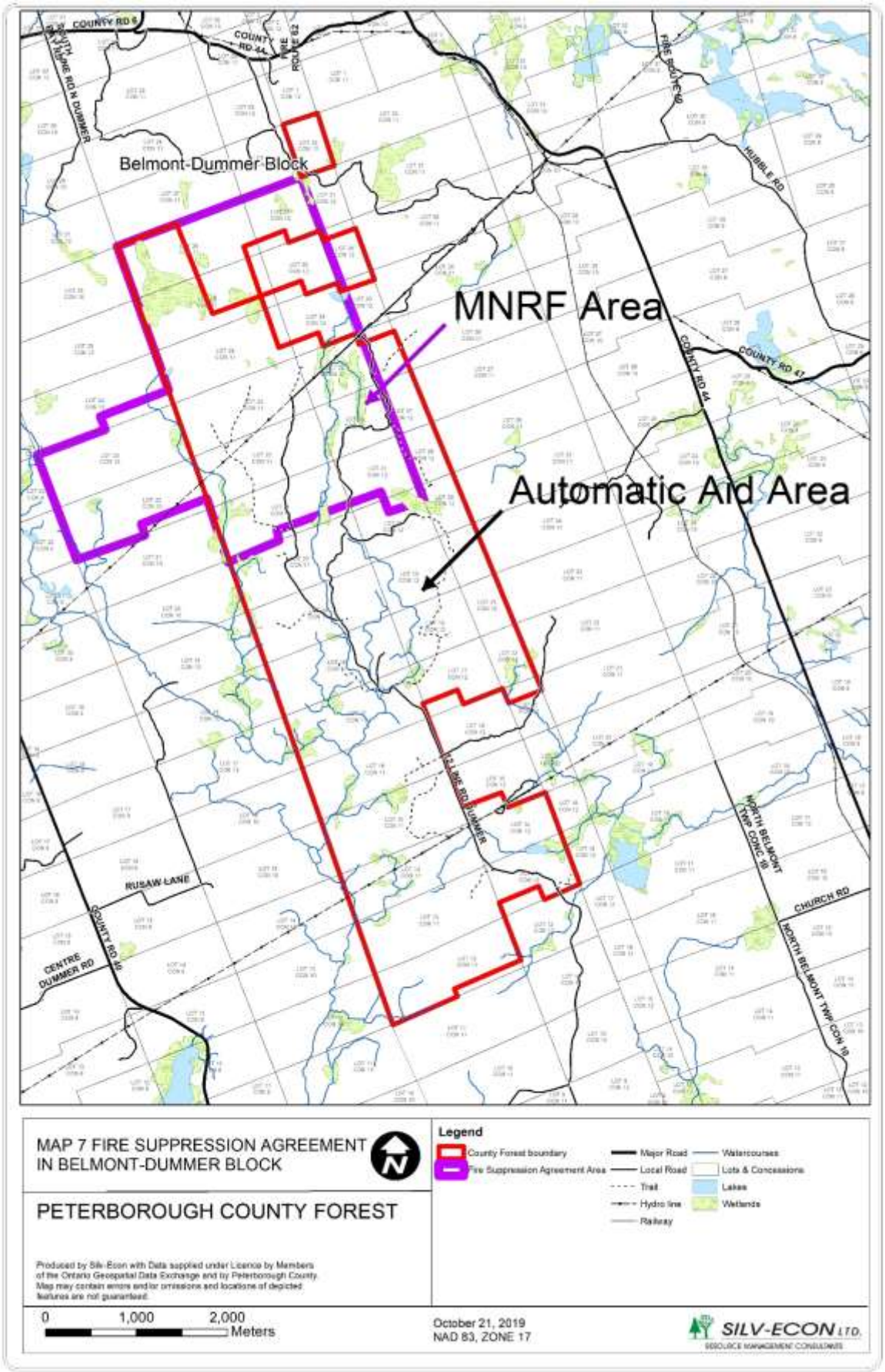
Belmont-Dummer Block
MNRF Area
Automatic Aid Area
COUNTY RD 6
COUNTY RD 44
ROUTE 62
FIRE ROUTE 49
HUBBLE RD
COUNTY RD 47
COUNTY RD 44
RUSAW LANE
COUNTY RD 46
CENTRE DUMMER RD
CHURCH RD
NORTH BELMONT TWP CONC 10
NORTH BELMONT TWP CON 10
MAP 7 FIRE SUPPRESSION AGREEMENT IN BELMONT-DUMMER BLOCK
PETERBOROUGH COUNTY FOREST
Legend
County Forest boundary
Fire Suppression Agreement Area
Major Road
Local Road
Trail
Hydro line
Railway
Watercourses
Lots & Concessions
Lakes
Wetlands
Produced by Silv-Econ with Data supplied under Licence by Members of the Ontario Geospatial Data Exchange and by Peterborough County. Map may contain errors and/or omissions and locations of depicted features are not guaranteed.
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October 21, 2019
NAD 83, ZONE 17
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7.4 Forest Inventory Update

A forest inventory is a fundamental tool for describing the current health of the forest, identifying resource values, and identifying stands that will benefit from silvicultural management. A comprehensive forest inventory was completed for the Cavan Block in 2018. The forest inventory for the Belmont-Dummer and Havelock Depot Blocks was last updated in 1999 and a new inventory is proposed for these blocks during the 2020-2024 operating period.

The inventory will involve establishing approximately 500 sample plots throughout the two blocks. Data to be collected include tree species and diameter at breast height (DBH), average height, regeneration species composition, ground vegetation, and wildlife habitat features. The results of the inventory will be used to confirm the stands proposed for harvesting in these blocks over the period of this management plan.

7.5 Infrastructure Improvements

7.5.1 Access

The existing network of access toads and trails has been adequate to support previous forest management activities and recreational use of the County Forest blocks. Harvesting is scheduled in all three blocks during the term of this management plan. The road network in the Cavan and Belmont-Dummer Blocks is sufficient to support the proposed harvesting activities. The previous extraction road in the Havelock Depot Block will need to be re-opened. Approximately 1 kilometre of new extraction road may also be required to access the eastern portion of this block. This road will be constructed by the harvesting contractor.

The updated forest inventory may also identify stands at the north end of the Belmont-Dummer Block for future harvesting (Lots 25 & 30 Concession 12). If so, additional access roads will be needed to reach these stands. The roads will also improve access for recreational activities in this section of the Belmont-Dummer Block.

7.5.2 Signage

A Peterborough County Forest sign including the FSC logo and contact information is proposed for the Cavan and Havelock Depot Blocks. Signage indicating Permitted and Prohibited Uses is recommended for all three Blocks.

7.5.3 Protection from Illegal Cutting and the Dumping of Garbage

There is on occasion the illegal cutting of fuelwood in the Belmont-Dummer Block. This has been confined to areas along the main road. The occurrence is normally on weekends and when management activities in the County Forest are not taking place. This does not appear to be an issue in the other blocks.

The illegal dumping of garbage is not a problem on either of the Cavan or Havelock Block but is a concern in the Belmont-Dummer Block. This too occurs after hours, on weekends and is generally confined to areas along the main road. Items have ranged from fibreglass boats, construction materials, yard waste, shotgun shells, furniture, tires, and other household garbage.

Routine monitoring by County staff and contractors of access points, property boundaries, and road corridors for illegal activity and dumping of garbage will help to identify issues as they arise. The County may also wish to consider fostering partnerships with Forest users to enhance and facilitate the monitoring of the County Forest.

8.0 MONITORING AND REPORTING

Routine monitoring of forest conditions, recreational use, and management activities is an important component in sustainable forest management. Formal monitoring is based on documented protocols and is typically completed on a regular basis. Examples include:

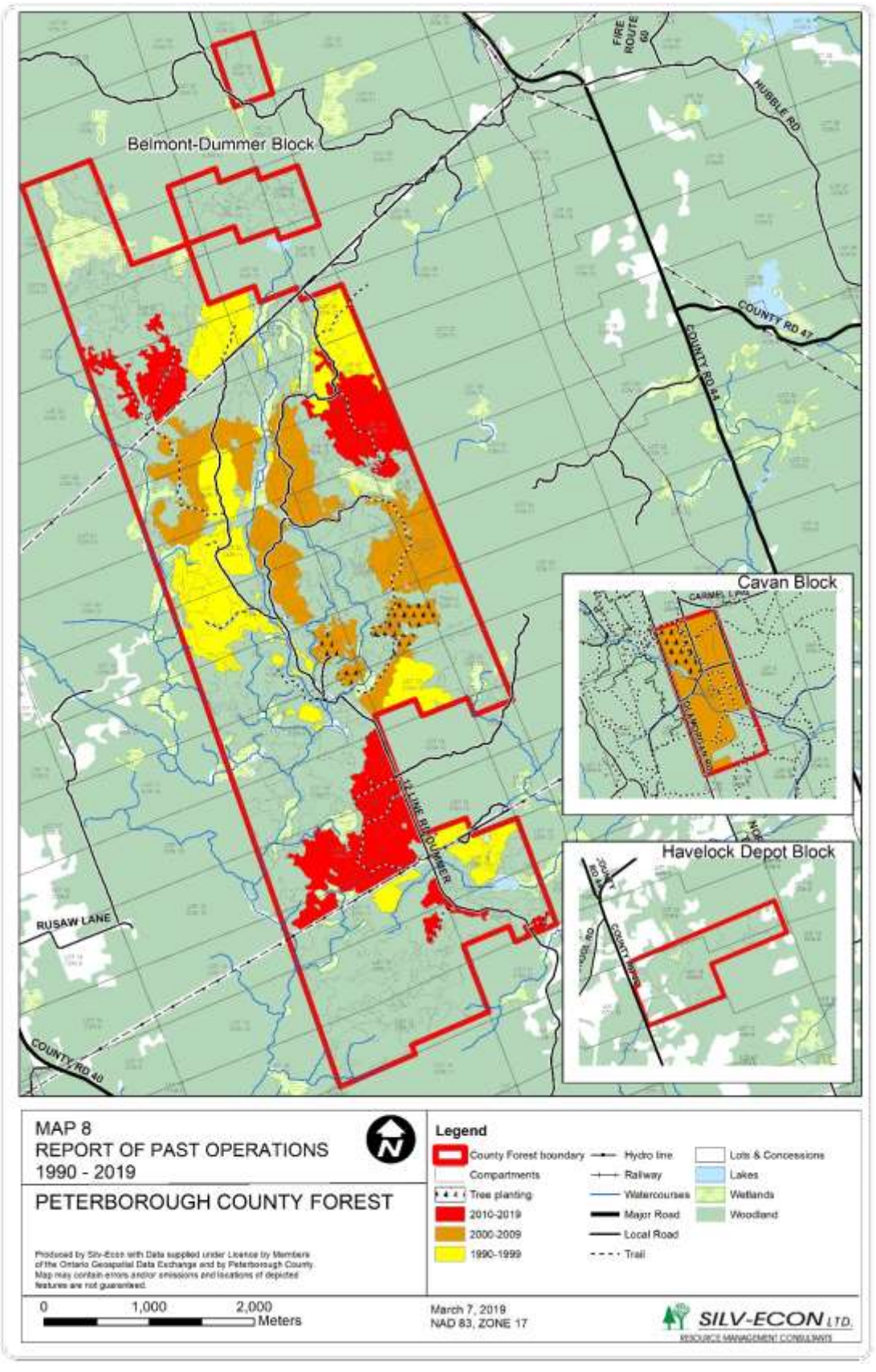
- Timber harvest inspections
- Forest inventory updates (every 10 years)
- Tree planting survival assessments (1,3, & 5 years following planting)
- Annual inspections for invasive plants and non-native insects
- Inspections of access roads and trails

Informal monitoring is typically based on ad-hoc inspections or qualitative observations, examples of which include site inspections in response to complaints and observations made during other monitoring activities.

The duration and frequency of monitoring activities (formal or informal) vary in the County Forest. Monitoring activities are developed based on the scale and intensity of management/uses and may change over time in response to changes in the forest and management pressures.

The County's contract forest manager prepares Annual Reports of Forest Management Activities and Annual Work Plans accompanied by a list of proposed activities for the following year with forecast expenditures and revenues.

APPENDIX 1 PAST OPERATIONS 1990-2019



APPENDIX 2 SILVICULTURAL SYSTEMS AND GROUND RULES

Silvicultural Systems

The principle means by which timber management objectives are achieved is through the application of silvicultural systems. Silviculture may be described as the theory, science and art of controlling forest establishment, development, composition and reproduction. The practice of silviculture involves various treatments to maintain and enhance the productivity of forest stands in addition to controlling and manipulating the above. A silvicultural system is the process by which the forest is managed (harvested, renewed, maintained).

A sound working knowledge of the nature of forest tree species and how they grow, reproduce and respond to environmental changes enables managers to critically assess site and forest stand conditions. Management systems can be adopted which will best suit the forest species and surrounding environment.

One of the most important functions of silviculture is to promote the compositional development of the forest stand to those species that are best suited to the local sites. Inferior tree species and poorly formed stems occur in most forest stand situations. These individuals grow at the expense of desirable trees therefore efforts to control their numbers will be made. This is achieved primarily through the control of harvesting activities. It is recognized that poorly formed and declining trees have their place in the ecosystem and although efforts to control their numbers are proposed they will not be eliminated from the forested landscape.

Altering the intensity and timing of harvesting operations will result in the control of undesirable stems, and the progression towards the development of healthy, productive forest stands containing vigorous individuals well suited to grow on that particular site. Harvest control can also produce environments that are more suitable for the establishment and growth of a particular tree species over another if that is a desired management outcome.

Implementation involves pre-harvest assessment and development of silvicultural prescriptions by a Registered Professional Forester and tree marking of selected stands by provincial Certified Tree Markers.

Three basic approaches have been developed over the years to successfully establish and maintain different forest types. These systems compliment the natural forces of establishment, growth, competition and decline that are at work in the forest, to achieve the desired outcomes. They are flexible and thus allow for protection and enhancement of other forest values and uses.

The following management systems are the basic techniques used to establish, maintain and improve the different forest types found in Ontario and will be utilized in the management of the Peterborough County Forest.

Selection System

The selection system is ideally suited to the upland tolerant hardwood forest type and in areas where a high degree of forest cover is beneficial to other forest values and uses.

Trees are commonly removed either as single individuals or in small groups, at relatively short time intervals (15-20 years). The choice of single vs group selection is dependent upon the

objectives of the stand and the species present or desired in the forest. These periodic harvests create a forest containing trees of all sizes and ages.

Trees of all ages are harvested including those that are defective, over mature and those trees competing with others of greater potential value. Some poor quality trees are retained in the stand to provide specific biological and ecological functions (snags, cavity –den trees etc.). This improves the quality and the health of the remaining forest.

In maple, beech and hemlock forest mixtures, most species present will grow and reproduce in the shade of other trees. Regeneration develops from natural seed or seedling sprouts in the small openings created.

Shelterwood System
The shelterwood management system is used to regenerate tree species that have light requirements between that produced by the selection and clear-cut management systems. The amount of light available to the regenerating trees is managed by a series of cuts. The first cut leaves a partial cover of the best trees to provide seed and the necessary shade to obtain and develop regeneration. Once seedlings have established the overstory is further reduced and / or removed completely to allow the new forest to grow unimpeded.

By having the new forest in place before the partial cover is removed, the forests under this management system maintain their aesthetic appeal and cover for wildlife. This is a useful system for regenerating species such as white pine, hemlock, red oak and yellow birch. This system can also be utilized in the management of some tolerant hardwood forests. Forests managed under this system normally contain trees that are approximately the same age.

Both the selection and shelterwood timber management systems utilize natural regeneration to renew the forest although artificial measures may be used to supplement natural regeneration.

The uniform shelterwood system will be the preferred technique to be used in the Peterborough County Forest, however, the strip shelterwood system may be employed for some stand types.

Clearcut System
When this system is employed all merchantable trees are removed at one time. This type of harvesting system is well suited for species requiring full sunlight to establish and grow (e.g. poplar, white birch, red pine). Regeneration may come naturally from seed present on the forest floor or sprouts from the cut stumps or artificially by planting.

Specific trees (species, size, quality) can be strategically retained to provide additional regeneration options as well to provide for both the species and structural diversity of the future stand. These trees are called seed trees or standards. This technique will be utilized wherever possible.

The *Silvicultural Guide for the Tolerant Hardwood Forest* (OMNR 1998) and the *Silvicultural Guide for the Great Lakes St-Lawrence Conifer Forest* (OMNR 1998) and the *Silvicultural Guide to Managing Southern Ontario Forests* (OMNR 2000) in Ontario provide excellent discussions of these silvicultural systems.

Silviculture plays a major role in forest management. It is recognized that there may exist situations where the normal silvicultural system does not fit the forest condition. In these

situations, deviations from the established system may result and are recommended where necessary to meet forest management objectives and the individual needs of each forest stand.

Silvicultural Ground Rules for Normal Operations

As part of the forest inventory process all individual stands were assigned to a forest community to facilitate the organization and management of the forest community types in the County Forest. A forest community is defined as an aggregation of stands which are to be managed under the same rotation and silvicultural system. Five forest communities are recognized in the Peterborough County Forest as shown previously in Figure 1.

Stands are assigned to forest communities based on the composition of the overstory. Other stand features / parameters such as structure, quality, regeneration, and soil characteristics are not considered at this point but are taken into consideration at the time of prescription development and management implementation to ensure the treatment is appropriate for the stand-site conditions and the objectives of the forest stand.

The forest communities and the silvicultural system to be applied are listed in Table 7. These silvicultural systems are accepted management practices and are consistent with sustainable forestry. The criteria used and the management system to be used is described in more detail in Appendix 3.

Table 7 Silvicultural System by Forest Community

Forest Community	Silvicultural System
White & Red Pine	Uniform Shelterwood
Upland Hardwood	Selection (individual tree or group)
Bottomland Hardwood	Selection (individual tree or group)
Bottomland Conifer	Clearcut - strip or Uniform Shelterwood
Poplar	Clearcut – with residual standards

Operational Strategies for Areas of Concern

A number of resource features, referred to as areas of concern (AoC), can be encountered when performing forestry operations, (e.g. critical habitats for wildlife, riparian areas, wetlands, high conservation value forest). The Ministry of Natural Resources has developed guidelines for conserving areas of concern. Appendix 5 provides a summary of Area of Concern Strategies and Forest Conservation Measures for the Peterborough County Forest and references for the provincial AoC guidelines.

APPENDIX 3 SUSTAINABLE TIMBER MANAGEMENT

Sustainable Timber Management Model

The long-term sustainable timber management for the Peterborough County Forest is estimated following the approach described in BOREAL: A tactical planning system for forest ecosystem management (Puttock et al. 1998). The calculations for each forest community take into consideration the age class distribution, pre-thinning stand structure (species composition, density, basal area) regeneration species and density, presence of invasive species and primary

disease factors (e.g. red pine decline), yield tables that describe expected growth rates, previous management activity, and targets for residual stand structure. The system projects outcomes of management alternatives in terms of sustainable harvest levels. System components include descriptive statistics and other information that describe the state of the forest, silvicultural systems and yield tables, and various policy scenarios.

The BOREAL model was updated in 2016 with revised growth projections using data obtained from increment cores collected during the previous plan period The updated model applied to estimate sustainable harvest levels for 5 year periods over a 100 year planning horizon.

The updated BOREAL model was applied to the areas of the County Forest that are available for silvicultural management. The managed forest area of 1585 hectares represents approximately 85 per cent of the total County Forest area and does not include wetlands and inoperable areas such as riparian buffers, steep slopes, and inaccessible or wet forest sites.

A variety of silvicultural systems are used in managing the timber resources of the Peterborough County Forest including (i) 2-, and 4-step uniform shelterwood, (ii) uneven-aged single tree and group selection, (iii) even-aged clear-cut with standards, and (iv) even-aged clear-cut strip/patch. The *Silvicultural Guide for Southern Ontario* (OMNR 2000) provides excellent discussions of these silvicultural systems. Table 8 provides a description of the silvicultural systems and management criteria for the forest communities in the Peterborough County Forest.

Table 8 Silvicultural Systems and Management Criteria - Peterborough County ForestTable

Forest Community	Silvicultural System	Rotation / Cutting Cycle (yrs.)	Regeneration Period (yrs.)	Thinning Stages	% Basal Area Cut	Basal Area Growth Factor in Managed Stands
White Pine, Red Pine (includes plantations)	Uniform Shelterwood 4-cut	140	5-10	• 1st thinning at age 50 • 2nd thinning at age 65 • Prep cut at age 90 • Seed cut at age 110 • Release cut at age 130 • Final cut at age 140 • Stand remains as pine	1st and 2nd - 30% Prep – 40% Subsequent 50% Final 90%	0.18 m^2/ha/yr.
Bottomland Conifer (Cedar, Spruce, Larch, Balsam)	Patch/Strip Cut with standards	120	5-10	• 1st thinning at age 60 • 2nd thinning at age 80 • Final thinning at age 100 • Stand remains as bottomland conifer	1st - 30% 2nd - 50% Final - 90%. Retain 4m^2/ha.	0.18 m^2/ha/yr.
Upland Hardwood, Bottomland Hardwood (Red oak, Sugar maple, White ash, Red maple, other hardwoods)	Selection	15-20	1	• managed under an all-aged or uneven-aged management system • stand remains as upland/bottomland hardwood	25-30 % basal area reduction at any one time	0.24 m^2/ha/yr.
Poplar (Poplar, White birch)	Patch Cut with Standards	80	1	• Final thinning at age 70 • Stand remains as intolerant hardwood/Poplar	Final – 80%. Retain 4 m^2/ha	0.45 m^2/ha/yr.

APPENDIX 4 SCHEDULED OPERATIONS 2020-2029

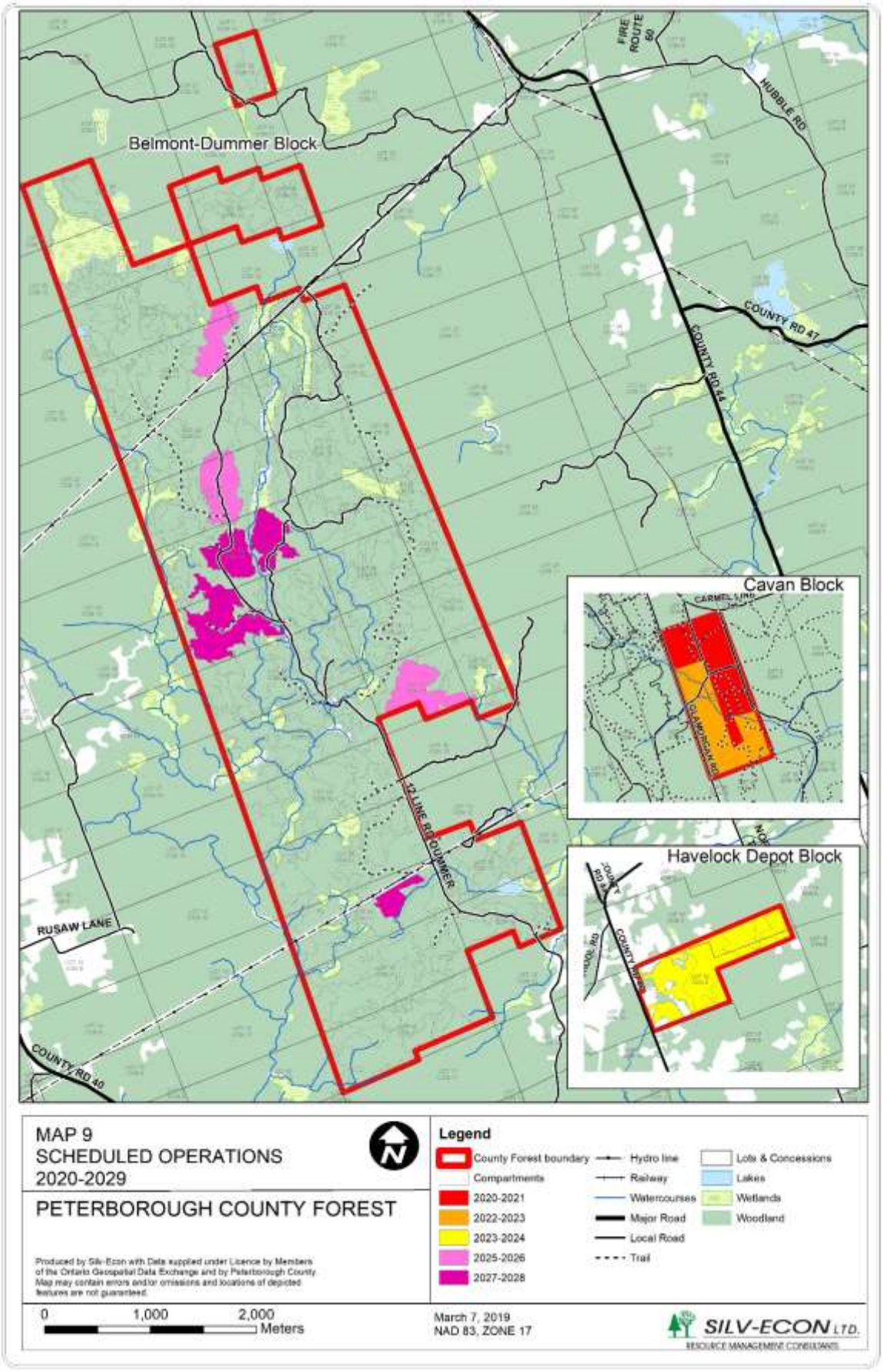
Tree Marking 2019, Harvest 2020/2021								
Comp #	**Area (Ha)**	**Block**	**Forest Type**	**Age**	**Overstory Species Composition**	**Advanced Regeneration Species Composition**	**Invasive Plants**	**Management Objectives & Special Features**
537	11.6	Cavan	Red Pine	73	PR9 OW1 (PW)	CB4 IW2 PW2 AW2	Buckthorn (few)	• Selection thinning to create canopy gaps to encourage/promote natural regeneration • Increase species diversity • Promote growth and health of the overstory trees.
538	11.1	Cavan	Red Pine	73	PR7 OR2 (CB PO PW)1	CB4 AW3 OR2 MH1	Buckthorn (few) DSV (heavy)	
539	11.7	Cavan	Red Pine	73	PR9 OR1	OR2 BE2 CB2 IW2		
543	7.1	Cavan	Red Pine	73	PR9 MH1	OR10		
Total	**41.5**							

Tree Marking 2021, Harvest 2022/2023								
Comp #	**Area (Ha)**	**Block**	**Forest Type**	**Age**	**Overstory Species Composition**	**Advanced Regeneration Species Composition**	**Invasive Plants**	**Management Objectives & Special Features**
540	1.1	Cavan	Upland Hardwood	88	CB2 MH2 PO2 PR2 BW1 IW1 (OR)	CB6 AW4	Buckthorn (heavy) DSV (few)	• Selection thinning to create canopy gaps to encourage/promote natural regeneration • Increase species diversity • Promote growth and health of the overstory trees. • In upland hardwoods promote old growth features
541	9.4	Cavan	Red Pine	73	PR8 OR2 (CB IW)	CB5 OR2 PW2 HAW1	Buckthorn (heavy	
542	20.6	Cavan	Red Pine	73	PR9 OR1	CB2 OR2 PW2 BW1 HAW1		
544	14.6	Cavan	Upland Hardwood	133	MH5 OR4 PW1 (CB)	IW5 AW5		
Total	**45.7**							

Tree Marking 2023, Harvest 2024/2025								
Comp #	**Area (Ha)**	**Block**	**Forest Type**	**Age TBD**	**Overstory Species Composition (Based on 1999 FRI)**	**Advanced Regeneration Species Composition TBD**	**Invasive Plants TBD**	**Management Objectives & Special Features**
32	8.0	Havelock Depot	Bottomland Hardwood/Poplar		PO6 BW2 MH2 6BW 2 MH2			• Forest inventory will be updated in 2021/2022 • Management objectives and special features will be determined based on results of the forest inventory and stand and site conditions.
33	21.0	Havelock Depot	Upland Hardwood		PO5 MH2 OR2 OW1			
34	0.6	Havelock Depot	Upland Hardwood		MH10			
36	11.9	Havelock Depot	Bottomland Conifer		CE4 MS2 PO2 OW1 BW1			
40	3.5	Havelock Depot	Upland Hardwood		PO5 MH2 OR2 OW1			
43	4.5	Havelock Depot	Bottomland Hardwoods/Poplar		MH4 MS2 PO2 CE2			
44	0.5	Havelock Depot	Upland Hardwood		PO5 MH2 OR2 OW1			
343	0.9	Havelock Depot	Upland Hardwood		MH7 SW1 BD1 BF1			
344	5.0	Havelock Depot	Upland Hardwood		MH10			
345	2.1	Havelock Depot	Bottomland Hardwood/Poplar		PO6 BW2 MH2			
346	0.9	Havelock Depot	Upland Hardwood		MH5 PO3 OR1 BW1			
347	1.5	Havelock Depot	Bottomland Hardwood/Poplar		PO4 MH2 CE2 OR1 BW1			
348	0.1	Havelock Depot	Bottomland Hardwood/Poplar		PO6 BW2 MH2			
Total	**60.5**							

Tree Marking 2025, Harvest 2026/2027								
Comp #	**Area (Ha)**	**Block**	**Forest Type**	**Age TBD**	**Overstory Species Composition (Based on 1999 FRI)**	**Advanced Regeneration Species Composition TBD**	**Invasive Plants TBD**	**Management Objectives & Special Features**
134	21.1	Belmont-Dummer	Upland Hardwood		MH5 BD2 BE2 MS1			• Forest inventory will be updated in 2021/2022 • Management objectives and special features will be determined based on results of the forest inventory and stand and site conditions.
164	11.1	Belmont-Dummer	Upland Hardwood		MH4 BD2 PW1 MS1 BE1 PO1			
249	21.8	Belmont-Dummer	Upland Hardwood		MH5 BD2 OR1 IW1 BE1			
406	15.7	Belmont-Dummer	Upland Hardwood		BD 2 MH2 BE1 PW1 OW 1 OR1 BW1 BE1 PO1			
Total	**69.8**							

Tree Marking 2027, Harvest 2028/2029								
Comp #	**Area (Ha)**	**Block**	**Forest Type**	**Age TBD**	**Overstory Species Composition (Based on 1999 FRI)**	**Advanced Regeneration Species Composition TBD**	**Invasive Plants TBD**	**Management Objectives & Special Features**
154	9.6	Belmont-Dummer	White Pine		PW4 CE2 BF1 BW1 PO1 MH1			• Forest inventory will be updated in 2021/2022 • Management objectives and special features will be determined based on results of the forest inventory and stand and site conditions.
160	5.0	Belmont-Dummer	Upland Hardwood		MH3 OR2 OW1 BY1 BW1 MS1 IW1			
164	11.1	Belmont-Dummer	Upland Hardwood		MH4 BD2 PW1MS1 BE1 PO1			
166	3.7	Belmont-Dummer	White Pine		PW4 PR1 SW1 BF1 PO1 BW1 MS1			
187	10.0	Belmont-Dummer	Upland Hardwood		MH3 BW2 OR1 PO1 IW1 BD1 BE1			
199	1.6	Belmont-Dummer	White Pine		PW10			
207	21.9	Belmont-Dummer	White Pine		PW4 PR2 BW1 CE1 OR1 PO1			
431	7.1	Belmont-Dummer	Upland Hardwood		MH4 BD2 BE1 OR1 HE1 BY1			
Total	**70.2**							


Belmont-Dummer Block
FIRE ROUTE 60
HUBBLE RD
COUNTY RD 47
COUNTY RD 44
Cavan Block
CARMEL LINE
GUAMACHAN RD
12 LINE RD DUMMER
RUSAW LANE
COUNTY RD 40
Havelock Depot Block
COUNTY RD 29
MAP 9
SCHEDULED OPERATIONS
2020-2029
PETERBOROUGH COUNTY FOREST
Produced by Silv-Econ with Data supplied under Licence by Members of the Ontario Geospatial Data Exchange and by Peterborough County. Map may contain errors and/or omissions and locations of depicted features are not guaranteed.
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March 7, 2019
NAD 83, ZONE 17
Legend
County Forest boundary
Compartments
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Trail
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Woodland
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APPENDIX 5 AREA OF CONCERN STRATEGIES AND FOREST CONSERVATION MEASURES FOR THE PETERBOROUGH COUNTY FOREST

Introduction

Forests are used for a variety purposes and are home to many different species of plants and animals. Land and forest management activities may have both positive and negative impacts on particular features, habitats and recreational uses. Resource managers must be aware of the impacts that planning and operational decisions can have on these values.

The identification of areas, sites or features that may be affected by resource management activities is incorporated into the planning process. Treatment plans and silvicultural prescriptions are developed with these areas of concern (AOC) in mind. These values can be general habitat requirements for a single or multitude of species or very site specific features such nesting sites, seepage ways and trails.

Areas of concern can be encountered when performing forest management operations. It is important that individuals involved in management activities have the knowledge to recognize these resource values and modify management activities accordingly to conserve, protect and/or enhance the particular resource feature that is encountered.

There are numerous guidelines that resource managers can employ to ensure that healthy forested ecosystems are maintained. Included here is a brief summary of the Area of Concern Guidelines and Forest Conservation Measures that are proposed for implementation in the Peterborough County Forest. These are to serve as general guidelines to assist managers. Attempts have been made to standardize seasonal timing restrictions on forestry operations to cover the general sensitivities to disturbances of most birds and fauna that may be found in the County Forest. There may be situations where restrictions and modifications to planned activities may need to be more or less rigorous than those presented in this summary. These guidelines should be reviewed regularly and updated accordingly as management techniques, philosophies and approaches change.

Area of Concern, Strategies and Forest Conservation Measures for the Peterborough County Forest

TABLE OF CONTENTS

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
1. Warm, Coolwater Lakes and Streams Water systems in the proximity of the County Forest have been classified as Cold water. Therefore, the following has been included for informational purposes. • erosion • sedimentation • nutrient enrichment • fluctuating water levels / yields • loss of vegetation cover • increase water temperature • harvesting debris • food production • damage to spawning beds, nursery areas • increased access • shoreline stability • aesthetics	A variable-width reserve up to 90 metres dependent upon the slope of the shoreline. Slope AOC Modified 0-15% 30m 30m 16-30% 50m 50m 31-45% 70m 70m 45%+ 90m 90m Minimum reserve width of 10-30m may be imposed and AOC widths expanded where sensitive site conditions exist. To be applied to both sides of the stream where timber management activities occur. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. Use natural boundaries or topographic features such as ridge tops as AOC widths where feasible.	No operations in reserve when it is established. Modified operations may be permitted in AOC where it can be demonstrated that fisheries and other resource values can be protected. Selection harvest, and shelterwood permitted on a limited basis. Limited harvesting of trees within AOC may be permitted to provide / enhance fish and wild life habitat. No more than 50% of shoreline to be disturbed at one time. The Code of Practice for Timber Operations in Riparian Areas shall apply.	No operations in reserve when it is established. Prescribed burn permitted to travel into AOC. Mechanical site preparation may be permitted in modified area on a restricted basis where stable soil conditions exist; disturbance patterns to be at right angle to slope, leave coarse woody debris. Normal planting except where deciduous browse for wildlife is desired.	No operations in reserve when it is established. Normal cleaning and thinning activities provided resource values can be protected. Pesticides may be permitted on a restricted basis in modified area; stump or basal application only.	Construction of new roads and landings normally not permitted in AOC. Construction of aggregate pits not permitted within 30 m of waterbody. Exceptions may be permitted if no other alternative exists or if road is required to cross stream provided resource values can be protected. Location and type of road / crossing to be individually assessed and approved by the County. The MNR's Environmental Guidelines for Access Roads and Stream Crossings plus the Code of Practice for Timber Management Operations in Riparian Areas shall apply. Restrict mechanical equipment within 50m of shoreline.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
2. Coldwater, Headwater Lakes and Streams • erosion • sedimentation • nutrient enrichment • fluctuating water levels / yields • loss of vegetation cover • increase water temperature • harvesting debris • food production • damage to spawning beds, nursery areas • increased access • shoreline stability • aesthetics	A variable-width reserve up to 90 metres dependent upon the slope of the shoreline. Slope / AOC / Reserve 0-15% / 30m / 30m 16-30% / 50m / 50m 31-45% / 70m / 70m 45%+ / 90m / 90m To be applied to both sides of the stream where timber management activities occur. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. Use natural boundaries or topographic features such as ridge tops as AOC widths where feasible. Minimum reserve width may be expanded where sensitive site conditions exist.	Harvesting not permitted in reserve. Limited removal / harvesting of selected trees may be permitted to provide / enhance fish and wild life habitat. Where selected trees are to be removed as described above, the Code of Practice for Timber Management Operations in Riparian Areas shall apply.	No operations in AOC. Underplanting permitted to improve aesthetics and biodiversity. Prescribed burn permitted to travel into AOC.	No maintenance operations permitted in AOC other than protection.	Construction of new roads and landings normally not permitted in AOC. Construction of aggregate pits not permitted within 30 m of waterbody. Exceptions may be permitted if no other alternative exists or if road is required to cross stream provided resource values can be protected. Location and type of road / crossing to be individually assessed and approved by the County. The MNR's Environmental Guidelines for Access Roads and Stream Crossings plus the Code of Practice for Timber Management Operations in Riparian Areas shall apply. Restrict mechanical equipment within 50m of shoreline.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
3. Warm, Coolwater Lakes and Streams Water systems in the proximity of the County Forest have been classified as Cold water. Therefore, the following has been included for informational purposes. • erosion • sedimentation • nutrient enrichment • fluctuating water levels / yields • loss of vegetation cover • increase water temperature • harvesting debris • food production • damage to spawning beds, nursery areas • increased access • shoreline stability • aesthetics	A variable-width reserve up to 90 metres dependent upon the slope of the shoreline. Slope AOC Modified 0-15% 30m 30m 16-30% 50m 50m 31-45% 70m 70m 45%+ 90m 90m Minimum reserve width of 10-30m may be imposed and AOC widths expanded where sensitive site conditions exist. To be applied to both sides of the stream where timber management activities occur. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. Use natural boundaries or topographic features such as ridge tops as AOC widths where feasible.	No operations in reserve when it is established. Modified operations may be permitted in AOC where it can be demonstrated that fisheries and other resource values can be protected. Selection harvest, and shelterwood permitted on a limited basis. Limited harvesting of trees within AOC may be permitted to provide / enhance fish and wild life habitat. No more than 50% of shoreline to be disturbed at one time. The Code of Practice for Timber Operations in Riparian Areas shall apply.	No operations in reserve when it is established. Prescribed burn permitted to travel into AOC. Mechanical site preparation may be permitted in modified area on a restricted basis where stable soil conditions exist; disturbance patterns to be at right angle to slope, leave coarse woody debris. Normal planting except where deciduous browse for wildlife is desired.	No operations in reserve when it is established. Normal cleaning and thinning activities provided resource values can be protected. Pesticides may be permitted on a restricted basis in modified area; stump or basal application only.	Construction of new roads and landings normally not permitted in AOC. Construction of aggregate pits not permitted within 30 m of waterbody. Exceptions may be permitted if no other alternative exists or if road is required to cross stream provided resource values can be protected. Location and type of road / crossing to be individually assessed and approved by the County. The MNR's Environmental Guidelines for Access Roads and Stream Crossings plus the Code of Practice for Timber Management Operations in Riparian Areas shall apply. Restrict mechanical equipment within 50m of shoreline.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
4. Wetlands (significant) Ouse Creek Wetlands – Life Science ANSI The following is provided for informational purposes. • erosion • sedimentation • water quality • water temperature • water flow and recharge • damage to spawning and nursery areas • vegetation cover • provision and maintenance of forest and habitat diversity including snags, den trees and downed woody debris • waterfowl staging and nesting areas • disruption of nesting and rearing activities • loss of nesting sites • degradation of forest and habitat diversity including snags, den trees and downed woody debris	Significant wetlands to be determined by appropriate agencies. Slope AOC Modified 0-15% 30m 30m 16-30% 50m 50m 31-45% 70m 70m 45%+ 90m 90m A variable width AOC up to 90m to be placed around all significant wetland areas. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. Use natural boundaries or topographic features such as ridge tops as AOC widths where feasible. AOC width dependent upon slope of wetland area and featured value. AOC width may be expanded as required.	Selection harvest allowed, shelterwood permitted on a limited basis in modified management area provided values can be protected. Patch cutting of poplar permitted to promote wildlife food supply. No more than 50% of shoreline area to be disturbed at one time. No disturbance in significant waterfowl areas between April 1 – June 30: normal operations from July 1 – March 31 permitted. Leave snags, cavity and nest trees.	Normal silvicultural treatment sequence in modified area. Restrict mechanical site preparation to minimize soil exposure, orient furrow / patterns at right angles to slope, use light equipment. Prescribed burn permitted to travel into AOC. Avoid restocking conifer within 30m of waters edge. Maintain naturally occurring coarse woody debris.	Normal silvicultural treatment sequence in modified area. Pesticides may be permitted on a restricted basis in modified area; stump or basal application only. Normal cleaning and thinning activities provided resource values can be protected.	Construction of new roads and landings normally not permitted in AOC. Construction of aggregate pits not permitted within 30 m of waterbody. Location of road to be approved by the County, use narrow right-of-way. Adhere to the Code of Practice for Timber Management Operations in Riparian Areas. Restrict mechanical equipment within 50m of shoreline.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
4. Deer Habitat **a) Winter Habitat** (Deer) • maintenance of coniferous shelter (particularly He, Ce) • travel, escape routes • feeding areas • known bedding areas • provision of adequate browse	The County Forest contributes to larger scale, landscape and/or range-like features. He, Pw, Pr, Ce cover types are important shelter areas. Maintain 10-30% of total deer range in conifer cover types, maintain 60% crown closure in wintering areas. Bedding sites and travel corridors are traditionally found on conifer ridges containing stands of He, Pw and occasionally upland Ce. They are also found along shorelines or water course. Local knowledge will be required to adequately protect these areas. Where conifers other than He and Ce provide cover in bedding or travel corridors, canopy closures levels > 80% are desirable.	Normal silvicultural treatments, shelterwood or patch cut. Winter harvest where feasible. Maintain crown closure requirements, retain clumps of 3-5 conifer trees with touching crown. Conifer shelter to be at least 10m in height. Space clumps 10-30m apart. Retain all conifer in mixed wood stands where conifer content is low in winter yards. Maintain at least 80% crown closure in bedding areas, travel corridors and conifer ridges. Stimulate browse within 30m of shelter areas by reducing basal area in tolerant hardwood stands below normal levels or allow small patch cuts to occur.	Normal silvicultural treatments / operations. Encourage natural regeneration of deciduous species to serve as winter food. Protect conifer patches. Plant suitable conifer species where shelter is limited or a concern and where feasible.	Normal silvicultural treatments / operations. Conduct thinning operations in winter to provide additional feeding opportunities.	Avoid construction of major access in existing or potential wintering areas. Roads and landings to be located to optimize benefits for deer. No landings in small conifer patches. Seed landings with clover / grass mixture. Deer trails, corridors to be kept free of logging debris.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
b) Summer Habitat (Deer) • provision of browse, feeding areas • maintenance, creation of openings • maintenance, improvement in mast production potential	Maintain 10-15% of forest in early successional stages (5-35 years old). 5-15% of range to be in permanent openings 0.2 - 4 ha in size. Distribute disturbance and components of habitat throughout deer range.	Normal silvicultural operations. Retain small clumps of conifer in hardwoods stands. Release mast producers from competition, retain non-declining mast producers. Retain at least 7-8 mast producing trees per hectare.	As above (winter habitat). Do not plant trees on roads / landings. Encourage Or, Be regeneration through the release of established natural regeneration or planted patches. Use prescribed burn where appropriate to encourage suitable regeneration.	As above (winter habitat).	No landings in small conifer patches. Seed landings with clover / grass mixture. Deer trails, corridors to be kept free of logging debris.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
5. Marten Habitat The marten population in this part of the province is relatively low. The information provided here is for general guidance and information. • degradation of habitat at landscape and stand level • loss of specific habitat features / components • loss of connectivity between core / critical habitat	AOC Reserve Modified n/a n/a n/a Provisions of some habitat components for marten are made through the application of the deer, moose, pileated wood-pecker and biodiversity guidelines **Landscape Level:** Maintain approximately 10-20% of the forest, which has capability of produce marten, in suitable conditions; • stands having a coniferous component greater than 40% • canopy crown closure of coniferous species is greater than 50% • coniferous species are at least 15m in height • uneven canopies preferred • mature stands **Stand Level:** • retain at least 6 dead / declining trees per hectare – 2 should be 30cm in dbh or greater • retain logs, stumps and downed woody debris	Normal silvicultural treatments. Adhere to snag / cavity tree guidelines within the scope of health & safety parameters. Allow operators to leave hollow logs and downed woody debris in the bush.	Normal silvicultural treatments. Modify site preparation to avoid windrowing, leave larger logs scattered, and create small bush piles. Modify the use of prescribed burning to minimize the impact on downed woody debris where possible.	Normal silvicultural treatments. Adhere to snag / cavity tree guidelines within the scope of health & safety parameters.	No landings in small conifer patches. Seed landings with clover / grass mixture. Wildlife trails, corridors to be kept free of logging debris.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
6. Pileated Woodpecker Habitat (PWP) The Pileated Wood-pecker is a featured species in the Great Lakes-St. Lawrence Forest Region and provisions for its habitat requirements are addressed on a regular basis. • degradation of habitat at landscape and stand level • loss of specific habitat features / components • cavity trees • snags • downed woody debris • safety	AOC Reserve Modified n/a n/a n/a Provisions of some habitat components for pileated wood-pecker (PWP) are made through the application of the marten and biodiversity guidelines **Stand Level:** • retain 6 cavity trees / hectare > 25 cm dbh • at 1 /ha should be > 40 cm dbh • cavity priorities; i. PWP roost trees ii. PWP nest trees iii. other nest cavities iv. escape cavities v. feeding excavations vi. potential cavity trees Making provisions for downed woody debris during the course of timber management operations.	Normal silvicultural treatments. In patch cuts, seed tree cuts, and shelterwood removal cuts; retain' i. trees with existing cavities to meet needs of cavity users of early successional forests ii. trees with potential to develop cavities to meet future needs of Pileated wood-pecker Retain dead standing trees where health & safety concerns can be met. Allow operators to leave hollow logs and downed woody debris in the bush. Consider leaving some unmerchantable trees or portions of trees on the ground and/or in the bush.	Normal silvicultural treatments. Retain dead standing trees where health & safety concerns can be met. Modify site preparation to avoid windrowing, leave larger logs scattered, and create small bush piles. Modify the use of prescribed burning to minimize the impact on downed woody debris where possible.	Normal silvicultural treatments. Retain dead standing trees where health & safety concerns can be met.	No limitations. Conserve valuable roost trees where they are encountered where feasible.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
7. Red-shouldered Hawk, Cooper's Hawk • loss of nesting / potential nesting trees • disruption of nesting and rearing activities • abandonment of nest and off-spring • large scale changes to habitat • reduction in mature – closed canopy forest • satellite nests	AOC Reserve Modified 400m 50m 350m Measured (radius) from active nest tree. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. No mechanical disturbance between March 1 – July 31, adjust depending on arrival and departure of birds. Adjust AOC widths to incorporate birds sensitivity to disturbance. AOC may be irregular in shape. Use natural topographic features for AOC where feasible. Protect satellite and confirmed stick nests in suitable habitat. AOC Reserve 1 tree length @ 20-25m	Not permitted in reserve. Selection cutting only in modified area. Maintain @ 70% crown closure in modified area and in modified zone around satellite nests. No harvesting in modified areas between March 1 – July 31.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in modified area.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in modified area.	New roads or landings not permitted in reserve. New roads in modified area may be approved where other alternatives not viable. Inspect site to evaluate specific situation. Design road to minimize impact on nesting values. No construction between March 1 – July 31. Use of existing roads restricted between March 1 – July 31 (including road maintenance, motorized vehicle use). No aggregate extraction in AOC.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
8. Northern Goshawk • loss of nesting / potential nesting trees • disruption of nesting and rearing activities • abandonment of nest and off-spring • large scale changes to habitat • reduction in mature – closed canopy forest • satellite nests	AOC Reserve Modified 400m 50m 350m Measured (radius) from active nest tree. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. No mechanical disturbance between March 1 – July 31, adjust depending on arrival and departure of birds. Adjust AOC widths to incorporate birds sensitivity to disturbance. AOC may be irregular in shape. Use natural topographic features for AOC where feasible. Protect satellite and confirmed stick nests in suitable habitat. AOC Reserve 1 tree length @ 20-25m	Not permitted in reserve. Selection cutting only in modified area. Maintain @ 70% crown closure in modified area and in modified zone around satellite nests. No harvesting in modified areas between March 1 – July 31.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in modified area.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in modified area.	New roads or landings not permitted in reserve. New roads in modified area may be approved where other alternatives not viable. Inspect site to evaluate specific situation. Design road to minimize impact on nesting values. No construction between March 1 – July 31. Use of existing roads restricted between March 1 – July 31 (including road maintenance, motorized vehicle use). No aggregate extraction in AOC.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
9. Red-tailed Hawk Broad-winged Hawk Sharp-shinned Hawk • loss of nesting / potential nesting trees • disruption of nesting and rearing activities • abandonment of nest and off-spring • large scale changes to habitat	AOC 150m Reserve 25m Modified 125m Measured (radius) from active nest tree. Protect nest tree and surrounding trees. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. No mechanical disturbance between March 1 – July 31, adjust depending on arrival and departure of birds. Adjust AOC widths to incorporate birds sensitivity to disturbance. AOC may be irregular in shape. Use natural topographic features for AOC where feasible.	Not permitted in reserve. Selection, shelterwood and limited patch cutting permitted in modified area. No harvesting in modified areas between March 1 – July 31.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in immediate vicinity of the nest.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in immediate vicinity of the nest.	New roads or landings not permitted in reserve. New roads in modified area may be approved where other alternatives not viable. Inspect site to evaluate specific situation. Design road to minimize impact on nesting values. No construction between March 1 – July 31. Use of existing roads may be restricted between March 1 – July 31 (including road maintenance, motorized vehicle use). Hauling may be permitted through modified management area during breeding season if > 50m from active nest. No aggregate extraction in AOC.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
10. Herons / Osprey • loss of nesting / potential nesting trees • disruption of nesting and rearing activities • abandonment of nest and off-spring • large scale changes to habitat	AOC 300m Reserve 75m Modified 225m Measured from the edge of the colony. AOC may be adjusted dependant upon the number of active nests. Maintain 30 m reserve where nest tree or colony is >150m of treed edge. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. No mechanical disturbance between March 1 – July 31, adjust depending upon the arrival and departure of birds.	Not permitted in reserve. Selection and shelterwood permitted in modified area. No harvesting in modified areas between March 1 – July 31. No cutting of potential nest trees around the edge of the wetland / pond. Restrict fuelwood cutting activities. Leave dominant and/or damaged Pw around the edge of the wetland as potential nest trees. Leave 5 snags and/or 5 clumps of 6-10 tall trees in modified area. Protect nests not used in the last 5 years.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in modified area.	Not permitted in reserve. No operations in modified areas between March 1 – July 31. Normal silvicultural treatments / operations between August 1 – February 28 in modified area.	New roads or landings not permitted in reserve. New roads in modified area may be approved where other alternatives not viable. Inspect site to evaluate specific situation. Design road to minimize impact on nesting values. No construction between March 1 – July 31. Use of existing roads restricted between March 1 – July 31 (including road maintenance, motorized vehicle use). No aggregate extraction in AOC.

11. Species of Concern, Threatened, and Endangered Flora and Fauna A search of the NHIC database in May 2014 did not identify any SAR within the County Forest blocks within the past 20 years. Species which may occur in the area of the County Forest that have not yet been listed in these general guidelines. **Species of Concern** • Bald Eagle • Cerulean Warbler • Red-headed Woodpecker • S. Flying Squirrel • Northern Map Turtle • Snapping Turtle • Five-lined Skink • Milksnake • E. Ribbonsnake **Threatened** • Least Bittern • E. Prairie Fringed Orchid • E. Spiny Softshelled Turtle • E. Musk Turtle • Blanding's Turtle • E. Hog-nosed Snake **Endangered** • American Ginseng • Butternut • Wood Turtle • Spotted Turtle	AOC width and details to be established based on an individual site inspection by experienced staff / MNR. AOC widths designed to meet the needs of the value. To be established based on; • available literature • provincial guidelines • experience of local experts To be investigated and appropriate measures applied whenever the species is locally confirmed AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis. Updated lists can be seen on the following web-sites; http://www.rom.on.ca/ontario/risk.php www.cosewic.gc.ca www.mnr.gov.on.ca/en/Business/Species	Operational prescription to be established on an individual basis depending the value and surrounding environment. Seasonal restrictions to be applied where appropriate to minimize disturbance. Silvicultural operations modified and/or restricted where required.	Operational prescription to be established on an individual basis depending the value and surrounding environment. Seasonal restrictions to be applied where appropriate to minimize disturbance. Silvicultural operations modified and/or restricted where required	Operational prescription to be established on an individual basis depending the value and surrounding environment. Seasonal restrictions to be applied where appropriate to minimize disturbance. Silvicultural operations modified and/or restricted where required	Access to be controlled based on the value and as required. To be located to minimize disturbance. Restrict mechanical equipment as required. No aggregate extraction in AOC.

12. Eastern Hog-nosed Snake The Eastern Hog-nosed snake is Provincially - Threatened. It is protected under the Species at Risk Act. It is at the northern limit of its natural range and was likely never common in Ontario. This species has been sighted in areas around the Cavan Block. (i.e. Northumberland County Forest). • loss of suitable habitat (e.g. riparian areas, forest edges, grasslands, woody debris, thickets, dry and open pine-oak forests, areas of sandy soils) • disturbance of hibernacula, nesting sites, basking sites • loss of forest cover and reduced habitat diversity • disturbance during critical periods (e.g. emerging from hibernation, nesting) • reduced population of its main prey, the American toad	AOC 50m Reserve 50m Modified 0m For known / identified hibernacula and nesting sites. Reserves and additional modifications may be incorporated if required. Provision of habitat for the Eastern Hog-nosed Snake can be achieved through the application of the guidelines for; ▪ Wetlands ▪ Marten ▪ Pileated Woodpecker ▪ Forest Diversity This will provide hollow logs and other downed woody debris, protect woodland pools and riparian areas, provide forest edges, and maintain forest diversity. Applying appropriate silvicultural systems will maintain canopy closure, thereby protecting travel corridors to feeding areas such as swamps, riparian zones and woodland pools. The need to establish AOC boundary lines will be determined on a case by case basis.	Not permitted in reserve. Apply seasonal limitations to restrict operations between May 1-Aug 31 in the vicinity of site specific habitat features and/or in particular sections of the County Forest. Normal silvicultural treatments / operations outside of critical periods. Allow operators to leave hollow logs and coarse woody debris in the bush. Maintain high residual basal area (no more than 50% removal) within 15 m of significant vernal pools that could be used by breeding frogs (> 200 m^2 in surface area).	Not permitted in reserve. Apply seasonal limitations to restrict operations between May 1-Aug 31 in the vicinity of site specific habitat features and/or in particular sections of the County Forest. Modify site preparation in vicinity of significant habitat features; avoid wind rowing, leave larger logs scattered and create small brush piles with tops, especially in areas having a south facing aspect~~s~~. Modify the use of prescribed burning to minimize the impact on coarse woody debris where possible. Normal silvicultural treatments / operations outside of critical periods.	Not permitted in reserve. Apply seasonal limitations to restrict operations between May 1-Aug 31 in the vicinity of site specific habitat features and/or in particular sections of the County Forest. Normal silvicultural treatments / operations outside of critical periods.	New access roads and landings not permitted in reserve or other critical habitat areas. Limit use of existing roads from May 1-Aug 31 during critical periods (emerging from hibernation, nesting). Skid trails not permitted in reserve. Restrict trails as required in vicinity of site specific habitat features and during critical periods. No aggregate extraction in AOC or in vicinity of other critical habitat features.

13. Forest Diversity To be applied throughout the County Forest. • maintenance of a healthy forest ecosystem • structural, functional diversity • loss or reduction of wildlife habitat • security cover, shelter • hiding, roosting places • soil enrichment • food	1. Wildlife Trees (Cavity and Den Trees	Retain suitable wildlife trees where encountered to maintain 6 cavity trees/ha (5 trees > 25cm, 1 large tree> 40 cm). Increase to 9 trees/ha in riparian areas. Recruit such trees by leaving poor quality or high risk stems. Trees should be well distributed and of different species.	Road and landings to avoid value where possible.
	2. Snags	Encourage operators to leave snags that are not a safety risk. Leave snags in various states of decay. Recruit such trees by leaving poor quality or high risk stems, girdling or stem injections.	Road and landings to avoid value where possible.
	3. Mast Producing Trees	Retain 8 mast trees/ha (Or, Be, Bd, Cb, Bn, Wn, Iw) in tolerant hardwood and coniferous forests where feasible. Mast trees should have large healthy crowns with abundant fine healthy branches, be in a dominant : co-dominant position and be >25 cm dbh (40+cm for optimal results). Retain sufficient mast producing trees to ensure sufficient cross-pollination and the maintenance of a viable gene pool.	Road and landings to avoid value where possible. No limitations.
	4. Super Canopy Trees	Retain 1 super canopy tree for every 4 hectares.	No Limitations
	5. Maternal-Veteran Tress	Retain 10 trees/ha. Veteran-maternal trees should be large, healthy trees having a dominant : co-dominant crown position and should be a long lived species. Other wildlife trees may contribute to veteran-maternal tree targets.	No limitations.
	6. Hollow Logs	Allow or encourage operators to leave hollow logs in the bush. Modify site preparation to avoid windrowing, leave larger logs scattered, create small bush piles.	No limitations.
	7. Downed Woody Debris	Approximately 40% of 190 invertebrate species in Ontario depend on DWD for some component of their habitat needs. Leave coarse woody material on site. Modify as per hollow logs listed above.	Road and landings to avoid value where possible.
	8. Solitary or Clumps of Conifer in Hardwood Stands	Retain and manage He, Ce, Pw, Pr , Sp trees or clumps to provide shelter and feeding areas for animals and birds, enhance tree species diversity. Approximately 10/ha. Trees should be long-lived species, >25 cm dbh (preferably > 40 cm), low risk and high vigour. Trees in clumps (3+) are good.	Road and landings to avoid these areas. Reduce right-of-way width.
	9. Intermittment Streams, Seasonal Seepage ways	Maintain adequate crown cover within 15m of value to protect water quality. Restrict mechanical disturbances, ensure adequate water crossing structures are used to maintain normal drainage flow patterns. Retain snags and den trees in these areas.	Road, landings and skid trails to avoid these areas.
	10. Woodland Pools	Where woodland pool has surface area > 200 m^2, protect pool by providing a 15m modified management area. Provide adequate crown closure by removing no more than 50% of basal area at one time in AOC. Crown closure may be higher if needed to provide for other sensitive species such as American ginseng. No trees to be felled around pool edge or into pool.	

Forest Diversity - continued	11. Riparian Areas	Conduct operations only where stable soil conditions exist, use light equipment. Conduct activities in conjunction with other applicable guidelines. Adhere to the Code of Practice for Timber Management Operations in Riparian Areas.	Road, landings and skid trails to avoid these areas.
	12. Log Landings, Tertiary Roads, Other Forest Openings	To provide early spring forage for deer, bear, grouse, etc., seed areas with native grass and/or flower mixtures, do not plant open areas with trees in locations where openings are limited.	Create larger landings in key locations where warranted.
	13. Forest Edges	Create suitable habitat for birds and animals by creating irregular harvest boundaries and distributing forest disturbances throughout forested area where feasible. Do not create unnecessary forest edges, be aware of fragmentation and interior habitat objectives.	No limitations.
	14. Forest Interior Habitats and Fragmentation	Maintain closed canopy conditions (@ 70%) where suitable by employing appropriate silvicultural practices, especially in areas of the forest that are >100m from the edge and where the forest block is >30-50 hectares in size. Avoid creating large or extended breaks in the canopy that may fragment critical interior forest habitats. Encourage regeneration of tree species in interior forest openings not required for other management objectives. Plant trees to provide connecting corridors to other forested areas, leave small areas unplanted for future canopy gaps and structural diversity.	Limit development of roads, abandon roads/trails not required for management purposes.
	15. Forest Cover Types (Successional Stages)	Maintain an array or mosaic of naturally occurring forest cover types in various successional stages. Distribute and manipulate the disturbance type, pattern and size throughout the County Forest. Allow a portion of the forest to grow beyond established timber rotation ages.	No limitations.
	16. Furbearer – Wetland (Beaver, Otter, Mink)	Allow limited patch cutting to occur to waters edge to encourage the growth of deciduous tree species. Avoid planting coniferous species within 30 m of shoreline. Avoid using pesticides to control deciduous species. Maintain forest debris and structural diversity along shoreline to provide habitat for furbearers and associated prey species.	Road, landings and skid trails to avoid these areas.
	17. Furbearer – Forest	Leave small forest patches undisturbed in gullies or on ridges. Alter size of operating blocks. Leave logging slash on site or in small piles where possible. Maintain snags, cavity trees, and coarse woody debris.	No limitations.

14. Areas of Natural and Scientific Interest (ANSI) Ouse Creek Wetlands – Life Science ANSI • recognition of natural heritage sites • negative or adverse impacts on identified value or feature • increased use through improved access	AOC n/a Reserve n/a Modified n/a Details of AOC to be established in site specific resource management plans prepared by provincial government and/or leading authority. There are no site specific management plans for the Ouse river Wetlands Life Science ANSI. County to work closely with government agency and/or leading authority to ensure integrity of ANSI is not adversely affected by forest management activities.	Forest Management activities to be consistent with ANSI plan and implementation strategy. Apply best management practices to conserve the vegetation communities within the ANSI.	Forest Management activities to be consistent with ANSI plan and implementation strategy. Apply best management practices to conserve the vegetation communities within the ANSI. .	Forest Management activities to be consistent with ANSI plan and implementation strategy. Apply best management practices to conserve the vegetation communities within the ANSI.	Forest Management activities to be consistent with ANSI plan and implementation strategy. No aggregate extraction in AOC.
15. Other Natural Areas • natural functions • biodiversity	AOC n/a Reserve n/a Modified n/a Applying sustainable resource management practices will enhance and maintain the integrity of the values and features identified in these landscape areas.	Develop and apply best management practices as required.	Develop and apply best management practices as required.	Develop and apply best management practices as required.	Develop and apply best management practices as required.

16. County Forest – Restricted Use Areas No areas have been identified where forest management activities would be restricted. If identified, appropriate management guidelines would be prepared.	AOC Reserve Modified tbd tbd tbd Develop and apply best management practices as required.	Develop and apply best management practices as required.	Develop and apply best management practices as required	Develop and apply best management practices as required	Develop and apply best management practices as required
17. **Significant Woodlands** A May 2014 review of significant woodlands in Peterborough County did not identify the County Forest as a Significant Woodland. If part of the County Forest is identified as a significant woodland through municipal or provincial natural heritage planning processes, the County will work with the stakeholders to ensure features are maintained.	AOC Reserve Modified tbd tbd tbd	Develop and apply best management practices as required.	Develop and apply best management practices as required.	Develop and apply best management practices as required.	Develop and apply best management practices as required.

18. **Cultural Heritage Values** Structural remains Archeological remains Traditional use sites Cultural landscapes • physical damage to historical values, artefacts and remains • access • aesthetics	AOC Reserve Modified n/a n/a n/a AOC to be determined on a site specific basis to protect the identified value. Consult with appropriate agencies (Ministry of Culture, Citizenship and Recreation)	No operations until specific management guidelines for known sites have been established. Operations to be consistent with recommendations.	No operations until specific management guidelines for known sites have been established. Operations to be consistent with recommendations.	No operations until specific management guidelines for known sites have been established. Operations to be consistent with recommendations.	New roads or landings may not be permitted within the AOC. No aggregate extraction in AOC. Construction of aggregate pits not permitted within the immediate vicinity of value. Existing roads may be used but shall not be upgrade beyond existing widths. Access may be controlled depending on value / feature identified. Skid trails may be restricted depending on value / feature identified.

19. **Recreational Trails - Permanent / Recognized** **X-Country Skiing, Snowmobile, Motorcycle, Hiking** • obstruction by logging debris • degradation of trail • aesthetics • noise • public safety	AOC n/a Reserve n/a Modified n/a Minimize direct user conflict and safety hazards by; • scheduling operations in the off-season when feasible; • temporarily close, restrict use, or re-route section of trail affected during operations; • joint use when ever feasible; • discuss options with affected parties; • place proper warning signs at all entry points on affected trails; • trails to be kept free of debris The need to establish AOC boundary lines prior to operational treatment will be determined on a case by case basis. Place warning signs at entrance points and other locations to advise public that forest management operations are in progress.	Normal silvicultural operations along the trail. Selection, shelterwood and limited patch cutting. Cutting along trail may be modified and shall be laid out considering natural features / landscape patterns and planned type. Protect visual values according to situations, maintain aesthetics.	Normal silvicultural operations along the trail.	Normal silvicultural operations along the trail. Girdling presents a safety concern, therefore not allowed within 25 m of the trail. Remove hazard trees within 25m of trail. All logging debris to be removed from trail immediately following the operation.	Co-ordinate the road location and construction to benefit trail and allow joint use. Cost sharing, construction assistance shall be encouraged by affected parties where modifications to road recommended for multiple benefits. Access should cross trails at right angles where possible. Trails to be kept free of logging debris. Use heavy equipment on trail-bed may be restricted. No skidding on trail. Damaged trail surface to be repaired by logger following operations. Post signs to advise public of operations.

20. **Boundary Lines** **(Property, Operating) (Private, Crown Lands)** • trespassing • survey monuments • public safety • aesthetics • property damage	AOC Reserve Modified 25m 0 25m The need to establish AOC boundary lines prior to operational treatment will be determined on a case by case basis. Prior to cut layout, offer landowner the opportunity to assist in the establishment of the property line. Provide landowner opportunity to inspect boundary location prior to commencing operations. Secure boundary line approval. Clearly mark survey monuments. Place proper warning signs to advise public and landowner of operations. Conserve aesthetic values accordingly.	Within the immediate vicinity of the boundary line, the cut shall be planned with the type of harvest / disturbance in mind. Schedule operations in the off-season where feasible. Normal selection, shelterwood harvest permitted up to the agreed upon boundary. Clearing cutting permitted on a limited basis within AOC provided values and be conserved and silvicultural objectives met. Tops to be lopped at 1m in height within AOC.	Normal silvicultural treatment / operations. Prescribed burning not permitted within 25m of boundary line.	Normal silvicultural treatment / operations. Girdling presents a safety concern, therefore not allowed within 25 m of the boundary.	New roads and landings should not be constructed in the immediate vicinity of the boundary line. Construction of aggregate pits not permitted within 15 m of the boundary line. Use existing and/or old roads / trails / landings wherever possible. Restrict mechanical equipment in the immediate vicinity of the boundary line. Consider access control measures.

21. **Roads - Highway, Municipal, Private** • degradation of road • obstruction from debris • aesthetics • public safety	AOC Reserve Modified 25m 0 25m The need to establish AOC boundary lines prior to operational treatment.will be determined on a case by case basis. Layout of forest management operations shall consider the type of disturbance and the natural features of the landscape. Advise Ministry of Transportation of pending operations when Entrance permit required. Advise those responsible for the road of the pending operation and/or need to use the road. Agreement on road use, maintenance and repair shall be reached prior to commencing operations. Joint inspection to determine existing road condition. The need for additional measures to be determined on a site specific basis. Place warning signs at entrance points and other locations to advise public that forest management operations are in progress.	Harvesting permitted within immediate vicinity of the road. Selection and shelterwood harvest permitted, patch cutting permitted on a restricted basis. Provide vegetation screen where necessary to protect values. Operational layout shall take into consideration the type of disturbance. Lop tops to 1 metre in height within the immediate vicinity of the road. Harvesting debris not allowed in the right-of-way. Post warning signs at strategic locations to advise public of operations.	Normal silvicultural treatments / operations.	Normal silvicultural treatments / operations. Girdling presents a safety concern, therefore not allowed within 50 m of road.	No landings within the immediate vicinity of the road and no roadside piling permitted unless approved by the County and those responsible for the road. Construction of aggregate pits not permitted within AOC unless approved by the County and those responsible for the road. Approved landings to be free of debris and seeded with a grass / clover mixture. Skidding not permitted on road right-of-way. Repair of damaged road surfaces is the responsibility of the forest operator. Road must not be obstructed during operations. Secure entrance permits from Ministry of Transportation before construction begins. Adhere to seasonal load restrictions. Adhere to speed limits and other safety matters.

22. **Hydro Transmission and Distribution Lines**	AOC n/a Reserve n/a Modified n/a The need to establish AOC boundary lines prior to operational treatment.will be determined on a case by case basis. Advise local Hydro office when pending operations are adjacent to lines.	Normal silvicultural operations in the vicinity of hydro line. No tops to be left on hydro right-of-way. Fell trees only if feature / structure can be protected.	Normal silvicultural operations in the vicinity of hydro line. Prescribed burn not allowed in hydro right-of-way.	Normal silvicultural operations in the vicinity of hydro line. As per Harvest.	New roads across Hydro right-of-way must be approved by Hydro and the County. Use of existing roads is encouraged, damage to roads to be repaired by contractor immediately. No skidding allowed in hydro right-of-way. No aggregate extraction in AOC.
23. **Research Plots / Environmental Monitoring Stations** None identified. • degradation of research • physical damage	AOC n/a Reserve n/a Modified n/a Details of AOC to be established on a site specific basis and to be consistent with the intent and type of research project. Advise principle researcher of pending forest activities. AOC boundary lines may or may not be installed prior to operational treatment. The need to establish AOC boundary lines will be determined on a case by case basis.	Forest management activities to be consistent with individual research project.	Forest management activities to be consistent with individual research project.	Forest management activities to be consistent with individual research project.	New roads or landing not permitted. Restrict mechanical equipment within tree length of research plot unless specifically requested by principle researcher. No aggregate extraction in AOC.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
24. Forest Dwelling Songbirds The information provided here is for general guidance and should be considered when planning and implementing forest management activities. • loss of nesting / potential nesting habitat • disruption of nesting and rearing activities • reduction in foraging opportunities • reduction of biodiversity • large scale changes to habitat	AOC Reserve Modified n/a n/a n/a Individual nests of songbirds are difficult to locate when performing forest management and related activities. General provisions for the habitat for a variety of songbirds can be achieved through the application of good forestry practices and sound silvicultural techniques. General habitat requirements can be further enhanced and supported through the implementation of other AOC guidelines outlined in this document such as; ▪ Forest Diversity ▪ Marten Habitat ▪ Pileated Woodpecker Habitat ▪ Deer Habitat ▪ Lakes and Streams ▪ Wetlands Following tree-marking prescriptions will maintain important habitat features where they occur in all stands, including snags, living cavity trees, mast-producing trees, coarse woody debris, and conifers for nest trees.	Applying appropriate silvicultural systems will maintain suitable crown closures, diversity of tree species, a range of forest cover types, interior and edge habitats, a suitable distribution and range of age classes in addition to providing vertical and horizontal diversity within the forested area. Adhere to sustainable harvest and treatment levels and distribute management activities throughout the County Forest Avoid mechanical disturbances during critical nesting periods for songbirds (May 1 – July 31). Normal silvicultural treatments / operations between August 1 – April 30 Maximize the level of merchandizing / delimbing activities at the stump where possible to minimize the ground area affected by mechanical equipment.	Avoid mechanical disturbances during critical nesting periods for songbirds (May 1 – July 31). Normal forest renewal treatments / operations between August 1 – April 30. Normal tree planting activities. Modified use of prescribed burning where it is recommended for regeneration, site restoration during the critical nesting period.	Avoid mechanical disturbances during critical nesting periods for songbirds (May 1 – July 31). Normal forest maintenance treatments / operations between August 1 – April 30.	No constructions during critical nesting periods for songbirds (May 1 – July 31). Minimize number of skid trails.

RESOURCE VALUE	AREA OF CONCERN	PRESCRIPTION			ACCESS
Name/Concern	**Description**	**Harvest**	**Renewal**	**Maintenance**	
25. Significant Landforms Oak Ridges Moraine (ORM) – Cavan Block Dummer Moraine – Belmont-Dummer Block • Contamination of surface water and groundwater • Soil erosion	AOC n/a Reserve n/a Modified n/a Forest management is a permitted use on the ORM and Dummer Moraine. Contamination of surface water and groundwater from fuel and oil spills is the greatest concern. Erosion associated with road construction, poorly maintained roads, flooding (from beavers), and skid trails could also occur.	Maintain equipment in good condition, clean equipment regularly to remove oil, grease & debris. Cleaning of machinery should be done off-site. Fuel equipment on a flat site. Use same site for re-fueling all equipment. Maintain a proper spills kit on site. Clean up all spills immediately. Report abnormal spills to the MOE Spills Action Centre. Category X spills are non-reportable (See Ontario Regulation 224/07 under the Environmental Protection Act)	See Harvest	See Harvest	No new road construction or aggregate pits in the Cavan Block. Any new road construction in the Belmont-Dummer Block and Havelock Depot to follow best practices as described in Environmental guidelines for access roads and water crossings (OMNR 1990) Minimize number of skid trails. Maintain roads through grading. Keep culverts free of debris.

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