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High Conservation Value Forest in the Mistik FMA Area

An assessment of forest values and their conservation in the Mistik FMA area from a global, national, and regional perspective based on the Forest Stewardship Council's Principle 9

Version 1.4 2009 June 1

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Executive Summary

A 'High Conservation Value Forest' assessment undertaken for the Mistik Management Ltd. in accordance with Principle 9 of the FSC principles and criteria and the National Boreal HCVF Framework for Canada resulted in seven HCV designations. Some of these seven are umbrella values underlying HCVs, most notably the "Areas adjacent to surface water" HCV includes riparian, cultural, erosion control, and other values. The HCVs in Table 1 that are numbered from 1 through 7 are the primary HCVs designated by the Mistik forest managers.

Table 1. Identified High Conservation Values on Mistik FMA. (Primary HCVs are preceded by the acronym "HCV").

Element	Description of Values	Designation
Category 1 Biodiversity values		
1.	Species at Risk SAR	HCV Woodland caribou habitat and Wolverine (grouped w Caribou) HCV Rare plant species ; HCV 6 Spp of Listed Birds
2.	Endemic Species	None
3.	Critical seasonal habitat	Woodland Caribou habitat (grouped w Caribou discussed in element 8)
4.	Critical regional habitat	None
5.	Edge of range spp.	None
6.	Conservation areas, PAs	HCV Protected Areas
Category 2 Landscape Level Forest		
7.	Landscape Level Forest	HCV Large core areas
Category 3 Rare, Threatened Ecosystems		
8.	Rare ecosystems	HCV Late seral stage forests Woodland Caribou Habitat , Wetlands (Grouped w HCV Areas adjacent to surface waters).
9.	Declining Ecosystems	HCV Late seral stage forests
10.	Residual intact forest -see 7	None
11.	Significant unique ecosystems	None
Category 4 Basic Services of nature		
12.	Drinking water	None
13.	Mediating water flow	Wetlands (Grouped w HCV Areas adjacent to surface waters)
14.	Erosion control	Drainage (Areas high slope class > 30%-- Grouped w HCV -- Areas adjacent to surface water)
15.	Fire breaks	None.
16.	Benefit to fisheries and farms	None.
Category 5 Needs of Communities		
17.	Community economic need	Wild rice harvesting areas (grouped w HCV -- Areas adjacent to surface water)
Category 6 Community Tradition and Culture		
18.	Sites cultural social significance	HCV High cultural and traditional use areas ; Waterways (grouped w 7)
19.	Overlap of values	HCV Areas adjacent to Surface Waters

Acronyms

CMB	Co-management Board
FMP	Forest Management Plan
EMS	Environmental Management System
ENGO	Environmental Non-government Organizations
HCVF	High Conservation Value Forest
HCV	High Conservation Value
LLF	Landscape Level Forest
MFMA area	Mistik Forest Management Agreement area

MLTC	Meadow Lake Tribal Council
SAR	Species at Risk
VOIT	Values, objectives, indicators and targets (from CSA system)

Reading this document – An HCVF assessment is primarily a communications document. It brings together all of the values information in one location to allow for a fair assessment of what is true High Conservation Value. To accomplish this, there is a very heavy reliance on many other documents. Most of these are accessible on the internet, and URLs for most are included in this report. If the reader wishes to fully access these, this report should be read on a computer with a high speed internet connection. Here is some guidance on accessing the supporting documents:

- The document is provided in either WORD 2003 format or PDF because these are the most widely available and functional format.
- Some web documents are as large as 30 megabytes (such as the Forest Management Plan documents and maps). They may take a minute or so to download over a 1 meg / second connection.
- To access URLs in footnotes, double click on the footnote number. If you wish to see the document, click on the URL. After reading the footnote, to return to your place in the text, double click on the footnote number that precedes the footnote text.
- References are provided in several formats: URLs are provided for key documents in footnotes, and have been verified as of the date of this report; a citation list is provided for general scientific papers not available on line, and other papers of general interest, some documents are listed under “assessment methodology” within each element. Some redundancy has been allowed to make this document as communicative as possible.
- This document contains few maps and illustrations because the linked documents provide graphical information. This was a deliberate decision. Comments are welcome on whether more maps and illustrations would help the readability of the document for the next version.

Acknowledgements:

The authors of the current version of this report are indebted to the authors of the two previous HCV reports, the new FMP, and two key documents by Alpha Wildlife Research and Management Ltd and Ecomark Ltd. Text and ideas from all of these have been liberally quoted or paraphrased and credit given.

Overview of HCVF Assessment

Mistik Management Ltd. is a woodlands management company based out of Meadow Lake, Saskatchewan providing timber procurement and forestry services to NorSask Forest Products Inc. and Meadow Lake Mechanical Pulp Inc. Mistik is dedicated to the sustainable use and stewardship of 1.8 million hectares of boreal forest in northwest Saskatchewan, the Mistik Forest Management Agreement area (FMA area) (<http://www.mistik.ca/index.htm>).

Mistik Management Ltd. role is providing wood procurement and forest management services for NorSask Forest Products Inc. and Meadow Lake Mechanical Pulp Inc. Mistik recognizes the growing demand in the marketplace for third-party verification of well-managed forests. In response to this marketplace demand, Mistik has achieved certification (November 2007) of its Forest Management Agreement (FMA) Area to the Forest Stewardship Council (FSC) Canada's National Boreal Standard (August 2004).

Part of the certification process was an audit by KPMG in September of 2007 (http://www.mistik.ca/mistik_in_the_media.htm), which identified the requirement for the managers to complete an assessment of High Conservation Value Forest (HCVF) using the definition of the Forest Stewardship Council's Principle 9. The audit context for this HCVF assessment is central to Mistik's commitment and the purpose for this report. This context is discussed in detail in Appendix 2. HCVF Report Revision directed by FSC assessment.

According to the definition, High Conservation Value Forests are those that possess one or more of the following attributes:

- Forest areas containing globally, regionally or nationally significant:
- Concentrations of biodiversity values (e.g., endemism, endangered species, refugia); and/or
- 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.
- Forest areas that are in or contain rare, threatened or endangered ecosystems.
- Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).
- 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).

This assessment of HCV is guided by the "High Conservation Value Forest National Framework", which is Appendix 5 of the FSC Canadian National Boreal Standard¹.

Understanding HCVF on public land in Saskatchewan requires an understanding of the provincial approach to non-timber forest values. The Mistik FMA area is a large forest, publicly owned through the government of Saskatchewan and, by Canadian standards, fairly intensively used by the forest residents and visitors from the south. The scale of the forest alone pushes the requirements for HCVF analysis to a high level as described by the HCV National Framework (Section 4 - The issue of scale "...from large areas to single stands or ecosites..."). Current provincial forest policy addresses a wide range of values using policy documents, or resource guides for special values, and the background information for the FMP² and the FMP³.

¹ Forest Stewardship Council Canada Working Group. 2004. National Boreal Standard, Version August 6, 2004. URL: <http://www.fsccanada.org>

² Mistik 2007 FMP Vol I - Background Information Document.pdf (13252.2 KB) – available at <http://www.mistik.ca/fmp.htm>

³ Mistik 2007 FMP available at <http://www.mistik.ca/fmp.htm> or directly <https://www.isogis.com/isogis/dbv.do?id=11m682gbwa4kim&companyCode=mistik>

The role of the FSC HCVF process is to ensure that the regulated provincial planning and forest management system meets a global standard. There is no intention of revising the Saskatchewan terminology, which is well developed and familiar to the local residents. The public consultation process has been based on the use of local terminology rather than the FSC terminology. It is the responsibility of the managers to ensure that the full FSC meaning of HCVF is conveyed to the forest management planning (FMP) process.

Mistik regards all of the FMA area to have conservation value. Environmental values are often prominent in conservation, and they figure prominently in this HCV analysis. But also, by definition, a forest has “high” conservation value when “local communities use the forest for their basic needs or livelihoods.” This is no doubt the case for most of the Mistik FMA area. This forest has been the mainstay of aboriginal populations for millennia. Today, loggers, trappers, outfitters, and many others are economically dependent on it. As a result, extensive ongoing consultation is required, by law and common sense, even though compromise and difference of opinion are routine. To this end, the Proforest^{4 5} HCVF Toolkit makes an important point on the often difficult process of distinguishing between HCVs and non-HCVs:

“Although some values may have simple yes/no alternatives, many will be measured on a continuum of gradually increasing importance. This means that, although defining HCVF should always be based on the best available scientific information, the decision on the threshold level at which a ‘value’ becomes a ‘High Conservation Value’ is inevitably a value judgment”.

In assessing HCV for the MFMA, the managers have been quite inclusive in their approach in keeping with the FSC Principles & Criteria and the precautionary principle. Because of the sensitivity around HCVs, “netting down” of HCVs was the main challenge of this report. Mistik and the Saskatchewan Ministry of Environment biologists, planners and foresters responsible for HCVF do not claim the prescriptions and approaches are perfect, but they have been thoughtfully prepared, and are operationally sound. The managers are always open to reconsidering any of the approaches to managing HCVs.

The HCV conundrum... to designate or not to designate

An argument has been made that HCVs should be assessed on the merits of the value alone. Rareness, Social value, Historical value – managers should follow the strict definition of the FSC standard and the framework. The ability of the manager in question to affect control over the value, regardless of risk, is not relevant. This presents a conundrum.

Based on a cursory review of the value, lots of values may meet the threshold under some circumstances. The Whooping Crane should be a straight forward designation as an HCV, but it crosses North America from north to south and back, touching many locations. All of those locations are, by definition, Whooping Crane habitat. Is this entire habitat HCV? The imprecise use of language and imprecise habitat information cause confusion. Whooping Crane critical habitat is an HCV, but most people simply refer to Whooping Cranes as HCVs. And of course because we often do not know precise locations for critical habitat, it is reasonable to refer to a species in lieu of habitat. The HCV (Framework (NBS Appendix 5) in element 1, identifies “SAR or potential habitat of SAR”. The accompanying framework guidance sets the value as definitive HCV (a mandatory HCV) if the species is “representative of habitat types naturally occurring” in the forest. Later the framework guidance section also asks if the species have “sensitivity to forest operations”. This is a mixed message -- what exactly are the criteria are for designation? The framework is being pragmatic, as all of these factors should be considered by the manager.

So ideally, managers will define locations of specific critical values as HCVs. Mistik has taken the approach of identifying the HCVs broadly; consistent with the intent of the standard, even though in some cases there is a minimal management requirement (Phase 2 discussion).

⁴ N Judd, R Nussbaum, S Jennings, T Evans. 2004. HCVF Toolkit: Part 2, Defining High Conservation Values at a national level: a practical guide. Proforest, Oxford. URL: <http://www.proforest.net/publication/pubcat.2007-01-19.4709481979>.

⁵ Rayden, T. 2008. Assessment, management and monitoring of High Conservation Value Forest: A practical guide for forest managers. Proforest, Oxford. <http://www.proforest.net/publication/pubcat.2007-01-19.4709481979>.

Real risk is important to the value, and it is the reason for the precautionary principle in the FSC standard (see NBS glossary¹). Managers must be held responsible if they introduce real risk to the values or to critical requirements. As such the HCV precautionary approach is applied directly by the managers where they introduce real risk. To mitigate this risk they must assess a broad range of HCVs and adopt precautionary management for those in the scope of their management. But they are not held accountable for HCVs which they do not introduce risk, and are not within the scope of their control. We note that *indirect* risk can still be introduced, for example by increasing access. This is a real risk and, even though it is indirect, it requires a precautionary approach.

Other resource users may introduce risk. Other users may use the same list of HCVs and have a different set of values to which they must apply the precautionary principle. In this report, consistent with the HCV approach world wide, we have focussed on identifying HCVs broadly and preparing prescriptions for any real risk introduced and under the control of the managers.

In short, although managers must assess a broad range of values and may come up with a long list of designated HCVs, they must determine which HCVs they have some responsibility for and develop a precautionary management approach. The precautionary approach, as defined in the FSC standard⁶ (glossary), in practical terms means that:

- the value will be the primary objective for management in the HCV area,
- management avoids action that may lead to irreversible changes to ecosystem function and resilience.
- alternative strategies are developed, including no management, that are least likely to impair viability of species or ecosystem
- prescriptions must be shown to be effective through monitoring and prior evidence

Purpose and Audit Context

The purpose of this report is to describe how Mistik's approach to HCVF is in alignment with the current FSC approach to HCVs in the boreal forest. This report will attempt to communicate Mistik's efforts to safeguard HCVs, and how the FSC requirements are met.

HCVF as a concept has evolved quickly and fairly significantly, since the inaugural standard, when Principle 9 was solely concerned with old growth forest. It has attained a life of its own, outside of FSC. The concept continues to evolve based on experience in the world and in the boreal forest. The purpose of this report is to meet the conditions of the 2007 audit, and provide a document that can communicate the sometimes arcane language of HCVF into a form that is locally meaningful in the Mistik FMA area. In this section we review that context, because it has a significant influence on the structure of the report that follows.

The company has built their approach to HCVs over a long time period. Before the advent of FSC or HCVF, Mistik was managing for "other values" based on expert opinion as available, under the supervision government agencies mandated by the law using the science available and expert advice. This was done outside of the FSC context. FSC guidance for HCVFs has provided a more international language and increased the scrutiny for assessing values and monitoring the management standards.

In summary the development of the current approach to HCVs has developed as follows:

- Pre FSC "non timber values" management, overseen by government
- Ecomark Ltd. 2006 HCVF Summary report. HCVF report, Version 1.
- Alpha Wildlife Research and Management Inc. 2006 prepared management guidelines for animal species at risk in the Mistik FMA area.

⁶ Note: This approach is stronger than that in the Rio Declaration (1992, Principle 15, Agenda 21) which only refers to lack of scientific certainty: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. "

- Review of report by three environmental groups
- Mistik HCVF summary report, with revisions and additional HCVs. HCVF report, Version 2
- KPMG audit report with HCVF conditions
- This report. HCVF report updated, Version 3.

Some observers have noted that the FSC standard does not actually specifically require an “HCVF report.” Instead the standard directs managers to include HCVF management requirements in the forest management plan. The plan is the legal and guiding document, so it is sensible to always defer to the plan. We note that due to the regulatory and oversight role of the FMP on public land, governments may not always accept all of the monitoring requirements of HCVs as part of the FMP. The company is still responsible for these HCVs, and the HCVF report is a useful document to track the full FSC requirements.

Due to the complexity of the plan, and the demands of the FSC audit process, it is also sensible to have an HCVF report. The purpose of the HCVF report is to communicate in a clear manner the management strategies for the important values on the forest. It also provides the audit team with evidence that the managers have understood the HCVF principle and have implemented it effectively.

During the audit of Mistik in 2007, the auditors identified some shortfalls in the HCV reporting and these were made a condition of the certificate. In Appendix 2 we have listed the elements of the condition and describe the corresponding changes to the HCVF report.

Methodology

HCVF National Framework (Canada)

The National Framework provides a description of the approach used and guidance for assessing HCVF. The official version of this framework for all forest regions is the National Boreal Standard Appendix 5. There are four parts outlined that follow the FSC P9 requirements, which require that management activities in HCVFs “maintain and enhance the attributes which define such forests”. The four criteria are:

9.1 requires an assessment to determine the presence of attributes consistent with HCVFs (as presented in the definition above).

9.2 is guidance to certifiers on the consultative portion of the certification process (does not normally require further interpretation, indicators or verifiers).

9.3 requires a precautionary level of management and activities that ensure the maintenance or enhancement of High Conservation Values

9.4 requires monitoring the effectiveness of the management and activities implemented.

Phase 1 -- Assessment for HCVF Attributes (9.1)

Within the first phase, or the assessment phase (criterion 9.1), a list of questions are provided in the National Toolkit to determine whether individual attributes are HCVs. The following sections answer these questions, or come to a conclusion that a species is HCV. For each value the managers, with some expert consultation, have attempted to define thresholds for designating a High Conservation Value. Thresholds are levels, numbers, types or locations. Thresholds can relate to the number of species from a particular taxonomic group, a minimum size of a forest type, or the presence of a particularly important species.

During assessment, values are designated as HCV, not HCV, or possible HCV.

- HCV – follow guidance of P9 for management and monitoring
- Not HCV – follows guidance of P1 to P8 for management and monitoring
- Possible HCV – no locations are known to the manager although the value likely occurs on the forest.

Consultation (9.2)

There are four components to the HCVF consultation, consisting of:

- General Consultation – A broad review, based on the FMP process, to determine forest values generally in the Mistik FMA area which will include as a minimum individuals, First Nations, Community representatives, local stakeholder representatives including the Co-management Boards, Citizen’s Advisory Groups,
- Technical – Consultation with technical experts about species, ecosystems or values that are HCVs
- Stakeholders and First Nations – A focused review by regional and provincial stakeholders of the values and the management approach⁷. First Nations have been asked for comment.
- Open door policy – new HCVs and new management approaches will be assessed at any time, bearing in mind that consultation with other interests is required before modification.

General Consultation

The broad review and public consultation described in the first bullet point, is documented in detail as part of regular Saskatchewan FMP process (<http://www.mistik.ca/fmp.htm>), as part of the public record, and in the plan. This will also serve as part of the HCVF documentation process. In general during the course of a year Mistik participates in about 130 to 150 scheduled meetings (Table 2) with aboriginal groups, stakeholders, and other partners (not including those with a business relationship). Discussion of “forest values” in general is central to these meetings.

Table 2. Mistik FMA area meetings with aboriginal groups, stakeholders and others (approximate) per year, based on FMP Table 14.2.

Native, Stakeholders, Partners, and Other Groups	Group Description	Meeting Description	# of Mtgs / yr
1. Advisory / co-management boards	Local community-based groups representing a broad spectrum of stakeholder interests including cabin owners, recreational users, environmental groups, outfitters, trappers, elders, contractors, local gov't. officials, wild rice growers, municipalities and traditional resource users.	The following is a list of the groups: 1. Divide Forest Advisory Corporation 2. Pierceland/Goodsoil Forest Advisory Board Inc 3. Waterhen Lake Land and Resources Board 4. Buffalo Narrows Co-management Board 5. Sakitawak Resource Management Inc. (ILX) 6. DeneSuline Co-management Board (Dillon) 7. Canoe Lake Traditional Resource Users Board 8. Beauval Co-management Board Inc. 9. Big Island Lake Cree Nation (not a formal co-management board but periodic meetings are held with the Band)	9 5-6 6 9-10 3-4 3-4 10 10 3-4
2. Trapping	Zone 8 trappers - northern trappers are represented on each of the co-management boards.	Mistik interacts with or meets individually with over 30 trappers per year. Mistik no longer attends Trapper Conventions (2 per year in Sask.) but trapper reps are on all advisory/co-management boards.	30
3. Outfitting	Saskatchewan Outfitters Association -- a large, informally organized group with significant interest in the provincial forests of Saskatchewan - with a designated 'forestry' representative.	Mistik attends the outfitters convention once every 2 years, Mistik communicates, interacts or meets with at least 25-30 outfitters per year.	25-30
4. Commercial fishing	There are a number of commercial fishing co-operatives within the Mistik FMA area. Commercial fishing is a significant economic activity in the local area. Most co-management boards have commercial fishing reps.	Mistik communicates, interacts or meets with at least 5 commercial fishermen per year	5

⁷ (http://www.wwf.ca/newsroom/reports/forests_freshwater/hcvf.cfm)

Native, Stakeholders, Partners, and Other Groups	Group Description	Meeting Description	# of Mtgs / yr
5. Urban municipality	Meadow Lake is the primary service center in northwest Saskatchewan and home to most of the employees of Meadow Lake Pulp Limited Partnership, NorSask and Mistik.	Semi-annual interaction occurs with the Meadow Lake urban municipality.	2
6. Rural municipality	Rural Municipality (RM) of Meadow Lake #588 has some overlap with the Mistik FMA area (Divide and Beaver River MUs).	Quarterly interaction occurs with the rural municipality.	4
7. Environmental non-governmental organizations	Represent the interests of the hunting, fishing and trapping public as well as environmental sustainability issues - habitat protection, conservation and environmental quality.	Can be quite variable on a seasonal or yearly basis but at a minimum some type of interaction will occur 10-12 times per year.	10-12
8. Snowmobile association (recreation)	The Northern Lights Snowmobile Club has an extensive network of trails throughout portions of the Mistik FMA Area.	Informal interaction occurs once or twice during the winter months.	1-2
9. Grazing permittees	Portions of the Mistik FMA Area are allocated to grazing leases..	Infrequent meetings – 2-3 times per year	2-3
Business relationships			
10. Forest workers	Mistik undertakes its activities through a significant # of local contractors.	Interaction on weekly basis for approximately 8 months of the year for monitoring purposes	
11. Small volume timber harvesters (SE is main contact)	Some representation on advisory boards but no official or organized representative body.	Mistik communicates, interacts or meets with at least 5 small volume timber harvesters per year.	
12. Meadow Lake Pulp employees	All clerical, technical, management and operations staff at the Meadow Lake Pulp Limited Partnership pulp mill.	Monthly interaction occurs with the pulp mill.	
13. NorSask management staff	All clerical, technical, management and operations staff at the NorSask Forest Product's sawmill.	Monthly interaction occurs with the NorSask management staff.	
14. NorSask unionized staff	All mill workers at NorSask Forest Products sawmill.	Semi-annual interaction occurs with NorSask unionized staff.	
15. Meadow Lake Tribal Council	Represents the leadership of nine of the First Nations in northwest Saskatchewan (in and around the Mistik FMA Area).	Quarterly interaction occurs with MLTC.	
16. Regulatory agency	Represents the local regulatory (provincial government) agencies responsible for administering forestry and other activities on behalf of the province of Saskatchewan.	Weekly to bi-monthly interaction occurs with the regulatory agencies (approx 8 meetings).	

Technical

Mistik has consulted with technical experts at Saskatchewan Environment, particularly biologists assigned to caribou and other SAR. These experts are listed and referenced in specific discussions in this report. An extensive field assessment of plants was conducted by Ecomark. Ecomark included native experts to the extent possible. In May 2006, Ecomark sent forty-three

(43) letters to stakeholders and representatives of First Nations communities asking for assistance in identifying high value plants and ecosystem types in the Mistik FMA area. This was incorporated in their report (Ecomark 2006 b).

Stakeholders and First Nations

At the provincial and federal level a number of groups were approached for reviews of this report (in addition to the extensive consultation that was done in its preparation): The Nature Conservancy, World Wildlife Fund Canada, the Saskatchewan Wildlife Federation, Saskatchewan Environmental Society, Ducks Unlimited Canada and Canadian Parks and Wilderness Society. In addition, Mistik is seeking a review by the HCV Resource Network and Aboriginal Communities have been invited to comment on the document

Open Door

As well as scheduled meetings, listed in Table 2, Mistik maintains an open door policy for discussing values with individuals and groups.

Thresholds: Categorization as HCV, not HCV or Possible HCV

The concept of threshold for HCV is important. In practice, during preparation of this report there were certain factors which became critical in deciding whether a value required HCV designation. Ultimately, as directed by the standard, the forest manager must decide what is included, based on the HCVF definition and consultation. In Appendix 1 is a review of the basic framework to guide decisions about what is and is not HCVF. It is not comprehensive, nor always rigorously followed, but may help to illustrate the concept of threshold.

Keeping HCVs up to date – Process

Part of the HCV methodology must be a process for keeping records and prescriptions up to date. As described above, the primary driver for this must be the FMP process, which is the open public record of how and why the forest is managed as it is. It is a public record of forest management process and decision-making that is regulated by the Government of Saskatchewan.

As well, the contents of this HCVF report needs to be reviewed periodically to ensure that it is up to date with the FMP, and is in keeping with FSC P9. Mistik will ensure, as part of the responsibilities of the [designated staff member](#) for certification, that the HCV status is annually updated. Annual maintenance audits by the certifier will ensure that this is fulfilled.

Phase 2 -- Management (9.3) and Monitoring (9.4)

Once HCVs are assessed and a designation as HCV has been made in Phase 1, then the managers have to provide management prescriptions, Phase 2. Each HCV must have a prescription which is not only effective, but can be shown to be effective. This is in essence the precautionary principle. To show that a prescription is effective the managers must provide monitoring evidence, and monitor the application of the prescription. In Saskatchewan these are referred to as effectiveness monitoring and compliance monitoring, respectively.

Compliance Monitoring is the easier of the two. Once a prescription is endorsed, supervisors have clear direction about what the end product should look like. They instruct the operations staff on how to reach the desired condition. Mistik has experienced operations staff who can implement any of the HCV prescriptions. Mistakes during implementation result in “non-conformances” with the Environmental Management System (EMS). Errors are dealt with quickly, and if necessary the system is changed.

More challenging, effectiveness monitoring requires that the prescription has a proven track record. The key to the precautionary principle is, of course, not taking chances -- or at least not taking big chances. Mistik is overseen by the province, and also makes use of a wide experience in forest management techniques to safeguard the HCVs. Phase 2 of the report describes the management and monitoring requirements. In this report the description is brief and intended to convey the basic values and protection. As discussed above, the FMP is the regulated document which the company must abide by.

Alluded to above, part of the Mistik approach to HCVs is their participation in Saskatchewan's Forest Management Effects Monitoring Program (FMEMP). This was created based on recommendations from the Provincial Science Advisory Board, other scientific experts and representatives from the forest industry. The Science Advisory Board is made up of national experts appointed by the Minister to provide guidance to the monitoring program. Additional experts were used to provide a Saskatchewan perspective on the program. Forest companies were involved because they are legally required to develop and implement the program. The process was a collaborative effort to ensure both scientific validity and efficiency in application.

The FMEMP is a standardized provincial ecosystem monitoring framework that has been established for the purpose of monitoring forestry impacts on the environment and the long-term health of forest ecosystems. The program is focused on a set of indicators which reflect contemporary forest management concerns and knowledge. Mistik Management Ltd. (Mistik) has undertaken ecosystem monitoring activities in support of the provincial FMEMP since 2000. Formal submission of FMEMP reports to Saskatchewan Environment has occurred in 2002, 2003 and 2004.

More specifically, each HCVF must have a proven prescription. As part of phase 2 of the HCVF report we describe these prescriptions and the monitoring protocol in brief.

Mistik FMA Area Description

Type of operation

Mistik Management is 50% owned by NorSask Forest Products which is in turn wholly owned by the Meadow Lake Tribal Council (MLTC). The Mistik FMA area in northwest Saskatchewan (Figure 1) encompasses a total of 1,831,964 hectares of forests, water and non-forested lands. Softwood harvested by Mistik goes directly to the NorSask sawmill which is governed by its board of directors and MLTC. The hardwood harvested by Mistik goes to the Millar Western Pulp Mill operated by the Meadow Lake Pulp Partnership which is the other 50% of Mistik Management.

In conjunction with a management board comprised from the nine MLTC First Nations, Mistik governs itself according to the interests of community-based forest users such as trappers, wild rice growers/harvesters and outfitters. Mistik has a policy in place to give local residents the first right to economic opportunities flowing from its operations. Direct jobs from forestry-related activity associated with the Mistik FMA area support approximately 291 person years of employment (woodlands) with an additional 356 person years at the sawmill and pulp operations at Meadow Lake.

Mistik has achieved certification of its woodlands operations to ISO 14001 (August 20, 2004) and CSA Z809-02 (certification achieved August 16, 2005). The company has developed a detailed environmental management system (EMS) and sustainable forest management (SFM) plan to facilitate these certifications. It was FSC certified in 2007.

The FMA area is currently managed within the context of twelve management units ranging in size from 13,711 ha to 355,914 ha (Mistik Management Ltd. 2007 a). The average management unit size is 152,700 ha. The FMA was made on June 17, 1988 between NorSask Forest Products Inc. and the Province of Saskatchewan. The agreement was transferred from NorSask Forest Products Inc. to Mistik Management Ltd. on April 24, 1998. The term of the agreement is expressed to be for a period of 20 years, but contains provisions for renewal every 5 years.

Community profiles

Nine out of the 14 Indian Bands associated with the FMA area are members of the Meadow Lake Tribal Council (MLTC). Mistik's community profiles are discussed in more detail later. Big Island Lake Cree Nation (Big Island Lake) was a member of MLTC until 1989 when the Chief and Council chose to withdraw from all political umbrella organizations and pursue their interests on their own.

The registered First Nations population for these communities is about 23,000 of which half live on their own reserve, 40% live off-reserve and the remainder live on another reserve. A significant number of non-status First Nations individuals who remain associated with their communities, nor does it include Big Island Lake (estimated at approximately 300 individuals). Profiles for the Metis are difficult because they are self-identifying and not registered. There is a significant Metis population.

The non-First Nations communities within and adjacent to the Mistik FMA area are municipalities with a Mayor and Council. Many of these are predominantly Metis. The Northwest Metis Association operates as a political umbrella group. Mistik has created co-management boards (CMBs) throughout its FMA area. In addition, the company also works with a number of advisory boards in situations where CMBs do not exist.

Forest Management Planning

Mistik has recently developed a new (2007) FMP³ for the area covered by the Mistik FMA area. The FMP identifies SFM values, objectives, indicators and targets called VOITs that help facilitate the implementation of the management strategies outlined in the plan. The FMP includes 38 measurable indicators and targets that are linked to the objectives outlined in the plan. Objectives are linked to the criteria for the achievement (Canadian Council of Forest Ministers).

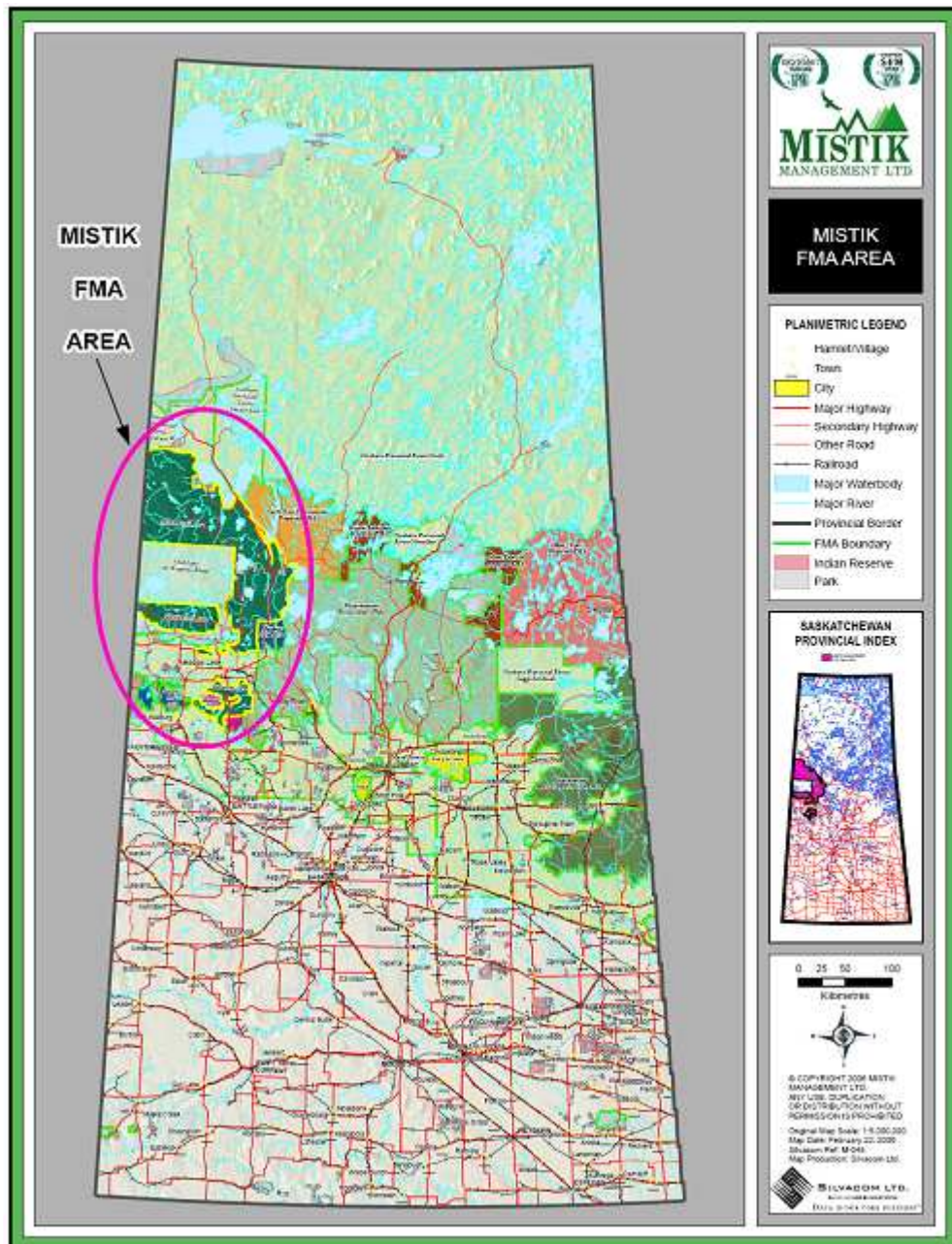


Figure 1. Location of Mistik FMA area in Saskatchewan.

Phase 1: Process for assessing for the presence of HCV attributes

The following assessment of the presence of HCV attributes is based on questions posed by the National HCVF framework¹, and suggested avenues for collecting information. The questions are divided into six separate categories related to the definition of HCVF above. The questions are numbered sequentially to 18, but are in six categories (Table 3).

Table 3. National Framework process for assessing the presence of HCV attributes.

Category 1: "...significant concentrations of biodiversity values."

1. Does the forest contain species at risk or potential habitat of species at risk as listed by international, national or territorial/provincial authorities?
2. Does the forest contain a globally, nationally or regionally significant concentration of endemic species?
3. Does the forest include critical habitat containing globally, nationally or regionally significant seasonal concentrations of species (one or several species e.g. concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors – latitudinal as well as altitudinal)?
4. Does the forest contain critical habitat for regionally significant species (e.g. species representative of habitat types naturally occurring in the management unit, focal species, species declining regionally)?
5. Does the forest support concentrations of species at the edge of their natural ranges or outlier populations?
6. Does the forest lie within, adjacent to, or contain a conservation area: a) designated by an international authority; b) legally designated or proposed by relevant federal/provincial legislation; or c) identified in regional land use or conservation plans?

Category 2. "...large landscape level forests..."

7. Does the forest constitute or form part of a globally, nationally or regionally significant forest landscape that includes populations of most native species and sufficient habitat such that there is a high likelihood of long-term species persistence?

Category 3 "...rare threatened or endangered ecosystems."

8. Does the forest contain naturally rare ecosystem types?
9. Are there ecosystem types within the forest or ecoregion that have significantly declined?
10. Are large landscape level forests (i.e. large unfragmented forests) rare or absent in the forest or ecoregion?
11. Are there nationally/regionally significant diverse or unique forest ecosystems?

Category 4 "...basic services... watershed protection"

12. Does the forest provide a significant source of drinking water?
13. Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?
14. Are there forests critical to erosion control?
15. Are there forests that provide a critical barrier to destructive fire (in areas where fire is not a common natural agent of disturbance)?
16. Are there forest landscapes (or regional landscapes) that have a critical impact on agriculture or fisheries?

Category 5 "...meeting basic needs of local communities."

17. Are there local communities? (This should include both people living inside the forest area and those living adjacent to it as well as any group which regularly visits the forest).
Question 17 further asks: Is any one in the community making use of the forest? Is the use for their basic needs/livelihoods?

Category 6 "...communities' local cultural identity..."

18. Is the traditional cultural identity of the local community particularly tied to a specific forest area?
 19. Is there significant overlap of values (ecological / cultural) that collectively constitute HCV?
-

The National Boreal HCVF Framework further provides what are described as 'definitive' or 'guidance' questions as well as suggested sources of information on the different values.

Category 1) Forest areas containing globally, nationally or regionally significant concentrations of biodiversity values.

1) Does the forest contain species at risk or potential habitat of species at risk as listed by international, national or territorial/provincial authorities?

Rationale:

“Ensures the maintenance of vulnerable and/or irreplaceable elements of biodiversity. This indicator allows for a single species or a concentration of species to meet HCV thresholds.”

Assessment Methodology:

The following sources were reviewed:

- Proulx, Gilbert. 2006. Management guidelines for species at risk in the Mistik FMA area (Saskatchewan). Alpha Wildlife Publications⁸. Co-published by Mistik Management Ltd. Includes bibliographical references and index. ISBN 0-9686235-4-9
- Ecomark Environmental Stewards Ltd. 2006 b. Plant Biodiversity Assessment: Mistik Management Ltd. Forest Management Agreement Area, Northwestern Saskatchewan, Canada. 202 pp.
- Interim List for Species at Risk in Saskatchewan⁹
- COSEWIC http://www.cosewic.gc.ca/eng/sct0/rpt/dsp_booklet_e.htm
- Saskatchewan Conservation Data Centre <http://www.biodiversity.sk.ca/>
- International Union for the Conservation of Nature, Red List
- The Birdlife International series on Important Bird Areas (IBAs) and Endemic Bird Areas (EBAs).

This element of the National Boreal HCVF framework is specifically aimed at “officially” listed species. In keeping with the FSC’s Boreal standard’s broad definition of SAR, all species that could be considered “at risk” were assessed. This included a few additional sources to assess, including the IUCN red list, and Bird Life International.

Assessment Results:

In previous work contracted by Mistik (Proulx 2006, Ecomark Environmental Stewards Ltd. 2006 a, b) there was a concerted effort to bring together a list of species for the MFMA area that are potential HCVs. This is a significant undertaking because of the size of the forest and the lack of previous work in the area. Although some work has been done, and some lists are available for Saskatchewan or for the mid boreal, it is hard to determine which species actually occur on the Mistik FMA area. Table 4 and

Although management may follow the caribou requirements closely, Wolverine has been designated HCV on its own merits as a SAR.

Table 5 in this report are from those earlier studies, and they are the prime source for the HCVs that are designated here.

The conservation status rank applied by the Saskatchewan Conservation Data Centre (CDC) is used to select and prioritize candidate species for listing under The Wildlife Act, 1998. The CDC maintains a centralized database used to store scientific information on the status, location and ecology of Saskatchewan species and plant communities, with a focus on those deemed to be at risk. CDC provided files for updating of the Ecomark list.

⁸ Published by Alpha Wildlife Publications, a division of Alpha Wildlife Research & Management Ltd., 229 Lilac Terrace, Sherwood Park, Alberta, Canada T8H 1W3

⁹ Prepared by Frances Bennett, Zoologist, Ministry of Environment, Fish and Wildlife Branch, January 2008. <http://www.environment.gov.sk.ca/adx/asp/adxGetMedia.aspx?DocID=1632,1631,254,94,88,Documents&MediaID=837&Filename=Interim+List+for+At-Risk+Species+in+Saskatchewan.pdf>

On the Saskatchewan government website is a web document called “Expected Occurrence of Plants and Animals by Ecoregion - May 2006”¹⁰ which provides a complete listing of known flora and fauna. There is a subset of this which covers the mid-boreal ecoregion. The reports by Proulx and Ecomark have refined this list and includes a list of the current COSEWIC species in the Mistik FMA from the total official list¹¹. For this version of the HCV report, the list has been updated to include a review of the latest COSEWIC assessment for Saskatchewan¹². This added the Greater Sage-Grouse (*urophasianus* subspecies) as endangered; Canada Warbler and Ferruginous Hawk, threatened; and Short-eared Owl, Special Concern. Of these only the Canada Warbler would be considered at risk directly from forest operations, and within the bounds of the FMA. This species and others from the previous list are discussed below (**Listed Bird Species**)

The Ministry of Environment, Fish and Wildlife Branch is mandated to address species at risk in Saskatchewan and the mission Saskatchewan Government species at risk program is to protect species from extirpation or extinction, and to prevent additional species and ecosystems from becoming threatened with extinction. This program is integrated with Canada's species at risk program. There are currently 15 at-risk plants and animals identified under the Saskatchewan Wildlife Act, 1998¹³. The list is outdated, and currently Saskatchewan is more reliant on the COSEWIC list which is updated and mandated by the Federal Species at Risk Act¹⁴. The work done by Proulx and Ecomark in 2006 have incorporated species listed in the Wildlife Act.

The Ecomark report refers to vascular and non-vascular plant species of concern that are presently classified as rare by global, federal, and/or provincial species at risk legislation or plant species that are considered to be endangered, threatened, vulnerable, or rare as classified by the University of Saskatchewan W.P. Fraser Herbarium.

Plant Species

The Ecomark Ltd. assessment (2006 b) concluded “Seventeen confirmed and seven unconfirmed rare vascular plant species were observed during surveys of over 390 locations in 2006. With the inclusion of previously known rare plant species, a total of 106 confirmed rare plant species have been recorded from within the Mistik FMA area (Ecomark 2006 b, Appendix 3). Of these, one species is listed in the regulations of the Species at Risk Act (SARA) and two are Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed.” The two species, *Carex arcta* and *Listera borealis* are highlighted in Table 4.

The Ecomark report presents the location of all known historical and 2006 rare plant occurrences for the study area, including Meadow Lake Provincial Park. In Table 4 is their list of 30 species which could be considered to occur in areas where forestry activity is possible. They concluded from their field results that rare plants will be scattered throughout the boreal forest in a wide variety of habitats and plant community types. The list, and the distribution map provided by Ecomark provides an understanding of the scale of the forest and the occurrence of special plants within it. These species are protected where they occur. Those listed as considered HCV where their location has been identified.

The focus on known locations is an important aspect of designating these species. All boreal species are adapted to disturbance. As a fundamental platform for management in the boreal forest managers are required to emulate natural disturbance patterns. One of the prime reasons for this is to ensure that wildlife habitat is maintained in the full range of types, ages and patterns to increase the likelihood of habitat existing for all species. This is called the coarse filter approach. This is discussed more fully in element 7, under [Coarse and Fine Filter](#). This discussion is relevant to all of the HCVs but is placed in element 7 because of the importance that core forest, connectivity and Landscape Level Forest have in sustainability in the Mistik FMA area.

¹⁰ Sask. Env. (<http://www.biodiversity.sk.ca/Docs/Expbyeco.pdf>)

¹¹ COSEWIC http://www.cosewic.gc.ca/eng/sct0/rpt/dsp_booklet_e.htm

¹² COSEWIC assessment for Saskatchewan http://www.cosewic.gc.ca/rpts/Summary_by_Range_e.html

¹³ Saskatchewan Wildlife Act, <http://www.environment.gov.sk.ca/Default.aspx?DN=5297a6b8-fa52-4af8-8dbf-51196e37fc6a>

¹⁴ Personal Communication, Saskatchewan Conservation Data Centre staff by TC

Table 4. Known Occurrences of Plant Species of Concern in the Mistik FMA Area with the Highest Probability of Forestry Impact (Ecomark 2006 a).

* Based on habitat types, the highlighted rows are occurrences of plant species of concern in the Mistik FMA area that occur in habitats most likely impacted by forestry

** "S1-ranked species refer to plant species that are considered critically imperiled in the province, with 5 or fewer locations in the province.

Habitat Type	Latin Name	Common Name(s)	Probability of Forestry Impact (Based on Habitat Type)
Aquatic	<i>Wolffia arrhiza</i>	Spotless watermeal	LOW
Aquatic	<i>Myriophyllum alterniflorum</i>	Alternate-flower water milfoil	LOW
Disturbed	<i>Achillea millefolium var. megacephala</i>	Large-headed wooly yarrow	MODERATE
Moist Woods	<i>Carex arcta</i>	Slender sedge	HIGH
Moist Woods	<i>Listera borealis</i>	Northern twayblade	HIGH
Riparian	<i>Polygonum punctatum var. confertiflorum</i>	Dotted smartweed	MODERATE
Riparian	<i>Anemone richardsonii</i>	Yellow anemone; Richardson's anemone	MODERATE
Rock/Sand	<i>Woodsia alpina</i>	Alpine cliff fern; northern cliff fern	LOW
Rock/Sand	<i>Muhlenbergia andina</i>	Foxtail muhly	LOW
Transition	<i>Botrychium lanceolatum var. lanceolatum</i>	Lance-leaved grape fern	MODERATE
Transition	<i>Trichophorum clintonii</i>	Clinton's bulrush	MODERATE
Wetland	<i>Botrychium lunaria</i>	Common moonwort	LOW
Wetland	<i>Carex cryptolepis</i>	Northeastern sedge	LOW
Wetland	<i>Carex laxiflora var. varians</i>	Pleasing sedge	LOW
Wetland	<i>Arethusa bulbosa</i>	Dragon's-mouth	LOW
Wetland	<i>Malaxis paludosa</i>	Bog adder's-mouth	LOW
Wetland	<i>Drosera linearis</i>	Slender-leaved sundew	LOW
Wetland	<i>Parnassia palustris var. parviflora</i>	Small northern grass-of-parnassus	LOW
Wetland	<i>Trientalis europaea var. arctica</i>	Arctic starwort	LOW

Animal Species

Proulx³⁷ reviewed animal species in Mistik FMA Area and described 22 species which should be assessed in an HCVF context. In Appendix 5 that list is reproduced along with a general management requirement. The work by Proulx provides guidance to this report by listing the risk as assessed by COSEWIC, Nature Serve and the Saskatchewan Conservation Data Centre. Of interest for element 1 for HCV assessment are species that are "listed" as threatened or Special Concern. Most of the species which are listed are addressed through forest practices that can be considered general habitat management or "good forestry practices"; the [coarse filter](#) approach. Note the discussion on [The HCV conundrum](#), regarding the importance of determining which HCVs that a manager is responsible for, and thus require application of the precautionary principle. Conservation of [Landscape Level Forest](#), and [Riparian Areas](#) are two HCVs that provide umbrella management for other values.

Caribou

The Mistik FMP³ (Vol 1 section 21.2.5 Methods Used by Mistik to Maintain the Diversity of Boreal Forest Values) states that currently, woodland caribou is the only animal species occurring within the Mistik FMA area listed as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, Canadian Species at Risk, November 2004¹⁵). The preferred habitat of woodland caribou is mature forests which contain large quantities of lichen adjacent to wetland complexes composed of bogs and fens. The Mistik FMA area contains an abundance of such habitat.

Provincial woodland caribou experts estimate that there are approximately 300 woodland caribou within the Primrose Woodland Caribou Management Unit. There are several known herds of woodland caribou within the FMA area occurring east of the Beaver River in the Beauval Management Unit (Dore Lake), between Kazan Lake and Canoe Lake and the Cold Lake Air Weapons Range in the Ile a la Crosse and Canoe Lake Management Units (Kazan Lake), north of Upper Cummins Lake in the Buffalo Narrows Management Unit (Cummins Lake), in the Dillon Lake area (both in the Dillon and Peter Pond Management Units) and south of the Cold Lake Air Weapons Range in the Muskeg River Operating Area.

There is further discussion of Caribou in element 3, as Mistik has taken the lead in designating Caribou as an HCV, and proposing management actions for this species. These are in Phase 2 of the HCVF process described later in this report.

Wolverine

Wolverine is listed as special concern by COSEWIC¹⁶ and also has distinct habitat requirements, as described by Proulx³⁷. He notes that Wolverine populations are believed to be rare in the southern boreal forest, but common in the north (total population < 1,000) and possibly declining. Banci and Proulx (1999) rated wolverine as a low resiliency species, i.e., with limited capability to recover from a reduction in numbers, because of their low densities, large home range sizes, and relatively low reproductive rate.

In the Mistik FMA area, where alpine and mountainous environments are absent, Proulx believes that wolverines are associated with moose and caribou. Thus they can be found in mosaics of young and mature forests interspersed with immature stands. This association with caribou also means that management for caribou, the prey species, is key for management for wolverine. Wolverines prey on ungulates (moose, caribou) in deep snow and when they are vulnerable (e.g., calving season). The connection between wolverine and caribou has been made recently in the Ontario Caribou Recovery Strategy¹⁷ and the science panel reviewing that document¹⁸. The connection is important, because direct management for wolverine, a very rare species would be very difficult. The connection between caribou and wolverine allows for practical solutions to habitat management. This species is designated HCV and is grouped with Caribou. In general Proulx recommends some landscape management concepts which fit the approach to caribou:

- Maintain early-successional stages for denning; mid-successional stands for connectivity; and late-successional stages for foraging and security;

¹⁵ COSEWIC Status report for Woodland Caribou http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_woodland_caribou_e.pdf

¹⁶ COSEWIC Status report for Wolverine http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_wolverine_e.pdf

¹⁷ Ontario Caribou Recovery Strategy <http://www.mnr.gov.on.ca/251755.pdf>

¹⁸ Science Panel reviewing Ontario Recovery Strategy <http://www.mnr.gov.on.ca/251753.pdf>

- Maintain a mosaic of large landscape segments ($\geq 100 \text{ km}^2$) used by main prey such as caribou and moose;
- Maintain connectivity between lowland and upland forested habitats;
- Landscape segments should encompass habitats providing wolverines with abundant snow (e.g., $> 1 \text{ m}$ of snow in spring); and
- Minimize density of active roads in areas of high-quality habitat. Limit the amount of open roads to vehicles to 0.6 km/km^2 within highly valuable watersheds.

Although management may follow the caribou requirements closely, Wolverine has been designated HCV on its own merits as a SAR.

Table 5. Wildlife SAR in the Mistik FMA Area with the Highest Probability of Forestry Impact based on Proulx³⁷.

Genus Species (=Synonyms)	Common Name(s)	Global & Provincial Ranks; COSEWIC Rank
<i>Surnia ulula</i>	Northern Hawk-Owl	G5 N5 S3B S3N; Not at Risk
<i>Strix varia</i>	Barred Owl	G5 N5 S3B S3N
<i>Aegolius funereus</i>	Boreal Owl	G5 N5 S3B S3N
<i>Strix nebulosa</i>	Great Gray Owl	G5 N5 S3B S3N
<i>Dendroica caerulescens</i>	Black-throated Blue Warbler	G5 N5B S2B
<i>Oporornis agilis</i>	Connecticut Warbler	G4 N5B S2B
<i>Gulo gulo</i>	Wolverine	G4 N3N4 S3S4
<i>Rangifer tarandus</i>	Woodland Caribou	T5T4 N4 S3

Listed Bird Species

All Species at Risk are regarded as having HCV status if they are “rare threatened or endangered” and that are, in the words of the framework, “...representative of habitat types naturally occurring in the management unit.” This fairly subjective definition points at the priority for forest managers – habitat. Yet it leaves latitude for managers to arrive at their designation decisions. In this report, the 22 animal species described by Proulx, and the 30 plant species described by Ecomark were assessed to determine if they are HCV. All of these species merit consideration in management; many of them are managed indirectly through general good forestry practices. The bird species in Table 5 meet the HCV threshold, in addition to the Canada Warbler, which was designated by COSEWIC since the work by Proulx. Wolverine and Caribou are separately designated. These are species for which 1) Mistik judged that there is a clear need for a precautionary approach, 2) they are indicated by the NBS Framework guidance for consideration.

On the basis of the framework, and the requirement to designate species (Element 1 “rare, threatened endangered species representative of habitat types naturally occurring”) Canada Warbler was designated HCV (discussed below). Other listed species are also designated. Canada Warbler is discussed in more detail.

At this time the COSEWIC Status report¹⁹ does not implicate forest operations in the threatened designation: “Throughout its breeding range, the Canada Warbler can also be locally abundant in regenerating forests (i.e., 6–30 years post-disturbance) following natural (forest fires) or anthropogenic (harvesting) disturbances (Titterington *et al.* 1979; Wildlife Resource Consulting Service MB Inc. and Silvitech Consulting 1995; Christian *et al.* 1996; Hobson and Schieck 1999; Drapeau *et al.* 2000; Schieck and Hobson 2000; Hobson and Bayne 2000b; ...).”

In the short term Mistik will monitor the status Canada Warbler, and the 5 other listed species (Barred Owl, Boreal Owl, Great Grey Owl, Black-throated Blue Warbler, Connecticut Warbler; note Northern Hawk-Owl was not at risk)

¹⁹ COSEWIC Canada Warbler status report: http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_canada_warbler_0808_e.pdf

for any direct risk to this species by the company through forest operations. It will maintain contact with scientists working directly on the species. If a specific management prescription is forthcoming, it will be applied.

HCV Designation Decision:

Although Mistik designates HCVs broadly, as described in “The HCV conundrum... to designate or not to designate

” it develops management prescriptions for the values that are directly at risk from forestry operations. For illustration -- Whooping Cranes are clearly HCVs. They do from time to time pass through the forest and use some of the wetland areas. This could meet the “representative of habitat” criterion for element 1, since those wetland areas fulfil some life requirement for the birds. They are not designated HCV in this report. The threshold for an HCV is not met, because of the infrequent use of those wetlands. The presence of wetlands did help in the designation of all riparian areas as HCVs in element 19...for overlapping values including protection from erosion, drainage and other HCVs. Based on a review of habitat requirements, current threats, range maps and known occurrence on the Mistik FMA area, potential impacts from forest operations, the status of populations and a supplementary literature review, findings are as follows:

Species Designated HCV:

- Woodland Caribou
- Wolverine
- Habitat for Rare Vascular Plants (listed species with known occurrence in FMA area-- Table 4)
- Critical Habitat for six listed bird species at risk
-

Management requirements for these species are discussed in Phase 2: Management and Monitoring of High Conservation Values in the Mistik FMA area, and Table 16. For most of the HCVs, these activities follow the requirements of the FMP³ which is the regulatory document requiring action. Where the FMP does not mention specifically an HCV, it is the responsibility of Mistik to ensure that the required actions are carried out. Mistik is dependent on the provincial government to carry out its commitment to managing these species using the precautionary approach. Connected with this Federal government has a role, but most management is done through the provincial government.

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

Rationale:

Ensure the maintenance of vulnerable and/or irreplaceable elements of biodiversity. Endemic species are more likely to be addressed under Principle 6 because their range/extent is geographically restricted. Hence, meeting the threshold of “critical and/or outstanding” likely requires a concentration of endemic species.

Assessment Methodology:

- Saskatchewan Conservation Data Centre
- WWF Ecoregion Conservation Assessment (Iacobelli 2003)
- Terrestrial Ecosystems of North America (Ricketts et al.1999, Island Press)
- Birdlife International

Assessment Results:

Discussion with an expert from the Saskatchewan Conservation Data Centre confirmed there were no endemics in the Mistik FMA area. They noted there are nearby endemics related to the Lake Athabasca sand dunes, which is the nearest location with endemic species. Birdlife International does not identify any Endemic Bird Areas (EBAs) in Canada²⁰.

²⁰ Birdlife International <http://www.birdlife.org/datazone/index.html> and <http://www.birdlife.org/datazone/ebas/index.html?action=EbaHTMFindResults.asp&INam=&Reg=9&Cty=38>

Endemism is rare with northern forests, which have evolved with short-term disturbance (fire and wind) and long term disturbance (continental glaciers). Species tend to be spread across large areas. Terrestrial Ecosystems of North America (Ricketts et al.1999) was also used to verify species endemism by ecoregion. This document uses a 50,000 km² threshold to identify restricted-range species consistent with the threshold used by Birdlife International's classification of endemic species. The presence of any endemic species identified by an appropriate agency (e.g. NHIC, COSEWIC) would meet the threshold of this criterion. This report also confirms the lack of endemics in the Mistik FMA area.

HCVF Designation Decision:

There are no HCVs designated in this element.

3) Does the forest include critical habitat containing globally, nationally or regionally significant seasonal concentrations of species (one or several species e.g. concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors – latitudinal as well as altitudinal)?

Rationale:

Addresses wildlife habitat requirements critical to maintaining population viability (regional “hotspots”).

Assessment Methodology:

- Mistik Forest Management Plan
- Bird Studies Canada Important Bird Areas <http://www.bsc-eoc.org/iba/IBAsites.html>
- Bird Studies Canada Birdmap Canada http://www.bsc-eoc.org/birdmap_e.htm#
- Saskatchewan Conservation Data Centre

Assessment Results:

We reviewed the wildlife concentration areas, critical breeding habitats, winter habitat for species and other concentration areas for a diversity of taxa as they are identified in the FMP. Identified values and their corresponding HCV designations are summarized in Table 6. Below is a discussion of the findings from a review of available data sources.

Important Bird Areas

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 three IBAs nearby or within the Mistik FMA area: Primrose Lake (id# SK092) part of the Cold Lake range, Kazan Lake to the northeast (id# SK110), and Midnight Lake (id# SK087) in the south.

- Primrose Lake²¹ is 450 km² in size within the Primrose Lake Air Weapons range, a large boreal forest lake containing Backes Island which supports American White Pelicans²², California Gulls and Common Terns.
- Kazan Lake²³ is 13.5 km² and supports a large colony of American White Pelicans, and other colonial birds. It is partially surrounded by mixedwood forest. It is also a provincial wildlife refuge.
- Midnight Lake²⁴ is 12 km north of Glaslyn and is described as a “forest fringe lake”, along its northern half. It is known as a staging area for Whooping Cranes.

²¹ IBA <http://www.bsc-eoc.org/iba/site.jsp?siteID=SK092>

²² IBA <http://www.birdlife.org/datazone/species/index.html?action=SpchTMDetails.asp&sid=3814&m=0>

²³ IBA <http://www.bsc-eoc.org/iba/site.jsp?siteID=SK110>

²⁴ IBA <http://www.bsc-eoc.org/iba/site.jsp?siteID=SK087>

These IBAs are not located directly on the forest, but because of their proximity they need to be assessed. Key values are breeding American White Pelican and staging observations by whooping cranes. Neither meets the “critical” threshold for an HCWF. IUCN did not red list American Pelican and they are not listed in Canada. Whooping Crane staging areas are not a “critical” value, although noteworthy.

From FMP³ 2007, (section 21.2.3 Upland Bird Values) “Saskatchewan harbours one of the richest avifaunas in North America, and the Mistik FMA area is no exception. Of the approximately 186 species of aquatic and upland-related birds breeding in Saskatchewan’s boreal forest, over 100 upland boreal forest bird species have been identified within the Mistik FMA area. For many of these species, the boreal forest represents greater than 80% of their breeding habitat.” Ironically, the rich avifauna does not congregate. The diversity is spread through the forest, and there have not been any major concentration areas identified.

Some characteristic migratory landbird species inhabiting the Mistik FMA area are the Sharp-shinned hawk, Broad-winged hawk, Ruby-throated hummingbird, Yellow-bellied sapsucker, Ovenbird, Canada warbler, Blue-headed (Solitary) vireo, and the Black-throated green warbler (Figure 21.65). There are a number of characteristic non-migratory species as well, including Ruffed grouse (Figure 21.66), Spruce grouse, Great gray owl, Boreal owl, Boreal chickadee, and Three-toed woodpecker.

Ecomark (2006 a, b) spent a considerable field effort on the forest and reported on a wide range of taxa and ecosystems:

1. Assessment of boreal forest ecosystems, vegetation types and plant species within the Mistik FMA area;
2. Assessment of vegetation species of concern and at risk within the Mistik FMA area and management recommendations;
3. Assessment of high conservation value forest areas with respect to vegetation types of concern and at risk within the Mistik FMA area;
4. Field assessments and monitoring of vegetation species of concern and at risk.

Saskatchewan Environment plays a key role as the regulator. Effective implementation is mandated by the performance indicators in section 9 of the FMP³ :

1. Provision of provincial direction and wildlife population data with respect to wildlife habitat maintenance;
2. Ensure that local wildlife habitat initiatives by Mistik on the FMA area are consistent with provincial priorities.

Woodland Caribou

The 2007 FMP³ (FMP section 21.0; and FMP APPENDIX H – Woodland Caribou Habitat Forestry Impact Mitigation Plan p 451) describes high quality Caribou habitat as a mosaic of mature upland coniferous boreal forest and treed peatland complexes. “Specifically, lichen-rich treed fens and bogs dominated by black spruce and larch with adjacent mature upland coniferous forests of black or white spruce and jack pine between the ages of 40 to 100 years and less than 70% crown closure is reported to be the optimum habitat for woodland caribou. Treed peatlands, at both the stand and landscape level, appear to be very strongly correlated with high-quality habitat usage and are significant determinants of critical habitat. Woodland caribou avoid shrub-rich habitat and aspen-dominated sites. Within the habitat mosaic, high-quality habitat needs to be functionally connected and buffered from population limiting factors. Forest ecosystem types that are not considered high-quality habitat function as habitat buffers between other ungulates (moose, white-tailed deer) and predator species (wolves). Boreal caribou require large contiguous tracts of high-quality habitat in order to maintain their unique predator avoidance behaviour and associated low population densities.”

It continues with a description of calving sites, which are critical in population maintenance. Features of calving sites include:

1. Isolated, raised stands of spruce and pine in treed peatlands;
2. Peninsulas and islands in lakes and rivers in high-quality caribou habitat;

A detailed assessment (Proulx³⁷ 2006) of quality habitat of woodland caribou²⁵ using the new Saskatchewan Forest Vegetation Inventory (SFVI) data identifies landscape-level areas within the Mistik FMA area with a high

²⁵ Proulx, G. 2006. Development of queries and predictive distribution maps for wildlife indicator species, species of concern and species at risk for the current (2006) forest condition in the Mistik FMA area. Alpha Wildlife Research and Management Ltd. Sherwood Park, Alberta. 74 pp.

proportion of contiguous, high-quality woodland caribou winter habitat. Contiguous, high-quality woodland caribou habitat currently encompasses an area of ~ 248,000 ha (~14% of the total FMA area) within the Mistik FMA area. A map of High-Quality Woodland Caribou Habitat is available (Map 10 URL in Appendix 4).

Mistik has determined that high quality Caribou habitat qualifies as an HCV under this element of the framework because it is a critical life requirement for a listed species. It is also designated in element 1.

Critical Fish Spawning Areas

We reviewed the Saskatchewan Conservation Data Centre (2008) fish listing for (E) mid-boreal upland which is the eco-region covering Mistik. On the Mistik FMA area, as discussed above in element 1, there were no SAR that were fish. COSEWIC 2008 lists four species of fish, and none of these occurred.

- Lake Sturgeon *Acipenser fulvescens* (S2 mid boreal lowland)
- Chestnut Lamprey *Ichthyomyzon castaneus* (S3 S4 mid boreal lowland)
- Bigmouth Buffalo *Ictiobus cyprinellus* (does not occur in either upland or lowland)
- Shortjaw Cisco *Coregonus zenithicus* (does not occur in either upland or lowland)

Currently Mistik takes a conservative approach to the protection of fisheries values. Spawning areas are at potential risk from impacts of water crossings and some forest operations. The relatively undisturbed nature of much of the forest has ensured that there are abundant spawning sites and fairly low impact. Local residents value the fisheries highly, providing a monitoring function for the managers. This is not HCV under this element. It is reviewed again in the social values discussed in elements' 16-19.

Mistik has put the following indicator into its new FMP³ (Criterion 3, Indicator #18 page 110): "100% of all sampled watercourse crossing activity (a minimum of ten sites – five from each district) shall be in compliance with DFO operational statements, letters of advice and prescriptions developed for the protection of water quality and fish habitat."

Proulx, G. 2006. Wildlife connectivity corridor network for the current (2006) forest condition in the Mistik FMA area. Alpha Wildlife Research and Management Ltd. Sherwood Park, Alberta. 10 pp.

Table 6. Significant breeding sites or seasonal concentration areas.

Values Assessed	SOURCES	SUMMARY OF ATTRIBUTES Stability, Sustainability and Risk	HCV DECISION Description of Quantifiable Threshold, and Decision
High Quality Caribou Habitat Rangifer tarandus caribou	1. FMP 2. 2007 – 2016 <i>Woodland Caribou Habitat Forestry Impact Mitigation Plan (FMP Appendix H, pp 443)</i> 3. COSEWIC	1. High-quality habitat of woodland caribou is a mosaic of mature upland coniferous boreal forest and treed peatland complexes. 2. Lichen-rich treed fens and bogs dominated by black spruce and larch with adjacent mature upland coniferous forests of black or white spruce and jack pine between the ages of 40 to 100 years and less than 70% crown closure. 3. Treed peatlands, at both the stand and landscape level, appear to be very strongly correlated with high-quality habitat usage and are significant determinants of critical habitat. 4. Boreal caribou require large contiguous tracts of high-quality habitat in order to maintain their unique predator avoidance behaviour and associated low population densities. 5. Primary forestry-related impacts to woodland caribou habitat in the Mistik FMA area are: 1. Access development (roads); 2. Access use (amount of vehicular traffic); and 3. Forest harvesting (change in age class structure).	1. Caribou are listed as threatened by COSEWIC. 2. There are declines in population size and distribution in Saskatchewan and throughout continental range. 3. Forest harvesting results in abrupt habitat change. While forest harvesting occurs exclusively in upland coniferous and deciduous forest types, these habitat types may be in association with peatlands occupied by woodland caribou. 4. Managers want to ensure that Mistik does not contribute to the decline in the range of this species. <i>High Quality Caribou habitat is Designated HCV</i>
Important Bird Areas IBAs	Bird Studies Canada Birdlife International Nature Studies Canada	1. IBAs provide essential habitat for one or more species of breeding birds 2. staging area for Whooping Cranes 3. Breeding sites for American White pelicans 4. Potential impact from forestry activities if in close proximity	1. Values are noteworthy but not critical; IBAs do not fall directly on the forest to merit designation by Mistik. 2. Improvement in status of American White Pelican(no longer a listed species); whooping crane staging is not meet “critical” test <i>IBAs are not designated HCV on Mistik FMA area.</i>
Fisheries Values/	Various cold- and warm-water fish species ²⁶ <i>Fish Spawning Areas</i>	1. Cold- and warm-water fish critical spawning areas 2. Abundant on Mistik FMA area 3. Critical habitats considered sustainable under current management guidelines; 4. No fish SAR AS discussed in elements 1 and 4. 5. Potential impacts from water crossing construction and maintenance on the Forest and possible impacts from forest operations 6. Federal Fisheries Act prohibits harmful alteration of fish habitat; provincial fisheries guidelines provide management direction for operations adjacent to riparian areas.	1. Values are noteworthy. On their own merits are not exceptional. Reviewed again in elements 17 and 19 of this assessment. Most of the prominent sites are known and mapped. Commercial species monitored and level of exploitation determined by government. 2. Management practices in FMP address these values. The species are widespread. <i>Fisheries Habitat is not designated HCV</i>

²⁶ Coldwater species include: brook trout, lake trout, rainbow trout, splake, Atlantic salmon, and lake whitefish. Warmwater species include: walleye, northern pike, smallmouth and largemouth bass, yellow perch and muskellunge.

HCV Designation Decision:

In accordance with the rationale provided in Table 6 and preceding discussion, Caribou Core Habitat is designated **HCV** under this category, as well as in element 1 and 8. Management is described in Table 16.

4) Does the forest contain critical habitat for regionally significant species (e.g. species representative of habitat types naturally occurring in the management unit, focal species, species declining regionally)?

Rationale:

Meta-population viability.

Assessment Methodology:

- Saskatchewan Conservation Data Centre, G3, S1-S3 species and communities
- Species representative of naturally-occurring habitat types or focal species
- Species identified as ecologically significant through consultation

Assessment Results:

Focal/Keystone Species

This HCV framework alters the previous question slightly, although there is overlap. Question 3 focuses on seasonal concentrations; this question is slightly broader, and considers “critical habitat” for “regionally significant species.” It is not only rare, threatened or endangered species, but includes “keystone” or “focal” species. A keystone species is defined by Paine (1966) as a species that plays a disproportionately large role (relative to numerical abundance or biomass) in ecosystem function. Focal species (Lambeck 1997) are a group of species whose requirements for persistence define the attributes that must be present if a landscape is to meet the requirements of the species that occur there. Practical definitions of keystone and focal species can be fairly difficult.

In common use today are two concepts related to “keystone” or “focal” species. Featured species (Thomas et al 1979) are species whose habitat and sometimes populations are managed for their importance to society – either as game species or species chosen for the habitat they represent or for other reasons. Regional indicator species are selected for a wide range of attributes that are similar in purpose to the description of focal species. Selections are made by biologists with input from various experts. Usually no direct habitat or population management occurs for these species but their habitat is monitored to determine the long-term regional effect of forest management.

Although management may follow the caribou requirements closely, Wolverine has been designated HCV on its own merits as a SAR.

Table 5 was used as the basis for assessing these species. There were no top predators or focal species previously identified in elements 1-3 of the framework. The wolf could be considered a keystone species because it is a significant population control on deer and beaver. The wolf is currently listed as secure in Saskatchewan. Featured species sometimes are listed as HCVs under this category if there is a critical habitat issue. For example, moose and deer, which support predators, can have significant economic importance, and can affect vegetation significantly, are sometimes designated. Although these species are very important, they do not have critical habitat components that can be regarded as HCVs. Their habitat needs are fairly widespread in the MFMA. Beaver is another example, but it too has a widespread habitat availability with no identifiable critical locations.

HCV Designation Decision:

No species was designated in this question.

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

Rationale:

Relevant conservation issues include vulnerability against range contraction and potential genetic variation at range edge. Outlier and edge of range populations may also play a critical role in genetic/population adaptation to global warming.

Assessment Methodology:

- Ecomark (2006 b)
- Saskatchewan Conservation Data Centre
- Species identified as ecologically significant through consultation

Assessment Results:

The Mistik FMA area sits just above the transition from the boreal plains to the mid boreal ecoregion in Saskatchewan. Notably the southern edge of the continuous forest cover is also in this area, and that explains most of the range limits for species. The result is that a number of species can be identified that are either at the northern or southern limit of their range. This is biologically interesting, but most of these species are secure according to national and provincial agencies (COSEWIC, Saskatchewan Conservation data Centre). Animal species that may be HCVs are already listed in Table 5. Caribou for example is at the edge of its range in this forest, but this is explained by the edge of continuous forest cover. Caribou is designated HCV, but not in this element of the framework because “edge of range” is not the limiting factor, and potential genetic variation at range edge, as the element mentions, has not been mentioned as an issue by experts.

In the Ecomark report (Ecomark 2006 b) they reported several rare vascular plant species in the Mistik FMA area based on distribution maps in the Flora of North America²⁷, Argus and Pryer (1990) and Maher *et al.* (1979) with distribution at the edge of their known natural range. They also note that some outlier populations in the Mistik FMA area may represent an incomplete database for the boreal forest region of Northwestern Saskatchewan. These species are designated under element 1 of the framework rather than under this element.

Tree species provide some explanation of the lack of rare or unusual species extending their range into this forest. The Mistik FMA area contains only the most common boreal species: Hardwoods -- White Birch, Trembling Aspen and Balsam Poplar; Softwoods – Jack Pine, Tamarack, White and Black Spruce and Balsam Fir. There are also the boreal shrub species such as swamp birch, alders, but there are no other species with a large life form. Adjacent forest have species such as Lodgepole Pine to the west and south; and Mountain Ash, American Elm, Bur Oak. Aside from the obvious climatic constraint, an explanation for low diversity, and few outliers and range extensions is related to the soils of the area. Multiple glaciations have left a complex soil structure, with evidence of up to eight previous glaciations. The soils of the area are remarkably deep (hundreds of metres in some places) but are acidic and have little buffering capacity. This reduces fertility and consequently supports fewer species. In contrast, to the east of the forest the soils are more buffered and calcareous, and this results in some additional tree species, as listed above.

In conclusion, a number of species could be declared at the edge of their range, but none represent a dramatic or even unusual range extension, and do not appear to have special genetic characteristics.

HCVF Designation Decision:

No species were designated under this element of the framework.

²⁷ Flora of North America www.eFloras.org

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- 6) Does the forest lie within, adjacent to, or contain a conservation area:**
a) designated by an international authority;
b) legally designated or proposed by relevant federal/provincial legislative body;
c) identified in regional land use plans or conservation plans.
-

Rationale:

This element ensures compliance with the conservation intent of a conservation area and that regionally significant forests are evaluated for consistency with the conservation intent. (Note: The original framework contains the statement: "Conservation areas that are withdrawn from industrial activity do not constitute HCV for management purposes but their values may need to be maintained or enhanced in adjacent or buffer areas". In practice most parks are now designated HCVs if they are within or adjacent to managed forest areas.

Assessment Source::

- Provincial Government Provincial Parks -- <http://www.tpcs.gov.sk.ca/Parks/>
- National
 - Parks Canada (federal) http://www.pc.gc.ca/progs/np-pn/index_E.asp
 - National Defence – Cold Lake Air Weapons Range
http://www.airforce.forces.gc.ca/4Wing/training/training5_e.asp
- International
 - UNESCO World Heritage sites -- <http://whc.unesco.org/en/statesparties/ca>
 - RAMSAR sites --
<http://ramsar.wetlands.org/Database/Searchforsites/tabid/765/Default.aspx>
- WWF gap analysis²⁸
- Mistik FMP Volume 1³

Assessment Results:

Provincial:

In Canada provincial governments control, and own, most of the forest resources. We start with a discussion of the provincial land use designations (Table 7), because they are most relevant. There are three significant (legally designated) provincial parks within the region of the Mistik FMA area: Clearwater River Provincial Park, Makwa Lake Provincial Park and Meadow Lake Provincial Park. These parks are mapped relation to the rest of the forest.

- Clearwater River Provincial Park is a natural environment park located to the north of the Mistik FMA area that provides recreational opportunities.
- Makwa Lake Provincial Park is primarily for recreation and has many facilities including more than 250 campsites.
- Meadow Lake Provincial Park encompasses more than 1,600 square km in area and has more than 20 lakes.

There are five provincially legislated ecological reserves known as Representative Area Networks²⁹ (RANs) located within the Mid-boreal Upland Ecoregion. The Primrose Lake, McCusker River, Caribou Flats, Budd Lake, and Selenite Point representative areas comprise nearly 189,585 hectares of ecologically important land within the ecoregion. Commercial timber harvesting, mineral exploration, hydroelectric development and other developments are not permitted in these areas (SERM, 2006a). In addition, there are a number of provincial parks adjacent to or within the vicinity of the FMA area including Meadow Lake Provincial Park, Clearwater River Provincial Wilderness Park located north of La Loche, and Makwa Lake Provincial Park located southwest of Meadow Lake (SERM, 2006a). There are also approximately 10 timber exclusion areas throughout the Mistik FMA area near First Nation

²⁸ WWF gap http://assets.wwf.ca/downloads/wwf_forest_aor_fullreport.pdf

²⁹ To obtain the map of ecological reserves:

<https://www.isogis.com/isogis/dropbox/DownloadFile.do?fileId=01rngi5dffjrkk&companyCode=mistik>

communities and villages. Some of the RANs and provincial parks are considered HCVs as detailed in Table 7.

National:

The Mistik FMA area is situated around the Cold Lake Air Weapons Range³⁰, an area approximately 600,000 hectares (on the Saskatchewan side) that is used by the Canadian military as training grounds for national and international pilots. As such, all forestry operations are excluded from this area as is mining and hydro operations. However it is an active weapons range and does not meet the typical IUCN designation for protection. Functionally it is protected and offers the full range of ecosystem services, and benefits of core habitat, old growth and other natural processes. The FSC standard would include the benefits of this area as part of integrated landscape management. Consideration of this reserve as HCV poses some philosophical questions when it comes to the precautionary principle. Two of the RAN are within the Range and Saskatchewan Environment has designated them as protected. We have included them as HCVs for this assessment, although the practical management measures may be minimal for this type of land use.

Representative Area Networks and provincial parks legally protect over 12% of the Mid-Boreal Upland Ecoregion from forestry operations. Arguably, a large proportion of the enduring features in the Mistik FMA area are considered adequately or moderately represented in protected areas throughout the ecoregion (Iacobelli *et al.*, 2003)³¹. At this time, there are no future plans to expand existing designated protected areas in the Mistik FMA area although Mistik, in collaboration with stakeholder groups, has identified 8 candidate protected areas, totalling over 600,000 ha for consideration by the province.

International Designations

There were no UNESCO World Heritage Sites, Biosphere Reserves or RAMSAR Wetland Sites on the Mistik FMA.

Mistik

As part of the FSC certification a condition was applied. This is addressed as part of the annual audit of the certificate. For information purposes the condition is restated here:

Condition 8: Within 12 months of certification, Mistik shall:

1. Ensure that a peer review of the BEACONS report is conducted and that recommendations from the review are considered by Mistik in fine tuning its candidate protected areas;
2. Formally consider the recommendations of CPAWS and WWF in fine tuning its candidate protected areas, and;
3. In conjunction with SE, develop a strategy for gaining broader input and support for Mistik's candidate protected areas.

Information on the Beacons project is located at: <http://www.ualberta.ca/~fschmieg/Beacons/index.htm>

Mistik is also in discussion with stakeholders regarding the status of the current protected areas network. Ultimately land use decisions are made at a higher level, by the provincial government with significant input from First Nations with an interest in of any candidate protected areas. Mistik has taken an active role in assessing the protected areas network because of the wood supply implications and more recently, because of their FSC certification. They are developing a position that meets representation requirements, while allowing cost effective forestry to occur.

As further background, in 1998, WWF and the Canadian Council on Ecological Areas developed, in their words, "*a coarse-filter conservation assessment of protected areas based on a landscape approach using 'enduring features' (essentially landforms or physical habitats) as geographic units that are surrogates for the distribution of species assemblages.*" These units were derived from the Soil Landscapes of Canada provided by Agriculture and Agri-Food Canada (1995) compiled at a scale of 1:1 million. The enduring features were identified and mapped according to their corresponding natural

³⁰ Cold Lake Weapons Range http://www.airforce.forces.gc.ca/4Wing/training/training5_e.asp

³¹ Iacobelli *et al.*, 2003 http://assets.wwf.ca/downloads/wwf_forest_aor_fullreport.pdf

region in order to recognise broad-scale climate and terrain patterns. A gap analysis conducted using these spatial units results in a map depicting the varying degrees of representation based on existing protected areas on the landscape. The coding system consists of four possible classes of representation: adequate, moderate, partial, or little or no representation.

Five main elements of ecological integrity are considered when assessing each enduring feature:

- Representing environmental gradients (i.e. elevation ranges and soil development types),
- Capturing important physical habitat types (i.e. headwater areas and shoreline habitats),
- Meeting size guidelines (determined by ecological processes typical of the natural region),
- Ensuring connectivity/adjacency
- Incorporating habitat requirements for umbrella species and habitat quality “naturalness”

Mistik FMA area report on HCVF from Ecomark originally recommended that protected areas not be designated as HCVs. The reason for this is that protected areas are outside of the license area of the company, and thus there should be no direct impact from forestry. At the time of that report this was the generally accepted approach. Since then, there has been a concern raised that HCVs just beyond the border of an SFL can be significantly impacted through roads and other activity. In Ontario which has about 12 HCVF reports on large public licenses, a number of stakeholders have commented that parks and conservation areas that were adjacent to a forest, should be regarded as HCV (Clark³² and Hayes 2007). For this reason, Mistik has designated (Table 7) several of the protected areas as HCVs. Management practices already take a precautionary approach.

Table 7. Protected areas within or adjacent to the Mistik FMA.

Reserve Name	Area (ha - - approx.)	Location within or near Mistik FMA area	HCV designation
Caribou Flats Ecological Reserve	9,600	Adjacent to Beauval MU	HCV
McCusker lake Ecological reserve	139,000	Cold Lake Air Weapons Range	HCV
Primrose Lake Ecological Reserve	19,500	Cold Lake Air Weapons Range	HCV
Primrose Lake Wildlife Refuge	11,750	Cold Lake Air Weapons Range	HCV
Balance of Cold Lake Air Weapons Range	430,000	Military reserve – mining forestry hydro excluded	Not HCV
Meadow Lake Provincial Park	160,000	Adjacent to Pierceland, Big Island L, Murray Bay Waterhen MUs	HCV
Turtle Lake Recreational Exclusion	1600	South end of Divide MU	HCV
Nesset Lake Recreational Area	600	Northwest corner of the Divide MU	HCV
French Bay Provincial Recreation Area (Alberta)	700	Alberta -- adjacent boundary with Mistik FMA	HCV
Makwa Lake Provincial Park	1800	27 km from MFMA	Not HCV
Bronson Forest and Bronson Forest Recreational Area	15000	Adjacent to Makwa Lake, about 20 km from MFMA	Not HCV
Minnow Lake Timber Exclusion	150	Approximately 15 km east of Waterhen Lake	Not HCV

³² Clark, T and A. Hayes (2007) provide the pros and cons of including or not including protected areas as designated HCVs.

Canoe Lake Recreational Area	500	West side of Canoe Lake, in Mistik FMA	
Budd Lake	17900	50 east of MFMA	Not HCV
Selenite Point R	4000	50 east of MFMA	Not HCV
Clearwater River Provincial Wilderness Park	190,000	More than 50 km north of MFMA	Not HCV

Consensus Candidate PAs

Peter Pond	31,000		HCV
Dillon – Vermette	41,000		HCV
Kazan Canoe	136,000		HCV
Dore Beaver	40,000		HCV
Lac La Plonge	4600		HCV
Mikinak Lake	3700		HCV
Hunting Lake	3100		HCV
Horsehead Lake	3000		HCV

HCFV Designation Decision:

There are no UNESCO World Heritage Sites, Biosphere Reserves or RAMSAR Wetland Sites on the MFMA. Nine designated reserves that are adjacent to possible forestry operations have been designated as HCVs (Table 7). Management is described in Table 16. These are not on the FMA Area and are not part of the operable land base. There is no logging or other resource extraction activities, however the possibility of indirect impact may exist, and consistent with the precautionary principle they are designated. Candidate Protected areas identified during a consensus process are designated as HCV as well.

Category 2) Forest areas containing globally, regionally, or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

An HCV in this category is designated if there is a significant part of large and relatively intact block of forest where these are rare in the wider landscape

7) Does the forest constitute or form part of a globally, nationally or regionally significant forest landscape that includes populations of most native species and sufficient habitat such that there is a high likelihood of long-term species persistence?

Rationale:

From the Framework: “The forest must not only be large enough to potentially support most or all native species, but long-term, large-scale natural disturbances can take place without losing their resilience to maintain the full range of ecosystem processes and functions (i.e. naturally functioning landscapes).”

NB: In addition, the following discussion addresses element 10 which directs HCV assessments to consider remnant patches “...large functioning landscape level forests are rare or do not exist (highly fragmented forest).” Our approach is to assess all of the concepts related to

Large Landscape Level Forest (LLLF) including core area and connectivity to determine if unfragmented forest is an HCV at any scale.

Assessment Methodology and Sources:

Assessment of Large Landscape Level Forest (LLLF), the essence of this element of the framework, is one of the most challenging parts of an HCV assessment. It brings in fundamental concepts of land use and land management that have major political and economic implications. Managers struggle with these issues throughout forest management plan development, and throughout plan implementation as forest advocates challenge management activities.

As a starting point the analysis considered the Global Forest Watch information, which is a standard assessment of intact forest in Canada. As well, the information from the Mistik forest inventory is essential, to view the overall infrastructure and intactness of the forest. More importantly, to assess HCV in the LLF context, Mistik has produced three separate studies of different aspects of LLF in order to reach a decision about HCV designation. The main sources of information for this element are:

- Mistik Forest Characterization (with infrastructure)
(<https://www.isogis.com/isogis/dbv.do?id=01597p70atsimq&companyCode=mistik>)
- Global Forest Watch^{33 34}
- Scientific studies in the Mistik FMA area (Van Wilgenburg, S L and K A Hobson 2007³⁵, Andison³⁶, and Proulx³⁷)

Assessment Results:

Our assessment of this element includes a general review of the infrastructure on the forest using the Mistik Inventory and the Global Forest Watch information but the foundation of the LLF assessment is the three local studies cited above. Andison provides the historical context for some landscape indicators and the pre-historic range of variation and is reviewed first, followed by van Wilgenburg which describes potential threat to wildlife guilds by the FMP. Proulx gives an assessment of the whole landscape from the point of view of connectivity including a map of the projected effects of the plan.

In order to provide guidance in assessing this question, the HCVF Canadian National Framework³⁸ sets example thresholds for unfragmented forest landscapes in the boreal as follows:

- Globally significant threshold > 500,000 ha and free of permanent infrastructures/roads and <1% non-permanent human disturbance
- Nationally significant threshold 200,000 to 500,000 ha free of permanent infrastructures/roads and <5% of non-permanent human disturbance
- Regionally significant threshold 50,000 to 200,000 ha and free of permanent infrastructures and <5% non-permanent human disturbances.

Managers reviewed the infrastructure on the forest. As well as their own inventory, the managers reviewed the original mapping available from Global Forest Watch (GFW) which was published in 2000³⁹ and updated in 2003³³. GFW is also the basis for the thresholds in the HCVF framework. GFW identified large landscape level forest on relatively low resolution maps. In general they found LLF in the Cold Lake Air Weapons Range and north to the FMA area boundary. This preliminary assessment was used as a starting point for consideration of the concepts underlying LLF, connectivity, and core areas.

³³ GFW http://www.globalforestwatch.org/english/canada/pdf/Canada_LIFL-Map_Section.pdf

³⁴ GFW http://www.globalforestwatch.org/english/canada/pdf/Canada_LIFL-Text_Section.pdf

³⁵ Van Wilgenburg <https://www.isogis.com/isogis/dropbox/DownloadFile.do?fileId=01uj0ablndzw8l&companyCode=mistik>

³⁶ Andison <https://www.isogis.com/isogis/dbv.do?id=0w4hw6prwetc2&companyCode=mistik>

³⁷ Proulx <https://www.isogis.com/isogis/dropbox/DownloadFile.do?fileId=011ct6waay3km&companyCode=mistik>

³⁸ Appendix 5 of the FSC Canada National Boreal Standard, Version 3.0. 2004.

³⁹ GFW http://www.globalforestwatch.org/english/canada/pdf/New_Block.pdf

Andison 2007³⁶ provides a model of the pre-historic condition of the Mistik FMA area to establish the natural range of variation for important landscape characteristics, particularly old growth. This is closely tied to intact forest and LLLF. He discusses the fundamental assumption of landscape management on large northern forests:

“The theory is certainly attractive; by maintaining the type, frequency, and pattern of change on a given landscape, we are more likely to sustain all biological values therein (Landres et al. 1999). So-called “coarse-filter” knowledge can also be applied directly and immediately to planning and management programs since the “language” of disturbance patterns is largely consistent with that used by forest management agencies. Finally, natural vegetation patterns serve as excellent indicators of biodiversity since many can be simply and easily measured and compared to historic benchmarks. However, the first challenge for those who wish to use natural patterns as management guides is defining those historic benchmarks.”

The report assesses core areas and, just as important from the point of view of LLF, linear disturbance. Andison recommends that for the Mistik landscape the focus for Core Habitat should be on “measuring the impact of permanent and/or recent cultural disturbances.” Andison provides tight criteria so that the outcome can be planned for, and will be measurable, auditable and enforceable through the FMP. Specifically his criteria for assessing core are:

1. 500 m is buffer distance from cultural and linear disturbance features
2. tracking at both the MU and total FMA area scales
3. any area that has been culturally disturbed (whether harvested or salvage logged) with forest less than 20 years of age be excluded from the CFH calculation (as well as any culturally disturbed area with no forest)
4. Use the existing FMA boundary to calculate current and future CFH areas for the next 10 years.
5. expansion of the current linear feature network on the Mistik landscape by at least 50% over the next decade due to a combination of external (and thus uncontrollable) agencies, and internal competing values.

Interested readers should consult the original report for a full description of Core³⁶. This assessment resulted in the determination of the core in the forest to be as listed in Table 8. To achieve this Mistik established an indicator for Core Forest Habitat in the 2008 FMP.

Table 8. Core area in Mistik FMA area by Management Unit

Mistik Management Unit	Area (ha)	Core Forest (%)
Divide	158,031	23
Pierceland	114,281	6
Big Island Lake	37,588	11
Waterhen	180,170	34
Beauval	144,357	51
Canoe Lake	177,299	69
Ile a-la-Crosse	109,908	76
Buffalo Narrows	115,611	61
Dillon	345,597	57
Murray Bay	60,561	39
Beaver River	13,448	23
Peter Pond	275,180	81
TOTAL	1,732,033	52

In addition to the assessment of core by Andison, Mistik managers considered the requirement of the rationale for areas "...large enough to potentially support most or all native species" while retaining resilience for long-term, large-scale natural disturbances. Logically, it is wildlife species that are potentially affected by forestry, so a direct review of the projected FMP impact is very relevant. As part of their new plan preparation Mistik worked with Environment Canada³⁵ to assess this question using bird communities as the indicator (Van Wilgenburg, S L and K A Hobson 2007).

They³⁵ addressed the central challenge of forest management which is to maintain all species assemblages:

"Due to the short history of large-scale forest harvesting in Saskatchewan, the adoption of the natural disturbance paradigm is a working hypothesis and the ability of this method to conserve biodiversity is unproven in the long-term. Since contrasts of late-seral bird communities in post-harvest and post-fire landscapes are not possible, the best alternative to assess potential implications of forestry is through modeling known bird habitat relationships and integrating these with forest growth-and-yield simulations. We developed spatially explicit statistical models to predict the probability of occurrence for two species and two guilds of birds occurring on the Mistik FMA, allowing us to assess potential changes in the occurrence and distribution of birds related to Mistik's proposed 2007 Twenty Year Management Plan. "

The authors modeled several species and guilds to assess the trade-offs and potential conflicts. With more than 120 species of birds on the Mistik FMA area any habitat change will cause some species to decline and others to increase. They selected several species/guilds to represent a substantial proportion of possible outcomes. They conclude:

"Considering the modeled species and guilds simultaneously, the Mistik 2007 Twenty Year Forest Management plan appears to strike a good balance in the maintenance of habitat for the bird community."

And

"...Within the context of the current analysis and assumptions however, the current management plan appears to provide a reasonable compromise for sustaining biodiversity, at least from the avian perspective..."

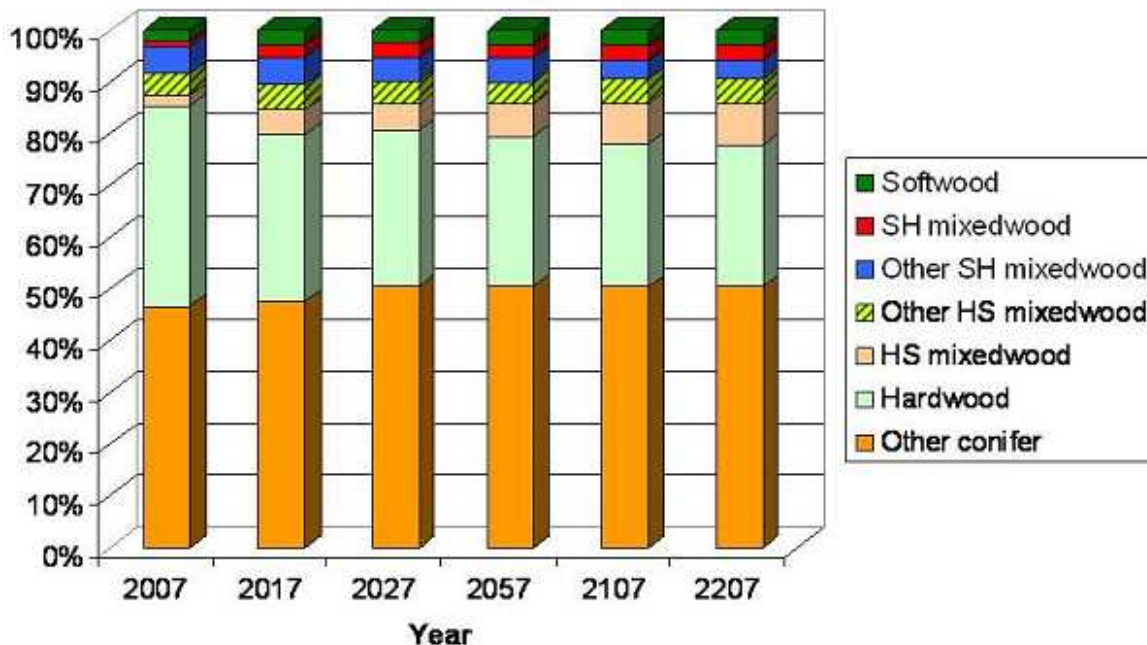


Figure 2. Projected change in the relative proportions of major forest types (excluding bog and fen) on the Mistik FMA area.

They felt the 2007 Twenty Year Management Plan favored the development of more mature mixedwood habitats. These are generally of greater conservation concern as forest harvesting and silvicultural practices may cause conversion of mixedwood stands into monospecific coniferous or deciduous stands (Thompson et al. 2003). The guilds associated with softwood dominated mixedwoods and other conifers generally may be relatively unaffected or positively affected by the proposed management plan as a result of the increased average stand age and an increased softwood component on the landscape.

They discuss in detail the scenarios for Ovenbird and White Throated Sparrow which their analysis showed some concern. The authors were concerned that their sample sizes for hardwood specialist and “old-growth” spruce specialist species were too small. This is an important guild. They argued that with a projected increase in the softwood component and increased stand ages, “old-growth” spruce specialists should benefit from the management plan. This has the effect that some hardwood specialists may decline in response but these species are more resilient and will likely make use of hardwood dominated mixedwood habitats.

In conclusion the authors assessed the Mistik FMP in terms of the projected impact on some of the more sensitive species over the long term and considering the overall shift in landscape feature. This includes the balance of LLF and other landscape parameters. In their words the plan “...appears to provide a reasonable compromise for sustaining biodiversity, at least from the avian perspective.”

Another study that was done on the Mistik FMA area by Proulx⁴⁰ analyzed the connectivity in the forest, a concept related to fragmentation and LLF. The maps developed in this assessment are detailed and should be downloaded directly by interested readers from the website in the footnote. This study focuses on the functional landscape and includes non forest operations areas. It is based on the assumption that corridors provide travel routes through the forest, a concept which has been under discussion (Schmiegelow⁴¹ et al. 2007; St Clair⁴² et al. 1998). Proulx has provided an overview of the entire Mistik FMA area and analysed connectivity and refers to the need for ensuring that connectivity is functional.

“The amount of potential connectivity provided by non-operational areas appears sufficient to maintain wildlife and plant species dispersal throughout the Mistik FMA area. Of course, when field-validating Proulx’s (2006) predictive wildlife species distribution maps and areas of greater wildlife biodiversity potential, attention should be paid to non-operational areas that link them to determine how effective they are in fostering animal movements across the landscape.”

Finally the role of protected areas in the provision of unfragmented forest is also considered. This is based on the review from element 6 in this report, and this is not further discussed here. Protected areas do contribute to meeting the LLF management objectives.

Coarse and Fine Filter

Coarse filter is a key concept in forest management, and relates to integrated resource management, multi-species management etc. It is related to HCVs because in effect, most of this report determines the threshold between HCV and not HCV or more conventionally stated the difference between fine filter and coarse filter as applied to all values, not just wildlife.

On the subject of thresholds or management activities, the majority of species in a forest ecosystem do not require “special” management. The theory is that good general forestry practices will conserve the forest ecosystem and in so doing, sustain all of the species. This theory is referred to commonly as the coarse filter approach. The difficult part of implementing this approach is determining which species do

⁴⁰ Proulx Connectivity <https://www.isogis.com/isogis/dropbox/DownloadFile.do?fileId=011ct6waay3km&companyCode=mistik>

⁴¹ Schmiegelow [http://www.ualberta.ca/~fschmiegl/Publications%20PDFS/Schmiegelow%20and%20Monkkonen%](http://www.ualberta.ca/~fschmiegl/Publications%20PDFS/Schmiegelow%20and%20Monkkonen%20et%20al.%202007.pdf)

⁴² St. Clair <http://www.ecologyandsociety.org/vol2/iss2/art13/>

require special management practices – the fine filter species. This is analogous to the HCV threshold. All HCVs are fine filter values (either species or other values), and because they require special management prescriptions. Noss⁴³ gave an excellent overview of the coarse filter approach:

“The Nature Conservancy calls its community-level conservation strategy a coarse filter (Noss 1987) and has estimated that 85-90% of species can be protected by conserving samples of natural communities without separate inventory and management of each species. A coarse-filter strategy can be implemented at any desired level of a hierarchical classification, including landscape types based more on vegetation or physical habitat pattern than on species composition (Noss 1987). Species not effectively captured by a coarse filter, such as narrow endemics or large carnivores, can be addressed through the conventional fine filter of rare-species inventory and protection.”

Some HCVs fall close to the threshold. Above we describe species of rare plants and some listed bird species. Management of these is addressed through general wildlife unless specific critical habitat is identified.

Mistik has addressed the role of the coarse/fine filter approach in several studies on their FMA area. Proulx³⁷ describes the fine filter coarse filter approach in the Mistik FMA area in terms of multi species management:

“It is therefore appropriate to consider a multi-species management approach for species at risk with similar habitat requirements. Such an approach can integrate coarse-filter and fine-filter management approaches to develop comprehensive landscapes to maintain viable animal populations.”

This is based on another paper by Proulx⁴⁴ (2005) on the subject. The above discussion is relevant to all of the HCVs but is placed here because of the importance that LLLF has in meeting the coarse filter approach in the Mistik FMA area. Andison³⁶ describes this well in his work where he makes the argument for broad indicators as coarse filter.

“The only way for more interior old forest to occur over time is by managing for a higher proportion of mature forest interior, which can only occur by managing for a higher proportion of immature interior forest, and so on. Thus, simply by measuring interior old forest, one is de facto capturing the interior conditions of all other seral-stages. In other words, old forest interior is in many ways a good coarse biological filter, which is entirely consistent with the spirit of this indicator.”

In practice this means that most species, even SAR, are conserved through balancing age class, distribution and abundance of forest types at the landscape level.

HCV Designation Decision:

Maintaining the natural landscape pattern is the priority in the management plan, and this was identified as such by input from a wide range of groups and individuals. Large core forest areas within the Mistik FMA area confer higher than average natural habitat features, likelihood of natural wildlife population dynamics and remoteness from human-related activities. Emulation of natural patterns has become a critical deliverable in FMPs in the boreal forest in the 21st century. The concept of LLLF, and unfragmented forest merits the HCV designation. Management is described in Table 16.

The challenge is to provide a definition that will be deliverable and measurable by the managers. From Mistik FMP, based on Andison³⁶ (2007) the HCV is defined as (indicators #9, 11, 12, 13, Table 17; from Mistik's 2007 20-Year FMP Appendix L) -- Core forest area is defined as any naturally occurring areas, or post-harvest areas that are at least 20 years of age, that are not within 500 m of a permanent cultural feature, or within 500 m of a harvested area less than 20 years of age.

⁴³ Noss on fine filter -- http://el.erd.usace.army.mil/emrrp/emris/EMRIS_PDF/ec.pdf

⁴⁴ Proulx on SAR -- http://www.llbc.leg.bc.ca/Public/PubDocs/bcdocs/400484/proulx_edited_final_march_17.pdf

Category 3) Forest areas that are in or contain rare, threatened or endangered ecosystems.

8) Does the forest contain naturally rare ecosystem types?

Rationale:

These forests contain many unique species and communities that are adapted only to the conditions found in these rare forest types.

Assessment Methodology:

- WWF Ecoregion Conservation Assessment (Iacobelli 2003)
- Conservation International
(<http://web.conservation.org/xp/CIWEB/regions/priorityareas/wilderness/>)
- NatureServe

Assessment Results:

Conservation International does not identify any biodiversity hotspots within Saskatchewan or Canada.

The Saskatchewan Conservation Data Centre does not rank ecosystem types for consideration in forest management planning.

Wetlands

The biodiversity assessment by Ecomark (2006) identified a number of potential special plant communities that may occur in the Mistik FMA area. Their vegetation field surveys during 2006 confirmed the presence of unique, unusual plant communities, or special plant communities in the Boreal Forest region. In their opinion most riparian shrubland, wetland, sparsely vegetated, and aquatic special plant communities should be protected through the creation of riparian or wetland buffers. Rare wet meadow, grassland, or seep communities often occur within forest openings, and may potentially be lost while accessing adjacent or surrounding merchantable stands.

Ecomark considered wetland and riparian habitats as significant ecosystems. They did not classify these into particular wetland types, as defined by Ducks Unlimited (discussed in element 13)

These wetland types generally:

- contain concentrations of uncommon to rare plant species,
- are important filters,
- have high utilization by wildlife.

They describe wetlands as including all bog and fen types, i.e., coniferous stands of moist to hygric sites, with black spruce, tamarack and/or pine dominant, and with dwarf birch-Labrador tea understories, and a high proportion of sedges (*Carex* spp.), peat mosses (*Sphagnum* spp.) or other mosses (e.g., brown, golden, feathermoss). Riparian zones include plant communities that occupy habitats in the vicinity of watercourses, or seepage areas with mesic to hydric moisture regimes.

Late Seral Stage Forest

Although late seral communities are not rare on the Mistik FMA area, large natural variation in all of the boreal forest means that there are some periods when some types are rare. This “rare communities” element is an appropriate location for assessing whether the “old growth” communities on the forest are HCVs.

The first step in assessment is defining old forest. Although historical evidence points to about a 50 year fire cycle for the Mistik FMA area, the managers chose to use the FMA area-wide Natural

Disturbance Emulation old forest retention thresholds identified by Andison (2007) for the 2nd quartile of the intermediate fire cycle of 74 years (vs. 55 yr and 100 yr fire cycles). In doing this, Mistik is taking a precautionary approach to the maintenance of old forest. Refer to Appendix 4. Maps of the Mistik FMA area for the location of Map #6 – Distribution of Old Forest for the current distribution of old forest in the Mistik FMA area.

Mistik has designated late seral stage forest as HCV for six forest types (Table 9). Current amounts of old forest exceed target amounts for white spruce, black spruce and mixedwoods. For very old forest (>120 years) all forest types currently exceed the 10% threshold. Due to the active and widespread natural disturbance regime (fires) over the last 100 years, there is currently insufficient old forest area for Jack pine and hardwood forest types in the Mistik FMA area. Mistik will recruit old forest to the levels identified for the bottom of the 2nd quartile of the 74 year fire cycle over one rotation (~ 100 yrs).

Diverse Deciduous Forest

Table 9 lists five rare vegetation communities identified by Ecomark (2006 b), as labelled in the Table. The original study was based on a broad survey of vegetation types. It identified 4 types that were characterized by mature or late seral deciduous forest types (Table 9), and one spruce forest type. The most comprehensive forest vegetation classification in Saskatchewan is by Beckingham et al. (1996). It classifies all of the forest types in the mid-boreal region. Mistik took the five communities identified by Ecomark and keyed them using the Beckingham (1996) Field Guide to Ecosites of the Mid-Boreal Ecoregions of Saskatchewan. The five ecosystems Ecomark described as HCV, listed in (Table 9), all key out to ecosite types that are rich or very rich with sub hygric soils.

Ecomark did not use the Beckingham classification system in their analysis. Their findings did support the robustness of the Beckingham classification but it also means that these ecosystems are part of the full spectrum of forest types that are managed for within the Mistik FMA. The abundance and distribution of these communities is monitored through the indicators. Although the stands are less abundant than some stands, they occur with the expected abundance. Although they may be uncommon, there is no evidence to show they have declined. Special designation as HCV does not seem warranted for these forest types, especially considering that old forest stands are designated separately. These five forest types are conserved through the coarse filter approach to management. Indicators that apply to the general forest condition (Indicator #s 2,3,4,8 and others P 61 of Volume 2, FMP³) will provide monitoring for these ecosite types as well.

Caribou Habitat

In conjunction with element 1, and as described by Ecomark (2006), certain high quality caribou habitat types, that can also be considered as a specific vegetation community type, are identified as HCVs Table 9.

Table 9. Vegetation communities identified by Ecomark as possible HCV (2006 b).

Community name	Description (Ecomark 2006)	Classification⁴⁵	Status
Woodland caribou habitat	Jack pine, or black spruce-tamarack forests with substantial presence Cladina reindeer lichen mats; white spruce/lichen woodlands on sand hills with Cetraria lichen mats; other mature forest types utilized by caribou with substantial presence of reindeer lichens and/or arboreal lichens. The presence of ground and/or arboreal lichens (25-50% cover or more) is an indicator of good forest health;	b→ b1 c→c1 (jp1b5)dry g→g1 (jp bs; bs jp) wet	HCV
'Old growth' forest stands, i.e., older than 1880-1890 for coniferous stands, and older than 1910 for deciduous stands	Dominated by balsam fir, or very large old aspen, poplar or paper birch. Very infrequent 2006 Ecomark; not reported NorSask 1992-1993; uncommon in the boreal forest; few old stands remain. Birch and poplar are harvested for firewood; they contain snags, standing dead trees utilized by woodpeckers and other birds, and may contain high biodiversity and uncommon to rare plant species;	Deciduous-d Coniferous-f	HCV

⁴⁵ Beckingham et al 1996, Classifications as assigned by Mistik staff

Ecomark Identified Forest Units

Mature deciduous forests (A)	With alder-leaved buckthorn (<i>Rhamnus alnifolia</i>) in the understory. These are closed canopy stands, often dominated by balsam poplar on level, wet, nutrient rich sites with well developed shrub layers, high cover by buckthorn, and a horsetail ground layer. Infrequent 2006 Ecomark; not reported NorSask 1992-1993; uncommon in the boreal forest;	f ostrich fern	Not HCV
Mature deciduous forests (B)	With ostrich fern (<i>Matteuccia struthiopteris</i>), or other ferns in the understory. These are moist, nutrient rich stands of seepage areas on hillsides, or in depressions; balsam poplar is often the dominant tree, though paper birch or aspen may be co-dominant. Infrequent 2006 Ecomark; not reported NorSask 1992-1993; uncommon in the boreal forest; provides habitat for uncommon to rare plant species	f ostrich fern	Not HCV
Closed, maturing aspen stands	With prickly rose / spreading dogbane understories on gently sloping fluvial terraces, and moderately to well drained sandy sites; bog cranberry and hairy wild rye are usually in the understory. Infrequent 2006 Ecomark; not reported NorSask 1992-1993; uncommon in the boreal forest;;	f ostrich fern	Not HCV
Open-canopied late seral white spruce stands	Often with alder-birch / horsetail / moss understories. Stands occupy depressional or riparian sites that have avoided frequent fire, and contain high cover by feathermosses, river alder, Alaska birch, horsetails, and/or arboreal lichens. Very infrequent 2006 Ecomark; not reported NorSask 1992-1993; uncommon in the boreal forest; few old stands remain.	e3 dogwood white spruce	Not HCV
Late seral balsam poplar stands	With river alder-red-osier dogwood /horsetail understories. These stands occupy openings and light gaps within other forest types, or older upper to middle alluvial terraces and along watercourses, in the absence of frequent fire or flood. These are mesic sites with prickly rose, low-bush cranberry, and running raspberry as common elements below a dense tall shrub layer; arboreal lichens, old large trees, snags and logs often present. Very infrequent 2006 Ecomark; not reported NorSask 1992-1993; uncommon in the boreal forest; few late seral stands remain.	e1 dgwood balsam poplar	Not HCV

HCV Designation Decision:

Mistik has used a broad designation of all wetland and riparian zones to be HCV, referred to as “Areas immediately adjacent to surface waters”. Management is described in Table 16. This is intended to ensure that demarcation does not exclude some potential sensitive areas. This value is discussed again in element 13 and 19 where it is included in the broad discussion of [riparian](#) values. Arguably, wetland and riparian zones do not stand out as an HCV as described here in element 8. However as an overlapping value, it is designated as HCV in Element 19.

Five mature and late seral communities were assessed Table 9. Originally stands of this type were considered HCVs based on some unusual species associated with them. When they were evaluated using the Beckingham classification, which is the conventional these stands were determined to be consistent with their expected level of abundance, and did not stand out as HCVs. They were not designated. More specifically however, ‘Old growth’ forest stands, i.e., older than 1880-1890 for coniferous stands, and older than 1910 for deciduous stands were designated HCV.

As well Caribou habitat specifically Jack pine, or black spruce-tamarack forests with substantial presence by *Cladina*, is designated HCV, in conjunction with element 1. It was designated again under this element, although for simplicity, it is only referenced once as an HCV.

9) Are there ecosystem types within the forest or ecoregion that have significantly declined?

Rationale:

Vulnerability and meta-population viability. This indicator includes rare forest ecosystem types that are rare due to historic harvest practices (e.g. late seral red and white pine in eastern Canada).

Assessment Methodology:

- NatureServe
- Saskatchewan Conservation Data Centre
- Mistik FMA FMP³

Assessment Results:

Late Seral

In the previous element, rare ecosystems were discussed and some identified as HCVs. In this element the focus is on long term declines particularly those that may be related to human activity. Because the boreal is subject to natural disturbance, and variation in the amount of particular vegetation communities, the FMP addresses this flexibility. Most pronounced is the impact of logging on old forest communities. In Table 10 we have copied the FMP targets for old growth retention. Note these are different than the specific old growth communities discussed in element 9 above, which refer to rare types. This element focuses on long term decline, and we have therefore assessed the old growth component of the major boreal ecosystem types. The FMP deals with this in great depth. Table 10 shows the current percentage of old forest, as an indication of the long term variation. Of the five major forest types, Hardwoods are below the desired target, and Jack Pine is slightly below. Only [late seral](#) stands older than 1880-1890 for coniferous stands, and older than 1910 for deciduous stands were designated HCV in element 8.

Table 10 Old forest retention Targets and Current Condition (FMP³ Table 10.5).

Forest Type	Total Area (ha) of Working Forest and Eligible Excluded Land Base (2006)	Target Old Forest Amount (ha (%))	Current Old Forest Amount (ha (%))
White spruce	31,245	2,812 (9%)	6,746 (22%)
Black spruce	74,553	3,728 (5%)	8,560 (11%)
Jack pine	320,079	16,004 (5%)	14,529 (5%)
Mixedwoods	176,599	17,660 (10%)	18,958 (11%)
Hardwoods	351,202	49,168 (14%)	33,580 (10%)
Total	953,678	89,372 (9%)	82,373 (9%)

Aspen Decline

The FMP has identified the decline of Aspen⁴⁶ (Hogg et al 2001) from a combination of forest tent caterpillar outbreaks and repeated drought or stand senescence in the southern portion of the MU. The managers are monitoring this situation for many reasons, as are the federal and provincial government. However this significant forest type undergoes fluctuations over time (Andison 2007 – Mistik PIC analysis). The community is not undergoing a long term decline. Preliminary results from the tree-ring analysis in the study by Hogg showed aspen forests in western Canadian Boreal undergo cycles of collapse and recovery since 1950. Growth was greatly reduced during 1961-1964, 1979-1984, and 1988-1995, corresponding to periods with regional drought and large-scale outbreaks by forest tent caterpillar. The aspen decline does not meet the threshold for an HCV.

⁴⁶ Aspen decline http://adaptation.nrcan.gc.ca/projdb/pdf/30_e.pdf.

HCV Designation Decision:

[Late seral](#) defined as older than 1880-1890 for coniferous stands, and older than 1910 for deciduous stands warrant designation as HCVF in the Mistik FMA area (see also element 8). Management is described in Table 16.

10) Are large landscape level forests (i.e. large unfragmented forests) rare or absent in the forest or ecoregion?

Rationale:

In regions where large functioning landscape level forests are rare or do not exist (highly fragmented forest), many of the remnant forest patches require consideration as potential HCVs (i.e. best of the rest). Identifies remnant forest patches/blocks where unfragmented (by permanent infrastructure) landscapes do not exceed size thresholds.

Assessment Methodology:

- WWF-Canada Assessment of Ecological Representation
http://assets.wwf.ca/downloads/wwf_forest_aor_fullreport.pdf
- Global Forest Watch Intactness mapping

Assessment Results:

The assessment for this element of the frame work is combined with element 7. For a detailed discussion please refer to that section. In that element LLF is designated as HCV. Large landscape level forests are not rare in the Mistik FMA area, as much of the area is free of permanent human disturbances

HCV Designation Decision:

There is no separate HCV designation decision under this element.

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

Rationale:

Vulnerability; species diversity; significant ecological processes.

Assessment Methodology:

- As in element 8

Assessment Results:

This element is similar in many ways to the rare ecosystem assessment done in element 8. The primary difference is the requirement for species diversity. In this northern forest the amount of diversity is limited. There were no ecosystems identified as being particularly high in diversity.

In the Mid Boreal Upland Ecoregion, there are some features which may provide substrate for uncommon vegetation features: escarpment, post-glacial processes and features (e.g., hummocky moraine, fluvial beds, sand dunes), and the Canadian Shield. In the Mistik FMA area, moisture regime, and to lesser extent, aspect and slope are important microclimatic conditions that strongly affect vegetation cover. Protected valleys, depressional sites, seepage sites, and areas with seasonal or temporal water supplies, all have the potential for high plant biodiversity, and rare plants. Rare plants, however, can occupy most habitat types in the region. Areas affected by fire are potentially subject to dramatic shifts in moisture and temperature changes, and thus vegetative cover. None of the features described above provide enough potential for unique diverse ecosystems.

Unique geological or topographic areas (steep slopes) were brought forward as a possible HCV in element 14 where they are linked with the topographic characteristics [slope greater than 30%](#).

HCV Designation Decision:

Slopes greater than 30% were designated as HCV in element 14. No other HCVs are designated in this element.

Category 4) Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).

Context:

The concept of the “basic services of nature” is of necessity very broad. Not all aspects of this can be fully assessed, but we have attempted to review the major elements as outlined in the National Framework. The following questions, 12 to 16, in category 4, are especially important in a working forest, which Mistik FMA area certainly is. Water management, land management, and business uses of the forest are all potential critical values that may be HCVs. In assessing these values we have drawn heavily on the work done during the preparation of the FMP because avoiding conflict with other users is key to that process. A great deal of consultation has been done as part of that. As well, ecological services are also protected by the Canadian Environmental Protection Act, the Navigable Waters Protection Act and the Fisheries Act. In addition, provincial flood rights and limits, and local building by-law restrictions are considered.

12) Does the forest provide a significant source of drinking water?

Rationale

The potential impact to human communities is so significant as to be ‘catastrophic’ leading to significant loss of productivity, or sickness and death, and there are no alternative sources of drinking water.

Assessment Methodology

- Known usage of water by local communities
- Saskatchewan Watershed Authority
- OBM base maps showing topography
- Local terrain mapping
- Provincially Significant Wetlands

Assessment Results

The Mistik FMA area is primarily situated in the Churchill River drainage basin, which includes the Beaver River watershed and the Churchill River watershed (SWA, 2006). Drinking water in these watersheds are primarily surface waters from northern lakes and rivers.

Agencies such as SaskWater, Saskatchewan Environment, and the Saskatchewan Watershed Authority are directly involved in the management of the province's water resources. Saskatchewan Environment's Drinking Water Quality section ensures safe drinking water for the province. Presently, there are no water protection plans in place and there is little information about critical catchment areas in these areas (SERM, 2006b, Kelly, 2006, Pers. Comm.).

In Canada, poor quality drinking water is often an issue of concern in rural and aboriginal communities. According to a study by the Canadian Medical Association (CMA), as of Feb. 29, 2008 there were boil-water advisories in place in 93 First Nations across the country. In 2008, the same study ranked Saskatchewan No. 4 in Canada with 126 advisories as of Mar. 31, 2008. Of these, 53 were emergency boil-water orders, meaning a threat to human health had been identified. The province had another 73

precautionary drinking water advisories in place, meaning residents were advised to boil water because of the possibility problems exist with their water.

At least 2 of the 19 identified communities within the Mistik FMA area had Precautionary Drinking Water Advisories (PDWA) in place as of July 2008 and it is not clear whether this list includes all of the First Nations communities in the area. While the water quality issues identified likely do not have a direct link to forestry operations but rather are often related to equipment malfunction or other issues in treatment facilities, they do highlight the importance of clean drinking water supplies within the forest area.

The definitive question here is whether or not the forest area of interest encompasses a sole available and accessible source of drinking water for the communities located there. According to the available information, there is no one main source of drinking water on the Mistik FMA area. Many of the waterbodies and waterways within the Mistik FMA area are regularly used to provide water for human consumption.

The 20 Year FMP has not been 'formally' reviewed by a water management agency. Mistik has ongoing discussion and interaction with the Saskatchewan Watershed Authority (SWA) regional office located in North Battleford, SK (e.g. meetings, phone calls, forest tour, etc.). A few years back the SWA did have some concerns but through consultation these have been alleviated.

The FMP does identify at least one frequently used source of potable water for local Beaval community residents, who made their concerns about water quality known to Mistik during a 2001 bridge reconstruction at the Lac La Plonge crossing. This is the outflow point (weir location) of Lac La Plonge. While this provides one specific example, it is difficult to assess other locations in the forest that may have importance as drinking water sources in light of the limited information in the management plan.

Given the importance of clean drinking water for local communities, known sources of potable water or areas of concern may be considered HCV. There is a close relationship between this value and other riparian values, described generally as "areas adjacent to surface waters". Management prescriptions also apply to all of these designations.

HCV Designation Decision:

Drinking water is designated as part of the Areas adjacent to Surface Waters in element 19. One specific outflow point (weir location) of Lac La Plonge; and other water source locations would be specifically identified as HCVs. Buffers for safeguarding drinking water are described in Table 16.

13) Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?

Rationale:

Forest areas play a critical role in maintaining water quantity and quality and the service breakdown has catastrophic impacts or is irreplaceable.

Assessment Methodology:

- Government policy, monitoring & response programs (Saskatchewan Environment)
- Saskatchewan Watershed Authority
- Provincial Wetlands
- Literature Review – Effects of forest disturbance on water yield

Assessment Results:

Wetlands and riparian areas figure prominently in a number of the elements of the framework due to their importance as habitat (elements 1, 3 and 4) and as unique ecosystems ([element 8](#)). They are discussed in detail here, and cross referenced from other locations, for simplicity. This element

addresses wetlands for the ecological service directly, rather than as the home for other values. Both are important.

Long-term stream flow data suggests that there are a variety of areas that provide an ecological service in the Mistik FMA area. A combination of factors affects discharge rates into Waterhen River including Primrose Lake and Cold Lake acting as storage reservoirs, and groundwater flow from the Mostoos Hills. Canoe River and Churchill River are both highly influenced by flow from large wetland areas and lakes in the drainage basin, whereas Beaver River and Dillon River appears to be most influenced by snowmelt and precipitation inputs (Mistik, 1995). Large wetlands are listed in Table 11. Wetlands and riparian areas are all considered critical features in the Beaver River and Churchill River watersheds, as they contribute to the high quality of runoff, provide natural settling and nutrient removal, and regulate stream flow.

The Forest Management Plan includes provisions for the protection of water quality. There is a provincial standard for riparian reserves which equates to 15, 30 and 90 meter buffers. The width of the buffer to be applied depends largely on the presence or absence of 'game fish'. Mistik observes and in many instances exceeds the required buffer when warranted.

Following concerns expressed by the Saskatchewan Watershed Authority (SWA) regarding the effects of harvesting on overland flow, a joint site visit and tour with SWA assisted Mistik in determining the appropriate watershed sub-basin to use the FMP process. The discussions and field tour resulted in the consensus that forest harvesting impact on water quantity and discharge is likely not distinguishable within the range of natural variability. The opportunity exists in the future to operationally assess this assumption based on the metering sites at the sub sub sub basin level.

According to a 2007 study of deep lakes in Meadow Lake Provincial Park prepared for Mistik Management, the "synoptic characteristics of the study lakes indicate that most of them are highly vulnerable to potential nutrient inputs from forestry". Results indicated that small increases in nutrients could result in major trophic changes. In other words, deep, coldwater lake ecosystems have little resistance to nutrient increases. The riverine aspects (e.g. connectivity of the mainstream lakes) also suggest that they have low system resilience, i.e. the ability to 'bounce back' from disturbances and that consequently, cold, oxygenated deepwater habitats could be at risk.

The study does caution that lakes may be vulnerable to potential nutrient increases from other causes as well, including forest fire, agriculture, atmospheric deposition and even climate change.

Ducks Unlimited Canada (DUC) has produced a document reviewing the status of the boreal plains wetlands⁴⁷. This document defines a rigorous satellite based method for evaluating wetlands in the boreal plains eco-region which has been implemented over a wide area⁴⁸.

Mistik has signed an MOU with DUC to complete this assessment for special or potential wetland HCVs. An implementation trial is ongoing in the Beauval⁴⁹ area of the Mistik FMA. Ducks Unlimited is moving forward with a high level classification project intended to provide recent, regional scale baseline inventory on the various upland and wetland cover types. This will provide resource managers, industry, and other organizations with detailed information on the spatial distribution of cover classes for use in management decisions, research and many other uses. Currently the project is completing the mapping phase.

In general, wetlands on the forest provide ecosystem service functions such as: ground water recharge and discharge; flood damage reduction; shoreline stabilization; sediment trapping; and nutrient retention and removal. These wetlands also provide habitat for many bird, amphibian, reptile and mammal species, including many of the furbearers. Wetland areas of various sizes and types are

⁴⁷ Smith, K.B., C.E. Smith, S.F. Forest, and A.J. Richard. 2007. A Field Guide to the Wetlands of the Boreal Plains Ecozone of Canada. Ducks Unlimited Canada, Western Boreal Office: Edmonton, Alberta. 98 pp.
<http://www.ducks.ca/conservation/programs/boreal/pdf/fguide.zip>

⁴⁸ <http://www.ducks.ca/conservation/programs/boreal/index.html>

⁴⁹ <http://www.ducks.ca/conservation/programs/boreal/beauval.html>

scattered throughout the Mistik FMA area and are often associated with lake, river and stream systems. These aquatic systems may serve as travel corridors and feeding areas for wildlife. Wetlands are also important for fisheries habitat. Some species of fish, such as northern pike and muskellunge rely on wetlands as spawning areas. For other species, wetlands can be valuable feeding or food-producing areas, providing frogs, insects, bait fish and other food. Significant wetlands identified to date are listed in Table 11.

Table 11. Significant wetlands in the Mistik FMA area related to waterfowl habitat.

Wetland Name	Location
Canoe Lake	Canoe Man. Unit
Parker Lake	Canoe Man. Unit
Apps Lake	Ile A La Crosse
Kazan Lake	Ile A La Crosse
Amyot L, south to the end of the Durcoher L chain	Ile A La Crosse and Beauval
Beaver River area	Man Units
	South of Beauval

Forest managers have no direct control over water level fluctuations and flow regulation associated with the hydroelectric industry, climate effects or other water users but must ensure that forest operations have no significant negative impacts.

HCV Designation Decision:

Wetlands are designated HCVs and grouped with other aquatic values in element 19 HCV: Areas adjacent to surface waters, as part of the broad designation of all riparian and wetland areas in the FMA area. Management is described in Table 16.

14) Are there forests critical to erosion control?

Rationale:

Soil, terrain or snow stability, including control of erosion, sedimentation, landslides, or avalanches.

Assessment Methodology:

- Review of base maps showing topography
- Review of local terrain mapping

Assessment Results:

There is risk of erosion through harvesting and road construction across any forested landscape. Wind erosion often occurs on large areas of exposed fine textured soils and water erosion is primarily a function of precipitation, slope, and soil characteristics (Padbury and Van Rees, 2005).

The major landform feature of the province is the escarpment created by erosion that separates Saskatchewan Plain from Alberta Plain and Manitoba Plain. Except for the Cypress Hills near the U.S. border, Saskatchewan lies on a plain. However, its landscape is not absolutely flat--Saskatchewan is a province of gently rolling rounded hills.

Approximately 97% of the Mistik FMA area landscape has a slope class less than 10%. There is little risk of wind erosion in the Mistik FMA area unless large forested areas, particularly on sandy soils and dune areas are cleared and the protective forest floor layer is significantly disturbed. Wind erosion may occur on exposed very fine sands or silty surface layers following fires (Padbury and Van Rees, 2005).

Practically speaking this does not happen. Residual structure requirements and fast replanting of sites does not leave large exposed areas.

Because of the level landscape, the risk of water erosion is also low in the Mistik FMA area. Water erosion could be a concern if vegetation is removed and if soils are disturbed in some areas eg. on the steep east-facing slopes in the Peter Pond FMU, and steep sloping areas along the escarpment in the Dillon, Canoe Lake, Waterhen, Murray Bay, Big Island Lake, and Pierceland FMUs (Padbury and Van Rees, 2005).

While areas of steep terrain may be small and localized, they may still have significant erosion potential. All of slope classes greater than 30% follow along temporal and permanent drainages. This connection with surface waters is of significance given this repeated theme through a number of elements.

HCV Designation Decision:

Slope classes greater than 30% along temporal to permanent drainages are HCV due to higher erosion potential, plus higher than usual levels of plant biodiversity, utilization by wildlife, and occurrence of rare plants. These are addressed in element 19, which discusses overlap of values, because they almost exclusively follow streams and rivers through the forest.

15) Are there forests that provide a critical barrier to destructive fire (in areas where fire is not a common natural agent of disturbance)?

This question is deemed not relevant to forest ecosystems in Canada (see Appendix 5 in FSC Canada National Boreal Standard, Version 3.0).

16) Are there forest landscapes (or regional landscapes) that have a critical impact on agriculture or fisheries?

Rationale:

Mediating wind and microclimate at the scale of ecoregions affecting agriculture or fisheries production. Riparian forests play a critical role in maintaining fisheries by providing bank stability, sediment control, nutrient inputs and microhabitats. More local effects of forest areas (e.g. adjacency of forests to agriculture and fisheries production) may be more relevant in the HCV component regarding meeting basic needs of local communities.

Assessment Methodology:

- Review Literature
- Discussions with local SE fisheries managers
- FMP comments

Assessment Results:

Fisheries

There are over 500 lakes, rivers, and streams within the Mistik FMA area, many of which are important to the commercial, subsistence, and recreational fishery in the area. In 1993, Terrestrial and Aquatic Environmental Managers Ltd. conducted fish habitat assessments, literature reviews and interviews with local fishers in the North Saskatchewan River, Beaver River, Waterhen River, and Upper Churchill River watersheds. Numerous spawning locations, rearing habitats and significant habitat attributes were identified for northern pike, walleye, lake whitefish, and trout throughout the FMA area (Mistik, 1995). Undisturbed riparian areas are essential in maintaining fish habitat attributes in the Mistik FMA area.

Fisheries have clearly demonstrated sensitivity to forest harvesting (*i.e.* higher temperatures, increased sedimentation, increased flow rates, lower dissolved oxygen levels, reduced cover for juveniles,

decreases in food sources for invertebrates, destruction of spawning habitat, etc.). Mistik maintains fish habitat attributes through riparian reserves and by applying guidelines for minimizing sedimentation from roadways and crossing structures.

There is a significant commercial fishery within several of the large lakes and waterways within, and adjacent to, the Mistik FMA area. In 2003, there were fourteen lakes within or bordering the Mistik FMA area that were fished commercially. There were a total of 490 commercial fishing licenses for those lakes. The number of commercial fishers was less than this number as one fisher may have several licenses. In 2003-2004, there was 836,000 kilograms of fish worth \$1.4 million harvested commercially within or near the Mistik FMA area. This equates to revenue of \$2,760/license. The most important fish species in terms of value was walleye, which provided \$847 thousand in revenue which represented 63% of the total commercial fishing value for 2003-2004. Whitefish was the second most important species in terms of value with a harvest worth \$312 thousand or 23% of the total value. In terms of price per kilogram, walleye/sauger was also the most valuable at \$4.11/kg. Whitefish was second at \$1.32/kg. The most important lake in terms of the value of harvest was Peter Pond Lake with a harvest worth \$401 thousand in 2003-2004, which represented 30% of the total harvest. Ile a la Crosse was second with a harvest worth \$292 thousand or 22% of the total harvest.

Sport fishing is also a significant forest use on the Mistik FMA. Multiplying the number of angler-days in the survey areas in which the Mistik FMA area is located by the average daily expenditure gives a total expenditure on sport fishing within the Mistik FMA area and adjacent areas of \$35 million in 2000, according to angler surveys conducted across the province.

Table 12. Areas with known sport fisheries values.

Management Unit	Areas with known sport fisheries values
Divide MU	<p>Primary water bodies with significant fisheries values include: Turtle Lake and Mikinak Lake</p> <p>Many of the primary creek systems that have year round flow, such as Alcott Creek, all contain some form of fish species (dominantly minnows)</p> <p>In the past (several decades ago), during extremely high water levels, there have been commercial and sport fish species reported in some of the major creek systems</p> <p>There are three known sites pertaining to enhancement of surface waters - the three projects involve dams and dykes in order to create greater water surface area for the enhancement of water fowl habitat – two sites are located at the north end of the MU and one in the south of the MU in the vicinity of Horseneck Lake</p>
Pierceland MU	<p>Primary water bodies with fishery values include: Martineau River, Bid Lake, Sekip Lake, Pipe Lake, Kukuka Lake</p> <p>Many of the primary creek systems that have year round flow, all contain some form of fish species (dominantly minnows)</p>
Big Island Lake MU	There are no primary water bodies with fisheries values in this MU
Murray Bay MU	<p>Primary water bodies with fishery values include: Kukuka Lake, Pipe Lake, Mallard Lake, Dennis Creek, Carl Creek, Delaronde Creek</p> <p>Many of the primary creek systems that have year round flow, all contain some form of fish species (dominantly minnows)</p>
Beaver River MU	<p>Primary water bodies with fishery values include: Beaver River, unnamed lakes</p> <p>Many of the primary creek systems that have year round flow, all contain some form of fish species (dominantly minnows)</p>
Waterhen MU	<p>There are significant sport fishing values in the following lakes: Waterhen Lake, Waterhen River, Keeley Lake, Whitefish Lake, Fern Lake, Mallard</p>

Beauval Management Unit	Lake, Pagan Lake, Watt Lake, Keskuchow Lake, Jackman Lake, Jarvis Lake, Gaudry Lake, Boire Lake and Minnow Lakes Lac La Plonge Beaver River Durocher Lakes 'chain' Dore Lake Gallant and Ingleby Lakes Sandy Lake
Canoe Lake	Canoe Lake and Canoe River Keeley Lake and Keeley River Arsenault Lake and Arsenault River McCallum Lake
Ile a la Crosse	Cole Creek Beaver River Lac Ile A La Crosse Canoe River Kazan Lake
Buffalo Narrows	Little Buffalo Lake Niska Lake Niska Channel Kazan River Lac Ile A La Crosse Jeanotte Lake Little Point Lake McCusker River
Dillon Management Unit	Peter Pond Lake Vermette Lake Dillon Lake Dillon River Nipin River Vermette Creek
Peter Pond MU	Peter Pond Lake Dillon Lake Dillon River Barney Lake Graham Lake Acaster Lake Martin Creek Williams ('Medicine') Creek Brown Creek Kimowin River

Agriculture

The bulk of important agricultural regions in Saskatchewan are located in the southern half of the province⁵⁰. A 2006 Census Agricultural Regions map⁵¹ shows the main agricultural production areas ending just north of Prince Albert, or south of the Mistik FMA.

The Mistik FMA area is adjacent to several agricultural communities including Pierceland, Dorintosh, and Meadow Lake, among others. A portion of the Mistik FMA area is also allocated to individuals that

⁵⁰ Canadian Plains Research Centre Mapping Division:

http://esask.uregina.ca/entry/agricultural_regions.html

⁵¹ Saskatchewan Census Agricultural Regions. 2006. Statistics Canada:

<http://www.statcan.ca/english/agcensus2006/maps/skcar.pdf>

are granted grazing permits by Saskatchewan. Less than 1% of the FMA area itself is classified as agricultural. Agricultural lands are quite distinct from the forestry areas, and for the most part are private and not part of the license. Farms are economically independent of the rest of the economy, so forestry connection is minor. Agricultural activities therefore not classified HCV at this time.

HCV Designation Decision:

Lakes with commercial fishery are HCVs, grouped with other aquatic values in element 19 HCV: surface waters and adjacent areas. Examples are Peter Pond, and Ile a la Crosse).

Agricultural activities therefore not classified HCV at this time.

Category 5) Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health).

17) Are there local communities? (This should include both people living inside the forest area and those living adjacent to it as well as any group which regularly visits the forest).

Rationale:

This attribute looks at level of dependence of local communities on the forest to meet their basic needs. Question 17 further asks:

- Is anyone within the community making use of the forest? (Look at members or subgroups rather than treating the community as homogenous.).
- Is the use for their basic needs/ livelihoods? (Consider food, medicine, fodder, fuel, building and craft materials, water, income.
- If it is not possible to say that it is NOT fundamentally important, then assume that it is.

Assessment Methodology:

- Background Information Volume 1
- Discussions and correspondence with First Nations during forest management planning consultation sessions
- Discussions and correspondence with non-native communities and stakeholders during forest management planning consultation process

Publicly available, concise and descriptive reference material pertaining to the historical, cultural and economic characteristics of the various communities situated within the vicinity of the Mistik FMA area is generally lacking. The following web links provide some reference information pertaining to FMA area- associated communities:

- <http://career.kcdc.ca/comm/>
- <http://www.kayas.ca/communities.html>
- <http://www.sicc.sk.ca/bands/index.html>
- <http://www.aboriginalcanada.gc.ca/acp/site.nsf/en/sk80021.html>
- http://canadawiki.org/index.php/Saskatchewan_Aboriginal_Communities
- <http://www.metisnation-sask.com/index.html>
- <http://www.mltc.net/>

Timber Values

Timber, of course, is discussed extensively in the FMP. We include this brief discussion for context, to show the relative importance of timber in the life of the communities. It is not designated as an HCV although the economic importance is clear. Since 1997 NorSask has averaged 464,000 m³ of logs

delivered and Meadow Lake Pulp has averaged 791,000 m³. Over that period, NorSask averaged 159 person years of employment and Meadow Lake Pulp averaged 188.

Table 13. Current Timber Volume requirements by mill annually.

Area	Hardwood (aspen)	Softwood (white spruce, jack pine)	Total
NorSask Forest Products Ltd.	--	500,000 m ³	500,000 m ³
Meadow lake Pulp Limited Partnership	900,000 m ³	--	900,000 m ³
Total			1,400,000 m ³

The jobs associated directly with woodlands (Table 14) is significant in the small northern communities, as opposed to the more populated areas around the mills.

Table 14. Person years of woodland employment.

Activity Type	Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Mean
Harvest	240	240	240	240	240	240	240	228	228	228	236
Renewal	21	21	21	21	21	21	21	17	17	17	20
Mistik	45	45	45	45	35	30	25	25	25	25	35

Statistics Canada reported that the total direct employment by the wood products industries in the Mistik FMA area was about 7% of the total, which is a significant contribution in an area with average unemployment four times the province as a whole.

Aboriginal Hunting

Hunting is both an important source of food and an important cultural and social activity for Aboriginal people within the Mistik FMA area. A Mistik FMA area-related study by Dosman et al.⁵². (2001) discussed in the Mistik FMP included interviews with a sample of trappers and hunters (many interviewees participated in both activities) in the FMA area. They point out that the number of trappers in the area has declined over time but there has not been a corresponding decline in the number of Aboriginal hunters.

Of the harvesters surveyed in Dosman et al. 2001, moose was the most popular species with 96% of respondents indicating that they harvest moose. Over 92% of respondents harvest deer, 41% harvest elk and 25% harvest woodland caribou. The average number of animals harvested per hunter did not vary much between 1995 and 1999, but there were large differences between the average numbers harvested among the communities in the survey. FMP Table 18.1 estimated the number of Aboriginal hunters in selected FMA area communities (1999) as: Green Lake 48-64; Beauval 78-104; Waterhen 60-80; Canoe Narrows region 96-128; Dillon 33-44; TOTAL 315-420.

Hunting⁵³

Wildlife is abundant within the Mistik FMA area. This was studied in a report commissioned by Mistik (Dosman et al. undated) which details hunting and trapping statistics. The most common large

⁵² Dosman et al. 2001. Assessing impacts of environmental change on Aboriginal People: An economic examination of subsistence resource use and value. Available from Mistik

⁵³ FMP section 21.2.1 Wildlife and Hunting Values

mammals within the FMA area include white-tailed deer, moose and lesser numbers of elk and woodland caribou. Saskatchewan Environment undertakes periodic surveys of population trends for select wildlife. Population surveys are undertaken within the context of the provincial Wildlife Management Zones (WMZs).

Hunting (including subsistence, recreational and guided outfitting) is a major forest use activity within the Mistik FMA area. There are approximately 70 white-tailed deer outfitting licenses (Map 13 – Deer Outfitting Areas, Appendix F) and approximately 55 bear outfitting licenses (Map 14 – Bear Outfitting Areas, Appendix F) allocated within the Mistik FMA area. The most commonly hunted large mammals within the Mistik FMA area include white-tailed deer, moose and lesser numbers of bear, elk and woodland caribou. Woodland caribou are no longer hunted by sport hunters in Saskatchewan, although there exists an Aboriginal right to hunt woodland caribou for subsistence purposes. Where possible, Saskatchewan Environment maintains detailed annual reports of hunting statistics for select wildlife species. The hunting statistics are summarized within the context of the provincial Wildlife Management Zones (WMZs). There are a significant number of ungulates harvested each year by individuals exercising their Aboriginal rights to hunt.

Trapping

For the period 1988 to 2004, the total number of individuals trapping within the Fur Conservation Areas (FCAs) associated with the FMA area has always exceeded 120 individuals. The highest recorded number (285) of trappers for the period occurred in 1989. The fewest number (127) of trappers for the period occurred in 1998. For the period 1988 to 2004, there were approximately 180 trappers active within FCAs associated with the Mistik FMA area. There appears to be a decreasing trend in the overall number of trappers. Detailed statistics were reported in a study commissioned by Mistik (Dosman et al. undated).

Ecotourism

Ecotourism is undertaken on a small scale in various locations throughout the FMA area. There are a number of resorts (Figure 21.71) and tour operators that cater to a range of cultural and wilderness experience interests. Photography (Figure 21.72), hiking, canoeing, cross-country skiing, snow-shoeing (Figure 21.73), camping (Figure 21.74), nature appreciation and traditional use / cultural experiences are all available on a guided tour basis or undertaken individually by local residents. Equipment rentals (canoe, kayaks, snow shoes, quads, bicycles, etc.) for self-guided experiences are available at various resorts and major centres in the vicinity of the FMA area.

Wild Rice Harvesting

Wild rice (*Zizania palustris*) is a non-native plant that has been introduced into a number of the lakes and waterways of the Mistik FMA area. According to the the Mistik FMP, the wild rice production from Saskatchewan and the Mistik FMA region is a significant proportion of Canadian production. Wild rice production has recently become an important source of income for FMA area residents. In 2000, the Western wild rice producing region of Saskatchewan that corresponds closely with the Mistik FMA area, accounted for 37% of Canada's wild rice production and 55% of Saskatchewan's production.

HCV Designation Decision:

Wild rice harvesting areas is an HCV grouped with other values in element 19 -- surface waters and adjacent areas.

Category 6) Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

18) Is the traditional cultural identity of the local community particularly tied to a specific forest area?

Rationale:

In the context of this standard, 'local' is defined as in the national Boreal Standard. People are considered local when they permanently reside within commuting distance by car or boat from the management unit, or where they are part of the aboriginal communities whose lands and territories contain or are contained within the management unit.

Assessment Methodology:

- NRVIS data on cultural values
- Heritage River Parks on the Forest
- Canadian Heritage River Program
- Background Native Information Report
- Discussions and correspondence with aboriginal communities during forest management planning consultation sessions
- Discussions and correspondence with non-native communities and stakeholders during forest management planning consultation process

Assessment Results:

Native Values

The entire Mistik FMA area, and adjacent area, has had continuous cultural and traditional use for millennia. Several ongoing Aboriginal land claims underscore the importance of the forested landscape in northwest Saskatchewan to Aboriginal peoples. Traditional and cultural use within the FMA area is well-recognized and well-documented in Mistik's 2007 20-Year FMP and spatially identified in its geographic information system (GIS). In Appendix 4 are weblinks to the Tactical plans for each of the communities in Mistik FMA area. On these maps are the actual (approximate) locations of archaeological values for the community. This is a very high level of openness for the communities to share this information. Each of the sites contains artefacts,

The significant number of sites of archaeological, heritage and cultural significance within the FMA area (Table 15 and FMP Table 21.1) is indicative of the long history of human presence and settlement in the area. A number of these sites (wagon trails, portage routes, cabin sites, etc.) are of continued significance to local communities.

The Mistik FMA area has been inhabited by humans for approximately 8,000 years⁵⁴. The first settlers are suspected to have arrived in the area via either an ice bridge across the Bering Strait or over a landbridge that was revealed due to low sea levels during the last ice age. Subsequent population growth and settlement within the FMA area occurred during the fur trade (ca. 1780s) and most recently, in the last century, with agricultural and forest fringe settlement associated with European immigrants. The significant number of sites of archaeological, heritage and cultural significance within the FMA area is indicative of the long history of human presence and settlement in the area. A number of these sites (Table 15) wagon trails, portage routes, cabin sites, etc. are of continued significance to local communities.

Table 15. Important cultural and historic sites within the Mistik FMA area⁵⁴.

Source Saskatchewan Culture, Youth and Recreation – Heritage Resources Branch

Site Type	Period	Culture	Culture 2	Culture 3	Total Sites
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⁵⁴ FMP section 21.3 Archaeological and Heritage Values

Artefact find	Pre-contact				134
Artefact find	Historic	Euro-Canadian			2
	European				
Artefact find	Historic First Nation	Indian			1
Artefact find	Pre-contact	McKeen			1
Artefact Scatter	Pre-contact				103
Artefact Scatter	Pre-contact	Clearwater L	Late Taltheilei	Middle Taltheilei	1
Artefact Scatter	Pre-contact	Early Taltheilei	Late Paleo-indian		1
Artefact Scatter	Pre-contact	Pelican L			1
Artefact Scatter	Pre-contact	Besant			2
Artefact Scatter	Pre-contact	Besant	Pelican L		1
Artefact Scatter	Pre-contact	Clearwater L			3
Artefact Scatter	Historic First Nation	Indian			4
Artefact Scatter	Pre-contact	Mckeen			2
Pre-contact artefacts and features	Pre-contact				31
Historic Artefacts and structures	Historic European	Euro-Canadian			8
Historic artefacts and structures	Historic First Nation	Indian			3
Historic artefacts and structures	Historic First Nation/ Métis	Indian	Métis		1
Historic artefacts and structures	Historic Métis	Métis			2
Burial or suspected burial	Historic First Nation	Indian			1
Burial or suspected burial	Pre-contact				3
Burial or suspected burial	Historic Dene	Dene			1
Historic structures	Historic Dene	Dene			1
Historic structures	Historic European	Euro-Canadian			2
Historic structures	Historic First Nation	Indian			4
Historic cabins	Historic Dene	Dene			3
Stone Circle	Pre-contact				1
Fish Cleaning	Historic First	Indian	Métis		1

Station	Nation		
Traditional cultural location	Historic First Nation	Indian	3

Other values

Rivers and smaller waterways in the FMA area have great historical and cultural significance because they have been used and travelled for millennia by the aboriginal people. The history and significance of these waterways is not discussed here but they are grouped with other values in element 19 -- surface waters and adjacent areas. The discussion of each management unit in the FMP³. The waterways are shown in detail in Map number [8_high conservation value areas.pdf](#).

HCV Designation Decision:

Aboriginal and historic sites designated by Saskatchewan Culture, Youth and Recreation – Heritage Resources Branch are designated HCV as listed on current maps. Sites identified by local communities and people as having significant traditional and historic value and an accurate recorded location are HCVs.

Waterways are HCVs grouped with other values in element 19 -- surface waters and adjacent areas. Management is described in Table 16.

19) Is there a significant overlap of values (ecological and cultural) that individually did not meet HCV thresholds, but collectively constitute HCVs?

Rationale:

Consideration of several spatially overlapping values is important in optimizing conservation management.

Assessment Source

Review of all of the assessed values from all elements, whether they are identified as HCVs or not.

Assessment Results

Areas Adjacent to Surface Waters

During the assessment of HCVs throughout this document, and during the extensive consultation, there was a clear theme which arose in most of the elements. That was water. Perhaps this is not surprising given the importance of water for human use – historical, cultural, and for flora and fauna. Even the biophysical geography is shaped by water drainage, and it plays an important role in shaping the landscape. Saskatchewan is a dry part of Canada and that no doubt increases the human value of the resource.

The managers have phrased the name of the HCV carefully: “Areas adjacent to Surface Waters”. This very broad description shows that the very wide scope of this HCV from small wet areas to large waterways. This reflects the importance that the communities have placed on water. Water is fundamental to the economic and cultural well being of these communities.

The nature of these values are self evident. Individually the values of water are identified throughout the elements of the framework have merit, and these are described or referenced in the individual elements. Collectively, it is apparent that forest managers need to be diligent around water. The following is a basic list with hyperlinks to other elements:

Element 8 [Wetland](#) types generally contain concentrations of uncommon to rare plant species, are important filters, have high utilization by wildlife.

Element 13 In general, wetlands on the forest provide ecosystem service functions such as: ground water recharge and discharge; [flood](#) damage reduction; shoreline stabilization; sediment trapping; and nutrient retention and removal.

Element 14 While areas of steep terrain may be small and localized, they may still have significant [erosion](#) potential. All of slope classes greater than 30% follow along temporal and permanent drainages and need special attention.

Element 16 There are over 500 lakes, rivers, and streams within the Mistik FMA area, many of which are important to the commercial, subsistence, and recreational [fisheries](#) in the area.

Element 17 [Wild rice](#) production has recently become an important source of income for FMA area residents. Eco-tourism, trapping and other commercial values also are centred on water.

Element 18 [Waterways](#) have a great cultural significance throughout Canada and often are regarded as HCVs.

The company addresses surface water issues of one kind or another on a regular basis. Their approach has for practical purposes, always been to regard them as HCVs even before the term was coined.

Riparian Management – example

The Buffalo Narrows Co-management Board, at a regularly scheduled meeting, expressed concerns to Mistik about development (e.g. forestry activity, traditional resource use cabin leases, commercial activity, etc.). They were concerned that this may affect the fisheries and large ungulate habitat in the Niska Channel, Niska Lake and McCusker River areas. Mistik went to the Buffalo Narrows Co-management Board with a counter proposal that Mistik was comfortable with and which could serve to address many of the board's concerns. Mistik proposed a 200 meter buffer, versus the provincial standard of 90 meters, on Niska Channel, Niska Lake and the McCusker River. The buffer would serve to provide additional protection to the fisheries in these areas, provide visual aesthetics and alleviate some of the board's concerns re ungulate habitat in the area. Mistik also committed to increased interaction/consultation with the board when any harvest activity is planned adjacent to the 200 meter buffer. In May 2008, the Buffalo Narrows Co-management Board had a helicopter tour of planned harvesting and road development activities on the east side of Niska Lake. The Buffalo Narrows Co-management Board found Mistik's proposal to be acceptable.

HCV Designation Decision:

Areas adjacent to Surface waters are designated. Management is primarily by buffers as described in Table 16.

Phase 2: Management and Monitoring of High Conservation Values in the Mistik FMA

The overall goal of managing HCVF in keeping with the FSC criterion 9.3 is

“The management plan shall include specific and implemented measures that ensure the maintenance and or enhancement of the applicable conservation attributes consistent with the precautionary approach.”

Several points from this criterion have guided our approach to managing HCVs:

- The Forest Management Plan³ provides the direction for HCV management; there is no separate list of prescriptions or objectives for HCVs.
- “Specific and implemented measures” – detailed prescriptions are written for the values during the planning process
- “Maintenance or enhancement” – based on the concept of no net loss, managers must ensure that the value is sustained.
- “Precautionary approach” – the precautionary approach means that monitoring for effectiveness of management activities is carried out to ensure that no impact is occurring

It is worth repeating that the FMP and the planning exercise drive Mistik’s approach to HCVs. The planning process contains a significant amount of public consultation, which has also been verified to meet FSC standards through the certification assessment process.

Table 16 provides an overview of the HCV values that were assessed as HCVs in Phase 1 of this study. It also describes the responsibility for inventory and monitoring. Mistik is responsible for implementation of the detailed management prescription. There is a shared responsibility between Mistik and the government of Saskatchewan for evaluating the effectiveness of management prescriptions. To meet the HCVF precautionary principle, prescriptions must be shown to be effective.

Monitoring for HCV attributes are described in Table 16. Only monitoring for designated HCV attributes are listed in this table. The information provided covers only who is responsible and basic information reviewing the monitoring process. It is beyond the scope of this report to review all of the monitoring procedures.

Table 16. Management and monitoring of HCV identified on Mistik FMA.

HCV & Attribute	Responsibility -- Inventory and Monitoring	Strategy or Management Prescription	Current Monitoring for compliance and effectiveness
1) HCV Caribou habitat	Mistik has undertaken planning of caribou core areas through the FMP process, with the assistance of Sask Environment biologists and other experts.	Mistik's 2007 20-Year FMP, and FMP Appendix H (2007 – 2016 Woodland Caribou Habitat Forestry Impact Mitigation Plan) See original document ³ for details	FMP Section 9.0, Indicator #5 Wildlife habitat and species at risk
Element 1 Species at Risk – Caribou	Caribou surveys and population monitoring is the responsibility of Sask Environment	Key features of this plan include: <ul style="list-style-type: none"> • Identifying provincially and nationally protected areas within or immediately adjacent to the Mistik FMA area; • Identifying high-quality woodland caribou habitat within the Mistik FMA area; • Maintaining a spatial database of past and present woodland caribou sightings; • Establishing measurable targets for the period 2007 to 2016 related to minimizing forestry impacts within landscape-level woodland caribou ranges within the Mistik FMA area that are delineated by processes and action plans arising from the provincial Woodland Caribou Recovery Strategy; • Identifying and maintaining landscape connectivity within and between woodland caribou ranges in the Mistik FMA area and with adjacent protected areas for the period 2007 to 2016 ; • Long-term, landscape-level forest-use planning (future harvest location and road construction); • Identifying and implementing 'least impact' forestry activities when conducting forestry operations in woodland caribou ranges within the Mistik FMA area; • Commitment to contributing to the provincial recovery strategy for boreal woodland caribou; • Commitment to periodic review and endorsement of the plan by provincial wildlife experts. 	Compliance: Contact Kevin Gillis at Mistik; Planning Roger Nездoly
Element 3 Critical Habitat	Wolverine follow Caribou habitat requirements. A this time the for caribou is the umbrella species for wolverine, given the very low density in the FMA, and scientific support for the overlap in habitat.		Caribou: Gigi Pitoello, Sask Ministry of Environment Tim Trotier Al Arseneault author Provincial Caribou Strategy
Element 8 Rare habitat – Caribou and Wolverine			

HCV & Attribute	Responsibility -- Inventory and Monitoring	Strategy or Management Prescription	Current Monitoring for compliance and effectiveness
2) HCV Habitat for Rare Vascular Plants Element 1 Species at Risk	Mistik is responsible for: plan implementation including operational layout of blocks to ensure rare plants are buffered if present; training related to the identification of rare plants measurement of the indicators; Government determines whether the performance is satisfactory.	Mistik's 2007 20-Year FMP Mistik's ISO 14001 EMS, SOP EMSOP017_High Conservation Area Planning and Forestry Implementation.doc When specific locations of rare plants are known they are designated and protected from operations through the procedures outlined in EMSOP003_Pre-harvest site prescription.doc which describes the completion of Pre-Harvest Site Prescription. This is submitted to MOE area forester prior to approval. Often locations for rare plants are not known, and the manager relies on the coarse filter for conservation of species. Several indicators provide for this	Indicators #20. % of sampled harvest blocks that are in compliance with provincial or FMA standards related to riparian areas management. Mistik Indicator #21. % of all harvest blocks in which chemical herbicides have been applied. Mistik Indicator #25. Develop and maintain a thematic map of Non-timber forest resources and non-timber forest-use activities. Monitoring of these indicators is based on regular compliance inspections of all operations and regular measurements. Compliance: Kevin Gillis at Mistik Effectiveness: The coarse filter approach to forest management is approved by the government. Technical responsibility and plan approval related to wildlife is by biologists of the Saskatchewan Ministry of Environment. Saskatchewan Ministry of Environment, Local biologist: Rhys Beaulieu Provincial: Michael McLaughlin

HCV & Attribute	Responsibility -- Inventory and Monitoring	Strategy or Management Prescription	Current Monitoring for compliance and effectiveness
3) HCV Habitat for Six Listed Birds	Mistik is responsible for: plan implementation including operational layout of blocks to ensure habitat is buffered if present; and training related to the identification of birds measurement of the indicators; Government determines whether the performance is satisfactory.	<p>Mistik's 2007 20-Year FMP</p> <p>Mistik's ISO 14001 EMS, SOP EMSOP017_High Conservation Area Planning and Forestry Implementation.doc</p> <p>When specific locations of bird are known they are designated and protected from operations through the procedures outlined in EMSOP003_Pre-harvest site prescription.doc which describes the completion of Pre-Harvest Site Prescription. This is submitted to MOE area forester prior to approval.</p> <p>Often locations for critical habitat are not known, and the manager relies on the coarse filter for conservation of species. Several indicators provide for this.</p>	<p>Indicator #5 Wildlife habitat and species at risk</p> <p>Monitoring of these indicators is based on regular compliance inspections of all operations and regular measurements.</p> <p>Compliance: Kevin Gillis at Mistik</p> <p>Effectiveness: The coarse filter approach to forest management is approved by the government. Technical responsibility and plan approval related to wildlife is by biologists of the Saskatchewan Ministry of Environment.</p> <p>Saskatchewan Ministry of Environment, Local biologist: Rhys Beaulieu Provincial: Michael McLaughlin</p>
4) HCV Protected areas directly adjacent to MFMA Element 6 Legally designated Conservation Areas	Protected areas are government responsibility. In this case provincial government ensures that there are no direct impacts to the HCV. Mistik is responsible for ensuring compliance by operators.	<p>As normal operating procedure, Mistik's Environmental Management System ensures boundary markings are respected. Approvals for roads are done by the provincial government, with consultation from the public, stakeholder organizations and First Nations.</p> <p>There have been no requests for special management prescriptions adjacent to protected areas. In the event that a potential impact is identified, Mistik will implement a procedure to safeguard the HCV.</p>	<p>Indicator #25, 31</p> <p>Compliance: Mistik and Sask Environment staff ensure that reserve boundaries are respected. Contact Kevin Gillis at Mistik</p> <p>Effectiveness: Provincial Parks staff are responsible for ensuring there is no impact from any adjacent forestry operations</p> <p>Contact: Saskatchewan Environment -- Marlon Klassen</p>

HCV & Attribute	Responsibility -- Inventory and Monitoring	Strategy or Management Prescription	Current Monitoring for compliance and effectiveness
5) HCV Large Landscape Level Forest (LLLLF) Element 7 & Element 10 Core Forest or Unfragmented Forest	Mistik will provide operational maps and update GIS and analysis annually to ensure the prescription is met. Sask Env has undertakes responsibility for monitoring effectiveness of prescription, and protection measures.	Mistik has included an indicator to ensure that Indicator NP4 from Andison (2007) ³⁶ . Core Forest Habitat. Mistik's forest operations shall not cause the proportion of forest land area classified as CFH to fall below 40% for the FMA area as a whole over the next 10 years. CFH is defined as any naturally occurring areas, or harvested areas at least 20 years of age, that are not within 500 m of a permanent cultural feature, or within 500 m of a harvested area less than 20 years of age.	FMP Sect. 9 – Indicators 9, 11,12, 13 Indicator NP4 – Core Forest habitat Compliance: SE and Mistik planning staff will evaluate the performance against the indicator NP4. Contact Roger Nездoly for specific information. Effectiveness: SE staff review the FMP implementation and effectiveness. Responsible individual for oversight of effectiveness: Gigi Pitoello Ministry of Environment

HCV & Attribute	Responsibility -- Inventory and Monitoring	Strategy or Management Prescription	Current Monitoring for compliance and effectiveness
6) HCV Late Seral Stage Forests	Inventory, forestry operations, and compliance monitoring are the responsibility of Mistik	As part of the 2007 FMP ³ , Mistik has developed a strategy for maintaining late seral forest, with three indicators FMP # 2,3,4 page (SEE FMP for official and unabridged text) :	Indicators 2,3,4, as outlined in the FMP section 9.0 ³ .
Element 8 Naturally rare ecosystems	Effectiveness of prescriptions responsibility of Saskatchewan Ministry of Environment	<p>Mistik Indicator #2. % of the forest land base (working forest + eligible excluded forest) that is 'old' and 'very old' forest cover types:</p> <p>For Old forest</p> <ol style="list-style-type: none"> 1. S-bS (> 100 yrs); >= 5% 2. S-jP (> 100 yrs); >= 5% 3. S-wS (> 100 yrs); >=9% 4. SH-all species (> 100 yrs); >=10% 5. HS-all species (> 90 yrs); >= 10% 6. H-deciduous (> 90 yrs). >=14% 	<p>Indicators:</p> <ol style="list-style-type: none"> 2 Old forest total amount 3 Old Forest spatial distribution 4 Old Forest patch size
Element 9 decline in ecosystems		For very old -- All types (> 120 yrs) >=10% of above	Annual reports are used as the basis for compliance -- landscape measures for the three indicators.
		<p>Due to the active and widespread natural disturbance regime (fires) over the last 100 years, there is currently insufficient old forest area for hardwood forest types in the Mistik FMA area. Mistik will recruit old forest to the levels identified for the bottom of the 2nd quartile of the 74 year fire cycle over one rotation (~100 yrs). For details of the prescription and the strategy see the FMP³.</p>	Contact: Roger Nездoly Planning
		Supporting the above indicator and target are indicators for standard deviation, and frequency distribution:	<p>Effectiveness:</p> <p>Sask Env responsible contact: Gigi Pitoello Kathleen Gazey</p>
		<p>Mistik Indicator #3. The current standard deviation of old forest area (working forest + eligible excluded forest) among the management units in the Mistik FMA area for each of the six forest cover types:</p> <p><i>Target The standard deviation associated with any level of old forest amount shall not deviate by more than 5% of the modeled linear relationship of the natural range of variation of standard deviations among management units for a specified old forest amount (and never below 2%).</i></p>	
		<p>Mistik Indicator #4. Frequency distribution of patch size (>500 ha) of old forest (working forest + eligible excluded forest) cover types combined. <i>Target Maintain the % of area of old forest patches (all forest cover types combined) larger than 500 ha at 3%.</i></p>	

HCV & Attribute	Responsibility -- Inventory and Monitoring	Strategy or Management Prescription	Current Monitoring for compliance and effectiveness
7) HCV High cultural and traditional use areas	Inventory, forestry operations, and compliance monitoring are the responsibility of Mistik	Mistik's 2007 20-Year FMP (Vol 2), Section 5 Strategies to integrate Forestry Activities and non-timber values. Specific indicators for monitoring these values are listed in that section.	Indicators #24, 25, 29, 31, 32 Compliance through EMS coordinator Kevin Gillis
Element 18	Effectiveness is reported by local communities		SE approves AOP, And field officers Kathleen Gazey
8) HCV Areas immediately adjacent to surface waters	Inventory, forestry operations, and compliance monitoring are the responsibility of Mistik	Mistik EMS SOP Riparian Buffers file: "EMSOP010_RIPARIAN BUFFERS.DOC Mistik Riparian Buffer Standards"	FMP Sect. 9 -- Indicator #20 % of sampled harvest blocks that are in compliance with provincial or FMA standards related to riparian area management.
Element 19	Effectiveness of prescriptions responsibility of Saskatchewan Environment	Waterbody Type	
Overlapping values- riparian areas		Ephemeral / intermittent	Buffer Width (m) 5-10m variable
13 wetlands		Minor streams (< = 2.5 m) potholes and wetlands	15-20m
flow		Major streams (> 2.5 m width) and small lakes	30-40 m
mediation		Rivers and large lakes	90 m
8 wetlands			Compliance monitoring: occurs as part of the routine silvicultural monitoring, during harvest if it occurs.
14 drainage			Contact: Kevin Gillis; and District Superintendent Forestry Supervisors
17 Wild Rice			Effects Effectiveness: Sask Ministry of Environment local: Kathleen Gazey
18 culturally significant waterways			Dept of Fisheries and Oceans Vince Harper

Table 17. Indicator #, Description from FMP³ and a partial listing of HCVs related to the indicator

Indicator #	Indicator Description	HCV related (partial listing)
1	White spruce and softwood-dominated mixedwoods	
2	Old forest – total amount	1) HCV Caribou 6) HCV Late Seral
3	Old forest – spatial distribution	6) HCV Late Seral
4	Old forest – patch size	1) HCV Caribou 6) HCV Late Seral
5	Wildlife habitat and species at risk	1) HCV Caribou 3) HCV Habitat for Six Listed Birds
6	Conifer seedlots – wild seed	
7	Conifer seedlots – genetically improved	
8	Use of native boreal plant species	
9	Post-harvest – residual forest area	5) HCV Large Landscape
10	Post-harvest – forest renewal success	
11	Maintenance of productive land base	5) HCV Large Landscape
12	Harvest event size class distribution	5) HCV Large Landscape
13	Salvage harvest impact	5) HCV Large Landscape
14	Accuracy of timber yield projections	
15	Adherence to tactical plan harvest profile	
16	Actual harvest volume vs. approved harvest volume	
17	Soil disturbance	
18	Road reclamation	
19	Watercourse crossings	
20	Riparian area management	2) HCV Habitat for Rare Vascular Plants 8) HCV Areas immediately adjacent to surface waters
21	Herbicide use	2) HCV Habitat for Rare Vascular Plants
22	Revenue contributions to co-management boards	
23	% of annual Mistik payments to local vendors / contractors	
24	# of stakeholder communications	7) HCV High cultural and traditional use areas
25	Non-timber values map	4) HCV Protected areas 7) HCV High cultural and traditional use areas
26	# of local communities in workforce	
27	Volume-weighted haul distance	
28	Maintenance of Alcott Demonstration Forest	
29	% local Aboriginal communities involved in review of plans	7) HCV High cultural and traditional use areas
30	% of Mistik's workforce that is of Aboriginal ancestry	
31	Protection of cultural, heritage and traditional sites	4) HCV Protected areas 7) HCV High cultural and traditional use areas
32	Result of public consultation and forest values survey	7) HCV High cultural and traditional use areas
33	% of Mistik's workforce that is from local communities	
34	Invitation to the public to report on perceived non-compliances	
35	# of meetings held with Mistik's Public Advisory Group related to the 20-Yr FMP	
36	% of co-management / advisory boards involved in 20-Year FMP meetings	
37	Age of forest inventory	
38	Environmental and sustainable forest management training of workforce	

Conclusion

Just as the commitment to the FSC principles and criteria is long term, understanding and fulfilling the requirements of assessing, managing and monitoring High Conservation Value Forest is an ongoing effort. This report is the third update to the report, following the initial Ecomark. We encourage comments, reviews, new element occurrences or general interest. This report is publicly available, and can be requested from NRFM. We will provide electronic copies free of charge.

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Appendix 1. Thresholds for HCV non-HCV and possible HCV.

This is a précis of the National HCV Framework using local policy and information. This is a discussion of the general thresholds for designation as HCV. The importance of the designation is that once designated the management approach must meet the “precautionary test”. In other words prescriptions must be proven to be effective and their effectiveness must be monitored. There is no overall rule for HCVs -- managers must use the advice given to them to establish the true HCVs. The table below is generic, and a number of the final HCV decisions do not follow these.

		Threshold	Quantifiable -- Frequency of Occurrence and Location	Management and Monitoring
Not HCV	1.	Common values - addressed in day to day operations as Areas of Concern. There is low or no risk that a management error will cause long term loss or harm to this type of value on the forest. The importance of these values means they are addressed by the manager and government as a standard practice.	Frequent occurrences with fair predictability. Values are either listed in FMP documentation in advance or staff are trained to observe, record and adjust for unrecorded occurrences.	Management is by an accepted FMP prescription consistent with P1 to P8; that is well tested and does not need monitoring
	2	Rare - Although value occurs, all known sites are recorded and protected.	Usually less than 10 occurrences in the forest. Biological values that are rare and maybe unpredictable, but small likelihood of an impact	All known locations of these values in forest are protected. Therefore, the management approach is as a “fine filter” occurrence consistent with P1-P8.
	3	Parks and Protected areas – already are protected, no active prescriptions are required, no monitoring.	Approx % of total landscape	Not part of HCV because of land use designation
HCV	1	Common –Value provides multiple benefits – especially if there is a commercial value in addition to other values such as aesthetics (this may be a Q19 HCV).	Occurs in a particular forest type and age class. Wildlife species habitat characteristics are well documented (e.g. provincially featured species; some commercial trees such as pine in old growth condition)	Special consideration as HCV managed under P9; consistent with P1 to P8. Monitoring (not every site every year)
	2	Uncommon -- Listed species	When occurrence is uncommon but somewhat predictable. (e.g. Red Shouldered Hawks; Massasauga Rattlesnake Hibernacula) (When occurrence is unpredictable and forestry impact likely, designation as possible HCV below)	Training requirement for vigilance from field staff. (e.g. Key's provided to tree markers)
	3	Uncommon – and at risk, listed species. Precautionary principle	Occurrence is uncommon but partly predictable as red oak, black cherry, silver maple.	Training requirement vigilance of field staff (key's provided) for spp

		applies		
	4	Historic/ cultural	Examples include waterways or FN values.	Management often by reserve, or discussion with effected parties.
Possible HCV	1.	<p>“Possible” designation means that the forest managers will not be expected to be aware of these values unless they are brought to their attention, and there is a case for designation as HCV. E.g. rare plants in upland sites at risk from operations; or areas of significant cultural or social importance.</p>	<p>Likely only one or a few occurrences. This designation is intended for distinctive values.</p> <p>Possible examples are tourism values that are used as a source of livelihood – possibly trails or water bodies. For example some Resource Stewardship Agreements will be HCV. First Nations values; Very rare plants.</p>	<p>As a one of a kind designation, there is a range of possibilities for management that could be negotiated with non-timber commercial interests, First Nations, or other parties. When designated HCV, a monitoring program will be designed that may use affected parties to ensure compliance. Info tracked in NRVIS when available, monitoring designed as needed.</p>

Appendix 2. HCVF Report Revision directed by FSC assessment.

The following is from the KPMG audit of Mistik in 2007 repeating the condition applied during the certification. The condition is parsed into its basic elements which are described in the table below. The purpose of this is to provide evidence to the audit team on the course of action that the managers took to meet the condition. Further down is provided the words from the FMP regarding the process for monitoring implementation. The approved FMP provides the government with legal authority to enforce the implementation of the plan including the commitment to manage and monitor HCVs. Including HCV commitments directly in the FMP provides an added control to government.

Condition 10: Within 12 months of certification, Mistik shall:

1. Require that Ecomark amend their HCVF report to. Upon correction, the treatment of species at the edge of their range should be re-examined to determine whether misinterpretation of the precautionary approach affects the report's conclusions with respect to these species;
2. Update Mistik's own HCVF document to better indicate how it has incorporated the precautionary approach into its management planning for each of the HCVF attributes identified, rather than for just the most important HCVF attributes. The updated report must then be peer reviewed and peer review recommendations considered in a revised document;
3. Reword Mistik's High Conservation Value Areas Planning and Forestry Implementation SOP such that High Conservation Value Forest (HCVF) is addressed regardless of where it occurs, rather than only within the separately defined High Conservation Value Areas (HCVA). For example, at present uncommonly diverse deciduous stands and old seral forest currently only need to be treated as HCVF if they fall within an HCVA;
4. Make its HCVF assessment documents available to the public, and;
5. Supplement the monitoring approach described in the FMP with a formal monitoring plan that incorporates elements of both implementation monitoring and effectiveness monitoring (e.g., to demonstrate the effectiveness of the proposed riparian buffers in maintaining the HCVF values associated with riparian areas).

Condition 10 was parsed into the following elements in order to implement them appropriately.

Elements (abridged)	Interpretation	Action
1 Require Ecomark amend their HCVF report regarding precautionary approach	Auditor had significant concerns about the Precautionary Principle used.	The report has been completely rewritten and uses the appropriate definition of precautionary from the NBS glossary. Ecomark was not part of the revision, however information from the original report was used.
2 Edge of range species should be re-examined	This was re-examined. The precautionary principle was revisited.	Mistik notes that many species are at the edge of their range due to the sharp line between forest ecosystem and prairie ecosystem. Edge of range" does not automatically mean common species are HCVs. Examination of species life requirements shows most species are at the limit because of the limit of forest cover. Proper forest management safeguards this.
3 Correctly reflect the precautionary approach in all HCVs	As described in the document, precautionary approach in practice means effectiveness monitoring is in place. In most HCVs the role of the Sask Government in ensuring management is effective is critical.	Upon adoption of the FMP the Saskatchewan government accepts responsibility for reviewing and monitoring the indicators for the FMP which includes many of the HCV prescriptions.
4 Update report for precautionary approach description		The report has been completely rewritten and uses the appropriate definition of precautionary

5 Obtain peer review	There is no requirement for peer (“independent expert”) review under P9. 9 1 3 requires a “credible outside review” of the report.	The report was submitted to the following organizations: DUC, TNC, WWF, CPAWS SASK ENV SOC., Sask. Wildlife Fed.
6 Update HCVF SOP to address values wherever they occur -- particularly diverse deciduous and old seral types	Related to hardwood ecosite	HCVs have been redefined. All HCVs are connected with indicators from the FMP for monitoring and management purposes which is described in Table 17. Indicator #, Description from FMP3 and a partial listing of HCVs related to the indicator)
7 Make HCVF documents available to the public		Final HCVF report placed on website
8 Prepare formal monitoring plan	The “formal” monitoring plan is incorporated in the FMP. This has the advantage that it is a regulated document and is legally enforceable by the government. This HCVF report provides contact information for all of the compliance and effectiveness monitoring (Table 16). 9.4 requires a “monitoring program”, and does not specifically refer to a separate monitoring plan. In the interests of harmonization Mistik has included the monitoring requirements directly in the FMP and referenced the indicators in this report.	The FMP activities are regulated and also specifically referenced in the NBS. Mistik has provided the text* below to describe their approach to monitoring as it has been placed in . Mistik’s approach to formal monitoring is through annual reporting ⁵⁵ on indicators for each HCV. Some HCVs may require special monitoring programs and these will be put in place as required.
9 demonstrate the effectiveness of the proposed riparian buffers in maintaining the HCVF values associated with riparian areas	HCVF values in Riparian buffers include: 1. Water quality maintenance 2. Biodiversity attributes – upland and aquatic species 3. Ecological and habitat interface attributes 4. Large, old forest types 5. Social values – recreation, cabins, aesthetics, ecotourism, fishing, 6. Economic activity – high concentration of bear outfitting, wild rice harvesting, trapping 7. Heritage values 8. Forest connectivity attributes 9. Potential for site and habitat degradation	This item is an Opp For Improvement. Mistik ia working with DUC in preparing a review of Mistik’s riparian habitat management strategy for delivery Sep 2008.

⁵⁵ Annual reports will be available on the Mistik website when completed.

*In keeping with the pre-eminence of the FMP we repeat the following text from section 10.4.1.11 which describes the annual monitoring of implementation of HCV prescriptions.

In the FMP, Table 12.1 summarizes the self-assessment documentation that will comprise Mistik's Annual Report. The indicators identified in Mistik's High Conservation Value documentation will be assessed and reported on an annual basis. Annual monitoring and reporting to Saskatchewan Environment and the public will occur by August 30 or as agreed to by Saskatchewan Environment. The High Conservation Value Attributes Section will consist of a 'fact sheet' for each indicator that includes:

- identification of threshold levels;
- identification of baseline level (status of indicator at start of monitoring period);
- identification of current value; and
- commentary on current value and threshold level.

In the case that a threshold has been exceeded, Mistik shall propose to Saskatchewan Environment and Mistik's Public Advisory Group one of two outcomes accompanied by a written rationale:

- the deviation is acceptable and the threshold value should be revised;
- the deviation is unacceptable and Mistik needs to make fundamental operational changes in order to achieve the target.

Appendix 3. Downloadable pdf files of Mistik's 2007 20-Year Forest Management Plan

These can be accessed by clicking on the following links (the list is also available on the Mistik website: <http://www.mistik.ca/fmp.htm>)

1. Mistik 2007 20-Year Forest Management Plan: Volume I (including maps)

<https://www.isogis.com/isogis/dbv.do?id=011egwui66t0u6&companyCode=mistik>

2. Draft Mistik 2007 20-Year Forest Management Plan: Volume II (including maps)

<https://www.isogis.com/isogis/dbv.do?id=11m682gbwa4kim&companyCode=mistik>

3. Draft Appendix K - Key Support Documents

<https://www.isogis.com/isogis/dbv.do?id=0w4hw6prwetc2&companyCode=mistik>

4. Draft Appendix L - Forest Characterization (including maps)

<https://www.isogis.com/isogis/dbv.do?id=01597p70atsimq&companyCode=mistik>

5. Draft Appendix M - Forest Development (including maps)

<https://www.isogis.com/isogis/dbv.do?id=0yub334215lil&companyCode=mistik>












6. Draft Appendix N - Wood Supply Analysis (including maps)











<https://www.isogis.com/isogis/dbv.do?id=1hsmu8w6cfnt3&companyCode=mistik>

Appendix 4. Maps of the Mistik FMA

The following listing is from the Mistik website: <https://www.isogis.com/isogis/dbv.do?id=11m682gbwa4kim&companyCode=mistik> which contains the following links. These maps cover a wide range of the tactical plans, and values descriptions for the MFMA. In the event that the links do not connect properly the root web link on the Mistik web site is: <http://www.mistik.ca/fmp.htm>. Check the file size before downloading.

File #	File Name	https://www.isogis.com/isogis/dbv.do?id=11m682gbwa4kim&sortOrder=ASC&sortColumn=name	File Size	Time Uploaded
1	 0_mistik 2007 fmp vol ii may 29 2008.pdf	Description (note FMP map numbers are in this description) Mistik 2007 fmp vol ii May 29 2008	10,170 KB	July 4, 2008 1:06 PM
Tactical maps				
2	 26_mu21peter_pond_map1.pdf	Management Unit -- Peter Pond map 2 (map 1 below)	14,526 KB	June 27, 2008 8:38 AM
3	 25_mu20beaver_river.pdf	Management Unit Beaver River	9,800 KB	June 27, 2008 8:34 AM
4	 24_mu12murray_bay.pdf	Management Unit Murray bay	10,975 KB	June 27, 2008 8:31 AM
5	 23_mu11dillon_map2.pdf	Management Unit Dillon map 2	16,466 KB	June 27, 2008 8:28 AM
6	 23_mu11dillon_map1.pdf	Management Unit Dillon map 1	16,049 KB	June 27, 2008 8:24 AM
7	 22_mu10buffalo_narrows.pdf	Management Unit Buffalo Narrows	13,590 KB	June 27, 2008 8:20 AM
8	 21_mu09ile_a_la_crosse.pdf	Management Unit Ile a la Crosse	13,754 KB	June 27, 2008 8:16 AM
9	 20_mu08canoe_lake_map2.pdf	Management Unit Canoe Lake map 2	14,980 KB	June 27, 2008 8:12 AM
10	 20_mu08canoe_lake_map1.pdf	Management Unit Canoe Lake map 1	10,444 KB	June 27, 2008

File #	File Name	https://www.isogis.com/isogis/dbv.do?id=11m682gbwa4kim&sortOrder=ASC&sortColumn=name	File Size	Time Uploaded
		Description (note FMP map numbers are in this description)		8:08 AM
11	 19 mu07beauval.pdf	Management Unit Beauval	14,490 KB	June 27, 2008 8:05 AM
12	 18 mu04waterhen.pdf	Management Unit Waterhen	15,678 KB	June 27, 2008 8:01 AM
13	 17 mu03big_island_lake.pdf	Management Unit Big island Lake	8,853 KB	June 27, 2008 7:57 AM
14	 16 mu02pierceland.pdf	Management Unit Pierceland	8,356 KB	June 27, 2008 7:55 AM
15	 15 mu01divide_map2.pdf	Management Unit Divide map 2	8,755 KB	June 27, 2008 7:52 AM
16	 15 mu01divide_map1.pdf	Management Unit Divide map 1	8,510 KB	June 27, 2008 7:50 AM
17	 26 mu21peter_pond_map2.pdf	Management Unit Peter Pond map 1	14,448 KB	June 27, 2008 7:48 AM
18	 7 2007-2016 mistik fma area tactical plan.pdf	Tactical Plan for MFMA	15,649 KB	June 27, 2008 7:35 AM
19	 13 tactical plan and woodland caribou ranges.pdf	Map 13 Tactical plan and woodland caribou ranges	28,742 KB	June 4, 2008 4:28 PM
Forest Description				
20	 12 intact area and high quality woodland caribou habitat.pdf	Map 12 Intact area and high quality woodland caribou habitat	28,502 KB	June 4, 2008 4:19 PM
21	 11 intact area and woodland caribou ranges.pdf	Map 11 Intact area and woodland caribou ranges	19,084 KB	June 4, 2008 4:09 PM

File #	File Name	https://www.isogis.com/isogis/dbv.do?id=11m682gbwa4kim&sortOrder=ASC&sortColumn=name	File Size	Time Uploaded
22	 14 non operable land base and potential landscape connectivity.pdf	Map 14 Non operable land base and potential landscape connectivity	79,764 KB	June 4, 2008 4:03 PM
23	 9 protected areas and woodland caribou ranges.pdf	Map 9 Protected areas and woodland caribou ranges	14,396 KB	June 4, 2008 2:22 PM
24	 8 high conservation value areas.pdf	Map 8 High conservation value areas	24,101 KB	June 4, 2008 2:18 PM
25	 6 distribution of old forest.pdf	Map 6 Distribution of old forest	24,798 KB	June 4, 2008 2:05 PM
26	 10 high quality woodland caribou habitat and caribou ranges.pdf	Map10 High quality woodland caribou habitat and caribou ranges	25,706 KB	June 4, 2008 1:37 PM
27	 4 season of access.pdf	Map 4 Season of access	17,944 KB	June 4, 2008 12:30 PM
28	 3 location of sampled stands.pdf	Map 3 Location of sampled stands	25,884 KB	June 4, 2008 12:24 PM
29	 2 forest development types.pdf	Map 2 Forest development types	32,708 KB	June 4, 2008 12:16 PM
30	 1 forest characterization.pdf	Map 1 Forest characterization	58,021 KB	June 4, 2008 12:05 PM
31	 5 fire suppression priority areas.pdf	Map 5 Fire suppression priority areas		

Appendix 5. Animal Species at Risk, Modified from Proulx 2006.

Column on Management Guidelines adapted from Proulx by the authors.

Scientific name	Ranking			COSEWIC	Management Guidelines*	
	Global	National	Provincial			
Invertebrates						
Monarch	<i>Danaus plexippus</i>	G5	N4N5B	S3B	Special concern	General good forestry
Checkered White	<i>Pontia protodice</i>	G4	?	S2	-	NA
Amphibian						
Northern Leopard Frog	<i>Rana pipiens</i>	G5	N5	S3	Special concern	riparian
Birds						
Clark's Grebe	<i>Aechmophorus clarkia</i>	G5	N2B	S1B	-	riparian
American White Pelican	<i>Pelecanus erythrorhynchos</i>	G3	N4B	S3B	Not at risk	riparian
Great Blue Heron	<i>Ardea herodias herodias</i>	G5	N5B	S3B	-	riparian
Golden Eagle	<i>Aquila chrysaetos</i>	G5	N4	S3B,S4M,S3N	Not at risk	General good forestry
Yellow Rail	<i>Coturnicops noveboracensis</i>	G4	N4B	S3B,S2M	Special concern	riparian
Whooping Crane	<i>Grus americana</i>	G1	N1B	SXB,S!M	Endangered	riparian
Semipalmated Plover	<i>Charadrius semipalmatus</i>	G5	N5B	S1B,S5M	-	riparian
Short-billed Dowitcher	<i>Limnodromus griseus</i>	G5	N5B	S1B,S4M	-	riparian
Glaucous Gull	<i>Larus hyperboreus</i>	G5	N5,N5N	S2N,S2M	-	riparian
Caspian Tern	<i>Sterna caspia</i>	G5	N4B	S2B,S2M	Not at risk	riparian
Northern Hawk-Owl	<i>Surnia ulula</i>	G5	N5	S3B,S5N	Not at risk	guideline <2 ha openings
Barred Owl	<i>Strix varia</i>	G5	N5	S3B,S3N	-	Large interior forest (LLF)
Boreal Owl	<i>Aegolius funereus</i>	G5	N5	S3B,S3N	Not at risk	Large interior forest (LLF)
Great Gray Owl	<i>Strix nebulosa</i>	G5	N5	S3B,S3N	Not at risk	Large interior forest (LLF)
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	G5	N5B	S2B	-	Large interior forest (LLF)
Connecticut Warbler	<i>Oporornis agilis</i>	G4	N5B	S2B	-	Large interior forest (LLF)
Mammals						

Wolverine	<i>Gulo gulo</i>	G4	N3N4	S3S4	Special concern	HCV -- Special stand and site requirements
Plains Bison	<i>Bos bison bison</i>	G4TU	N3	S3	Threatened	General good forestry
Woodland Caribou	<i>Rangifer tarandus</i>	G5T4	N4	S3	Threatened	HCV -- Special stand and site requirements

- For specific details see Proulx, G. 2006. Management guidelines for 'species at risk in the Mistik FMA area (Saskatchewan). Alpha Wildlife Research and Management.

Appendix 6 Review Comments and Response to the Review Comments

The review comments were very helpful, including detailed comments on the text with small changes. The small changes are not included in this document. We note almost all of the small changes were made, with minor exceptions. A copy of these comments is available by contacting Mistik directly. The two major points that the reviewer made are discussed below. At the completion of this version of the HCV report, only one review was available. It is included here in keeping with the intent of the FSC standard.

The following review was provided to Mistik Forest Management on March 30, 2009 by World Wildlife Fund Canada.

Re: High Conservation Value Forest Report for Mistik Forest (Version 1.3)

Thank you for the opportunity to review the High Conservation Value Forest (HCVF) assessment undertaken by Mistik Forest Management Ltd. as part of their commitment to Forest Stewardship Council (FSC) certification. WWF-Canada is a long-standing supporter of the inclusion of HCVF assessment as an integral component of sustainable forest management.

It is evident from the 2008 HCVF report that Mistik has invested significant resources and effort towards preparing an informed and rationale assessment of the status of high conservation values within their forest management agreement area (FMA). To date, Mistik has undertaken several analyses to explicitly identify HCVs on their forest (*i.e.* Ecomark's plant biodiversity assessment, and Proulx's species at risk analysis), as well as other research-based analyses that have informed the HCVF discussion (*e.g.* Anderson's analysis of pre-industrial for condition and natural disturbance patterns). In addition, Mistik has obtained external review of their HCVF assessments on several occasions: Lee (October 2006), Fitzsimmons (SES, October 2006), Henschel (CPAWs, May 2007) and Drever (TNC, January 2008). Finally, Mistik's HCVF assessment was auditing by KPMG Forest Certification Services to FSC's National Boreal Standard in November 2007.

The Clark & Burkhardt Report effectively compiles the wealth of knowledge generated in previous analyses, while also addressing many of the shortcomings identified by both external reviewers and FSC auditors. Overall, the report allows for simple navigation between designation questions, value discussions, the reference material on which designation decisions are made, and management practices to be implemented within the Forest Management Plan (FMP).

Of greatest concern in reviewing any HCVF report are the final decisions made relating to designation of values as HCVs. The approach taken to HCVF designation in the Mistik report is framed by discussion of two of the more challenging issues in HCVF assessment: (1) adopting the precautionary principle in HCVF assessments for values potentially outside of the influence of forest management and (2) balancing Coarse- Filter and Fine-Filter approaches to conserving biodiversity.

1. The Precautionary Principle and Manager Responsibility

The Mistik report contends that managers are responsible for designating values as HCVs only if there is potential to introduce real risk to those values through forest operations. This approach to HCV designation is pragmatic, as many candidate HCVs exist on the landscape that could warrant designation based on their value alone (*e.g.* cultural, ecological values) but would not require additional management considerations since they occur outside the scope of forest operations. However, in the Mistik report this argument based on limited scope of influence is exchanged for a rationale based on the precautionary principle, stating:

...real risk is important to the value, and it is the reason for the precautionary principle. Managers must be held responsible if they introduce real risk to the values. As such the HCV precautionary approach is applied directly [by] managers for values which they introduce real risk". (Pg. 8)

In this context, the precautionary principle is misappropriated, as this principle relates to the concept of uncertainty rather than responsibility. According to the Rio Declaration (1992, Principle 15),

Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Based on this definition of the precautionary principle/approach, candidate values should not be excluded from HCV designation based on uncertainty, or lack of conclusive evidence to suggest HCV designation is warranted. If this approach is adapted to address management responsibility and the consequences for HCV designation – as it has in the Mistik report -- it could be argued that unless explicit evidence suggests values are not at risk (either from forest operations or other land uses) then all candidate values

should be designated as HCVs. This approach, which is closer aligned to the FSC standard, accounts for the cumulative impacts that may endanger high conservation values on the landscape. Although the approach described in the report does justify using cautious management practices for species at greatest risk from forestry activities, it does not excuse other potential HCVs from designation by Mistik.

2. Coarse-Filter and Fine-Filter Approaches

Mistik's HCVF designations include both coarse- and fine-filter conservation values, as is necessary to effectively conserve biodiversity targets at varying spatial scales. Coarse-filter HCVs such as large core forest areas and areas adjacent to surface waters are necessary values to be conserved within the Mistik forest, especially due to the large size of the FMA. The designation of large core forest areas as an HCV is commendable, especially due to the rigorous analysis used as basis of this designation. Similarly, designation of areas adjacent to surface waters is warranted based on the repeated occurrence of water-related values within the Mistik FMA. Fine-filter" HCVs such as woodland caribou, wolverine and rare plant species are warrant the more detailed management approach as attributed to them in the Mistik report.

The challenge for HCVF designation in the Mistik Forest is careful balance of the coarse and fine-filter approaches, especially when coarse-filter values are used explicitly to account for fine-filter values that may warrant their own designation. Specifically, there are two designations presented within the Mistik report that could be questioned: (i) "Diverse Deciduous Forests", and (ii) the Canada Warbler.

i. Diverse Deciduous Forests (C3Q8)

The five diverse deciduous forests originally proposed by Ecomark (2006) (listed in Table 9, pg. 39 of the Mistik Report) are uncommon within the boreal forest, and in some instances contain comparatively rare species. Mistik has justified not designating these forest communities, stating "these were determined to be consistent with their expected level of abundance, and did not stand out as HCVs". The rationale is presented that "the species are conserved through the coarse filter approach to management"; which in the case of open-canopied late seral white spruce stands and late seral balsam poplar stands this may be true (through designation of "old-growth" forests as HCVs), but the mature or maturing diverse deciduous forest types will not be conserved through this designation, nor will they be specifically addressed by the forest management indicators in the FMP pertaining to old forest retention.

ii. The Canada Warbler (C1Q1)

The Canada Warbler, a species listed by COSEWIC as threatened and highlighted in the report as potentially at direct risk from forest operations, was not chosen for designation. Further, no explicit rationale was provided to explain this choice. Due to the recognized vulnerability of this species in Canada, as well as the documented threat forest operations pose this species, Mistik should designate the Canada Warbler as an HCVF.

In conclusion, the HCVF report prepared by Clark and Burkhardt for Mistik Forest Management Ltd. is overall an excellent example of rigorously researched and well-considered HCVF assessment. The Mistik HCVF assessment follows the overall structured outlined in the HCVF National Framework and is prepared with the intention of meeting the FSC National Boreal Standard. Although several candidate values were not designated within this most recent report (e.g. the Canada Warbler and "Diverse Deciduous Stands"), the overall approach to HCVF designation adopted in this report is warranted.

Sincerely,



James Snider
GIS Analyst, WWF-Canada

Response to World Wildlife Fund Canada review From Mistik

1. The Precautionary Principle and Manager Responsibility

The reviewer comment caused a rewrite of the section “The HCV conundrum... to designate or not to designate”. We made it clear that the Canada Warbler and the five other listed bird species are HCVs. The discussion of the precautionary principle was also changed. The FSC application is broader than the original UN application. However, the UN application does not distinguish between various resource users. In our application of the precautionary principle, we are clear that we accept responsibility for risk from forestry, even indirect risk, but we cannot be responsible for other forest users. This is consistent with the application of this principle internationally.

2 . Coarse-Filter and Fine-Filter Approaches

In particular the reviewer states:

“The challenge for HCVF designation in the Mistik Forest is careful balance of the coarse and fine-filter approaches, especially when coarse-filter values are used explicitly to account for fine-filter values that may warrant their own designation. Specifically, there are two designations presented within the Mistik report that could be questioned: (i) “Diverse Deciduous Forests”, and (ii) the Canada Warbler.

The reviewer has described very effectively the challenge of determining when a specific conservation intervention is required for a fine filter value.

In the case of Diverse Deciduous Forests (element 8) the reviewer states “...mature or maturing diverse deciduous forest types will not be conserved through this designation, nor will they be specifically addressed by the forest management indicators in the FMP pertaining to old forest retention.”

The current HCVF report has reanalysed the five ecosites identified by EcoMark based on conventional Forest Ecosystem Classification (Beckingham 1996) used in Saskatchewan. When placed into the larger context these ecosites occur with the expected abundance. Although they may be uncommon, there is no evidence to show they have declined. The managers decided to focus on specific stands which are old (HCV -- ‘Old growth’ forest stands, i.e., older than 1880-1890 for coniferous stands, and older than 1910 for deciduous stands). Across the landscape, older ecosite will be conserved and continue to develop through landscape management as required by the FMP and as monitored by the indicators.

In the case of Canada Warbler, Mistik has agreed with the reviewer that the species should be designated as HCV. In addition five other listed bird species were designated. The rationale is described in the revised text. As it is discussed in Phase 2 of the report, the active management as a fine filter species is limited to monitoring new research and maintaining contact with biologists working on the Mistik FMA and in the mid boreal region, to. At this time the COSEWIC Status report⁵⁶ does not implicate forest operations in the threatened designation:

“Throughout its breeding range, the Canada Warbler can also be locally abundant in regenerating forests (i.e., 6–30 years post-disturbance) following natural (forest fires) or anthropogenic (harvesting) disturbances (Titterington *et al.* 1979; Wildlife Resource Consulting Service MB Inc. and Silvitech Consulting 1995; Christian *et al.* 1996; Hobson and Schieck 1999; Drapeau *et al.* 2000; Schieck and Hobson 2000; Hobson and Bayne 2000b; ...).”

⁵⁶ COSEWIC Canada Warbler status report: http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_canada_warbler_0808_e.pdf

Mistik acknowledges the need to designate Canada Warbler and to carefully monitor the ongoing research. Any management recommendations that follow from this work will be implemented appropriately by Mistik Forest Management.

Sincerely

Al Balisky
General Manager
Mistik Forest Management