

**An Assessment for the Presence of High Conservation Values
on the Gordon Cosens Forest, Kapuskasing, Ontario, Canada**

Version 7.03

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Executive Summary

This report describes the results of an assessment for the presence of biological and environmental High Conservation Values (HCVs) on the Gordon Cosens Forest (GCF), Kapuskasing, Ontario, Canada. High Conservation Value Forests (HCVFs) are defined in Principle 9 of the Forest Stewardship Council's Principles and Criteria as forests that contain outstanding or critical biological, environmental or social values. This assessment has been prepared as part of Tembec's efforts to meet the requirements of the Forest Stewardship Council (FSC) certification for the GCF. Tembec received FSC certification for the Gordon Cosens Forest on 3 April 2003 with one of the conditions to complete the requirements of Principle 9.

This assessment is intended to identify High Conservation Values (HCVs) only, and not to recommend management prescriptions or monitoring protocols. As such, it is consistent with the requirements of FSC Criterion 9.1. The requirements of Criteria 9.2, 9.3 and 9.4, which address management strategies to maintain and enhance any identified HCVs and related monitoring protocols, will be handled through the Forest Management Planning Process, which is required for forest management of Crown Lands under current regulation in Ontario, and addressed within the approved Forest Management Plans for the Gordon Cosens Forest.

This assessment of the GCF was conducted using a draft of a guidance document on meeting the requirements of FSC Principle 9, which was jointly developed by Tembec and WWF Canada (see Appendix 1). This approach and the HCVF checklist are consistent with the direction of current international efforts by ProForest (with funding from Ikea and FSC A.C) to define HCVF attributes and assessment methodologies. During the development of this report and analysis, FSC Canada released a draft national HCVF toolkit based to a large extent on the guidance document developed jointly by Tembec and WWF. As the development of HCVF assessment methodologies is at an early stage, this evaluation should be viewed in that context.

This report concludes that the GCF contains 4 HCVs:

- ?? Woodland Caribou which is considered a globally/nationally significant species at risk;
- ?? White Pine and Red Pine that are at the edge of their natural ranges and some small populations of White Pine that are considered to be outliers.
- ?? Lake Sturgeon, which is considered to be regionally rare.
- ?? Unregulated protected areas identified under Ontario's Living Legacy – Approved Land Use Strategy, 1999; and
- ?? Regionally significant large landscape level forests.

Potential HCVs in the GCF subject to further investigation include:

- ?? Drummond's Mountain Avens (regionally rare) given an identified occurrence and the potential for habitat north of Smoky Falls;
- ?? Potentially significant large landscape level forests connected to the unallocated forest to the north of the forest licence, as well as the northwest corner of the management unit.

The identification of High Conservation Values is an ongoing process that will change over time as new and improved information becomes available. Future revisions of this report will continue to examine the broadest reasonable range of data in an attempt to provide the most realistic analysis of the values on the forest landscape.

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1.0 Overview

The Gordon Cosens Forest (GCF) is located primarily within the Northern Clay Belt of the Boreal Forest Region of northeastern Ontario (Map A). This area is dominated by clayey soils with some occurrences of sandy plains and gravel ridges primarily in the southern portions, where the forest also begins to overlap into Canadian Shield rock. Most of the mature forest is of fire origin and there is an abundance of the over-mature age classes, as is the case with many Northern Ontario fire-origin ecosystems, in part as a result of fire suppression activities over the past century. There is close to 100 years of logging history in this area, although large-scale industrial harvesting began in the 1960's. The fire and logging history is apparent in satellite images for the area (see Map B as an annex to this report).

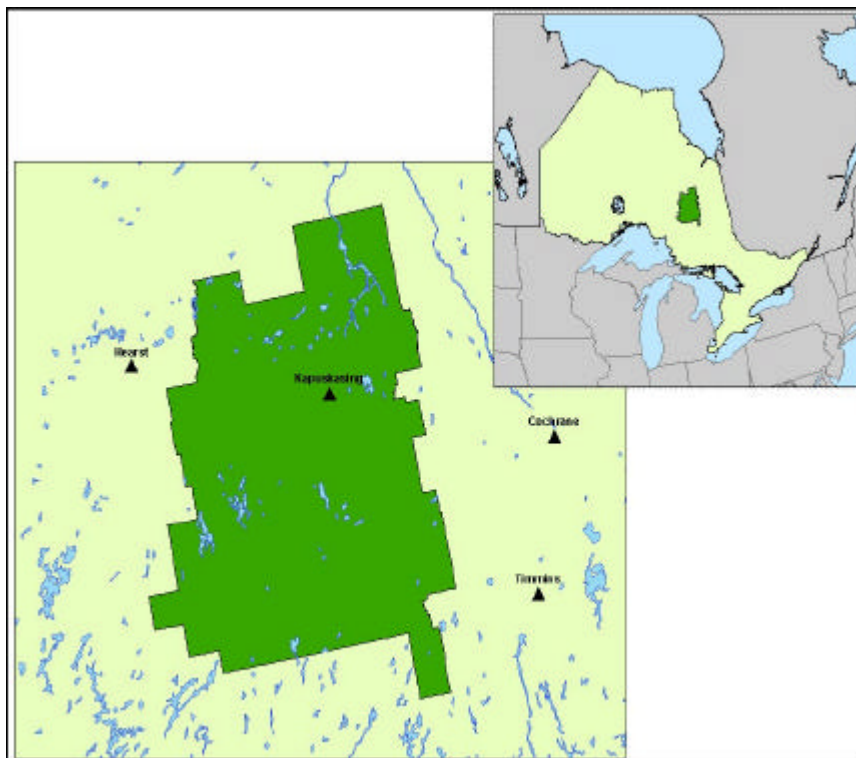


Figure 1: The Gordon Cosens Forest (GCF) Sustainable Forest Licence in northeastern Ontario. Sustainable Forest Licenses are area-based forest management units in Ontario.

The predominant tree species in the Clay Belt is black spruce, however, other distinct forest types and associations can be found on a site-by-site basis. Large, relatively pure stands of black spruce cover the poorly drained lowlands as well as the gently rising uplands.

The extreme southern portion of the GCF lies within the Canadian Shield and is characterized by upland sites that have much greater hardwood components than the rest of the forest. This part of the forest also has a large number of Spruce Budworm depleted areas that contain only scattered conifers such as white spruce.

Box 1: Definition of HCVFs

HCV1. Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia).

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.

HCV3. Forest areas that are in or contain rare, threatened or endangered ecosystems.

HCV4. Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).

HCV5. Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health).

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).

FSC Principles and Criteria, February 2000

The GCF falls entirely within one natural region (Hill's Site Region 3E) in the ecological land classification used by the Ontario Ministry of Natural Resources. Three site districts intersect the GCF: 3E-1, 3E-2 and 3E-5. As a result of the Ontario's Living Legacy (OLL) – Approved Land Use Strategy, 1999, a significant number of large patches of mature and over-mature forest in this natural region have been identified for protection on the GCF. These OLL areas, the responsibility of the Crown to manage and monitor, are not included as HCV's in this report.

Tembec-Forest Resource Management, Boreal-West manages the GCF and began working toward Forest Stewardship Council certification in 2002. The Gordon Cosens Forest received its FSC certification on 3 April 2003 with one of the conditions to complete the requirements of Principle 9. As identified under FSC Principle 9, Criterion 9.1, an assessment to determine the presence of the attributes consistent with High Conservation Value Forests must be completed, appropriate to the scale and intensity of forest management. In response to this requirement, Tembec has undertaken an assessment of the attributes of a High Conservation Value Forest (HCVF) for the GCF.

According to the FSC definition, 'management activities in high conservation value forests shall maintain or enhance the attributes which define such forests'. High conservation value forests, for the purposes of this report, are those forests that within which management activities could occur and that possess one or more of the following attributes described in Box 1:

2.0 Purpose & Scope

This report provides an assessment for the presence of High Conservation Value (HCV) attributes on the GCF. As the first attempt to identify HCV attributes on a Tembec managed forest, and indeed one of the first such efforts in Canada, this report will also serve as a template that can be followed and expanded upon for future HCVF assessments on other Tembec managed forests.

This assessment is intended to identify HCV attributes or potential attributes only and is consistent with meeting the requirements of FSC's Criterion 9.1. This report does not discuss management prescriptions or monitoring protocols. The requirements of Criteria 9.2, 9.3 and 9.4, which address management strategies to maintain and enhance any identified HCVs and related monitoring protocols, will be handled through the legislated Forest Management Planning process and approved Forest Management Plans.

3.0 Methodology

The assessment report is based upon a guidance document that was jointly developed by Tembec and WWF Canada for meeting the requirements of FSC Principle 9 (see Appendix 1). This approach and the HCVF checklist used are consistent with the direction of ongoing early stage international efforts by ProForest (with funding from Ikea and FSC A.C) to define HCVF attributes and assessment methodologies. During the development of this report and analysis, FSC Canada released a draft national HCVF toolkit based to a large extent on the guidance document developed jointly by Tembec and WWF.

Consistent with the FSC definition of HCVFs, the identification of HCV attributes in this report uses a multi-scale, systematic approach of defining indicators and thresholds at global and regional scales (see Appendix 1). For example, “globally or nationally significant” would be applied to broad landscapes or ecoregional scale forests that are significant on a global, continental or Canadian level, while “regionally significant” might apply to a watershed or a particular ecosystem that is significant at the Provincial or regional level.

As described in Appendix 1 (Tembec Guidance Document on Meeting the Requirements of Principle 9), Tembec’s approach to Principle 9 follows a three-phase multi-step process. Phase 1 is the focus of this report and deals with the steps that lead to the assessment and designation of HCVF attributes. The assessment identified 17 potential HCVF attributes at various scales. This involved many weeks of data acquisition, processing and correction of spatial data layers as well as gathering other information including lists of provincial species at risk and consulting with local communities.

Thresholds for attributes were determined and a preliminary assessment conducted to check for the presence of the attribute. Where a preliminary assessment indicated the possible presence of an attribute, additional data were used to confirm the presence of the attribute. At that point, a decision was made as to whether to designate the attribute a HCV or to manage the attribute under Principle 3, 4 or 6. If there was uncertainty over the presence or designation of an attribute, the precautionary approach was applied and the attribute was designated a HCV. Where an attribute was rejected as a HCV, rationale has been provided in this report.

The report describes the significance of each attribute and a rationale for HCV designation.

4.0 Assessment for the Presence of HCV Attributes

The assessment is divided into sections based on the four parts of the definition of HCVFs that were evaluated (see Box 1). For each part of the definition, a series of questions has guided the identification of potential HCV attributes.

HCV1) Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia).

The following questions address criteria that are relevant at a global, regional or national scale.

Question 1) Does the Gordon Cosens Forest contain species at risk or potential habitat of species at risk by international, national or state/regional/provincial authorities?

Rationale:

The purpose of examining this attribute is to ensure the maintenance of vulnerable and/or irreplaceable elements of biodiversity. The presence of rare, threatened or endangered species requires a commitment by the forest manager that management practices must not put at risk the survival of these species and to work to enhance or restore these species where possible.

Assessment Methodology:

The Ontario Natural Heritage Information Centre (NHIC) database (<http://www.mnr.gov.on.ca/MNR/nhic/nhic.cfm>) was used as the primary data source for the occurrence of globally rare species in the GCF. At a global scale, the presence of G1 (globally extremely rare) and G2 (globally very rare) occurrences are the relevant NHIC designations.

The COSEWIC list (<http://www.cosewic.gc.ca>) was used to check for the presence of nationally/regionally designated species at risk.

Assessment Results:

The following table (Table 1.1) provides a general overview of the NHIC coding system for G1 and G2 occurrences. As shown in the table, there are no reported G1 or G2 occurrences in the GCF.

Rocky Mountain Capshell, *Acroloxus coloradensis*) is the only listed G1/G2 species that occurs in the surrounding region (MNR Site Region 3E). However, the COSEWIC status for the species is indeterminate due to data deficiency and some uncertainty about the taxonomic identity of the species. Species occurrence from few locations is based on old (pre 1970) information. There is no recent information available on distribution, and no information on population size and trends. In addition, there is some uncertainty about the taxonomic identity of the species. Due to these factors and spatial separation from the GCF (with no reported occurrences on the forest) the Rocky Mountain Capshell is not considered a HCV for the Gordon Cosens forest.

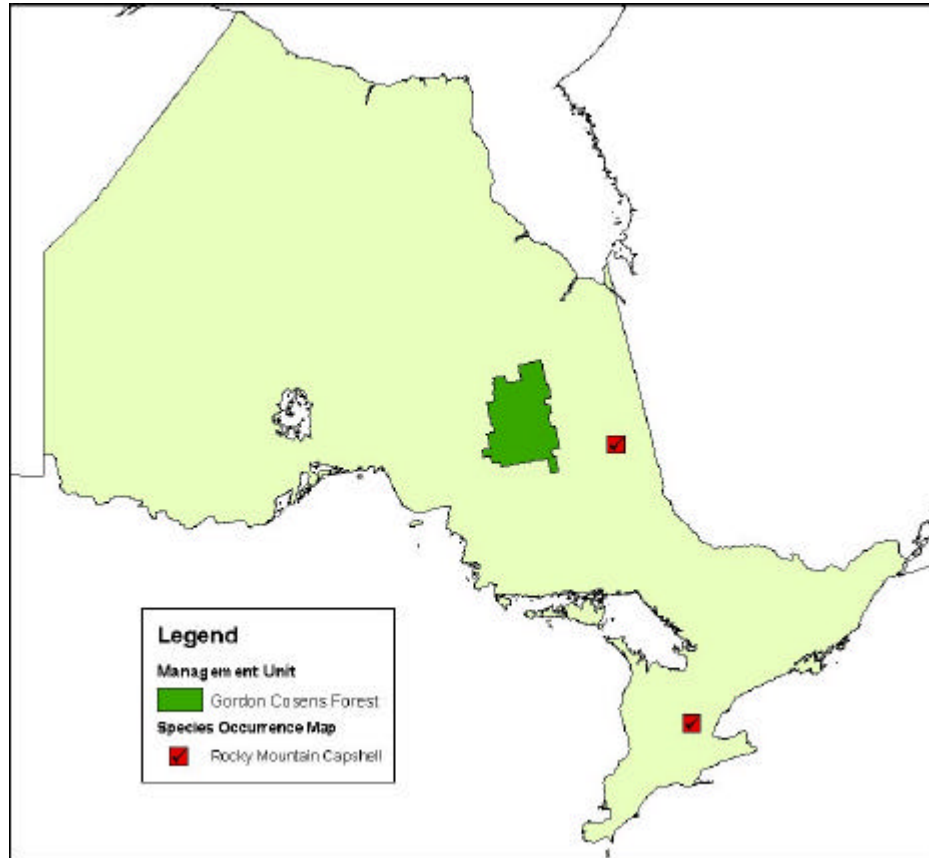


Figure 2: Pre-1970 Occurrences of Rocky Mountain Capshell. There is no recent information available on distribution, and no information on population size and trends. In addition, there is some uncertainty about the taxonomic identity of the species.

Table 1.1 G1 and G2 ranking system for species element occurrences developed by The Nature Conservancy.

Level	Description	Reports in GCF
G1 Extremely Rare	5 or fewer occurrences in the overall range	0
G2 Very Rare	20 or fewer occurrences in the overall range	0

At a regional/national scale, 4 species on the COSEWIC list of species at risk occur within or at the borders of the surrounding MNR Site Region 3E these include the monarch butterfly, woodland caribou, deepwater sculpin, and peregrine falcon.

The COSEWIC range map for deepwater sculpin indicates that the species is predominantly located in the Great Lakes and Lake Nipigon, with an identified outlier population approximately 150 kilometres east of the east most boundary of the GCF on the Ontario and Quebec borders at the eastern edge of Site Region 3E.

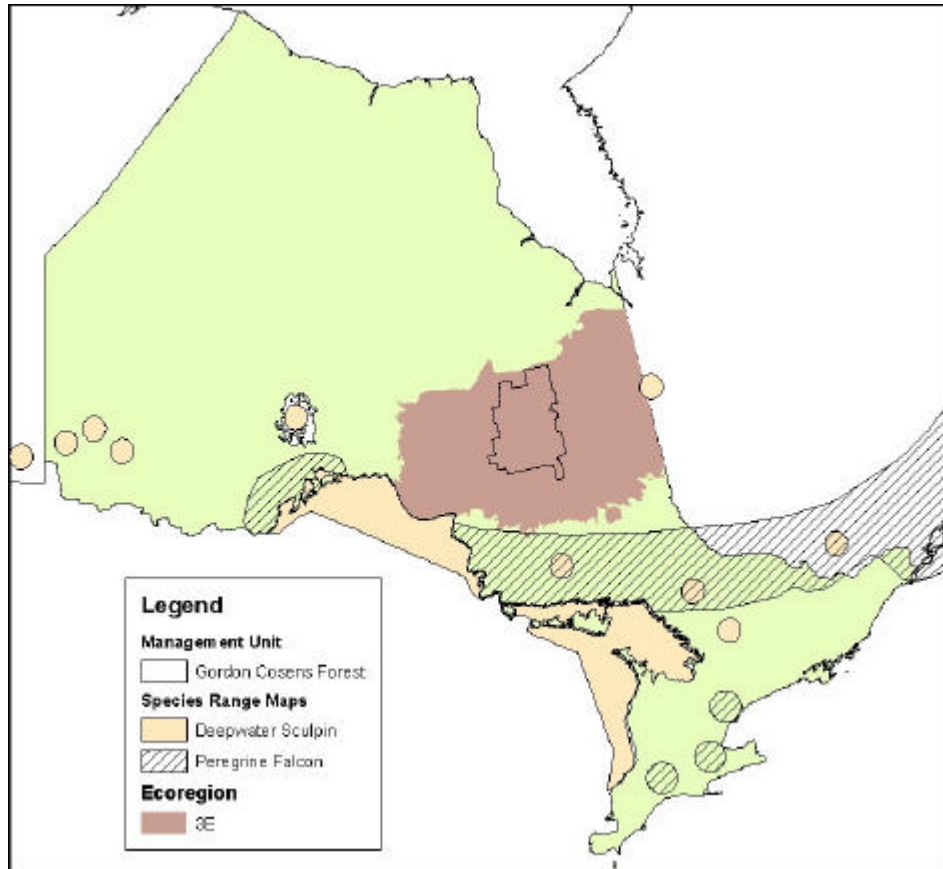


Figure 3: Species Range Maps for Deepwater Sculpin and Peregrine Falcon as compared to MNR Ecoregion 3E and the location of the Gordon Cosens Forest.

Peregrine falcon range, as identified by the COSEWIC range maps, touches on the southern edge of Site Region 3E which is roughly 100 kilometres south of the south most border of the Gordon Cosens Forest.

Neither deepwater sculpin nor peregrine falcon are known to occur on the GCF and their required habitat conditions are not found on the forest.

Woodland caribou and monarch butterfly have been noted to occur on the forest and there are indications of some degree of supporting habitat. Figure 4 identifies the location of the identified ranges of these species in comparison to the boundary of the Gordon Cosens Forest.

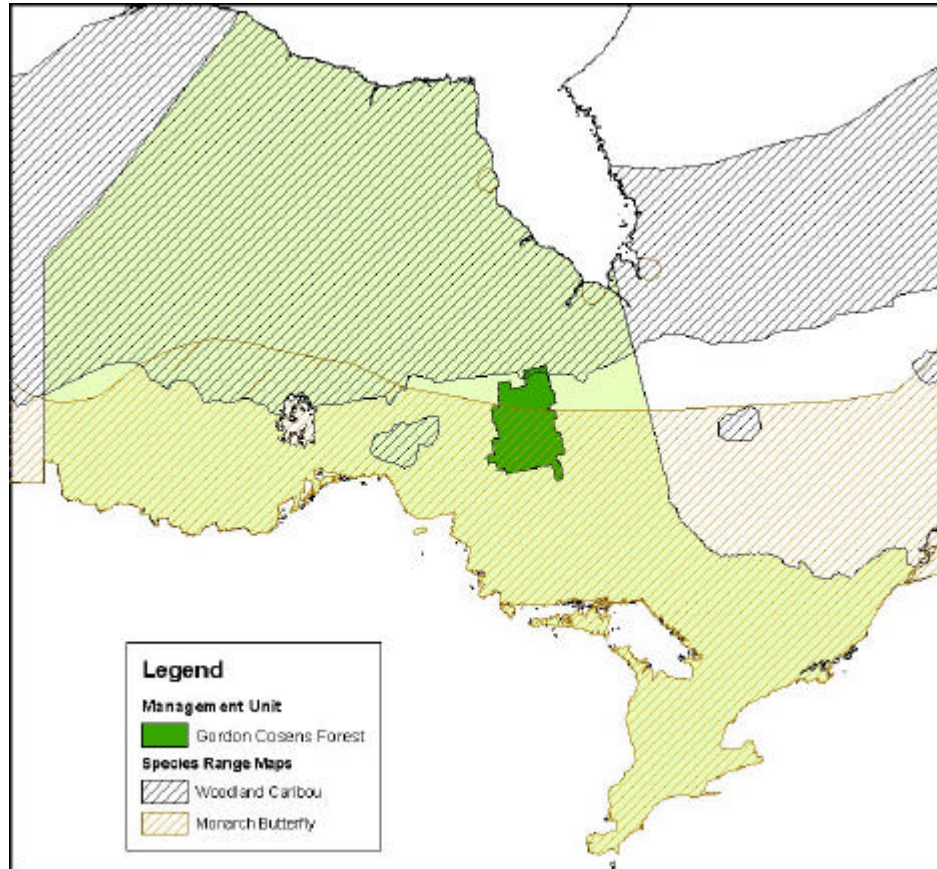


Figure 4: Woodland Caribou and Monarch Butterfly Range Maps overlaid against Gordon Cosens Forest boundary.

Table 1.2 lists the species and relevant information to determine the HCV status.

Table 1.2 COSEWIC species with occurrences in the GCF or broader natural region

Species Name	COSEWIC Status	Preferred Habitat	Extent of Habitat in GCF
Monarch Butterfly	Special Concern	Breeding habitat are patches of milkweed (NatureServe Explorer, http://www.natureserve.org/explorer/)	Disturbed habitat (likely from human causes) would comprise suitable breeding habitat.
Woodland Caribou	Threatened	Older forests with suitable lichen crop. Wetlands and islands for prey evasion and calving.	Est'd area: 198,708ha Ave stand size: 19 ha % of GCF: 10% Habitat is fragmented and found primarily in the north and south as well as a band through the central portion of the GCF.
Peregrine Falcon	Threatened	Limiting habitat is likely cliffs that are suitable nesting areas. (NatureServe Explorer,	No occurrences. Habitat type is not characteristic of the

		http://www.natureserve.org/explorer/)	GCF.
Deepwater Sculpin	Threatened	Deep cool lakes such as Lake Superior and Lake Ontario. (NatureServe Explorer, http://www.natureserve.org/explorer/)	No occurrences. Habitat does not exist in the GCF which is geographically remote from both Lake Superior and Lake Ontario.

The COSEWIC species range map for the Monarch butterfly¹ shows that the edge of the species northern range roughly parallels the settlement line corresponding to the east/west Highway 11 Corridor. Monarch butterfly's range is linked to the presence of its preferred habitat, which occurs primarily wherever milkweed (*Asclepius*) and wildflowers (such as Goldenrod, asters, and Purple Loosestrife) exist. The Highway 11 Corridor contains areas of abandoned farmland, numerous roads and other open spaces where many of these plants grow.

The southern limit of the COSEWIC species range for woodland caribou² overlaps the extreme northern portion of the GCF. While most of the GCF is outside of the accepted current extent of woodland caribou range, sporadic sightings of woodland caribou have occurred within the management unit. These woodland caribou appear to be a transient population that is sighted in the forest once every several years. It should be noted that the range of woodland caribou in Ontario has been retreating northward in recent decades.

It is generally assumed that woodland caribou prefer mature forests that contain large quantities of lichen and are associated with marshes, bogs, lakes and rivers. This description does not homogeneously match with the habitat characteristics of the region of the GCF within which the caribou sightings have occurred (see figure 3). Tembec is currently involved with a caribou radio-collaring program on the adjacent management unit to the north. This research may shed further light on caribou preferred habitat and the reasons for their periodic use of the Gordon Cosens Forest.

HCVF Designation Decision:

Of the five species identified the three (Rocky Mountain Capshell, Peregrine Falcon, and Deepwater Sculpin) that occur within the broad area encompassed by MNR Site Region 3E are not supported as potential HCV's given the lack of occurrence and habitat on the GCF.

The habitat requirements of the Monarch Butterfly are linked to cleared patent lands or travel corridors, (highways and railways), which are not managed as part of the Gordon Cosens Forest. Monarch Butterfly has therefore not been designated as an HCV.

Woodland caribou have been designated as an HCV within the Gordon Cosens Forest for the following reasons:

- (1) The known range distribution of woodland caribou in Ontario passes through the Gordon Cosens forest;

¹ Monarch Butterfly range map: http://www.speciesatrisk.gc.ca/search/speciesDetails_e.cfm?SpeciesID=294

² Woodland Caribou range map: http://www.speciesatrisk.gc.ca/search/speciesDetails_e.cfm?SpeciesID=636

- (2) Sightings data available from the Ontario Ministry of Natural Resources (OMNR) confirm the presence of woodland caribou within the forest; and
- (3) Woodland caribou are listed as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Woodland caribou range in Ontario overlaps the northern portion of the Gordon Cosens forest (Fig. 5). Sightings data available from the OMNR indicate woodland caribou were historically located in the Gordon Cosens forest and are currently present, albeit in seemingly low numbers (Fig 6). This database includes a combination of surveys conducted by OMNR personnel, as well as sightings by the general public. All sightings within 34 km of

the GCF were considered in the assessment, as caribou in the area are known to range this far between summer and winter ranges (Brown *et al.*, 2003, *in press*). Between 1950 and 2003 a total of 62 sightings of caribou were documented. Seventeen of these sightings occurred between 1999 and 2003, and 7 of these were within the GCF. Group

sizes ranged from 1 to 13 individuals and a median group size of 1. Although sightings data do not provide an estimate of population density, they are indicative of utilization of an area. Forest-dwelling woodland caribou typically occur at low densities across large areas of mature boreal forest. The average home range size of woodland caribou in northeastern Ontario is 4026 km² (Brown *et al.*, 2003, *in press*). Animals exhibit seasonal movement within a home range, as well as, fidelity to seasonal ranges. Consequently, evidence indicates caribou currently utilize portions of the Gordon Cosens forest. Actual population density is unknown and unlikely to be determined in the near future.

Figure 5. Changes in the southern limit of woodland caribou continuous distribution in Ontario (modified from Cumming and Beange, 1993).

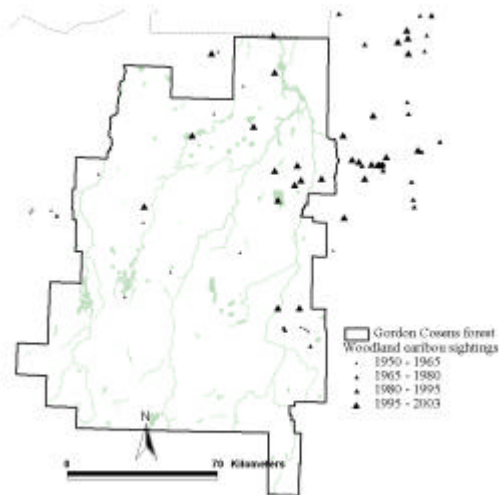
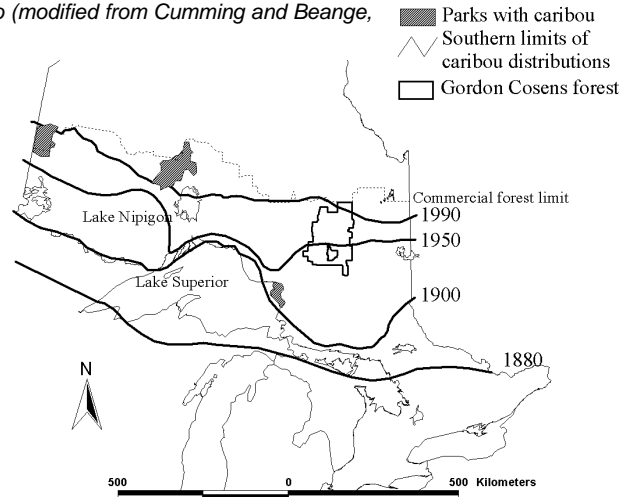


Figure 5. Changes in the southern limit of woodland caribou continuous distribution in Ontario (modified from Cumming and Beange, 1993).

A reduction in caribou numbers in Ontario has been documented since the early 1900's (DeVos and Peterson, 1951; Cringan, 1957; Cumming and Beange, 1993). By 1929, the population had sufficiently declined to warrant a closure on hunting of woodland caribou by non-natives (Ontario Ministry of Natural Resources, 1920-1935). Nationally, COSEWIC officially lists the boreal population of woodland caribou as a threatened species (Thomas and Gray, 2001).

Suitable caribou habitat on the Gordon Cosens forest:

Of the species within the GCF that are currently listed by COSEWIC as at risk, woodland caribou is the only species for which the extent of available habitat could be quantified. The forest resource inventory (FRI) was deemed adequate to provide a coarse estimate of the habitat suitable to woodland caribou, due to their use of forested landscapes. The remaining species do not rely on forest communities as important habitat, and thus the FRI does not provide an adequate representation of habitat availability.

Although ongoing research on woodland caribou in the region will provide a more precise definition of caribou habitat, work on other boreal populations in Ontario and Canada support use of the following query: stocking ≤ 0.6 , age ≥ 60 , species composition cedar + larch + jack pine + black spruce + white spruce + balsam fir $> 50\%$ of canopy. This query identified almost 200 000 ha of stand area deemed suitable to caribou (10% of the GCF). Suitable habitat is found primarily in the north and south, as well as, a band through the central portion of the GCF. However, stands are extremely fragmented and transected by road networks (Fig. 7). The portion of the GCF north of highway 11 is the most accessible to caribou found at the southern limit of continuous distribution. The limited sightings data available from the OMNR also indicate caribou have been found in this area of the GCF in recent years. Although the southern section of the forest is less fragmented by roads, it is also considered to be unavailable to the continuous population of woodland caribou.

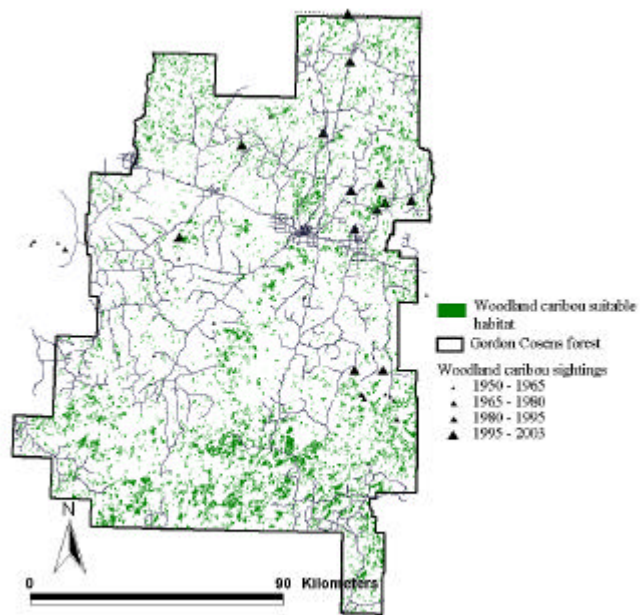


Figure 7. Conifer dominated forest cover on the Gordon Cosens forest deemed suitable for woodland caribou.

No critical wintering areas for woodland caribou were identified on the GCF. Habitat is considered to be most limiting to caribou during late winter when animals require access to arboreal and terrestrial lichens. Flight surveys conducted by OMNR personnel in the winter of 2003 did not confirm the presence of caribou in stands identified on FRI maps as late winter habitat (*pers. comm.*, John Sadowsky, OMNR). Surveys were conducted

in areas where concentrations of suitable stands were located. Calving areas may also be considered critical or important habitat. However, calving sites utilized by females are virtually impossible to identify via aerial surveys as animals are dispersed in isolated areas at this time of year. Intensive research efforts involving appropriate survey methods, such as telemetry, would be required to identify calving locations.

The preceding estimate of potential caribou habitat on the GCF is merely a preliminary estimate and not intended to be conclusive or prescriptive in nature. An explicitly defined HCV caribou zone is not delineated in this report, as management for caribou must occur at extremely large spatial and temporal scales. Racey *et al.* (1999) recommended that woodland caribou habitat management should provide a continuous supply of large areas (> 10 000 ha), with habitat supply assessed on an area of approximately 700 000 ha. Past attempts to protect caribou habitat at the stand scale have proven ineffective (Anonymous, 2003; Cumming and Beange, 1993). Caribou require large areas to maintain spacing from predators and supply adequate mature forest (Bergerud and Page, 1987; Seip, 1992; Racey *et al.*, 1999). Older conifer forests provide caribou with terrestrial and arboreal lichens, an important dietary component (Schaefer and Pruitt, 1991). Research defining the interaction of factors limiting caribou in northeastern Ontario is currently unavailable. However, findings in other boreal systems indicate that the interactions between predation, habitat alteration (timber harvesting, linear corridors, alternate prey), and human activity (recreation, road use, etc.), should be considered in developing management strategies for woodland caribou. Consequently, protecting caribou as a HCV in the Gordon Cosens forest will require strategic planning of the size and spatio-temporal distribution of harvest blocks. This will require consultation with OMNR and the completion of ongoing research of woodland caribou in the region. A satellite telemetry study of caribou north of Cochrane will be completed by the spring of 2005. This work will provide important information as to the habitat utilization and spatial scale at which caribou in the region utilize the landscape.

Question 2) Is the forest within an ecoregion that contains a concentration of endemic species?

Rationale:

The rationale for assessing this attribute is to ensure the maintenance of vulnerable and/or irreplaceable elements of biodiversity that are unique to the ecoregion.

Assessment Methodology:

To help assess for a concentration of endemic species³, the assessment in the Terrestrial Ecosystems of North America (Ricketts *et al.* 1999) was used, which provides an analysis and maps of geographic patterns of species endemism by ecoregion. This document uses a 50,000 km² threshold to identify restricted-range species, which is consistent with the threshold used by Birdlife International to classify endemic species. The presence of any endemic species identified by an appropriate agency (e.g. Conservation Data Centre, COSEWIC) would meet the threshold of this criterion.

³ Endemic species are ones that are confined to a particular geographic area. When this area is restricted, then a species has particular importance for conservation

For this report, the draft checklist that is currently under development by ProForest was used to establish the threshold for this attribute on the GCF. Specific questions asked included:

1. Does the forest contain critical habitat for endemic species?
2. Does the forest or ecoregion include greater than 10% of the continental population for the species?
3. Are any of the endemic species found in the forest a keystone or focal species?

Assessment Results:

The Gordon Cosens Forest (GCF) rests almost entirely (93%) within the Central Canadian Shield Forests ecoregion with the remaining 7% of the forest falling within the Eastern Forest/Boreal Transition ecoregion (see Map 3).

Ricketts et al. provides an analysis of the geographic patterns of species richness and endemism and a series of maps to illustrate. According to Ricketts et al. (1999), the portion of the GCF that falls within the Central Canadian Shield Forests ecoregion may contain some endemic snail species. Across the entire GCF, there does not appear to be any other endemic plant or animal species.

The following table (Table 2.1) is a summary, by ecoregion, of richness and endemism (See Category A.1 - 2) within the GCF management unit boundary:

EcoRegion	Species Group	Richness (# species)	Endemic (# species)
Central Canadian Shield Forests – #94	Birds	154-178	0
	Mammals	44-54	0
	Butterfly	63-87	0
	Reptiles	63-87	0
	Amphibians	7-13	0
	Snails	0	0
	Tiger Beetle	4-6	0
	Vascular Plants	1088-1412	0
	Trees	20-38	0
	Conifer	7-10	0
	TOTAL	1189-1600	0
Eastern Forest/Boreal Transition - #8	Birds	204-228	0
	Mammals	55-65	0
	Butterfly	114-139	0
	Reptiles	114-139	0
	Amphibians	20-26	0
	Snails	53-78	1-22
	Tiger Beetle	11-13	0
	Vascular Plants	1088-1412	0
	Trees	39-58	0
	Conifer	11-12	0
	TOTAL	1601-2011	1-25

Table 2.1 Summary of biodiversity scores from Ricketts et al (1999) for the two ecoregions that include the GCF.

HCVF Designation Decision:

According to the assessment by Ricketts et al. (1999), the GCF does not contain a significant concentration of endemic species. While there may be a number of possible endemic species of snails, these would not be considered a focal or keystone species in the GCF. As a result, endemic species have not been designated an HCV attribute on the GCF.

Question 3) Is the forest within an area that contains critical breeding sites, migration routes, flyways or seasonal concentrations of species?

Rationale:

The rationale for assessing this attribute is to maintain population viability, identify and protect regional “hot spots” and provide protection for critical breeding areas, migration routes, flyways or seasonal concentrations of species.

Assessment Methodology:

Various databases, including the Ontario Ministry of Natural Resources ‘Natural Resource Values Information System’ (NRVIS) document wildlife concentration areas, such as critical breeding or winter habitat for a single species or concentration areas for a diversity of taxa, as they are identified in the field. In particular, wetlands tend to be the most obvious area for wildlife concentration in many parts of the country due to the variety of habitats available at the aquatic-terrestrial interface and generally high productivity associated with these habitats. Birds are most often associated with these habitats and information at global scales (Birdlife International, <http://www.birdlife.net/sites/index.cfm>) and related national scales (<http://www.ibacanada.com>) were obtained. Ducks Unlimited Canada was also contacted to provide regional information.

Regional and local data on critical habitat values for a wider range of taxa were examined using the Ontario Ministry of Natural Resources’ NRVIS data, the NHIC, and Tembec values. This involved reviewing the pertinent 70 individual values (i.e. map layers) including fisheries values (spawning areas, migration routes), nesting sites (herons, waterfowl, hawks, and osprey) and moose habitat values (aquatic feeding areas, calving sites, and mineral licks). Priority values were selected among the 70 layers based on conservation interest (Table 3.1).

Table 3.1 Description of wildlife themes used to examine wildlife concentration areas in the GCF.

NRVIS or GCF (FMP) Theme Nesting sites	Conservation Interest <i>Based on OMNR’s NRVIS data the known bald eagle, great blue heron and osprey nests were identified in the GCF. All are associated with waterways and relatively intact forest (i.e. in proximity of dense forest, large trees, snags, 30-50% canopy) Great blue heron nests are usually found in groups.</i>
Spawning areas	<i>NRVIS data identifies known locations of Brook trout, northern pike, sturgeon and walleye spawning areas.</i>

Staging areas	<i>Area where waterfowl is known to rest during migration.</i>
Moose mineral licks	<i>These occur in areas of sedimentary and volcanic bedrock or in granitic bedrock overlain by calcareous glacial till.; usually appear as open muddy areas.</i>
Moose calving sites Moose aquatic feeding areas	<i>Usually isolated sites such as islands, peninsulas or virtual islands on land (in bogs or cutovers); or in poorly drained areas or close to water. Generally found on cool-water lakes, on medium sized and shallow rivers; usually in waterways of slow-moving water that support preferred vegetation types. These types of areas, given the nature of the clay belt, are quite prevalent in the GCF.</i>
Suitable marten habitat map (from F.R.I.).	<i>According to OMNR, marten preferred habitat includes mature conifer or mixed forest. Its home range can be from 1 to 3 km².</i>

Assessment Results:

According to Bird Studies Canada, an Important Bird Area (IBA) is a site providing essential habitat for one or more species of breeding or non-breeding birds. These sites may contain threatened species, endemic species, species representative of a biome, or highly exceptional concentrations of birds. There were no IBAs identified on the GCF. Further discussions with Bird Studies Canada will be held to verify if other areas of significance have been identified by the organization.

There is currently no data available for the GCF that indicates the proportion of the global, regional or national population of any species that uses staging or migration areas found on the forest. Further efforts will be made to pursue this line of inquiry with local and regional biologists.

HCVF Designation Decision:

There are no IBAs on the GCF based on data provided by Bird Studies Canada. There are no other known data sources to assess the presence of globally significant wildlife concentration areas.

The data used to assess the presence of regionally significant wildlife concentration areas is not well documented and, hence, only allows for the identification of potential HCVs.

During the forest management planning process, detailed operational prescriptions are developed in order to prevent, minimize or mitigate any adverse effects that forest management operations may have on these values. These operational prescriptions are based on approved operational guidelines that have been developed for the purpose of protecting these critical habitat values.

Question 4) Does the forest support concentrations of species at the edge of their natural ranges or outlier populations?

Rationale:

Species at risk with known or probable occurrences on the GCF were compared to their natural range maps.

Edge of range populations are those that inhabit the extreme edge of the areas considered to be their natural range. Outlier populations are concentrations of species that occur outside of the edge of what is considered their natural range. Relevant conservation issues for outlier populations include species vulnerability against range contraction and potential genetic variation at range edge.

Assessment Methodology:

All known tree species occurrences on the GCF were compared with their respective natural range maps⁴ in order to identify possible outlier populations. Tree species were used as a surrogate for vegetation community occurrences as there is currently insufficient data on this variable.

An examination of potential regional focal wildlife species with known or probable occurrences on the GCF were also compared to their natural range maps. The focal species review was undertaken independently based on selection criteria defined by Lambeck (1997), as explained in Appendix 2.

Assessment Results:

Tree Species

Concentrations of white and red pine were identified on the Gordon Cosens Forest through the Forest Resource Inventory (see Map 4.1). Occurrences of red and white pine on the GCF are considered to be at the edge of their ranges with some outlier populations of white pine as far north as Five Pines Lake located in the northern part of the forest. Due to their rarity, white and red pine provide unique ecosystems not generally found on the GCF or the region. In the southern portion of the Gordon Cosens Forest, white pine is found more frequently as a small component in the stand, but not in stands of any significant size.

The current Forest Management Plan (FMP) prescriptions for treatment of white and red pine are dependent on the concentration and size of area. The existing white and red pine strategy is to maintain the presence of these species on the GCF by incorporating a range of treatments rather than focus on one specific treatment. The general practice with these stands has been to avoid harvesting within those areas. These species are not locally at risk.

The current FMP also includes direction for management practices around Black Ash. Black Ash is considered to be within its natural range on the GCF which, although it cannot be considered abundant, occurs throughout the forest where conditions are conducive to its growth. Black ash occupies well-drained sites and can tolerate standing water for many weeks, sometimes in pure stands, but usually grows mixed with black

⁴ Trees in Canada, Farrar, John Laird 1995.

spruce, balsam fir, eastern white cedar, speckled alder, red maple, and sliver maple and is intolerant of shade. In the management plan, where concentrations of black ash are found to occur on sensitive sites, these areas are flagged and protected from harvest operations.

Wildlife Species

Only woodland caribou are known to be at the extremity of their range on the GCF. Several authors have reported caribou range reduction in Ontario, with decline documented to have commenced in the early 20th century (DeVos and Peterson, 1951; Cringan, 1957; Cumming and Beange, 1993). Population decline has involved a series of local range reduction events, rather than a decrease in numbers within a well-maintained range distribution. Woodland caribou were once found as far south as Lake Nipissing (Cringan, 1957). Long-term accounts of range reduction in Ontario are indicative of a recession northward (Fig. 1)(Cumming and Beange, 1993; Schaefer, 2003). The southern limit of continuous caribou distribution in Ontario runs in an east-west direction, extending westward from north of Cochrane to the northern end of Lake Nipigon. This line is approximated by the northern limit of large-scale timber management (Racey *et al.*, 1991).

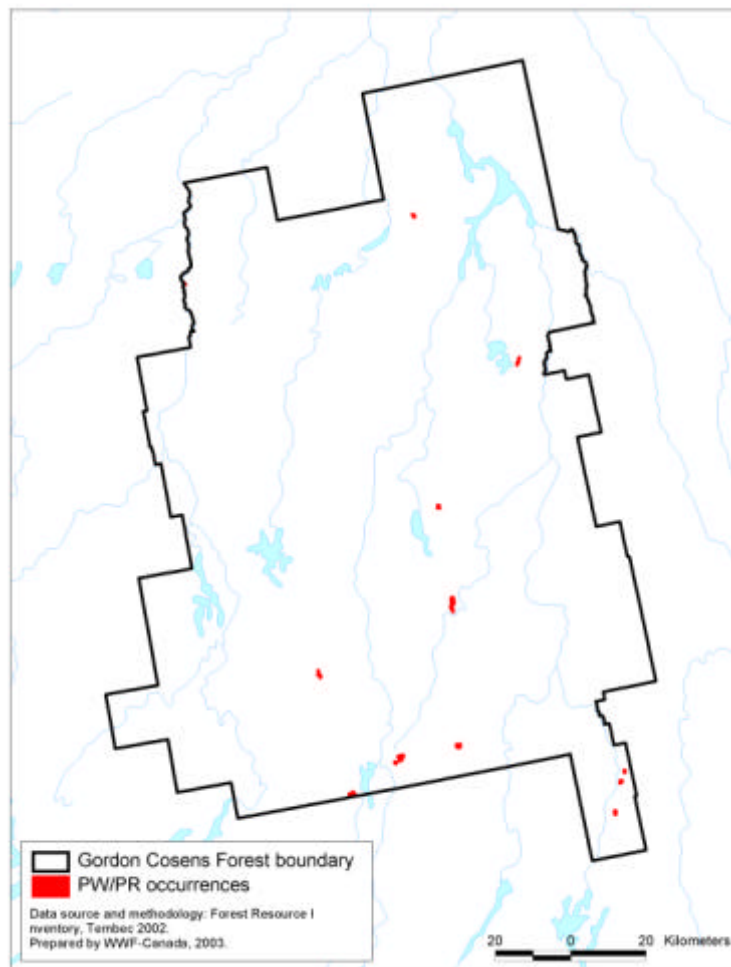
The Canadian *Species at Risk Act* (Bill C-5, December 12, 2002) indicates that all threatened and endangered species acquire immediate protection on federal lands, including prohibition from damaging or destroying the residence of one or more individuals. A provincial recovery strategy is currently in preparation by the Ontario Woodland Caribou Recovery Team (Anonymous, 2003). The team includes research scientists and forest managers from government, industry, and academic institutions. An important recommendation of this strategy is the need to maintain current range occupancy. As abundance and distribution of caribou are linked (Messier *et al.*, 1988), retraction of a range reflects a reduction in population size (Hobbs and Mooney, 1998). Consequently, maintaining current range occupancy, as defined by the zone of continuous distribution and known occurrences of caribou, is considered vital to the woodland caribou recovery strategy.

HCVF Designation Decision:

Although woodland caribou were previously identified as a HCV due to their species at risk status, their occurrence in the GCF at the edge of their natural range warrants additional mention herein. This information has important implications as to how caribou should be managed both within the GCF, as well as across adjacent management units in northeastern Ontario.

Given that both white and red pine are on the edge of their natural range with some outlier populations of white pine on the northern portion of the forest, and their relative rarity white pine, red pine have been designated HCV attributes on the GCF.

Black ash, although it is within its natural range, is not considered abundant on the forest and often inhabits sensitive sites therefore it has also been designated as an HCV attribute.



Map 4.1 Known locations of white and red pine in the GCF. Data from Tembec Forest Resource Inventory, 2002.

Question 5) Does the forest contain concentrations of regionally rare species?

Rationale:

The rationale for assessing this attribute is to maintain population viability, identify and protect regional “hot spots”.

Assessment Methodology:

At a regional scale, the presence of G3 (globally rare to uncommon), S1 (regionally extremely rare), S2 (regionally very rare) and S3 (regionally rare to uncommon) occurrences can be used to measure the presence of this attribute. The G3, S1, S2 and S3 coding in the Ontario Ministry of Natural Resources’ Natural Heritage Information Centre (NHIC) database indicates whether the species is of global or regional significance, and how rare it is.

Assessment Results:

At a regional level, a total of 24 occurrences have been reported in the NHIC database. The following table (Table 5.1) provides a general overview of the NHIC coding system and occurrences on the GCF.

Table 5.1 National to regional scale (G3, S1 to S3) ranking system for species element occurrences developed by The Nature Conservancy.

Level	Description	Reports in GCF
G3 Rare to Uncommon	100 or fewer occurrences in the overall range	15
S1 Extremely Rare	5 or fewer occurrences provincially	3
S2 Very Rare	20 or fewer occurrences provincially	5
S3 Rare to Uncommon	100 or fewer occurrences provincially	16

According to the NHIC database, 9 different species occurrences have been recorded within the GCF. The following table (Table 5.2) provides a summary of the G3, S1, S2 or S3 occurrences for the GCF, including the last year in which each species was observed.

Table 5.2 NHIC rank for regionally rare species in the GCF.

Species	NHIC Global Rank	NHIC Ontario Rank	Reports in GCF	Last Year Observed	COSEWIC Status
Lake Sturgeon (<i>Acipenser fulvescens</i>)	G3 (Vulnerable)	S3 (Rare to Uncommon)	13	1986	Not at Risk
Lieberg's Panic Grass (<i>Panicum leibergii</i> var. <i>baldwinii</i>)	G5T? (Secure)	S2 (Very Rare)	5	1959	
Heart-leaf Alexanders (<i>Zizia atera</i>)	G5 (Secure)	S1 (Extremely Rare)	1	1912	Not at Risk
Spatulate Moonwort (<i>Botrychium spatulatum</i>)	G3G4 (Vulnerable – Apparently Secure)	S1 (Extremely Rare)	1	1952	
Drummond's Mountain-avens (<i>Dryas drummondii</i>)	G5 (Secure)	S1 (Extremely Rare)	1	1937	
Taiga Alpine Butterfly (<i>Erebia mancinusi</i>)	G5 (Secure)	S3 (Rare to Common)	1	1981	
Purplish Copper (<i>Lycaena helloides</i>)	G5 (Secure)	S3 (Rare to Common)	1	1938	
Macoun's Arctic Butterfly (<i>Oeneis macounii</i>)	G5 (Secure)	S3 (Rare to Common)	1	1996	
Weigand's Sedge (<i>Carex weigandii</i>)	G3 (Vulnerable)	SH (Historically Known)	1	1882	

As shown in the above table, only two of these species (lake sturgeon, heart-leaf alexanders) are listed by COSEWIC. Both of these species are listed as “Not at Risk”.

Lake Sturgeon, which has an NHIC ranking of G3 (globally vulnerable) and S3 (rare to uncommon in Ontario), is the most noted NHIC species on the GCF. Lake sturgeon can be found in the Hudson Bay drainage, the Great Lakes drainage and the Mississippi Drainage south to Alabama and Missouri in large rivers and lakes including the St. Lawrence River, the Mississippi River, and the Tennessee River in Alabama. Due to their large size, the species is generally restricted to large lakes and rivers. They prefer clean sand, gravel, or rock bottoms and avoid muddy bottoms. To spawn, they move into smaller streams.

Drummond's Mountain-avens, which has an NHIC ranking of G5 (globally secure, common, typically widespread and abundant) and S1 (extremely rare in Ontario), provides a very interesting overlap in described habitat and actual ground conditions at the identified location on the GCF. The habitat of this species is described as being in crevices of steep, rocky, dry cliffs, and on limestone rock along rivers. Elevation ranges from 1900 to 6800 feet. Given the topography of the Clay Belt it is considered unlikely that this species normally ranges in the GCF. The location where the species was identified in 1937 is on the northern edge of the Gordon Cosens Forest in the vicinity Smokey Falls' area and northward along the Mattagami River. The rock outcrops along the river in these areas could be a match to the plant's habitat requirements.

Heartleaf Alexanders has an NHIC ranking of G5 or globally secure (common, typically widespread and abundant) species and S1 or extremely rare in Ontario. Species documentation indicates that normal habitat is rocky woods with the species moving into roadsides. Additional information on this species was difficult to find and it is currently presumed that the species occurrence on the GCF, or even within Ontario, is mainly due to range limitations for the species.

The preferred habitat of this species does not appear to overlap with the general forest conditions on the Gordon Cosens Forest (e.g. wet, lowland black spruce) or the area in which this species was reportedly observed. This area, located off of CSR 2A, is located within the Flutes⁵ surficial geology type, which does not qualify as rocky woods. The sighting location was harvested and regenerated in the late 1980's.

Taiga Alpine Butterfly has an NHIC ranking of G5 (globally secure, common, typically widespread and abundant) and S3 (rare to uncommon in Ontario). Information gathered on this species indicates that its habitat requirements are black spruce – sphagnum bogs with a range that is holarctic⁶. Range and habitat includes Sub-arctic Alaska and Canada east and south across Canada to East-central Ontario and northern Minnesota. Isolated records of occurrences can be found from Northern Quebec and Labrador.

Purplish Copper has an NHIC ranking of G5 (globally secure, common, typically widespread and abundant) and S3 (rare to uncommon in Ontario). This species' habitat is identified as disturbed areas including roadsides and open fields, wet meadows, marshes, sides of streams, and valleys. The Purplish Copper ranges from the Great Lakes through the northern Midwest and northern plains to British Columbia and south to Baja, California. Given the range description it is likely that this species would be at the extreme edge of its range in the GCF.

Macoun's Arctic Butterfly has an NHIC ranking of G5 (globally secure, common, typically widespread and abundant) and S3 (rare to uncommon in Ontario). Habitat for this species is described as openings in forests of western Jack or Lodgepole Pine with a range identified as spanning across southern Canada from British Columbia through the prairie provinces to northern Michigan and central Ontario. Like Purplish Copper, this species is likely on its extreme range edge in the GCF.

Wiegands's Sedge has an NHIC ranking as a G3 (globally vulnerable) and SH or historically known from Ontario but not verified recently (typically not recorded in the province in the last 20 years – this particular sighting has a recorded date of 1882). This species requires a habitat of peaty or boggy soils associated with forested wetland, open wetland (not coastal nor river shore (non-forested, wetland)) or Coastal non-tidal wetland (non-forested, wetland). The identified range for this species is from Newfoundland to Ontario, south to northern New England. This species is considered to be rare in Maine, New Hampshire, Vermont, Massachusetts, and New Brunswick. As noted by the Maine

⁵ The Flutes - This area covers most of the northern part of the southern limits. A few of the townships involved are Carmichael, Casselman, Maude, Owens, Rykert and Staunton. Low drumlins run north north-east but the definite flutes or narrow ridges that run north-west are the main criterion of the type. Materials are generally light till (a sandy silty-clay loam) with flute ridges and lacustrine clay between the ridges.

⁶ Holarctic - pertaining to the whole northern or arctic region.

Department of Conservation, this species is believed to be more common than collection records indicate, because it can be difficult to identify.

Dichanthelium liebergii (Vasey) Freckmann or **Lieberg's Panic Grass** has an NHIC classification of G5T (globally secure (common, typically widespread and abundant) infraspecific taxon (trinomial)) and S2 (very rare in Ontario). The global ranking describes this as a critically imperilled subspecies of an otherwise widespread and common species with an inexact numeric ranking. However it is important to note that the Integrated Taxonomic Information System (ITIS) site identifies the taxonomic status of this species as not accepted (as it is a synonym for *Dichanthelium leibergii* (Vasey) Freckmann).

The identified range for this species is considered to be from Western New York to Saskatchewan ranging down into central states. Habitat for this species is Bracken Grassland, Prairie, Savannah, and Southern Upland Forest, with a preference toward neutral to slightly alkaline sandy loam. Given the identified range and habitat requirements, it is likely that the species does not inhabit the GCF.

The five sightings occurred during a period from 1958 to 1959 along the Highway 11 corridor or adjacent to the Kapuskasing River and forest access roads in Parnell and Cummings Townships. Two of the sightings are on the extreme western boundary of the forest beside the Opatatika River. These areas have been harvested and regenerated through periods of time ranging from 1928 along the Kapuskasing River, 1941 to 1944 along the Opatatika River, and the early 1950's in the Parnell Township area.

The last species, **Spatulate Moonwort**, has an NHIC classification of G3G4 (global status uncertain - vulnerable to apparently secure) and S1 (extremely rare in Ontario). The range of the species is identified as scattered locations in northern North America including the northern Great Lakes region through to James Bay and the Gaspé region. In western North America, the species occurs from western Montana northward to Alaska. Typical habitat for Spatulate Moonwort involves open or partly open areas with sandy soils including grassy fields, sand dunes, tailings piles, and along railroads and roadsides. Apparent threats to the species are not well understood but it is thought that the combined effect of drought and fire can lead to population decline. In addition natural plant succession toward closed-canopy conditions could be considered a threat.

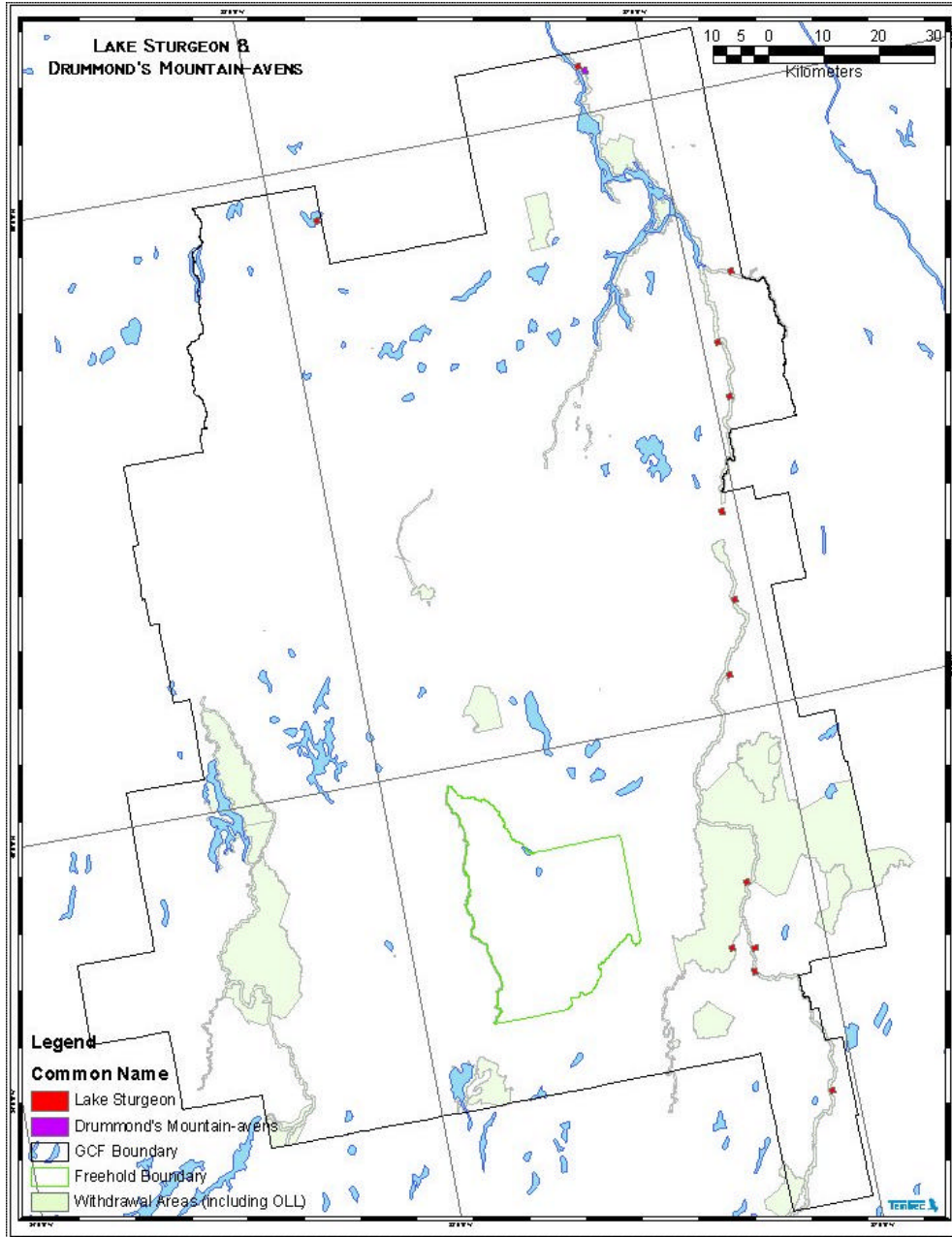
Spatulate Moonwort appears to be a little identified or poorly understood species at this time. Its need for open spaces with sandy soils would likely be a mitigating factor in its maintaining establishment in the Clay Belt. The single sighting of this species occurred on the forest in 1952 in the vicinity of the corridor of Highway 11 through Kapuskasing.

HCVF Designation Decision:

Due to the Lake sturgeon's NHIC ranking as globally vulnerable (G3) and rare to uncommon in Ontario (S3), its high number of sightings and the significance of the lake sturgeon fishery, this species and areas on the license where critical habitat exists have been designated a HCV attribute on the GCF.

Drummond's Mountain Avens could also be considered to be a HCV attribute due to the coincidence of preferred habitat and actual ground conditions, and the classification of this species as very rare in Ontario. Yet, this species has not been observed to be

present in concentrations, which is a key factor in determining whether it warrants a HCV designation. However, given the presence of suitable habitat in the GCF, it is recommended that it be identified as a potential HCV for further monitoring.



Map 5.1 Location of known lake sturgeon and Drummond's Mountain-Avens occurrences in the GCF.

Based on the age of the sighting, the forest management activities in the area, the resulting current forest condition (regenerated Sb stands), and surficial geology of this area, we conclude that Heart-leaf Alexanders does not warrant a HCV designation at this time.

Likewise, given the age of the last sighting of Wiegands's Sedge, and the lack of information to substantiate the presence of this species on the GCF, we conclude that this species is not a HCV at this time.

With respect to Lieberg's Panic Grass, given the date of sighting, the confusion over taxonomy with this species as well as its habitat requirements, it has not been designated as a HCV attribute at this time.

As for Spatulate Moonwort, there has only been one sighting of the species on the forest. Given that and the fact that its preferred habitat of open spaces with sandy soils is likely be a mitigating factor in its maintaining establishment in the Clay Belt, this species has not been designated a HCV attribute.

Question 6) Does the forest contain critical habitat for species that are regionally in decline?

Rationale:

This indicator is intended to identify regionally important species/community types that may not register on a national list such as COSEWIC, but are threatened regionally or locally.

Assessment Methodology:

Species of concern that are listed nationally or provincially have already been assessed and discussed under Indicators 1 and 5. This assessment considered two components including provincially featured species, and the potential regional focal species listed in Appendix 2. Both were assessed based on current information and local knowledge in order to identify any that may be experiencing regional or local declines.

Two provincially featured wildlife species, pine marten and moose, are found on the forest. Both of these species have a significant presence as shown in Maps 11 and 12. Management of forest cover for these two species also maintains habitat for a wide variety of other wildlife species.

Pine marten (*Martes americana*) was elevated to the status of "a provincially featured species by the Environmental Assessment Board's Decision on Timber Management on Crown Land (April 1994). The board directed that guidelines be prepared to manage for marten habitat in the boreal forest. These guidelines have been considered in the approach to managing for marten that has been developed in this forest management plan.

Marten prefer "mesic coniferous forests that exhibit complex physical structure near the ground, along with a number of attributes that are generally found in the latter stages of forest succession.

The Forest Management Guidelines for the Provision of Marten (1996) have been implemented into the current forest management plan. The target is to maintain on the landscape 10 to 20 percent of the forest, which has the capability to produce pine marten,

in suitable conditions arranged in core areas between 30 and 50 square kilometres in size, with a minimum of 75% of core habitat being comprised of suitable stands.

In the current forest management plan, marten core areas were distributed across the forest and wherever possible these areas were linked to one another by riparian reserves, Ontario Living Legacy areas, biodiversity leave areas and other uncut areas to create travel corridors for marten. Individual core areas will be re-assessed as part of the next forest management plan for the Gordon Cosens Forest. Core areas will move around the landscape over time in response to changes in forest composition, structure and age.

As shown on Map 11, marten habitat is well distributed on the GCF. Habitat suitability for marten is shown as preferred (suitable) and used (capable) marten habitat as per the Forest Management Guidelines for the Provision of Marten Habitat.

Map 12 shows preferred and used habitat for Moose (*Alces alces*). Like marten, moose habitat is also well represented on the forest. The ability of the forest to support moose changes through time. These changes can occur slowly as a forest develops and matures, or they may occur quickly as a result of such events as fire, insect damage or logging.

Fragmentation on the GCF has been influenced through past and current application of the Timber Management Guidelines for the Provision of Moose Habitat as well as the current application of Forest Management Guidelines for the Provision of Marten Habitat (1996).

In addition to moose and marten, habitat suitability was also examined for a number of selected species. The extent to which habitat for these species can be maintained is limited somewhat due to the current age class structure and the impact of fire suppression activities across the forest. The species that have been examined in this plan were selected by staff from the Northeastern Region of the Ontario Ministry of Natural Resources (OMNR). Selected indicator species examined for the GCF include Black Bear, Woodland Caribou, Deer Mouse, Northern Flying Squirrel, Snowshoe Hare, Lynx, Pileated Woodpecker, Great Grey Owl, Boreal Chickadee, White Throated Sparrow, Ruffed Grouse, Spruce Grouse, Least Flycatcher, Black Backed Woodpecker, Ruby Crowned Kinglet, Blue Spotted Salamander and Bay-breasted Warbler. Of these species only the Woodland Caribou (vulnerable) appears on the COSEWIC list.

Although many of these species have little or no preferred habitat on the Gordon Cosens Forest, they do, for the most part, have some “used” or marginal habitat in the planning area. The habitat for all selected species will be maintained to the greatest extent possible which may influence the degree to which the forest is fragmented.

Assessment Results:

Initial discussions with local biologists on the species listed in Appendix 2 suggest that only woodland caribou, which as already been designated an HCV attribute, could be considered to be regionally in decline. Continued efforts will be made to explore the issue of regionally important species in future workshops with local and regional biologists. A peer review of the focal species suggested in Appendix 2 will also be conducted.

HCVF Designation Decision:

At this point in time, no HCV attributes have been designated under this indicator category, however, further investigation will be ongoing.

7) Does the forest lie within or contain a conservation area designated by an international authority?

Rationale:

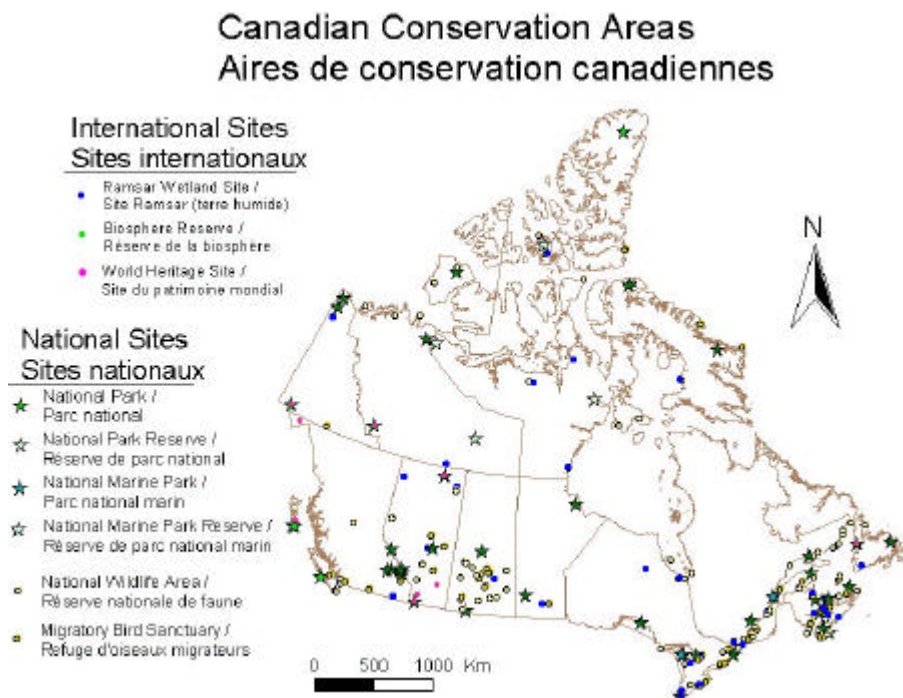
This attribute is examined to ensure compliance with the conservation intent of a protected area designated by an international authority. Where there is conflicting information regarding the location and/or conservation status of protected areas or candidate sites, the forest manager should assume that the forest contains HCVs.

Assessment Methodology:

The presence of this attribute was assessed through an examination of the Canadian Conservation Database which identifies important areas designated through international conventions. An on-line query of the Ontario Ministry of Natural Resources Natural Areas Database provided a list of International Biological Program (IBP) sites.

Assessment Results:

Examination of the Canadian Conservation Database (Figure 7.1 below) revealed that there are no protected or candidate UNESCO World Heritage Sites, Biosphere Reserves or RAMSAR Wetland Sites on the GCF.



Map 7.1 International and national conservation areas.
Source: http://geogratis.cgdi.gc.ca/ccea/ccea_e.html.

HCVF Designation Decision:

There are no protected or candidate UNESCO World Heritage Sites, Biosphere Reserves or RAMSAR Wetland Sites on the GCF.

8) Does the forest management unit lie wholly or partly within a protected area or area proposed by a relevant legislative body for future protection?

Rationale:

This attribute considers compliance with the conservation intent of a protected area. The presence of a protected area or candidate site proposed by a relevant legislative body for future protection constitutes a HCV.

Assessment Methodology:

This attribute was assessed through the examination of available information from relevant authorities (e.g. national and provincial government agencies responsible for protected areas planning).

Assessment Results:

As shown above and in Map 7.2, there are no national parks or park reserves, national marine parks or park reserves, national wildlife areas or migratory bird sanctuaries on the GCF.

Currently there are two regulated provincial parks located on the GCF, Missinaibi River Provincial Park, which is located in the western portion of the forest, and Rene Brunelle Provincial Park, which is situated on the north shore of Remi Lake. Because of the popularity of the Missinaibi River as a canoe route, there are a number of restrictions applied to mitigate the impacts of forest management operations on the Missinaibi River Provincial Park.

Protected area expansion and development was identified in Ontario's Living Legacy – Approved Land Use Strategy, 1999 (see map 7.2). The newly identified areas on the GCF designated as protected areas through the Ontario Living Legacy (OLL) program are listed in Table 8.1

Table 8.1 Ontario Living Legacy sites designated for protection in the GCF.

OLL Area	Proposed Land Use	Total Area (hectares)
P1542 - Missinaibi River Addition	Provincial Park	2,308
P1543 - Missinaibi River Addition	Provincial Park	26,390
P1550 – Nemegosenda River Wetlands Park Addition	Provincial Park	4,140
C1553 – Stanley Creek Drumlins	Conservation Reserve	3,741
C1562 – Bennet Lake Esker Kame Complex	Conservation Reserve	3,408
C1565 – Vimy Lake Uplands	Conservation Reserve	1,341
C1566 – Nova Township Clay Plain Peatlands	Conservation Reserve	3,220
P1568 – Mattagami River Beach & Aeolian Deposit Park	Provincial Park	155
P1569 - Groundhog River Waterway Provincial Park	Provincial Park	12,353
C1570 – Mowbray Township Linear	Conservation Reserve	3,196

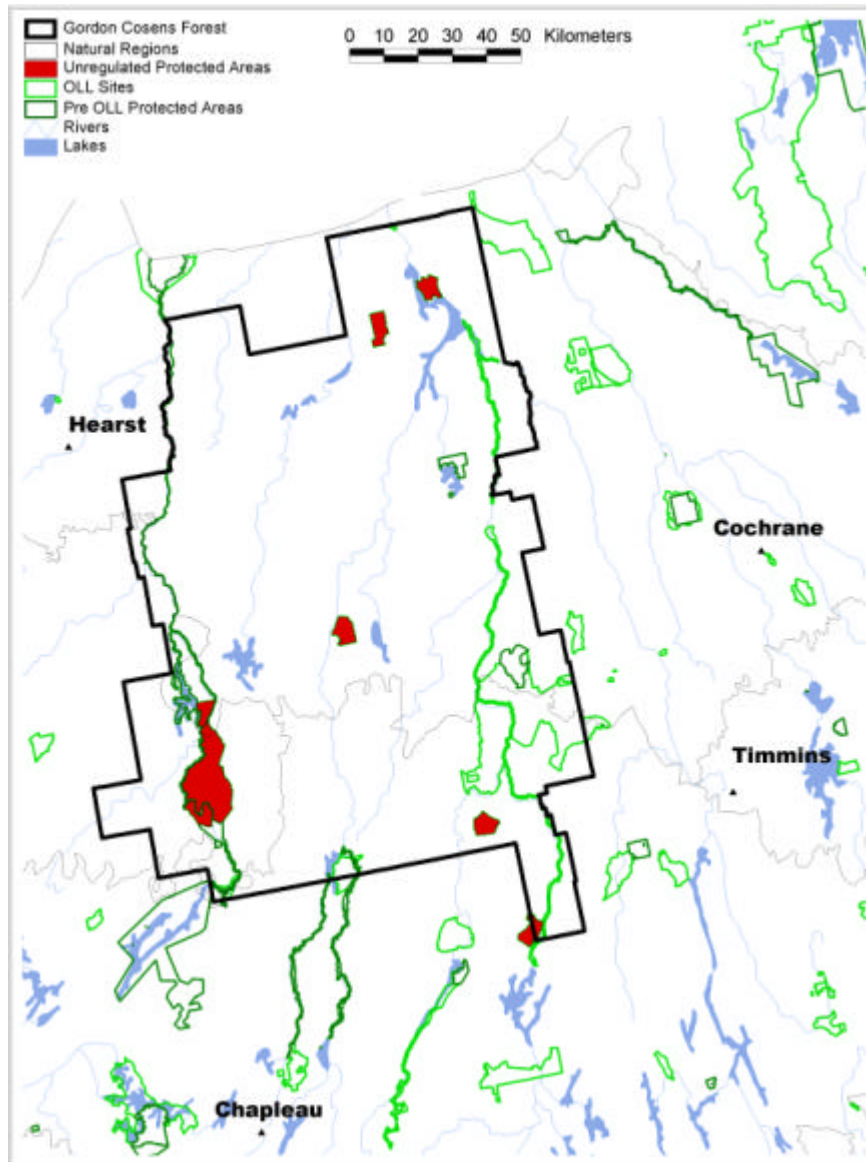
Five of these OLL areas (C1702, P1542, P1550, P1568 and P1569) are expected to be regulated over the next five-years. In the current forest management plan, these OLL areas do not form part of the land base that is available for forest management activities. The other six proposed protected areas do form part of the Available Crown Production Forest but were not eligible for harvest, renewal or tending operations during the development of the current forest management plan. To date, a decision to regulate the remainder has been deferred pending successful negotiations to allow replacement wood to flow from north of the “Area of the Undertaking”. Despite lack of progress on this issue, Tembec is now working cooperatively with the OMNR, WWF-Canada and the Wildlands League to move these sites to regulation.

The largest proposed conservation reserve, referred to as the Northern Claybelt Forest Complex (C1702), is comprised of a significant complex of string bogs and wetland areas.

HCFV Designation Decision:

Existing regulated parks within the GCF already have formal protection and have not been designated HCV attributes. All candidate (non-regulated) sites have been designated HCV attributes for the time being (Map 8.1).

Tembec continues to work with WWF-Canada to review and consider additional deferral options to ensure adequate representation across its managed forests.



Map 8.1 Location of unregulated Ontario Living Legacy protected areas in the Gordon Cosens Forest.

9) Does the forest lie within or contain a conservation area identified in regional land use plans or conservation plans?

Rationale:

This attribute is examined to ensure that regionally significant forests are evaluated for consistency with the conservation intent. Completion of conservation plans implies high conservation value for the associated land. Any core, corridor or linkage zones identified in a conservation plan should be evaluated for HCVF designation.

Assessment Methodology:

The North-Eastern Ontario Strategic Land Use Plan (1982), Moose River Basin Report (1998), and District Land Use Plans for Chapleau, Cochrane, Kapuskasing and Timmins were examined.

Assessment Results:

Examination of the above documents revealed that there are no known conservation areas on the GCF identified in regional land use plans or conservation plans.

HCFV Designation Decision:

Based on the above assessment this HCV attribute is not considered to exist on the GCF.

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.

This type of HCV recognizes the importance of maintaining large blocks of intact forest, or forest where disturbance due to road construction, forest harvesting or other development has not substantially changed species distribution and abundance (i.e. areas that still have fully functioning ecosystems at landscape levels).

History of Resource Use in the GCF

The level of fragmentation on the GCF is partially a result of natural succession and fire and partly from direct human impact. The evolution of harvesting and management practices has influenced disturbance pattern and fragmentation (see Map B)

Horse logging was the main logging method employed on the Gordon Cosens Forest from the 1920's up until 1963. During the horse-logging era much of the harvest was conducted in and around major water ways in order to facilitate transportation of logs to mill via river drives. The Smokey Line railroad was also developed during that time-period in order to transport wood to Spruce Falls Power & Paper Company.

From 1960 to 1990, forest management practices evolved both technologically and conceptually. Timber management plans developed during the late 1980's were focused on managing the forest for the provision of moose habitat and the protection of the habitat of other species whose long-term survival was of concern (i.e. vulnerable, threatened and endangered species). This approach also had profound influence on how the current forest is spatially arranged in terms of patch size and distribution of disturbance polygons. While the moose guidelines tended to favour species that were reliant on edge, some area sensitive species were ignored. This created a pattern of very fragmented, and numerous, disturbance patches on the landscape. Analysis of historic disturbance patterns has shown that the natural pattern for the Clay Belt is one that is dominated by very large disturbance patches. Application of the moose habitat guidelines on this forest increased the fragmentation of the forest, thus potentially negatively impacting biological diversity.

Current values for fragmentation indices, calculated for the GCF using FRAGSTATS, suggest a high level of human impact at both the landscape and class scale (Appendix 4). Total core area for the entire GCF (landscape) and core area for each class (seral stage & forest type) as a percentage of total landscape and class area, respectively, are quite low.

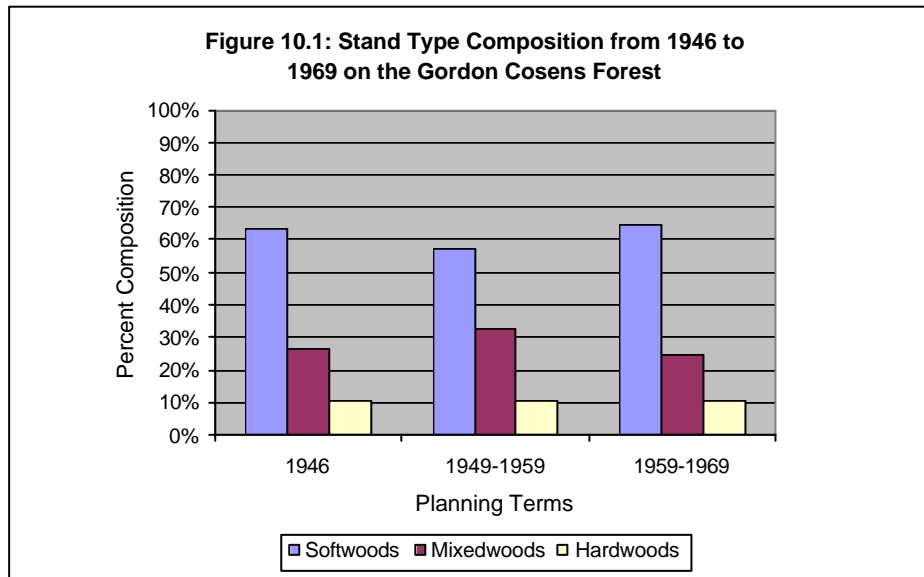
Another major influence on the forest landscape was the settlement of the Clay Belt area for agriculture in the 1920's, 1930's and 1940's. The result of this settlement was the conversion of significant areas of forest into agricultural land. Most of this area has never been intentionally reforested and is now comprised of mostly hardwood and mixedwood stands adjacent to the Highway 11 and railway corridors, both of which influenced settlement activities in the area.

Map B shows general habitat types based on an ortho-rectified Landsat 7 satellite image. Pink coloured areas on the map represent recently harvested areas. As the pink colour fades and moves through the spectrum of lighter to darker greens the growth of the forest becomes evident.

Species Composition in the CGF

The Gordon Cosens Forest has undergone significant change over the past 150 years. Forest composition and structure have been modified over time by natural disturbances (i.e. wildfire, blow-down, and insect infestations) and forest management activities. Pre-settlement conditions in the Clay Belt were heavily influenced by fire disturbance patterns and regimes. Although the Gordon Cosens Forest is a fire origin forest, fire suppression has effectively removed the element of fire from the forest since the 1920's and 1930's. Forest composition and structure have since been influenced a number of factors including forest management activities, insect infestations, settlement and agricultural development.

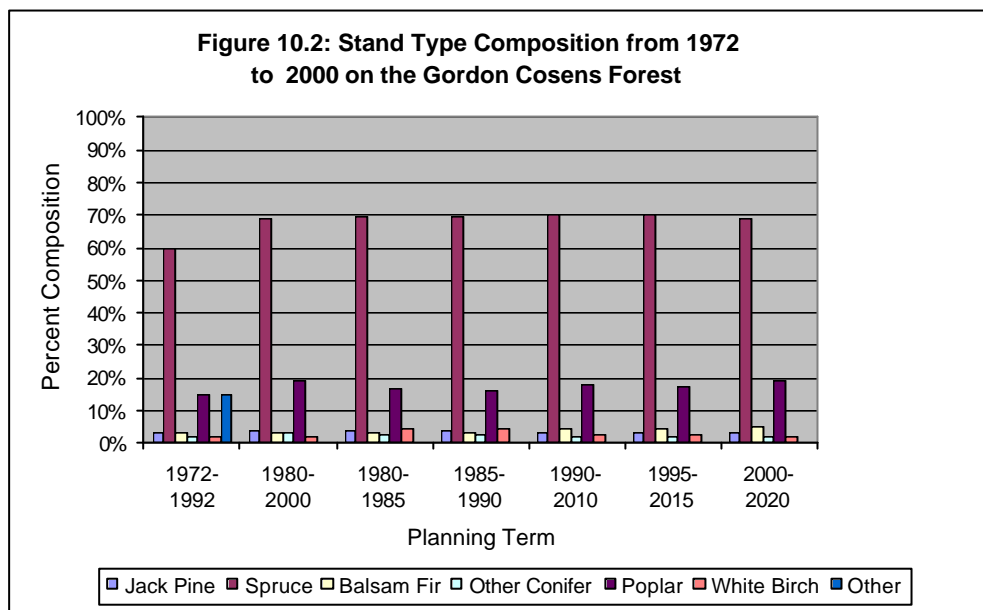
The pre-European settlement forest was of fire origin having evolved over thousands of years. The origin of the present mature and over-mature forest appears to have evolved from several very large fires that occurred prior in 1850 (and earlier), 1895 and 1905. These wildfires covered extensive areas of the forest and resulted in vast areas of even-aged forest in the early 1900's. The type of forest that regenerated following wildfire was influenced by the season of the fire, site type and species composition. Early spring fires, for example, may have stimulated the regeneration of an aspen dominated forest while a fire occurring on the same site type later in the spring or summer would kill much of the aspen and allow the regeneration of a spruce dominated forest. The natural relationships that existed between climate, soils, drainage and plant communities contributed to the present distribution of forest types.



Comparison of broad forest types in past and current forest management plans indicates that forest composition on the forest has remained relatively stable over time. This trend should continue given the current objectives and strategies for maintaining forest types on the GC F.

At the management unit level, the stand type composition changes were examined using forest description information documented in forest management plans that were developed between 1946 and the present for the Gordon Cosens Forest. Figure 10.1 shows that there was very little change in broad forest type on the forest between 1946 and 1969.

As shown in Figure 10.2, the percentage area by working group on the Gordon Cosens Forest remained relatively stable between 1972 and 2000. Some of the changes that have occurred can be attributed to land base changes (i.e. amalgamation of the Kapuskasing Management Unit) and forest resource inventory updates.



Recognizing that there was a need to maintain or create particular landscape characteristics (i.e. percent of forest types and age classes, forest patch size and distribution, etc.), Krabbe and Phoenix (1994) developed a “Biological Diversity Strategy” in the 1995-2015 Forest Management Plan for the GCF. The underlying assumption of this approach was that all native species and ecological processes were more likely to be maintained if managed forests are made to resemble those forests created by natural disturbance agents such as fire, wind, insects and disease. Because the boreal forest is largely a fire disturbance regime, forest management planning during the development of that forest management plan was designed to mimic natural disturbance patterns (Landscape Management). This approach was carried forward and expanded upon in the 2000-2020 Forest Management Plan which contains specific objectives and strategies for maintaining the forest type composition and age class structure.

Trends of forest type composition will be monitored following each five-year term to ensure that the objective is being achieved. When imbalances occur, harvesting and silviculture methods will be altered to maintain the forest balance. The landscape scale is the appropriate scale to monitor the overall composition of the forest. Changes to the forest

however, occur at the disturbance patch scale and this is the appropriate scale at which to make adjustments to achieve the strategy.

Within the current forest management plan for the GCF there are a number of strategies aimed at retaining structural elements within harvest areas. Many organisms depend on the natural decay cycle. Decaying wood, for example, provides habitat for numerous vertebrates, fungi, lichens, plants and micro-organisms. Dead wood also plays an important role in nutrient cycling. Standing dead trees (snags) and fallen logs (coarse wood debris) are important to retain, as are live and dying trees, which provide a source of future snags and downed logs.

Coarse woody debris is defined as “sound and rotting logs and stumps that provide habitat for plants, animals, insects and a source of nutrients for soil development”. Maintaining coarse woody debris after harvesting is a critical element of managing for biodiversity. It is recognized, however, that maintenance of coarse woody debris in harvest areas is limited somewhat due to existing utilization standards and current methods of site preparation. Larger pieces, generally greater than 10 centimetres, are preferable as they provide the greatest longevity and potential for nutrient cycling and wildlife use in second-growth forests. Coarse woody debris is rarely evenly distributed, but should be as well distributed as possible throughout the harvest block.

Standing dead and living trees provide nesting and foraging habitat for a wide variety of species including cavity-nesting birds. Some existing snags should be retained, but equally important is ensuring that new snags will be recruited into the stand in the future. Retention of these structural elements can be achieved through a variety of harvest practices including Careful Logging Around Advanced Growth (CLAAG) and Group Seed Tree.

Ideally, representative standing dead trees would also be left during harvest. While these may occur within leave areas and result from subsequent mortality of group seed trees and standing unmerchantable trees, considerations for safety and the requirements of the Occupational Health and Safety Act, constrain the ability to leave these standing dead trees.

Rationale:

This indicator addresses forest condition from the perspective of species composition in comparison to the “original” forest. This type of HCV (large landscape level forests) identifies large remaining blocks of intact forest, or forests where disturbance due to road construction, forest harvesting or other development has not substantially changed species distribution and abundance (i.e. areas that still have fully functioning ecosystems at landscape levels).

Assessment Methodology:

The original approach suggested in the report, A Tembec Guidance Document on Meeting the Requirements of FSC Principle 9: Version 1, considered whether portions or all of the managed forest are significant at global or local scales for two factors (degree of fragmentation/dissection and forest condition). Four questions (Questions #10-13) are posed to address these two factors from global to regional scales:

- 10) *Does the forest constitute or form part of a forest landscape that is natural/near natural in terms of species composition, stand structure and habitat composition (in terms of original intact forest)?*
- 11) *Does the forest constitute or form part or any of a forest landscape that is unfragmented or little fragmented by direct or indirect human impact (including fire)?*
- 12) *Does the forest constitute or form part of a forest landscape that is significantly more natural in terms of species composition, stand structure and habitat composition than what is usual in the area or region?*
- 13) *Does the forest form part of a forest landscape that is significantly less fragmented by human impact than what is usual in the area or region?*

In an attempt to simplify the assessment of large landscape level forests, a slightly different approach was taken that considers the same factors (fragmentation and condition), but in a sequential evaluation with varying thresholds for determining global, national and regional (ecoregion) significance. The methodology follows three general steps, outlined below, to determine the forest condition in selected unfragmented landscapes. Once these analytical steps are completed, the results are tested against thresholds for determining globally, nationally and regionally significant large landscape level forests (see section below on Thresholds for Determining Large Landscape Level Forests at Multiple Scales).

1. Unfragmented forest landscapes, based on data for permanent infrastructure are compared within the Gordon Cosens Forest (GCF) and within the larger natural regions intersecting the GCF.

This information provides guidance regarding the need to restore or maintain large landscape level forests in the management unit relative to the surrounding forest landscape. There are three broad examples to consider:

- a) The forest landscape within and surrounding the management unit is heavily fragmented (landscape restoration required).
- b) The forest landscape surrounding the management unit is relatively fragmented, but not heavily modified, and is less fragmented in the management unit. This scenario potentially results in more flexibility for the forest manager to maintain large landscape level forests.
- c) The forest landscape surrounding the management unit is heavily fragmented and is less fragmented in the management unit. This scenario places more emphasis on maintaining large landscape level forests in the management unit since they likely represent the remaining options to maintain viable populations of native species.

2. Unfragmented forest landscapes based on coarse-scale permanent infrastructure determined in the previous step are compared with the results based on more detailed data, including non-permanent disturbances.

This step is introduced into the analysis in order to ‘ground truth’ the results of the coarse data analysis and ensure that up-to-date data on permanent infrastructure and non-permanent disturbances (such as harvest and tertiary roads) are considered.

Additionally some work has been begun to examine stratifying forest age and accessibility due to road condition and state. This fine detail examination considers the functional intactness of new and healthy forest that is no longer accessible due to abandoned or otherwise naturally decayed road networks. This information is currently used as an underlying map layer to the Global Forest Watch data set to better help reflect the current state of the forest as a whole.

3. The quality of the forest is examined both within the unfragmented forest landscapes identified in steps 1 and 2 and the areas of forest considered, by the analysis to be fragmented. The unfragmented forests have been examined on the basis of the proportion of late seral forests. The remaining forest area is shown as an underlying data layer that stratifies primary (age greater than 60 years) and secondary (age less than 60 years) forest in comparison to an accessibility factor of high or low based on age and state of forest access roads. This approach provides a clearer picture of the current forest condition, as a whole, and introduces discussion around the concept of ‘functionally intact’ forest.

Thresholds for Assessing Large Landscape Level Forests at Multiple Scales

Globally significant large landscape level forests are unfragmented forest landscapes > 500,000 ha. This size threshold for an unfragmented forest landscape is within the range of values in the scientific literature for a single area to maintain viable populations of native species (Gurd *et al.* 2001⁷). Forest quality criteria are not required for unfragmented forest landscapes of this size.

Nationally significant large landscape level forests are unfragmented forest landscapes between 250,000 – 500,000 ha and should include between 20% to 30% old growth. Gurd *et al.* (2001) provide a range from 270,000 ha to over 1 million ha for a single protected area to maintain a viable population of native species. In the eastern boreal forest, with a fire cycle > 100 years, there is general agreement that roughly one third of

⁷ The species-area estimates in Gurd *et al.* (2001) are for the Algonquonian-Alleghenian mammal province.

stands (more than 33%) would be older than the fire cycle (Bergeron et al. 1999). Hence, a requirement for 20-30% late seral is credible given that the age for determining late seral may exceed 100 years.

Regionally significant large landscape level forests are unfragmented forest landscapes less than 200,000 ha and larger than 50,000 ha and should include > 30% old growth to be considered HCV. For this assessment, a threshold of 50% old growth was used as a guide for determining HCV in unfragmented forest landscapes of this size.

Assessment Results:

1. Unfragmented forest landscapes based on coarse-scale permanent infrastructure data

The best available coarse-scale roads and line data (railways, pipelines, hydro lines, and other utility lines) were used to assess forest block sizes within the GCF and within the broader ecodistricts (3E-5, 3E-2, 3E-1). The northeast portion of the GCF was not included in the analysis as it connects to the northern unfragmented and unallocated forest. The results are summarized below and illustrated in Map 10.1.

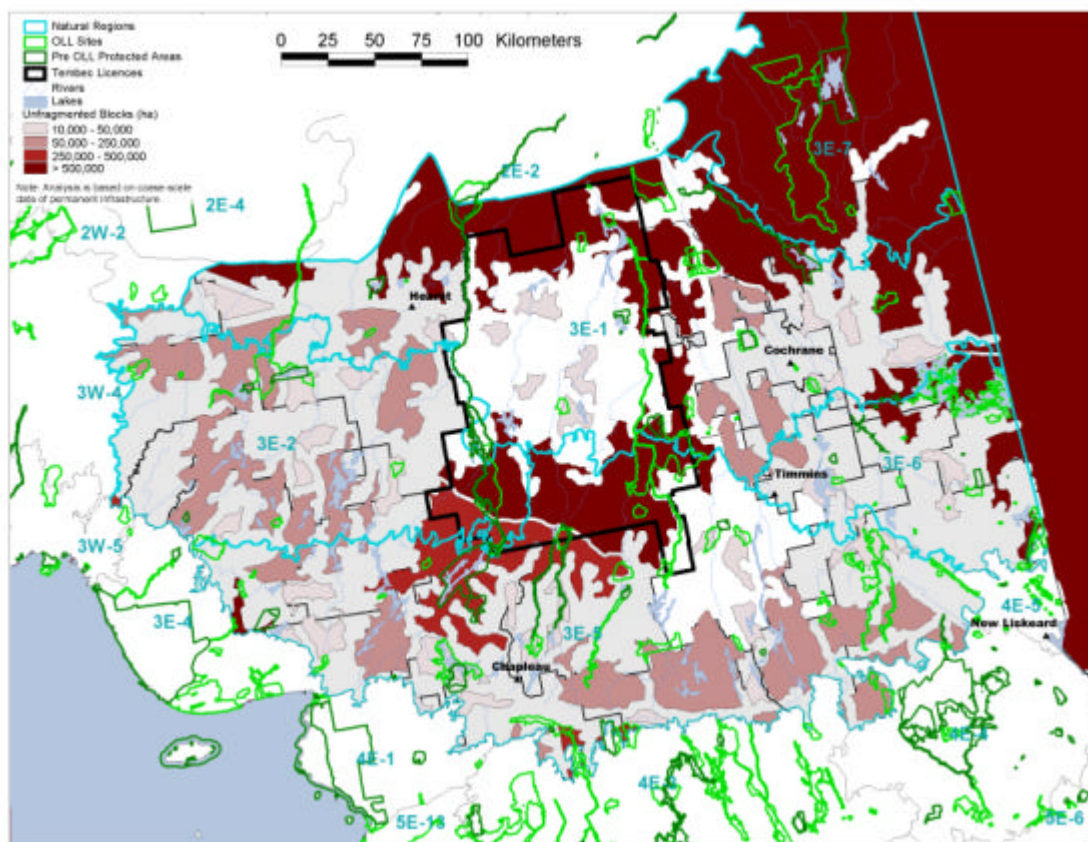
- ?? Of the 10 largest blocks in the 3 natural regions, 2 occur within or intersect the GCF. These two forest blocks are the largest and third largest blocks within the 3 ecodistricts (540,000 ha and 390,000 ha). These two forest blocks are adjacent to one another and are separated by a railway.
- ?? In addition, the northeast portion of the GCF is connected to the unfragmented (and unallocated) forest to the north. In this way, the GCF includes or is connected to 3 of the 4 largest forest blocks within or intersecting the natural regions.
- ?? Only a small portion of the second largest forest block (490,000 ha) occurs in ecodistrict 3E-5. Most of it occurs to the south. Hence, the largest potential intact forest blocks in the affected natural regions (3E-1, 3E-2, 3E-5) intersect the GCF.
- ?? The distribution of block sizes is roughly similar for the GCF and the surrounding natural regions.
- ?? The remaining areas within the management unit are predominantly new and maturing forest classified as either primary or secondary forest that is accessible or non-accessible.

2. Comparison of unfragmented forest landscapes in the Gordon Cosens Forest based on coarse-scale and fine-scale data.

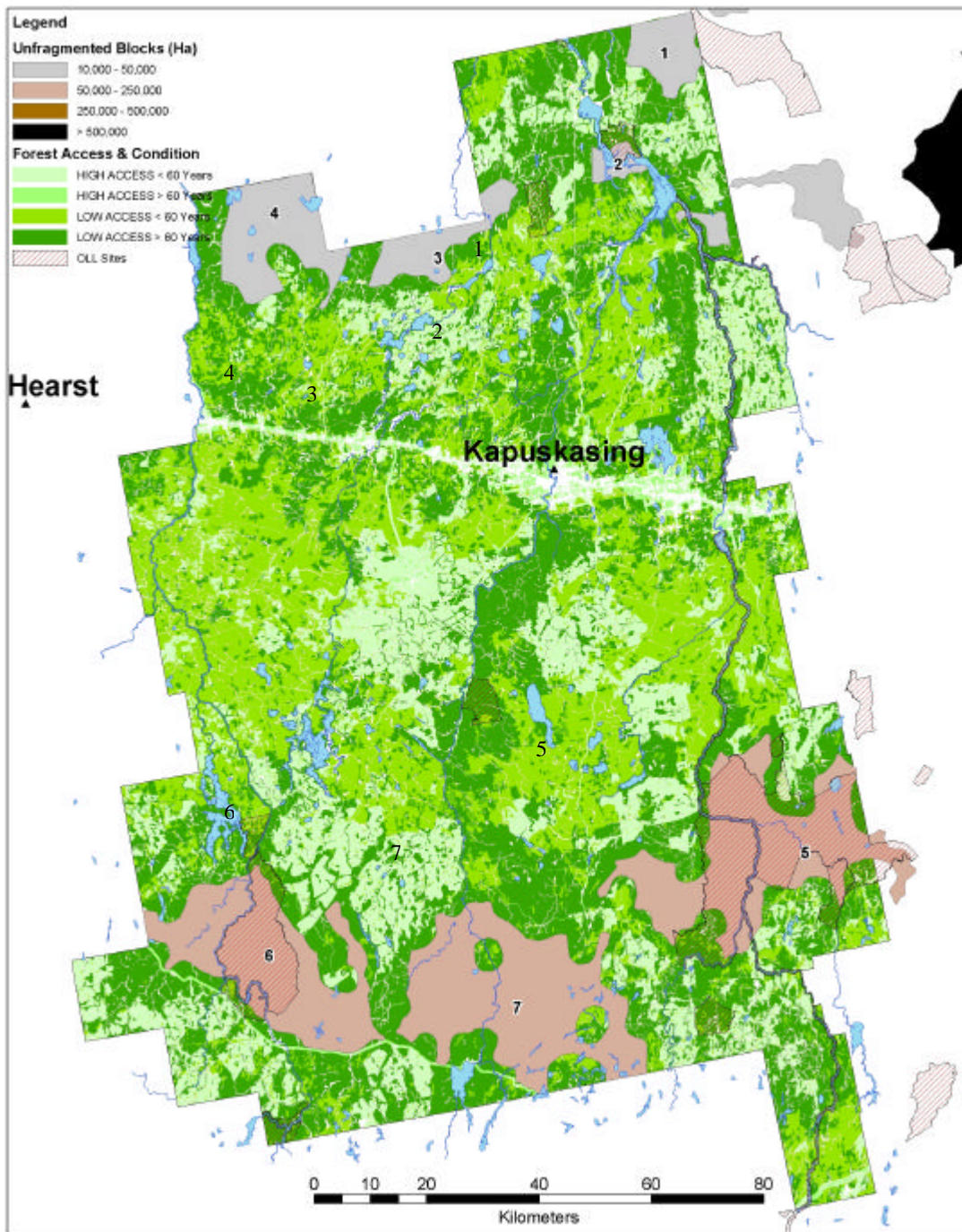
More detailed roads and lines data available from Tembec Inc. indicates that the largest unfragmented forest landscape is approximately 81,000 ha and there are 7 potential large landscape level forests larger than 10,000 ha. Map 10.2 shows the distribution of the 7 potential large landscape level forests (labelled Block 1 to Block 7) overlain on a preliminary analysis that stratifies accessed and non-accessed primary and secondary forest across the landscape.

3. Forest quality within the unfragmented forest landscapes examines mature (old growth) forests and within the fragmented forest considers the functional intactness of new and maturing to mature forests and reduced access due to road degradation.

In general, remaining mature forest (old growth) in the GCF coincides with the largest unfragmented forest landscapes. In fact, stands defined as between 100-150 years comprises up to 60% of the area of two unfragmented forest landscapes (forest landscapes 5 and 7 in Table 10.1), it should be noted that for the most part stands in these age ranges are predominantly spruce and that, as these stands approach the top end of this range, they begin to exhibit significant increases in mortality with a subsequent increase in forest succession.



Map 10.1: Unfragmented Forested Landscapes in Ecodistricts 3E1, 3E2, 3E5, 3E6 and 3E7 (note: data within the 10,000 to 50,000 classification, outside of the Gordon Cosens Forest has not been verified with current forest harvest records).



Map 10.2

Unfragmented forest landscapes in the Gordon Cosens Forest based on fine-scale data. Fine-scale data may include non-permanent human-caused disturbances. Remaining forest area classified to accessibility and age greater or lesser than 60 years.

Table 10.1 Assessment of forest condition of unfragmented forest landscapes based on the proportion of mature (old growth) forests.

Forest Landscape	Area (ha) of Forest Landscape	Age Class 100-150 year		Age Class 150-200 years	
		Area (ha)	Proportion (%)	Area (ha)	Proportion (%)
1	35,235	6,342	18	0	0
2	10,126	3,949	39	0	0
3	14,835	297	2	0	0
4	29,508	295	1	88	0.3
5	80,599	47,553	59	0	0
6	64,533	32,912	51	0	0
7	81,390	48,834	60	0	0
Totals	316,226	139,421		88	

HCV Designation Decision

Three of the unfragmented forest landscapes located in the northern portion of the GCF (areas #1, #3 and #4) are associated with a larger unallocated forest located to the north of the management unit that, based on coarse scale analysis, appears to exceed 500,000 hectares. These areas are considered to be potential HCV areas..

Area #2 is approximately 10,000 ha and includes over 30% old growth, this does not exceed the HCV threshold selected for this ecosystem, however at this time this should not preclude the area from being considered as a potential HCV.

Areas #5, #6 and #7 exceed the selected thresholds based on the size of the unfragmented forest landscapes (> 50,000 ha) and the proportion of the area in old growth stands (>50%) and therefore are considered potential High Conservation Values.

The Ontario Living Legacy process has identified a number of sites on the Gordon Cosens Forest that overlay areas #2, #5, #6, and there are additional sites that overlay areas that are considered to be functionally intact due to low access, forest structure, and ages greater than 60 years.

As part of the identification of High Conservation Value for unfragmented and functionally intact forests, on the Gordon Cosens and other units managed by Tembec, WWF and Tembec have been actively participating in the development of a deferral process. The goal of this process is to develop a managed approach to maintaining representative areas across the landscape and will, in conjunction with the forest management planning process in Ontario identify HCV areas through consultation with stakeholders in coordination with Government initiatives (such as OLL).

Next Steps in the Determination of Large Landscape Level Forest HCVs:

In addition to seral stage distribution, consideration of suitable habitat for focal species provides another aspect of forest condition. Two provincially featured wildlife species, pine marten and moose, are found on the forest. Both of these species have a significant presence. Management of forest cover for these two species also maintains habitat for a wide variety of other wildlife species.

Pine marten (*Martes americana*) was elevated to the status of “a provincially featured species” by the Environmental Assessment Board’s Decision on Timber Management on Crown Land (April 1994). The board directed that guidelines be prepared to manage for marten habitat in the boreal forest. These guidelines have been considered in the approach to managing for marten that has been developed in this forest management plan.

Marten appear to prefer mesic coniferous forests that exhibit complex physical structure near the ground, along with a number of attributes that are generally found in the latter stages of forest succession. This hypothesis is currently being examined through studies of younger forests which also exhibit the types of structure marten appear to prefer as trappers on the forest indicate healthy marten populations in these areas.

The Forest Management Guidelines for the Provision of Marten (1996) have been implemented in the current forest management plan. The target is to maintain on the landscape 10 to 20 percent of the forest, which has the capability to support pine marten, in suitable conditions arranged in core areas between 30 and 50 square kilometres in size, with a minimum of 75% of core habitat being comprised of suitable stands.

In the current forest management plan, marten core areas were distributed across the forest and wherever possible these areas were linked to one another by riparian reserves, Ontario Living Legacy areas, biodiversity leave areas and other uncut areas to create travel corridors for marten. Individual core areas will be re-assessed as part of the next forest management plan for the Gordon Cosens Forest. Core areas will move around the landscape over time in response to changes in forest composition, structure and age. As shown on Map 3.1, marten habitat is well distributed on the GCF.

HCV3) Forest areas that are in or contain, rare, threatened or endangered ecosystems.

This type of HCV attribute identifies forest ecosystems that occur in very limited amounts, either due to natural rarity, or due to past development having disturbed major portions of their former range. These may often overlap with those types defined above due to concentrations of endemic or endangered species, and will vary widely with regard to the scale at which they are defined.

14) *Are there forest ecosystem types within the management unit or ecoregion that have significantly declined?*

Rationale:

This attribute is intended to assess whether or not the forest ecosystem types within the management unit or ecoregion have significantly declined.

Assessment Methodology:

For this attribute, both the COSEWIC data and the various maps provided by the World Wildlife Fund in conjunction with the Terrestrial Ecosystems of North America (Ricketts et al.) were examined. Historical (1946-1969) and current (1972-2000) information on

stand type composition for the forest presented in Figures 10.1 and 10.2 were also used to assess this indicator.

Assessment Results:

According to Ricketts et al. (1999), approximately 92.7 % of the GCF rests within the Central Canadian Shield Forests with remaining 7.3 % lying within the Eastern Forest/Boreal Transition. The Central Canadian Shield Forests are identified as bioregionally outstanding and relatively stable while the Eastern Forest/Boreal Transition is considered to be nationally important and vulnerable.

As presented earlier in Figures 10.1 and 10.2, there has been very little change, at the management unit level, in broad forest type or working group between 1946-1969 and 1972-2000. Some minor changes that have occurred can be attributed to land base changes (i.e. amalgamation of the Kapuskasing Management Unit) and forest resource inventory updates.

White pine, red pine and black ash have been discussed earlier in the report and while it is unclear if these species have declined from historical levels they have already been designated HCV attributes under Indicator #4.

HCV Designation Decision:

The analysis of changes in species composition on the GCF suggests that the forest ecosystem types on the GCF have remained relatively stable over the last half a century or more. As effective active fire suppression in the region did not commence until the 1930s, the forest composition characterization in 1946 is considered to be relatively "natural". As a result, this indicator has not been designated a HCV attribute on the GCF.

15) *Are there regionally/nationally significant diverse or unique forest ecosystems?*

Rationale:

The rationale for assessing this attribute is to examine vulnerability, species diversity and significant ecological processes in terms of significant diverse or unique ecosystems.

Assessment Methodology:

As per Indicators 4 and 14, locally and regionally unique stands of white pine and red pine and black ash have already been identified as HCV's.

At present, all of the Areas of Natural & Scientific Interest (ANSIs) in the region identified in the past by the OMNR have been included in the new OLL candidate protected area sites and designated as HCVs.

The only infrequent surficial deposit type that may promote unique vegetation assemblages is the Oates Dunes (Leach 1998, based on Brown and Breare 1972) covering parts of the townships of Ossin, Loughheed, Oates and Shenango and is windblown sand dunes that have never been overridden by any other material.

HCV Designation Decision:

As discussed under indicator 4, concentrations of black ash and white and red pine have been designated HCVs on the GCF due to their uniqueness on the management unit.

The Oates Dunes could be considered a potential HCV depending on whether the area supports relatively unique vegetation assemblages in comparison with majority of the Clay Belt.

**HCV4) Forest areas that provide basic services of nature in critical situations
(e.g. watershed protection, erosion control)**

This type of HCVF identifies forests that are critical in providing indirect ecological or environmental benefits. The following points address criteria that may be helpful in identifying the basic services of nature provided by the forest in critical situations.

16) *Does the forest provide one or more of the following basic services for people, communities or societies: water supplies for human use; stream flow regulation; soil, or terrain stability (erosion, sedimentation); fire barrier or prevention; and control of wind.*

Rationale:

This attribute looks at the potential impact on human communities with respect to catastrophic impacts that may affect the basic services of nature with respect to water quality, soil/terrain stability, fire protection and wind control.

Assessment Methodology:

This attribute was assessed by looking at number of sources of information including: Tembec's Environmental Management System, resource management studies, economic development studies, past/current forest management plans, district land use plans and regional land use plans.

Assessment Results:

The GCF provides many basic services for local people and communities. The quality of these basic services is maintained through the various resource management plans that are in place.

The GCF is relatively flat with little difference between upland and lowland areas, therefore the risk of erosion and slope stability is minimal. Where high/steep riverbanks with unstable slopes have been encountered (on the Nat River), alternative routes have been selected to ensure water quality and soil/terrain stability has been maintained. Large wetlands do play a critical role in water filtration and river recharge for water supplies of local communities, therefore it is important that steps be taken to mitigate potential impacts on water quality due to siltation or other events. On the GCF, a number of strategies have been identified in the current forest management plan to maintain water quality including the establishment of reserves, the width of which is based on the slope of the stream bank or lakeshore. In the case of trout streams and cold water lakes, critical fish habitat and headwaters, these reserves are continuous and treed. Timber harvesting may occur along up to one-half of the shoreline on warm water lakes and streams provided that adequate protection is in place for fish habitat and other values. Forest operations are carried out in a manner that avoids damage to banks, keeps logging debris away from streams and prevents the occurrence of significant erosion.

During construction of water crossings, it is expected that there may be some temporary impacts on water quality and fish habitat. These impacts are mitigated using proven techniques which are found in the Timber Management Guidelines for the Protection of

Fish Habitat, the Environmental Guidelines for Access Roads and Water Crossings and the Code of Practice for Timber Management Operations in Riparian Areas. These practices include limiting operations to upland sites, seasonal operations (i.e. winter only), and using high floatation equipment.

Specific measures have also been implemented to provide protection to riparian areas, which are the transitional zones between water bodies and adjacent upland forests. These areas play an ecologically important role in the regulation of light penetration and water temperature, control of sedimentation, maintenance of ground water tables, and provision of food for aquatic fauna.

During planning and operations, all other related legislation is followed and guidelines are considered including requirements stated under the Fisheries Act. In addition, special precautions are taken to ensure that MOE Buffer Pesticide Zones are in place to protect aquatic habitat from aerial tending.

Tembec ensures continual improvement on a range of environmental quality issues through the setting of objectives and targets and implementing associated action plans on its own operations under its Environmental Management System, which is ISO 14001 registered. Harvest schedules are developed based on consideration of site information and current science that utilizes the most appropriate machinery to minimize impact on environmental quality. Specific strategies that have been implemented include limiting operations to upland sites, seasonal operations (i.e. harvesting in winter only), and using high floatation equipment to reduce rutting and other site damage.

HCV 5 and 6) Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Rationale:

This attribute looks at level of dependence of local communities on the forest to meet their basic needs.

These basic needs include subsistence (food, shelter), health (recreational activities, herbal remedies), cultural (pre- and post-settlement sites, travel routes, gathering areas), ecological, economic (remote based tourism, forest industry, mining) and religious/spiritual (native burial grounds, religious sites).

Assessment Methodology:

Information about the non-timber needs of local communities is generally gathered through OMNR NRVIS data sets, Tembec values information, local socio-economic studies and consultation with First Nations and local residents. Information regarding these values and needs is gathered on a continual basis (during and after the development of forest management plans) to ensure that the basic needs of local communities are maintained.

Assessment Results:

In this report the basic needs of local communities are described under the following categories: cultural, recreation/small commercial operations, forestry, and aggregates/mining.

a) *Cultural*

The "Timber Management Guidelines for the Protection of Cultural Heritage Resources" (1991) outlines the methodology to be followed to identify and protect heritage resources in the forest management planning process. Included in the process to identify values is the requirement to "apply and document appropriate site potential models for the management unit (or parts thereof)" and assemble all relevant environmental and cultural data necessary to translate the models into maps showing areas with high potential for heritage resources". This process was followed during the development of the current forest management plan.

Cultural heritage values (native and non-native) that are considered can be broken down into different categories which included cultural landscapes, structural remains, archaeological remains, and traditional use sites. The focus is on human-made heritage resources associated with activities, endeavours, or events of historic (subsequent to contact with Europeans in the area) or pre-historic periods in Ontario. Specific measures are taken to protect these features.

During the development of forest management plans, First Nations cultural heritage values are protected/maintained through consultation with communities that Tembec knows have traditionally used the forest.

Some discussion has occurred regarding traditional native trapping areas. Historically, traditional trapping was associated with families working in areas directly associated with specific waterways that facilitated transportation to and from the traplines. While recent mapping exercises tend to examine and consider broad traditional trapping zones, discussion with native communities is required to better identify the culturally significant components within these zones.

This report identifies that continued consultation with native communities is required around traditional trapping routes in regard to high conservation values.

b) Recreation/Small Commercial Operations

The GCF is used for trapping, commercial baitfish harvest, berry picking, tourism operations that offer hunting and fishing, and recreation such as skiing, canoeing, cottaging, camping, snowmobiling, fishing, and hunting. These activities contribute significantly to the quality of life in Northern Ontario, and forest operations are designed to ensure that these uses continue.

Ontario Ministry of Natural Resources' NRVIS (Natural Resource Values Information System) data sets and Tembec values information are the initial sources of information regarding other uses and users of the forest. These values databases are examined during forest management planning and prescriptions, where required, are developed to maintain or protect these values.

During the development of forest management plans access is always a key issue that must be addressed. Road access promotes various uses of the forest including hunting, fishing, snowmobiling and trapping. Due to the rapid deterioration of unmaintained forest access roads that were constructed for the purposes harvesting, other forest users such as trappers and recreational forest users feel they are losing economic and recreational opportunities as roads are no longer maintained and become impassable for vehicles. As well, in abandoning roads, the bridges crossing the rivers and creeks deteriorate in load bearing capacity over time and must either be removed or reconstructed in some way to serve as access for light vehicular traffic. Loss of access in certain portions of the Gordon Cosens Forest will increase angling and hunting pressure on the limited remaining accessible area. Use management strategies for access roads will be developed in a manner that is consistent with current land use guidelines and intended use for the roads (e.g., primary versus secondary).

Adherence to the biodiversity strategies identified may not on all occasions provide the best possible mitigation of conflicting uses and values on the landscape. Since other users and values are part of the ecosystem, efforts are made to accommodate them.

Other users and values commonly include tourist outfitter operations, cottage developments, and trappers. These groups are consulted during the planning process and prescriptions and road use strategies are developed to alleviate any conflicts that arose. For other types of values (i.e. significant berry picking areas), specific measures are taken to protect those areas.

A total of 102 (native and non-native) partial or full trapline areas fall within the GCF. While trapping brings in revenue to the trapper, many trappers value their work beyond the amount of revenue, as recreation and as a tradition. Because revenues are only part of the value of the resource, and because revenue information is private and not available, revenues are not shown.

Resource-based tourism is distinguished from resource-based recreation in that tourism involves the use of a commercial tourism operator, i.e. outfitter. Resource-based tourism on the GCF includes moose hunting, bear hunting, and fishing. Attempts to attract 'eco-tourists' have met little success. Resource-based tourism is less popular in this area than in more scenic areas of the province.

There are a number resource-based tourism establishments who operate in the GCF. Almost all are either remote (fly-in) or semi-remote (fly-in with restricted use of local roads to access the waterbody). Most of the outfitters have establishments on other Forests as well, notably in Chapleau District. The establishments are concentrated in the southern edge of the GCF, bordering Chapleau District, where the terrain is more scenic and the lakes more productive. The number of employees per establishment is not available. There is no reliable data on the amount of revenue or days of effort for fishing or for moose hunting from tourism establishments. Resource Stewardship Agreements will be established with licence operators during development of the next forest management plan.

The GCF is also used for recreational fishing and hunting. There are several active hunting & fishing clubs in the communities. The people of that live in and around the GCF place a very high value on fishing and hunting and on the unrestricted use of forest access roads built by the forest industry. As forest access roads are constructed, new areas are made accessible for hunting and fishing, and some lakes can be vulnerable to over-fishing. The forest industry is not obliged to maintain roads and water crossings that it no longer requires, and the natural deterioration of them can result in areas being rendered inaccessible. The issue of the creation and maintenance of access roads and water crossings is one of the most important to the people of the area.

Hunting opportunities are abundant on the forest with moose, bear, small game and waterfowl representing the most important species. Hunting is permitted in most areas except for provincial parks and the Chapleau Crown Game Preserve.

c) *Forest Industry*

A socioeconomic profile, describing the social and economic context within which forest management decisions are made, was prepared for the current forest management plan. This profile described a range of social and economic factors of dependent communities, wood-using mills, and the primary users and uses of the forest. It was derived from the most recent census of population, mill returns, and other district information.

In order to understand the effects of forest management activities on the social fabric, it is necessary to identify all communities that will be directly affected by the operations. This profile included communities which are within the bounds of the Gordon Cosens Forest, or which contain mills that obtain more than 10% of their fibre supply from the Gordon Cosens Forest.

The following communities were included in the profile:

- ?? Kapuskasing
- ?? Hearst
- ?? small communities from Calstock to Strickland
- ?? Timmins
- ?? Englehart

The major consumptive use of the Gordon Cosens Forest is commercial timber harvest. The mills and forest companies that are supplied from the Gordon Cosens Forest are shown in Appendix 1, along with any timber commitments and current allocation levels.

The following table summarizes production by product and sources of Crown fibre for each wood-processing mill that receives roundwood from the Gordon Cosens Forest. The number of employees refers to mill and office employees, and may include harvest operation employees, but not contractors.

Mill	Employees	Product	Production
Spruce Falls Inc - studmill, Kapuskasing Spruce Falls Inc – newsprint, Kapuskasing	1000 in paper mill, studmill, woodlands	stud grade lumber newsprint, specialty paper	105,000 Mfbm – 1998 377,000 tonnes - 1998
Excel Forest Products, Opasatika Lecours Lumber Company Ltd., Calstock	113 200	SPF lumber SPF lumber	9,439 Mfbm – 1998/99 104,000 Mfbm – 1997/98
Tembec- Hearst Tembec –Timmins St Mary's Paper, Sault Ste Marie	425	SPF lumber SPF lumber Supercalendared paper	budget: 230,000 tonnes/yr
Levesque Plywood(Columbia), Hearst		Po plywood; also lumber	120,000Mft2(3/8) 8,500 Mfbm average annual
Grant Forest Prod – Timmins Grant Forest Prod – Englehart Norbord Industries Inc, Cochrane	n/a n/a 220	Oriented Strand Board Oriented Strand Board Po plywood	n/a n/a 80,000 Mft2 in 1998/99
Cayouette Cabinets, Moonbeam White Cedar Products, Moonbeam	10 seasonal	cabinets, flooring, etc cedar lumber	n/a

6.0 Summary

Based on the analysis that was undertaken on the Gordon Cosens Forest, it is apparent that some HCV attributes do exist on the forest. These attributes include woodland caribou, black ash, edge of range or outlier species such as white and red pine, regionally rare species (Lake sturgeon), and protected areas. In addition, potential HCVs were identified in cases where the HCV thresholds are not clearly exceeded or where ongoing discussion is required in keeping with the legal requirements of Ontario.

Specific management objectives and strategies for the maintenance and/or protection of these HCV attributes exist in the current forest management plan for the GCF and monitoring programs for evaluating changes in these attributes and assessing management effectiveness are already in place. Any further development of special management approaches and monitoring programs that are not presently identified in the current forest management plan will occur during the development of subsequent plans based on consultation with appropriate stakeholders and First Nations.

Continual monitoring of NRVIS and COSEWIC databases will occur on a periodic basis to ensure that information is up-to-date and accurate. If a species that is identified on the COSEWIC is found, specific prescriptions consistent with appropriate guidelines will be developed to protect the critical habitat of those rare, threatened or vulnerable species that are found on the Gordon Cosens Forest.

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