



MANAGED FORESTS



Forest Management Plan
2005 - 2025

Forest Management Plan for Saugeen Conservation Managed Forests

For The Period of
January 2005 to December 2024

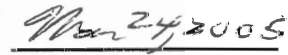
I hereby certify that this plan has been prepared under my personal supervision and that all field work and calculations have been carried out to the best of my skill and judgement



OPFA SEAL



Associate Professional Forester




Date

Approved by the Board of Directors of Saugeen Conservation

on this the 24th day of March in the year 2005.



Chairman: Doug Freiburger



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This plan was modified in 2015 to
reflect changes necessary to
obtain FSC certification

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Forest Stewardship Council Certification

In 2014, the SVCA Board of Directors approved that the Saugeen Valley Conservation Authority enter into an agreement to become Forest Stewardship Council (FSC) certified as a community forest under the Eastern Ontario Model Forest (EOMF) FSC certificate. FSC certification is a system that ensures forests are being managed to a set of standards that promotes good forestry practices. SVCA is committed to meeting the FSC standards according to the Forest Stewardship Standard Great Lakes-St. Lawrence Region Draft 3.0. An independent third party organization, in this case Smartwood, will audit SVCA's forest management activities on an annual basis to guarantee that the forest is being managed to these standards.

Being a member of the FSC and following its principles greatly reflects the SVCA commitment to its Forest Management Goal which is, To manage Authority owned forest stands on a sustainable basis to ensure the forest ecosystems are kept in a diverse, vigorous, healthy condition, while maintaining or improving habitat, contributing to the aesthetic, cultural, and recreational values of the property, providing economic benefit, thereby aiding in the enjoyment of the attributes of the forests now and in the future.

Prologue

Southwestern Ontario is home to the Saugeen River Watershed, the third largest watershed in Southern Ontario. The Saugeen Valley Conservation Authority has jurisdiction over the Saugeen, Penetangore, Lake Fringe, and Pine River watersheds. A watershed is defined as *'The area drained by a river or river system'* (Webster's New World College Dictionary). A river system includes all of the lakes and small streams which flow into the main channel. The Saugeen River watershed is 4,675 sq km. (1,805 sq mi.) in size, and covers parts of Grey, Bruce, Wellington, and Huron Counties.

Saugeen Conservation owns 8568.29 hectares (21,171.95 acres) of land across this watershed. Forested land holdings total 8408.36 hectares (20,776.78 acres). Approximately 90 percent of this forested land is productive timber land, with the remainder being comprised of lowland, poor quality, or inaccessible timber.

In 1961, the Saugeen Valley Conservation Authority began placing all forested properties under a forest management agreement with the Ontario Ministry of Natural Resources. These agreement forest properties were under a 20 year management plan from 1980 to 2000. In 1997, the Authority initiated the resources inventory of all of its forested properties. Both Authority staff and private sector consultants were used to carry out the inventory. This information provides the basis for the operating plans for each individual tract of forest. In 1998, due to changes within the Ontario Ministry of Natural Resources, the Forestry Agreement was terminated. From 1998 forward, the Authority has been solely responsible for the management of its forested properties. In 2002, a new forest management plan to guide the future management of all Authority forests was initiated. This plan is to replace the expired 1980-2000 Management Plan written by the Ontario Ministry of Natural Resources.

This 2005-2025 Management Plan will include all Authority owned forested properties. This management plan will serve as the governing document for all forest management activities on Authority properties.

The Plan includes details of all aspects of the forest ecosystems within Saugeen Conservation Forests. These ecosystems include forest soils, weather and climate, tree species, wildlife habitat, wildlife, vegetative communities, wetlands and lakes, human interaction, and topography. More specifically, the Plan addresses forest health, forest management practices, sustainability, species and ecological diversity, economics, social and cultural concerns, wetland and water system health, property maintenance, education/research concerns, property acquisition/ consolidation.

1.0 Management Goal (see section 23.0 Recommendations #2)

To manage Authority owned forest stands on a sustainable basis to ensure the forest ecosystems are kept in a diverse, vigorous, healthy condition, while maintaining or improving habitat, contributing to the aesthetic and recreational values of the property, providing economic benefit, thereby aiding in the enjoyment of the attributes of the forests now and in the future.

Management Objectives

- a) Forest Health
To maintain or improve forest ecosystem health through the implementation of good forestry practices and the designation of appropriate land uses/ activities
- b) Forest Management Practices
To ensure that all management conforms to the following definition of good forestry practice;
Silvicultural activities are to be conducted in ways that enable the stand to maintain ecological processes and wildlife habitats, as well as, grow healthy plants.
- c) Sustainability
To manage forests by applying current proven methods of maintaining or improving forest growth/ health
To ensure that all silvicultural prescriptions and management activities conform to the following definition of sustainable forest management;
Management regimes applied to forest land which maintain the productive and renewal capacities as well as the genetic, species and ecological diversity of forest ecosystems.
- d) Species and Ecological Diversity
To maintain or improve ecological diversity through the analysis of inventory information
To identify areas or species of concern and implement appropriate management activities
- e) Economics
To ensure that forests are managed in a sustainable manner so as to provide sustainable economic benefits
- f) Social and Cultural Concerns
To ensure that property users and uses, including historical, present and future, are identified and that forest management activities are undertaken with consideration to those users and uses
- g) Wetland and Water System Health
To ensure management practices do not negatively impact on the hydrologic/ hydraulic processes, and that ecosystem functions are maintained or enhanced
- h) Property Maintenance
To maintain or improve the physical infrastructure and aesthetics of the properties
- i) Education/ Research Concerns
To encourage educational and research opportunities throughout Authority forests

- j) Property Acquisition/ Consolidation
To acquire lands where it is deemed to be a priority and financially viable to facilitate forest management objectives
- k) Work Together With Neighbours
To work cooperatively with neighbouring landowners when planning forestry activities
- l) Promotion of Good Forest Management
To manage Saugeen Conservation forests as demonstration forests setting standards to which other forest owners should or may strive to achieve

2.0 Introduction to Saugeen Conservation

Southwestern Ontario is home to the Saugeen River Watershed, the third largest watershed in Southern Ontario. The Saugeen Valley Conservation Authority has jurisdiction over the Saugeen, Penetangore, Lake Fringe, and Pine River watersheds. A watershed is defined as *'The area drained by a river or river system'* (Webster's New World College Dictionary). A river system includes all of the lakes and small streams which flow into the main channel. The Saugeen River watershed is 4,675 sq km (1,805 sq mi.) in size, and covers parts of Grey, Bruce, Wellington, and Huron Counties.

The Saugeen Valley Conservation Authority is governed by a Board of Directors. The Board of Directors is responsible for all decisions concerning the development and implementation of the programs and projects of the Authority. This Board of Directors is comprised of representatives from the fifteen municipalities within the watershed. In 2003, there were a total of twelve Directors governing Saugeen Conservation. A Forestry Committee was formed in 1997, consisting of five volunteers from the Board of Directors.

In 1961, the Saugeen Valley Conservation Authority began placing all forested properties, purchased between 1952 and 1973, under a forest management agreement with the Ontario Ministry of Natural Resources. A few properties purchased after this date were also placed under the agreement. In 1997, the Authority initiated the resources inventory of all of its forested properties. Both Authority staff and Lands & Forest Consulting were used to carry out the inventory. This information provides the basis for the operating plans for each individual tract of forest. In 1998, due to changes within the Ontario Ministry of Natural Resources, the Forestry Agreement was terminated. From 1998 forward, the Authority has been solely responsible for the management of its forested properties. In 2002, a forest management plan to guide the management of all Authority forests was initiated. The objective of this plan is to replace the expired 1980-2000 Management Plan written by the Ontario Ministry of Natural Resources which covered agreement forest properties only.

2.1 Background

Prior to 1836, the area which is now under Saugeen Valley Conservation Authority jurisdiction was settled in part by the Ojibway (Chippewa) Native American peoples. The Ojibways reportedly migrated southward from the north shore of Lake Superior and displaced the Iroquois in the early 1700's. In 1836, the Indians surrendered all lands in the Saugeen area by Treaty to the Crown.

The Townships in the Grey County portion of the Saugeen Watershed were surveyed in the 1840's and early 1850's. The majority of the Townships in the Bruce County portion of the Saugeen Watershed were surveyed in the 1850's, with the south part of Southampton being surveyed in 1875.

Prior to, and at the time of settlement, extensive forests covered both Grey and Bruce Counties. These forests were predominately hardwoods with some dense cedar swamps. This type of forest cover hindered the growth of agricultural crops, and, therefore, was removed across a large portion of the watershed. As a result, by the early 1880's these once forested areas were reduced to the farm woodlots which can be observed today. The majority of farms were cleared from the road to the rear of the farm. Most of the Greenock Swamp, the Osprey Wetlands, and other smaller wetlands, were never cleared due to excessive soil moisture. Much of the cleared land had proven to be marginal farm land and was later abandoned or removed from farming. A small fraction of this land has since been returned to forest cover.

Throughout the period of settlement, the accessible forests of Grey Bruce have been harvested. These harvests have been for numerous purposes, including creating shelter, creating building materials, and providing revenue. In the mid to late 1900's, many of the forests within the watershed were subject to the removal of all large healthy trees. The practice of large healthy tree removal is known as 'highgrading'. As a result of this highgrading technique, many of the remaining forests contain many poor quality trees. The majority of harvesting from the late 1900's onward has been done in an attempt to improve forest health and residual tree quality. Other harvesting methods have included diameter limit cutting which is the removal of all stems above a set diameter for a species.

Current good forestry practices do not permit highgrading, diameter limit cutting, or other non-sustainable harvesting methods. Current good forestry practices have regard for wildlife and the overall ecological effects of tree removal. Sustainable harvesting is an important aspect of good forestry practices. It is an attempt to ensure that the forests present today, will remain for future generations on both public and private lands.

Many of the present day harvests are carried out to provide revenue for the landowner. Harvesting on a sustainable basis has become a well known and respected practice. Reputable harvesters and consultants are practicing sustainable forestry on public and private lands throughout the Saugeen River watershed.

2.2 Purpose and Scope of the Plan

This plan is intended to replace the existing 1980 to 2000 Management Plan, written by the Ontario Ministry of Natural Resources (OMNR). The OMNR Plan included management guidelines for Agreement Forested properties only. This 2004-2024 Management Plan will include all Authority owned forested properties. This management plan will serve as the governing document for all forest management activities on Authority properties. (see section 23.0 Recommendations #1)

The Plan includes details of all aspects of the forest ecosystems within Saugeen Conservation Forests. These ecosystems include forest soils, weather and climate, tree species, wildlife habitat, wildlife, vegetative communities, wetlands and lakes, human interaction, and

topography. More specifically, the Plan addresses forest health, forest management practices, sustainability, species and ecological diversity, economics, social and cultural concerns, wetland and water system health, property maintenance, education/research concerns, and property acquisition/ consolidation.

This 20-year plan includes, as appendices, ten-year operating plans and inventory information for each property, and a glossary of terms. The ten-year operating plans are developed under the guidelines of this 20-year Plan. Each operating plan will include data specific to each property. The specific data will include soils and topography, flora and fauna, tree species, vegetative communities, wetland and water systems, management objectives/strategies, social and cultural concerns, and recommended silvicultural systems. (see section 23.0 Recommendations #10)

3.0 General Description of Saugeen Conservation Forest Properties

3.1 Property Location and Area

The Saugeen Valley Conservation Authority manages natural resources over all lands draining into the Saugeen River, Penetangore River, Lake Fringe, and Pine River Basins.

Saugeen Conservation owns 8568.29 hectares (21,171.95 acres) of land which is spread across this watershed in Grey, Bruce, and Wellington County. Table 3.1 summarizes the Authority land holdings by County.

Forested land holdings total 8408.36 hectares (20,776.78 acres). Approximately 90 percent of this forested land is productive timber land, with the remainder being comprised of lowland poor quality, or inaccessible timber.

Table 3.1 Summary of Saugeen Valley Conservation Authority Owned Properties by County

County	Acres*	Hectares**
Grey County	10227.65	4139.13
Bruce County	10757.3	4353.48
Wellington County	187	75.68
Total Ownership	21171.95	8568.29

*Areas have been gathered from 12/08/09 Valuation Notices prepared by the Ontario Property Assessment Corporation

**Hectares were calculated using the direct conversion of the acreage total for each County, this leaves an accuracy of ± 0.05 hectares

3.2 Climate

The Saugeen River Watershed falls within three climatic regions, which are the Lake Huron-Georgian Bay Region, the Huron Slopes Region, and the Dundalk Upland Climatic Region. The climate of the watershed is best described as temperate because of location in the mid-latitudes. The extremes of the climate are moderated by Lake Huron and Georgian Bay, also influence the precipitation throughout the watershed.

The lowest monthly mean temperature occurs in January and ranges from -10.0 to -13.1°C. The highest monthly mean temperature occurs in July and ranges from 22.8 to

26.0°C. Heat units across the watershed average 2500 units, the range is between 2300 and 2700 units. The growing season averages 200 days across the watershed, ranging between 190 and 210 days.

Mean annual precipitation average 976 mm per year. Mean annual snowfall averages 846 mm per year. Table 3.2 lists the climatic conditions at various locations in the Saugeen River Watershed.

Table 3.2 Climate Conditions Within the Saugeen River Watershed

The information within this table was derived from Canadian Climate Normals 1971-2000, Environment Canada.

Parameter	Location					
	Hanover	Durham	Mount Forest*	Paisley	Proton Station	Southampton
Mean Annual temperature °C	6.5	6.3	5.3	6.2	5.0	6.7
Mean Daily Maximum Temperature °C						
-January	-3.0	-3.7	-5	-3.2	-5.0	-2.7
-July	26.0	25.0	24.2	25.0	23.5	22.8
Mean Daily Minimum Temperature °C						
-January	-11.2	-11.5	-13.1	-10.7	-12.8	-10
-July	13.0	13.6	12.0	12.7	12.0	14.5
Mean Annual Precipitation(mm)	787	816	709	803	752	628
Mean Annual Snowfall (mm)	262	269	298	390	331	203

* The information for Mount Forest was compiled between 1891 and 1986.

** The information for Southampton was compiled between 1872 and 1982.

3.3 Bedrock and Surficial Geology

The bedrock of the Saugeen Watershed is composed of sedimentary rocks formed in a warm, shallow marine environment, during the Paleozoic era, 405-430 millions years ago. Various limestone and dolostone bedrock formations underlie the Saugeen Watershed, including Delaware, Detroit River, Salina and Bass Island, Lockport, Guelph, Queenston, and Beekmantown.

The surficial geology of the watershed is a direct result of the last period of continental glaciation that ended about 10,000 years ago. In some areas during glacial advance, the underlying materials were molded into hill formations known as drumlins. When glacial retreat stagnated, ridges of material, such as end moraines and kame moraines, were deposited. Clay deposition occurred during different lake stages during the regression of the receding glaciers in the western portion of the watershed. The vast amount of water produced during the melting of the glacier carved wide valleys, now known as spillways, into the landscape. The current drainage pattern follows many of these old spillways. According to Chapman and Putnam, 1973 the watershed is comprised of a

mix of physiographic regions including Huron Fringe, Huron lope, Horseshoe Moraines, Teeswater Drumlin Field, Saugeen Clay Plain, Aaron Drumlin Field, and the Dundalk Till Plain region.

3.4 Topography and Drainage

The topography of the watershed consists mainly of drumlinized till plains and spillway land formations. Also found within the watershed are undrumlinized till plains, till moraines, bevelled till plains, sand plains, kame moraines, clay plains, peat and muck, swamps and bogs, eskers, drumlins, kettle lakes, lakes, and beach formations. These varied land formations allow the majority of the watershed to have good drainage.

The majority of the entire area is drained by a series of streams, creeks, and rivers to the Saugeen River. The main creeks and rivers draining the Saugeen Watershed are the Beatty Saugeen River, Rocky Saugeen River, Teeswater River, South Saugeen River, North Saugeen River, Main Saugeen River, Styx River, Camp Creek, Carrick Creek, Otter Creek, Deer Creek, Vesta Creek, Willow Creek, Mill Creek, Snake Creek, Meux Creek, Pearl Creek, Formosa Creek, Greenock Creek, Kinlough Creek, and Burgoyne Creek. The Main Saugeen River drains into Lake Huron at the Town of Southampton. In addition, the Huron Fringe, Pine River, and Penetangore River drain directly into Lake Huron. This area includes Royal Oak Creek, Kincardine Creek, Andrews Creek, Tiverton Creek, Little Sauble River, and Underwood Creek. For the most part this drainage largely follows the Spillway Formations.

3.5 Soils

Soils within the Saugeen Watershed belong to the Grey-Brown Podzolic Group, Alluvial, Bog Soils, Brown Forest Group, Brown Forest- Grey-Brown Podzolic Intergrade Soils, Dark Grey Gleisolic Great Soil Group. Much of the soil characteristics present across the watershed are a result of the bedrock formations beneath and glacial action. It should be noted that many of the Authority owned properties contain Muck or Organic soils which belong to the Bog Soils Group.

According to the Ontario Ministry of Agriculture and Food (OMAF), 1975, Podzolic soils have developed under coniferous and mixed-forest vegetation, and are found in cold to temperate climates on acid parent materials. The Brown soils group had a similar development with the exception of having many stony areas with bedrock exposure. Gleisolic soils are soils that are saturated with water during some period of the year. Bog soils are developed from accumulations of organic material that is in varying stages of decay. Bog soils are, usually, saturated throughout most of the year. Alluvial soils were formed during the release of water from a glacier up to and including present day processes.

3.6 Forest Species and Forest Stands

The Saugeen Valley Conservation Authority is situated within the Great Lakes St. Lawrence Forest Region, this is a forest unit characterized primarily by deciduous species, such as maple, beech, and ash. On less productive sites and swamp areas, coniferous species such as cedar and hemlock predominate. Many abandoned or retired farm fields have been replanted with a variety of tree species, these planted areas are called plantations. Currently, approximately 29 percent of the watershed remains in forest cover with the majority of this

percentage occurring in the upper watershed areas of Grey County. The forests with the Authority holdings can be grouped into the following categories. The categories list below can also be cross-referenced with the Ontario Ministry of Natural Resources publication, A Silvicultural Guide to Managing Southern Ontario Forests, 2000.

Upland Tolerant Hardwoods

The upland hardwood forests occur on sites with imperfect to good drainage. Many of the sites are undulating with areas of moderate to steep slopes. The soil types commonly supporting these hardwood forests are silty sands, sandy loams, and fine loams. Authority owned upland tolerant forests consist mainly of sugar maple and white ash with a mix of the following American beech, white elm, yellow birch, white birch, black cherry, red maple, hop-hornbeam, and eastern hemlock. Less common species which occur are basswood, butternut, bitternut hickory, blue beech, red oak, white oak, eastern white cedar, black walnut, and poplar. Many of these forests are immature and un-even aged. Products available from this forest type are mainly sawlogs and fuelwood.

Lowland Hardwood and Swamps

The Lowland Hardwood and Swamp forests occur mainly on sites with imperfect to poor drainage and bottomlands. Soils commonly supporting this forest type are sands and loams. Lowland Hardwoods and Swamps rarely occur on clay soils. There is also a high component of organic material within the soils associated with Lowland Hardwood Forests and Swamps. Species commonly found in the Lowland Hardwood Forests of the Saugeen River watershed include red maple, silver maple, yellow birch, black ash, blue beech, white elm, and balsam fir. Less common species are Manitoba maple, poplar, basswood, white birch, eastern white cedar, eastern hemlock, sugar maple, butternut, white pine, white ash, and bur oak. Many of these forests are immature and uneven aged. Fuelwood and sawlogs are the most common products of this forest type.

Early Successional Hardwoods

Early Successional Hardwoods are commonly found on abandoned farm fields, or marginal areas that are currently unmanaged. Species composition is dependant on soil types, drainage, and seed sources. The most common early successional hardwood forest species found on Authority properties are poplar, white birch, white spruce, balsam fir, white pine. This forest type is generally short lived and of little commercial value. Products are available from this forest type are mainly Fuelwood, Pulpwood, Boltwood.

Other Hardwood Forest

Other Hardwood Forest encompasses all hardwood forest types which are not mentioned above, excluding plantations. The majority of these forest types can occur as a small pocket within another forest type. Many of the other hardwood forests are of a single dominant species. Species commonly placed into this category include yellow birch, eastern hemlock, black cherry, sugar maple. Products commonly available from this forest type are fuelwood and sawlogs.

Cedars and Cedar Swamps

Cedars and cedar Swamps commonly occur on sands, clays, or loams with poor to good drainage. Saugeen Valley Conservation Authority owned Cedars and Cedar Swamps, occasionally, contain balsam fir, eastern hemlock, red maple, yellow birch, white birch, black ash, poplar, and sugar maple. Products available from this forest type include cedar posts, cedar poles, sawlogs, and fuelwood.

Plantation Forest

Plantations are commonly found on abandoned farm fields and aggregate sites. Soil types, topography, and drainage are used to determine appropriate species for planting. Species commonly planted include white pine, white spruce, red pine, Norway spruce, eastern white cedar, European larch, and tamarack. Other species planted in plantations throughout Authority properties include black walnut, Scots pine, jack pine, black spruce, white ash, and green ash. Boltwood, pulpwood, and sawlogs are the main products of Authority plantations.

Other Coniferous Forest

The Other Coniferous Forest classification includes all coniferous forest types not mentioned above. Many coniferous forests are of mixed species and occur in association with a larger forest stand of a different species. These forest stands occur on a variety of soil and drainage types. Products commonly available from these stands include pulpwood, boltwood, sawlogs, cedar posts, and cedar stakes.

4.0 Forest History

4.1 Property Acquisition

The Saugeen Valley Conservation Authority began acquiring properties in 1952, and has continued purchasing and accepting properties as donations from that time. Properties were acquired for various reasons, including river access, flood control, erosion control, reforestation, demonstration pasture farms, wetland conservation, park land, and demonstration dump sites. This plan will address the management of the forested properties which could include properties purchased for reforestation, wetland conservation, and flood control projects. Table 4.1 depicts the forested

properties that have been acquired by the Saugeen Valley Conservation Authority. Each property is listed with its legal description, tract number, purchase date, and the acreage as per assessment documents dated 2002.

4.2 Reforestation

From the beginning of acquisition of Authority lands in the early 1950's, reforestation efforts were a prime concern of the Authority. Many parcels of land purchased were, basically, run down and unproductive farms. These parcels were planted back into productive tree species. The primary trees planted were conifers, with white pine, red pine, white spruce and Norway spruce planted in either solid blocks or alternating rows. Some plantations include other species such as Scots pine, jack pine and European larch and even hardwoods such as black walnut, white ash and poplar. Records indicate that the hardwoods appear to have been planted on an experimental basis to evaluate their potential as a planted species.

Typical spacing arrangements for the plantations appear to be quite varied from plantation to plantation, depending mostly on when the property was planted. The most common spacing throughout most Authority plantations is 6 feet by 6 feet (1.8 m by 1.8 m), however, there are sites where spacing of 3 feet by 5 feet (0.9 m by 1.5 m) is evident. Several plantings were completed since 1980 and were done with a spacing of 6 feet by 8 feet (1.8 m by 2.4 m), as recommended by Ministry of Natural Resources research departments. This latter spacing required fewer trees per area while still maintaining tree form and vigor.

The bulk of the reforestation of Authority lands occurred during the time of the Agreement Forest Program. This provincially funded and coordinated program funded 100 percent of the reforestation costs throughout the term of the agreement. It is estimated that approximately 2.7 million trees were planted on Authority lands under the agreement forest program. Additional reforestation projects were undertaken on properties that were not under the agreement but were purchased for other purposes such as flood control, recreation or wetland conservation. This reforestation added another 73,000 trees to the total planted area of Authority lands.

Table 4.1 Forested Properties Acquired by Saugeen Conservation

Bruce County				
Location	Tract #	Purchase Date	Location	Acreage*
Amabel	41-540-05	4/17/73	Lot 56, 57 Indian Strip	74
	41-540-05	7/7/75	Pt. Lot 56; Indian Strip	Above
Brant	41-340-10	11/22/63	Part Lots 29, 30; Con. 3 SDR	64
	41-340-05	1/13/62	W ½ Lost 5; Con. 11	51.23
Bruce	41-260-15	12/6/57	Lot 32, Con. 3	99.48
	41-260-05	11/5/57	W ½ Lot C, Con. 9	50
	41-260-10	12/20/56	Pt. Lot 57 & 58 Con. LR	Below
	41-260-10	5/11/65	Pt. Lot 57 & 58 Con. LR	114.66
Carrick	41-010-05	12/18/52	Lot 13; Con. 3	Below
	41-010-05	11/18/60	Lot 12; Con. 3	Below
	41-010-05	9/6/62	Pt. Lot 12 S ½ Lot 11; Con. 4	327
	41-340-10	11/22/63	Pt. Lot 12, 13; Con. 15 along with Pt Lots 29 & 30, 3 SDR, Brant	13
	41-010-10	4/27/72	S ½ Lot 20, Con. 1	50.48

Location	Tract #	Purchase Date	Location	Acreage*
Culross	41-060-15	3/23/72	E ½ Lot 30; Con. 13	Below
	41-060-10	11/16/60	Lot 29; Con. 14	147.5
	41-060-05	2/17/59	N Lot 30;; Con. 15	38.8
	41-060-20	8/17/72	S Pt. Lost 25; Con.6	36
Elderslie	41-380-10	10/17/69	Lot11; Con.7	Below
	41-380-10	1/12/65	Pt. Lots 9, 10; Con. 8	279
	41-380-05	10/13/72	N ½ Lot 7; Con. 8	50.5
	41-380-20	4/24/74	Pt. Lot 3, 4; Con. 1, Pt. Lot 3, Con.2	134.18
	41-380-15	11/17/70	Pt. Lot 3, Con. 6, Pt. Lot 3, Con. 7	5.6
Greenock	41-310-90	12/3/74	Lot 11; Con. 10	312
	41-310-90	11/18/55	Lots 9, 10; Con. 10	Above
	41-310-90	10/11/56	Pt. Lot 8; Con. 10	Above
	41-310-95	2/14/74	Lot 8; Con. 11	172.07
	41-310-95	1/18/80	Pt. Lot 9; Con. 11	Above
	41-310-95	11/26/73	Lot 10, 11; Con. 11	212.9
	41-310-40	2/12/74	Lots 31, 32; Con. 4	334
	41-310-80	11/28/75	Pt. Lot 13; Con. 11	75
	41-310-85	3/29/70	N ½ Lot 10; Con. 7	269
	41-310-85	12/31/75	W ½ Lot 11, Lot 12; Con. 8	Above
	41-310-85	9/30/70	E ½ Lot 11; Con. 8	Above
	41-310-85	1/13/77	W ½ Lot 10; Con. 8	Above
	41-310-30	6/3/77	E ½ Lot 21; Con. 10	74.25
	41-310-30	12/8/65	E ½ of W ½ Lot 21; Con. 10	Above
	41-310-15	1/16/59	Lots 21, 22, 23, 24; Con. 4 NDR	694
	41-310-15	12/29/76	Lots 22-24; Con. 5	Above
	41-310-55	9/12/79	Pt. Lot 18; Con. 3 & 4	106.09
	41-310-75	3/9/84	Lots 26 & 27; Con. 5 & 6	388
	41-310-50	10/25/85	Lots 23& 24; Con. 12	198
	41-310-30	10/25/85	Lots 21-26; Con. 9	599
	41-310-25	10/25/85	Lot 21-26; Con. 8	582
	41-310-25	10/25/85	Lot 21-26; Con. 7	603
	41-310-15	10/25/85	Lot 21-23; Con. 6	294
	41-310-15	10/25/85	Lot 21; Con. 5	98
	41-310-35	10/25/85	Lot 20; Con. 9	98
	41-310-35	10/25/85	Lot 19 to 20; Con. 8	196
	41-310-15	10/25/85	Lot 19; Con. 5	98
	41-310-35	10/25/85	Pt. Lot 16, Lots 17 & 18 Con. 7	262.5
	41-310-60	12/24/59	Lot 12; Con. 3 NDR	200
	41-310-60	6/28/71	Lot 13; Con. 3	Above
	41-310-40	11/16/60	Lots 28, 29 & 30; Con. 3 NDR (along with lot 29; Con. 14 Culross) Lot 30 Purchased in 1974	297
	41-310-15	2/2/72	Pt. Lot 22, 23, 24; Con. 3	114.7
	41-310-60	4/3/67	Pt. Lots 11, 12 E Pt. Lot 13; Con. 4	100
	41-310-60	10/2/57	Pt. Lot 11; Con. 4	Above
	41-310-15	12/2/57	Lot 20; Con. 5	283
	41-310-15	8/14/64	Lot 20; Con. 6	Above
	41-310-15	1/16/59	Lot 20; Con. 4	Above
	41-310-35	4/18/69	Lot 20; Con. 7	346

Location	Tract #	Purchase Date	Location	Acreage*
Greenock Contd.	41-310-35	3/12/70	N ½ Lot 19; Con. 7	Above
	41-310-35	7/30/71	Lots 17, 18; Con. 8	Above
	41-310-85	1/30/87	W ½ Lot 12, 13; Con. 9	148.9
	41-310-85	11/14/73	Lot 11, E ½ Lot 12; Con. 9, SE Lot 12; Con 10	134
	41-310-20	1/10/91	E ½ Lot 22; Con. 10	33
	41-310-20	12/8/65	Lot 24; Con. 10	203
	41-310-20	11/18/55	Lot 25; Con. 10	Above
	41-310-25	11/26/56	Lot 27; Con. 8	100
	41-310-20	12/8/65	Pt. Lot 23; Con. 10	49.5
	41-310-30	2/16/62	Lot 27; Con. 10	99
	41-310-50	12/8/65	Lot 25; Con. 11	302
	41-310-50	12/9/68	Lot 24; Con. 11	Above
	41-310-50	11/12/61	Lot 26; Con. 11	Above
	41-310-45	9/24/65	Lot 17 E ½; Con. 15	49.5
	41-310-05	2/12/68	Lot A & B; Con. 25 SDR	184.15
	41-310-05	11/29/55	Pt. Lot C & D; Con. 25 SDR	Above
	41-310-05	11/29/55	Pt. Lot 17, 18; Con. 1 SDR	Above
	41-310-05	12/19/58	Lot 19; Con. 1 SDR	Above
	41-310-10	5/10/62	Lot 18, 19; Con. 1 NDR	99.44
	41-310-65	1/5/60	W ¾ Lot 12; Con. 2 NDR	78
	41-310-70	12/16/71	Pt. Lot 4; Con. A	62
Kincardine	41-210-05	6/26/73	Lots 38, 39, Pt. Lot 40; Con A	90
		1/11/89	Pt. Lot 30; Plan 361	20.01
		7/19/73	Plan 61 Mill Block 1 W side Queen; or Pt. 2, Plan 3R-386	0.13
		7/19/73	Plan 61 Mill Block 1 W side Queen; or Pt. 2, Plan 3R-386	0.24
		7/19/73	Plan 61, Pt. L2 Sub. L. 12, 13, 14, 15 Pt. Mill Block 1 E side of Huron Terrace or Pt. 4, Plan 3R-386	0.1
		6/17/74	Pt. of Bed of Penetangore R. opposite Pt. Lot 2; Plan 61 & Pt. of Mill Bl. No. 1 designated as Pt. 1, Water Lot Location CL1566	0.33
		4/5/79	Pt. Lot 2, R.P. 61	0.33
		1.27/94	Pt. Mill Block #1, Pt. Malcom St. Plan #61, Pt. Lots D & E West side Queen St., Plan 61	1.06
Paisley		11/10/76	Pt. Park Lot 11 N side Cambridge St., Village of Paisley	2.9
		12/15/81	Pt. Lot G, N/S Water St.	2.5
		9/12/82	Pt. Lot G, Plan 124	0.25
		5/12/82	Pt. Lot 19, Plan 42	1
		11/1/82	Lot 1, W/S George, Plan 92	0.5
		8/8/83	Pt. Lot 20, Plan 42 & Pt. 5, R.P. 3R-3438	0.33
		10/21/83	Lots 14 & 20 E/S Queen St.	0.64
		5/16/84	Pt. Lot 13, S/S Cambridge	0.16
		9/11/84	Pt. Lot 13, S/S Cambridge (Pt, 1 R.P. 3586)	0.07
		2/19/85	Pt. Lot 16, Elderslie, Various Paisley (see survey plan)	41.77

Location	Tract #	Purchase Date	Location	Acreage*
Paisley contd.		12/5/85	Pt. Lots 18 & 21, R.P. 41 (Eld. Twp.)	0.5
		4/4/86	Pt. Lots 14, 15, 16,17, R.P. 41 and Pt. 1 R.P. 3R-3810 (Eld. Twp.)	8
		3/10/86	Pt. Park Lots B,C,D,E, R.P.41 (Eld. Twp.) Parts 4 & 5, R.P. 3R-3810	4.4
		9/25/87	Pt.Lots 1, 2, 3; Plan 255	1
Saugeen	41-440-05	2/23/73	Lots 9-13; Rive Range C	397
	41-440-05	12/1/75	Lot 9 River Range A (WSR), Pt. Lot 10 Rive Rand C (WSR)	99.5
Walkerton		3/14/69	Part Lot 41; Plan 162	<1
		7/13/69	Part Lot 4 & 5, E/S Mary St. & N/S of Joseph St. R.P. 9	<1
Grey County				
Artemisia	42-180-10	7/6/59	Lot 32, 33; Con. 3 SDR	160
	42-180-05	1/10/64	Pt. Lot 10; Con. 4	82
Bentinck	42-280-05	1/14/53	Pt. Lots 1 & 2 Lot 3; Con. 2 WGR	191.43
	42-280-10	8/11/53	N ½ Lot 27; Con. 14	50.00
	42-280-15	1/4/67	Lot 39; Con. 3 SDR	142.20
	42-280-15	10/30/58	Lot 40; Con. 3 SDR	Above
	42-280-20	1/26/69	Pt. Lot 10; Con. 9	96.00
	42-280-20	11/26/69	Pt. Lot 11; Con. 10	30.00
	42-280-15	4/26/82	Pt. Lot 42; Con. 3 SDR	282.94
	42-280-15	12/11/52	Lot 43, 44; Con. 3 SDR	Above
	42-280-15	8/27/82	Pt. Lot 41; Con.3 SDR	Above
	42-280-15	4/2/85	Pt. Lot 41; Con. 3 SDR	3.35
Egremont	42-060-10	11/8/54	Lot 19; Con. 18	100
	42-060-05	1/24/67	N 1.2 Lot 23; Con. 22	56.45
Euphrasia	42-390-15	3/25/65	W ¼ Lot 12; Con. 9	75
	42-390-10	5/14/62	S ½ Lot 15; Con. 10	100
	42-390-10	2/270	W ½ of E ½ Lot 13; Con. 10, E ½ of S ¼ Lot 14; Con. 10	75
	42-390-10	12/19/77	N ½ Lot 14 & N ½ of the S ½ Lot 14; Con. 10	150
	42-390-05	5/1/86	N ½ of E ½ Lot 15; Con. 11	50
Glenelg	42-220-40	1/9/64	Pt. Lot 8, 9, 10; Con. 2 SDR	72
	42-220-35	2/3/64	Lot 6, 7; Con. 3 EGR	300
	42-220-35	8/11/53	Lot 8; Con. 3 EGR	Above
	42-220-45	12/31/56	Lot 13; Con. 4 SDR	56
	42-220-25	9/14/53	Lot 15; Con. 7	102.51
	42-220-15	12/6/56	Lot 18; Con. 8	100
	42-220-10	10/17/60	Lot 2; Con. 9	100
	42-220-20	12/8/54	Lot 18; Con. 9	100
	42-220-50	11/13/65	Lot 13; Con. 12	Below
	42-220-50	11/7/63	Lot 11; Con. 13	Below
	42-220-50	9/10/62	Lot 15; Con.13	Below
	42-220-50	9/19/57	Lot 14; Con. 13	Below
	42-220-50	8/9/57	Lot 12; Con. 13	Below
	42-220-50	2/22/54	Lot 13; Con. 13	Below
	42-220-60	1/27/54	Pt. Lot 12, 13, 14, 15; Con. 14, Lot 13, 14; Con 15	1132.4

Location	Tract Number	Purchase Date	Location	Acreage*
Glenelg contd.	42-220-60	7/30/59	Lot 15, 16, 17; Con. 15	Above
	42-220-60	1/27/54	Lot 15; Con. 14	Above
	42-220-55	7/17/72	Lot 10; Con. 13	Above
	42-220-50	10/22/75	Pt. Lot 11, 12; Con. 14, 15 and Pt. of Rd. All between Con. 14 & 15	Above
	42-220-50	5/5/82	Lot 12; Con. 12	100
	42-220-35	4/17/72	Pt. Lot 51; Con. 1 SDR	Below
	42-220-35	4/13/73	Lot 50; Con. 1 SDR	75
	42-220-35	9/13/88	Pt. Lot 52, 53; Con. 1 SDR	10
	42-220-30	1/4/65	Pt. Lot 57; Con. 1 EGR	Below
	42-220-30	8/30/65	Pt. Lot 58; Con. 2 EGR	Below
	42-220-30	8/27/65	Pt. Lot 58; Con. 2 EGR	93.7
		3/4/63	Pt. Lot 19 E of Albert St., Lot 20 & 21 E of Albert St., Pt. Lot 20 W of Elgin St., Pt. Lot 20 E of Elgin st., Pt. Lot 21 & 22 E Elgin St., Lot 21 SW of Kincardine St., Pt. Lot 22; W Kincardine St., Bl. B-S Chester St., Lots 26, 27, 28 WS of Albert St., Pt.	35
		2/24/65	Pt. Block C, Edge Survey = R.O.W.	12
		6/1/65	Pt. Block C, Edge Survey	6.02
		6/9/64	Lots 20, 21, W Albert St. Edge Survey	0.75
		9/30/74	Pt. Bl. C, Pt. Lot 14, 15; Edge Survey	6.6
		11/7/74	Lot 19, Pt. Lot 17, 18, 20; E of Elgin St., Lot 19, 20, Pt. Lot 18, 21 WS Kincardine St.; Pt Block B, Pt. of closed portion of Elgin and Kincardine St. Edge Survey	0
		2/19/79	Lot 22, 23, Plan 502, Pt. Block C Edge Survey	4
		12/30/67	Lots 8, 9, 10, 11, Pt Lot 6; W side Queen St. S, Lots 3, 4, 5, 6, 7, 8, 9, 10, Pt. Lot 11 Countess St. E	10.5
		4/5/83	Pt. Lot 1, WS Countess St. RP. 500, Pt. Block 1 RP. 513	2.45
		5/14/90	Flood rights-lower dam	2.3
Holland	42-360-05	8/11/53	Lot 69; Con. 2 EGR	100
	42-360-10	6/23/59	Lot 61; Con. 2 EGR	100
	42-360-15	8/11/53	Lots 55,56; Con. 2 SWTSR	100
	42-360-20	8/11/53	Lots 52, 52, 54, 55; Con. 3 SWTSR	200
	42-360-25	12/9/54	Lots 53, 54,; Con. 3 NETSR	100
	42-360-40	9/13/54	Pt. Lot 30; Con. 7	548.87
	42-360-45 42-360-50	2/1/54	Pt. Lot 29 & 30; Con. 8 EGR	Above
	42-360-45 42-360-50	2/24/59	Lot 29, 30; Con. 8 EGR	Above
	42-360-50	1/7/54	Pt. Lot 29, 3 Con. 8 EGR	Above
	42-360-35	1/5/61	Lot 11; Con. 8 EGR	186
	42-360-30	10/11/55	Lot 12; Con. 11 EGR	200
Normanby	42-010-05	1/23/67	Pt. Lot 11; Con. 17	80
	42-010-10	12/8/67	W 2/3 Lot 27, Lot 26; Con. 17	166.66

Location	Tract #	Purchase Date	Location	Acreage*
Normanby contd.	42-010-15	4/9/69	Pt. Lot 3, 4; Con. 18	212.59
	42-010-15	7/5/71	Pt. Lot 3, 4; Con. 18	Above
	42-010-15	7/23/73	Pt. Lot 3, 4; Con. 18	Above
	42-010-15	12/15/81	Pt. Lot 5; Con.18	Above
		3/1/54	Pt. Lot 3; Con. 1	5.43
		3/16/54	Pt. Lot 3; Con. 1	Above
		8/21/62	Lots 34, 35, 36; Fields St. East Enniskillen	0.72
Osprey	42-140-05	12/31/79	Lot 23; Con. 3 SDR	80
	42-140-05	7/9/80	Pt. Lots 26-29; Con. 3 SDR	261.25
	42-140-05	5/6/76	Lot 25 N 1/2; Con. 3	Above
	42-140-05	9/14/53	Pt. Lots 27, 28; Con. 1 SDR	590
	42-140-05	2/28/77	Lot 24; Con. 2 SDR	Above
	42-140-05 42-140-10	12/17/56	Lots 31, 32; Con. 2 SDR, Lot 33; Con. 1 NDR	Above
	42-140-05	12/11/52	Lots 25, 26; Con. 2 SDR	Above
	42-140-05	12/11/52	Lots 27, 28, 29, 30; Con. 2 SDR	Above
	42-140-05	12/22/69	Lot 33; Con. 2 SDR	Above
	42-140-05	1/24/67	Lots 31, 32, 33, 34; Con. 1 SDR	600
	42-140-15	12/3/68	Lot 29; Con. 1 SDR	Above
	42-140-15	2/28/77	Lot 35; Con. 1 SDR	Above
	42-140-10	3/21/60	Lot 36; Con. 1 NDR	Above
	42-140-10	12/11/52	Lots 31, 32; Con. 1 NDR	Above
	42-140-10	10/20/78	W ½ Lot 34; Con. 1 NDR	Above
	42-140-10	10/27/78	E ½ Lot 34; Con.1 NDR	Above
	42-140-10	5/31/52	Lot 35; Con. 1 NDR	Above
	42-140-20	1/0/00	Pt. Lots 33, 34; Con.3 SDR	140
Proton	42-090-50	12/24/56	Lot 34; Con. 4	99
	42-090-25	2/5/57	Lot 3; Con. 9	99
	42-090-20	10/8/59	Lot 42; Con. 10	99
	42-090-45	8/13/62	Lot 10; Con. 8	99
	42-090-40	12/14/60	Lot 6, 7; Con.9	198
	42-090-55	10/3/03	Pt. Lots 11 & 12, Con. 7	103
	42-090-55	10/3/03	Pt. Lots 11 & 12, Con. 7	103
	42-090-15	4/17/67	S ½ Lot 29; Con. 13	48.98
	42-090-35	4/28/67	Lot 7; Con. 8	99
	42-090-30	3/7/73	Lot 4; Con. 8	99
	42-090-05 42-090-10	9/15/54	Lot 24; Con. 18, W ½ Lot 24; Con. 19, Lot 27; Con 19	556.93
	42-090-05	9/15/54	E ½ Lot 24; Con. 19	Above
	42-090-05	3/7/54	Lot 25; Con. 18	Above
	42-090-05	10/17/60	Lot 23; Con. 19	Above
	42-090-10	12/30/58	Lot 26; Con. 19	Above
Sullivan	42-320-20	7/17/61	E ½ of S ½ Lot 30; Con. 5	350
	42-320-20	12/22/55	N ½ & SW ¼ Lot 30; Con. 5, NE ¼ & S ½ Lot 29; Con. 5	Above
	42-320-05	7/16/62	Pt. Lot 17; Con. 6	97
	42-320-10	11/5/57	3 rd Div. 16, 1 & 2 Div. 17; Con. 2	164.5
	42-320-10	1/17/57	E Pt. Div. 2 & 3 of 18; Con. 2 WGR	70

Location	Tract #	Purchase Date	Location	Acreage*
Sullivan contd.	42-320-15	12/10/56	E ½ 23 S ½ 22; Con. 3 WGR	400
	42-320-15	12/2/57	N ½ 22; Con. 3 WGR	Above
	42-320-15	9/11/61	W ½ 23; Con. 3 WGR	Above
	42-320-25	4/8/04	Pt. Lot 17; Con. 3 & 4	
Wellington County				
Minto	23-41-10	1/3/57	Lot 13; Con. 13	100
	23-41-05	1/4/65	Pt. Lots 16 & 17; Con. 15	87

*The terms above and below indicated that the acreage for that parcel is included in the total listed above or below the parcel description.

4.3 Harvesting Activities

Over the years there have been considerable harvest activities undertaken on Authority properties, much of it occurring during the term of the Agreement Forest Program. Although the records of the agreement forest activities are somewhat vague or incomplete, it appears that the majority of the harvests were improvement harvests. As most of the forests purchased as agreement forests were neglected or exhibiting poor quality or growth conditions, considerable improvement work had to be undertaken to return the forest to a proper productive state. Most improvement harvests involved the removal of diseased and defective stems or undesired species. This material was generally removed and made use of as fuelwood.

Table 4.2 Hardwood Harvests and Improvement Cuts 1996-2003

Year	Township	Lot	Concession	Acreage	Material Removed
1996	Bentinck	39,40	3SDR	901	31, 394fbm* sawlogs
	Bentinck	41 to 44	3SDR	111	98, 254 fbm sawlogs
1997	Greenock	22 to 25	7	150	303, 620 fbm sawlogs
	Glenelg	13 4SDR	32	32	57, 593 fbm sawlogs
1998	Greenock	11, 12	9	104	85,512 fbm sawlogs
	Greenock	21 to 26	7	310	1, 109,541 fbm sawlogs
	Carrick	11, 12, 13	3, 4	175	288, 484 fbm sawlogs, 142 cords fuelwood
	Bentinck	39, 40	3SDR	90	394 cord fuelwood
2000	Bentinck	41 to 44	3SDR	111	1005 cord fuelwood
	Sullivan	16, 17	2	117	81, 710 fbm sawlogs, 474 cord fuelwood
2001	Bruce 32	32	3	25	76, 137 fbm sawlogs, 329 cord fuelwood
	Glenelg	51 to 53	1SDR	25	10, 488 fbm sawlogs, 180 cord fuelwood
	Culross	Pt. 25	6	25	9, 836 fbm sawlogs, 275 cord fuelwood
2002	Greenock	9, 10	10	37	44, 896 fbm sawlogs, 203 cord fuelwood
	Artemsia	Pt. 10	4	15	22, 165 fbm sawlogs, 49 cord fuelwood
	Saugeen	11 to 13	River Range	30	65, 326 fbm sawlogs, 97 cord fuelwood
2003	Bentinck	11	10	19	26, 313 fbm sawlogs, 108 cord fuelwood
	Bentinck	10	9	19	35, 989 fbm sawlogs, 162 cord fuelwood
	Holland	55, 56	3WTSR	63	26, 621 fbm sawlogs, 142 cord fuelwood
	Holland	53, 54	3ETSR	63	53, 319 fbm sawlogs, 186 cord fuelwood

* fbm: foot board measure

Harvest activities on non-agreement forest properties have occurred over the years, but on an infrequent basis. The preceding table lists some of the harvest activities and information

pertaining to these lands. Harvest activities were, generally, carried out to address overstocking within productive stands and to keep their growth vigorous and with good form.

4.4 Tending Activities

Considerable tending activities have taken place on Authority forests over the years. Tending can be defined as any operation carried out for the benefit of a forest crop at any stage in most Authority forests, when acquired, were of poor form, poor growth, or contained excessive quantities of unwanted species, tending was required on virtually every property. In the case of newly reforested areas, tending was required to ensure the survival of planted trees, to refill areas of poor survival and to control insect and disease outbreaks.

One type of tending operation that was common during the agreement forest period but is no longer practiced was that of girdling. This consisted of severing the bark and underlying cambium layer in a continuous circular pattern around the circumference of the bole of the tree. This process cut off the flow of water and nutrients within the tree and the tree gradually, died within a couple of years of being girdled. The girdled trees remained standing, for several years after dying and gradually rotted and fell to the ground. The trees typically girdled were small diameter and only usable for fuelwood. During the agreement forest period fuelwood markets were almost non-existent, and, therefore, the decision to girdle was based on a cost effective method to reduce the stocking with minimal impact on the characteristics of the stand. As well, the girdled trees provided valuable habitat for woodpeckers and other forms of wildlife. The practice of girdling is now deemed to be costly and wasteful as markets for fuelwood have been very strong in the past several years.

Another common tending operation during the agreement forest period was that of crop tree pruning. This was a common practice in well established plantations to assist in the development of clear boles and high value knot free lumber by removing lower limbs up to a height of 17 feet (5.2 m). Pruning which was a labour intensive procedure was done primarily on White Pine and quite often was left until the tree was too large to benefit properly. The results were trees that still showed indications of knots many years after the pruning was done. Recent research indicates that unless the pruning is done when the tree is less than 4 inches (10 cm) in diameter the tree will not develop the clear lumber as desired. The majority of plantations are now too large in diameter to warrant pruning.

A more recent tending operation has been row thinning of plantations. Most Authority plantations have reached an age (35 to 40 years) where they require a thinning to reduce the stocking and renew their vigor and growth. As almost all plantations had been established in uniform rows, a systematic row thinning is the most practical process to follow. Silvicultural recommendations, typically, call for the removal of between 25 to 35 percent of the stocking during the first thinning. In Authority plantations 30 percent was the target and this is achieved by removing every fourth row with another 5 percent selectively marked and removed from adjacent rows. The first properties selected for thinning had some utilization of the thinned material however much of the smaller material was left as waste in the plantation. In recent years, markets for the smaller diameter material have dramatically improved resulting in better utilization of the plantation material. Virtually, all Authority plantations have now received their first thinning process, thanks to the improved softwood markets.

A recent and important tending practice that is incorporated on Authority Forests is the use of basal area analysis when considering selection thinning in upland and lowland hardwoods. Basal area of a tree, as defined in the glossary of forest terminology, is “the cross sectional area of the bole of a tree, measured 1.3 m (4.25 ft) above the ground”. The basal area of a stand is the sum of individual tree basal areas for a given land area. The recommended “ideal” basal area for our location ranges between 18 to 22 meters squared per hectare as outlined in the Silvicultural Guide to Managing Southern Ontario Forests (OMNR 2000). Determining the basal area of a stand is now a primary and fundamental step in determining when and how a stand is thinned. (see section 23.0 Recommendations #3)

4.5 Access Road and Landing Construction

Forest management activities quite often create a need for improved access to properties to undertake the required work. This may be in the form of access roads to gain unrestricted entry into a forested property or clearing of an area as a landing to facilitate the extraction of harvested material. Access roads and landings are constructed or improved on an “as required” basis. Where little or no forest management activities will occur on a given property, there is no need for a solid road or landing. On the other end of the scale, where a property has forest stands that will generate high quality forest products on a regular basis, then solid and permanent roads and landings are a necessity. Table 4.3 shows access roads and landings that have been constructed since 1996.

Table 4.3 Access Roads and Landings 1996 to 2003

Year	Township	Lot	Concession	Access road	Landing
1996	Bentinck	39, 40	3SDR		yes
1997	Greenock	22 to 25	7	yes	yes
1999	Greenock	21 to 26	7		yes(2)
2002	Greenock	9, 10	10	yes(reconstructed)	

Once access roads and landings have been constructed on Authority forest properties, it is quite often necessary to control unauthorized access. Numerous incidences of illegal garbage deposition, abandoned vehicles, destructive activities, and unauthorized camping have taken place. The Authority has had to expend financial resources and manpower to clean up or repair resulting damages. Properties where frequent access is required for property and trail maintenance, frequently, have locking gates installed. Properties where infrequent access is required, for example once every 10 years, frequently have immovable barriers such as boulders placed to restrict access. The latter may be temporarily moved aside by appropriate equipment when access is required.

4.6 Fire Protection, Fencing and Boundary Delineation

Fire protection activities were common occurrences during the time of the forestry agreement. Fire guards were established around and within newly established plantations to prevent, limit or prevent the spread of a forest fire. On some properties, ponds were constructed or made accessible to provide a water source for fire fighting purposes. Signs identifying Authority forest properties also displayed the local fire department phone number for ease of notification of fires. During the course of the forestry agreement there was no record of a forest fire on Authority properties. The probability of a fire, within a forest, in Southern Ontario is extremely rare. Consequently, maintenance of fire guards and fire ponds was discontinued.

Fencing on Authority Forest properties has only been undertaken on an “as required” basis. Where an abutting property owner is using their property for pasturing livestock, and a fence is required to restrict access to Authority lands. A fence would be constructed or rebuilt according to accepted fencing standards. Fence ownership on boundaries is determined with either the common “your half on right” or a negotiated arrangement when only a portion of fence is required. Demand for fencing has been non-existent for the past 20 years.

Boundary delineation has been an ongoing necessity on Authority forests due to the nature of forest growth. Virtually, every Authority forest property abuts another forest, and in most cases the forest stands are seamless as they extend across the landscape. Efforts in the past to delineate property boundaries have included; blazing marks on trees, paint markings, flagging and marker signs. Over the years, as trees grow, blazing marks disappear, paint fades, flagging disintegrates and signs fall down or are destroyed. Boundary delineation was most often required when harvest operations were to take place on Authority forests or on abutting lands. This was taken care of at the time on an “as required” basis.

5.0 Areas of Concern

The Ontario Ministry of Natural Resources, 2000, defines Areas of Concern (AOC) as “An area adjacent to an identified value that may be affected by some (or all) aspects of forest management activity”, (OMNR, 2000). The Saugeen Valley Conservation Authority owns AOC’s of the following variety: Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands(PSW), other wetlands and waterbodies, significant wildlife species and habitats, other wildlife habitat features, and natural heritage features which includes cultural features.

Provincial Policy Statement

Section 2.3.1 of the 1997 Ontario Provincial Policy Statement states that:

“Natural heritage features and areas will be protected from incompatible development.

a) Development and site alteration will not be permitted in:

- significant wetlands south and east of the Canadian Shield, and
- significant portions of the habitat of endangered and threatened species;

b) Development and site alteration may be permitted in:

- fish habitat;
- significant wetlands in the Canadian Shield;
- significant woodlands south and east of the Canadian Shield;
- significant valleylands south and east of the Canadian Shield;
- significant wildlife habitat, and
- significant areas of natural and scientific interest, if it has been demonstrated that there will be no negative impacts on the natural features or the ecological functions for which the area is identified”, (OMMAH, 1997)

A designation applied to some Areas of Concern may also be Conservation Land. Conservation Land is a designation given by the Ontario Ministry of Natural Resources to properties that include:

- provincially significant wetlands;
- provincially significant areas of natural and scientific interest (ANSI);
- habitat of endangered species;
- lands designated as escarpment natural area in the Niagara Escarpment Plan, and
- community conservation lands

This designation allows for some tax relief. To be eligible for the Conservation Land Tax Incentive Program, the land must be considered highly significant by the Ministry of Natural Resources (MNR), (OMNR, 2001). (see section 23.0 Recommendations #4)

High Conservation Values

The SVCA will maintain a current High Conservation Values Report. This report will be reviewed annually and updated as required. A copy of the most recent HCV Report will be appended to the Forest Management Plan. All staff and contractors will be made aware of any HCV concern located within properties that will be managed. (See Appendix I High Conservation Values Report)

5.1 Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest or ANSI's are defined as A "...areas of land and water containing natural landscapes or features that have been identified by the Ontario Ministry of Natural Resources as having values related to natural heritage protection, appreciation, scientific study or education. There are two different types of ANSI's. Life science areas include living parts of the natural landscape such as forests, marshes, plants and animals and their supporting environments. Earth science areas include; the physical elements of the natural landscape, created by geological processes within or on the earth's surface. They include features such as landforms, fossils and rock strata." (OMNR, 1993) The overall objective of the ANSI program is to identify areas that contribute to the representation of the geological environments and vegetative site types in Southern Ontario. Provincially, significant ANSI's are classified as Natural Heritage resources and many will correspond with other significant features and areas such as wetlands, valleylands, and woodlands.

The majority of ANSI features found on Authority properties are categorized as Life Science ANSI's. In addition, the majority of the Life Science ANSI's owned by the Authority also fall within the boundaries of Provincially Significant Wetlands. Only a few properties owned by the Saugeen Valley Conservation Authority include portions which are classified as Earth Science ANSI's. These properties contain significant landform features such as eskers and drumlins. Table 5.1 Summarizes the Conservation Lands owned by the Authority by municipality or township.

All Authority owned ANSI's should be managed to provide protection from incompatible development. Wherever possible, management activities may encourage diversity, and the maintenance of the areas surrounding the ANSI to provide a buffer zone between areas. Forestry may be permitted in the majority of Authority owned ANSI's, provided that management activities do not result in any

adverse effects to the significant feature or the functions for which the area is identified. (see section 23.0 Recommendations #4)

5.2 Provincially Significant and Other Wetlands

As stated above, the large portion of the Life Science ANSI's owned by the Saugeen Valley Conservation Authority also fall within the Provincially Significant Wetlands (PSW's) as identified by the Ontario Ministry of Natural Resources using evaluation procedures established by the province. 'Wetlands means lands that are seasonally or permanently covered by shallow water, as well as, lands where the water table is close to the surface. In either case, the presence of abundant water has caused the formation of hydric soils and has favored the dominance of either hydrophytic plants or water tolerant plants', (OMMAH, 1997). Wetland types present on these Authority properties include: fens, bogs, marshes, and swamps. These wetlands consist of varying cover types including: open water, shallow water, grass, thicket, naturally occurring and planted trees. Currently, 54 percent of all lands owned by the Authority are Provincially Significant Wetlands.

Wetlands perform a number of important functions, including:

- the recharge and discharge of groundwater, ensuring a stable, long-term supply;
- flood damage reduction through the control and storage of surface water;
- corridors for the movement of species between habitats;
- recreational, educational, and tourism opportunities;
- renewable harvesting for timber, fuelwood, fish, and wildlife;
- the provision of habitat for a wide variety of plant and wildlife species;
- water quality improvement through the trapping of sediment, the removal and/or retention of excess nutrients, the immobilization and/or degradation of contaminants, and the removal of bacteria, (OMNR, 1999)

All Authority owned PSW and properties with other wetlands should be managed to provide protection from incompatible development. Authority management practices should ensure that the functions of the wetlands will be maintained. Forestry may be permitted in the majority of Authority owned PSW's provided that management activities do not result in any adverse effects to the significant feature or functions of the area. In addition, it can be noted that there may be portions of Authority owned PSW's that may not be managed if the value of the wetland is needed to be protected or if the forest cannot be harvested sustainably. (see section 23.0 Recommendations #4)

Table 5.1 Summary of Conservation Lands Owned By Saugeen Conservation as of September 2000

Municipality	Total Owned*	Total Conservation Land**	ANSI		Provincially Significant Wetlands
			ALS***	AES***	
Chatsworth Township	2616.37ac/1058.84ha	511.7ac/207.08ha	296.25ac/ 119.89ha	0	266.80/107.97ha
Municipality of Grey Highlands	2363.25ac/956.40ha	1904.50ac/770.75ha	1753.00ac/ 709.44ha	1519.5ac/ 614.94ha	1467.30ac/593.82ha
Town of Durham	51.31ac/20.76ha	0	0	0	0
Southgate Township	1554.36ac/629.05ha	1044.6ac/422.75ha		48.0ac/ 19.43ha	997.00ac/403.48ha
West Grey Township	3504.36ac/1418.21ha	845.8ac/342.29ha	0	0	845.80ac/342.29ha
Town of Saugeen Shores	496.5ac/200.9ha	0	0	0	0
Municipality of Kincardine	374.49ac/151.56ha	149.48ac/60.49ha	149.48ac/ 60.49ha	0	56.10ac/22.70ha
Municipality of South Bruce	612.78ac/247.99ha	183.1ac/74.10ha	183.0ac/ 74.06ha	0	182.20ac/73.74ha
Municipality of Arran-Elderslie	535.3ac/216.64ha	0	0	0	0
Town of South Bruce Peninsula	74ac/29.95ha	0	0	0	0
Town of Minto	187ac/75.68ha	0	0	0	0
Municipality of Brockton	8664.23ac/3506.41ha	8063.34ac/3263.23ha	7636.89ac/ 3090.65ha	0	7639.69ac/3091.78ha
TOTALS	21033.95ac/ 8512.44ha	12702.52ac/5140.71ha	10018ac/ 4054.53ha	1567.5ac/ 634.37ha	11454.89ac/4635.78ha

* Areas have been gathered from 12/08/99 Valuation Notices prepared by the Ontario Property Assessment Corporation

** Areas have been gathered from 25/09/00 Conservation Lands spreadsheet prepared by the Ontario Property Assessment Corporation and the Ontario Ministry of Natural Resources

*** ALS is the acronym for Area of Life Science, AES is the acronym for Area of Earth Science.

5.3 Significant Flora and Fauna Habitat

According to the Significant Wildlife Habitat Technical Guide, (OMNR, 2000), “wildlife habitat means areas where plants, animals, and other organisms live, and find adequate amount of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual life cycle and areas which are important to migratory or non-migratory species. Wildlife habitat is considered significant where it is ecologically important in terms of features, functions, representation, or the amount (size) and contributing to the quality and diversity of an identifiable geographic area. Significant wildlife habitat can be described as follows:

- seasonal concentration of animals;
- rare vegetation communities or specialized habitats for wildlife;
- habitats of species of conservation concern, and
- wildlife movement corridors.”

Where significant wildlife habitat has been previously identified, or there is documented evidence of the use of a particular habitat on Authority owned lands through the preparation of a management plan. The Authority management practices should be such that this natural heritage feature or area will be protected from incompatible use or unsuitable management practices.

In determining the significance of a population or researching the possible status of a property or forest stand all current recognized classification systems will be used including: Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Recovery of Nationally Endangered Wildlife in Canada (RENEW), and Natural Heritage Features. All attempts will be made to ensure that the most up-to-date information is used.

It is recommended that the following policy will be used to ensure the protection of significant flora and fauna habitat; the Saugeen Valley Conservation Authority will hold itself to the same standard or higher than those standards imposed by the various levels of government on private landowners throughout the Saugeen River watershed to ensure the protection of significant flora and fauna habitat. (see section 23.0 Recommendations #4&5)

5.4 Regional Areas of Concern

Regional areas of concern (RAOC's) are areas that have been identified by either Provincial or local specialists as containing an identified value that may be affected by forest management operations. RAOC=s may include flora, fauna, ecosystems, or habitat types that are not common within the region.

Known regional areas of concern may be identified in operating plans and silvicultural prescriptions. These areas should be protected from incompatible use or unsuitable management practices were possible. Newly identified RAOC's may be recorded when identified or reported to Authority staff. (see section 23.0 Recommendations #4)

5.5 Species at Risk

Species at risk are protected under the regulations of various Acts, including the federal Migratory Birds Convention Act, the Fish and Wildlife Conservation Act, and Ontario's Endangered Species Act. Recovery plans have been prepared for some species at risk. The Natural Heritage component of the Provincial Policy Statement under Ontario's Planning Act also provides protection for the habitat of species at risk listed in regulation under the Endangered Species Act. Species at risk are also protected by forest management guidelines set out by the Ontario Ministry of Natural Resources in A Silvicultural Guide to Managing Southern Ontario Forests (OMNR, 2000).

SVCA will maintain an up-to-date list of Species at Risk from the OMNRF District office. This list, local knowledge, and staff records will be compiled to create a complete listing of species of concern and their habitats on SVCA lands.

SVCA keeps abreast of changes on the status of species at risk (SAR) identified by both the Province and the Federal government. In addition to this means of staying informed on SAR, they have a list of regionally rare species from the OMNRF. This contains a listing of:

- endangered regulated species
- endangered non regulated species
- threatened species
- species of special concern

SVCA’s watersheds fall within the Mixed Forest Region of Canada. Across this entire region, Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists 86 species at risk. Of these, the range maps indicate that there are 34 species at risk within SVCA’s watersheds or in Lake Huron and Georgian Bay. Each of these species is also listed in the Provincial SAR list. Table A1 summarizes the Provincial species at risk (SAR) in this area by general habitat type that may occur within the SVCA watershed. Please note that this list is updated annually and only the most current will be used. For the most current listing the Ministry of Natural Resources website will be used:

<http://www.ontario.ca/environment-and-energy/species-risk-area> .

TABLE A1: SPECIES AT RISK IN THE SAUGEEN RIVER WATERSHED BASED ON BROAD HABITAT TYPES**

FORESTED HABITATS	WETLAND HABITATS	FIELDS, PASTURES AND AGRICULTURAL AREAS	AQUATIC
Butternut	Eastern Prairie Fringed Orchid	Butternut	Black Redhorse
American Hart's Tongue Fern	Dwarf Lake Iris	Bobolink	Northern Brook Lamprey
Eastern Massasauga Rattlesnake	Tuberous Indian Plantain	Eastern Meadowlark	Pugnose Shiner
Jefferson Salamander	Eastern Ribbonsnake	Barn Swallow	Redside Dace
Eastern Ribbonsnake	Blanding's Turtle	Henslow's Sparrow	Fawnsfoot
Whip-poor-will	Northern Map Turtle	Loggerhead Shrike	Rainbow Mussel
Canada Warbler	Snapping Turtle	Short-eared Owl	Hill's Pondweed
Cerulean Warbler	Least Bittern	Milksnake	Hungerford's Crawling Water Beetle
Olive-sided Flycatcher	King Rail	American Badger	
Red-headed Woodpecker	Yellow Rail	Monarch	
Louisiana Waterthrush	Short-eared Owl		
Grey Fox	Black Tern		
Hill's Thistle	Bald Eagle		
Little Brown Myotis	Peregrine Falcon		
Northern Myotis	Grey Fox		

Lake Huron Shoreline	Alvars	OPEN & EDGE HABITATS, ANTHROPOGENIC FEATURES	NIAGARA ESCARPMENT
Pitcher's Thistle	Gattinger's Agalinis	Butternut	Jefferson Salamander
Dwarf Lake Iris	Hill's Thistle	Chimney Swift	Louisiana Waterthrush
Peregrin Falcon		Common Nighthawk	American Hart's Tongue Fern
Bald Eagle		Golden-winged Warbler	Butternut
Chimney Swift		Monarch	Little Brown Myotis
		Milksnake	Northern Myotis
		Whip-poor-will	
		Barn Swallow	
		Little Brown Myotis	

** current as of November 2013, the list is subject to change and should therefore be checked periodically for updates through the MNRF District office.

6.0 Social and Cultural Considerations

6.1 Public Consultation Process and Input to the Plan

The public consultation process was initiated with the formation of the Saugeen Conservation Forest Management Plan Public Advisory Committee (PAC) in the winter of 2002. The first meeting of this PAC was in January of 2003. This introductory meeting gave Committee members the opportunity to reminisce about the history of the Saugeen River Watershed and Saugeen Conservation forestry. The drafted goals and objectives for the management plan were also reviewed and discussed.

The Public Advisory Committee was formed to provide a broad range of special interest groups and agencies/organizations with the opportunity to exchange information and ideas about the future use and management of Authority forest properties, as well as, to facilitate public input to the preparation of the forest management plan. Specific responsibilities of the PAC included commenting on each individual plan section, providing input on possible land use/management conflicts, ensuring the viability of the management plan, and assisting with open house meetings.

Committee members share the common goal of healthy, diverse, productive, and accessible forests. At each meeting of the PAC, Committee members were encouraged to provide input into each section of the Forest Management Plan. The result of this input will be the creation of a Forest Management Plan that ensures the inclusion of all users and user groups, the maintenance of a healthy forest, and the sustainable production of wood products.

6.2 Current Recreation Use and Facilities

Currently, twenty Authority properties are quite extensively used for various forms of recreation. These twenty properties consist of 2134.54 hectares (5274.37 acres) which represents 25% of the total property ownership. These recreational properties do not necessarily include all lands which are used by hunters, hikers, naturalists, or other more passive users. The majority of these properties are used informally. Many properties do not contain structured trail systems, facilities, or have a designated parking area and access point.

Common recreational uses of Authority forests include: hiking, skiing, cycling, bird watching, fishing, wildlife viewing, hunting, snowmobiling, and horseback riding. While many properties are used by all-terrain vehicles, four wheel driven vehicles, and dirt bikes, this usage is not promoted and in many cases it is discouraged. All wetland properties owned by the Authority have restrictions against all motorized vehicles other than snowmobiles.

Trails running through Authority forests range from random footpaths to mapped, signed, and groomed trails. Footpaths or cycle paths are trails that have been created in forests by visitors and are not maintained by Authority staff. Logging roads are often used as trails and are occasionally incorporated into formal trail systems. Formal trail systems refer to marked, mapped, and signed trails. The maintenance of existing trails and the control of the creation of new trails is quite important in ensuring forest health. Trails that are poorly placed or poorly designed will require repeated re-construction and maintenance and may result in the relocation of the trail. While trails may facilitate forest management, too many trails can hinder forest health. Trail maintenance is normally performed by Authority staff, however on a few properties local volunteers assist in trail maintenance.

Facilities available on Authority forest properties range from picnic shelters, vault privies and washrooms to no facilities. The majority of Authority forests do not offer any facilities to visitors. Facilities are normally available within formally established Conservation Areas or very heavily used properties. Facilities are maintained by Authority field staff or volunteer groups.

The development of new trails or facilities may occur in any situation that the Authority has determined that the development is warranted, is financially viable, or will be maintained, and that the development is compatible with the natural elements of the property.

6.3 Current Education and Research Use

Currently 56 percent or 4775.06 hectares (11,799.00 acres), of Authority owned properties are used for education or research. Numerous Agencies, Ministries, Consultants, Universities, and Authority staff perform research studies or educational programs on Authority properties. Research programs both historically, and, currently, have ranged in scope from forest health monitoring plots, forest growth and yield monitoring plots, wildlife population monitoring to wetland health monitoring plots, groundwater monitoring plots, surface water monitoring plots, and biological monitoring plots. Education programs or events occurring on Authority properties includes private consultants having field days, staff having field days, staff delivering an educational program for local school children or other members of the public, ministry staff having training days, and people from the general public taking private tours to see various sites or occurrences.

All forest management activities may be carried out so as to provide a minimum disturbance to any known established research plots or educational areas. Having made the aforementioned statement, research plots and educational areas must be defined and reported to the Authority to ensure that these uses are taken into account when prescribing management activities.

New research plots or educational uses may be encouraged on the majority of Authority lands. Providing lands for research and education emphasizes the Authority's role in ensuring a healthy environment for all.

It is suggested that the Authority develop a policy that would ensure the continuation, or expansion of education and research projects on Authority lands. (see section 23.0 Recommendations #6)

6.4 Future Demands and Anticipated Conflicts/Methods of Resolution

Future conflicts are likely to mimic the problems presently experienced by the Authority. Major problems occurring as a result of forest management or on Authority properties are the misuse of trail systems, conflicts regarding active management, the creation of 'old growth' forests, wildlife management and forest pest control, and conflicting property uses and municipal zoning. (see section 23.0 Recommendations #7)

a) The Misuse of Trail Systems

This misuse includes lowland trails being used in wet conditions, the use of methods of travel that are not permitted, users rerouting or creating trails at their own discretion, illegal disposal of garbage, and the destruction of boardwalks and facilities.

It is anticipated that the demand for trails suited for all-terrain vehicle riding will increase. The Authority has established a policy prohibiting all-terrain vehicles from all wetlands. This prohibition has also included dirt bikes and four wheel driven trucks. Properties that are not wetlands are to be assessed by staff to determine their suitability for all-terrain vehicle use. It is anticipated that denying access to properties already used by the above motorized vehicles will cause great conflict and may lead to property destruction.

The most obvious method of resolution for this conflict is to educate the public on the rationale behind limiting trail users, and the importance of proper trail use. This education would best occur through a public information campaign. Informing the public on the importance proper trail use and the potential results of misuse may lead to conflict resolution or avoidance.

b) Conflicts Regarding Active Management

Conflicts regarding active management include the misconception that conservation means preservation, that forests will continue to improve in health naturally without human intervention, that all forest management is destructive, and that forest management is only performed to produce a revenue.

The most obvious method of resolution for this conflict is to educate the public on the rationale behind forest management activities. This education would best occur through public information sessions and tours. These information sessions should focus on informing the public on the value of forest management activities, and the potential benefits.

Anticipated conflicts between property users and logging activities include the loss of trail use during management activities, loss of nature viewing opportunities during logging operations, and road construction in areas that have had little access prior to road building. These conflicts are easily resolved through proper signage, the careful timing of logging operations, and limiting road construction.

Forestry staff of the Authority must be available to respond to enquiries. All enquiries that cannot be answered satisfactorily by forestry staff will be forwarded to the General Manager. If the response to the enquiry has still not met the expectations of the enquirer the subject shall be forwarded to the Forestry Committee of the Board of Directors. If the Forestry Committee believes it necessary the enquiry will be forwarded to the full Board of Directors.

It is suggested that a policy addressing the importance of public education and signage be created.

c) 'Old Growth' Forests

"There is also considerable diversity on the approaches used to define old growth and to assess its significance in forest stands and ecosystems and across forested landscapes. Numerous authors from across North America...consider many criteria as indicators of old growth forest condition. These may include any or all of the following:

- large old trees for species and site;
- complex stand structure characterized by wide variation in tree size and
- spacing with multiple canopy layers and canopy gaps;
- large dead standing trees and accumulations of downed woody debris, tip- ups and mounds;
- few or no signs of human disturbance;
- net growth equal to or less than zero;

- age of dominant species exceeding average natural disturbance interval for
- ecosystem, and
- forest system near or in late successional or 'climax' state." (OMNR, 2003)

According to the publication, *Conserving Ontario's Old Growth Forest Ecosystems*, "Old growth forest ecosystems are characterized by the presence of old trees and their associated plants, animal, and ecological processes. They show little or no evidence of human disturbance." (OMNR, 1994) The range in ages for 'old trees' is from 70 to 140 years depending on tree species present.

As very little of Authority owned property contains 'old trees', for the purposes of this plan, the Authority may extend the following modified definition of old growth. Old growth forests are forests that have ceased to be actively managed. These forests include forests of all classes: upland, lowland, and swamp. This modified definition will be used on Authority properties as very little of the total land base has never received management, and, therefore, does not qualify for various other definitions.

There has been some conflict over the retention of old growth forests. To resolve this conflict the Authority will address the issue of old growth forests as wildlands in Section 17.0 of this plan. Another method of resolution for this conflict is to educate the public on the definition of, and criteria for selecting old growth forest areas. This education would best occur through public information sessions, and tours that will inform the public on the importance of maintaining a variety of forest types, and the future of an old growth forest. (see section 23.0 Recommendations #8)

d) Wildlife Management and Forest Pest Control

Hunting is permitted on the majority of Authority lands. This policy has led to little or no conflict with hunters, or other adjacent property owners. The management of problem wildlife has led and will likely continue to lead to many conflicts. Problem species have included beaver, porcupine, and various insects.

In the past, trappers have been permitted and occasionally sought after to trap beavers on Authority properties. This method of pest control appears to be most effective for this species. For the control of porcupine within Authority forests where there has been an obvious problem with the destruction of trees and neighbouring property, hunters or qualified firearm operators have been encouraged to lower the population.

The various insect problems within the Authority forests have been ongoing. The alleviation of these insect problems in many cases may only occur through either salvage operations or aerial spraying. The latter two solutions may cause conflict with watershed residents and visitors.

The resolution of wildlife management and forest pest control problems may be best carried out through public education initiatives. However, any issues that forestry staff have not adequately responded to may be forwarded to the Authority General Manager. If the reply to the issue does not satisfy the inquisitor the issue may then be forwarded to the Authority Forestry Committee, and then to the full Board of Directors.

e) Conflicting Property Uses and Municipal Zoning

Municipal zoning may affect forest management activities through the changing of zoning. Different zoning classes have different restrictions. Some classes permit or prohibit forestry operations. For example, forestry is permitted in the majority of Agricultural zoning, and it is prohibited in the majority of Residential zoning. This potential change in zoning will lead to a conflict in managing Authority forests, as many forests which may have been designated for management may no longer be permitted to be managed regardless of their health.

This conflict is most easily resolved through the careful analysis of proposed zoning by-laws and official plans, and the appeal of non-compatible zoning classifications.

6.5 Cultural Features

Many of Authority properties contain sites with cultural value. The Authority places a high value on the protection of cultural features. All identified Cultural Features will be treated as an Area of Concern during the planning and implementation of forest management activities.

7.0 Economic Considerations

7.1 Wood Consumption Requirements of Primary Wood Using Industries

Wood has been and still is a very strong component of the local economy within the Saugeen River Watershed. Local history books have described numerous sawmills that dominated the landscape and provided a local means of employment, as well as, providing material for buildings and furnishings. Even today, while most of the small local mills have faded from the scene, larger, more productive mills have become established and continue to be a solid component of the local economy. The following paragraphs will briefly describe the various types of wood consumption that originate from the local forests.

Hardwood Sawlogs

Since a significant portion of the forests of the Saugeen River Watershed are of the Upland Tolerant Hardwood Forest type, it is understandable that considerable quantities of hardwood sawlogs are derived from these forests. It has come to be known that the quality of hard maple originating from the Counties of Grey and Bruce is exceptional, and is indicated by the high prices paid for this local timber. Proof of this statement can be found in the Forest Products Marketing Bulletin published by the Ontario Forestry Association. The December 2000 edition of this publication showed the price of hard maple from the Grey/Bruce region ranging from \$750 to \$1,900 per thousand fbm (foot board measure) while hard maple from the Orillia-Barrie region was significantly lower at \$250 to \$500 per thousand fbm. Grey/Bruce pricing is generally 40-80 percent higher than the remainder of the province. As a result, there is a very strong demand for hardwood sawlogs from Saugeen River Watershed forests. Many sawlogs are graded as veneer quality and often are exported out of Ontario to various processing plants typically found in the United States and Europe. The value of veneer is substantially higher than sawlog prices.

It is not just the high quality timber that is in demand but rather there is a strong demand for virtually all quality of sawlogs. The middle to lower grades of sawlogs are primarily processed for use by several local furniture factories. As well, several sawmills process sawlogs into dimension lumber and ship it to other processors throughout Southern Ontario.

The demand for lower quality and especially smaller diameter sawlogs is moderate locally as several sawmills have modern equipment such as bandsaws which can process the small logs with not much waste. The standard method of sawing logs was with a circular saw which wasted much of the log due to the width of the kerf (saw blade). Most local mills have recently upgraded to bandsaws which process logs with considerably less wastage. This is important when processing small dimension sawlogs as there is less material to work with. Most of this smaller dimension stock is used in the flooring industry.

Conifer Sawlogs, Poles and Pulpwood

The establishment of plantations beginning in the early 1900's has resulted in a supply of small diameter conifer sawlogs from plantation thinning operations. With technological changes in sawmill operations in the 1980's, namely the use of band saws allowing smaller diameter material to be sawn more efficiently, a strong demand for this material has developed. There are sawmills in Southern Ontario that now process small dimension conifer sawlogs into dimension lumber.

Larger dimension conifer sawlogs have been used to a limited extent within the local sawmill trade. Some of this larger material does end up in the log home market but the demand is rather limited at this time. The standards for the log home industry are rather specific for the size and quality of logs required. As well, some of the larger trees might be used as utility poles as there is a specialized market for this type of material. Again, the standards that the log has to meet for utility poles are strict and therefore only a limited amount of local material enters this market. As the plantations age and are appropriately managed there is a greater percentage of material that will be available to these markets. The smallest conifer size class material harvested from plantations is generally of little use, other than for the pulp and paper industry. As most of the Authority plantations are composed of white pine, little is usable for pulpwood. Occasionally, small amounts of white pine can be used for pulp, however, only small quantities are allowed to be mixed in with the other species. Only white spruce, Norway spruce and balsam fir are suitable for use in the pulp and paper industry.

Cedar Posts, Poles and Sawlogs

Cedar is one species where there has always been a strong demand for virtually any size of material. Fence posts are the most common material to be marketed, however sawlogs and poles are readily sold as well. Most of the material comes from natural stands. Very few cedar plantations have been established as cedar regenerates naturally.

Fuelwood

The existence of numerous fuelwood contractors throughout the Saugeen River Watershed indicates a very strong market for this forest product. While some contractors extract the material from woodlots and process it directly into fuelwood, other contractors purchase log length material from logging operators and process it into fuelwood. As well there are numerous farm operations throughout the watershed that generate and sell small volumes of fuelwood. The burning of fuelwood for heating purposes has been a long standing tradition in Southern Ontario. This, no doubt, will continue regardless of any other heat source becoming economical or of any new developments in the home heating market. Most people look upon wood as a cheap renewable, locally grown fuel and will continue to use it as a primary or secondary heat source for many decades to come.

7.2 Saugeen Conservation Expectations for Revenue Generation

The Authority Forest Management Program is designed to be a self-supporting program. Revenue generation is required for the ongoing operating expenses such as property taxes, forestry staff, fencing, trail maintenance and signage. As well, one of the goals of the Authority is to manage the forests on a sustainable basis and therefore harvests will be required to keep the forests in a vigorous healthy state. From time to time other non-standard expenses such as insect or disease control may be required.

The value of forest products will vary from time to time, creating wide variations in revenues received from forest products sales. The timing of these sales may have to be adjusted to take advantage of the times when the markets are at their highest and also to refrain from sales during periods of price slumps in the market place. As such, the maintaining of a forest management reserve for excess revenue will assist in balancing the variations of revenues generated on a yearly basis. Based on revenues generated over the past seven years, which has varied from a low of \$75,000 to a high of almost \$400,000, and once the majority of forest stands have had improvement harvests to maximize their growth and vigor, it may be feasible to establish a harvest cycle where harvests can be undertaken on a rotating schedule. As well, as the forests are improved through management, the value of forest products should improve substantially. This should provide for more flexibility in budgeting for forestry issues over the long term.

7.3 Requirements of the Tourism Industry

Authority Forests presently only permit passive use such as hiking, birding, nature appreciation, skiing, hunting, horseback riding, cycling, fishing, and snowmobiling within their boundaries. With such a broad land base, it may be possible to incorporate other tourism related uses without creating conflicts between users or with forest management objectives. One example would be the incorporation of all terrain vehicle trails on designated properties to meet the increasing demands for this recreational pastime. Although liability issues are substantial with this use of Authority property, perhaps this could be resolved by working closely with local organized clubs or groups to minimize the impact and liability that will be associated with the use.

At the time of writing this plan, there does not seem to be any requirement that needs to be addressed. However, the Authority will be open to consider other tourism requirements that may materialize in the future. Authority forests are intended to be managed to allow multiple uses while maintaining a viable forest management program. Tourism is a valued industry within the Saugeen River Watershed. (see section 23.0 Recommendations #9)

8.0 Summary of the Forest Resource Inventory

8.1 History of Property Inventory

The majority of the forested areas presently owned by Saugeen Conservation were inventoried by Ontario Ministry of Natural Resources (OMNR) staff on various dates from the 1960's to the 1990's.

The most recent OMNR inventories were performed using the variable radius plot sampling method, using a prism to determine basal area. This method required compass lines to be walked and information gathered along the sides of the lines for a specified distance. Prior to the inventory field work, aerial photos, past records, and maps were consulted to determine the compass bearing that would cover the most representative area of land. The records of these inventories are not complete and, in many cases, are non-existent. This lack of records and the changeover from OMNR management to Saugeen Conservation management prompted the start of the most recent inventory in 1997.

From 1997 to date, Saugeen Conservation has been working towards the completion of forest inventories for each of their properties. In 1997-1998 the Authority contracted this service to Lands and Forests Consulting. This inventory included the majority of the forested properties owned by Saugeen Conservation located in the County of Grey. In 1998, in an effort to become more independent in managing their forested lands, the Authority hired an inventory crew of two forestry technicians to complete the forest inventory and operating plans for the remainder of the properties. The methods of inventory used by the inventory crew technicians are discussed below. A table listing the status of the inventory completion is included as Appendix G.

8.2 Inventory Procedures

Properties were located using a combination of deeds, survey records, Ministry of Natural Resources records, assessment notices, previous SVCA mapping, aerial photography, assistance from SVCA staff, and municipal staff. Property boundaries were located on aerial photographs, township grid maps, and on the ground, and then compared prior to the commencement of any inventory.

The total area of each property was determined using deeds, aerial photography, and assessment notices from the Municipal Property Assessment Corporation, formerly the Ontario Property Assessment Corporation.

Once the property boundaries were located on the photographs, approximate stand boundaries were located and areas calculated. Inventory plots were then established by placing a north-south/east-west grid over the photograph, stratifying forest stand types, and randomly selecting plots areas at a minimum of 100 meter intervals within the various stand types. The grid was used for ease of inventory and future reference.

The majority of Saugeen Conservations forests were inventoried using one plot for every two hectares (five acres) of property owned. Properties that appeared uniform through aerial photography and file analysis were inventoried with one plot for every four hectares (10 acres). These plots were established on the ground according to the preset grid. Plot inventory consisted of recording site topography and drainage and the information contained in Table 8.1. With the exception of recording mature tree species, plots with an eight meter (twenty-six foot) radius were established and the contents recorded. Wildlife, topography, and drainage were also noted between plots. Mature trees were inventoried using a prism with a basal area factor of two. This is a standard forestry practice.

Table 8.1 Typical Inventory Information

Inventoried Information	Mature Trees	Regenerating Trees	Shrubs	Ground Vegetation	Wildlife
Species	✓	✓	✓	✓	✓
Abundance	✓	✓	✓	✓	✓
Diameter	✓				
Height	✓	✓			
Health	✓	✓			
Potential Productivity	✓				
Basal Area	✓				

* Please see section 8.3 for more information.

8.3 Site Quality/Characteristics

Throughout the inventory process site quality and characteristics are recorded and researched. Site quality refers to the growth potential of the site, while site characteristics refer to the individual components of the site which determine the site quality. Past records of property usage and forest management activities, soil maps, and other property information documents should be researched or consulted prior to the preparation of an operating plan. Site analysis is incremental in determining proper forest management objectives and guidelines for each property. Information on site quality/characteristics should be continually updated to ensure that forest management activities do not have a negative impact on the site.

8.4 Inventory Outputs/Operating Plans

Inventory information was compiled to provide accurate information on species present, species quality, forest health, and forest features. Once the information was compiled it was then used to produce Operating Plans and, if necessary, silvicultural prescriptions. Operating plans combined inventory information with data from other sources to provide an accurate view of the present forest conditions. Other data sources included: the Management Plan for Saugeen Valley Conservation Authority Forests, the Ontario Ministry of Natural Resources records, Ontario Ministry of Agriculture and Food soil maps, Saugeen Conservation historical files, and Saugeen Conservation staff.

The format of the Operating Plans was, originally, developed by the Forestry staff of Saugeen Conservation, however, the present plan format will follow the layout of the Managed

Forest Tax Incentive program plans. A copy of an Operating Plan is attached as an example in Appendix E. Operating Plans for each property will include the following specific data: soils, topography, flora and fauna, tree species, vegetative communities, wetland and water systems, social and cultural interactions, management objectives/strategies, and recommended silvicultural systems. Operating Plans will be reviewed and modified pending the adoption of policies as recommended in this Management Plan. (see section 23.0 Recommendations #10)

Silvicultural prescriptions may be produced, if necessary, at the time of the drafting of the Operating Plan. Silvicultural prescriptions will be based on the information contained in the Operating Plan, and will be drafted according to the standards of the Management Plan, as well as, other pertinent information such as the provincial silvicultural guidelines. (see section 23.0 Recommendations #11) A table listing the status of the preparation of Operating Plans is included in Appendix G.

9.0 Special Wildlife Habitat Features and Concerns (see section 23.0 Recommendations #12 & 19)

9.1 White-tailed Deer Yards

White-tailed deer are abundant throughout the Saugeen River Watershed and deer wintering areas are located in virtually every large tract of forest that contains adequate conifer cover. Mapping may be obtained from the Owen Sound District Land Use Guidelines, MNR 1983, which gives the general location of all deer wintering areas in most of the watershed. Two Authority Forest properties are, locally, known to be used by White-tailed deer for wintering purposes, one being within the Greenock Wetlands and one near Bell's Lake. Several other Authority tracts are probably being used as wintering areas as well due to being part of a larger block of contiguous forest cover.

Managing the forest stands that provide deer wintering habitat is acceptable providing certain criteria are taken into consideration. The OMNR publication entitled "Forest Management Guidelines for the Provision of White-tailed Deer Habitat, 1997" provides detailed information not only on proper management for the provision of appropriate deer habitat but also on when and how to undertake management without compromising the existing habitat. White-tailed deer rely on stands with ample amounts of white cedar and hemlock to not only provide for the moderated micro-climate for wintering purposes, but also for the appropriate provision of browse material for a food source. Proper forest management dictates that forest management focuses on ensuring that known deer wintering areas are not significantly disturbed for prolonged periods or over large portions of the area.

9.2 Wildlife Corridors

Wildlife corridors are bands of vegetation, usually trees that connect one forested area to another. Authority forests in many cases form the common forest area with wildlife corridors acting as connecting links to other forest areas. These wildlife corridors are important for the movement of many species of plants and animals from one forest area to another. Under proper forest management guidelines forest operations should cause little disturbance to adjacent wildlife corridors and, where possible, efforts should be made to enhance their use by wildlife. This may be achieved by planting specific vegetation in the areas of the wildlife corridors or perhaps by limiting harvest activities in close proximity to them.

9.3 Open Areas and Edge Effects

The peripheral area of the forest, known as the edge, provides a diverse cover that is preferred habitat by many species of wildlife. Provincial forest management guidelines advise that this edge effect should be managed to minimize disturbance and encourage diversity. Occasionally, the edge needs to have management to rejuvenate and re-establish new growth where older trees have dominated the growing space.

Open areas within the forest provide the higher light levels that some forest species need to propagate and thrive. These increased light levels allow different forms of shrub and ground cover to exist that provide food sources that are not normally found in the forest interior. Larger open areas also have their own edge effect around their perimeter, much like the perimeter of the forest itself.

Most Authority forest stands contain open areas of some kind, either in the form of landing areas created during logging operations, small wetlands or areas of natural blow downs. The landings are maintained for their intended purpose but also serve to provide some fringe effect on a minor scale. In some situations landings are seeded with mixtures that provide additional forage for wildlife. Open areas that are the remnants of old abandoned fields are left as they are to provide additional diversity for the benefit of wildlife. In some specific situations where it is preferred to encourage the establishment of mid-tolerant tree species such as black cherry, open areas can be created to provide the needed light levels. These newly created open areas also provide additional wildlife habitat by allowing browse material to become established. Native shrub species, typically, establish into most open areas shortly after their creation. Properties are evaluated on a regular basis to determine the amounts of open areas and the creation of openings prescribed where warranted.

9.4 Forest Interior Features and Concerns

Forest interior is described as habitat deep within the forests. More specifically, forest interior is described as blocks of forest at least 100 m (328 ft.) from the forest edge or any man made opening such as a field, roadway or utility right-of-way. Forest areas of 200 hectares (500 acres) and greater have the most forest interior but smaller areas of 100 hectares (250 acres) still provide the typical "interior" habitat. Many species of wildlife and bird species in particular, depend on the features of a large forest interior for their existence. The Red Shouldered Hawk, Acadian Flycatcher, Cerulean Warbler, Scarlet Tanager and Pileated Woodpecker are examples of birds that prefer the depths of the forest interior for their habitat.

Managing large blocks of forest that contain forest interior requires certain considerations to minimize the disturbance to wildlife and their habitat. Such things as reducing or eliminating the harvesting of trees around the edge, along riparian corridors or around forest pools or ponds will benefit the interior inhabitants. As well, minimizing the establishment of roads and landings and the time and extent of harvest operations within the interior will lessen the impact on wildlife. Maintaining a good diverse range of species and size classes is beneficial as well with perhaps a need to leave more of the largest size class trees as super canopy trees. Management of the forest interior will be an integral part of the overall management practices of Saugeen Conservation.

9.5 Upland Tolerant Hardwoods

Upland tolerant hardwood stands within the Saugeen River Watershed are typically managed using the single tree selection silvicultural system. This system provides a diverse range of species as well as size classes. Ample regeneration occurs on a regular basis that is beneficial for wildlife. While the main focus should be on the production of high quality timber producing trees, cavity trees and mast producing trees should be retained, according to provincial guidelines, to provide wildlife habitat and food sources. A well managed upland hardwood stand provides ample diversity which benefits numerous species of wildlife.

9.6 Lowland Hardwoods and Mixed woods

These types of stands are managed using the single tree selection silvicultural system and perhaps in certain situations the group selection silvicultural system. The lowland hardwoods respond much the same as the upland hardwoods when properly managed with the exception of a slower growth rate. Wildlife benefits mostly from regular scheduled harvest cycles as the stands are opened up to allow for renewed vegetation in the 1 to 3 meter (3 to 10 feet) range. Solitary conifers and groups of conifers should be retained within stands where there the predominant cover is deciduous species. In some instances, for example in the Greenock Wetlands where vast areas of lowland hardwoods exist, it may be beneficial to wildlife to do some selective clear cutting in circular plots to encourage white cedar to re-populate the area. The planting of conifers may be necessary where there are virtually no conifer seed trees within the immediate area.

Mixed woods are managed to retain a balance of conifers and deciduous species that is most productive yet provides ample benefits for wildlife. The proportion of conifers to deciduous within each stand may be monitored to ensure a suitable balance between the two is maintained.

9.7 White Cedar and Tolerant Conifers

White cedar and tolerant stands generally provide excellent cover and food sources for wildlife throughout the year. This is, especially, true for wintering deer populations. There are situations where stands of conifers attain very high stocking which eliminates all under storey vegetation due to lack of adequate light levels. These stands are managed using the shelterwood or clearcut silvicultural system to replenish and encourage ground level vegetation. Where white cedar stands exist on upland sites it may be necessary to manage the stands to prevent the conversion to predominantly deciduous species such as maple or ash. This can be achieved by selectively thinning out the hardwood regeneration that occurs within the stands.

9.8 Conifer Plantations

Conifer plantations are intensively managed to encourage optimum height and girth which produces quality timber. During certain stages of management these plantations offer little benefit to wildlife other than cover. However, wildlife habitat does improve as the stands age and through proper thinning the stands are opened up allowing deciduous species to establish themselves. In most stands, there are existing openings around stone fence rows, stone piles, ponds and locations where low survival has created open areas which add to the wildlife potential of the stands. Solitary mast producing trees such as black cherry should be retained within the conifer stands to provide a

valuable food source. Eventually conifer plantations will mature into hardwood stands with some conifers retained for diversity.

9.9 Stick Nests

Squirrels and many bird species build or use stick nests as their nesting habitat. Bird species that build stick nests includes: hawks, herons, ravens, eagles, osprey, and crows. Bird species that use stick nests that have been built by other species includes falcons and owls. Piles of sticks at the base of a fork of branches in a tree can also be the result of bears breaking off branches to feed, or the natural accumulation of debris from the upper canopy of the forest. Birds will commonly use stick nests, repeatedly, for many years or a series of nests by annual rotation. Any disturbance near, or the felling of, a tree containing a stick nest during forest management activities may displace the bird from the area.

Saugeen Conservation forest management practices follow or exceed the most recent provincial guidelines for the protection of nesting habitat for raptors and great blue herons to ensure the present populations of species are maintained. Generally, the Authority ensures that, at a minimum, identified stick nests and the trees immediately touching the canopy of the tree that contains the nest will be retained in all situations that do not violate other forest management guidelines or health and safety guidelines. This minimum practice provides protection for nests that have not or cannot be identified as being built or used by a specific species. Naturally, accumulating debris piles or bear nests may not receive any protection. All known stick nests are identified within operating plans, and harvesting activities are excluded from the area of the known nest during breeding season.

9.10 Cavity Trees

Many species of wildlife rely on cavity trees for habitat. While some species excavate their own cavity, others use naturally formed cavities or cavities created by other wildlife species. These cavities provide valuable wildlife habitat. Silvicultural prescriptions, generally, state that a minimum of six cavity or potential cavity trees, over 50 centimeters (20 inches) in diameter, per hectare (2.5 acres) will be retained where possible.

In cavity tree selection, priority is given to cavities in living hardwood trees, pileated woodpecker roost or nest trees, trees with other woodpecker species nest cavities, natural nest or den cavities, trees with escape cavities and trees with obvious woodpecker feeding damage. Forest management guidelines dictate that when selecting trees that may develop cavities the focus should be on trees that are of good health, trees with holes that are not open to the rain, and trees that are 50 centimeters (20 inches) or greater in diameter, and trees that provide multiple benefits to wildlife.

9.11 Conifers in Hardwood Stands and Hardwoods in Conifer Stands

The maintenance of species diversity is of great importance throughout the majority of forest management operations. Conifers in hardwood stands and hardwoods in conifer stands are vital to a variety of wildlife. In this instance tree species diversity enables wildlife habitat diversity and assists in the provision of wildlife corridors. Solitary trees or groups of uncommon trees species are retained where possible while ensuring that forest health is maintained.

9.12 Mast Producing Trees

Many species of wildlife rely on mast for food. Mast is best described as the nuts and fruits produced by trees and woody shrubs. Native mast producing trees within the Saugeen River Watershed, commonly relied upon by wildlife, can include the following tree species families: oak, beech, hop-hornbeam, hickory, walnut, butternut, cherry, and apple. Numerous other tree and shrub species also provide mast and should be managed within forest management plans.

Standard forest management practices dictate that eight mast trees per hectare (2.5 acres) should be maintained, at a minimum, when prescribing forest management activities. Priority should be given to maintaining the oak, hickory, butternut, walnut, and beech tree species. Notwithstanding the latter, the maintenance of a variety of mast trees is also of great importance. These mast trees should be scattered throughout each hectare of the forest as much as possible.

9.13 Supercanopy Trees

Supercanopy trees are trees with crowns that exceed the average height of the forest canopy. These trees provide valuable wildlife habitat for eagles, ospreys, bears, and other species. Standard forest management practices dictate that one supercanopy tree per two hectares (5 acres) should be maintained at a minimum, when prescribing forest management activities, where possible. The supercanopy tree minimum applies mainly to mature forest ecosystems. While supercanopy trees do exist within young forest stands, their importance is not realized until the young stand matures.

9.14 Downed Woody Debris

“Downed woody debris refers to fallen trees, limbs, and branches, and their remains, found on the forest floor. This organic material provides important habitat for fungi, reptiles, amphibians, small mammals, invertebrates, and bacteria. As the wood decays, it returns nutrients to the forest soil and creates and maintains the fertile, moist conditions that many tree and herbaceous species need to grow. Some tree species, such as yellow birch and hemlock, commonly, regenerate on rotting logs and stumps.” (OMNR, 2000:67, 68) The importance of downed woody debris is to be reflected in forest management planning.

10.0 Botanical Resources

Many varied botanical communities exist within Saugeen Conservation Forests. Although the majority of these communities are common to the area, a few are significant. Among and outside of these significant communities are significant plant populations. Significant plant species and communities are determined upon reviewing the various documents provided and are more commonly referred to as rare or endangered species. Exact locations, species, and population numbers will remain as protected information to ensure that damage and exploitation of these populations is avoided. The majority of this information is received from the Province with the understanding that it will remain protected.

It is suggested that the Authority develop a policy on archiving information to ensure that information can legally be protected from viewing by the general public.

Forest management must only be undertaken after reviewing available botanical information and current site conditions. This review will assist in determining the appropriate time, location, and type of management suited to the forest.

Under the Conservation Authorities Act - R.R.O. 1990, Reg. 133, Prohibited Activities and Activities Requiring Permits section, “No person shall, in the conservation area..., c) cut, remove, injure or destroy a plant, tree, shrub, flower or other growing thing”. Within the Act, a conservation area is defined as “the land owned by the Authority”. This legislation is required to ensure that the destruction of botanical populations does not occur without the prior research of the potential effects and other possible alternatives to avoid the destruction.

Invasive and alien species will be controlled as necessary, where feasible, to ensure the health of the existing native species. Invasive species are species which are generally not native to the area in which they are found and their growth rates and habits commonly overcrowd native species. Alien species are those species which are not native to the area in which they are found and these species may become invasive. Many alien species may however provide benefits for various wildlife populations and are therefore beneficial to the health of the forest. When dealing with invasive and alien species control any operations requiring the use of chemicals must following the appropriate Authority SOP. (See Appendix H Chemical Usage in Saugeen Conservation Forests)

As mentioned in the ‘Significant Flora and Fauna’ (Section 5.3), the Authority will use all available resources including documents from: COSEWIC, RENEW, and the Natural Heritage Features section of the OMNR to ensure that significant botanical populations are not put at risk or destroyed. (see section 23.0 Recommendations #12 & 13)

11.0 Biodiversity

Maintaining biologically diverse forests assists in the assurance of healthy forests. Biodiversity includes the diversity of tree, plant, wildlife, and all other biota present.

Biodiversity is an important component of silvicultural prescriptions. Both species and size class diversity is considered to be important. To ensure that biodiversity is encouraged and maintained, detailed forest resource inventories will be completed prior to the drafting of every silvicultural prescription. In some cases proper forest management and more, specifically, management activities regarding insect and disease control cannot ensure that maximum biodiversity is maintained at the stand level.

Abiotic components (non-living things: rocks, topography, air, etc.) of the forest most often affect or create the conditions of the biotic components (living things: plants, trees, wildlife, etc.) of the forest. As a result of this, information gathered during forest resource inventories includes abiotic information. The prescription is then drafted based on the information gathered during the inventory using size, species, and quality abundance information, as well as, information on the site conditions.

Management planning should focus on the maintenance of biodiversity at the landscape level, with a secondary look at diversity at the stand level. This requires combining the stand inventory information with all available information on the lands surrounding the stand. (see section 23.0 Recommendations #12)

12.0 Ecological Land Classification

In 1998, the Ontario Ministry of Natural Resources released a newly developed manual entitled Ecological Land Classification for Southern Ontario: First Approximation and its Application. The purpose of this manual was to present the tools and techniques for the consistent description, identification, classification, and mapping of ecological land units in Southern Ontario.

Land classification within this management plan does not follow the Ecological Land Classification system (ELC) as established by the manual. This management plan follows the most commonly understood method of classifying forest types using a site description and tree type description. For example: Upland Hardwood Forest – a dry, higher site consisting mainly of hardwood trees species. While this simple, now dated, method of classification is being used for the preparation of this plan and the inventory that will be carried out as a result of this plan, the Authority is not limited to this system of classification, and may move towards utilizing the ELC. The ELC has not been used in this plan as it may lead to the exclusion of input from people that do not understand the codes used by the ELC, and the fact that there is a gap within the classification system.

It is suggested that, as it is the desire of the Authority to work with landowners, user groups, and other members of the public throughout its forest management planning activities, until the public has a better understanding of the ELC the existing classification system be used. The Authority may, eventually, adopt the ELC as the sharing of Geographical Information Systems materials increases. (see section 23.0 Recommendations #14)

13.0 Mineral and Aggregate Resources

Mineral and aggregate resources are valuable non-renewable resources that are available within some Authority properties. Historically, these resources have not been excessively used by the Authority. Small amounts of aggregates have been relocated within properties for trail, road, and landing construction. Many properties had been subject to aggregate removal prior to the sale of the land to the Authority. These former aggregate sites are, generally, quite small in size and have been left to naturally regenerate into grasslands, meadows, and forest.

Due to the size of the pockets, the quality of the aggregates and minerals and the potential environmental disruption required when establishing an extraction site, it is recommended that there will be no significant aggregate or mineral extractions, on lands now held, occurring within the period of this plan. The feasibility of mineral and aggregate extraction may be re-evaluated at the end of this planning period. Small amounts of aggregate material may be relocated within any one property to develop, maintain, or enhance trails, roadways, and landings. All aggregate material handling will be in accordance with all applicable legislation. (see section 23.0 Recommendations #15)

14.0 Outdoor Education and Research

14.1 Saugeen Conservation Delivered Education Programs

Historically, schools within the Saugeen River Watershed relied on their school boards to offer outdoor educational programming at school board facilities/properties and relatively few teachers felt

confident enough to lead their own programming at outside properties. Only a few educational programs took place beyond the most popular of Authority properties.

Currently, most conservation education programs conducted by Authority staff are delivered on Authority owned properties with facilities ranging from vault privies to heated resource centres. These programs (over 50 different programs currently available) are with students ranging from grades kindergarten through 12 from our 45 watershed schools and homeschooling associations. Advertising of these programs on our website has brought classes and groups from outside the watershed as well to use our properties. Community youth groups (Scouts, Guides etc.) also make use of the education programs run by the Authority. Owing to the diverse curriculum and badge requirements, a variety of properties are used on a regular basis highlighting both the earth sciences and life sciences of the properties. On occasion, forest management techniques are investigated with classes, focussing on properties with visible recent activity.

A number of elementary and secondary schools as well as community youth groups currently use local properties on their own to conduct their own investigations into our natural heritage. While permission is not sought from the Authority before use, hearsay attests to the use of the properties. Some schools and groups have actually “adopted” certain properties to conduct conservation projects such as Earth Day clean-up activities to combine with their studies. With the increasing cost of bussing students farther from their schools, future programs may utilize Authority properties closer to the schools. More education programs are being designed to highlight these properties and their earth and life science investigation potential.

14.2 Other Education and Research

Many educational institutions, Provincial Ministries, and Federal government departments have, from time to time, requested and used various Authority owned properties for research projects. This openness to providing research opportunities has and will provide the Authority with an excellent working relationship with these groups as well as encourage the sharing of information.

Interpretive signage may be erected in areas deemed appropriate to educate the public on various natural and cultural features of a property. This signage should result in a greater awareness of the feature and the effects of human disturbance on the environment.

Research and educational opportunities will continue to be provided or encouraged on Authority owned properties. Each proposed project will be, carefully, examined prior to granting permission for property use. This close examination will assist in ensuring that the negative effects of the project will be negligible and that the project is valid. A copy of any document, report, or information that has been created as a result of research performed on Authority owned lands must be provided to the Authority. (see section 23.0 Recommendations #6)

15.0 Carbon Sequestration

Carbon sequestration or carbon storage refers to the storage of the carbohydrates or carbon dioxide within the tree or soil. These stored carbons are considered to be available carbon credits. A Carbon Credit is the term used to describe the potential sale of the carbon rights of a carbon sink to an industrial entity. Saugeen Conservation will continue to investigate all carbon sequestration options throughout the period of this plan. For more information on carbon sequestration please see Appendix B.

16.0 Outdoor Recreation Activities

The properties owned by Saugeen Conservation offer many outdoor recreational opportunities. To ensure that these opportunities remain available in perpetuity not all activities are permitted on all properties. Properties that have restrictions on their use are posted with signs stating the activity that is not permitted. All property users must be respectful of other property users and uses. (see section 23.0 Recommendations #6)

16.1 Walking, Hiking, Snowshoeing, and Wildlife Viewing

Walking, hiking, snowshoeing, and wildlife viewing are permitted on all properties owned by the Authority. Cross-country skiing is a permitted activity on all properties, however, only a few properties have established ski trails. The properties with ski trails include: Headquarters Conservation Area, Tracts 42-280-15 (Allan Park), 42-320-20 (Kinghurst), and 41-210-05 (Stoney Island). These ski trails are often used by pedestrians/hikers as well.

16.2 Horseback Riding

Horseback riding is permitted on all hard packed trails. Horses are not permitted on boardwalks or in wet areas. To confirm that riding is permitted on the trails, riders are asked to contact the Authority office. Riders are responsible for removing all horse droppings from the trails and parking areas.

16.3 Snowmobile Riding

Snowmobiling is permitted on all snowmobile trails established by the Ontario Federation of Snowmobile Clubs (OFSC), in agreement with Saugeen Conservation. Many OFSC trails pass through Authority properties. Under OFSC user guidelines trails maintained by OFSC clubs or representatives are open exclusively to permit holders during the snowmobile season unless permission has been granted by the OFSC for other users. Trails are often used by pedestrians/hikers in the warmer months.

16.4 All Terrain Vehicle Riding

Many Authority properties have been used, to some degree, by motorized all-terrain vehicles (ATVs). This use has on numerous occasions caused extensive damage to the environment in which they were riding. On less frequent occasions property users have visited on ATVs and left very little evidence of their presence. To date, there are no properties open for ATV use. ATV's are considered to be unauthorized vehicles on Authority properties. In the

future, trails may be established or open for ATV use. The Authority will make this determination based on site conditions, liability concerns, potential environmental impacts, and proof of responsible riding.

16.5 Hunting, Fishing, and Trapping

Hunting and fishing are permitted on the majority of Authority properties providing users comply with all applicable legislation. The Authority established a hunting policy to regulate hunting on Authority properties. A copy of this policy can be found in Appendix C. Trapping is an act that requires a permit from the Authority. All trappers must comply with all applicable legislation.

17.0 Wildlands

Wildlands is a term that will be used to describe areas that are forested and will cease, or have ceased to be actively managed, that are not forested (i.e. grasslands, meadows, wetlands), and areas of natural regeneration. Wildlands will include forests that may eventually gain the status of “old growth” after a time of maturation. (see section 23.0 Recommendations #16)

Minimal property maintenance will occur on properties that are designated as Wildlands. This maintenance can include: hazardous tree removal, garbage clean-up, fire suppression, fencing, wildlife control, trail development and maintenance, sign installation and maintenance, and fallen tree removal from trails and roadways. These ‘no active management properties’ will serve as examples of natural succession for everyone to view and enjoy. The designation of these properties will be re-evaluated at the end of the time period for this forest management plan.

Upon researching various documents and discussing, naturally, maturing forests with many forest managers it has been determined that there are no specific guidelines recognized to determine what percentage of land should be set aside to grow naturally and be un-managed. Therefore, Saugeen Conservation has established a list of properties to be designated as wildlands based on the features of the properties and with a wide variety of ecosystem types represented. Table 17.1 lists the locations and descriptions of the various tracts that are recommended to be designated as Wildlands as well as the rationale for the designation. Properties were designated for ‘no management’ based on the following factors, which are listed in no particular order:

- location
- geological features
- forest types
- wetland types
- species present
- present property use
- Provincially significant features as designated by the Province
- neighbouring property uses
- practicality of traditional management systems
- other significant features or attributes

Table 17.1 Forest Tracts Designated as Wildlands

Tract Number(s) (refer to Table 4.1)	Area in Acres
41-540-05	74
41-340-10	77
41-260-10	114.66
41-260-05	50
41-380-05, 41-380-10	329.5
41-380-15	5.6
41-310-15	381
41-310-55	106.09
41-310-60, 41-310-65	378
41-310-70	62
42-180-10	160
42-390-05	50
42-360-45, 42-360-50, 42-220-50	1248.87
42-220-30	93.7
42-010-10	166.6
42-010-15	212.59
42-140-05, 42-140-10, 42-140-15, 42-140-20	1671.25
42-090-05, 42-090-10, 42-090-15, 42-090-20, 42-090-30, 42-090-50, 42-090-55	902.91
42-320-10	84.5
23-41-10	100
Total Owned	21033.95
Total Reserved	6268.27
Total Difference	14765.68
Percentage Reserved	29.7

18.0 Forest Health

Determining and monitoring forest health is a crucial aspect of forest management. Insect outbreaks, disease population explosions, and natural disruptions within a forest drastically affect the management options available for the forest.

There are many variables dictating forest health, the majority of which have been addressed in the preceding chapters: areas of concern, special wildlife habitat features and concerns, botanical resources, biodiversity, and outdoor recreation activities. The variables that have not been addressed in the preceding chapters are forest insects and diseases. Timber harvesting procedures can have an effect on forest health and will be addressed in the following chapter 21.

To ensure that forest health is monitored efficiently Saugeen Conservation works with other forest health professionals and neighbouring landowners by sharing information and reporting findings from field work. Working with neighbouring landowners is a priority in planning to control forest pests and cooperation will be sought wherever possible. During forest resource inventory field work, all aspects of forest health are recorded and general comments on conditions are made.

Forest health commonly dictates the forest management activities that are best suited for the forest. As an example, the silvicultural prescription for a forest that is over crowded and contains a large percentage of eutypella canker would focus on the removal of diseased trees and thinning out the remainder of trees based on spacing, size diversity, and basal area.

Insect population explosions or outbreaks occasionally occur within a forest. These outbreaks often require human intervention to level the populations. During the occurrence of a severe outbreak, Saugeen Conservation contacts Provincial, Federal, or other specialists for information on managing the insect population and forest.

Occasionally, forest pests (insects or diseases) require drastic management techniques. These drastic measures have and will only be completed upon consulting various forestry and forest health professionals. Drastic measures include: salvage operations, aerial spraying, patch clear cuts, and other management methods.

Saugeen Conservation forestry staff maintain a sound understanding of forest pest occurrences and their diagnosis through various workshops, publications, and personal contact. This knowledge is vital to ensure the timely reporting of pest outbreaks.

In the event of a common pest outbreak Saugeen Conservation uses all available information to form a plan to deal with the pest. The majority of the common pests occurring within the Saugeen River watershed have been analyzed and proper management methods dictated. Management methods to deal with common pests include: pruning, single or multiple tree removal, limb removal, manual spraying, and other management methods. (see section 23.0 Recommendations #12)

18.1 Monitoring and Assessment

Permanent sample plots will be established in stands of each forest type. These plots will be monitored to ensure that the Authority's forest management goals, objectives, and harvesting/ residual targets are met. Plots will be located within designated Wildlands, and forests that are actively managed. In areas where there are known HCV's SVCA staff will monitor the effectiveness of the measures being employed for their maintenance, protection, or restoration. These HVC's include all known cultural values, resources, and uses.

19.0 Silvicultural Guidelines and Strategies

Silvicultural guidelines and strategies have been developed by forestry professionals over time and in the year 2000 have been summarized into the Ontario Ministry of Natural Resources publication: A Silvicultural Guide to Managing Southern Ontario Forests. This guide forms the foundation of all the following silvicultural strategies. In the following sections, each commonly used silvicultural system will be summarized as it pertains to the lands owned by Saugeen Conservation. The following definition has been taken from the OMNR, 2000 Silvicultural Guide: "a silvicultural system is a planned series of treatments that are carried out during the entire life of a forest stand with the main objective of controlling the establishment, species composition, and the growth of the stand." When planning for the use of a silvicultural system Saugeen Conservation must ensure that the system chosen will not jeopardize areas of concern.

When applying silvicultural systems forestry professionals often use the term ‘working group’ to refer to forest stands. To ensure the understanding of the following sections the following definition of working group should be observed: “an inventory aggregation for management purposes. An aggregate of stands, including potential forest areas assigned to this category, having the same predominant species and managed under the same rotation or cutting cycle and broad silvicultural system.” (OMNR, 1998. Glossary of Technical Terms). (see section 23.0 Recommendations #17)

19.1 Selection Silviculture System

The selection silviculture system is only applicable within forest stands that are uneven-aged. This silvicultural system is the most common system used to manage the natural forest stands on Authority lands. There are a couple of variations of this system that are commonly used. These variations are: single-tree selection and group selection systems.

19.1.1 Single-tree Selection

Single-tree selection refers to the selection of individual trees for removal based on inventory information, site conditions, general observations, and management objectives. Single-tree selection is commonly used to improve spacing, removal of poor quality trees, or to remove less desirable tree species. This variation requires the forest workers to be very knowledgeable in the growth patterns of forest trees/stands. Basal area is a crucial factor in single-tree selection and is used to ensure that stand density is properly maintained. This variation of the selection system is only used in forest stands that are shade-tolerant, as single-tree selection does not create large openings in the forest canopy. Single-tree selection is recommended for use in the upland tolerant hardwood, lowland hardwoods and mixed woods forest types. This method is the most common management system used on Authority lands.

19.1.2 Group Selection

Group selection refers to the selection of a group of trees for removal. The group selected for removal is chosen based on location, site conditions, seed sources, and tree species present. Group selection is commonly used to create openings within the forest canopy to provide enough light to support the growth of mid-tolerant tree species. On Authority lands this system is commonly used to promote the regeneration and growth of black cherry, a shade intolerant tree species. Other tree species that may benefit from group selection include red oak, white ash, basswood, and yellow birch.

By using the group selection system, even-aged patches of midtolerant or intolerant species should be regenerated. The sizes and shapes of these patches must be clearly defined prior to the commencement of harvest operations. The forest surrounding the patch is generally under the single-tree selection system.

The basal area within the group selection area is of no significance. However, a proper basal area must be maintained within the remainder of the forest.

Group selection is recommended for use in upland tolerant hardwood forests. Determining the location, size, and shape of the groups selected requires a sound knowledge of forest tree/stand growth requirement and patterns.

19.2 Shelterwood Silviculture System

The shelterwood system refers to the removal of the overstory trees through a series of harvesting operations. This system, usually, requires three stages of harvests. These stages are the preparatory cut, the seed-tree (regeneration) cut, and the harvest cut. The preparatory cut is the only cut of this series which may not be required in the shelterwood system.

The preparatory cut removes undesirable tree species, poor quality trees, and trees that are overcrowded. This tree removal opens the canopy to permit the growth of the crowns which in turn increases seed production. This cut may not be necessary if the crowns within the stand are of sufficient size. During this stage of the shelterwood operation crop trees are selected. Crop trees are the better quality stems in any stand. These stems may be the largest stems within the stand and will be retained until the harvest cut is initiated.

The seed-tree (regeneration) cut involves the removal of all material growing between the crop trees that are of merchantable size.

The harvest (removal) cut involves the removal of the crop trees to release the regeneration or understory. The timing of this cut is determined by the height of the regeneration.

There are three variations of the shelterwood silviculture system: the uniform shelterwood system, the strip shelterwood system, and the group shelterwood system. The process of harvesting is well described by the names of these three systems. The uniform shelterwood system refers to an operation that encompasses the entire stand. The strip shelterwood system refers to an operation that is performed in strips throughout the stand. The group shelterwood system refers to an operation that encompasses many hectares and many stands.

The shelterwood silviculture system is commonly used in even-aged stands of hardwood or softwood tree species to release semi-intolerant tree species. This system is very rarely used on Authority properties as the vast majority of Authority owned stands are un-even aged.

19.3 Clearcut Silviculture System

The clear cut silviculture system is commonly used to regenerate shade intolerant tree species, or even-aged forests. Clear cutting refers to operations that

remove the majority of the trees from the forest stand in one harvest. Regeneration of the stands that have been clear cut can be from seed trees, the release of seedlings present in the understory, stump sprouts, or through tree or tree seed planting.

The size of the clear cut area is often determined based on the source of regeneration. In stands where seed trees will be providing the source of regeneration the size of the clear cut must be limited to the area in which the seed will travel.

There are three main variations to the clearcut silviculture system: the seed tree method, the patch clear cut method, and the progressive strip cut method.

The seed tree clear cut method involves the removal of all trees from the stand excluding the desired number of trees to produce seed to regenerate the stand. While this method is rarely used in the Saugeen River Watershed, occasionally, the seed tree method is used with the patch or progressive strip cut method.

Patch clear cutting refers to the removal of all trees within certain patches of a stand. The size and shape of the patch is often determined through the analysis of the species present, the regeneration method, and the desired regenerating species. Patch clear cutting can create pockets of even-aged forest within a forest stand. This variation of the clear cut system is used throughout the Saugeen River Watershed to manage coniferous forests, most commonly white cedar.

Progressive strip clear cutting is best described as the division of the harvest area into strips and then the removal of trees within a strip. As the next harvest cycle approaches the strips adjacent to the strip, previously, removed are harvested. As in the patch clear cut system, the size and shape of the strips are often determined through the analysis of the species present, the regenerating method, and the desired regenerating species. Progressive strip clearcutting occurs on Authority lands within forests consisting largely of white cedar.

19.4 Upland Tolerant Hardwoods

As described in section 2.6 of this plan, the upland tolerant hardwood working group consists primarily of sugar maple and white ash in the Saugeen River Watershed. For information on the variety of species and site characteristics in which the upland tolerant hardwood working group is found, see section 2.6.

In managing the upland tolerant hardwood working group Saugeen Conservation relies on basal area calculations and stand inventory information to determine the best management methods.

The most common method of management applied to Saugeen Conservation upland tolerant hardwood forests is single tree selection.

The ideal basal area of the upland tolerant hardwoods in the Saugeen River Watershed is considered to be 20m²/ha. Forests with a basal area of less than 24m²/ha are generally not considered for a harvest as volumes are, usually, not great enough to support a harvest. Forest stands that exceed 24m²/ha are considered for harvest if the site conditions are acceptable (within the parameters of section 4 of this plan). Good forest management practices suggest (or indicate) that for high density stands no more than one third be removed during any regular harvest cycle. Under exceptional circumstances, it may be necessary to remove more.

Most commonly, the management of upland tolerant hardwoods on Authority lands is carried out in fifteen year harvest cycles. Stocking, pest outbreaks, and site conditions may warrant deviation from this cycle.

It is suggested that all management of Authority upland tolerant hardwood forests should conform to the silvicultural guidelines as outlined in the publication: A Silvicultural Guide to Managing Southern Ontario Forests, by the Ontario Ministry of Natural Resources, 2000.

19.5 Lowland Hardwoods

As described in section 2.6 of this plan, the lowland hardwood working group consists mainly of red maple, silver maple, yellow birch, black ash, blue beech, white elm, and balsam fir in the Saugeen River Watershed. For more information on the variety of species and site characteristics in which the lowland hardwood working group is found see section 2.6.

In managing the lowland hardwood working group Saugeen Conservation relies on basal area calculations and stand inventory information to determine the best management methods.

The most common method of management applied to Saugeen Conservation lowland hardwood forests is single tree selection.

The ideal basal area of the lowland hardwoods in the Saugeen River Watershed is considered to be 20m²/ha. Forests with a basal area of less than 24m²/ha are generally not considered for a harvest as volumes are, usually, not great enough to support a harvest. Forest stands that exceed 24m²/ha are considered for harvest if the site conditions are acceptable (within the parameters of section 4 of this plan). Good forest management practices suggest (or indicate) that for high density stands no more than one third be removed during any regular harvest cycle. Under exceptional circumstances, it may be necessary to remove more.

Most commonly, the management of the lowland hardwoods is carried out in fifteen year harvest cycles. Stocking, pest outbreaks, and site conditions may warrant deviation from this cycle.

It is suggested that all management of Authority lowland hardwood forests should conform to the silvicultural guidelines as outlined in the publication: A Silvicultural Guide to Managing Southern Ontario Forests, by the Ontario Ministry of Natural Resources, 2000.

19.6 Early Successional Hardwoods

As described in section 2.6 of this plan, the early successional hardwood working group consists primarily of poplar, white birch, white spruce, balsam fir, and white pine in the Saugeen River Watershed. For information on the variety of species and site characteristics in which the early successional hardwood working group is found, see section 2.6.

In managing the early successional hardwood working group Saugeen Conservation relies on basal area calculations and stand inventory information to determine the best management methods.

The most common method of management applied to Saugeen Conservation early successional hardwood forests is single tree selection.

The ideal basal area of the early successional hardwood forests in the Saugeen River Watershed is considered to be 20m²/ha. Forests with a basal area of less than 24m²/ha are, generally, not considered for a harvest as volumes are usually not great enough to support a harvest. Forest stands that exceed 24m²/ha are considered for harvest if the site conditions are acceptable (within the parameters of section 4 of this plan). Good forest management practices suggest (or indicate) that for high density stands no more than one third be removed during any regular harvest cycle. Under exceptional circumstances, it may be necessary to remove more.

Most commonly, the management of early successional hardwood forests is carried out in fifteen year harvest cycles. Stocking, pest outbreaks, and site conditions may warrant deviation from this cycle.

It is suggested that all management of Authority early successional forests should conform to the silvicultural guidelines as outlined in the publication: A Silvicultural Guide to Managing Southern Ontario Forests, by the Ontario Ministry of Natural Resources, 2000.

19.7 Other Hardwood Forest

As described in section 2.6 of this plan, the other hardwood forest working group consists of all hardwood forest types which are not, previously, mentioned in chapters 2 or 18. For more information on the variety of species and site characteristics in which the other hardwood forest working group is found, see section 2.6.

In managing the other hardwood forest group Saugeen Conservation relies on basal area calculations and stand inventory information to determine the best management methods. As the majority of this forest group occurs as a small pocket within another forest types, these forests are often managed as a part of the dominant forest group in the surrounding stands. Often these stands or portions of these stands, are retained during the harvest cycle to maintain diversity and forest health.

The ideal basal area of the other hardwood forest group in the Saugeen River Watershed is considered to be 20m²/ha. Forests with a basal area of less than 24m²/ha are, generally, not considered for a harvest as volumes are, usually, not great enough to support a harvest. Forest stands that exceed 24m²/ha are considered for harvest if the site conditions are acceptable (within the parameters of section 4 of this plan).

Good forest management practices suggest (or indicate) that for high density stands no more than one third be removed during any regular harvest cycle. Under exceptional circumstances, it may be necessary to remove more.

Most commonly, the management of the other hardwood forest working group is carried out in fifteen year harvest cycles. Stocking, pest outbreaks, and site conditions may warrant deviation from this cycle.

It is suggested that all management of Authority other hardwood forests should conform to the silvicultural guidelines as outlined in the publication: A Silvicultural Guide to Managing Southern Ontario Forests, by the Ontario Ministry of Natural Resources, 2000.

19.8 Cedars and Cedar Swamps

The Cedar working group and its preferred site is described in Section 2.6 of this plan. In managing the cedar working groups Saugeen Conservation relies on basal area calculations and stand inventory information to determine the best management methods.

The most common silviculture systems used in the management of Saugeen Conservation cedar forests are two variations of the clear cut silviculture system: the patch clear cut and the progressive strip clear cut silvicultural system. The decision between these two systems is based on the basal area and site conditions. Occasionally, the selection silviculture system is also implemented within the cedar forests owned by Saugeen Conservation. Cedar is commonly managed by size, age, and market demand.

It is suggested that all management of Authority cedar forests and cedar swamps should conform to the silvicultural guidelines as outlined in the publication: A Silvicultural Guide to Managing Southern Ontario Forests, by the Ontario Ministry of Natural Resources, 2000.

19.9 Plantation Forest

The majority of plantations within the Saugeen River Watershed are comprised of white pine, white spruce, red pine, Norway spruce, white cedar, European larch, tamarack, Scots pine, or a combination of the aforementioned species. For information on the variety of species and site characteristics in which plantation forests are found, see section 2.6.

In managing the plantation forests, Saugeen Conservation relies on basal area calculations, stand inventory information, and accessibility to determine the best management methods for the forest stands. The ultimate goal in the management of Authority plantations is the conversion of the plantation to upland hardwood forest, as would occur in natural succession. A small number of residual plantation species will be retained where ever possible to maximize species diversity.

The most common methods of management applied to Saugeen Conservation plantation forests are either fourth row removal thinning combined with single tree selection, or group selection. The decision between these actions is based on the species, basal area and site conditions. Fourth row removal thinning is also considered a progressive strip clearcut, as all trees within the row are removed.

Most commonly, the management of plantation forests is carried out in fifteen to twenty-five year harvest cycles. Stocking, pest outbreaks, and site conditions may warrant deviation from this cycle.

There is little comprehensive documentation available on plantation management, at the time of writing. Therefore, plantation management on Authority lands will conform to all up-to-date available plantation management strategies which focus on the regeneration of hardwood tree species.

19.10 Other Coniferous Forest

As described in section 2.6 of this plan, the other coniferous forest working group consists of all coniferous forest types which are not, previously, mentioned in chapters 2 or 18. For more information on the variety of species and site characteristics in which the other coniferous working group is found, see section 2.6.

In managing the other coniferous forest group Saugeen Conservation relies on basal area calculations and stand inventory information to determine the best management methods. As the majority of this forest group occurs as a small pocket within another forest types, forests of this group are often managed as a part of the dominant forest group in the surrounding stands. Often these stands, or portions of these stands, are retained during the harvest cycle to maintain diversity and forest health.

The ideal basal area of the other coniferous forest group in the Saugeen River Watershed is considered to be 20m²/ha. Forests with a basal area of less than 24m²/ha are generally not considered for a harvest as volumes are, usually, not great enough to support a harvest. Forest stands that exceed 24m²/ha are considered for harvest if the site conditions are acceptable (within the parameters of section 4 of this plan). Good forest management practices suggest (or indicate) that for high density stands no more than one third be removed during any regular harvest cycle. Under exceptional circumstances, it may be necessary to remove more.

Most commonly, the management of the other coniferous forest working group is carried out in fifteen year harvest cycles. Stocking, pest outbreaks, and site conditions may warrant deviation from this cycle.

It is suggested that all management of Authority other coniferous forests should conform to the silvicultural guidelines as outlined in the publication: A Silvicultural Guide to Managing Southern Ontario Forests, by the Ontario Ministry of Natural Resources, 2000.

20.0 Available Harvest Area

Available harvest area (AHA) is a relatively new term in forestry. AHA is replacing maximum allowable depletion (MAD) which had replaced annual allowable cut (AAC). An understanding of the progression of these terms will enable all to understand the necessity of change.

Annual allowable cut (AAC) implied the recalculation of cut areas every year and did not appear to account for potential natural depletion. Maximum Allowable Depletion (MAD) was developed to be recalculated every five years and to address actual depletions. Available Harvest Area (AHA) was developed to increase the recalculation period to ten years and to accommodate forest modeling information. "The available harvest area serves as the upper limit for the selection of areas for harvest for the ten year period." (MNR, June, 2004)

These types of calculations are widely used in areas of large continuous forests, such as Crown land in northern Ontario. On smaller forested areas AHA is often not necessary. Smaller forest tracts are easily inventoried and researched. These inventories combined with the research of past management activities create an accurate picture of the proper harvest cycle and management activities.

21.0 Timber Harvesting Procedures

The following sections refer to procedures presently used. (see section 23.0 Recommendations #18)

21.1 Identification of Areas of Concern

The identification of Areas of Concern (AOC) is an important aspect of forest management. AOC are recorded within the silvicultural prescription, included on all

maps related to the harvest, and all timber sale documents. AOC are discussed with operators prior to the implementation of any harvest activities. If required a buffer around the AOC will be marked to ensure limited disturbances within the AOC. Mapping is also available to the operators to keep with them on site. AOC in this context refers to both regional areas of concern (RAOC) and the provincially recognized AOC.

21.2 Preparation of Silvicultural Prescriptions

Prior to the commencement of any tree marking on Authority lands a silvicultural prescription will be developed. The development of this prescription will include the use of current stand inventory information, site conditions, AOC information, and wildlife habitat information, to determine the appropriate marking intensity.

Silvicultural prescriptions will be used as guidelines for all tree markers on Authority lands. Additional professional guidance will also be called upon from time to time to properly implement and to achieve the objectives of the silvicultural prescription. A copy of a silvicultural prescription is included in Appendix F.

21.3 Tree Marking

All tree marking within Authority forests will be undertaken by Provincially certified tree markers or markers performing their tree marking audit to obtain their certified status.

Tree markers will implement current silvicultural prescriptions and use professional judgment to determine which trees to mark and which to retain. Property boundaries will be located prior to the commencement of any marking activities. Harvest area and property boundaries will be marked with either paint or flagging where necessary.

22.0 Timber Sale Process and Contract

In accordance with Authority policy timber sales with values less than \$10,000.00 are negotiated by staff to obtain fair market value. Timber sales over \$10,000 are done by public tender and are reviewed and approved by the Forestry Committee prior to awarding sale. As a part of the tendering process, advertising will take place in local newspapers. The tender opening process is open to the public. All tenders that are properly completed and accompanied by the appropriate payment will be considered. 'Highest or any tender not necessarily accepted' is standard in all forestry tenders. This ensures that the health of the forest is not compromised by a high tender from a low quality operator. Input on the quality of workmanship and management practices of the logging company will be sought prior to the acceptance of any tender. Once accepted by motion of the Forestry Committee the tender form becomes the contract between the Authority and the tendering company or person. Copies of the both tender forms are included in Appendix D. (see section 23.0 Recommendations #18)

22.1 Timber Sale Agreement

All timber sales must be accompanied by a signed tender package acknowledging an understanding of the terms and conditions of the sale and the payment schedule. Saugeen Conservation has developed a timber sale agreement which is included in Appendix D.

22.2 Timing of Operations

Harvest operations will, for the most part, be carried out between August 1 and March 31 of a given year. Harvesting during this time period will minimize the damage to both the site and residual trees. Also, harvesting during this time period will limit the disruption of wildlife during their breeding season.

Exceptions to this time period may be made based on an individual site evaluation or during forest health improvement operations (i.e. insect outbreaks). Operations must be suspended during unsuitable conditions to minimize site disruption and damage (i.e. extreme wet periods).

22.3 Access Roads

While the majority of Authority forested properties contain access roads and former skid trails, many trails are impassable. Where new or replacement roads are required the Authority will work, closely, with the logging company to ensure that the roads are wisely located and constructed. Skid trails will be designed and constructed by the logging company with an emphasis on minimizing site disruption and total trail length. The logging company will be responsible for the maintenance of the skid trails during their harvest operation and leaving them in good or better condition at the end of the harvest.

22.4 Landings

Landings have been established within a large portion of Authority forests. These established landings will be used whenever possible. However, many historical landings may require clearing, enlargement, or other alterations. The creation of new landings or alteration to existing landings will be completed following discussions with the logging company. The logging company will be responsible for the maintenance of the landing during their harvest operation, and the removal of refuse upon the completion of their harvest operation.

22.5 Harvest Operation Monitoring and Assessment

SVCA will monitor all operations on all properties on a regular basis. A Pre-harvest meeting will be arranged with the contractor to discuss landing areas, main skid trails, and any specific AOC's present on the property. Once the operation is underway, a harvest inspection form is used to track the progress of operations and pinpoint potential problems. The harvest inspection form records any stand and site damage, number of skid trails, and also checks for butt marks. Appendix J indicates the Minimum Acceptable Damage Standards and the Criteria used for assessing both logging damage and

site damage. The contractor will be notified immediately of any infractions. Cut inspection reports will be recorded and made available to the public upon request. Conflicts will be resolved at the staff level as much as possible.

23.0 Recommendations

1. That the 2005-2025 Forest Management Plan be adopted as the governing document for all forest management within Authority forests.
2. That the management goals and objectives of the 2005-2025 Forest Management Plan be adopted as policies in managing the forested properties owned by Saugeen Conservation.
3. That the management of Authority forests conforms to the silvicultural guidelines within the document entitled, "A Silvicultural Guide to Managing Southern Ontario Forests." (OMNR 2000) or the most recent published silvicultural guide prepared and published by the Ontario Ministry of Natural Resources.
4. That all regionally significant, provincially significant, wetlands, areas of natural and scientific interest (ANSI) and areas of significant flora and fauna habitat be managed to provide protection from incompatible activity.
5. That Saugeen Conservation hold itself to the same standard or higher than those standards imposed by the various levels of government on private landowners throughout the Saugeen River watershed to ensure the protection of significant flora and fauna habitat, biodiversity, and overall forest health.
6. That new research opportunities be encouraged and that existing research and education projects continue or expand on Authority lands.
7. That the Authority work to increase the awareness of the public on accepted uses of Authority properties, and that as a method of increasing public awareness, the signage of Authority properties be reviewed regularly and that the Authority work towards enforcing property use policies.
8. That the Authority work to increase the public's awareness of the importance of maintaining a variety of forest types including old growth forest.
9. That the Authority be open to consider tourism opportunities that materialize in the future.

10. That Operating Plans be reviewed and modified on a regular basis pending the adoption of policies as recommended in this Management Plan.
11. That silvicultural prescriptions be produced, if necessary, at the time of the drafting of the Operating Plan. These silvicultural prescriptions will be based on the information contained in the Operating Plan, and will be drafted of the Operating Plan, and will be drafted according to the standards of the Management Plan, as well as other pertinent information such as the Provincial silvicultural guidelines.
12. That wildlife habitat, diversity, and forest health be managed according to the guidelines set out in the document entitled, "A Silvicultural Guide to Managing Southern Ontario Forests." (OMNR 2000) or the most recent published silvicultural guide prepared and published by the Ontario Ministry of Natural Resources.
13. That the Authority develop a policy on archiving information to ensure specific can, legally, be protected from viewing by the general public. This policy should be in two parts. Part one, to ensure that specific information typically required for the public's use is archived to maintain its accessibility. Part two, to ensure that specific information of a sensitive nature remains protected (e.g. Natural Heritage Information Centre (NHIC) documents, etc.
14. That, as the Geographical Information Systems (GIS) materials sharing matures, the Authority work towards the adoption of the Ecological Land Classification (ELC) system.
15. That, during the period of the Plan, there will be no significant aggregate or mineral extractions on lands now held by the Authority. Small amounts of aggregate material may be relocated within any one property to develop, maintain, or enhance trails, roadways, and landings.
16. That 'Wildlands' be used to describe areas that are both forested and not forested (i.e. old fields, grasslands, meadows, wetlands) or are areas of natural regeneration that will cease to be actively managed. Wildlands will include forests that may eventually gain the status of "old growth" after a time of maturation, and that the properties listed within table 17.1 of the Management Plan be designated as Wildlands, and that the designation of these properties will be reevaluated at the end of the time period for this Forest Management Plan.

17. That in high density stands, no more than one third be removed during any harvest cycle. Under exceptional circumstances, it may be necessary to remove more.
18. That the existing timber harvesting processes and timber sales contract processes continue until research suggests modifications for approval by the Authority's Board of Directors.
19. That stick nests, cavity trees, mast trees, lone conifers in hardwood stands, lone hardwoods in conifer stands, forest interior, forest edge, supercanopy trees, and veteran trees be managed to the guidelines set out in the document entitled, "A Silvicultural Guide to Managing Southern Ontario Forests." (OMNR 2000) or the most recent published silvicultural guide prepared and published by the Ontario Ministry of Natural Resources.

23.1 Information Gaps and Research Needs

Throughout the creation of this plan there have been references to information that requires further study and areas of research that have not been completed. Listed below are a few key areas which require action to ensure the effectiveness of this plan.

- ☑Completion of the inventory process
- ☑Completion of the 10 year operating plans
- ☑The development of an operation schedule
- Creation of monitoring plots within each forest type to determine the effects of management
- Establishment of public information programs about Authority properties, forestry, and appropriate property usage
- Completion and continuation of the GIS compilation and database referencing
- The generation of technical information regarding plantation management
- A better understanding of the proper usage of the Ecological Land Classification system
- More research on vegetative communities within Authority properties to determine the existence of significant flora.
- Completion of the GPS work to verify property boundaries and other forest information
- Increased awareness of insect and disease species, populations, and their effects
- Establishment of an inspection and maintenance program for Authority properties and trail systems
- ☑Increased enforcement of property use policies and regulations
- ☑Increase and update knowledge of management of abandoned fields (e.g. pits and mounds) and work towards the implantation of these management methods
- ☑Ongoing review of best management practices and approaches dealing with incompatible property uses
- ☑Investigate forest certification programs and their implementation

A

abiotic factors - The non-living components of the environment, such as air, rocks, soil, water, peat and plant litter.

Acre - An imperial measure of land area equal to 43,560 square feet, 4046.7 m² or 0.4 ha.

advance growth - Young trees that have become established naturally under a mature forest canopy and are capable of becoming the next crop after the mature crop is removed.

advanced regeneration - Trees that have become established naturally under a mature forest canopy and are capable of becoming the next crop after the mature crop is removed.

Age - of a tree:

breast height: the number of annual growth rings between the bark and the pith, as counted at breast height.

harvest: the number of years required to grow from establishment to maturity.

stump: the number of annual growth rings between the bark and the pith, as counted at stump height.

total: the number of years elapsed since the germination of the seed or the budding of the sprout or root sucker.

of a forest, stand or forest type, the average of the trees comprising it:

harvest: The number of years between the establishment and the final harvest of a forest crop.

total: The average total age of the trees comprising it

age class – One of the intervals into which the range of age classes of trees in a stand are divided into for classification and use.

acceptable growing stock (AGS) - Trees suitable for retention in the stand for at least one cutting cycle (15 to 25 years). They are trees of commercial species and of such form and quality as to be saleable for sawlog products at some future date.

all-aged - Applies to a stand that contains trees of all ages.

all-aged management - A system of growing forest trees in groups where the individual trees are not the same age (theoretically, an all-aged forest has trees scattered throughout that range in age from one year to the oldest tree, whatever its age may be).

allowable cut - The volume of wood that may be harvested, under management, for a given period.

annual ring - The growth layer of one year, as viewed on the cross section of a stem, branch, or root. One year's growth consists of a layer of lighter-coloured wood (springwood) and a layer of darker-coloured wood (summerwood).

areas of natural and scientific interest (ANSI) - Area of land and water containing natural landscapes or features that have been identified by the Ontario Ministry of Natural Resources as having life science or earth science values related to protection, scientific study or education.

area of concern (AOC) - An area adjacent to an identified value that may be effected by some (or all) aspects of forest management activity.

aquatic system - Area where water levels are greater than 2 m in depth.

artificial regeneration - Renewal of a tree crop by direct seeding or by planting seedlings or cuttings.

audit - A formal examination of an organization's or individual's performance.

Autecology - Autecology refers to the study of the ecology of a single species. It refers to information on the biological behaviour of a plant species essential to understanding its growth, reproduction and response to disturbance and essential to choosing appropriate silvicultural treatment. It includes information about a species: habitat requirements, modes of reproduction, phenology, and response to disturbance.

B

basal area - *of a tree:*

the cross-sectional area of the bole of a tree, 1.3 m above the ground. Basal area = diameter of tree (cm) squared, times 0.00007854. (Expressed in m²).

of a stand of trees:

the sum of all the individual tree basal areas for a given land area. Commonly expressed as m²/ha.

biodiversity (biological diversity) - The variety and variability (in time and space) among living organisms and the ecological complexes in which they occur.

biomass - The dry weight of all organic matter in a given ecosystem. It also refers to plant material that can be burned as fuel.

biota - All living organisms of an area, taken collectively.

blow down (windthrow) - Uprooting by the wind. Also refers to a tree or trees so uprooted.

board foot (bd ft) - A volume measure of lumber, being one foot wide, one foot long and one inch thick.

bole - The main trunk of a tree.

breast height - The standard height, 1.3 m above ground level, at which diameter of a standing tree is measured.

browse - Small bushes, sprouts, herbaceous plants, small trees, etc. that wildlife feed on.

brush - Commonly refers to undesirable shrubs and other low-lying vegetation.

buck - Cutting a felled tree into specified log lengths for yarding and hauling; also, making any bucking cut on logs.

buffer - A zone or strip of land that shields one area from another. Commonly used along streams or as visual barriers.

bumper tree - A poor-quality, low-value tree that grows in close proximity to higher-value trees. Skid roads should be located next to bumper trees in order to protect residual trees from damage during a logging operation.

burl - An abnormal growth on a tree stem, with wood tissue growing in an irregular pattern. Usually, circular in shape, these growths are widely sought for their interesting grain pattern.

butt - The base of a tree or log.

C

caliper - An instrument used to measure diameters of trees or logs. It consists of two parallel arms at right angles to a graduated rule, with one arm that slides along the rule.

cambium - A layer of cells between the woody part of the tree and the bark. Division of these cells results in diameter growth of the tree through formation of wood cells (xylem) and inner bark (phloem).

canker - Dead area of a branch or stem caused by fungal or bacterial attack.

canopy - A collective term for the layer formed by the crowns of the taller trees in a forest.

canopy closure - The progressive reduction of space between crowns as they spread laterally, increasing canopy cover.

canopy gap - A hole in the forest canopy that allows light penetration to the forest floor. Can be formed by naturally falling trees, standing dead trees and logging practices.

cavity - An unfilled space within a mass, a hollowed out space. In forestry and wildlife there are several categories of cavity trees, each with their own importance in the ecosystem:

Pileated woodpecker roost cavities: The first priority for retention are living or standing dead trees with cavities used by pileated woodpeckers for roosting. These are, usually, large (40+ cm DBH) diameter trees that are hollow and have at least two excavated entrance holes. These holes are somewhat oval, about 7.5 to 10 cm wide and 10 to 12.5 cm high. Holes are, symmetrically, oval, smooth edged and deep.

Pileated woodpecker nest cavities: The second priority for retention are living trees with cavities used by pileated woodpeckers for nesting. These are usually large (40+ cm DBH) diameter trees in which pileated woodpeckers have excavated one or more nest chambers and associated entrance holes. Nest and roost trees can be distinguished by the number of entrance holes and tree condition. Roost trees may have 2 to 10+ entrance holes and entrance holes may be less than 1 m apart. Condition is probably the best clue to separate nest and roost trees. Pileated woodpeckers excavate nest cavities in trees with white spongy heart rot (not trees with existing hollows). Roost cavities are in hollow trees (look for seams, barreling, etc. to indicate hollowness).

Other woodpecker nest cavities or natural nest or maternal den cavities: The third priority for retention are living trees with cavities excavated by other woodpeckers (e.g. yellow-bellied sapsucker, hairy woodpecker, northern flicker) for nesting or cavities suitable for nesting or denning (by secondary cavity users) that formed from natural decay processes.

Escape cavity: The fourth priority for retention are living trees with natural cavities that provide temporary shelter, escape from predators, foodcaching sites, or resting/loafing/roosting sites. They are not ideal for nests or dens because of location, size, entrance hole size, or orientation.

Feeding cavity: The fifth priority for retention are living trees with Feeding excavations created by woodpeckers in search of food. They are generally rectangular, semi-circular, or irregular. Holes do not typically enlarge into chambers suitable for nesting or escape. Edges and surfaces tend to be rough.

Potential cavity tree: Trees with potential to attract excavators or develop natural cavities. Typically, they have evidence of advanced heart rot. These living trees are retained when situations arise in areas that do not have at least 6 existing cavities per hectare left after tree marking.

clearcut - An area on which the entire timber stand has been harvested. *see reproduction methods.*

clear-length - Branch-free length of the bole.

co-dominant trees - Trees with crowns forming the general level of the crown cover and receiving full light from above, but comparatively little from the sides; usually, with medium size crowns. *see crown class.*

commercial thinning - Removing trees from a developing young stand, so that remaining trees will have more growing space; dead and dying trees will be salvaged and the operation will make a net profit.

community - An integrated group of species inhabiting a given area and influencing one another's distribution, abundance and evolution.

competition - The general struggle for existence within a trophic level in which the living organisms compete for a limited supply of the necessities of life.

composition - The representation of tree species in a forest stand, expressed quantitatively as per cent by volume or basal area of each species.

conifer - A tree belonging to the order Coniferae, usually, evergreen with cones, needle-shaped leaves and producing wood known commercially as 'softwood.'

conservation - In forestry, the wise use of natural renewable resources. A key idea for understanding 'conservation' is 'use' by people.

conventional ground skidding - Any combination of rubber-tired or tracked skidding equipment.

coppice - A shoot (sprout) originating from a stump.

cord - 128 cubic feet of stacked roundwood (whole or split, with or without bark) containing wood and airspace, with all the pieces of similar length and lined up on approximately the same direction, i.e. a pile of firewood 4' x 4' x 8'.

corridor - A band of vegetation, usually older forest, which serves to connect distinct patches on the landscape. Corridors provide connectivity, which permits the movement of plant and animal species between what would otherwise be isolated patches.

cover - Vegetation or other material providing protection. Plants or objects used by wild animals for nesting, rearing of young, resting, escape from predators, or protection from adverse environmental conditions.

critical wildlife habitat - Part or all of a specific place occupied by a wildlife species or a population of such species and recognized as being essential for the maintenance of the population.

crook - A defect in logs and poles or pilings, consisting of an abrupt bend. Also refers to edgewise warp in a piece of lumber.

crop tree - A tree selected in a young stand, to be retained until final harvest.

crotch - The fork of a tree or branch.

crown - The branches and foliage of a tree.

crown class - A designation of trees in a forest with crowns of similar development and occupying similar positions in the crown cover. Differentiation into crown classes applies to even-aged stands and within small even-aged groups in which trees in an uneven-aged stand are often arranged. Five crown classes are commonly recognized: dominant, co-dominant, intermediate, overtopped (suppressed), and wolf trees.

crown closure - The time at which the available crown space has become fully occupied.

crown cover - The canopy of green leaves and branches formed by the crowns of all trees in a forest, generally, expressed as a per cent of total area.

crown density - The compactness of the crown cover of the forest; depends on the distance apart and the compactness of the individual crowns. A loose term combining the meanings of 'crown closure' and 'shade density.'

cruising - Measuring standing trees to determine the volume of wood on a given tract of land. Used for harvesting, purchasing and general management.

cubic meter (m³) - A volume measure, 1 m by 1 m by 1 m.

cull - A tree or log of merchantable size rendered non-merchantable because of poor form, large limbs, rot, or other defects.

cull tree - A live tree of merchantable size but non-merchantable because of defects or decay.

cutting area - A portion of woodland on which timber is being cut or will be cut.

cutting cycle - The planned interval between major harvesting operations in the same stand. A 20-year cutting cycle indicates a harvest is done once every 20 years.

D

diameter at breast height (DBH) - The diameter of a tree outside of the bark at roughly breast height. Normally measures 1.3 m off the ground on the uphill side of the tree. It is easier to measure at this height and many trees have large swells in the stem below this point that could increase errors in computing tree volumes.

deciduous - Term applied to trees (commonly broad-leaved trees) that drop all their leaves sometime during the year.

decline causing defects - Mechanical or pathological defects that may cause decline or cause the tree to be of high risk. These defects will also cause the decline of the products which may be recovered from a tree or severely limit the potential of a tree to produce anything better than low-value products.

defect - Any irregularity or imperfection in a tree, log, piece, product, or lumber that reduces the volume of sound wood or lowers its durability, strength, or utility value.

defect class - A system of categorizing tree defects by severity of degradation of the tree and/or the merchantable portion of the tree over time:

major defect: The tree will degrade rapidly.

moderate defect: The tree will degrade slowly.

minor defect: The tree will maintain quality over cutting cycle period.

defoliator - An agent that damages trees by destroying leaves or needles.

den tree - A tree having a hollow or cavity used by animals for refuge or hibernation.

diameter class - One of the intervals into which the ranges of diameters of trees in a forest is divided for purposes of classification and use. Generally, this is done in 2 cm, even increments (40 cm class would contain trees from 39.1 to 41.0 cm).

diameter limit - The smallest (occasionally the largest), size to which trees or logs are to be measured, cut, or used. The points to which the limit usually refer are stump, breast height, or top.

diameter-limit cutting - A system of selection harvest based on cutting all trees in the stand over a specified diameter. This eliminates marking individual trees. This is not a recognized silvicultural system in Ontario.

disease - Harmful deviation from normal functioning of physiological processes, generally pathogenic or environmental in origin.

dominant trees - Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, with crowns well developed, possibly somewhat crowded on the sides. *see crown class.*

dormancy - A biological process in which a plant ceases most growth activities and simply maintains existing tissue. Caused by periods of moisture and/or temperature stress. A state of reduced activity in seeds that prevents germination under favourable environmental conditions.

downed woody debris (DWD) - Sound and rotting logs and stumps that provide habitat for plants, animals and insects and a source of nutrients for soil development.

drumlin - Elongated oval or 'whale-back' ridge of deep molded glacial till formed during ice advance and with long axis parallel to ice movement.

dry rot - A decay of the "brown rot" type, caused by specialized fungi capable of conducting moisture from an available source and extending their attack to wood previously too dry to decay. Found chiefly in buildings. The term is open to the misinterpretation that wood will rot when dry, which is not true.

duff - Forest litter and other organic debris in various stages of decomposition on top of the mineral soil; typical of coniferous forests in cool climates, where rate of decomposition is slow and where litter accumulation exceeds decay.

E

ecology - The science that deals with the interaction of plants and animals with their environment.

ecological land classification (ELC) - A system devised by OMNR to describe over 80 wetland and terrestrial forest vegetation types in southern Ontario. This preliminary community classification system has six different organizational levels.

ecosite - The fifth organizational level that identifies a site based on bedrock type, soil depth, texture, and moisture regime, hydrology, drainage, nutrient regime, and vegetation structure and species composition.

ecosystem - A functional unit consisting of all the living organisms (plants, animals and microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size—a log, pond, field, forest, or the earth's biosphere—but it always functions as a whole unit. Ecosystems are, commonly, described according to the major type of vegetation, for example, forest ecosystem, old-growth ecosystem, or wetland ecosystem.

ecosystem management - The use of an ecological approach to achieve productive resource management by blending social, physical, economic and biological needs and values to provide healthy ecosystems.

edge - The transitional zone where one cover type ends and another begins.

endangered species - A species of native fish, wildlife, or plants found to be threatened by extinction because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of over-exploitation, disease, predation, or other factors its survival requires assistance.

environment - All elements living and inanimate, that effect a living organism.

environmentally sensitive areas (ESAs) - A general term for natural areas whose significance has been assessed on the basis of a series of qualitative criteria applied on a local or regional basis by municipalities, conservation authorities or others.

epidemic - Widespread insect or disease incidence beyond normal proportions; usually accompanied by excessive damage.

even-aged - The conditions of a forest or stand composed of trees having no, or relatively small, differences in age. Although, differences of as much as 30 per cent are admissible in rotations greater than 100 years of age.

even-aged management - The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20 per cent of the age of the stand at maturity. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Cutting methods producing even-aged stands are clearcut, shelterwood, or seed-tree.

exotic - Not native; foreign.

F

felling and bucking - The process of cutting down standing timber and then cutting it into specific lengths for yarding and hauling.

final cutting - The removal of seed or shelter trees after regeneration has been effected, or removal of the entire crop of mature trees under a clearcut silvicultural system.

fish habitat - Spawning grounds and nursery, rearing food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

fixed area plot sampling method - A controlled cruise method where small plots of a fixed size are used to sample a portion of a forest area to obtain information (such as tree volume) that can be used to describe the whole area.

fluxing - An abnormal discharge from a crack or seam.

forest - A plant community predominantly of trees and other woody vegetation, growing more or less closely together. An area managed for the production of timber and other forest products, or maintained under woody vegetation for such indirect benefits as protection of site or for recreation.

forest management - The application of business methods and technical forest principles to the management of forest property.

forest survey - An inventory of forest land to determine size, condition, timber volume and species, for specific purposes or as a basis for forest policies and programs. Also refers to, carefully, measuring and marking property boundaries.

forest type - A descriptive term used to group stands of similar character in composition and development, to differentiate them from other groups of stands.

forestry - The science, art and practice of managing and using for human benefit the natural resources that occur on and in association with forest lands.

form - The shape of a log or tree.

forwarder - A machine used to move short log lengths from the stump to the landing, often in a carrier that keeps the logs off of the ground.

fragmentation - The process of transforming large continuous forest patches into one or more smaller patches surrounded by disturbed areas. This occurs naturally through such agents as fire, landslides, windthrow and insect attack. In southern Ontario, agriculture and development have contributed to forest fragmentation.

free-to-grow - A condition in which a forest is considered established based on a minimum stocking standard, a minimum length and freedom from competition that could impede growth.

frost crack - Longitudinal crack on the outside of a tree, caused by extreme cold. Especially common on thin-barked species.

fuelwood - Trees used for the production of firewood logs or other wood fuel.

full-tree harvesting - A tree harvesting process that includes removing the trunk, branches and in some instances the roots from a forested site. In Canada this process is used to control root diseases.

fungus - A plant without chlorophyll that derives its nourishment from the organic matter of other plants.

G

gall - A pronounced localized swelling of greatly modified structure that occurs on plants from irritation by a disease or insect.

gap - A site at which a canopy tree has died and at which active recruitment of new individuals into the canopy is occurring.

geographic information system (GIS) – is a system of computer software, hardware and data, and personnel to help manipulate, analyze and present information that is tied to a spatial location.

gene pool - Sum of all genes among scattered populations of a given species.

genetic diversity - The diversity of genes among members of the same species or population.

germination - The resumption of active growth in the embryo of a seed, as demonstrated by the protrusion of a radicle (embryonic root axis).

girdle - To encircle the stem of a living tree with cuts that completely sever bark and cambium and often are carried well into the outer sapwood, done to kill the tree by preventing the passage of carbohydrates to the roots. Also refers to same process caused by animals, such as mice or beavers.

global positioning system (GPS) – a digital system that provides specially coded satellite signals that can be processed in a GPS receiver, enabling the receiver to compute position, velocity and time.

grade - A system of classifying lumber or logs according to quality. The steepness of a forest road.

group selection - Modification of the selection system in which trees are removed in small groups rather than as individuals.

Growing degree days (GDD) - Accumulated number of degrees of mean daily temperature above a base temperature of 5.5°C. This provides an index, which is used to estimate the growth and development of plants and insects during the growing season.

growth - The increase in diameter, basal area, height or volume of individual trees or groups of trees during a given period.

growth rate - With reference to wood, the rate at which wood has been added to the tree at any particular point, usually expressed in the number of annual rings per centimeter. May also be stated as “annual leader growth.”

H

habitat - The environment in which the plant or animal lives.

hardwood - Generally, one of the botanical group of trees that have broad leaves, in contrast to the needle-bearing conifers. Wood produced by broad-leaved trees, regardless of texture or density.

harvest - Extraction of some type of product from the forest. Generally associated with a cutting.

heart rot - A decay characteristically confined to the heartwood. It usually originates in the living tree.

heartwood - The inner core of a woody stem, wholly composed of non-living cells and usually differentiated from the outer enveloping layer (sapwood) by its darker colour.

hectare (ha) - An area measure of 10,000 square meters. Basic unit of land area.

herb - A non-woody flowering plant.

hibernacula - Caves and mines (bats), subterranean areas below the frost line (reptiles) with openings to above ground where these animals can safely hibernate during the winter months.

high grading - The removal from the stand of only the best trees or tree species, often resulting in a poor quality residual stand.

hydric - A general term for soils that develop under conditions of poor drainage in marshes, swamps, seepage areas or flats.

I

ice damage - Breakage of tops and branches and stripping of branches and needles by an ice storm.

immature - Trees or stands that have grown past the regeneration stage, but are not yet mature.

improvement cutting - The elimination or suppression of less valuable trees in favour of more valuable trees, typically in a mixed, uneven-aged forest.

increment - An increase in the diameter, basal area, height, volume, quality, or value of individual trees or stands over time.

Current Annual Increment (CAI): Growth increment in a given year of the diameter, basal area, height or volume for a given tree or group of trees.

Mean Annual Increment (MAI): The average annual increment for the total age of the diameter, basal area, height or volume for a given tree or group of trees.

increment core - That part of the cross section of a tree extracted by an increment borer. Used to determine tree age and growth.

indicator species - Species of plants used to predict site quality and characteristics.

intermediate trees - Trees shorter than those in the dominant or codominant classes, but with crowns either below or extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above, but none from the sides; usually with small crowns, considerably crowded on the sides. *see crown class*.

intolerance - Trees unable to survive or grow satisfactorily under specific conditions, most commonly used with respect to their sensitivity to shade but also to conditions such as wind, drought, salt and flooding.

Invasive exotic species - An invasive exotic species is a non-native plant or animal that threatens the survival of native species.

K

knot - That part of a branch that has been incorporated into the main stem.

L

landing - The area where logs are collected for loading for transport to a mill.

landscape - All the natural features, such as fields, hills, forests and water that distinguish one part of the earth's surface from another part; usually that portion of land or territory which the eye can comprehend in a single view, including all of its natural characteristics.

layering - The rooting of an undetached branch, lying on or partially buried in the soil or other forest floor media, that is capable of independent growth after separation from the parent plant.

leader - The growing top (terminal shoot) of a tree. The distance up the main stem of the tree between each whorl of branches generally represents one year of height growth.

leave tree - Tree left in or just outside a harvest zone (often otherwise a clearcut) to re-seed the area. This is nature's method of reforestation; but it is often slower and it does not have the more assured results of direct seeding or planting. May also refer to trees left after a thinning.

litter - The uppermost layer of the soil, made up of freshly fallen or slightly decomposed organic materials.

log - To cut and deliver logs. A tree segment suitable for lumber and other products.

logger - A person who is engaged in a logging operation; locally, one who moves logs to landings or skidways.

log rule - A table showing the estimated or calculated amount of lumber that can be sawn from logs of given length and diameter.

log scale - The lumber content of a log as determined by a log rule.

M

management plan - A written plan for the organized handling and operation of a forest property. It usually includes data and prescribes measures designed to provide optimum use of forest resources according to the landowner's objectives.

marking timber - Selecting and indicating, usually by a paint mark, trees to be cut or retained in a harvesting or tending operation.

mast - The fruit and nuts of trees and woody shrubs used as a food source by wildlife.

mast trees - Trees supporting mast productions, e.g. oak, beech, cherry.

maturity - For a given species or stand, the approximate age or condition beyond which the growth rate declines or decay begins to assume economic importance.

mechanical site preparation - Any activity that involves the use of mechanical machinery to prepare a site for reforestation.

merchantable - That part of a tree that can be manufactured into a salable product.

merchantable height - The length of the tree stem from the top of the stump to the top of the last merchantable section. Usually expressed in meters or number of logs.

merchantable length - Length of the tree from which could be produced a merchantable product under given economic conditions.

merchantable timber - A tree or stand of trees that may be converted into salable products.

merchantable volume - The amount of wood in a single tree or forest stand that is considered salable.

mesic - Describing the sites that are neither humid (hydric) nor very dry (xeric). The average moisture conditions for a given climate.

meter (m) - Measure of length equal to 100 cm.

metric chain - A 20 m measure.

microclimate – Generally, the climate of small areas, especially insofar as this differs significantly from the general climate of the region. Stands often create microclimates.

microsite - A portion of a site that is uniform in microtopography and surface soil materials. It can range in size from less than 1 m² to occasionally over 5 m². Microsites are dynamic in that their characteristics are ever-changing, imperceptibly or suddenly.

mineral soil - Soil consisting predominately of, and having its properties determined by, inorganic matter. Usually, contains less than 20 percent organic matter.

mortality - Death of forest trees as a result of competition, disease, insect damage, drought, wind, fire and other factors.

mycorrhiza - A rootlet of a higher plant modified through integral association with a fungus to form a constant structure that differs from either component but is attached to the root system and functions somewhat as a rootlet. It is usually considered to be beneficial to the associated plant.

N

natural regeneration - The renewal of a forest stand by natural seeding, sprouting, suckering, or layering seeds may be deposited by wind, birds, or mammals.

natural thinning - Death of trees in a stand as a result of competition.

nurse tree (crop tree) - A tree or crop of trees, shrubs, or other plants that foster another, generally a more important, tree or crop.

O

old field – an area of land formerly used for agriculture that has been abandoned and has been regenerating with native trees and plants.

old growth - A relatively old forest that little or no evidence of human disturbance. This term is misapplied by many to describe any forest that appears to be old. Individual trees in this type of forest are, usually, over 200 years old and there are large standing and fallen dead trees throughout the stand.

operation - Used interchangeably for logging jobs, harvesting, cutting, milling, etc. An all-inclusive term for harvesting and hauling out the forest products.

organic litter - The layer of decomposing leaves, bark, twigs and other organic debris that lies on the forest floor.

organic soil - Soil containing a high proportion (greater than 20 or 30 percent) of organic matter.

overmaturity - That period in the life cycle of trees and stands when growth or value is declining.

overstocked - A condition of the stand or forest, indicating more trees than desired, normal, or full stocking would require.

overstory - That portion of the trees in a stand forming the upper crown cover.

P

partial cutting - Refers generically to stand entries, under any of the several silvicultural systems, to cut selected trees and leave desirable trees for various stand objectives. Partial cutting includes harvest methods used for seed tree, shelterwood, selection and clearcutting with reserves systems.

patch cutting - A silvicultural system that creates openings less than one hectare in size and is designed to manage each opening as a distinct even-aged opening.

per cent grade - The vertical rise of land in 100 horizontal units. A 16 percent grade means that in 100 m horizontal, the elevation has changed 16 m. Amount of forest volume found to be in a given log grade.

pest - A plant, animal, or thing that is troublesome or annoying (from a human value perspective).

pH - A measure of the hydrogen ion on a scale of 0 (very acidic) to 14 (very basic). A pH value of 7 is neutral. Every change in one unit of measure indicates a 10x change in the quantity of hydrogen ions (e.g. a pH of 5.0 is 10x more acidic than a pH of 6.0 and 100x more acidic than a pH of 7.0).

phloem - The tissues of the inner bark, characterized by the presence of sieve tubes and serving for the transport of elaborated foodstuffs.

photosynthesis - The conversion by green plants of light, water and air into food energy.

physiographic system - A system that comprises the inorganic portion of the environment outside of the works of man.

pioneer (botanical) - A plant capable of invading bare sites (that is, a newly exposed soil surface) and persisting there until supplanted by successor species. A species planted to prepare a site for such successor species and therefore, a nurse crop.

plantation - An artificially reforested area established by planting or by direct seeding.

plot - A carefully measured area laid out for experimentation; may be permanent or temporary.

point sampling - A method of selecting trees for measurements and of estimating stand basal area at a sample location or point sample. Also called plotless cruising, angle count

method. A 360° sweep is made with an angle gauge about a fixed point and the stems with breast height diameters appearing larger than the fixed angle subtended by the angle gauge are included in the sample.

pole - A young tree between 10 and 25 cm in DBH. A log cut for the manufacture of utility poles (usually trees larger than 30 cm DBH).

polewood - Trees with a DBH between 10 and 25 cm.

population sink - A habitat insufficient in size or resources to support a viable population of a species, yet which may attract dispersing individuals.

precommercial thinning - Removal of some of the trees in a young stand to reduce competition for water, nutrients and light and to accelerate commercial growth on remaining trees. Trees thinned from these stands have no commercial value.

preparatory cutting - The removal of trees near the end of a rotation, which permanently open the canopy and enable the crowns of seed bearers to enlarge, to improve conditions for seed production and natural regeneration. Typically, done in the shelterwood system.

prescribed burning - The knowledgeable application of fire to a specific unit of land to meet predetermined resource management objectives.

prescription - A course of management action prescribed for a particular area after specific assessments and evaluations have been made.

primary excavator (tree cavity) - Animals that excavate their own cavities.

prism - A wedge-shaped piece of clear or amber-coloured glass that is used to select trees for timber sampling or to estimate basal area.

pruning - The removal of live or dead branches from standing trees, usually the lower branches of young trees and the removal of multiple leaders in plantation trees, for the improvement of the tree or its timber; the cutting away of superfluous growth, including roots, from any plant to improve its development. *see self-pruning.*

pulpwood - Wood cut or prepared primarily for manufacture into wood pulp, for later manufacture into paper, fibreboard, or other products.

R

raptor - A bird of prey.

recovery plan - A plan developed specifically for a species at risk with the primary goals being to ensure the species does not become extirpated in Canada and that population numbers increase sufficiently to allow for its recovery.

recruitment - Process of maintaining, restoring, or increasing the seedling and sapling component of a stand.

reforestation - The natural or artificial restocking of an area with forest trees.

regeneration - The renewal of a tree crop whether by natural or artificial means.
Also the young crop itself which commonly is referred to as reproduction.

release - Freeing a tree or group of trees from competition by cutting or, otherwise, eliminating growth that is overtopping or closely surrounding them.

removal cut - One or more cuts in the shelterwood system that releases established seedlings.
The last removal cut is called the final removal cut.

reproduction - The process by which a forest is renewed:

artificial: Renewal by direct sowing or planting.

natural: Renewal by self-sown seeds, sprouts, rhizomes, etc.
Seedlings or saplings of any origin.

reproduction methods -

clearcutting: Removal of the entire forest in one cut. This method perpetuates even-aged stands.

seed-tree: Removal of the mature timber in one cut, except for a small number of seed trees; called a group cutting when the seed trees are left in groups, a reserve cutting when, specifically, selected seed trees are left for growth, as well as to furnish seed.

selection: Removal of mature timber, usually the oldest or largest trees, either as single scattered trees or in small groups at relatively short intervals, commonly 15 to 25 years, repeated indefinitely. This encourages a continuous establishment of natural reproduction and an uneven-aged stand is maintained.

shelterwood: Removal of the mature timber in a series of cuttings, which extend over a period of years. Usually, equal to not more than one-quarter (often not more than one-tenth) of the time required to grow the crop. The establishment of natural reproduction under the partial shelter of seed trees is encouraged, but sometimes these areas must be artificially regenerated.

coppice: Forest regeneration by sprouting (vegetative reproduction) from stumps or roots.

reserve - An area of forest land that, by law or policy, is not available for harvesting. Areas of land and water set aside for ecosystem protection, outdoor and tourism values, preservation of rare species, gene pool, wildlife protection, etc.

residual basal area - The basal area per hectare of acceptable trees left standing after harvest.

residual stand - Trees, often of sawlog size, left in a stand after thinning to grow until the next harvest. Also called leave trees.

residuals (residual trees) - Trees left standing after harvesting.

resource values - Products or commodities associated with forest lands and largely dependent on ecological processes. These include, but are not limited to, water quality and quantity, forage, fish, wildlife, timber, recreation, energy, minerals and cultural and heritage resources.

riparian zone - That area adjacent to rivers and streams identified by vegetation, wildlife and other qualities unique to these locations.

roots - The below-ground tree or plant parts that provide physical support, absorb water and nutrients from the soil and store food produced by photosynthesis.

root graft - A functional union of two roots after their formation, commonly between roots of the same individual, or roots of neighbouring trees of the same species.

rotation - The period of years required to establish and grow a timber crop to a specified condition of maturity, when it may be harvested and a new tree crop started.

rotation age - The age at which a stand is considered ready for harvesting under an adopted plan of management.

rot - Wood in a state of decay.

S

salvage - To harvest trees that are dead or are in poor condition but can still yield a forest product.

sample - A small collection from some large population.

sanitation cut - The removal of dead, damaged, or susceptible trees done primarily to prevent the spread of pests or pathogens and so promote forest hygiene.

sapling - A young tree of small diameter, typically 1 to 9 cm DBH.

Sapwood - The light-coloured wood that appears on the outer portion of a cross section if a tree. Contains living cells; serves to conduct water and minerals to the crown.

sawlog - A log large enough to be sawn into lumber.

sawtimber - Trees that yield logs suitable in size and quality for the production of lumber.

scale - The estimated sound volume of a log or group of logs in terms of a given log rule or formula; used to estimate the sound volume of a log or group of logs.

scarify - To disturb the forest floor and top soil in preparation for natural regeneration or direct seeding or planting.

second growth - A second forest that develops after harvest of the original, natural forest.

secondary cavity-user - Wildlife that use decay cavities or ones abandoned by primary excavators.

seedbank - The store of dormant seeds buried in the soil.

seedbed - The soil, forest floor or other media on which seed falls.

Seed cutting - Removal of trees in a mature stand to effect permanent openings in the canopy (if not done in a preparatory cutting) and thereby provide conditions for securing regeneration from the seed of trees retained for this purpose. Also the first of the shelterwood cuttings.

seed tree - A tree that produces seed. Trees reserved in a harvest operation to supply seed.

Seed year - A year in which a given species produces a seed crop greatly in excess of the normal. Applied, usually, to trees of irregular or infrequent seed production.

seed zone - Areas of similar climatic and elevation conditions, used to specify where tree seed was collected and where trees from such seed are most likely to be successfully grown.

seedbed - In natural plant reproduction, the soil or forest floor on which seed falls; in nursery practice, a prepared area in which seed is sown.

Seeding - A reforestation method by sowing seeds, aerially or by hand. Often done immediately after harvest so that a new forest is started the next growing season.

seedling - A small tree grown from seed. Usually, the term is restricted to trees equal to or less than 1 cm DBH.

selection silvicultural system - A periodic partial-cutting, controlled by basal area, using vigor and risk characteristics to determine individual tree selection. An uneven-aged silvicultural system.

Selective cutting - The cutting of individual selected trees. There are, generally, few if any control measures. Also known as high-grading. Not to be confused with the selection silvicultural system.

self-pruning - The natural death and fall of branches from live trees due to causes such as light and food deficiencies, decay, insect attack, snow and ice; also called natural pruning.

senescence - The process of turnover of green biomass into yellow (or dead) biomass. Senescence mainly depends on origin and development of a plant, but it is also influenced by dryness and/or nutrient stress and pest diseases.

shade tolerance - The capacity of a tree or plant species to develop and grow in the shade of and in competition with other trees or plants.

shelterwood - The cutting method that describes the silviculture system in which, in order to provide a source of seed and/or protection for regeneration, the old crop (the shelterwood) is removed in two or more successive shelterwood cuttings. The first cutting is ordinarily the seed cutting, though it may be preceded by a preparatory cutting and the last is the final cutting. Any intervening cutting is termed removal cutting. An even-aged stand results.

shelterwood silvicultural system - An even-aged silvicultural system where in order to provide a source of seed and/or protection for regeneration, the old crop is removed in two or more successive cuttings:

Group Shelterwood System: Patches of advanced regeneration arising from thinnings or from natural disturbances, commonly developed in even-aged stands. Where this condition is prominent, shelterwood cuttings can be made, specifically, in relation to the requirements of each group of advanced regeneration. These clumps of regeneration are enlarged by the removal of all or most of the trees above them and initiating preparatory or seeding cuttings around them. The holes created in the canopy are gradually enlarged to keep pace with the establishment of reproduction.

Irregular Shelterwood System: Harvest cutting in which opening of canopy is irregular and gradual; generally in groups, with the final cutting often in strips; regeneration natural; regeneration interval long, often up to half the rotation and the resultant crop considerably uneven-aged and regular.

Strip Shelterwood System: A shelterwood system in which regeneration cuttings are carried out on fairly wide strips, generally, against the prevailing winds and progress rapidly; regeneration is mainly natural, regeneration interval short and resultant crop fairly even-aged and regular.

Uniform Shelterwood System: A shelterwood system in which the canopy is opened fairly evenly throughout the regeneration area; regeneration is mainly natural, though it may be supplemented artificially; regeneration interval fairly short and resultant crop more or less even-aged and regular.

shrub - A woody perennial plant (lives more than one year) that differs from a perennial herb by its woody, persistent stems and from a tree by its low stature and branches that start from the base.

significant wildlife habitat - Wildlife habitats that are ecologically important in terms of features, functions, representation or amount, and their contribution to the quality and diversity of an area.

silvics - A knowledge of the nature of forests and forest trees, how they grow, reproduce and respond to changes in their environment.

silvicultural system - A process whereby forests are tended, harvested and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop with a view to regeneration and according to the type of forest thereby produced.

silviculture - The art and science of producing and tending a forest; the theory and practice of controlling forest establishment, composition, growth and quality of forests to achieve the objectives of management.

silviculture prescription - A site-specific operational plan that describes the forest management objectives for an area. It prescribes the methods for harvesting the existing forest stand and a series of silviculture treatments that will be carried out to establish a free growing stand in a manner that accommodates other resource values as identified.

single-tree selection - The cutting method that describes the silvicultural system in which trees are removed individually, here and there, each year over an entire forest or stand. The resultant stand usually regenerates naturally and becomes all-aged. *see selection silvicultural system.*

site - An area of land, especially with reference to its capacity to produce vegetation as a function of environmental factors (climate, soil, biology, etc.)

site class - A grouping of similar site indexes that indicates relative productivity. The common system in Ontario is Site Class X, 1, 2, 3, 4 (PFR).

site preparation - Any treatment of a forest site to prepare it for establishment of a plantation or for natural regeneration.

skid road (skid trail) - A pathway over which logs are dragged (skidded) from the stump to the landing. Logs are dragged by a machine called a skidder or by horses.

skidder - A wheeled or tracked vehicle used for sliding and dragging logs from the stump to a landing.

skidding - The process of dragging logs from the woods to a landing.

slash - Tree tops, branches, bark and other debris, left after a forest operation; or The process of cutting down undesirable vegetation.

snag - A standing, dead tree or a standing section of the stem of a tree broken off at the height of six meters or more. If less than six meters, it is properly termed a stub.

Softwood - One of the botanical group of trees that generally have needle or scale-like leaves—the conifers. Also the wood produced by such trees, regardless of texture or density.

soil - Unconsolidated mineral material or organic material that is greater than 15 cm thick that occurs at the earth's surface, has undergone soil formation processes, usually exhibits a distinct soil profile and is capable of supporting plant growth.

soil horizon - A layer of soil with distinct characteristics that separate it from other soil layers.

soil moisture - The relative amount of water in the soil; usually applied to upper levels of soil, occasionally to humus layer.

soil profile - A vertical section of soil showing the nature and thickness of the various horizons, often used in soil classification.

soil series - Grouping of soils with similar profile characteristics.

soil texture - The relative proportion of various particle sizes such as sand, silt, clay and coarser materials in a mineral soil sample. The Canadian System of Soil Classification describes the basic textural classes (clay, silty clay, sandy loam, etc.)

spacing - The distance between trees in a plantation, a thinned stand, or a natural stand. The removal of undesirable trees within a young stand to control stocking, to maintain or improve growth, to increase wood quality and value, or to achieve other resource management objectives.

Species of conservation concern - Includes endangered, threatened, vulnerable (or rare) plant or animal species as well as plant or animal species currently experiencing significant population declines in the province, or plant or animal species of particular importance to the Province or to a local region for any number of reasons.

species (of trees) - Trees having very similar genetic makeup, so that they freely interbreed and have common characteristics. In common language, a 'kind' or 'variety.' Each species is identified by a scientific name that consists of a genus portion and then a species portion (*Pinus strobus*, white pine).

species composition -The percentage of each recognized tree species comprising the forest type based upon the gross volume, the relative number of stems per hectare or basal area.

sprout - Any shoot rising from a plant; or A young tree developed directly from the base, stump, or root of another tree. Relatively common among hardwoods.

stand - An aggregation of trees occupying a specific area and uniform enough in composition (species), age and arrangement to be distinguishable from the forest on adjoining areas.

stand density - The number of trees usually expressed on a per hectare basis.

stand structure - The distribution and representation of age and/or size classes and of crown and other tree classes within a stand.

stand table - A summary table showing the number of trees per unit area by species and diameter classes, for a stand or type. The data may also be presented in the form of a frequency distribution of diameter classes.

stem - The trunk of a tree.

stick nest - A platform of sticks (twigs up to small branches) constructed by some bird species for nesting.

stocking - A qualitative expression of the adequacy of tree cover on an area, in relation to a pre-established norm, expressed in terms of crown closure, number of tree, basal area, or volume.

fully stocked: Productive forest land stocked with trees of a merchantable species. These trees, by number and distribution or by average DBH, basal area, or volume, are such that at rotation age they will produce a timber stand that occupies the potentially productive ground. The stocking, number of trees, and, distribution required to achieve this will usually be determined from yield curves. Sometimes called *normally stocked*.

over stocked: Productive forest land stocked with more trees of merchantable species than normal or full stocking would require. Growth is in some respect retarded and the full number of trees will not reach rotation age according to an appropriate yield and stock tables for the particular site and species.

stream - A permanent or intermittent water course.

stumpage - The value of timber as it stands uncut in the woods; in a general sense, the standing timber itself. Can also denote price paid for this timber.

succession - The replacement of one plant community by another in progressive development towards climax vegetation.
types of succession:

primary: Plant succession on newly formed soils or surfaces, exposed for the first time, that have never borne vegetation.

secondary: Plant succession following the destruction of a part or all of the original vegetation.

sucker - A sprout from the lower portion of a stem, especially from the root.
A shoot or tree originating from adventitious buds on roots.

sunscald - Death of cambial tissue on one side of a tree, caused by exposure to direct sunlight.

supercanopy tree - A living tree that sticks up well above the main canopy of a forest stand.

sustainability - The concept of producing a biological resource under management practices that ensure replacement of the part harvested, by re-growth or reproduction, before another harvest occurs.

sustainable forest management - Management regimes applied to forest land which maintain the productive and renewal capacities as well as the genetic, species and ecological diversity of forest ecosystems.

sustained yield - A policy, method, or plan of forest management that calls for continuous production, to achieve, at the earliest practicable time, an approximate balance between net growth and amount harvested.

swamp - A mineral-rich wetland characterized by a cover of deciduous or coniferous trees.

sweep - A gradual, but pronounced, bend in a log, pole, or piling; considered a defect.

T

tally- The count of trees, logs or other products; to count trees, logs, or other products; to record products, distances, etc. as measured.

taper - The gradual reduction of diameter in a stem of a tree or a log from the base to the top.

tending - Generally, any operation carried out for the benefit of a forest crop at any stage of its life, e.g. cleaning, thinning, pruning.

terrestrial system - Upland areas, where the water table is normally below the soil surface.

thinning - Cutting in an immature stand to increase the growth rate of the leave trees. The goal is to foster quality growth, improve composition, promote sanitation and recover and use material that would, otherwise, be lost to mortality. Thinning does not, generally, increase per-hectare volume growth, but it can increase lumber yield.

till - Glacial deposits laid down directly by the ice with little or no transportation or sorting by water.

timber- A term loosely applied to forest stands or their products; often applied to wood in forms suitable for heavy construction.

tolerance - The capacity of a tree or plant to develop and grow in the shade of (and in competition with) other trees or plants; a general term for the relative ability of a species to survive a deficiency of an essential growth requirement (light, moisture, nutrient supply).

tree - A woody plant having one well-defined stem and a more or less definitely formed crown, usually attaining a height of at least three meters.

tree age - The number of years since the germination of the seed, or the budding of the Sprout or root sucker.

tree length - Entire length of tree, or with the top lopped off at small diameter, as in skidding tree length to a landing for bucking into logs.

tree marking - Selecting and marking trees to be harvested and trees to be left to grow. Selected trees are usually identified with coloured paint on the tree trunk at DBH and at the stump. Normal colours used in Ontario are: orange/yellow for stem removal and blue for residual stems.

U

unacceptable growing stock UGS - These trees have a high risk of dying and are expected to decline over the next cutting cycle. They include trees that are of poor form and/or low quality.

underbrush - The brush growing in a forest.

undergrowth - Small trees and shrubs and other plants growing under a forest canopy.

understory - That portion of the trees or other vegetation in a forest stand below the canopy.

uneven-aged - Applied to a stand in which there are considerable differences in the age of the trees and in which three or more age classes are represented.

uneven-aged management - The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species and the orderly growth and development of trees through a range of diameter or age classes. Cutting methods that develop and maintain uneven-aged stands are single tree selection and group selection.

V

vegetation type - The sixth and finest level of resolution in the Ecological Land Classification system. It represents recurring vegetation patterns observed on the landscape, based only on plant species composition. Normally, "Vegetation Types" include the names of dominant plant species of the community, based on relative abundance.

vegetative reproduction - Reproduction by a root, stem, leaf, or some other primary vegetative part of a plant body.

veteran tree - a tree that is considered to be a supercanopy tree of the future. These trees have survived previous disturbances such as fire and harvesting.

volume - The amount of wood in a tree, stand, or, other specified area according to some unit of measurement or some standard of use (e.g. m³ or m³/ha)

W

water table - The upper surface of the water saturation zone.

wetland - Land that is seasonally or permanently covered by shallow water, or land where the water table is close to or at the surface. In either case, the presence of abundant water has caused the formation of hydric soils and has favored the dominance of either hydrophytic or water-tolerant plants.

wetland system - Areas where water levels fluctuate and are under two meters in depth.

wildlife - All wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria and other wild organisms.

wildland - areas that are both forested and not forested (i.e. old fields, grasslands, meadows, wetlands) or are areas of natural regeneration that will cease to be actively managed. Wildlands include forests that may eventually gain the status of "old growth" after a time of maturation.

windfall - A tree uprooted or broken off by wind; an area on which the trees have been thrown by wind. See windthrow

windfirm - Descriptive of trees and plantations that, because of species, soil or relative exposure, are unlikely to suffer windthrow.

windthrow - Uprooting or breakage of trees caused by strong winds.

wood - The lignified water-conducting, supporting and storage tissue of branches, stems and roots.

Y

yield - Growth or increment accumulated by trees at specified ages expressed by volume or weight to defined merchantability standards.

young growth - Any forest of relatively young age and condition.

Appendix A
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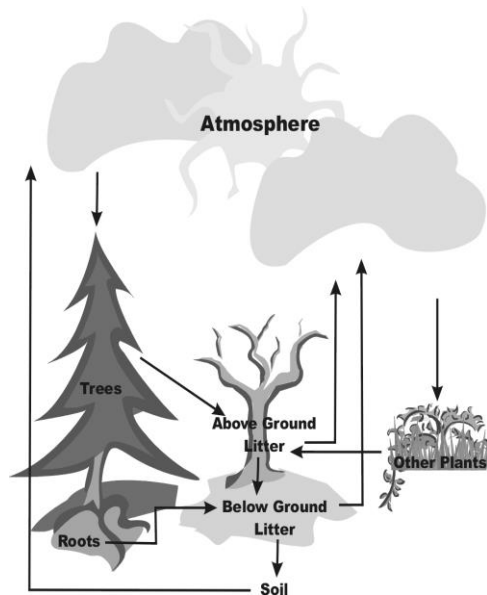
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Appendix B
Carbon Sequestration

The Kyoto Protocol was signed by Canada as a member of the United Nations Framework Convention on Climate Change in December of 1997. This protocol requires industrialized countries to reduce the amount of greenhouse gases. It has been determined that “to reach our climate change goals, we will have to make use of all possibilities, and CO₂ capture and storage is an important option.” (Natural Resources Canada, 2003) As a result of this necessity, on June 25, 2003, Canada signed an international carbon sequestration agreement entitled the Charter for the Carbon Sequestration Leadership Forum. This agreement was developed to help combat climate change. It was noted that the Carbon sequestration agreement will also reaffirm Canada’s commitment to the sustainable use of our natural resources.



Photosynthesis in trees requires the tree to use atmospheric carbon dioxide to produce carbohydrates. These carbohydrates are stored within the trees’ roots, trunk, branches, and leaves until decomposition. During decomposition the carbon is then released into the atmosphere. Carbon can also be found in the plants, duff layer, and soil of a forest. See Figure 14.1. Carbon sequestration or carbon storage refers to the storage of the carbohydrates or carbon dioxide within the tree or soil. These stored carbons are considered to be available carbon credits. A Carbon Credit is the term used to describe the potential sale of the carbon rights of a carbon sink to an industrial entity.

Figure 14.1 The Flow of Carbon in a Forest

Deforestation or intensive forest management can have drastic effects on the carbon dioxide released into the atmosphere as well as the amount of carbon dioxide absorbed from the atmosphere. Deforestation has therefore been a concern under the Kyoto Protocol. Saugeen Conservation has also been concerned with deforestation or intensive forest management. Selective thinning, plantation thinning, and sawlog harvests are performed based on basal area calculations, and are only carried out when the forest is overstocked and forest health is being threatened.

Reforestation has become an important aspect of reducing the carbon dioxide emissions. As the Authority has in the past, tree planting will continue to be a major program encouraging landowners to replant marginal and fragile lands. Through tree planting, new carbon storage areas are created and therefore reduce the amount of carbon dioxide in the atmosphere.

Currently, there is much speculation on the marketing of ‘carbon credits’. It should be understood that the value of the forest as a carbon reservoir is not in question. Saugeen Conservation will continue to investigate all carbon sequestration options throughout the period of this plan.

Appendix C
Hunting Policy

**SAUGEEN VALLEY CONSERVATION AUTHORITY
HUNTING POLICY (as per Motion #E80-109)**

Hunting is allowed on all Authority-owned lands within the watershed, in compliance with regulations made under the Game and Fish Act, with the following exceptions:

Hunting is **not permitted** at the properties listed below:

Headquarters Conservation Area
Varney Conservation Area
Denny's Dam Conservation Area
Durham Conservation Area
Saugeen Bluffs Conservation Area
(Lot 9, 10, Range C only)
Brucedale Conservation Area
(Campground area only)

Hunting is **permitted between October 15 to February 15** at:

Saugeen Bluffs Conservation Area
(Lots 11-13, Range C)
Brucedale Conservation Area
(East of designated campground)
Stoney Island Conservation Area

Hunting of migratory waterfowl is **not permitted on or around Schmidt Lake** in the Greenock Wetlands Project Area

Hunters should be aware that other activities may also be occurring concurrently on Authority properties during certain times and conditions during the year. **Caution must be exercised**, especially at the Allan Park Conservation Area, Stoney Island Conservation Area, and the Saugeen Bluffs Conservation Area, properties where cross-country skiing and hiking trails have been provided for these seasonal activities.

Appendix D
Timber Sale Agreement

TENDER FOR TIMBER SALE Tender: SVCA-3-01

Return Completed tender form to:

Saugeen Valley Conservation Authority
R. R. # 1, Hanover, Ontario
N4N 3B8

The undersigned hereby tenders for the purchase of standing timber as outlined in the attached timber sales estimate and conditions of sale and in the location outlined in **red** on the attached map or air photo.

Tenders to be in a sealed envelope, marked Tender # SVCA-3-01, and must be received at the Saugeen Valley Conservation Authority office by 12:00 noon on Wed. August 29th, 2001.

Tenders will be opened publicly and read at 2:00 pm on Thursday August 30th, 2001 in the Resource Centre at the Saugeen Valley Conservation Authority Headquarters Property.

Sawlog Purchase Price:	\$ _____
Fuelwood Purchase Price:(optional)	\$ _____
Sub-total	\$ _____
GST @7% (if applicable)	\$ _____
Total:	\$ _____

Tender submission with a total value greater than \$1000.00 must be accompanied with a certified cheque or money order equal to 10% of the total tender price. **Cheque or money order made payable to Saugeen Valley Conservation Authority.**

Enclosed is certified cheque or money order as required in the amount of \$

Balance of payment to be made prior to commencement of cutting or by December 31st, 2001 or which ever occurs first. All tenders are subject to a reserve bid. The highest or any tender not necessarily accepted.

The undersigned is fully aware of the aforementioned terms and attached conditions of sale. This tender is submitted in accordance with these terms and conditions as stated on the reverse and should this tender be accepted the undersigned agrees to comply with the terms and conditions.

Full Legal Name of Business	Telephone #:
Business Address:	City, Town, or Village:
Province:	Postal Code:
Authorized Signature:	Name (please print):

SAUGEEN VALLEY CONSERVATION AUTHORITY

Agreement for the Sale of Timber

GENERAL TERMS AND CONDITIONS

1. The Purchaser agrees to notify Saugeen Valley Conservation Authority at the telephone or address number shown on the agreement, before commencing any operations on the property as described in the Agreement.
2. The Purchaser agrees to obtain, at his own expense, all permits from public authorities which may be required in connection with the performance of the Agreement and to comply with all municipal, provincial, federal and other laws, statutes, ordinances and requirements in regard to the same.
3. At the end of the operating period shown in the Agreement, all operations must cease and all uncut timber, cut and/or piled wood will revert back to the property owner and may be resold. REFUNDS WILL NOT BE GRANTED.
4. Only trees marked under the direction of the Saugeen Valley Conservation Authority for harvesting are to be cut. Trees to be harvested are marked with **pink** paint.
5. To cut trees so that the stump heights are not over 30 cm (12 in.), except that a stump height may not be greater than its diameter and not over 60 cm (24 in.), (exception where fence wire exists in tree trunk, tree can be cut above wire).
6. To carry out operations in a workmanlike manner, to minimize damage to unmarked trees, roads, trails, fences, etc., and to repair any and all damage caused by the operations. Lodged trees are to be felled immediately. Gates will be kept closed and locked to prevent entry by unauthorized persons.
7. To keep all roads, trails and water courses free of logging debris, and to keep roads passable at all times.
8. To ensure that no garbage or litter accumulates or is left on the property and disposal will be in designated sites.
9. No forest products shall be cut until the full Agreement price has been paid, unless satisfactory arrangements are made beforehand.
10. The property in all timber felled under this Agreement shall vest in the Purchaser and will be at the risk of the Purchaser, and he is responsible for all infractions occurring on the Agreement area.
11. Saugeen Valley Conservation Authority may order work to cease if any conditions of the Agreement are violated; the Agreement may be terminated, and the purchaser may be ineligible for another Agreement for a stated period of time.
12. The Agreement may be assigned to a third party only at the discretion of and with the written permission of the owner.
13. TO PAY AS LIQUIDATED DAMAGES, AND NOT AS A PENALTY A SUM OF \$1000.00 PER TREE FOR EACH UNMARKED TREE WHICH IS CUT DOWN, DESTROYED OR DAMAGED BY THE OPERATOR OR HIS EMPLOYEES. DAMAGE TO THE RESIDUAL GROWING STOCK WILL NOT BE TOLERATED.
14. The Purchaser agrees to fully indemnify and save harmless Saugeen Valley Conservation Authority and its employees or the landowner from and against all claims, demands, judgements, loss, costs, damages, and expenses which at any time or times Saugeen Valley Conservation Authority and its employees or the landowner may bear, sustain, incur, receive, be put to for reason of or on account of any act or omission of the Purchaser or the employee of the Purchaser or any of them.
15. Skidding length must be limited to 32 feet or less. Tops and large limbs must be removed from trees where they fall prior to skidding.
16. The Purchaser agrees to suspend all cutting operations during spring thaw and or other unusually wet periods until the ground is capable of withstanding heavy equipment.
17. The location, size and establishment of landing areas and main skid roads to be mutually agreed upon before any trees are cut.
18. No skidding is to be done during the loose bark season (approximately March 30 to July 30) without special authorization from Saugeen Valley Conservation Authority.
19. **Cutting Period: September 20th, 2002 to September 20th, 2003**

SAUGEEN VALLEY CONSERVATION AUTHORITY
TENDER # SVCA-3-01
SAWLOG HARVEST

August 7, 2001

Tender #	Comp.#	Location	Acreage	Marking Colour	No. of trees & species	Volume (FBM*) OLR**	Average Diameter

* FBM - Foot Board Measure ** OLR - Ontario Log Rule

All volumes are estimated as Gross Merchantable and are not guaranteed.

Conditions of Cutting: There will be one year allowed for removal with no operations during prolonged wet periods.

**Tender Forms are available from:
Saugeen Valley Conservation Authority, R. R. # 1, Hanover ON N4N 3B8
(Phone 519-364-1255)**

Tenders must be received at the office of the Saugeen Valley Conservation Authority by 12:00 noon on Wednesday August 29th, 2001.

Tenders will be opened Thursday August 30th, 2001 at 2:00 pm in the Resource Centre at the Headquarters Property of the Saugeen Valley Conservation Authority.

PLEASE NOTE

In addition to the Sawlogs, the following marked firewood material and tops may be purchased as an option.

Property	Comp.#	Location	Acreage	Marking Colour	No. of Trees	Volume OLR*	Average Diam.

*OLR – Ontario Log Rule

Appendix E
Operating Plans

Glammis Bog Management Unit

Forest Management Operating Plan

2001 - 2011



Compiled by: D. Jardin, D. Kuntz
March 22, 2001

Glammis Bog Management Unit
Area; 40.26 ha, 99.48 acres

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FOREST MANAGEMENT OBJECTIVE:

To manage forest stands on a sustainable basis that ensures the forests are kept in vigorous healthy condition, while maintaining wildlife habitat, contributing to the aesthetic and recreational values of the property, providing economic benefit to all, and thus enabling all to enjoy now and in the future.

Glammis Bog Management Unit

Area; 40.26ha/99.48 acres

Property Location

The Glammis Bog Management Unit is located 0.6 km (1.5 miles) northwest of the Hamlet of Glammis. The property is accessed via Concession Road 2-3 in the Municipality of Kincardine, former Township of Bruce.

Site Description

This 40.26 hectare property contains a mix of upland hardwoods, bog edge, dead treed swamp, and supported by the presence of a small lake. The mix of ecosystems within this property provide excellent wildlife habitat for many species. This property is wet to very wet seasonally. Trees present within this property are, generally, of poor health due to excess moisture, and this stress has been increased due to beaver flooding.

Site History

This property was purchased in 1957. No further records were found on the history of this property.

Soil, Drainage and Topography

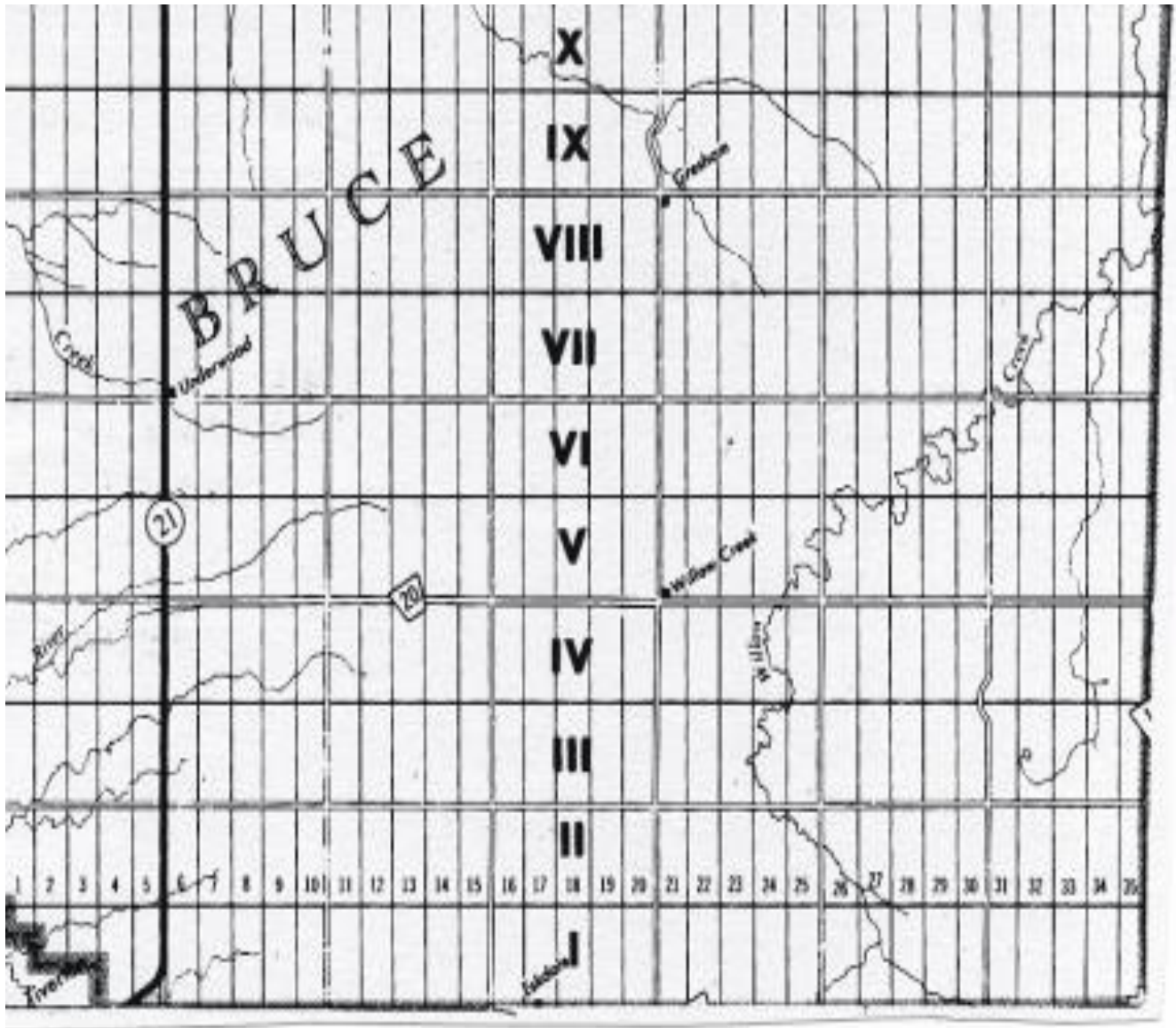
This property contains Muck and Waterloo Sandy Loam soils (see Appendix C). Drainage within this property is good in the central section and poor in the southern and northern sections. A moderate to steeply sloping topography is present throughout this property. The southern and northern sections are wetter than the remainder of the property and contain a small lake on the western side.

Forest Operations to Date

The property was completely logged in the 1950's. In 2001, Forest Management Technicians from the Conservation Authority performed a property inventory, the details of this are the basis of this plan. Trees were marked and an upland improvement/sawlog harvest took place in 2002.

**Glamis Bog Management Unit
Area; 40.26ha/99.48 acres**

PROPERTY LOCATION MAP



Lot 32, Con. 3 Municipality of Kincardine, former Township of Bruce, Bruce County
Scale: 1:60,000

Glammis Bog Management Unit
Area; 40.26ha/99.48 acres

AERIAL PHOTO DELINEATING PROPERTY



Lot 32, Con. 3, Municipality of Kincardine, former Township of Bruce, Bruce County
Scale 1:10,000
Aerial Photo Date: 23/04/90

Glammis Bog Management Unit
Area; 40.26ha/99.48 acres

Stand Summary Table

PROPERTY: Glammis Bog Management Unit
 LOCATION: Lot 32, Con 3, Bruce Township, Bruce County
 TOTAL LAND: 40.26 hectares, 99.48 acres

Stand Number	Species Composition	Area in Hectares	Age in Years	Height in Meters	Basal Area
1	Ce ₅ Ms ₂ Mh ₁ Aw ₁ He ₁	17.63	53	11	3.8
2	Mh ₇ O ₃	15.21	75	14	29.3
3	Ms ₂ He ₂ Ta ₁ Sw ₁ Bw ₁ By ₁ Pw ₁ Ce ₁	7.42	40	8	9

STAND LOCATION MAP

INSERT MAP

Glamis Bog Management Unit

Area; 40.26ha/99.48 acres

Stand Description

Stand #1

General Information

This 17.63ha (43.57acre) stand is classified as a Dead Treed Swamp. The tree species mix within this stand include; Hard Maple, Soft Maple, Eastern White Cedar, White Ash and Eastern Hemlock. The stand is of poor health due to the wet conditions present throughout the stand. Many trees within this stand are dead and many blow downs are present.

Flora and Fauna

Due to the snow cover present during the inventory of this stand little ground vegetation was observed, this included; Cattails, Red-Osier Dogwood, Goldenrod, Spirea and Shrub Willow. Regeneration over one meter includes Yellow Birch, Black Ash, Eastern White Cedar, Soft Maple, Tamarack, Hard Maple and Eastern Hemlock. There is little regeneration both over and under one meter present. Wildlife species inhabiting the area include; Woodpecker, Beaver and Wood Duck.

Stand Summary

All size classes within this stand are understocked. The average height, within this stand, is 11 meters with the average age being 53 years. The lack of healthy trees in all size classes is, likely, the result of poor growing conditions. A harvest is not recommended for this stand. This stand should remain undisturbed to maintain wildlife habitat and diversity both within this property and the surrounding area.

Stand #2

General Information

This stand is classified as an Upland Hardwood and is approximately 15.21 ha (37.58 acres) in size. The trees within this stand are mostly healthy with a few poor quality pockets. The healthy pockets contain trees of good form and very little fallen debris. The poor quality areas are a result of Eutypella Canker and Sugar Maple Borer. These areas have dead standing cavities, as well as, holes and rot in many stems.

Glamis Bog Management Unit

Area; 40.26ha/99.48 acres

STAND DESCRIPTION CON'T

STAND #2 CON'T

Flora and Fauna

Due to the snow cover present during the inventory of this stand little ground vegetation was observed, this included; Grasses, Wood Fern, Canada Yew and Grape Vine. Regeneration under one meter includes; White Ash, Hard Maple, American Beech and Eastern Hemlock. Regeneration over one meter consists of; Hard Maple, American Beech, White Ash, Yellow Birch and Eastern White Cedar. Wildlife species inhabiting the area include; Winter Wren, Redtailed Hawk, Black-capped Chickadee, Groundhog, Woodpecker, Ruffed Grouse, Eastern Cottontail and Eastern Wild Turkey.

Stand Summary

The Polewood (10-24cm DBH) and Small (26-38cm DBH) size classes are overstocked. The Medium (40-48cm DBH) size class is well stocked and the Large (50cm+) sawlog are understocked. The average height within this stand is 17 meters with the average age being 75 years. The lack of large diameter trees is the result of the harvest in the 1950's. A harvest took place in 2002 to remove poor quality trees and sawlogs.

Stand #3

General Information

This 7.42 ha (18.33 acre) stand is classified as a Bog Edge. The tree species mix within this stand include; Tamarack, White Spruce, White Birch, Soft Maple, Yellow Birch, White Pine, Eastern Hemlock, and Eastern White Cedar. The stand is, generally, of poor health which is likely a result of the wet conditions present throughout the stand. There are many dead standing and live standing cavity trees present.

Flora and Fauna

Due to the snow cover present during the inventory of this stand little ground vegetation was observed, this included; Canada Holy and Service Berry. There was no regeneration under one meter observed. Regeneration over one meter consists of Soft Maple, White Spruce, Yellow Birch, White Birch and Eastern White Cedar. Wildlife species inhabiting the area include Eastern Cottontail and Eastern Wild Turkey.

Glamis Bog Management Unit Area; 40.26ha/99.48 acres

STAND DESCRIPTION CON'T

STAND #3 CON'T

Stand Summary

All size classes within this stand are under stocked. The average height, within this stand, is 8 meters with the average age being 40 years. The lack of trees in all size classes is likely the result of poor growing conditions. A harvest is not recommended for this stand. This stand should remain undisturbed to maintain wildlife habitat and diversity both within this property and the surrounding area.

Stand Management Strategies

Stand #1

Due to the sensitive nature of this stand, management should be limited to wildlife population inventories. Beaver populations should be monitored annually. A harvest is not recommended.

Stand #2

Allow the stand to mature until the next harvest cycle (15-20 years). Monitor insect, wildlife, and disease populations.

Stand #3

Due to the sensitive nature of this stand, management should be limited to wildlife population inventories. A harvest is not recommended.

Appendix A
STAND ANALYSIS TALLY SHEET
FOR HARVEST OR INTERMEDIATE CUTTING

PROPERTY NAME	Glamis Bog			
PROPERTY LOT	32	CONCESSION	3	
TOWNSHIP	Bruce	STAND #	1	
COUNTY	Bruce	OWNERSHIP	SVCA	
FIELD CREW	D. Kuntz, D. Jardin, J. Wyatt		AREA	17.63 ha
DATE INSPECTED	March 22, 2001	HEIGHT	11 meters	

PRISM TALLY: 2 m²/ha

STATIONS TALLIED

9

STAND ANALYSIS TALLY

TREE SIZE CLASSES	POLEWOOD		SAWTIMBER						TOTAL ALL	
	10 - 24 cm		SMALL 26 - 38 cm		MEDIUM 40 - 48 cm		LARGE 50 cm +			
SPECIES	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
Hard Maple	4	1		2					4	3
White Ash	2		2						4	0
Soft Maple		1	1						1	1
Eastern Hemlock					3				3	0
White Cedar					1				1	0
									0	0
									0	0
									0	0
									0	0
									0	0
TOTAL TREES	6	2	3	2	4	0	0	0	13	4
BA (m²/ha)	1.3	0.4	0.7	0.4	0.9	0.0	0.0	0.0	2.9	0.9
TARGET BA (m²/HA)	1.8		1.1		0.9		0.0		3.8	
IDEAL BA (m²/HA)	5		7		4		4		20	

Total Trees 17		x	<u>BAF (2)</u>	=	3.8 Actual BA/ha
9 # of Stations					

Appendix A
STAND ANALYSIS TALLY SHEET
FOR HARVEST OR INTERMEDIATE CUTTING

PROPERTY NAME	Glammis Bog			
PROPERTY LOT	32	CONCESSION	3	
TOWNSHIP	Bruce	STAND #	1	
COUNTY	Bruce	OWNERSHIP	SVCA	
FIELD CREW	D. Kuntz, D. Jardin, J. Wyatt		AREA	15.21 ha
DATE INSPECTED	March 22, 2001	HEIGHT	14 meters	

PRISM TALLY: 2 m²/ha

STATIONS TALLIED

11

STAND ANALYSIS TALLY

TREE SIZE CLASSES	POLEWOOD		SAWTIMBER						TOTAL ALL	
	10 - 24 cm		SMALL 26 - 38 cm		MEDIUM 40 - 48 cm		LARGE 50 cm +			
SPECIES	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
Hard Maple	26	7	40	13	20	4	9	2	95	26
Black Cherry	7	1	10						17	1
White Ash	2		5		1				8	0
Soft Maple	1		1		1		1		4	0
Beech			3			1		2	3	3
White Birch			1	1					1	1
White Elm	2								2	0
									0	0
									0	0
									0	0
									0	0
TOTAL TREES	38	8	60	14	22	5	10	4	130	31
BA (m²/ha)	6.9	1.5	10.9	2.5	4.0	0.9	1.8	0.7	23.6	5.6
TARGET BA (m²/HA)	8.4		13.5		4.9		2.5		29.3	
IDEAL BA (m²/HA)	5		7		4		4		20	

Total Trees 161 x BAF (2) = 29.3 Actual BA/ha 11 # of Stations

Appendix A
STAND ANALYSIS TALLY SHEET
FOR HARVEST OR INTERMEDIATE CUTTING

PROPERTY NAME	Glammis Bog			
PROPERTY LOT	32	CONCESSION	3	
TOWNSHIP	Bruce	STAND #	1	
COUNTY	Bruce	OWNERSHIP	SVCA	
FIELD CREW	D. Kuntz, D. Jardin, J. Wyatt		AREA	7.42ha
DATE INSPECTED	March 22, 2001	HEIGHT	8 meters	

PRISM TALLY: 2 m²/ha

STATIONS TALLIED

4

STAND ANALYSIS TALLY

TREE SIZE CLASSES	POLEWOOD		SAWTIMBER						TOTAL ALL	
	10 - 24 cm		SMALL 26 - 38 cm		MEDIUM 40 - 48 cm		LARGE 50 cm +			
SPECIES	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
White Pine			2	4					2	4
Soft Maple	2	3		1					2	4
Yellow Birch	1								1	0
Hemlock	2								2	0
White Cedar		1		2					0	3
									0	0
									0	0
									0	0
									0	0
									0	0
TOTAL TREES	5	4	2	7	0	0	0	0	7	11
BA (m²/ha)	2.5	2.0	1.0	3.5	0.0	0.0	0.0	0.0	3.5	5.5
TARGET BA (m²/HA)	4.5		4.5		0.0		0.0		9.0	
IDEAL BA (m²/HA)	5		7		4		4		20	

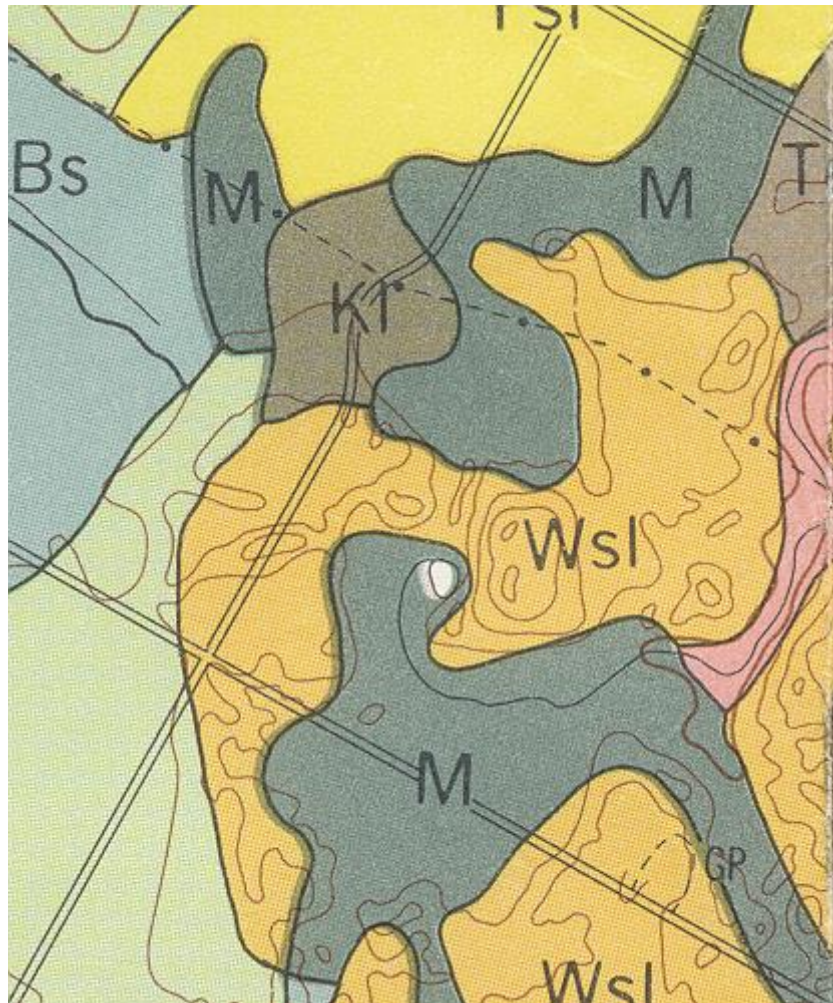
Total Trees 18	x	BAF (2)	=	9 Actual BA/ha
4 # of Stations				

Appendix B
Summary of Management Strategies

Stand Number	Management Required	Year Implement	Comments
1	Monitor Wildlife Populations	Ongoing	Beaver Monitoring
2	Monitor Wildlife Populations	Ongoing	
3	Monitor Wildlife Populations	Ongoing	

Additional Comments:

Appendix C
Map Depicting Soil Types and Property Boundary



Source: Agriculture Canada, Cartography Section, Land Resource Research Institute, Research Branch. Soils of Bruce County. South Sheet Ontario. Soil Survey Report No. 16. 1983.

Appendix D
Summary of Lands Acquired

Registered	Lot and Con	Vendor	Hectares/Acres	Price
06/12/57	Lot. 32, Con 3	Jacklin	40.26 ha/ 99.48 ac	\$1600.00

Appendix E

Glossary of Terms and Abbreviations

General Terms

Pt Part Lot	N North
Ha Hectares	Sp Species
AGS Acceptable Growing Stock	UGS Unacceptable Growing Stock
DBH Diameter at Breast Height	cm Centimeters
BA Basal Area	m Meters

Tree Species

Ms Soft Maple	Mh Hard Maple	He Eastern Hemlock	Bb Blue Beech
Aw White Ash	Ab Black Ash	Pj Jack Pine	Ows Swamp White Oak
Ew White Elm	Ba Basswood	Oh Other Hardwood	Bn Butternut
Cb Black Cherry	Po Poplar	Mh Hard Maple	Le European Larch
By Yellow Birch	Bw White Birch	Ab Black Ash	Wi Willow
Be American Beech	Ir Ironwood/ Eastern Hornbeam	Ba Basswood	Oc Other Conifer
Hi Hickory	Fb Balsam Fir	Po Poplar	
Ce Eastern White Cedar	Ta Tamarack	Bw White Birch	
Sw White Spruce	Sb Black Spruce	Ir Ironwood/Eastern Hornbeam	
Sn Norway Spruce	Pw White Pine	Fb Balsam Fir	
Pr Red Pine	Ps Scotch Pine	Ta Tamarack	
Wb Black Walnut	Bb Blue-beech	Sb Black Spruce	
Ow White Oak	Ows Swamp White Oak	Pw Whit Pine	
Ob Bur Oak	Bn Butternut	Ps Scotch Pine	

Definitions of General Terms

BA Basal Area of a Tree - the cross-sectional area of the bole of a tree, 1.3 meters above the ground. Basal area = diameter of tree (cm) squared, times 0.00007854. Expressed in square meters.

Basal Area of a Forest Stand - the area, in square meters per hectare, of the cross-section of all The tree measured 1.3 meters above the ground.

DBH Diameter at Breast Height - the diameter of a tree trunk measured 1.3 meters above the ground.

AGS Acceptable Growing Stock - Trees suitable for retention in the stand for at least one cutting cycle (15to25 years). They are trees of commercial species and of such form and quality as to be saleable for sawlog products at some future date. The designation itself is not a cut/residual decision. Some AGS will be cut in a stand, as will some UGS be left as residuals.

UGS Unacceptable Growing Stock - These trees do not have the potential to make saleable sawtimber products in the future, but may have merchantable products now. They may be high risk trees- trees with disease, damage, or dieback that threatens their survival- or trees of such poor form that they just have to be removed regardless of the effect that removal will have on stand structure and species composition.

Appendix F

References

Agriculture Canada, Cartography Section, Land Resource Research Institute, Research Branch, Soils of Bruce County, South Sheet Ontario, Soil Survey Report No. 16. 1983.

Heimbürger, Margaret L., and Soper, James H., Shrubs of Ontario. Royal Ontario Museum, Toronto. 1982

Hosie, R. C., Native Trees of Canada. Fitzhenry & Whiteside Limited, Don Mills. 1979.

McKenny, Margret, and Peterson, Roger, A Field Guide to Wildflowers of Northeastern and North-central North America. Houghton Mifflin Company, Boston. 1968.

Appendix F
Silvicultural Prescription

Bester Lake, Stand # 11
Silvicultural Prescription by Donna Kuntz, November 23, 1999

Ownership: Saugeen Valley Conservation Authority

Location: Lots 9 and 10, Concession 10, Municipality of Brockton, Ward of Greenock, Bruce County

Stand Description: Mh7Bd1Aw1O1 **Basal Area:** 40.0m²/ha (AGS 32.5m²/ha, UGS 7.5m²/ha)

Stand Area: 15.0ha/ 37.06ac **Silvicultural System:** Single Tree Selection

Long Term Goals

The level of Acceptable Growing Stock within this stand is quite high. This stand will be Managed, so as to provide a sustainable supply of high quality sawlogs, as well as, other timber products. This stand will continue to provide wildlife habitat and contribute to the aesthetic values of the area. Over the long term, the stand will be managed, with each successive harvest cycle, to approach the ideal regulated uneven-aged tolerant hardwood forest condition.

Silvicultural Prescription

This stand has received little management aside from a partial Fuelwood marking by the Ministry of Natural Resources in 1984. This stand contains a large percentage of AGS quality stems. Acceptable Growing Stock makes up 81% of the overall stand structure with the following breakdown for each size class. AGS makes up 75% of the polewood, 89% of the small sawlog, 73% of the medium sawlog, and 78% of the large sawlog size classes.

The stand now requires a stand improvement thinning/ small sawlog harvest. The stand target is to mark to an average residual basal area of 27.0m²/ha. Marking will concentrate on the removal of UGS in the polewood, small, medium, and large sawlog size classes. AGS may be removed in areas overstocked with AGS quality stems. UGS stems will be retained where necessary to maintain stocking or to satisfy wildlife concerns. Yellow paint will be used to mark all trees to be removed. A slash will indicate a fuelwood tree, and a dot will indicate a sawlog tree. Butt marks will be applied to all trees that are to be removed.

A ten meter (33') buffer will be established along the wetland boundaries. This buffer will prevent excessive ground disturbance to the sensitive wetland ecosystems within the surrounding area.

Markers will, within the size and quality constraints, favor the best quality trees possible, preserve scarce seed sources, and strive to maintain uniform spacing among residual trees. Markers will attempt to maintain a minimum of 6-8 cavity trees per hectare, and 7-8 mast producers per hectare. Solitary conifers will be retained. Stick nests will be identified and proper AOC's enforced, according to OMNR regulations.

Size Class (cm)	Polewood 10-24		Small Sawlog 26-40		Medium Sawlog 42-48		Large Sawlog 50+		Total	
	AGS	UGS	AGS	UGS	AGS	USG	AGS	USG	AGS	USG
BA m ² /ha	10.75	3.5	16.0	2.0	4.0	1.5	1.75	0.5	32.5	7.5
Total BA m ² /ha	14.25		18.0		5.5		2.25		40.0	
Target BA m ² /ha	8.75		12.0		4.0		2.25		27.0	
Ideal BA m ² /ha	4.0		6.0		5.0		5.0		20.0	
Trees to Remove	2 of 4		1 of 3		1 of 5		0 of 7			

Appendix G
Inventory and Operating Plan Completion Schedule

Inventory and Operating Plan Completion Schedule

Bruce County	Township	Tract #	Inventory Status	Completion Date	Operating Plan Status	Completion Date	
Bruce County	Carrick	41-010-05	Complete		Complete		
		41-010-10	Complete		Complete		
	Culross	41-060-05	Complete		Incomplete	2006	
		41-060-10	Complete		Complete		
		41-060-15	Complete		Complete		
		41-060-20	Complete		Complete		
	Kincardine	41-210-05	Complete		Complete		
	Bruce	41-260-05*	Complete		Incomplete	2006	
		41-260-10*	Complete		Complete		
		41-260-15	Complete		Complete		
	Greenock	41-310-05	Complete		Incomplete	2006	
		41-310-10	Complete		Incomplete	2006	
		41-310-15*	Complete		Incomplete	2006	
		41-310-20	Incomplete	As conditions permit	Incomplete	Unknown	
		41-310-25	Incomplete	As conditions permit	Incomplete	Unknown	
		41-310-30	Incomplete	As conditions permit	Incomplete	Unknown	
		41-310-35	Complete		Incomplete	2006	
		41-310-40	Incomplete	As conditions permit	Incomplete	Unknown	
		41-310-45	Complete		Complete		
		41-310-50	Incomplete	As conditions permit	Incomplete	Unknown	
		41-310-55*	Complete		Complete		
		41-310-60*			Incomplete	2006	
		41-310-65*	Complete		Incomplete	2006	
		41-310-70*	Complete		Complete		
		41-310-75	Complete		Incomplete	2006	
		41-310-80	Complete		Complete		
		41-310-85	Incomplete	As conditions permit	Incomplete	Unknown	
		41-310-90	Complete		Incomplete	2006	
	41-310-95	Incomplete	As conditions permit	Incomplete	Unknown		
	Brant	41-340-05	Complete		Incomplete	2006	
		41-340-10*	Complete		Complete		
	Elderslie	41-380-05*	Complete		Complete		
		41-380-10*	Complete		Complete		
		41-380-15*	Complete		Not Applicable		
		41-380-20	Complete		Complete		
	Amabel	41-540-05*	Complete		Complete		
	Saugeen	41-440-05	Complete		Incomplete	2006	
	Grey County	Township	Tract #	Inventory Status	Completion Date	Operating Plan Status	Completion Date
		Normanby	42-010-05	Complete		Complete	
			42-010-10*	Complete		Complete	
			42-010-15*	Complete		Complete	

	Egremont	42-060-05	Complete		Complete	
		42-060-10	Complete		Complete	
Grey County	Township	Tract #	Inventory Status	Completion Date	Operating Plan Status	Completion Date
	Proton	42-090-05*	Incomplete	As conditions permit	Incomplete	Unknown
		42-090-10*	Incomplete	As conditions permit	Incomplete	Unknown
		42-090-15*	Incomplete	As conditions permit	Incomplete	Unknown
		42-090-20*	Incomplete	As conditions permit	Incomplete	Unknown
		42-090-25	Incomplete	As conditions permit	Incomplete	Unknown
		42-090-30*	Incomplete	As conditions permit	Incomplete	Unknown
		42-090-35	Complete		Incomplete	2006
		42-090-40	Complete		Incomplete	2006
		42-090-45	Complete		Incomplete	2006
		42-090-50*	Incomplete	As conditions permit	Incomplete	Unknown
		42-090-55*	Incomplete	As conditions permit	Incomplete	Unknown
	Osprey	42-140-05*	Incomplete	As conditions permit	Incomplete	Unknown
		42-140-10*	Incomplete	As conditions permit	Incomplete	Unknown
		42-140-15*	Incomplete	As conditions permit	Incomplete	Unknown
		42-140-20*	Complete		Incomplete	2006
	Artemesia	42-180-05	Complete		Complete	
		42-180-10*	Complete		Complete	
	Glenelg	42-220-05	Complete		Complete	
		42-220-10	Complete		Complete	
		42-220-15	Complete		Complete	
		42-220-20	Complete		Complete	
		42-220-25	Complete		Complete	
		42-220-30*	Complete		Complete	
		42-220-35	Complete		Complete	
		42-220-40	Complete		Complete	
		42-220-45	Complete		Complete	
		42-220-50*	Complete		Complete	
		42-220-55	Complete		Complete	
	Bentinck	42-280-05	Complete		Complete	
		42-280-10	Complete		Complete	
		42-280-15	Complete		Complete	
		42-280-20	Complete		Complete	
	Sullivan	42-320-05	Complete		Complete	
		42-320-10	Complete		Complete	
		42-320-15	Complete		Complete	
		42-320-20	Complete		Complete	
		42-320-25	Incomplete	As conditions permit	Incomplete	Unknown
	Holland	42-360-05	Complete		Complete	
		42-360-10	Complete		Complete	
		42-360-15	Complete		Complete	
		42-360-20	Complete		Complete	

		42-360-25	Complete		Complete	
		42-360-30	Complete		Complete	
		42-360-35	Complete		Complete	
		42-360-40	Complete		Complete	
		42-360-45*	Complete		Complete	
Grey County contd.	Township	Tract #	Inventory Status	Completion Date	Operating Plan Status	Completion Date
	Holland contd.	42-360-50*	Complete		Complete	
	Euphrasia	42-390-05*	Incomplete	As conditions permit	Incomplete	Unknown
		42-390-10	Complete		Complete	
		42-390-15	Complete		Complete	
Wellington County	Township	Tract #	Inventory Status	Completion Date	Operating Plan Status	Completion Date
	Minto	23-41-05	Incomplete	As conditions permit	Incomplete	Unknown
		23-41-10*	Incomplete	As conditions permit	Incomplete	Unknown

Appendix H
Chemical Usage in Saugeen Conservation Forests

SVCA employs an Integrated Pest Management approach when dealing with insect infestations, invasive species and vegetation control. In all cases, chemical products are used only as needed and are applied by licensed exterminators according to product label guidelines. Chemicals identified by FSC as highly hazardous will not be used.

Standard Operating Procedures (SOPs) or Safe Work Procedures (SWPs) are in place and implemented regarding safe handling and disposal of chemicals, liquid and solid non-organic wastes including fuel and oil. These SOPs or SWPs reflect best management practices and at minimum ensure compliance with all regulatory guidelines. When applying chemicals the SVCA's Safe Work Procedure will be followed.

A recycling program is in place for used oil and pesticide containers.

In the event of a hazardous product spill, the manager shall immediately contain the product, notify the appropriate authorities, and begin cleanup and product elimination with the assistance of qualified personnel.

Contractors working on SVCA properties will also be responsible for following all SVCA Standard Operating Procedures (SOP) or Safe Work Procedures (SWP) in regards to chemicals, containers, liquid and solid non-organic wastes including fuel and oil and any accidents or spills that may occur during the operation.

Leaking equipment will be repaired or removed from the forest. Recovered material is taken to a designated approved disposal site.

Appendix I
High Conservation Values Report

Appendix E High Conservation Value Forest Assessment Framework – GLSL

This framework is designed to be used in order to help identify potential High Conservation Value Forests (HCVF) in the context of achieving certification to FSC Canada’s Great Lakes/St. Lawrence Standard. It is based on a framework originally developed by ProForest and since that time it has been applied in many forest regions around the world.

The framework is organized as a table covering six categories derived from the definition of HCVFs from the FSC standards. The six categories are:

- Category 1: Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia);
- Category 2: Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;
- Category 3: Forest areas that are in or contain rare, threatened or endangered ecosystems;
- Category 4: Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control);
- Category 5: Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health); and,
- Category 6: Forest areas critical to local communities’ traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Each category has a question or questions (the left-hand column below) that aim to identify whether the management unit contains any of the values relevant to each category. Negative answers to these questions mean that the forest operation likely does not include High Conservation Values (HCV) in that category. Positive answers lead to further investigation. The second column explains the rationale for the conservation of the particular value. The third column provides sources of information on these values (e.g., COSEWIC lists in Canada, Conservation Data Centre lists, etc.). The fourth column provides further guidance to help determine whether or not a particular area might be considered a High Conservation Value Forest.

Scale and diversity in the Great Lakes/St. Lawrence region: This toolkit is designed to be used across the GLSL region, and applied in small private forests, on community forests and in large public forests. The manager may be operating in a highly fragmented landscape, where the stands with exceptionally high conservation value may be very small and require a high degree of protection, or in a much more intact landscape, where the HCVF toolkit can help to identify relatively broad features across the landscape in which the changes to management activities may be relatively modest although nevertheless significant at the landscape level. Furthermore, these diverse management regimes occur across a range of ecosystem types, from the Carolinian forests of southwestern Ontario through the mixed wood forests of southern Ontario and Québec and northwards to forests that are in the boreal transition zone. This diversity means that HCVF assessments will be carried out differently on these various forests, and will produce vastly different results. In developing a toolkit that is intended to apply across this diversity it is not possible to provide specific thresholds or numerical responses to questions such as “What is the minimum size of a HCVF area?” or “What percentage of a management unit should be designated as HCVFs?”

“Critical habitat” and “Essential Habitat.” In this Toolkit, and elsewhere in this standard, the term “Critical habitat” is used only in the context of Species at Risk that have been listed by federal or provincial agencies. It is used in this narrow sense in order to align the use of the term in this Standard with the legal requirements that exist in federal and provincial legislation pertaining to maintaining and restoring critical habitat for species at risk. “Essential habitat” has the same meaning as “critical habitat,” but applies to all wildlife species, and not only to rare, threatened or endangered species.

HCV Summary for the <u>Saugeen Valley Conservation Authority</u>		Approximate Total (Hectares)
HCV1	Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia).	8541.98
HCV2	Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.	0.00
HCV3	Forest areas that are in or contain rare, threatened or endangered ecosystems.	80.32
HCV4	Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).	0.00
HCV5	Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health).	0.00
HCV6	Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).	29.95
	Total Area	8652.25

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
1. Does the forest contain concentrations of species at risk as listed by international, national or provincial authorities?		Natural Heritage Information Centre		Portions Of Tract #'s	Species at Risk	Ongoing	SVCA	SVCA Forest Management Plan	Ongoing as Required	
		Department of Fisheries and Oceans		23-41-05	Massasauga Scarlet Beebalm Snapping Turtle			Under AOC's, Botanical Resources, and Significant Flora and Fauna Sections		35.21
		Ministry of Natural Resources – Landowner Information Centre- ANSI mapping		23-41-10	Massasauga Scarlet Beebalm Snapping Turtle			OMNR Regulations and Guidelines		40.47
				41-010-10	Eastern Meadowlark Snapping Turtle			Department of Fisheries and Oceans Regulations and Guidelines		20.43
				41-010-15	Beaked Spike-rush					10.41
				41-060-05	Beaked Spike-rush Clamp-tipped Emerald Snapping Turtle					15.70
				41-060-10	Beaked Spike-rush Clamp-tipped Emerald Snapping Turtle					
				41-060-15	Beaked Spike-rush Clamp-tipped Emerald Rigid Sedge Snapping Turtle					59.69

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)										
				41-060-20	Beaked Spike-rush Clamp-tipped Emerald Snapping Turtle					14.57
				41-210-05	Ram's-head Lady's-slipper					36.42
				41-210-10	Great Lakes Wild Rye Low Nutrush Ram's-head Lady's-slipper					18.71
				41-210-15	Great Lakes Wild Rye Low Nutrush Pitcher's Thistle Prairie Dropseed Ram's-head Lady's-slipper					7.98
				41-260-05	Dwarf Lake Iris Eastern Meadowlark Eastern Ribbonsnake Loggerhead Shrike Low Nutrush Milksnake Prairie Dropseed Queensnake Ram's-head Lady's-slipper Snapping Turtle					20.23

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				41-260-10	Beaked Spike-rush Eastern Ribbon Snake Great Lakes Sand Reed Low Nutrush Milksnake Ram's-head Lady's-slipper Snapping Turtle					46.40
				41-310-05	Beaked Spike-rush Clamp-tipped Emerald Snapping Turtle					74.52
				41-310-10	Beaked Spike-rush Clamp-tipped Emerald Snapping Turtle					40.24
				41-310-15	Beaked Spike-rush Snapping Turtle					640.08
				41-310-20	Snapping Turtle					
				41-310-25	Bobolink Large Round-leaved Orchid					
				41-310-30	Snapping Turtle					948.08

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				41-310-35	Bobolink Eastern Meadowlark Large Round-leaved Orchid Snapping Turtle					365.23
				41-310-40	Beaked Spike-rush Clamp-tipped Emerald Snapping Turtle					255.36
				41-310-50	Snapping Turtle					202.34
				41-310-55	Beaked Spike-rush Snapping Turtle					42.93
				41-310-60	Beaked Spike-rush					
				41-310-65	Beaked Spike-rush					152.97
				41-310-75	Beaked Spike-rush					157.02
				41-310-80	Snapping Turtle					30.35
				41-310-85	Milksnake Snapping Turtle					223.35
				41-310-90	Snapping Turtle					
				41-310-95	Snapping Turtle					282.05
				41-340-05	Snapping Turtle					20.73

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				41-340-10	Eastern Meadowlark Scarlet Beebalm Snapping Turtle					25.90
				41-380-05	Bobolink					
				41-380-10	Bobolink					133.34
				41-380-20	Northern Brook Lamprey					54.30
				41-440-05	Bobolink Eastern Meadowlark Snapping Turtle Tuberous Indian-plantain					112.38
				42-010-05	Scarlet Beebalm					32.38
				42-010-10	Scarlet Beebalm					67.42
				42-010-15	Scarlet Beebalm					86.03
				42-010-20	Scarlet Beebalm Snapping Turtle					2.14
				42-060-05	Clamp-tipped Emerald					22.84
				42-060-10	Clamp-tipped Emerald Eastern Meadowlark Snapping Turtle					40.47

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				42-090-05	Bobolink Snapping Turtle					
				42-090-10	Bobolink Snapping Turtle					225.37
				42-090-15	Snapping Turtle					19.82
				42-090-25	Clamp-tipped Emerald Snapping Turtle					40.06
				42-090-30	Clamp-tipped Emerald Snapping Turtle					40.06
				42-090-40	Clamp-tipped Emerald Snapping Turtle					40.06
				42-090-45	Clamp-tipped Emerald Snapping Turtle					40.06
				42-090-55	Snapping Turtle					41.68
				42-140-05	Snapping Turtle Redside Dace					
				42-140-10	Snapping Turtle Redside Dace					
				42-140-15	Snapping Turtle Redside Dace					

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				42-140-20	Bobolink Snapping Turtle					676.33
				42-180-05	Bobolink					33.18
				42-180-10	Bobolink Snapping Turtle					64.75
				42-220-05	Eastern Ribbonsnake Harlequin Darner Hart's-tongue Fern					121.40
				42-220-10	Harlequin Darner Hart's-tongue Fern					40.47
				42-220-15	Eastern Meadowlark Harlequin Darner Hart's-tongue Fern					40.47
				42-220-20	Eastern Meadowlark Harlequin Darner Hart's-tongue Fern					40.47
				42-220-25	Harlequin Darner Hart's-tongue Fern					41.47
				42-220-30	Bobolink Hart's Tongue Fern Scarlet Beebalm					37.92
				42-220-35	Clamp-tipped Emerald Redside Dace					34.40

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				42-220-40	Bobolink Clamp-tipped Emerald Eastern Meadowlark					29.14
				42-220-45	Clamp-tipped Emerald					22.65
				42-220-50	Harlequin Darner Hart's Tongue Fern Snapping Turtle Bobolink					
				42-220-55	Harlequin Darner Hart's Tongue Fern					
				42-220-60	Hart's Tongue Fern Harlequin Darner Snapping Turtle					498.73
				42-280-05	Eastern Ribbonsnake Hart's-tongue Fern Snapping Turtle					77.47
				42-280-10	Eastern Ribbonsnake					20.23
				42-280-15	Eastern Ribbonsnake Scarlet Beebalm Snapping Turtle Bobolink					173.40
				42-280-20	Scarlet Beebalm					50.99

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)										
				42-320-05	Eastern Ribbonsnake					39.25
				42-320-10	Eastern Ribbonsnake Hart's-tongue Fern					94.90
				42-320-15	Bobolink Eastern Ribbonsnake Hart's-tongue Fern					161.86
				42-320-20	Eastern Ribbon Snake					128.92
				42-320-25	Eastern Ribbonsnake Snapping Turtle					10.23
				42-360-05	Eastern Ribbonsnake Harlequin Darner Hart's-tongue Fern					40.47
				42-360-10	Eastern Ribbonsnake Harlequin Darner Hart's-tongue Fern Snapping Turtle					40.47
				42-360-15	Harlequin Darner Hart's-tongue Fern Snapping Turtle					
				42-360-20	Harlequin Darner Hart's-tongue Fern					121.41

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				42-360-25	Harlequin Darner Hart's-tongue Fern Snapping Turtle					40.47
				42-360-30	Snapping Turtle					80.94
				42-360-35	Hart's Tongue Fern Schweinitz's Sedge Snapping Turtle					75.26
				42-360-40	Harlequin Darner Hart's Tongue Fern					83.90
				42-360-45	Bobolink Harlequin Darner Hart's Tongue Fern Snapping Turtle					
				42-360-50	Harlequin Darner Hart's Tongue Fern					392.71
				42-390-05	Bobolink					
				42-390-10	Eastern Prairie Fringed-orchid Snapping Turtle					151.76
				42-390-15	Snapping Turtle					30.35
2. Does the forest contain a concentration of species having a restricted geographical range?	Ensures the maintenance of vulnerable and/or irreplaceable elements of biodiversity.	Ministry of Natural Resources – Landowners Information Centre		A portion of the Tract #’s 41-310-45 41-310-70	Deer Yard Area Deer Yard Area	Ongoing	SVCA	SVCA Forest Management Plan – Significant Flora & Fauna, and AOC sections	As Required	20.03 25.08

Item	Rationale	Sources of information	Further Guidance	EOMF HCV: SVCA						
				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
Category 1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)										
3. Does the forest include regionally significant seasonal concentration of species?		SVCA GIS Database	Forests that contains a minimum of 100 meter radius without edge	41-010-05	Forest Interior Habitat	Ongoing	SVCA	SVCA Forest Management Plan	As Required	132.33
				41-090-20	Forest Interior Habitat					40.06
				41-090-35	Forest Interior Habitat					40.06
4. Does the forest support regionally significant species (e.g., species declining regionally, culturally important species)?				None						
5. Does the forest support concentrations of species at the edge of their natural ranges or outlier populations?				None						
6. Does the forest lie within, adjacent to, or contain a conservation area: a) designated by an international authority, b) legally designated or proposed by relevant federal/provincial/ territorial legislative body, or c) identified in regional land use plans or conservation plans?				Lockerby	SVCA Conservation Area	Ongoing	SVCA	SVCA Forest Management Plan	As Required	2.27

Item	Rationale	Sources of information	Further Guidance	EOMF HCV:						
				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
Category 2) Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance										
				None						

Item	Rationale	Sources of information	Further Guidance	EOMF HCV:						
Category 3) Forest areas that are in or contain rare, threatened or endangered ecosystems				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
9. Does the forest contain naturally rare ecosystem types?				None						
10. Are there ecosystem types within the forest or ecoregion that have significantly declined?				None						
11. Are there sites with unique or exceptional ecological characteristics?				A portion of Tract #'s		Ongoing	SVCA	SVCA Forest Management Plan	As required	40.26
				41-260-15	PSW & ANSI			Ministry of Natural Resources		40.06
				42-090-50	PSW					

Item	Rationale	Sources of information	Further Guidance	EOMF HCV:						
Category 4) Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				None						

Item	Rationale	Sources of information	Further Guidance	EOMF HCV:						
Category 5) Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
				None						

Item	Rationale	Sources of information	Further Guidance	EOMF HCV:						
Category 6) Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities)				Comp.	Value	Year Completed	Stakeholder	Management Guidance	Monitoring	Area (Ha)
16. Is the traditional cultural identity of the local community particularly tied to a specific forest area?				A Portion of Tract # 41-540-05	Native Burial Ground/ Archaeological site	Ongoing	SVCA/ First Nations People	SVCA FMP - Wildlands	None	29.95
17. Is there a significant overlap of values (ecological and/or cultural) that individually did not meet HCV thresholds, but collectively constitute HCVs?				None						

Appendix J
Minimum Acceptable Damage Standards

Minimum Acceptable Damage Standards	
Damage to Residual Trees	After harvesting, 90% of residual basal area (10 cm + DBH) should be free of major damage and 90% of Acceptable Growing Stock (AGS) should be free of major damage.
Damage to Regeneration	After harvesting, 90% of residual basal area (< 10 cm DBH) should be free of major damage.
Skid Trail Coverage	A minimum of 80% of the ground area to be free of skid trails. Main skid trail must be delineated. Parallel skid trails should be no closer than 60 metres apart.
Damage to Physical Environment	Trees felled over a watercourse. Debris not cleared. Major/Extreme Ruts are greater than 30 metres in length. No ruts should be deeper than 15 cm on spur trails. No ruts should be deeper than 30 cm on main skid trails.
Logging Damage Assessment Criteria	
Type of Damage	Unacceptable Level of Damage
Stem Wounds - Trees 10 – 31 cm DBH - Trees > 32 cm DBH	Gouging, scraping and peeling of the bark (can occur at the ground level due to skidding or higher in the tree as a result of felling impacts). Any wound greater than the square of the Diameter at Breast Height (DBH) – i.e. a 10 cm DBH tree – major wound is greater than 100 cm ² Any wound greater than 1,000 cm ² Note: If there is Ground Contact, a major wound is considered to be 60% of the size indicated for all size classes.
Broken Branches	More than 33% of the crown is destroyed.
Root Damage	More than 25% of the root area is exposed or severed.
Broken Stems	Primary stem or any other major limb is broken.
Uprooted Trees	More than one-half of tree roots are broken and/or exposed.
Girdled Trees	Area where bark has been removed encircles tree or is at least 50% of the circumference of the tree.
Leaning Tree	Tree is leaning 10 degrees or more because of logging damage.
Site Damage Assessment Criteria	
Type of Damage	Unacceptable Level of Damage
Skid Trail Ruts	Minor (acceptable) – ruts 15 cm or less in depth & < 30 metres in length. Moderate (unacceptable) – ruts 16 – 30 cm in depth & > 30 metres in length. Major (unacceptable) – ruts 31 – 60 cm in depth & > 30 metres in length. Extreme (unacceptable) – ruts > 61 cm in depth & > 30 metres in length.
Excessive Number of Skid Trails	Skid trails less than 60 metres apart.
Logging Debris	No tops blocking trails. No debris leaning against any trees. No limbs or tree tops left higher than 1 metre above the ground. No logs that have slipped out of the choker and are lying on the trail.
Excessive Skid Trail Width	No skid trail wider than 3 metres (10 feet).