NISBET
INTEGRATED FOREST
LAND USE PLAN

July 2012

Government of Saskatchewan

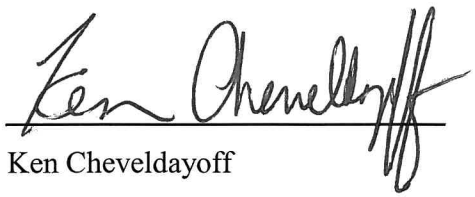
Minister's Message

The Nisbet Integrated Forest Land Use Plan promotes a balanced approach to land and resource management for 80,000 hectares of provincial forest located between Saskatoon and Prince Albert. This plan will help us to make sound decisions about this land, ensuring that future generations continue to benefit as we address both the opportunities and challenges of growth.

This plan has been shaped by the views and advice of many people, groups and organizations. It represents the collaborative perspective of everyone who participated in the planning process. The guidance provided in this plan represents our best efforts to document and balance local traditional knowledge and science with economic development. As our knowledge grows over time, we will seek to improve its application and include new information as we make important decisions for the area.

The planning process was complex and, as with anything worthwhile, was not without its share of challenges. We overcame these challenges and continued to move ahead with help from a broad spectrum of people, including First Nations and Métis, local communities and municipalities, environmental interests, mining, forestry, recreational users and area residents. *The Nisbet Integrated Forest Land Use Plan* would not have been possible without their participation. I want to extend my sincere appreciation to everyone for their steadfast commitment to see the plan through to completion.

Our healthy environment, our growing economy and, most of all, our people help make our province the best place in Canada to work, to live and to raise a family. By working together to implement the direction set in this plan, we will continue to demonstrate Saskatchewan's leadership and commitment to a sustainable future.



Ken Cheveldayoff

Minister of Environment

Preface

Nothing in this plan is intended to abrogate or derogate from the existing Aboriginal or treaty rights of Aboriginal Peoples in Saskatchewan, as recognized and affirmed by Section 35 of the Constitution Act 1982. The Provincial Government has a legal duty to consult and accommodate First Nations and Métis communities on matters that have an impact on Treaty or Aboriginal rights. Although this planning process included consultation with many First Nations and the Métis Nation, and this document provides broad information about interests in the area, the Province will continue to consult on individual matters in order to meet its consultation obligations.

Acknowledgements

The ministry would like to thank those organizations and individuals who participated throughout the planning process. This plan could not have been produced without the assistance of those who took the time to share their knowledge, ideas, wisdom and insight. Many spent long hours preparing for and participating in public advisory committee meetings – a process that spanned over five years.

In addition, a number of provincial government ministries and branches were also instrumental in providing input and guidance to the objectives and actions contained in this plan. All will continue to play a role in working with the ministry to implement many of the actions contained in this plan.

- Ministry of Environment, Lands Branch

EXECUTIVE SUMMARY:

The Nisbet Provincial Forest (the Nisbet Forest) is approximately 80,000 ha in size. It is an "island forest" surrounded by agricultural development, and adjacent to city and rural residential development. This easy accessibility for people means the forest is subjected to more concentrated pressures for recreation and economic use than other, more northern, provincial forests. The forest provides habitat for many wildlife species, and at the same time people use it for recreation, forest products harvesting, cattle grazing, hunting, trapping, gathering of non-timber forest products and gravel extraction. Provincial highways, grid roads, railroads and major utility routes pass through the forest.

This area is unique in that it remains as a forest in a part of the province developed for agriculture. It is in the Boreal Transition Ecoregion, a transition zone from parkland to boreal forest, which some believe may be the part of the boreal forest that is most likely to show the first signs of climate change.

The purpose of this integrated forest land use plan (IFLUP) is to provide well thought out direction to government, government agencies, and forest users for land and resource management decisions in this forest. As the Ministry of Environment uses an ecosystem-based approach to forest resources management, social and economic needs must be balanced with the need to protect the ecological integrity of the Nisbet Forest.

During plan development, the public and the advisory committee expressed a desire to manage the forest to ensure long-term ecosystem health, and secondly for its multiple human values. No particular human value (economic or social) was identified as being more important than any other. This plan reflects the multiple public values of this forest, and includes issue identification, management objectives, policies and actions.

This plan is not intended to address specific operational or "on the ground" issues that were identified during plan development. Rather, it provides a roadmap for management decisions in the Nisbet planning area that will work toward achieving the plan goal (page 3). Throughout the planning process, representatives from other ministries and branches of Environment were involved through representation on the steering committee and/or advisory committee, and as reviewers through the various drafts. Operational issues, or issues related to provincial standards identified during plan development were forwarded too, and addressed by appropriate Ministry staff.

The plan uses a zoning framework common to all provincial IFLUPs, and includes the following three management zones:

- Protected – for areas where industrial activity or increased access will affect the sustainability of ecosystems in the area, or for areas where cultural, spiritual or other values need maximum protection. Industrial activity is not normally allowed in this zone;
- Sensitive – for areas where site-specific guidelines for activities are required to protect identified values;
- Management – for areas where current legislation and policies are adequate to protect ecosystem values – activities must follow current guidelines, policies and legislation.

This plan also has additional "sub-zones" identified under the protected and sensitive zones.

Zoning in this plan guides resource management decisions under the authority of the Ministry of Environment, and is not to be confused with municipal land use zoning and development controls under The Planning and Development Act.

Ecosystem-based forest management requires the continued involvement of other levels of government, Aboriginal governments, forest users and the public.

Aboriginal communities have a unique relationship with the forest and wildlife. Local and Aboriginal traditional knowledge is encouraged and necessary as part of ecosystem-based management.

This plan recognizes that resource management must change as we obtain new knowledge. Good decisions are based on sound science and information changes over time. Assessment and monitoring of management decisions as recommended in many parts of this plan are a critical part of plan implementation. Responsibility for plan implementation will rest primarily with the ministry.

Many people were involved in the development of this plan, and many will be involved in plan implementation. The ministry will establish a public advisory committee that will be responsible for providing advice to the ministry during plan implementation and review. As well, the general public will have an opportunity to review this plan every five years after it is approved.

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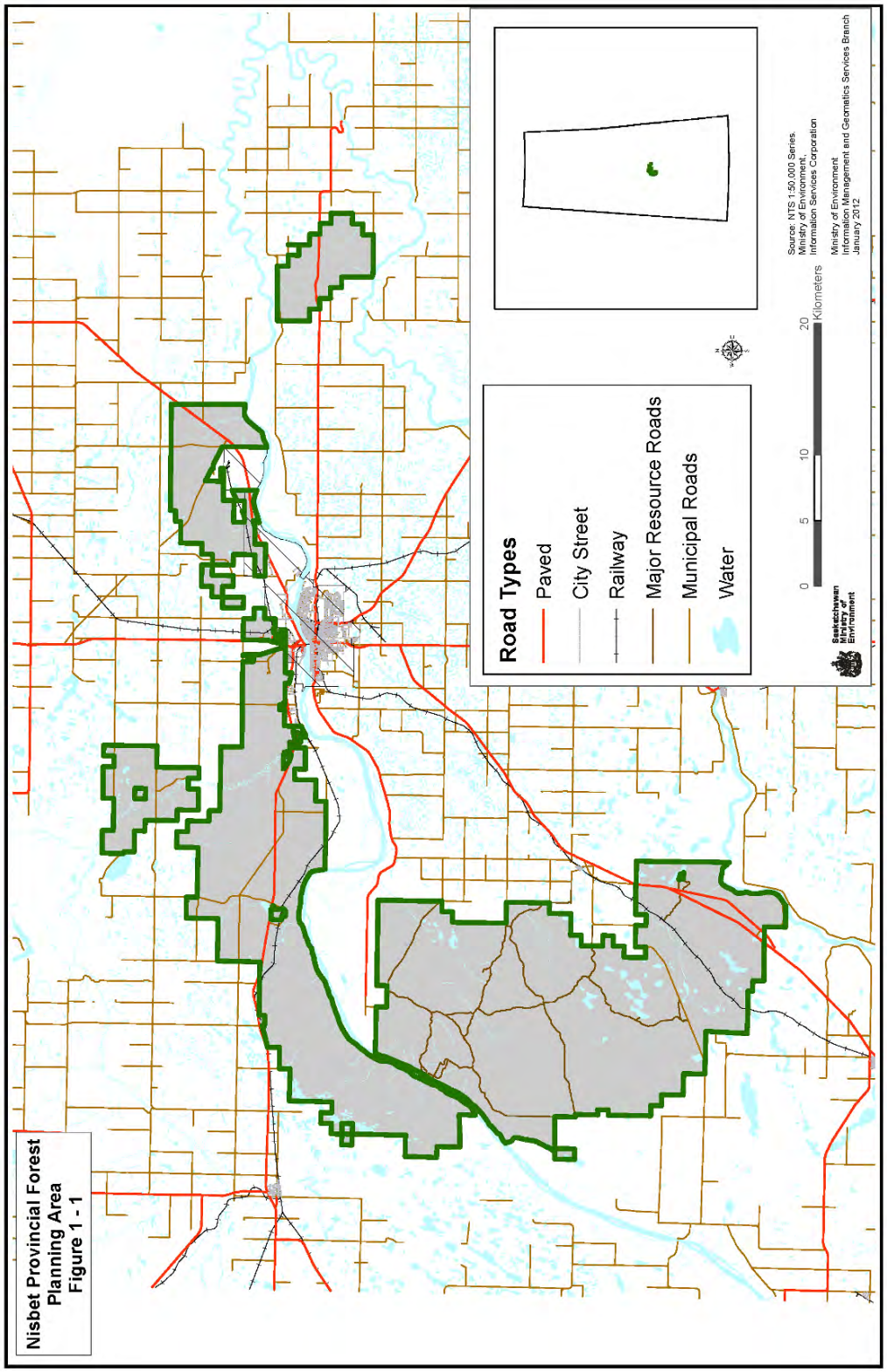
Nisbet Provincial Forest
Planning Area
Figure 1 - 1
Road Types
Paved
City Street
Railway
Major Resource Roads
Municipal Roads
Water
0
5
10
20
Kilometers
Source: NTS 1:50,000 Series.
Ministry of Environment,
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Ministry of Environment
Information Management and Geomatics Services Branch
January 2012
Saskatchewan
Ministry of
Environment

1 INTRODUCTION

This Nisbet Integrated Forest Land Use Plan (IFLUP) is the second part of a two-part document. Part 1 is the Background Information Document, December 2000. The background document describes the forest ecology, boundary, use and issues associated with forest management.

PLAN CONTEXT

The Ministry of Environment's mandate;

To work with Saskatchewan stakeholders to protect our water, air and natural resources to achieve a high environmental standard and to support sustainable development in the usage of these resources. The ministry guides government efforts to help Saskatchewan people and communities Go Green and to meet provincial greenhouse gas emission targets.

The Ministry of Environment's vision;

The Ministry of Environment provides public service excellence in protecting the environment and promoting sustainable use of natural resources to enhance economic and social benefits.

This IFLUP is a Ministry of Environment policy document, intended to achieve the ministry's vision by coordinating policies, programs and activities. It will serve as a guide to resource management decisions within the plan area.

This plan does not create new laws or amend legislation. However, there are several sections that call for a review of Ministry of Environment legislation that, if implemented, may result in changes to legislation.

PLAN AREA

The plan boundary includes all of the Nisbet Provincial Forest, as described in The Forest Resources Management Regulations, which is approximately 80,000 ha in size (See Figure 1-1). The Nisbet Provincial Forest is recognized as a single management unit.

PLAN PRINCIPLES

This IFLUP recognizes that people are a part of this Nisbet Forest ecosystem, and it was developed using the ministry's Principles for Ecosystem-Based Management. The principles are:

1. Focus on the long-term;
2. Concentrate on ecosystem health and integrity;
3. Decisions are based on science, traditional knowledge, and human values;
4. Involve people who will be affected by decisions or who have an interest in the outcome;
5. Use adaptive management; and
6. Look at the big picture.

1.1 PLAN GOAL

To manage the use of the land and renewable natural resources (and non-renewable sand, gravel, minerals, oil and gas) in the planning area on an integrated and environmentally sound basis to ensure sustainable ecological, social, economic and cultural benefits for present and future generations.

1.2 PLAN OBJECTIVES

1. Manage the Nisbet Provincial Forest for multiple uses, balancing current environmental, social and economic needs with future needs, so as to work toward achieving a healthy future forest ecosystem.
2. Maintain or restore ecological integrity and biological diversity.
3. Manage forest resources within sustainable limits, and support sustainable land use decisions.
4. Consider all values when making resource management decisions.
5. Respect treaty and Aboriginal rights.
6. Respect the needs and interests of local communities, local stakeholders, and the people of Saskatchewan.
7. Provide for effective public consultation in the development of plan implementation.
8. Maintain resource management flexibility, so as to accommodate new information and changing forest resource circumstances and demands.
9. Minimize negative effects from allowed uses.
10. Encourage the development of forest stewardship opportunities with local municipalities, First Nations, Métis and interest groups.

WHY AN INTEGRATED FOREST LAND USE PLAN (IFLUP)?

Effective environmental stewardship for the Nisbet Forest requires shared responsibility for decisions and actions among different levels of government, stakeholders and the public. The ministry's challenge for land management decisions is to balance social and economic demands for development, *and* maintain a healthy forest ecosystem that can support native biological diversity for the long term.

The ministry's administrative responsibilities are derived from The Forest Resources Management Act, The Forest Resources Management Regulations, The Provincial Lands Act, The Crown Resource Lands Regulations, The Environmental Assessment Act, The Environmental Management and Protection Act, The Prairie and Forest Fires Act, The Wildlife Act, and The Fisheries Act.

Nothing in this plan is intended to abrogate or derogate from the protection provided for existing Aboriginal or treaty rights, as recognized and affirmed by Section 35 of The Constitution Act, 1982.

KEY ISSUES FOR THE NISBET FOREST

1. **Forest accessibility**: The Nisbet Forest is easily accessed, close to large urban and rural populations, and used extensively for recreation and economic purposes. Further, the forest is situated in the central part of the province, where there is considerable demand for power, telephone, gas, municipal roads and highway developments to benefit the local and provincial populations. These developments pass through the forest in various locations. Pressures for new land sales and leases to facilitate various developments are ongoing. Together, all of these developments can negatively affect forest ecosystem functioning through fragmentation and human access.
2. **Many administrators, one forest**: Legislation to deal with all issues related to use of the area is not the responsibility of a single provincial ministry, and management issues cross over to the federal government, other provincial ministries, provincial agencies and municipalities. Sustainable resource management requires planning and coordination on the ministry's part, but it also requires cooperation among governments responsible for different aspects of administration for this land base.
3. **Many values and expectations**: People want access to the forest for recreation and economic opportunities. The ministry's challenge is to balance provincial and local needs and demands, yet remain within the forest's sustainable capacity.

   The Nisbet Forest provides opportunities in forest management (forest products harvesting and renewal), tourism, recreation, cattle grazing and non-renewable resource extraction. People also value the forest for hunting, aesthetics, recreation, forest products gathering, and wildlife watching.

   Aboriginal people value this forest for cultural, hunting, trapping and sustenance purposes. Aboriginal and treaty rights provide First Nations people with access to forest resources. Consequently, Aboriginal people are not subject to all of the same legal requirements as the general public.
4. **Fire and Forest Health Management**: The forest is a fire-driven ecosystem, renewing itself naturally through large, stand replacing fires. Because people both live near and use the forest commercially, fires have been put out for decades for safety and economic reasons. However, as a forest it is subject to disease and insect infestations over time, an older, unhealthy forest can be a fire threat to the people who live near it. The ministry has pressures to create fuel breaks to decrease the fire risk to safety and properties, yet there are pressures to maintain the stands for aesthetic and recreation values.

   In the past, funding for forest renewal had not kept up with forest harvesting which has had negative implications for forest health and sustainability.
5. **Cumulative Effects**: Many activities occurring on the same land base can cause forest ecosystem functioning and health problems. The cumulative effects of human activities

on forest ecosystem functioning are not well understood, and development of policy and legislation to effectively recognize and deal with these effects are ongoing.

6. **Information:** Information on which management decisions are based is often outdated or lacking.

1.3 THE INTEGRATED FOREST LAND USE PLAN PROCESS

The Nisbet Provincial Forest Background Information Document, December 2000, was used as a basis for discussions in the development of this plan.

Public Advisory Committee (PAC): Planning for the Nisbet Forest started with the establishment of a PAC in April 2001, and 46 committee meetings were held to July 2006. The committee included representatives from local municipalities, First Nations, Métis, and stakeholders representing sand and gravel, cattle grazers, forest harvesters, ecotourism, tourism, environmental and recreation interests. Membership ranged from 24 to 45 people over the period of time meetings were held. See Appendix 1 for the list of PAC participants over time, and Appendix 1-2 for a list of opportunities suggested by the PAC.

Public Review: The ministry held public meetings at the start of the planning process in 2001 to explain the purpose of the plan and the proposed planning process, and to find interested members of the public who could represent stakeholder interests. Public open houses were held in November 2004 in Prince Albert and Duck Lake to inform the public about advisory committee discussions and to seek feedback on outstanding issues. Further public open houses were held in September 2008 in Saskatoon, Prince Albert and Duck Lake to provide additional opportunities to review the draft IFLUP and provide comments.

Independent Scientific Review: A reviewed by Timberline Natural Resources Group was completed in March 2009. The intent was to assess and report how well the draft plan adhered to The Forest Resources Management Act (1996) and The Forest Resources Management Regulations (1999). The review team found the draft plan to be a well organized document which does a good job of presenting the information concerning the resource and land use issues for the Nisbet Provincial Forest. Recommendations were made where a change is required to bring the Plan into compliance with the Act and regulations. Suggestions were made where it was felt changes could be made to strengthen the Plan or future development processes. All recommendations and many of the suggestions have been incorporated in the final version of the Plan.

Minister's Approval: The Nisbet Integrated Forest Land Use Plan became ministry policy once the draft plan was reviewed and signed by the Minister of Environment.

1.4 NOT INCLUDED IN THIS INTEGRATED FOREST LAND USE PLAN

During development of this plan, the public advisory committee identified issues both inside and outside the scope of a land use plan. The issues outside the scope of this IFLUP related to either very detailed management activities, or activities governed by

legislation administered by other provincial ministries (such as Ministry of Energy and Resources (MER), Saskatchewan Watershed Authority, or The Ministry of Municipal Affairs (MMA)).

Issues related to how forest management activities are carried out are addressed through operating plans or provincial manuals. Some of these forest management issues were entered into Forest Service Branch's Environmental Management System[1], some were forwarded to land managers to incorporate into operating plans, and others were forwarded to staff responsible for the development of forest planning manuals.

Some issues are complex and the ministry may not be responsible for administering the appropriate legislation, or may have minimal influence over a given activity. Municipalities or other provincial government ministries may be responsible for the governing legislation. Resource use issues governed by other jurisdictions will continue to be further integrated with appropriate agencies during implementation of this plan.

The Macdowall Bog Protected Area, the Nisbet Trails Recreation Site, and the Sturgeon River Recreation Site are administered under The Parks Act, which is administered by the Ministry of Tourism, Parks, Culture and Sport (TPCS), Parks Branch. These areas are included in this plan to address large-scale ecological management, fire management or access management issues, however, they should also be managed to meet TPCS's biodiversity, ecological and cultural integrity objectives.

OTHER PLANNING INFLUENCING DEVELOPMENT IN THE NISBET PROVINCIAL FOREST:

Municipal Development Planning: Seven municipalities have parts of the Nisbet Forest within their boundaries. Through The Planning and Development Act, each municipality can regulate developments within their municipality, including the part of the Nisbet Forest that is within their boundaries. Municipalities are also responsible for development and maintenance of municipal roads through the Nisbet Forest. The following municipalities cover portions of the Nisbet Provincial Forest:

The City of Prince Albert	The R.M. of Shellbrook
The R.M. of Prince Albert	The R.M. of Garden River
The R.M. of Buckland	The R.M. of Leask
The R.M. of Duck Lake	

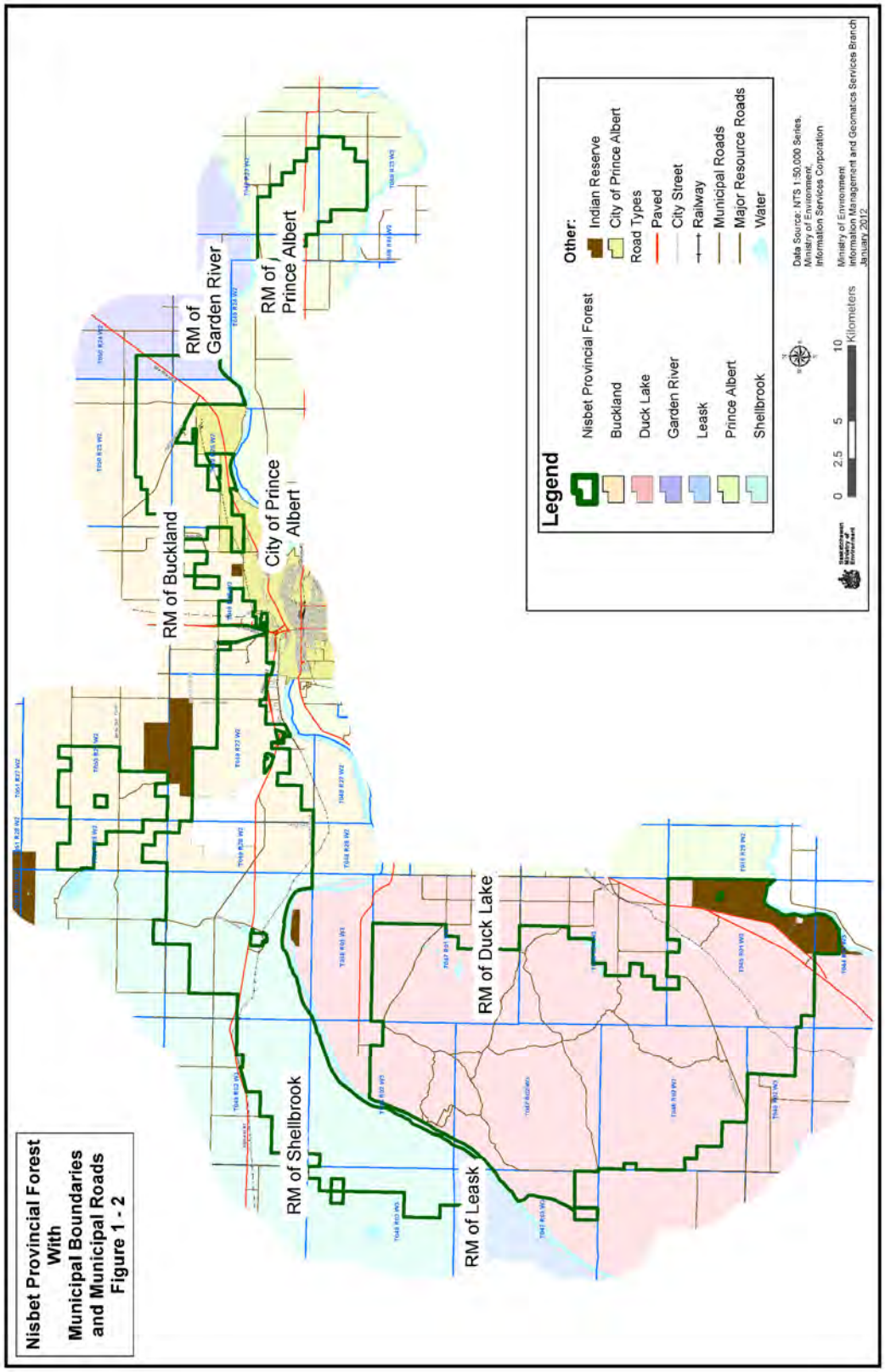
This IFLUP has sections that call for integration with municipal planning bylaws and policies. For a map showing the Nisbet Forest and municipal boundaries, see Figure 1-2.

The Ministry of Municipal Affairs (MMA): Amendments have been made to The Planning and Development Act that include a number of provincial interest statements. Provincial interest statements provide direction and guidance to provincial and municipal planning decisions, developers, and planners on community and economic development, land use planning, public participation, and subdivision of land. Statements of Provincial

[1] http://www.se.gov.sk.ca/forests/forestmanagement/

Interest address provincial policy related to ecological integrity, First Nations and Métis relations, forests, heritage, housing, land use / settlement, minerals, municipal services infrastructure, petroleum and natural gas, public safety, quarrying (including sand, gravel and limestone), recreation and tourism, shoreland and water bodies, source water protection, transportation, and agriculture.

The North Saskatchewan Watershed Area Plan: The focus of this plan is to protect source waters within the watershed, with an emphasis on drinking water sources. The plan is currently under development, and portions of the IFLUP area abut the watershed planning area. Portions of this plan call for cooperation between the watershed plan and IFLUP management sections.


Nisbet Provincial Forest
With
Municipal Boundaries
and Municipal Roads
Figure 1 - 2
RM of Buckland
RM of
Garden River
RM of
Prince Albert
City of Prince
Albert
RM of Shellbrook
RM of Duck Lake
RM of Leask
Legend
Nisbet Provincial Forest
Buckland
Duck Lake
Garden River
Leask
Prince Albert
Shellbrook
Other:
Indian Reserve
City of Prince Albert
Road Types
Paved
City Street
Railway
Municipal Roads
Major Resource Roads
Water
0 2.5 5 10
Kilometers
Data Source: MTS 1:50,000 Series.
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January 2012

MINISTRY OF ENVIRONMENT COMMITMENTS (NISBET FOREST):

There are many federal or provincial accords, agreements and strategies, such as the Canada Forest Accord or the National Forest Strategy, which may affect the way the Province of Saskatchewan makes provincial forest management decisions. These are not specifically identified in this plan. The following plans or strategies and commitments are referenced within this plan:

BIODIVERSITY ACTION PLAN

A healthy environment is the key component for sustaining future populations. Sustainable development requires society to consider not only our current needs, but to ensure that what we do today does not compromise the needs of future generations. Saskatchewan developed a policy document in response to the *Canadian Biodiversity Strategy*, entitled *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*. Starting in 2010, development began on a new Biodiversity Action Plan framework that builds on the existing plans and programs and incorporates actions to bridge gaps and enhance biodiversity.

TREATY LAND ENTITLEMENT (TLE)

Fulfilling TLE commitments is a priority for the ministry. The Province of Saskatchewan, the Government of Canada and 25 First Nations signed the *Saskatchewan Treaty Land Entitlement Framework Agreement* in 1992. There are currently 33 First Nations with Treaty Land Entitlement settlement agreements.

"Saskatchewan is legally obligated to participate in TLE settlements due to the *Natural Resources Transfer Agreement* (1930). Pursuant to this agreement, Canada transferred to Saskatchewan all Crown lands, minerals and other natural resources within the Province, subject to a number of conditions. One such condition was that Saskatchewan would consider favorable selections on Crown Resource Lands to enable Canada to fulfill its obligations under treaties with First Nations"[2].

Currently, there is one small TLE selection in the Plan area, Peter Ballantyne Cree Nation (in the RM of Buckland) which remains unfinalized.

FIRST NATIONS ISLAND FOREST MANAGEMENT INC.

In June 2003, Saskatchewan signed a Joint Working Agreement with First Nations Island Forest Management Inc, made up of seven local first nations (Ahtahkakoop Cree Nation, Wahpeton Dakota Nation, Sturgeon Lake First Nation, Beardy's and Okemasis Willow Cree First Nation, One Arrow First Nation, Muskoday First Nation and James Smith Cree Nation). A three–year term supply license to harvest forest products in the Island Forests (Nisbet, Canwood, Fort a la Corne and Torch River Provincial Forests) was signed with

[2] Sask First Nations and Métis Relations. June, 2006. Treaty Land Entitlement Fact Sheet. http://www.fnmr.gov.sk.ca/html/lands/tle_factsheet.htm

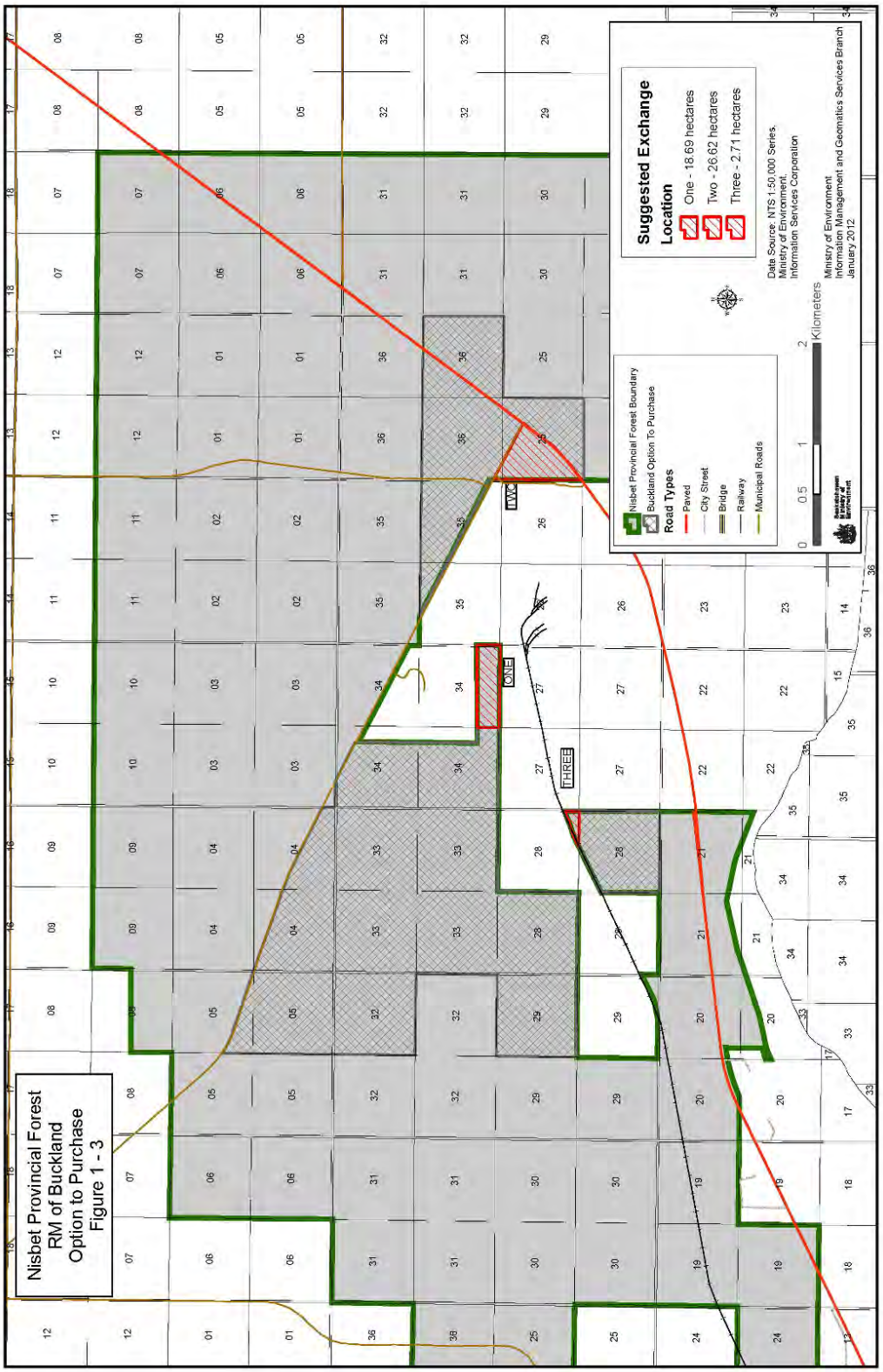
this group. The intent is to increase social, economic and environmental benefits from these forests.

ABORIGINAL CONSULTATION

The ministry has a duty to consult with First Nations and Métis people on resource management decisions. Of particular concern to First Nations are provincial government actions, legislation or policies that may affect their treaty or Aboriginal rights.

BUCKLAND OPTION TO PURCHASE

The ministry signed an agreement with the Rural Municipality of Buckland, which gives the municipality an option to purchase approximately 971 ha of Nisbet Provincial Forest land. The subject land is adjacent to the Buckland industrial park, and is shown on Figure 1-3. The R.M of Buckland has until 2014 to exercise the option to purchase. If they do acquire all or any part of the subject land, it will be withdrawn from the Nisbet Forest boundaries.


Nisbet Provincial Forest
RM of Buckland
Option to Purchase
Figure 1 - 3
TWO
ONE
THREE
Suggested Exchange Location
One - 18.69 hectares
Two - 26.62 hectares
Three - 2.71 hectares
Nisbet Provincial Forest Boundary
Buckland Option To Purchase
Road Types
Paved
City Street
Bridge
Railway
Municipal Roads
0
0.5
1
2
Kilometers
Data Source: NTS 1:50,000 Series.
Ministry of Environment.
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Information Management and Geomatics Services Branch
January 2012

2 INTEGRATED FOREST LAND USE PLAN

This plan contains resource management guidelines, goals and objectives intended to facilitate the plan. Guidelines are related to resource management activities within the control of the ministry.

All sections of this plan have a brief background description, followed by the following segments:

ISSUE: Identifies issues

MANAGEMENT OBJECTIVES: Describe desired management intentions/ intended outcome

MANAGEMENT POLICY: Describes how objectives will be achieved. This section may include recommendations for other provincial government ministries, Crown agencies, or other governments (e.g. municipalities, Aboriginal governments)

MANAGEMENT ACTIONS: These are specific actions that the ministry may carry out to achieve objectives.

Priority 1 means one to two years; Priority 2 means two to five years; and Priority 3 means five to eight years. Ongoing means that the action does not have a designated timeline but rather needs to be revisited throughout the timeline of the plan.

2.1 LAND AND RESOURCE MANAGEMENT-DEVELOPMENT REVIEW

The ministry is responsible for the administration of Nisbet Forest land and resources. For new development proposals, consultation and review requirements are decided prior to development approval.

Other development activities, such as utilities, highways, municipal roads, and mineral resources developments, occur on the Nisbet Forest land base and are governed by legislation administered by other branches within the Ministry of Environment, other government ministries, government agencies or municipalities.

ISSUES:

1. There are multiple government ministries responsible for coordination of all development activities that occur in the Nisbet Forest.

MANAGEMENT OBJECTIVES:

1. Manage the forest as a single ecosystem, and when approving developments, remain within sustainable ecosystem limits.
2. Consider all values and existing uses when reviewing new proposals. Use appropriate consultation procedures when considering new developments.

MANAGEMENT POLICY:

1. IFLUP plan administrator to coordinate the ministry resource development activities in the Nisbet Forest.
2. Where consultation with other forest users is undertaken, it does not mean that the user has authority to approve or deny, only the ministry will be made aware of concerns raised, and adjustments may be made to accommodate reasonable concerns.

Zoning:

3. Refer to IFLUP zoning text, Zoning Table 1-1, and Figure 2-1.

For all development proposals:

4. Where appropriate, the ministry will consult with other ministries, Crown agencies, municipalities, First Nations or Métis, and appropriate stakeholders.
5. Developments defined under The Planning and Development Act require municipal review and approval. When the level of access or degree of traffic is expected to affect a municipal road system, refer application to the affected rural municipality.
6. For any land use proposal that could restrict mineral, oil or gas exploration and/or development, refer proposal to MER to evaluate for development potential.
7. Proposed developments that may negatively affect wetlands, groundwater, or surface water quality and quantity will be forwarded to appropriate ministry staff, the Saskatchewan Watershed Authority (SWA) and the federal Department of Fisheries and Oceans (DFO) for review, as appropriate. When proposing wells, consult with SWA.
8. Unless conditions set out in an environmental impact assessment review allow, development or road construction activities must not result in the drainage of wetlands, nor the damning of water (e.g. a flowing fen). Where possible, use existing water crossings instead of developing new crossings. Where appropriate DFO will be consulted.
9. Where appropriate, ministry branches may review proposals for wildlife issues, pollution prevention, environmental protection, forest renewal, fire or forest protection requirements. The ministry may require consultation with existing disposition holders (e.g. grazing, trappers), recreation club(s) maintaining trails, and other known users.
10. Consider effects of proposed developments on ecosystem functioning, including wildlife and wildlife habitat. Refer new applications to the Wildlife Biologist, and/or Environmental Assessment Branch for review as needed.
11. When new access is proposed, the plan for closure is to be included in the proposal or the approval as appropriate.
12. Investigate subject area for presence of known wild species at risk. Document how the proposed development will or will not affect wild species at risk.
13. Minimize opportunities for introduction of exotic species and negative effects on existing users, wildlife and forest vegetation by using existing clearings, trails, utility corridors and roads where possible. Document measures to minimize the introduction of invasive exotic species.

For all developments / activities (including access roads and exploration) that will or might disturb the forest floor:

14. Minimize negative impacts to the ecosystem and other values and users by using the least intrusive disturbance methods.

15. Refer the proposal to Heritage Resource Branch of TPCS to determine whether a Heritage Resource Impact Assessment is required.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
As implementation progresses, the Lands Branch should ensure consistent review of development proposals that are approved by the Lands Branch. Ensure appropriate mapping is current and available to staff.	Ministry of Environment	Ongoing

TABLE 1-1										
ZONING TABLE	**PROTECTED REPRESENTATIVE AREAS NETWORK**	**PROTECTED- SITES OF HISTORICAL, CULTURAL, OR ARCHAEOLOGICAL SIGNIFICANCE**	**SENSITIVE-ROUGH FESCUE PRAIRIE ECOSYSTEM**	**SENSITIVE-WILD SPECIES AT RISK**	**SENSITIVE-RIPARIAN**	**SENSITIVE-BOG UPLAND**	**SENSITIVE-AESTHETIC AND RECREATION**	**SENSITIVE-RECREATION TRAILS**	**SENSITIVE-RESEARCH**	**MANAGEMENT**
TIMBER HARVEST	NP	C1	NP1	NP1	NP1	C1	NP1	NP1&C2	C1	P
SALVAGE HARVEST	NP	C1	NP1	NP1	NP1	C1	NP1	NP1	C1	P
FOREST RENEWAL	NP	C1	NP	NP1	C1	P	P	P	C1	P
COMMERCIAL NON-TIMBER FOREST PRODUCTS	NP	C1	NP	NP1	C1	P	C1	C1	C1	P
HAYING OR GRAZING	C1	C1	C1	C1	C1	C1	C1	C1	C1	P
TEMPORARY INDUSTRIAL USE: exploration for sand or gravel; minerals, oil or gas	NP	C1	C1	NR	C1	P	C1	C1	C1	P
SAND/ GRAVEL DEVELOPMENT	NP	C1	NP	NP	NP	C1	C2	NP	NP	P
INDUSTRIAL DEVELOPMENT: mineral, oil or gas	C1	C1	NR	NR	NR	C1	C2	NR	C1	P
INDUSTRIAL (except sand, gravel, oil, mineral or gas), COMMERCIAL, AGRICULTURAL (except haying or grazing), RESIDENTIAL, RECREATION, or any type of CABIN DEVELOPMENT	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP

MUNIC. ROAD / HIGHWAY OR UTILITY LINE	C1	C1	NR	NR	NR	C1	C2	C2	C1	P
INSTITUTIONAL	NP	C1	NP	NP	NP	NP	NP	C2	NP	C2
LAGOONS, LANDFILLS, UTILITY SITES, RESEARCH SITES, or other miscellaneous uses requiring permanent development*	NP	C1	NP	NP	NP	C1	NP	NP	NP	P
MISC. USE PERMITS – RECREATION USE*	NP	C1	C1	C1	C1	P	C1	C1	C1	P

* See Section 2.8 (Lands Dispositions or Sales/Public Utility Corridors/Roads) for further restrictions

P = Permitted (subject to normal review processes)

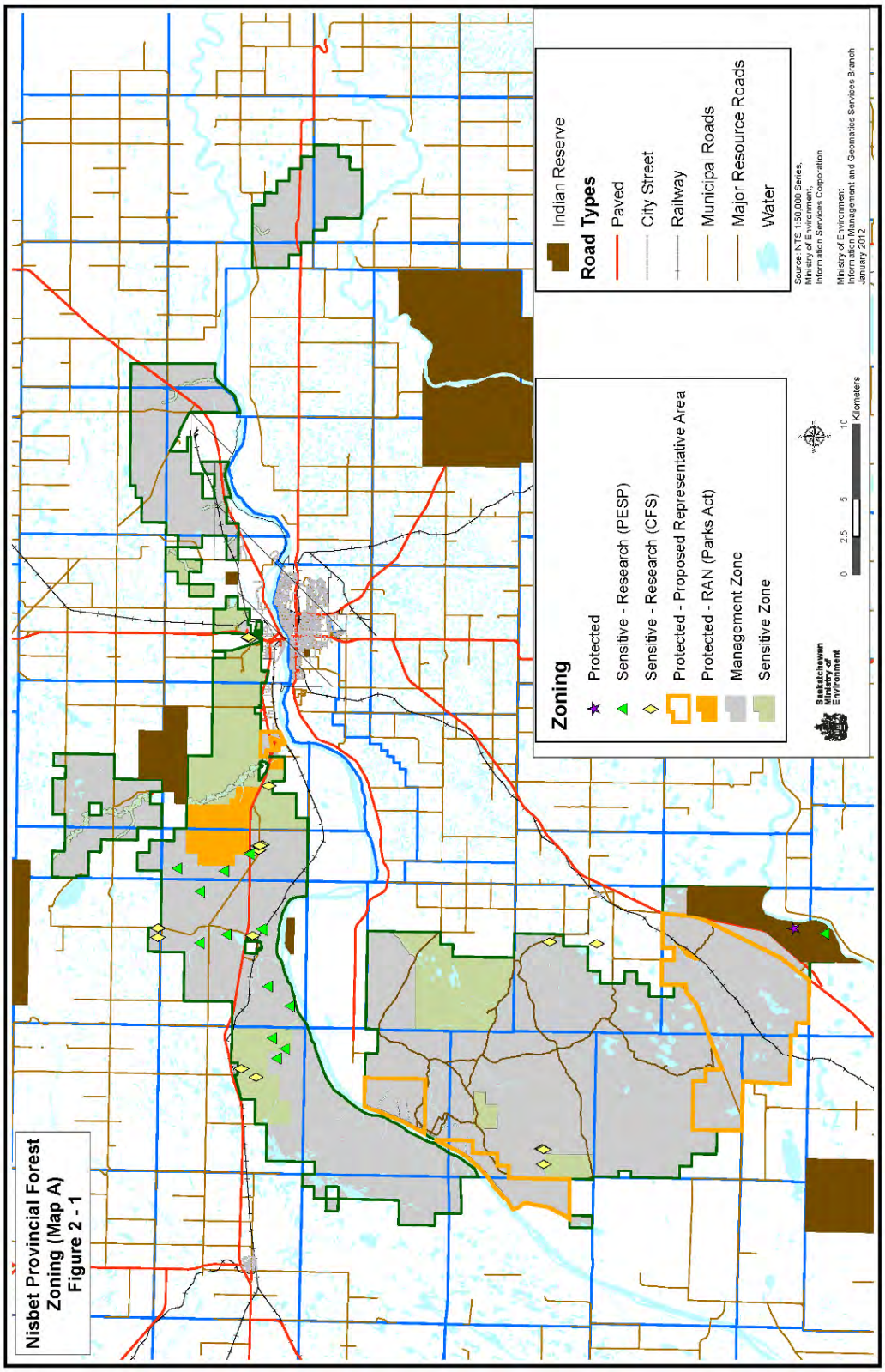
C1 = Conditional. May be allowed with conditions that the activity will not negatively affect the functioning, significance or intent of the zone. Consultation is required with applicable federal government / Ministry of Environment (for significant natural value or feature, scientific research activity or wildlife value); or with other government departments or agencies (e.g. SWA/ CYR) / municipal government / Aboriginal government (for identified value or feature requiring protection) prior to any approval

C2 = Conditional - May be allowed with conditions that the activity will not negatively affect the functioning, significance or intent of the zone. Additional public consultation (newspaper notice of planned activity) and consultation with recreation clubs maintaining recreation trails is recommended

NP = Not permitted. (Dispositions will not be issued)

NP1 = Not normally permitted. May be permitted with conditions if a Ministry of Environment Ecologist requires the activity to enhance the functioning or significance of the zone OR activity may be required for public safety (fuel breaks), long-term forest ecosystem health (insect or disease management)

NR = Not recommended (also includes activities governed by government / agency other than the Ministry of Environment)


Nisbet Provincial Forest
Zoning (Map A)
Figure 2 - 1
Zoning
Protected
Sensitive - Research (PESP)
Sensitive - Research (CFS)
Protected - Proposed Representative Area
Protected - RAN (Parks Act)
Management Zone
Sensitive Zone
Road Types
Paved
City Street
Railway
Municipal Roads
Major Resource Roads
Water
Indian Reserve
Saskatchewan Ministry of Environment
0 2.5 5 10
Kilometers
Source: NTS 1:50,000 Series,
Ministry of Environment,
Information Services Corporation
Ministry of Environment
Information Management and Geomatics Services Branch
January 2012

2.2 BIODIVERSITY

"Biodiversity is simply *the variety of life*. Biodiversity includes all species of plants, animals and microorganisms, from the smallest of insects to the towering white spruce and the ecosystems and ecological processes of which they are a part . . . Maintaining nature's rich variety of species, with all their genetic diversity and complex interactions with the physical environment are critical for the conservation and sustainable use of functioning ecosystems"[3]. Saskatchewan's Biodiversity Action Plan helps to guide government conservation action in ways that balance environmental, social and economic values that are at the heart of many issues affecting ecosystem health and biodiversity in the Province[4].

The ministry follows the principles of ecosystem-based management, sustainable development, and adaptive management when administering land and resources in order to protect biodiversity and prevent more species at risk from occurring. Ecosystem-based management recognizes that all components in an ecosystem are closely linked and cannot be managed in isolation. Sustainable development calls for simultaneously considering impacts on the air, land and water. Adaptive management requires the incorporation of new information from science, management experience and other sources.

Information about the full value of the Nisbet Forest ecosystems and the species within it is incomplete. For this reason, it is important to be cautious about how we use the forest, and that we conserve and maintain it for our enjoyment and the enjoyment of future generations.

The Nisbet Provincial Forest is part of a larger landscape - the boreal transition ecoregion. The land and aquatic resources of the ecoregion function together to provide wildlife and aquatic habitats, as well as human goods and services. The forest ecosystem continues beyond provincial forest boundaries onto private lands, and if it is to be managed appropriately, the forest (and parts within it) cannot be managed in isolation.

Saskatchewan's Biodiversity Action Plan recognizes that underlying threats to biodiversity are: the size and distribution of the human population, the level of resource consumption, programs and policies that effectively provide incentives for the depletion of biological diversity and failure to recognize the full value of environmental goods and services[3]. Western Canadian Boreal forests are highly vulnerable to climate change impacts, particularly with regard to moisture availability and disturbance events such as forest fires and insect outbreaks[5].

[3] Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009. Saskatchewan Environment, p. 2, p.4

[4] Saskatchewan Environment, 2005-2006 Provincial Budget Performance Plan, p.11

[5] Vulnerability to Climate Change (Limited Report to Nisbet Forest Land Use Team). Johnston, Mark, Saskatchewan Research Council. August, 2002. SRC Publication No. 11456-1E02

The ministry has developed provincial Natural Forest Patterns (NFP) Standards for forest products harvesting. Following the ministry goal of ecosystem-based management, the standards were designed to move harvesting activities closer to natural disturbance patterns. By following NFP standards, forest management activities are intended to maintain the structure and function of forest ecosystems, and provide habitat for all boreal forest species.

ISSUES:

1. Maintaining biodiversity and managing the Nisbet Provincial Forest land base to have a healthy ecosystem in perpetuity is a challenge due to the many human pressures placed upon it, conflicting resource demands, and administrative responsibilities that lie with multiple jurisdictions.
2. Issues identified as significant threats to Nisbet Forest health and associated biodiversity include: habitat fragmentation, invasive exotic species, over use, imbalance of forest products harvesting and renewal, and the prevalence of unmanaged dwarf mistletoe.

BIODIVERSITY MANAGEMENT OBJECTIVES:

1. Retain the appropriate amount of "parts" at the landscape level so that landscape, species and genetic diversity are maintained. Maintain species diversity, habitat diversity and integrity.
2. Minimize negative impacts to surface and subsurface flows of wetland systems.
3. Use representative areas as benchmark areas to compare the impact of management activities outside of representative areas.
4. Prevent the extirpation of wild species at risk; prevent other native species from becoming at risk; increase, where feasible, populations of wild species at risk; and re-introduce, where feasible native species that have been extirpated.
5. Use an ecosystem-based approach to managing developments and activities.
6. Build an adaptive and flexible forest management system that includes a range of potential responses to climate change in order to support a healthy forest ecosystem under climatic extremes.

BIODIVERSITY MANAGEMENT POLICY:

1. Refer to Caring for Natural Environments: *A Biodiversity Action Plan for Saskatchewan's Future 2004-2009* (Biodiversity Action Plan) for provincial direction.
2. Ensure proposals for development activities demonstrate how they maintain, enhance or minimize negative impacts to biodiversity.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Continue to work on the Provincial Forest Management Effects Monitoring Program (FMEMP) and report results periodically to the Nisbet Advisory Committee.	Ministry of Environment	Ongoing

2.2.1 PROVINCIAL REPRESENTATIVE AREAS NETWORK

In response to the need to conserve more areas in their natural state, the province is establishing a system of protected sites, called the Representative Areas Network (RAN). This program was established in 1997, and endorsed in Saskatchewan's Biodiversity Action Plan in 2000. The network consists of wildlife lands, riparian areas, wetlands, protected areas, bird sanctuaries, ecological reserves, parks and prairie rangelands[6]. These sites contain examples of Saskatchewan's biological and landscape types, and are selected based on "enduring features". Enduring features do not change over time, and are associated with climate, landforms and soil types. RAN sites can be used as benchmark sites. that can be studied and monitored over time. By monitoring the land and resources within the RAN, and comparing them to other similar areas in the province, resource managers are better able to determine how well we are managing lands and resources outside of the representative areas.

To be included in the RAN, potential sites undergo a comprehensive assessment process, including assessment for existing use, ownership and development. Land that has been extensively developed or land that has poor ecological value is not considered suitable.

Saskatchewan has a target of conserving 12% of the province's land base within the RAN, and intends to include representation from each of the province's eleven ecoregions. The Nisbet Provincial Forest is within the Boreal Transition Ecoregion, and the province has not yet reached the 12% target for that ecoregion, because much of the land is privately owned, and has been developed for agricultural or other uses. There are limited remaining options for RAN site selection in this ecoregion.

Four proposed sites, referred to as the North Block (1,082 hectares), the West Block (1,351 hectares), the South Block (8,025 hectares, excluding the existing Macdowall Bog Protected Area which is now encompassed by the "South Block"), and the Old Highway Block (155 hectares) add a total of 10,613 hectares of protected lands in the Nisbet (see Figure 2-1). These sites will contribute to the RAN and compliment existing protected areas managed under The Parks Act. These are the Nisbet Trails Recreation Site, the Sturgeon River Recreation Site and the Macdowall Bog Protected Area. These lands have a total area of 1,919 hectares, representing 2.4% of the Nisbet Forest land base. Combined, the proposed sites in addition to the existing protected lands contribute a total of 12,532 hectares to the RAN. This equates to 15% of the Nisbet Forest area being protected.

ISSUES:

1. Because representative areas are intended to, as much as possible, be left to natural processes, the following issues have been identified as possible impacts from minimal forest management:

    - Wildfire risks for human developments surrounding the Nisbet Forest.
    - Forest insect and disease incidence spreading from protected areas to surrounding provincial forest.

[6] http://www.se.gov.sk.ca/ecosystem/sran/EXECSUM.htm

2. The Nisbet Forest currently supports small forest harvesting operations, and there are possible effects to the local economy and forest harvesters if the allowed cutting limits are decreased because of representative areas.

MANAGEMENT OBJECTIVES:

1. See Biodiversity Management Objectives.
2. Select provincial Representative Areas Network sites based on enduring features that are under represented in the Boreal Transition Ecoregion.

MANAGEMENT POLICY:

1. Management plans for lands designated under the provincial RAN should be compatible with IFLUP forest management and biodiversity objectives.
2. Areas approved for the provincial RAN are zoned as Protected – Representative Areas Network.
3. Fire management in representative areas within the Nisbet will be managed similarly to the way it is in the surrounding Crown forest. Where safe, fires will be left to renew these areas naturally, but fire suppression action will be initiated where an area is deemed by Wildfire Management Branch to be within the protected values established.
4. If necessary, control techniques to prevent the spread of mountain pine beetle will also be considered within representative areas in the Nisbet.
5. Specific management techniques will be used to control dwarf mistletoe along the edges of representative areas.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Develop management plans for lands proposed for inclusion in the RAN.	Ministry of Environment	Priority 2 (3-5 years)
As part of the overall Ecoregion targets, continue to identify "shortfall" enduring features present in the Nisbet Forest required for possible inclusion in the provincial Representative Areas Network; determine suitability (ecological health and other requirements).	Ministry of Environment	Priority 1 (1-2 years)

2.2.2 WILDLIFE

A key concept of biodiversity is that every living thing, including people, has a connection to every other living thing and its environment.[7] Wildlife is inextricably part of forest ecosystems.

[7] Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009. Saskatchewan Environment, p. 1

Human activities carried out in the forest can negatively affect wildlife. Human access, use and demand of the Nisbet Forest land base and resources increase as human populations increase. The ministry's challenge is to balance social and economic demands placed on the forest within its ecological capacity.

Certain wildlife species in the Nisbet are important as a food source for Aboriginal people living in the vicinity of the forest. The level of harvesting wildlife in the Nisbet Forest as a food source for Aboriginal people is not known.

Wildlife can negatively affect the surrounding agricultural development through crop depredation and occasional predatory activities. Collisions between deer and vehicles on the provincial highways and grid roads through the Nisbet are a safety concern.

Figure 2-2 shows the hunting zones and trapping areas within the forest. Licences to carry out these activities are recorded by the ministry, but not specifically for the Nisbet Forest. For hunting, the forest is divided into four wildlife management zones. For trapping, the Macdowall Block of the Nisbet Forest is identified as the Pines Fur Conservation Area. The remainder of the forest is within the Southern Saskatchewan Trapping Zone.

Provincial fishing legislation applies to the fishing activities allowed on the rivers and ponds in the Nisbet Forest. The trout ponds in the Nisbet Trails Recreation Site and the Steep Creek are regularly stocked with trout.

ISSUES:

1. There is limited information about wildlife populations (including waterfowl) or the quality of their habitat in the Nisbet. As this plan was being drafted, Ducks Unlimited was in the process of conducting a waterfowl survey in the Nisbet.
2. There are two specific concerns related to baiting for hunting activities in the Nisbet:
    - Baiting creates safety concerns for hikers, as it attracts wildlife and predators to a given site. Current legislation prohibits bear baiting within 200 meters of maintained snowmobile trails or cross-country ski trails prior to April 1 of each year. The same measure of protection is not in place during the rest of the year when hiking occurs.
    - Grain or bales brought into the forest as bait can introduce seed from noxious weeds. (This is further discussed in the section 2.2.3 Exotics Species (Introduced Species) and Invasive Exotic Species.)

MANAGEMENT OBJECTIVES:

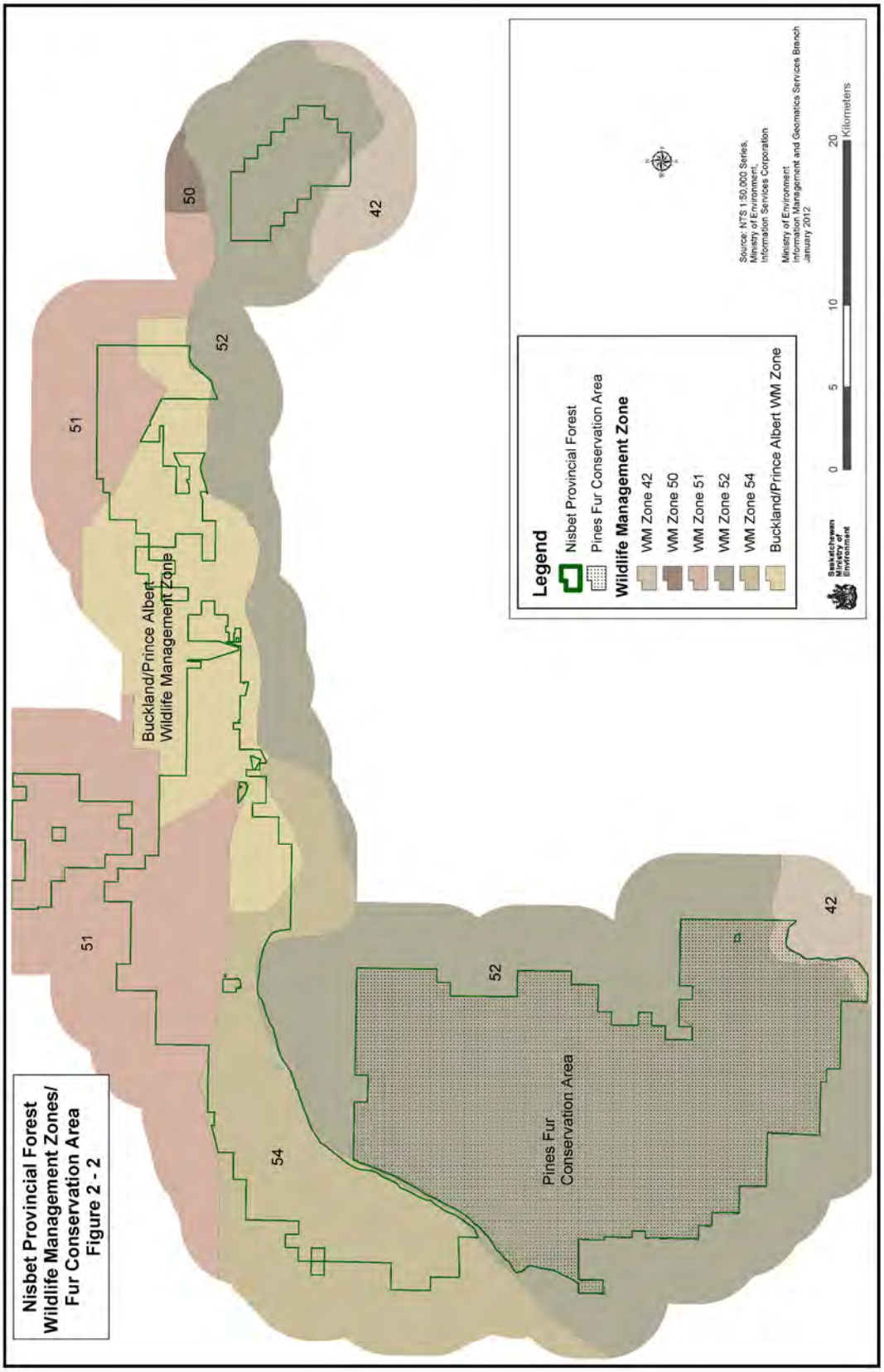
See Biodiversity Management Objectives.

MANAGEMENT POLICY:

1. The Wildlife–Landowner Assistance Regulations apply to situations involving crop depredation by wildlife on private lands outside of the forest.

2. Consultation with local First Nations and Métis, municipalities and affected user groups is recommended before developing any wildlife management plans, or any associated access management plans, which restrict vehicle access.
3. The public, nature groups, and education groups are encouraged to report significant wildlife observations such as heron rookeries, or eagle and raptor nest sites to the Conservation Data Centre at their website: http://www.biodiversity.sk.ca/.
4. Continue with current hunting and trapping license administrative zones.
5. All bait sites to be appropriately signed as required in the Saskatchewan Hunters' and Trappers' Guide.

MANAGEMENT ACTIONS	Agency Responsible	Time Frame to Complete
Maintain GIS points of significant wildlife reported to CDC for SRC harvest planning.	Ministry of Environment	Priority 2 (3-5 years)
Report to the Public Advisory Committee, the Ducks Unlimited waterfowl survey results.	Ministry of Environment	Priority 1 (1-2 years)
Develop an inventory of important wildlife habitat areas in the Nisbet Forest and apply this information to Forest and Wildlife Management decisions. Scott Lake, Callaghan Lake, and Lobstick Lake have been identified by advisory committee members as potential sites of importance to wildlife.	Ministry of Environment	Ongoing


Nisbet Provincial Forest
Wildlife Management Zones/
Fur Conservation Area
Figure 2 - 2
Buckland/Prince Albert
Wildlife Management Zone
Pines Fur
Conservation Area
50
42
52
51
54
Legend
Nisbet Provincial Forest
Pines Fur Conservation Area
Wildlife Management Zone
WM Zone 42
WM Zone 50
WM Zone 51
WM Zone 52
WM Zone 54
Buckland/Prince Albert WM Zone
Source: NTS 1:50,000 Series,
Ministry of Environment,
Information Services Corporation
Ministry of Environment
Information Management and Geomatics Services Branch
January 2012
0
5
10
20
Kilometers

2.2.3 EXOTIC SPECIES (INTRODUCED SPECIES) AND INVASIVE EXOTIC SPECIES

Saskatchewan's Biodiversity Action Plan defines invasive exotic species as those that are non-native or alien to the ecosystem under consideration, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. The plan identifies tactics to address exotic species, including: developing a provincial invasive exotic species plan; developing a means to address the threat of invasive exotic species; identifying and implementing measures to prevent the introduction of invasive exotic species; and introducing measures to control populations of invasive exotic species existing in the province[8]. Once developed, these provincial guidelines will apply to the Nisbet Forest.

Although all exotic species may be a concern**,** invasive exotic species are of particular concern to a healthy and sustainable forest ecosystem. Invasive exotic species include noxious weeds, which are identified in The Noxious Weeds Act, 1984 as "*any plant that the minister may designate in the regulations as a noxious weed for the purposes of this Act, and includes the seeds of that plant*". Specific noxious weeds are identified in The Noxious Weeds Designation Regulations. Toadflax, Canada thistle, stinkweed, wild buckwheat, wild oats and purple loosestrife are examples of listed noxious weeds that have been identified in the Nisbet Forest.

Any activity that disturbs the forest soil creates a medium of exposed soil for exotic species seeds to germinate, and all forest uses have a potential to bring exotic plant seeds into the forest. Disturbance activities that may create the conditions to allow invasive exotic species to become established in the forest include forest products harvesting, forest renewal, recreation, cattle grazing, road or utility construction, and sand or gravel extraction.

Invasive exotic plant species can be introduced into the forest through grasses and other seeds planted to re-establish cover in gravel pits, ditches or utility corridors. Smooth brome is a grass species commonly used for roadside or gravel pit reclamation. Although not intentionally introduced, crested wheat grass has overgrown jack pine plantations in the Nisbet Forest. Crested wheat grass and smooth brome are invasive, but not listed as noxious weeds.

Section 16 (3) of The Forest Resources Management Regulations (FRM Regulations) states that "no person shall introduce, transport, deposit, possess or propagate any noxious weed as defined in The Noxious Weeds Act,1984, or any exotic plant designated by the minister in or on any provincial forest land." Though to date, there are no exotic plants designated by the minister under the FRM Regulations, Section 16 (5) does give a clear description of "exotic plant". Section 18.41 (a) & (b) of The Wildlife Regulations, 1981 identify clear restrictions on bait for big game hunting as they pertain to noxious weeds, noxious week seed, and exotic plants.

[8] Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009. Saskatchewan Environment, p. 29-33

In the past, the ministry has allowed planting of trees or shrubs that are not native to the Nisbet Forest ecosystem (caragana, scots pine, red pine, lodgepole pine and ponderosa pine), but could be considered as exotic plants. Section 16 of The FRM Regulations has provisions to license the "reintroduction, propagation, rehabilitation, protection or scientific research" of forest products which include exotic plants.

Climate change predictions indicate that this forest may be subject to hotter, drier conditions, and could result in increased mortality of existing tree species[9]. Introducing non-native tree species has been suggested as a management option to deal with effects of predicted climate change. Forest Service Branch of the ministry has undertaken a project to examine stands of conifer trees planted in the Island Forests that are not native to this forest. The project explores options and associated benefits and risks related to planting alternative tree species[10].

ISSUES:

1. Recommendations for adapting to climate change include the possible introduction of non-invasive species that are native to the circum-polar boreal forest, and which could withstand a hotter, drier climate. Provincial policy restricts the introduction of "exotic" species to a forest ecosystem to meet management objectives (such as to establish drought-tolerant trees), yet are not currently considered to be "invasive exotic" species.

MANAGEMENT OBJECTIVES:

See Biodiversity Management Objectives.

MANAGEMENT POLICY:

1. Invasive exotic species listed in the Noxious Weeds Act, 1984 and Regulations will be dealt with according provincial legislation requirements. Enforce existing policy and legislation to prevent the introduction of noxious weeds into the Nisbet Forest through allowed activities.
2. As noted in this plan's climate change section, any plan that may call for large-scale introduction of species that are not native to this forest must be developed in consultation with the public.
3. No further planting of exotic plant species (other than for scientific studies) in this forest is allowed until scientific studies prove that a species considered as "exotic" to this forest ecosystem will not negatively affect forest ecosystem functioning, would be beneficial to this forest and/or the people who use it, and is suited to this forest (likely to thrive and withstand expected climate change pressures).

[9] *Vulnerability to Climate Change* August 2002. Johnston, M. Saskatchewan Research Council. Publication No. 11456-1E02.

[10] *Evaluation of Conifer Tree Species Alternatives for Island Forest Renewal*. Bendzsak, Michael, Saskatchewan Forest Centre. September 2006.

4. If exotic species are planted in the Nisbet, the purpose (scientific study, disease management, other) must be clearly identified and documented in this plan's monitoring and reporting process.
5. For all allowed activities in the forest, minimize the conditions that allow the accidental establishment of invasive exotic species by minimizing the:
    - duration of exposed soils;
    - disturbance depth and area of a site; and
    - opportunities to bring invasive exotic species into the forest.
    - use of non-native seed mixes in reclamation activities.
6. Where natural regeneration or tree planting is not feasible after a disturbance activity, re-seed to grass species/ species native to the forest. Refer to Kosowan and Smith's "Native Species Recommended for Site Restoration within the Mid-Boreal Upland, Mid-Boreal Lowland." For disturbances related to forest products harvesting activities, the area forester must approve seed and species mixtures.
7. Grazing cattle in the Nisbet Forest is a permitted use. Introducing other agricultural species (including bees) is not allowed.
8. Provincial policy on exotic species applies to fish stocking on non-isolated water bodies in the Nisbet. Fish stocking with species not native to the ecoregion is restricted to current sites (Nisbet Trails Recreation Site and Steep Creek Trout Pond) and similar sites deemed secure by the ministry's Fish and Wildlife Branch.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Map sites known to contain noxious weeds and invasive exotic species in the Nisbet. Determine appropriate action, and monitor sites over time to determine effectiveness of any action. Invasive exotic species information can be used for provincial monitoring and reporting as recommended in the Biodiversity Action Plan.	Ministry of Environment	Priority 2 (3-5 years)
Review provincial policy on exotics (vs. invasive exotics). Develop provincial standards that define acceptable practices when considering non-native tree species for afforestation and reforestation.	Ministry of Environment	Priority 2 (3-5 years)
Participate in climate change monitoring and report activities and results to the Nisbet Advisory Committee.	Ministry of Environment	Priority 2 (3-5 years)
Map all sites known to contain introduced exotic tree species and monitor them over time to determine if there are any impacts on the local forest ecosystem.	Ministry of Environment	Priority 2 (3-5 years)

2.2.4 WILD SPECIES AT RISK

The protection and restoration of wild species at risk (SAR) is the shared responsibility of the federal and provincial governments.

Federally, the Species at Risk Act (SARA) lists:

- **extirpated species** (a wildlife species that no longer exists in the wild in Canada, but exists elsewhere),
- **endangered species** (a wildlife species that is facing imminent extirpation or extinction),
- **threatened species** (a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction), and
- **species of special concern** (a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats) (http://www.speciesatrisk.gc.ca/).

Provincially, The Wildlife Act defines species at risk as any native wild species that have been designated and listed by the Lieutenant Governor in Council pursuant to subsection 49(1) as extirpated, endangered, threatened or vulnerable. That act makes provision for identifying **designated species** under The Wild Species at Risk Regulations. Designated species are listed as one of the following:

- **extirpated** (any native wild species that no longer exists in the wild in Saskatchewan, but exists in the wild outside of Saskatchewan);
- **endangered** (any native wild species that is threatened with imminent extirpation or extinction);
- **threatened** (any native wild species that is likely to become endangered if the factors leading to its endangerment are not reversed), or
- **vulnerable** (any native wild species that is of special concern because of low or declining numbers due to human activities or natural events but that is not endangered or threatened). The Wildlife Act further provides for recovery plans and activity restrictions for designated species.

Currently, there are no confirmed occurrences of designated species within the Nisbet Plan Area.

The Saskatchewan Conservation Data Centre (CDC) maintains a list of species at risk in Saskatchewan. Some species may be rare in the province, yet not at risk of extirpation[11].

The CDC identifies species as S1 (extremely rare), S2 (rare), S3 (rare-uncommon), S4 (common) or S5 (very common), and maintains records of confirmed sightings. Changes are made to their list and mapping from time to time, and one should refer to the CDC for current information. The CDC also identifies activity restriction guidelines for sensitive

[11] http://www.biodiversity.sk.ca/Docs/ranking.pdf

species in natural habitats. General locations of S1, S2 and S3 species in the Nisbet Forest at the time this plan is drafted are shown on Figure 2-3. For the Nisbet Forest, vulnerable species are generally either grassland or wetland species.

ISSUES:

1. The Nisbet Forest land base contains patches of rough fescue prairie, which are small remnants of prairie ecosystems. The rough fescue prairie ecosystems are identified as being at risk in Canada by the federal government. These ecosystems in the Nisbet are largely unaltered and are a valuable biodiversity resource. Although these ecosystems are not identified by legislation as needing protection, they do warrant careful management consideration.

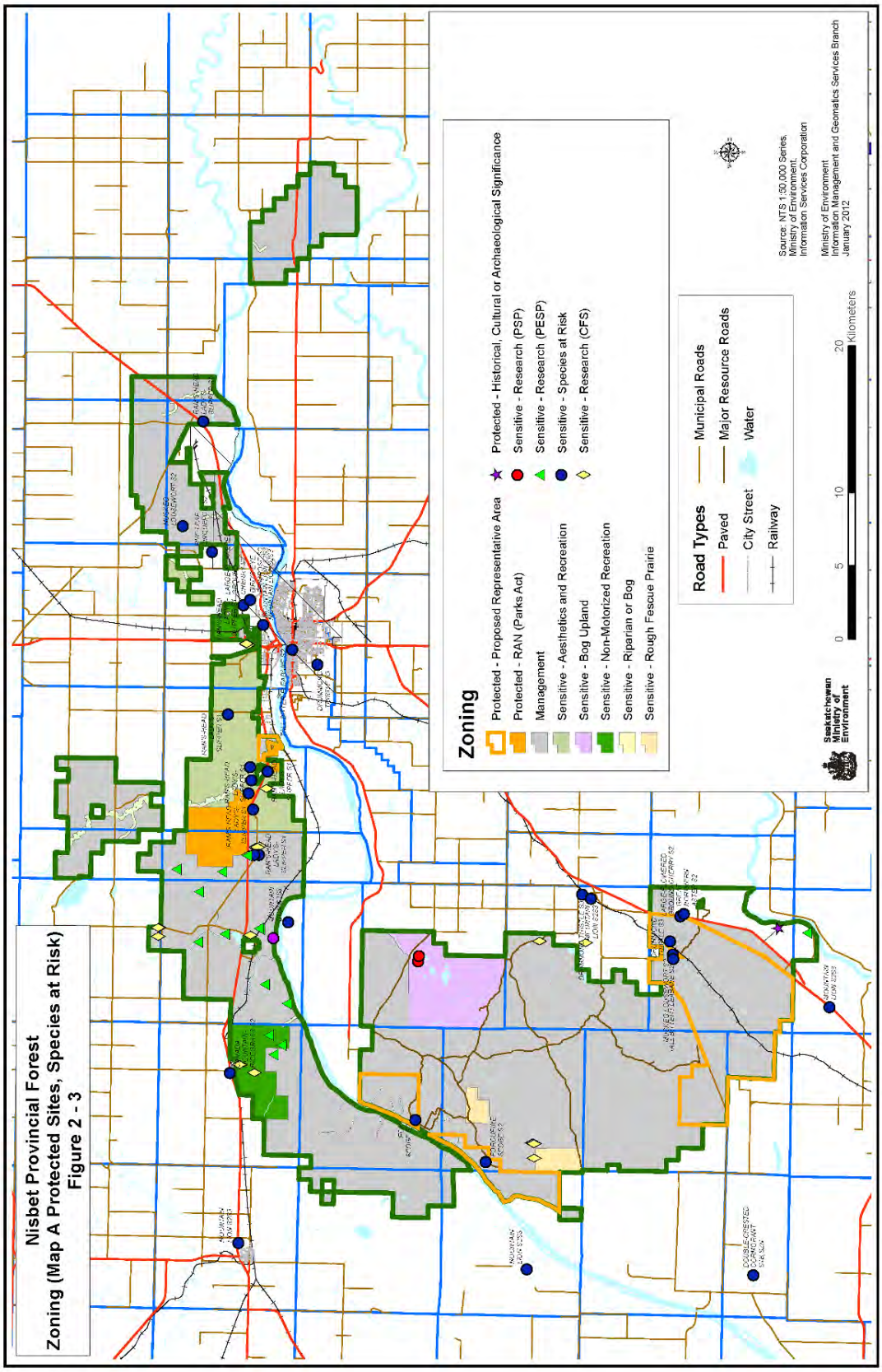
MANAGEMENT OBJECTIVES:

See Biodiversity Management Objectives.

MANAGEMENT POLICY:

1. Refer to the Conservation Data Centre for current information on locations of species at risk.
2. As a guide to assist in planning developments proposed for areas having species listed with the CDC as S1, S2, or S3, refer to the *Saskatchewan Activity Restriction Guidelines for Sensitive species in Natural Habitats*, found on the Saskatchewan Conservation Data website: http://www.biodiversity.sk.ca/ftp.htm
3. Where possible, work with local nature groups and education facilities to help in the identification of species at risk to the CDC.
4. For rough fescue prairie ecosystems:
    - Protect from conversion to other ecosystems.
    - Do not renew the fescue prairie ecosystem with trees. This includes parts of the Crutwell Burn where rough fescue prairie ecosystems may be present, but have not yet been confirmed.
    - Maintain prairie openings.
    - Protect sites from overgrazing by prohibiting cattle watering facilities (dugouts, portable water reservoirs).

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Determine the extent /locations of fescue prairie ecosystems in the Nisbet, map them and arrange for a field survey of the fescue grassland areas to document the flora. Recommend mid-June and mid August to catch early and late flowering species.	Ministry of Environment	Priority 2 (3-5 years)
Investigate the possibility of utilizing information collected through the FEC program as a basis to predict Nisbet ecosystems likely to have SAR present.	Ministry of Environment	Priority 2 (3-5 years)


Nisbet Provincial Forest
Zoning (Map A Protected Sites, Species at Risk)
Figure 2 - 3
Zoning
Protected - Historical, Cultural or Archaeological Significance
Protected - Proposed Representative Area
Sensitive - Research (PSP)
Protected - RAN (Parks Act)
Sensitive - Research (PESP)
Management
Sensitive - Species at Risk
Sensitive - Aesthetics and Recreation
Sensitive - Research (CFS)
Sensitive - Bog Upland
Sensitive - Non-Motorized Recreation
Sensitive - Riparian or Bog
Sensitive - Rough Fescue Prairie
Road Types
Municipal Roads
Paved
Major Resource Roads
City Street
Water
Railway
0
5
10
20
Kilometers
Saskatchewan Ministry of Environment
Source: NTS 1:50,000 Series, Ministry of Environment, Information Services Corporation
Ministry of Environment
Information Management and Geomatics Services Branch
January 2012

2.2.5 WATER RESOURCES: WETLANDS, RIVERS, LAKES, STREAMS AND GROUNDWATER

Wetlands serve many important functions: serving as a source of water, food and shelter for wild species, improving water quality and limiting flooding and soil erosion. If not carried out properly, activities requiring landscape modification (such as road construction, culverts, or drainage) can impede surface and sub-surface flow, and negatively affect wetlands function and productivity.

Mineral wetlands include swamps, marshes and shallow open water; organic wetlands include fens and bogs. Wetlands in the Boreal Transition Ecoregion are mainly connected through surface or groundwater hydrology, and maintaining their connectivity is critical if they are to maintain function and productivity[12].

Protecting the integrity of water resources is critical for overall ecosystem health, and for the health of the people of the planning area. In the Nisbet Forest, there is limited information about watershed flow and location.

SWA reviews and is responsible for issuing approval for water diversion projects within Saskatchewan. Beyond the boundaries of the Nisbet, the following projects can influence water levels on rivers or lakes in the Nisbet:

- Big Horn Dam and Brazeau Reservoir are located in Alberta (SWA has no associated regulatory responsibilities)
- A private drainage project (land control agreement) drains water from Ellis Lake into SW 10-49-2 then through natural runs to the North Saskatchewan River. The project received approval under the Water Corporation Act 1984.
- Yankee Drain: is an old government drainage project first constructed in 1908. The project was permitted under the Drainage Control Act to the RM of Buckland in 1983 and underwent significant repair work. This land control agreement drains a rural residential area to a series of natural runs into the Nisbet to Cobeaux Lake (locally known as Kristi Lake), the Little Red River and then to the North Saskatchewan River.
- Spruce River Diversion Project on Anglin Lake was reconstructed around 1960; it consists of a pump plant, short pipeline and series of ditches to maintain water levels on Emma and Christopher Lakes (upstream Spruce River / Little Red River). SWA is responsible for operating and maintaining the dam.
- Vant Creek Flood Control Project is licensed to the Vant Creek Conservation Area Authority and is intended to minimize flooding on agricultural land and maintain an area of wetland (drains into the Sturgeon River). It drains to the

[12] *Wetlands in the Boreal Plains of the Western Boreal Forest – and potential impacts of development activities*. Western Boreal Office Prairie Western Boreal Region Ducks Unlimited Canada and Western Boreal Hydrology Group, University of Alberta. 2006

Shell Brook, which in turn joins the Sturgeon River and then the North Saskatchewan River.

- Sucker Lake Complex is a Ducks Unlimited Canada project established to maintain wetlands around Sucker Lakes; it drains to the Sturgeon River and the North Saskatchewan River via Sucker Creek and the Shell Brook.

The Fish Habitat Protection Guidelines – Road Construction and Stream Crossings (revised in March 1995) was developed by Fisheries and Oceans Canada and the ministry to protect fish habitat and water quality. The guidelines identify protection areas (or buffer areas) where no development should occur. These areas, referred to as fisheries reserves, are based on the type of stream or river and the drainage basin, and vary from zero to 90 metres. Forest harvesting operations and related road construction observe these development buffers in parts of the Provincial Forest without specific Riparian Management Guidelines.

ISSUES:

1. There is little information about the types of wetlands, their hydrologic connectivity and their associated value for wildlife habitat in the Nisbet Forest.
2. Land development or use that negatively affects wetland systems can negatively affect wildlife that depends on them. Activities of particular concern to the advisory committee were cattle grazing and forest products harvesting. There are concerns that current fisheries reserves are not sufficient to protect all wetland systems, and that maintaining current buffer strips (fisheries reserves) over time can result in unnatural forest conditions.
3. Concerns over possible groundwater contamination from landfills, lagoons or environmental spills in the Nisbet were identified. Particular areas of concern were the Prince Albert Landfill, the Whispering Pines Lagoon, and other old landfills in the Nisbet.

MANAGEMENT OBJECTIVES:

See Biodiversity Management Objectives.

MANAGEMENT POLICY:

1. Maintain healthy watersheds by ensuring allowed activities do not negatively affect water quality and/or quantity.
2. Assess new developments for possible impacts to surface and sub-surface water flow.
3. For decommissioning of wells, consult with SWA for requirements to protect groundwater.
4. Lagoons and municipal landfills in the Nisbet are subject to provincial environmental protection legislation. Lagoons and landfills should be regularly monitored for possible groundwater contamination.
5. Forest products harvesting and related road construction activities will observe fisheries reserves until new Provincial Standards and Guidelines for forest products harvesting in riparian areas in Crown forests are approved.

6. Miner's Creek wetlands area has been identified as sensitive by Ducks Unlimited and the Saskatchewan Watershed Authority. This area is zoned as Sensitive in the plan.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Assess water crossings in the Nisbet to ensure they (bridges, culverts, other) meet provincial public safety and environmental standards for surface and subsurface flows.	Ministry of Environment	Priority 2 (3-5 Years) then ongoing
Review Ducks Unlimited (June 2006) report "An Assessment of Waterbird Populations & Wetland Habitats in the Nisbet" prepared for the ministry; identify important wetlands in the Nisbet and use this information in developing proposed reviews.	Ministry of Environment	Priority 1 (1-2 years)
Ensure permitted works (landfills and lagoons) are sampled as required in their permits to operate.	Ministry of Environment	Priority 2 (3-5 years)
Review the North Saskatchewan River Watershed Plan and incorporate/implement recommendations within the Nisbet IFLUP process as appropriate.	Ministry of Environment	Priority 2 (1-5 years)
Assist with development of provincial standards and guidelines for forest products harvesting in riparian areas in Crown forests.	Ministry of Environment	Priority 3 (5-8 years)
Identify specific sites that are a management concern because of current or past activities or developments in or near the Nisbet that may negatively affect water resources; develop appropriate mitigation steps and monitor them to ensure they are appropriate	Ministry of Environment	Priority 3 (5-8 years)

2.2.6 CLIMATE CHANGE

Scientific information on the local effects of climate change is incomplete. However, studies indicate the Canadian boreal forests, and especially forest fringe areas such as the Nisbet, are expected to be the first to show the effects of climate change. The scientific value of the Nisbet Forest is important both to study and document climate change effects, and to test possible mitigation practices.

The Saskatchewan Research Council produced a limited report entitled *Vulnerability to Climate Change* [13] for the Nisbet Advisory Committee in 2002. The report predicts a hotter, drier climate for the Nisbet Forest. With that, an increased stress to forest

[13] *Vulnerability to Climate Change* August 2002. Johnston, M. Saskatchewan Research Council. Publication No. 11456-1E02.

vegetation will occur. The report indicates the following could be affected by climate change:

Forest harvesting and renewal: increased tree mortality on dry sites, especially in newly established plantations; increased susceptibility to fire, forest insects and diseases.

Grazing: reduced water may be available for livestock grazing. Areas that are susceptible to sand dune activation could experience increased erosion in livestock concentration areas and on livestock trails.

Mining: increased potential for dune activation could increase the potential for erosion.

Recreation: Loss of tree cover could reduce the potential for forest-based recreation such as snowmobiling, skiing, and moose, elk and bear hunting. Areas susceptible to dune activation could experience increased erosion from motorized recreation vehicles.

Conservation and biodiversity: Some species may benefit from milder winters and others may not. A shift from species preferring dense forest to those inhabiting more open forest or grasslands is likely. Species from more southerly locations could migrate into the forest area. Changes in vegetative cover will affect the value of the forest as wildlife habitat, but it is difficult to predict what the changes may be.

ISSUES:

1. Because of the predominantly sandy soils in the Nisbet and their associated low water-holding capacity, vegetation may become stressed with climate change, and it may be more difficult to regenerate forest tree stands. Both fire risk and incidence of forest insects and diseases are expected to increase. Predictions of a hotter, drier climate indicate possible negative impacts to wildlife habitat, recreation, and the local economy.
2. Biodiversity and climate change plans are not necessarily complementary. For example, current biodiversity plans promote planting only native species in the forest, and climate change adaptation plans may call for the introduction of drought resistant species not native to this forest.

MANAGEMENT OBJECTIVES:

See Biodiversity Management Objectives.

MANAGEMENT POLICY:

1. Incorporate possible climate change scenarios into insect and disease management processes.
2. Climate change predictions indicate it may become increasingly difficult to establish new forest stands. Consider local site conditions with respect to water holding capacity when planning renewal activities and selecting appropriate species to plant. As well, with predictions for climate change, it is especially important in this forest to monitor forest renewal activities for successful re-growth.
3. Any plan that calls for large-scale introduction of species that are not native to this forest to deal with climate change must be developed in consultation with the public.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Continue to look at indicators for possible changes that could be attributed to climate change in the Nisbet.	Ministry of Environment	Priority 2 (3-5 years)
Review provincial policy on exotics. Determine social acceptability of deliberately introduced tree species that are not native to this forest as a way to maintain "forest" in a changing climate (warmer, drier conditions).	Ministry of Environment	Priority 3 (5-8 years)
Identify indicators (including wetlands) in the Nisbet that would gauge the effects and rapidity of climate-change	Ministry of Environment	Priority 3 (5-8 years)
Investigate areas of the forest where dunes exposed from human activities have been reported. Develop reclamation plan if necessary	Ministry of Environment	Priority 3 (5-8 years)
If species in the study area begin to decline, possibly due to climate change, provincial policies regarding biodiversity may need to be revisited.	Ministry of Environment	Priority 3 (5-8 years)

2.2.7 FOREST RESEARCH and MONITORING

Due to its proximity to post-secondary institutions and research facilities, the Nisbet Forest provides opportunities to carry out research related to forest ecosystem processes and use. Section 16 of The Forest Resources Management Regulations requires licensing of scientific research activities that may have an impact on the functioning of the forest ecosystem.

The Forest Management Effects Monitoring Program (FMEMP)

The ministry initiated a provincial monitoring program in 1997 for forestry related activities. Results from this monitoring program will be applied to forest management decisions in the Nisbet. The FMEMP is designed to compare succession pathways in forest cutover and renewal areas to natural (wildfire) renewal areas. The program measures vegetation growth, aquatic health, change in soil characteristics and change in songbird communities.

There are 13 permanent ecological sample plots (PESPs) in the Nisbet associated with the forest effects monitoring program, and they require protection. This plan has zoning provisions for PESPs as "Sensitive- Research" sites.

Other Research or Monitoring:

The Forest Ecosystem Classification (FEC) Project provincial in scope, was initiated in 1999 to provide better information for provincial forest management decisions by identifying and quantifying vegetative site and soils information. A field manual based

on information collected through this project will describe the forest ecosystems in each of Saskatchewan's ecozones. Publication of the field manual took place in 2011. The FEC system is the new provincial standard for describing forest ecosystems.

The FEC plot system could be used for longer term monitoring to evaluate change, but there is no immediate intention to re-measure the plots. The ministry does not require special protection for FEC sites.

Permanent Sample Plots:

Two permanent sample plots (PSP) in the Nisbet Forest are part of a provincial program of research on forest stand dynamics, including tree-level establishment, growth and mortality, and stand-level yield and species successional trends. Data from PSPs is used to develop yield tables for wood supply analysis, and for stand growth models used to evaluate the implications of alternative forest management actions.

The federal **Canadian Forest Service** (CFS) has long-term monitoring plots in the Nisbet.

ISSUES:

1. Other than monitoring impacts of forest harvesting activities (FMEP), there are no known monitoring initiatives that measure long-term cumulative impacts of other allowed activities in the forest, and resource managers don't always know when forest ecosystem sustainable limits have been reached.

MANAGEMENT OBJECTIVES:

See Biodiversity Management Objectives.

MANAGEMENT POLICY:

1. Forest monitoring activities of forest operations should be used to improve practices and ensure sustainable and healthy forest ecosystems.
2. Monitor human impacts on the health and functioning of Nisbet Forest ecosystems as appropriate.
3. Enforce licensing requirements for scientific research projects.
4. If activities requiring tree removal are planned within 50 metres of a known PSP, the proponent should discuss the proposal with the ministry's Forest Service staff before commencing work.
5. Researchers wanting to establish research projects in the Nisbet that may not be subject to license requirements are encouraged to consult with the Forest Service.
6. Encourage forest ecosystems research projects with educational institutions, non-government organizations, or others.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Maintain a map and tracking system to record licensed scientific research projects (location, purpose, protection level required) in the Nisbet.	Ministry of Environment	Priority 2 (3-5 years)

2.3 FOREST MANAGEMENT

Forest management includes the planning and administration of forested landscapes to achieve goals related to environmental, social, cultural or economic values – such as sustainable harvest and renewal, forest health, fish and wildlife, biodiversity, conservation, parks, wilderness, recreation, culture or aesthetics. Forest management includes a subset of activities known as forest operations, which involves planning, harvest, use, renewal and monitoring of forest resources.

Forest products harvesting is a forest management tool used to achieve a balance of certain objectives (environmental, social or economic) associated with forest use.

As there is no long-term Forest Management Agreement and associated forest management plan in place for the Nisbet, the ministry is responsible for long-term management of the forest. Since 2002, operating plans and renewal activities in the Nisbet, have been coordinated through the Island Forests Management Agreement.

FOREST MANAGEMENT OBJECTIVES:

1. Forest management activities will contribute to environmental, social and economic sustainability.
2. Forest management activities will contribute to healthy and sustainable future forest ecosystems. Maintain forest species diversity, habitat diversity and integrity.
3. Manage for multiple uses, while considering both present and future needs.
4. Reduce the fire hazard risk from dwarf mistletoe in forest stands; limit spread of dwarf mistletoe into existing stands; and minimize forest product loss from insects and diseases.

2.3.1 FOREST HARVESTING

"Timber districts" and "forest reserves" were created under federal legislation in 1872, and commercial forest harvesting has been allowed in the Nisbet since then. The earliest known commercial lumber mill near the plan area was erected in Prince Albert in 1878, using timber from this forest and more northerly forests. Ownership and control of forest resources were transferred to Saskatchewan in 1930. Today, independent forest harvesters carry out forest products harvesting in the Nisbet Forest.

Forest harvesting in the Nisbet has historically been done in small, dispersed blocks. This method of harvesting has made renewal difficult and expensive. Small patch cuts do not emulate large fire disturbances associated with the boreal forest.

One of the dominant tree species in the Nisbet Forest is jack pine, and many of the jack pine stands in this forest have high levels of dwarf mistletoe. Stands that are highly infected with dwarf mistletoe have low commercial value, since the disease negatively affects wood quality and volume.

The First Nations Island Forest Management Inc., representing the interests of seven local First Nations (Ahtahkakoop Cree Nation, Wahpeton Dakota Nation, Sturgeon Lake First Nation, Beardy's and Okemasis Willow Cree First Nation, One Arrow First Nation, Muskoday First Nation and James Smith Cree Nation), have established a long-term forest management license for the Island Forests, including the Nisbet Forest.

Additionally there are a number of small independent forest harvesters that currently have volume agreements in place.

The harvest volume schedule (HVS) is outlined in the following Inventory and Harvest Volumes for the Nisbet section of this plan. HVS information from this plan did not require a reduction in the overall volume available to the First Nations Island Forest Management Inc. TSL, and the existing independent forest harvesters.

Improved coordination of harvesting and renewal activities began in 2002, when the Island Forest Trust Fund was established. All forest management fees for the Island Forests are deposited into the fund and are used for the planning and co-ordination of forest operations in the Island Forests. The Saskatchewan Research Council plans and co-ordinates harvest and renewal activities in the Island Forests on a five-year basis. Stumpage (timber dues) is paid into provincial general revenue.

Public and "own use" harvesting:

The public is allowed to take dead or down trees as fuel wood, and Christmas trees from the forest for their own use without a permit. With home heating costs rising, it is expected there will be a steady or increasing demand on this forest for fuel wood.

A certain amount of the annual allowable harvest of green (live) trees is allocated to individual ("own use") harvesters. Currently this allocation is: 8 operators each granted a permit for 43m^3 of white spruce and 30 operators, each granted a permit for 2.4m^3 of white birch.

ISSUES:

1. The public is concerned with not sufficiently regenerated forest lands (NSR), insect and disease management, fire management, harvest locations, cut block size, possible over-harvest of white spruce and white birch, possible conversion of mixedwood stands to single species stands, and the overall volume of forest products that are harvested from this relatively small forest land base.
2. Some of the public has expressed concerns that they believe healthy forest stands are being harvested before the uneconomic dwarf mistletoe stands.
3. Though forest operations have occurred in some of the grazing areas, there are concerns over the effect of cattle access to the sites, and subsequent difficulty with successfully renewing stands.
4. Demand for "own use" white spruce and white birch exceeds the set annual limits. The areas of the forest with good road access receive the most pressure from public and "own use" forest products harvesters.
5. This forest, being close to densely populated areas, is where many people go to cut a Christmas tree, or to collect firewood. Clear direction to the public where they can harvest Christmas trees and dead or down trees for firewood is not always readily available. Both of these activities are a concern in protected or sensitive zones. Christmas tree cutting is a concern in areas where tree planting has been done following harvest or fire. Individuals cutting dead and down trees for fuel wood create problems when new trails are cleared and/or larger areas of the forest become cleared over time without having access management or renewal plans in place.

MANAGEMENT OBJECTIVES:

See Forest Management Objectives.

MANAGEMENT POLICY:

1. Coordinate forest operations with, disease management, fuel reduction, access management, grazing management and plan zoning requirements.
2. Forest operations in grazing permit areas should include consultation with the grazing permit holder to ensure appropriate protective measures are in place for forest renewal.
3. Plan zoning establishes areas that are managed for protected or sensitive values. Any forest operations proposed for these areas will be planned to enhance the management value identified in that zone, within the overall goal of developing a healthier forest ecosystem. For those reasons wood harvesting will primarily take place within the management zone.
4. Forest operations planning should include identifying areas suitable for "own use green" harvesting, and sites suitable for public gathering of firewood (e.g. high use, high diseased areas requiring renewal).
5. Once established, allow white birch (firewood) harvesting in designated areas only.
6. Standards in the provincial manuals apply to forest operations on all Nisbet Forest lands. For standards and guidelines not yet approved, license holders must follow conditions set within their licence or permit.
7. When forest operations are carried out, ensure they minimize site and soil disturbance, compaction, and wind or water erosion.
8. Generally harvested areas should be renewed to the pre-harvest stand type. The target for forest management planning should be to maintain forest cover types and stand mix over time and space.
9. Timing of forest operations is important to reduce negative impacts on sensitive wildlife, including nesting birds. Refer to Saskatchewan Activity Restrictions Guidelines for Sensitive Species in Natural Habitats (September, 2003) for guidance (http://www.biodiversity.sk.ca/ftp.htm).

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Provide an annual report on forest management activities that summarizes forest harvesting and renewal activities in the Nisbet.	Ministry of Environment	Priority 1 (1-2 years)
Until a forest management plan can be developed, prepare a five-year operating plan for proposed forest operations, indicating priority areas. The plan must be coordinated with fuel management insect and disease management objectives, and access development and reclamation targets.	Ministry of Environment	Priority 1 (1-2 years)

Determine the extent of forest stands not considered to be economically viable for forest products harvesting due to the presence of dwarf mistletoe. Identify actions required to achieve a healthy and sustainable forest ecosystem, and seek funding to carry it out.	Ministry of Environment	Priority 2 (3-5 years)
Determine the extent of any problems associated with forest operations (renewal) in areas where cattle are allowed to graze. Develop and monitor "test sites" to compare similar activities within and outside of areas subject to cattle grazing.	Ministry of Environment	Priority 2 (3-5 years)
Once developed, evaluate the provincial standards and guidelines for forest operations in riparian areas for appropriateness/suitability in the Nisbet Forest. Use these to develop appropriate policies for riparian harvesting in the Nisbet Forest, given its relatively small size and multiple values. Involve the PAC in the development.	Ministry of Environment	Priority 1 (1-2 years)
Evaluate the (draft) provincial Natural Forest Patterns (NFP) standards and guidelines to adopt specific standards for the Nisbet Forest and determine if NFP retention requirements for forest operations meet wildlife habitat needs.	Ministry of Environment	Priority 1 (1-2 years)
Identify and map preferred areas of the forest for harvesting fuel wood and Christmas trees. Create and keep current maps for distribution to the public. Encourage the public to use these areas.	Ministry of Environment	Priority 1 (1-2 years)
Designate areas for "own use" white birch and white spruce harvesting.	Ministry of Environment	Priority 1 (1-2 years)

2.3.2 FOREST INVENTORY AND HARVEST VOLUME

Forest inventory and calculations for allowable harvest volumes for industrial harvesting is normally a requirement of a forest management plan, required of a forest management agreement (FMA) holder. Since there is no FMA for the Nisbet Forest, the ministry is responsible for both.

The methodology used to calculate the HVS for the Nisbet Forest is located in Appendix 3, "Sustainable Harvest Levels in the Nisbet Island Forest". As this report was compiled prior to the finalization of the Zoning for the IFLUP, the numbers shown in the report are not current, but the report does correctly show how the HVS was calculated. All zoning effects, including recognition of the impacts of the RAN selections, have been included in the calculations.

ISSUES:

1. Forest inventory for the Nisbet was not updated on a regular basis. . The inventory used for calculations in this plan did not reflect forest growth from 1991 to present (2009), and it was not completely interpreted to Saskatchewan Forest Vegetation Inventory (SFVI)

quality standards. As a result, forest managers have expressed concerns over the quality of the information required to make appropriate decisions. (At the time of plan completion, a new SFVI standard inventory using 2004 photography was complete but was not available for use.)

MANAGEMENT OBJECTIVES:

See Forest Management Objectives.

MANAGEMENT POLICY:

1. The ministry will comply with provincial standards and guidelines for forest inventory and periodic recalculations of HVS.
2. Allocations for forest harvesting activities in the Nisbet Forest will not exceed sustainable limits.
3. Recalculations of harvest volumes are normally done once every 10 years. If there are significant reasons for doing so (such as a fire), a recalculation may be conducted at the five-year review.
4. HVS calculations will identify allowable harvest volumes for softwood and hardwood. The portion of the annual allowable harvest reserved for "own use green" harvesting of white spruce and white birch will be reviewed when the HVS for the Nisbet is set.
5. An allowable harvest of forest products will be identified in any forest management plan for the Nisbet. In the absence of a forest management plan, the allowable harvest or harvest volume schedule (HVS) is as follows (note: a new SFVI is underway, with an updated HVS recalculation scheduled to follow):

Softwood – total allowed volume per year: 13,857 m^3	Hardwood – total allowed volume per year: 31,480 m^3
9,180 m^3 jack pine	29,721 m^3 aspen
1,456 m^3 white spruce	55 m^3 white birch
3,221 m^3 other softwoods	1,704 m^3 other hardwoods

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Develop a schedule for inventory updates.	Ministry of Environment	Priority 1 (1-2 years)
Once the HVS can be recalculated using a new SFVI, the new HVS is to be shared with the PAC and implemented.	Ministry of Environment	Priority 2 (3-5 years)
Develop a sample plot program in the Island Forests to provide greater accuracy in future inventory work.	Ministry of Environment	Priority 1 (1-2 years)

2.3.3 FOREST RENEWAL

Prompt reforestation is imperative to produce a sustained flow of forest products and to maintain forest ecosystem health[14]. Due to concerns over NSR in the province and in the island forests, the ministry implemented two key objectives. The first was to include renewal standards in the Provincial Manuals - *Regeneration Assessment, March 2004*. The second was to address funding for forest planning and renewal in the Island Forests. The Island Forests Trust Fund was established in the spring, 2002, and all forest management fees paid for forest operations in these forests are deposited directly into the fund, which was initially managed by the Saskatchewan Forest Centre and is now managed by the Saskatchewan Research Council (SRC). The SRC uses this money to pay for operating plan development and renewal activities.

Establishing the trust fund has resulted in more timely renewal of harvest areas in the Island Forests. In the Nisbet Forest, 2128 hectares were harvested, and 2119 hectares were renewed (either planted or drag scarified) during the period 2002-2005. Renewal of harvest areas prior to 2002, including NSR areas, remains the responsibility of the ministry. Renewal efforts in the Nisbet are focused on renewing harvested areas, including fire salvage logged areas. Burn-over areas that are not logged for salvage are left to naturally renew. *The Regeneration Survey Manual for the Island Forests,* August 17, 2004 was developed to ensure adequate stocking, survival and growth rates are to a level that emulates natural yields.

The ministry funded a survey to determine the extent of the NSR lands in the Island Forests. The resulting report, titled *Saskatchewan Island Forests Regeneration Survey Program 2005* indicates that of 7,958 ha harvested prior to March 31, 2003, 5,990 ha (75.3%) were found to be sufficiently regenerated. A total of 1,968 ha (24.7%) were found to be NSR[15].

The extent of NSR lands resulting from fire in the Nisbet is not fully known. Since 1989, three fires burned 26,308 ha[16] of land (1989 – 17,026 ha, 1998 – 1 ha, and 2002 – 9,281 ha). The burned over areas in the Nisbet Forest were predominantly jack pine stands, many infected with dwarf mistletoe and some subject to successive wildfire burns and/or intense fires. In these situations, renewal may not be to natural densities. The Timberline *Saskatchewan Island Forests Regeneration Survey Program 2005* surveyed a portion of old fires that had no harvest history. Of the 6,124 ha of open productive (no harvesting

[14] Regeneration Assessment. March 2004. Saskatchewan Environment, Forest Service. p.1.

[15] *Saskatchewan Island Forests Regeneration Survey Program 2005* prepared for Saskatchewan Environment Forest Service. Timberline Forest Inventory Consultants Ltd. January 2006. p. 28. Note: these numbers include 476 ha of land recently treated for renewal. They were included in overall NSR figures because they have not yet grown to meet "sufficiently regenerated" standards.

[16] Area reported is total area of fires burned. It includes both inside and outside of the Nisbet Provincial Forest.

or silviculture) lands surveyed, 5116 ha (84%) were found to be sufficiently regenerated[17]. A total of 999 ha (16%) of old fire areas were found to be NSR[18].

Nisbet Forest soils are generally sandy, and often have a shallow duff layer. The method selected to establish a new forest can have a lasting impact on stand development[19]. Concerns have been raised by the public over past Ministry of Environment choices for silviculture treatments, particularly aggressive site preparation treatments in sandy soil types, associated moisture loss and failed plantations. Since 2002, these impacts have been minimized.

ISSUES:

1. Concerns that insufficient attention has been paid to renewing NSR land resulting in negative impacts to forest ecosystem health and decreased harvest levels.
2. Silviculture practice has been to leave burn-over areas to renew naturally. There can be problems associated with this practice, as stands that were diseased with dwarf mistletoe may not have a sufficient seed stock to renew to natural densities. The extent of NSR from fire activity or other factors remain largely unknown.

MANAGEMENT OBJECTIVES:

See Forest Management Objectives.

MANAGEMENT POLICY:

1. To minimize soil exposure from silviculture activities, Forest Management Agreement (FMA) soil disturbance standards will be followed for renewal activities in the Nisbet until provincial renewal soil disturbance standards are developed.
2. Provincial manuals for forest management, and associated standards and guidelines will be followed.
3. The first of two regeneration surveys is due within four to five years after harvest.
4. Maintain natural stand distribution patterns, including mixed wood stands and target similar species and species compositions as were present prior to harvesting.
5. When considering the use of prescribed burns as a tool in forest renewal, refer to The Ministry of Environment's *Use of Prescribed Fire*[20] guideline.

[17] Saskatchewan Island Forests Regeneration Survey Program 2005 prepared for Saskatchewan Environment Forest Service by Timberline Forest Inventory Consultants Ltd. January 2006. p. 31. Note: this figure includes 9 ha of regenerating land that has not yet reached "sufficiently restocked" standards.

[18] *Saskatchewan Island Forests Regeneration Survey Program 2005* prepared for Saskatchewan Environment Forest Service by Timberline Forest Inventory Consultants Ltd. January 2006. p. 31.

[19] Regeneration Assessment. March 2004. Saskatchewan Environment, Forest Service. p.1.

[20] *Use of Prescribed Fire*. Saskatchewan Environment. Fire Management and Forest Protection Branch. Guideline #502

6. Do not permit the conversion of native grasslands (fescue) to forest. Where plantations on native grassland soils have died from drought effects, do not replant to trees.
7. Avoid site preparation and stand tending in areas used by sensitive species, where possible, during nesting and fledgling seasons – normally late May to mid-July. For guidance, refer to Saskatchewan Activity Restrictions Guidelines for Sensitive Species in Natural Habitats (September, 2003) (http://www.biodiversity.sk.ca/ftp.htm).
8. Do not use herbicides in the Nisbet Forest as a silvicultural tool unless all other options have been reviewed.
9. Incorporate silviculture objectives into any forest management plan for the Nisbet.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Develop silviculture (renewal) objectives for the Nisbet Forest the opportunity for public review of plans to renew new harvest areas and NSR areas.	Ministry of Environment	Priority 1 (1-2 years)
Develop silviculture keys that are ecologically appropriate to assist in the documentation of appropriate site treatments and renewal options	Ministry of Environment	Priority 2 (3-5 years)

2.3.4 FOREST INSECT AND DISEASE MANAGEMENT

Nature provides for a diversity of insects and diseases in a healthy forest ecosystem, and under natural conditions, populations of insects and diseases are kept in check by density dependent factors like competition, parasites and predators and by density independent factors like extremes in temperature and stand-replacing fires.

Dwarf mistletoe is a parasitic plant that infects jack pine. It is native to the Nisbet Forest and boreal forests in western Canada. Trees severely infected with dwarf mistletoe produce fewer seeds, become stressed, and eventually die.

The most significant factor regulating the distribution and severity of dwarf mistletoe in the southern part of its range has been fire. However, because residences and properties are so close to the forest, and because of the economic benefits associated with forest products, fires have been fought aggressively for decades. Much of the forest is now beyond the age where it would have normally burned, and this older forest provides favorable conditions for insects and diseases – most notably dwarf mistletoe.

The ministry has developed dwarf mistletoe management standards and guidelines as part of the Provincial Manuals, aimed at ensuring the efficient and effective management of dwarf mistletoe in the province. The intent of the standards and guidelines is to provide a framework for managing the extent and severity of dwarf mistletoe.

Most of the other species of insects and disease found in the Nisbet Forest are not currently considered to be a significant threat, and they are valuable and essential components of a healthy forest ecosystem.

Responsibility for monitoring for insects and diseases in renewing stands in the Nisbet lies with the ministry.

ISSUES:

1. Areas of dwarf mistletoe in the forest can increase the risk of wildfire, decrease the commercial value, reduce available seed, increase susceptibility to insects and diseases and negatively affect aesthetic and recreation values.
2. Many of the jack pine stands in the Nisbet Forest are infected with dwarf mistletoe. The extent of the problem and the actions required to bring it within natural levels in this forest have not been identified.

MANAGEMENT OBJECTIVES:

See Forest Management Objectives.

MANAGEMENT POLICY:

1. Implement the provincial Dwarf Mistletoe Management Standards and Guidelines.
2. Coordinate dwarf mistletoe management, fuel management and forest operations. The following guidelines should be followed where appropriate.
    - In areas of advanced regeneration (after commercial harvest), all host species regeneration greater than 1 meter tall must be removed or killed.
    - Buffers to prevent spread of adjacent dwarf mistletoe stands should be monitored to ensure no re-occurrence of dwarf mistletoe. Natural buffers should be used when planning cut block layout and design.
3. Plan management actions to address dwarf mistletoe or other forest insects or diseases to achieve overall forest ecosystem health, to prevent the spread into future stands, and to recognize multiple forest values/ plan zoning. The sensitive values associated with protected or sensitive zones will be considered when planning required insect and disease management activities within them.
4. Land users and disposition holders should be consulted when planning for dwarf mistletoe or other forest insects or disease management. Ensure long term lease areas are included in overall area planning and treatment.
5. When planning forest harvest locations, identify dwarf mistletoe infected areas where the public can be directed to collect firewood.
6. The ministry should continue to monitor for forest pests and diseases either within existing operational surveillance programs, and develop or evaluate additional means as appropriate.
7. Forest users (recreation, lessees, and other forest users) are encouraged to report incidences of pests.
8. Pesticides or herbicides should be used as a management tool of last resort, after all other options have been considered.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Implement the Provincial Dwarf Mistletoe Standards and Guidelines to develop Dwarf	Ministry of Environment	Priority 1 (1-2 years)

Mistletoe Rehabilitation objectives for the Nisbet Forest.		
Some residual "islands" of standing live jack pine remain after the 1989 North Cabin Fire and the Crutwell Burn. Assess the "islands" for dwarf mistletoe occurrence, and the appropriate action undertaken to address the spread of dwarf mistletoe in regenerating stands.	Ministry of Environment	Priority 2(3-5 years)
Where there are recent renewal stands (2002 and later) adjacent to dwarf mistletoe where risk of infection is high, and where buffers are not present: 1) assess for presence of dwarf mistletoe and 2) establish buffers to protect regenerating stands.	Ministry of Environment	Priority 1 (1-2 years)
Assess renewing stands (2001 and earlier) for presence of dwarf mistletoe, and where necessary, treat for dwarf mistletoe control (see provincial *Dwarf Mistletoe Management Standards and Guidelines*).	Ministry of Environment	Priority 1 (1-2 years)

2.3.5 NON-TIMBER FOREST PRODUCTS

"Non-timber forest products" (NTFP) is a term that describes a wide assortment of forest products and plants found in the forest ecosystem. Local people value the NTFP of the Nisbet for food and medicinal use, and many forest products can be harvested commercially.

The ministry is in the process of developing a public and commercial harvester's educational package regarding appropriate harvesting methods, products specifications and the regulatory/planning requirements associated with NTFP harvesting.

ISSUES:

1. Impacts of commercially harvesting non-timber forest products are not well understood. In particular, the ecology and reproductive capabilities of individual species, and their associated symbiotic relationships with other plants in the forest ecosystem not fully understood.
2. As there is no formal NTFP inventory it is difficult to determine how much harvesting may be sustainable.
3. NTFP harvesting may be negatively affected by other forest activities when they are not documented or mapped (e.g. birch tapping in areas approved for birch harvest).

MANAGEMENT OBJECTIVES:

See Forest Management Objectives.

MANAGEMENT POLICY:

1. Ensure harvesting methods and sites, consultation with other users and timing of harvest are to be described in any required documentation submitted to the ministry to address potential negative impacts related to the activity.
2. Pickers should be listed with the buyer. If the pickers contact the buyer prior to harvesting, the pickers could be informed of the product requirements and harvesting conditions and methods.
3. Encourage research proposals that would result in a better understanding of:
    - the effects of harvesting non-timber forest products in Saskatchewan,
    - the ecological impacts of commercially harvesting the different NTFP,
    - using an existing inventory system to identify potential sites for different species of NTFP, and
    - the requirements for sustainable harvesting of different NTFP species.
4. Commercial harvesters are encouraged to work with Saskatchewan Research Council to identify the effects of harvesting. Partnerships between commercial harvesters and other research and development agencies are also encouraged.
5. Where possible, coordinate forest operations and mushroom harvesting activities taking into account the location and timing of harvest and the value of the respective products.
6. Where possible, avoid sensitive nesting and fledgling periods (late May to mid July) when issuing permits for products that may be used for nesting (e.g., birch sleeves, others).

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Establish a provincial record tracking mechanism that identifies land location for commercial non-timber forest products harvesting.	Ministry of Environment	Priority 2 (3-5 years)
Develop standard operating procedures for inspections of non-timber forest products purchasing and harvesting sites.	Ministry of Environment	Priority 2 (3-5 years)

2.3.6 GRAZING

Livestock grazing is an accepted use in the provincial forest, authorized under The Forest Resources Management Act (FRMA), and can be done by permit or term supply license. Grazing of cattle has occurred in the Nisbet Forest since before the transfer of resources to the Province in 1930. Allowing cattle grazing in the provincial forest is intended to complement the livestock producer's own grazing land, and the producer must demonstrate that private, federal and other provincial resources cannot be accessed.

As of the drafting of the plan, there were 44 cattle grazing permits issued in the Nisbet for about 40% of the Nisbet Forest land base (see Figure 2-4). The Forest Resources Management Regulations provides for a grazing season from May 24th to October 15th of each year, unless the Minister specifies a shorter period.

ISSUES:

1. Some forest users view grazing of livestock in the forest as beneficial, believing the activity can limit finer fuels (grasses, and shrub species), and can be used to emulate natural wildlife grazing activities (historic buffalo grazing). However, over-grazing can negatively affect local ecosystem functioning, and is especially a concern in wetland or riparian areas.
2. Fencing for grazing activities in the forest can negatively affect wildlife and other forest values such as ecotourism and recreation. Fences can restrict movement of people and wildlife, can be a safety concern for recreation, and can take away from the wilderness experience associated with ecotourism activities. Other issues related to fencing are lack of maintenance, fencing that does not reflect permit areas, fencing standards (attaching fence wire to live trees), and abandoned fences.
3. Grazing activities have a potential to bring invasive and exotic plant species into the forest.
4. Periods of drought and other external conditions have led to increased requests for grazing in the Nisbet Forest at times.
5. Limited resources have been available to regulate livestock grazing in the provincial forest. As of summer 2009, some of the grazing permit areas were being assessed for carrying capacity and range health. Plans are to continue assessing grazing permit areas in 2010.

MANAGEMENT OBJECTIVES:

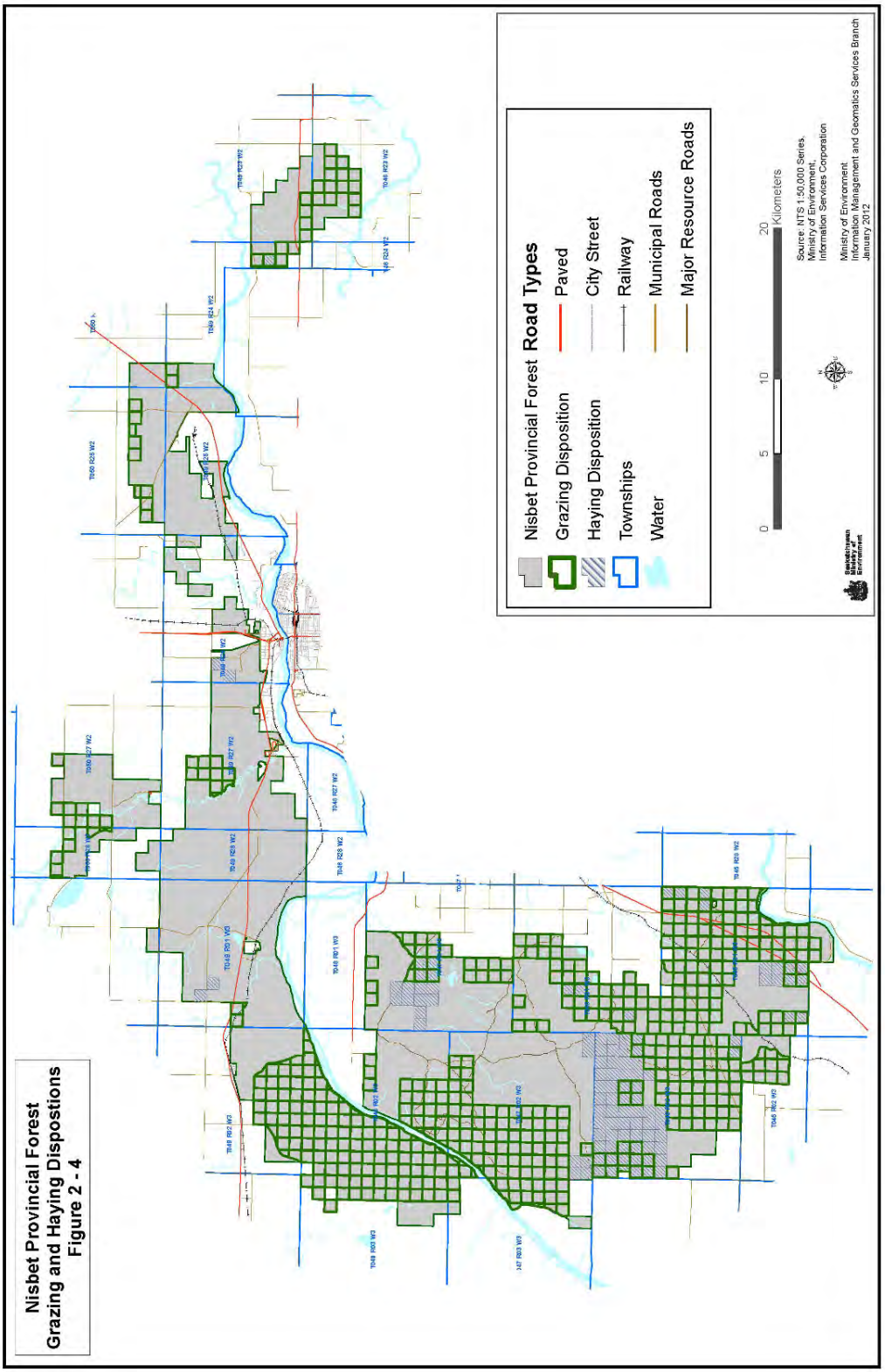
See Forest Management Objectives.

MANAGEMENT POLICY:

1. A carrying capacity assessment must be done for every new grazing license application.
2. For every forest area where cattle are allowed to graze, a range management plan will be required.
3. Adjust stocking rates and range management plans (especially during drought conditions) in order to maintain ecosystem health.
4. Range management plans associated with grazing permits will be reviewed periodically to ensure they meet provincial requirements and forest conditions.
5. In recent harvest and burn-over areas, range management plans and licences to graze livestock must be reviewed to assess the appropriateness of continued grazing.
6. For fescue grassland areas carrying capacity assessment and range management plans must ensure that grazing activities will not have a negative effect on the fescue. An ecologist should be involved in the approval and review of range management plans.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Ensure that range management plans are developed for each grazing permit area.	Ministry of Environment	Priority 2 (3-5 years)

Determine the extent and location of abandoned fencing in the planning area, and remove it as possible.	Ministry of Environment	Priority 2 (3-5 years)
Complete carrying capacity assessments for all remaining grazing permit areas. Priority inspection areas are fescue grassland areas, wetlands and riparian areas. Springs along the North Saskatchewan River and Miner's Creek Bog are riparian or wetland areas of particular concern.	Ministry of Environment	Priority 2 (3-5 years)
Develop a Best Management Practice for grazing in the Nisbet, or review and adopt a Provincial BMP for grazing in the Nisbet.	Ministry of Environment	Priority 2 (3-5 years)


Nisbet Provincial Forest
Grazing and Haying Dispostions
Figure 2 - 4
Nisbet Provincial Forest
Grazing Disposition
Haying Disposition
Townships
Water
Road Types
Paved
City Street
Railway
Municipal Roads
Major Resource Roads
0
5
10
20
Kilometers
Source: NTS 1:50,000 Series.
Ministry of Environment.
Information Services Corporation
Ministry of Environment
Information Management and Geomatics Services Branch
January 2012

2.3.7 HAYING

Haying is a licensed activity in the Provincial Forest, authorized by annual permit under The Forest Resources Management Act and The Forest Resources Regulations. As of the drafting of the plan, there were 17 active annual haying permit holders in the Nisbet Forest. The activity is intended to complement the producer's own haying land, and other lands to which they have access.

ISSUES:

1. Drought conditions can lead to increased requests for haying in the provincial forest.
2. Areas desired for haying activities are often nesting sites used by waterfowl and grassland songbirds. If haying activities are carried out too early, both nests and birds can be destroyed by the haying activity. The Forest Resources Management Regulations allow haying activities to start as early as July 1 of the year. Ducks Unlimited recommends hay cutting activities should be delayed until at least 80% of the nesting waterfowl hens have fledged their nests[21]. Survey information specific to the Nisbet has not been carried out, but Ducks Unlimited Canada (DUC) has carried out nesting chronology in a study area near the planning area in the Boreal Transition Ecoregion.

MANAGEMENT OBJECTIVES:

See Forest Management Objectives.

MANAGEMENT POLICY:

1. Applications to cut hay in the Nisbet Forest may be considered if they do not negatively affect local ecosystem health and biodiversity. Secondary considerations will be the potential effects on other social or economic forest values.
2. Each haying licensee must obtain ministry approval of an operating plan for the permit area prior to carrying out haying activities.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Confirm areas of the forest subject to haying activities and map them; require operating plan for hay permit areas.	Ministry of Environment	Priority 1 (1-2 years)
Establish a monitoring protocol for haying activities.	Ministry of Environment	Priority 2 (3-5 years)
Review and establish appropriate start date for haying activities in the Nisbet Forest.	Ministry of Environment	Priority 2 (3-5 years)

[21] Kornder, Mark. Ducks Unlimited Canada. Personal communication. November 2006.

2.4 WILDFIRE MANAGEMENT

The ministry addresses wildfire risk through fuel management (fuel breaks, thinning), fire suppression activities, fire preparedness programs (consultation with rural municipalities, First Nations, and property owners), and public education programs.

The ministry's plan for wildfire calls for minimizing risk and adverse impacts of wildfires on people, property and resources, and is to be carried out so that species habitat are protected and biodiversity and ecosystems are sustained. This is more difficult in the small Nisbet Forest, which:

- Is a multi-use forest, valued for recreation and aesthetics,
- Has a great deal of adjacent human development on privately owned forested areas,
- Has experienced decades of wildfire suppression activities, and
- Is dominated by jack pine, with much of that species aging and infected with dwarf mistletoe - resulting in some areas having high accumulations of volatile fuel.

Climate change predictions indicate hotter, drier forest conditions and increased incidences of insects and disease, further exacerbating the potential losses from wildfire.

The ministry promotes the use of *FireSmart: Protecting Your Community From Wildfire*, an interactive manual that provides individuals and municipalities with information to plan and mitigate the risk of fire in interface areas. It is available through http://www.partnersinprotection.ab.ca/downloads/.

ISSUES:

1. Wildfire in the Nisbet Provincial Forest is a concern of people who have properties near the forest.
2. The public and members of the Nisbet Advisory Committee expressed concerns over how fuel breaks sites are selected, and how they are managed.

MANAGEMENT OBJECTIVES:

1. Use a 'values at risk' approach to decision making related to fire suppression priorities. Human life and safety will receive the highest priority.
2. Minimize risk and adverse impacts of wildfires on people, property and resources.
3. Where possible, carry out wildfire management so that species habitat is protected and biodiversity and ecosystems are sustained.

MANAGEMENT POLICY:

1. An integrated approach will be used to make decisions regarding risks to economic, social, cultural and ecological values.
2. The Nisbet Forest falls within the ministry's full response fire protection zone. As such, all wildfires are actively suppressed until fully extinguished.

3. Fire may be used as a management tool in appropriate situations to achieve landscape management objectives.
4. Public consultation for fuel management plans should be carried out with municipal and Aboriginal governments, stakeholders and the public.
5. Thinning and/or understory removal is preferred for fuel breaks in sensitive zones, and where possible in other zones.
6. Provincial regeneration standards may be modified to meet this plan's objectives, such as thinner densities in fuel breaks or in sensitive recreation zones; or to convert stands from pure jack pine to mixedwood or hardwood to significantly reduce the potential fire threat.

Wildfire Suppression:

7. As much as possible, maintain ecological integrity on sites where fire fighting equipment is used.
8. For areas zoned as protected or sensitive:
   a) Recognizing that protection of life and property is priority, use the least disruptive ground fire-fighting methods available.
   b) Where possible, avoid ground equipment methods in protected zones.

Wildfire Risk / Preparedness:

9. Road closures to restrict public access and possible wildfire starts should be coordinated with other resource management objectives in the Nisbet.
10. When appropriate, develop and use co-operative fire protection initiatives with other governments and organizations to ensure that respective roles and responsibilities are clear, and that individuals, communities and rural municipalities are aware of preventative actions which can be taken to reduce wildfire risks.
11. Where possible, use existing breaks in the forest as fire guards.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Assess past fuel breaks to ensure they meet with plan objectives for forest management.	Ministry of Environment	Priority 2 (3-5 years)
As necessary, review local wildfire protection plans and/or fire emergency plans with municipalities and emergency organizations to ensure current information and maximum effectiveness.	Ministry of Environment	Priority 1 (1-2 years)
Provide advice to local jurisdictions wanting to minimize wildfire risk through subdivision design (access, densities), and local building, landscape, zoning and development bylaws.	Ministry of Environment	Ongoing

2.5 ACCESS MANAGEMENT

The Nisbet Forest must have a certain amount of access to allow for appropriate use, yet overall access must be limited to allow for ecosystem functioning, to protect sensitive areas and to decrease opportunities for both illegal garbage dumping and wildfire starts.

The Nisbet Forest is highly accessible for a variety of uses – recreation, non-timber forest products gathering, firewood gathering, commercial forest products, harvesting, and sand and gravel extraction.

Section 58 of The Forest Resources Management Act provides the ministry with authority to enforce and close roads to vehicles where the minister considers it necessary for the purposes of managing or protecting forest resources. Further, Section 61 allows the ministry to stop harvesting activities or to stop any activity where a person damages, or is likely to damage Crown resource land or forest products on Crown land.

ISSUES:

1. Once access is established in the Nisbet Forest, closing it is difficult.
2. Access routes are created for one use, then often used for many other uses. When access is not managed adequately, unrestricted public access provides opportunities for conflict over trail use; damage to regenerating and existing forest stands; and makes wildlife management or other forest management activities difficult.
3. Current legislation presents challenges as a means to control access management. Although The Forest Resources Management Act provides authority for the ministry to close roads for the purpose of managing or protecting forest resources, it is difficult to restrict road or recreation vehicle use to manage for issues related to fire risk, garbage dumping and recreation use conflict.
4. Municipalities are concerned when major developments are proposed for the Nisbet Forest, as they are responsible for road access and maintenance and may not be able to handle the additional costs.

MANAGEMENT OBJECTIVES:

1. Recognize that access into the forest is required for various uses, but manage access routes to protect sensitive areas, reduce user conflict, minimize opportunities for dumping garbage, and minimize opportunities for wildfire starts.

MANAGEMENT POLICY:

1. New access or trail openings must be associated with a specific use. Along with approval to construct access roads for new developments, the ministry will document: the owner or maintainer of the access route; timeline (life expectancy) for access; provisions for recording closure for each new road segment; plans for long term use or reclamation; provisions to ensure water flow is not hindered and aquatic ecosystems are protected; and any other resource or access concerns.
2. For certain sensitive or protected zones, use road closure provisions under The Forest Resources Management Act to minimize vehicle damage to the forest floor and vegetation, and/or to minimize recreation use conflict.
3. Use of signs to direct / restrict access must be approved by the ministry, unless they are warning signs posted by a licensee for road safety.

4. All road or trail closures (both permanent and temporary) excluding provincial highways and R.M. roads, require prior approval from the ministry and:

   a) May be carried out for sustainable resource management purposes. When closures are proposed, clearly specify what forest resource value will benefit from road closures.

   b) When closures (temporary or permanent) require the removal of culverts, consult with SWA and the federal Department of Fisheries and Oceans. An Aquatic Habitat Protection Permit from the ministry may also be required.

   c) Consult with the local municipality, First Nations, Métis and stakeholders when road closures are proposed.

   d) For permanent closure of trails / roads: Permanent closures would include reclamation of the entire road surface and right of way.

   e) For temporary closure of trails / roads: Provide signs, and identify reason for closure, and expected time frame of closure.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Develop and maintain an inventory of access roads, highways, trails, and utility routes in the Nisbet.	Ministry of Environment	Priority 2 (3-5 years)
Develop an access management plan for the Nisbet Forest. Identify areas of the forest where access should be restricted due to the sensitive nature of the site. Priority areas for access management include protected and sensitive zones.	Ministry of Environment/ municipalities	Priority 2 (3-5 years)

2.6 COMMERCIAL OUTDOOR RECREATION, TOURISM and ECOTOURISM

The Nisbet Forest is centrally located, close to urban and rural populations, rich in cultural history and easily accessed by our provincial highway system. The forest provides opportunities for wildlife watching, touring, canoeing, and learning about forest ecosystems. There is considerable potential for nature interpretation, ecotourism, and cultural tourism in the Nisbet Forest, activities that could contribute to regional and provincial economic sustainability. Adventure tourism, such as mountain biking, snowmobiling, and ATV use, is growing in popularity.

The ministry's *Commercial Outdoor Recreation Activities and Developments on Crown Resource Land* (COR) policy[22] was developed to provide direction for ecotourism, adventure tourism, indigenous tourism and cultural tourism activities and developments on Crown resource lands administered by the ministry. Examples of these activities are hiking, bird watching, canoeing or horseback riding. COR activities are generally

[22] http://www.se.gov.sk.ca/ecosystem/Land/COR_Policy_Resource_Lands2.pdf

considered to be non-consumptive, however there is an associated impact natural resources and the forest ecosystem. The COR policy does not allow for exclusive use of any part of the forest, nor does it require licensing for the activity.

ISSUES:

1. Other allowed activities carried out in the Nisbet, such as sand and gravel extraction, grazing, forest operations and some forms of recreation may not be compatible with ecotourism, indigenous tourism and cultural tourism activities.
2. Concerns were expressed over possible negative economic consequences if COR activities are restricted from certain areas of the forest.

MANAGEMENT OBJECTIVES:

1. Provide for commercial outdoor recreation activities within sustainable forest ecosystem limits to contribute to regional social and economic sustainability.

MANAGEMENT POLICY:

1. To provide for better forest stewardship, COR operators are encouraged to:
    - adopt a code of conduct,
    - monitor and minimize environmental impacts,
    - minimize conflicts with other users,
    - hire trained staff, and
    - become certified or accredited (such as with Sask Nature and Ecotourism Association)
2. The ministry will assist in providing information to ecotourism operators on other known activities.
3. No commercial dispositions for ecotourism should be permitted in the Nisbet Provincial Forest.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Identify and document the planning areas potential for tourism and recreation, its role in contributing to social and economic aspects of the local economy, in attracting people to live near the forest, and its importance to local Aboriginal people.	Ministry of Environment	Priority 2 (3-5 years)

2.7 OUTFITTING

Outfitting activities contribute to regional and provincial economic sustainability. This activity is considered to be a commercial consumptive activity, and is guided by provincial policy and license requirements for commercial outfitting.

When considering new dispositions to allocate wildlife resources, the ministry has developed the following priority list (from highest to lowest priority):

- conservation of wildlife resources

- obligation to fulfill treaty and Aboriginal rights
- non-commercial (recreational) use
- commercial and non-residential use

The following is a list of current licensed commercial outfitting activities allowed in the Nisbet (listed by wildlife management zone (WMZ)):

	WMZ 51 (Buckland)	WMZ 52 (Macdowall/ Steep Creek)	WMZ 54 (Shellbrook)
Licensed Outfitters	3	3	19
Whitetail deer – Can. resident	0	0	1
Bear- non-resident	1	1	6
Whitetail deer – SK resident	1	1	1
Elk – SK resident	1	1	1
Moose – SK resident	1	1	1
Migratory bird	3	3	12
Upland bird	2	3	12

ISSUES:

1. Outfitting is not always compatible with other activities carried out in the Nisbet, such as grazing, forest operations, some forms of recreation and tourism and ecotourism activities.

MANAGEMENT OBJECTIVES:

1. Maintain licensing provisions for outfitting activities pertaining to sustainable ecosystem limits along with other wildlife allocations.

MANAGEMENT POLICY:

1. No new dispositions for outfitting in the Nisbet will be issued due to pressures on wildlife.
2. The ministry should assist outfitters by providing information on other users to minimize conflict if requested.
3. No commercial land dispositions will be issued for outfitting in the Nisbet.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Upon renewal of outfitting license, review the license areas with the licensees to determine extent of use of the Nisbet Forest as part of outfitting operation. If the outfitting licensee agrees, remove the Nisbet Provincial Forest from the license area.	Ministry of Environment	Priority 1 (1-2 years)

2.8 LAND DISPOSITIONS OR SALES / PUBLIC UTILITY CORRIDORS / ROADS

The ministry recognizes that community economic development and expansion are linked to the environment and natural resources. The ministry is mandated not only to protect and manage Saskatchewan's environment and natural resources, but to also ensure sustainable development, and provide economic and social benefits for present and future generations. When making Crown land administration decisions, the ministry attempts to ensure environmental, social and economic sustainability for both the present and into the future.

There are pressures for Nisbet Forest land to be sold or leased for various developments such as highways, roads, utility corridors, commercial, industrial or residential developments, and community expansions (see Figure 2-5, Figure 2-6, and Figure 2-7).

The ministry is responsible for development, maintenance and closure of roads associated with renewable resources, sand and gravel use and longer term leases.

ISSUES:

1. **Loss of forest land base**:
   a) The public has expressed concerns over gradual loss of the forest land base and the associated negative impacts to forest ecosystem health and functioning, aesthetics and recreation values.
   b) The R.M. of Buckland Option to Purchase Lands (July 1, 1999) agreement to sell approximately. 971 ha of land leaves many small "islands" or "pieces" of Nisbet Forest land surrounded by land to be sold (see Figure 1-3). The RM of Buckland has also indicated a desire to adjust the boundaries to better accommodate industrial developments.
   c) Sale or long-term lease of land in the forest is a concern to local municipalities, as any form of private development requires municipalities to provide access and other municipal services.
2. Old Trespass cabins exist and may be used for unauthorized activities.

MANAGEMENT OBJECTIVES:

1. Allow planned and orderly community development that recognizes the value of ecological conservation and provides for future forest ecosystem health and functioning.
2. Support sustainable development which recognizes the role the forest plays in enhancing human wellbeing, local property values, recreation, economic opportunities and environmental quality.

MANAGEMENT POLICY:

1. The ministry intends to minimize negative impacts on the health and functioning of the forest ecosystem, and on other forest users by minimizing the loss of Nisbet Provincial Forest land base through land sales. Proposed new development must consider health and functioning of the forest ecosystem, and possible unintentional (new incidental) access to this plan's protected or sensitive zones.

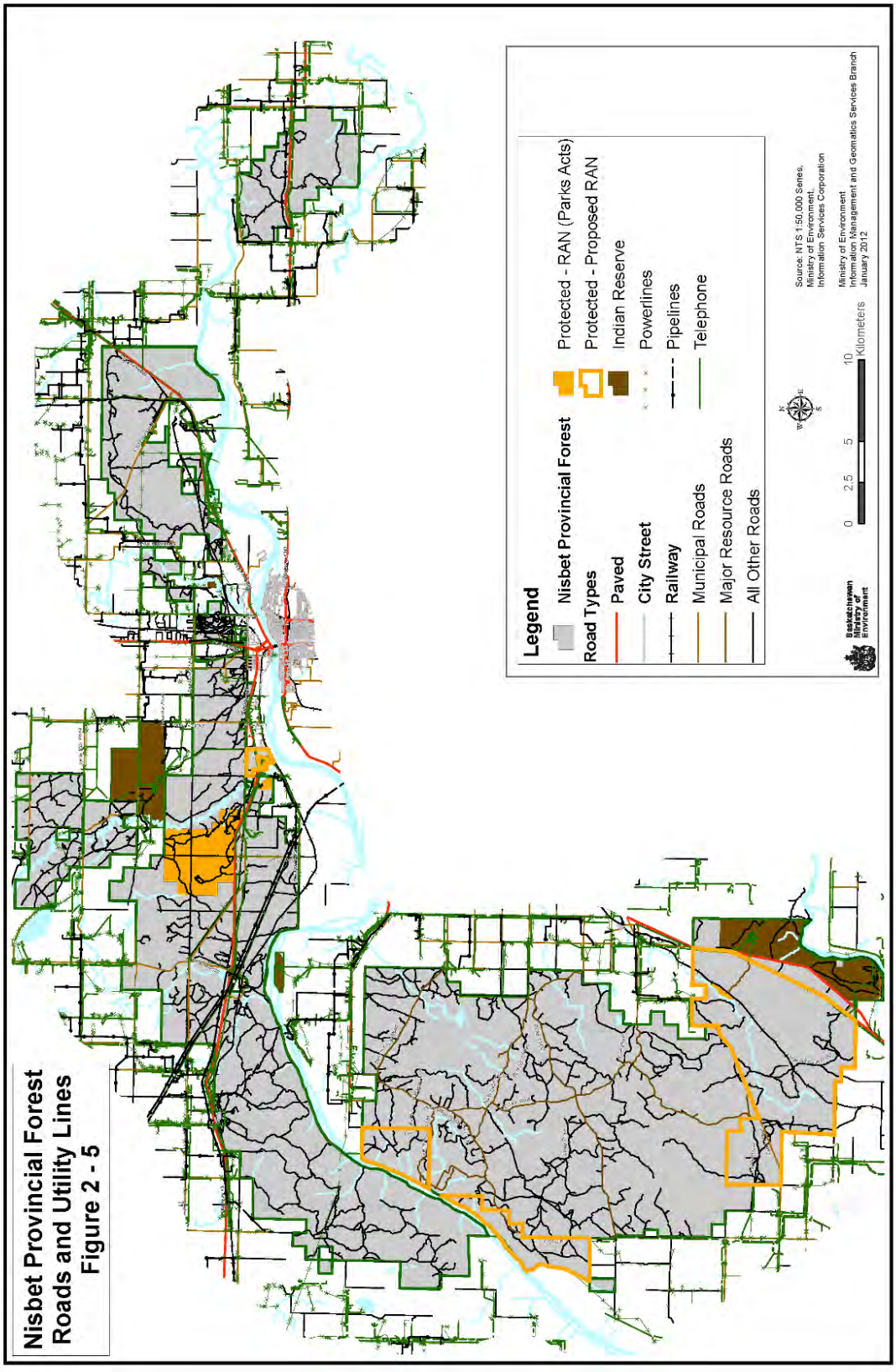
2. Developments as defined by The Planning and Development Act must have approval of the municipality. The municipality must review proposals for long-term lease, or subdivisions of Crown land.
3. Do not sell or transfer Crown resource land. In exceptional circumstances consideration may be given for: treaty land entitlement; lands required for provincial interests; municipal development needs; lagoons and landfills; and lands committed for sale or transfer prior to approval of this plan. Lands may be considered for municipal development only when land development needs are identified in the municipality's approved development plan, which outlines the community's land use and development objectives and policies.
4. For proposed new public utility corridors, provincial highways, rail lines and municipal roads: the ministry ensures developments in Saskatchewan are sustainable through the environmental assessment and review process[23]. Where appropriate plans for eventual closure, including plans for decommissioning and renewal to a healthy and functioning forest ecosystem should be part of planning for these new developments.
5. Lease of Crown lands for new developments may only be considered for allowed uses identified in this plan, and where municipal development planning bylaws permit that use.
6. Institutional leases (facilities operated on a non-profit basis by a recognized religious organization or corporation registered under The Non-Profit Corporations Act):
    a) No new institutional leases unless a suitable location can not be found outside of the provincial forest, and where public consultation on the proposal is carried out prior to approval.
7. Ensure new industrial, quarry and mineral lease proposals consider values of other users and the review process includes adequate consultation.
8. Only new miscellaneous use leases for *public* use (such as sewage lagoons, landfills and government facilities or utilities) are allowed, and only if they cannot be situated outside of the Nisbet Forest. Private miscellaneous use leases are not recommended.
9. No new Crown Land Dispositions will be allowed in the Protected Zones with the exception of development to accommodate existing mineral claims.
10. New leases or permits will not be issued in the Nisbet for:
    a) Commercial
    b) Agriculture
    c) Recreational
    d) Residential
    e) Traditional Resource Use (TRU).

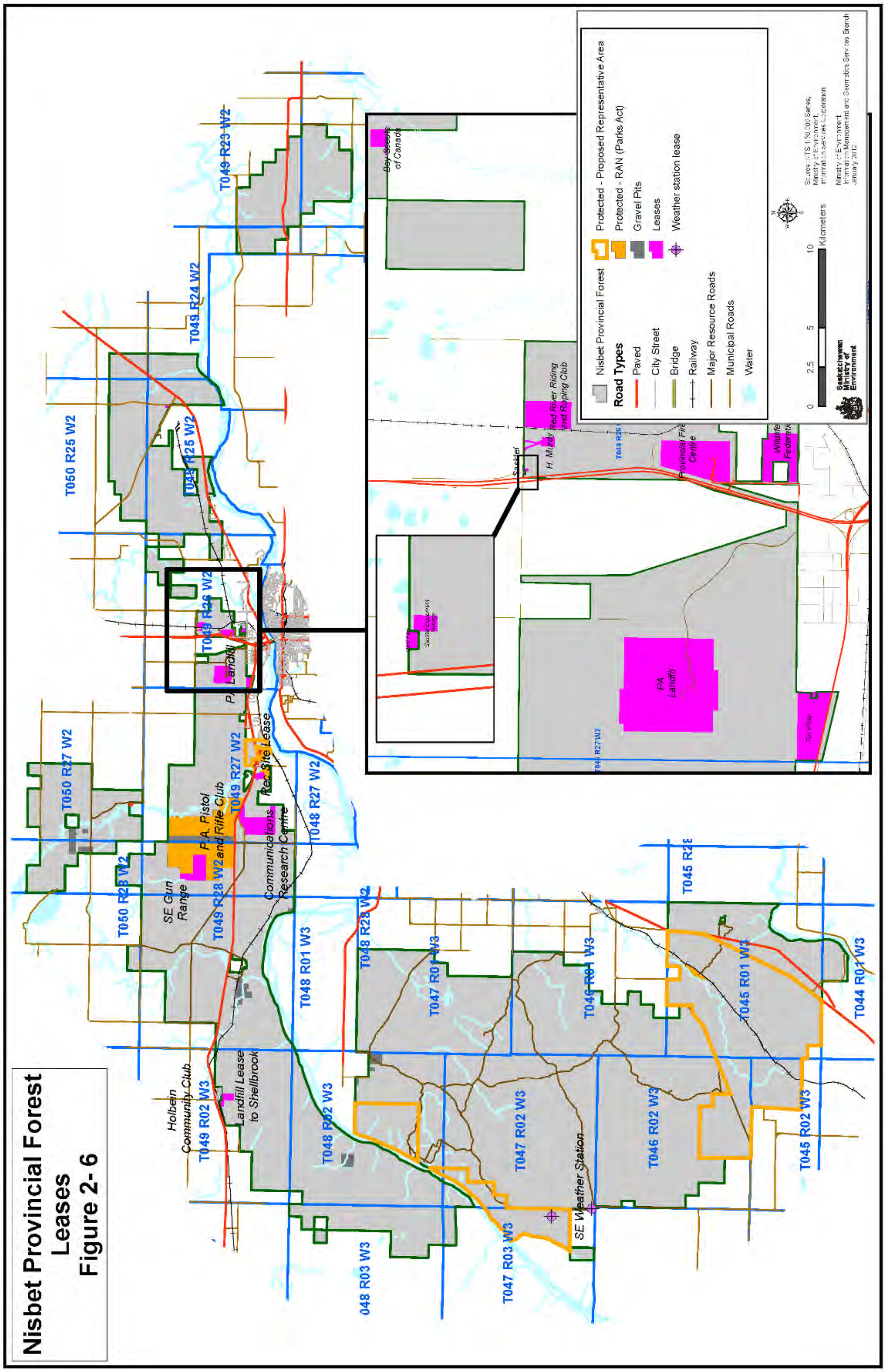
[23] http://www.se.gov.sk.ca/environment/assessment/

11. Miscellaneous use permits (normally issued for temporary work camps associated with forest harvesting activities or with mineral, oil or gas exploration or development) are allowed on Crown lands because of their temporary nature.
12. The Nisbet Trails Rec. Site, the Sturgeon River Rec. Site and the Macdowall Bog Protected Area are administered under The Parks Act. The following policies are provided for administration of these lands:
    a) If lands are no longer required as park or recreation site land, they should be reverted to Provincial Crown Land and consolidated with the rest of the Nisbet Provincial Forest.
    b) New applications for dispositions within these areas should consider development impacts on the forest ecosystems and other values associated with adjacent Nisbet Forest land.
    c) Management plans should be coordinated with provisions in this IFLUP and any other management plans for the Nisbet.
13. The following is a candidate area for new park or recreation site (potential transfer of administration of lands to be under The Parks Act) designation:
    a) Parcel A, surveyed in the N ½ of Section 2, Twp 45, Rge 1, W3M (surveyed January 2006) surrounded by the newly awarded One Arrow Treaty reserve, with ownership currently remaining with the Crown. This land was not included in the new reserve because of historic and cultural values attached to it (Figure 2-3).
14. New parks, urban parks or recreation sites may be considered, when:
    a) The management of the area(s) is included in overall forest management planning;
    b) The public and existing forest users have the opportunity to review proposals for change to park land.
15. Enforce trespass policy on cabins that do not have a disposition.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Maintain up to date mapping showing lands dispositions (leases, permits) land sales or transfer, roads, highways, and utility corridors.	Ministry of Environment	Priority 1(1-2 years)
For annual plan review, report on new approved forest land dispositions and sales, and associated review results regarding expected environmental, social and economic impacts.	Ministry of Environment	Priority 1(1-2 years)
Update the forest boundary legal description to reflect current status of the land base as needed.	Ministry of Environment	Priority 1 (1-2 years)

Review the July 1, 1999 Buckland Option to Purchase Lands Agreement with the RM of Buckland to exchange lands, acre for acre to minimize the creation “pieces” or “islands” of remaining Nisbet Forest land and provide for contiguous forest lands.	Ministry of Environment	Priority 1 (1-2 years)
Report on instances of trespass policy enforcement on cabins that do not have a disposition.	Ministry of Environment	Priority 1 (1-2 years)
Work with appropriate RM’s to determine the future of the abandoned rail lines and roads within the planning area.	Ministry of Environment	Priority 1 (1-2 years)


Nisbet Provincial Forest
Roads and Utility Lines
Figure 2 - 5
Legend
Nisbet Provincial Forest
Protected - RAN (Parks Acts)
Protected - Proposed RAN
Indian Reserve
Powerlines
Pipelines
Telephone
Road Types
Paved
City Street
Railway
Municipal Roads
Major Resource Roads
All Other Roads
0 2.5 5 10
Kilometers
Source: NTS 1:50,000 Series,
Ministry of Environment,
Information Services Corporation
Ministry of Environment
Information Management and Geomatics Services Branch
January 2012


Nisbet Provincial Forest
Leases
Figure 2- 6
Nisbet Provincial Forest
Road Types
Paved
City Street
Bridge
Railway
Major Resource Roads
Municipal Roads
Water
Protected - Proposed Representative Area
Protected - RAN (Parks Act)
Gravel Pits
Leases
Weather station lease
Kilometers
Saskatchewan Ministry of Environment
Holbein Community Club
Landfill Lease to Shellbrook
SE Gun Range
P.A. Pistol and Rifle Club
Communications Research Centre
Rec Site Lease
PA Landfill
Boy Scouts of Canada
H. Murdy Red River Riding and Roping Club
Provincial Fire Centre
SE Weather Station
T050 R27 W2
T050 R28 W2
T050 R25 W2
T049 R24 W2
T049 R23 W2
T049 R25 W2
T049 R26 W2
T049 R27 W2
T049 R28 W2
T049 R02 W3
T048 R27 W2
T048 R28 W2
T048 R01 W3
T048 R02 W3
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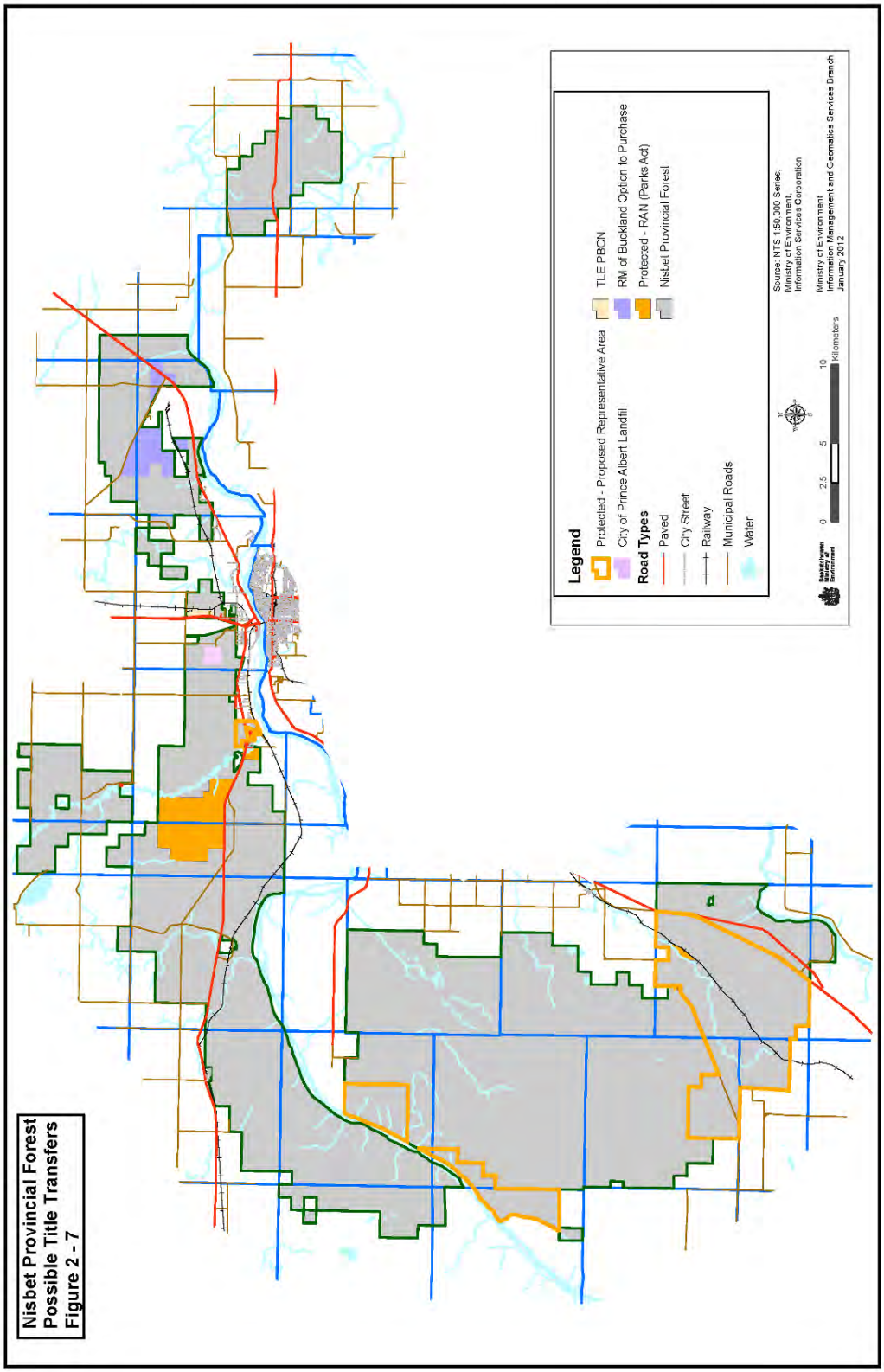
Nisbet Provincial Forest
Possible Title Transfers
Figure 2 - 7
Legend
Protected - Proposed Representative Area
City of Prince Albert Landfill
Road Types
Paved
City Street
Railway
Municipal Roads
Water
TLE PBCN
RM of Buckland Option to Purchase
Protected - RAN (Parks Act)
Nisbet Provincial Forest
0
2.5
5
10
Kilometers
Source: NTS 1:50,000 Series.
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January 2012

2.8.1 SAND OR GRAVEL EXTRACTION

The ministry is responsible for administering sand and gravel resources, and recognizes the important role they play in construction of roads, highways and developments associated with sustainable economies and communities. These resources are found only in limited areas of the province, and are found in the Nisbet Forest. For these reasons, the ministry allows extraction of sand and gravel in the Nisbet Forest. However, where extraction of these resources is allowed, it should be done with minimal impacts to ecosystem functioning and other values and uses.

The provincial Sand and Gravel Exploration, Extraction and Reclamation on Crown Resource Land Policy No. 2003.2 (November 15, 2003), and the Reclamation Guidelines for Sand and Gravel Operators (May, 2003) apply to the Nisbet Forest. Reclamation standards address slope, safety and renewal, and the ministry's policy requires secure financial assurance to guarantee reclamation after sand or gravel development is completed.

ISSUES:

1. Leases for gravel extraction are generally for a long term (decades), and lease periods can be extended. Large, open pits left unused for extended periods can disrupt local ecosystem functioning, provide opportunities for theft of the resource, and can have negative implications for public safety, recreation and aesthetics.
2. Although the ministry's provincial sand and gravel policy does indicate a maximum single lease size (65 ha or 160 acres), this may not be appropriate for the Nisbet, given its multiple values and small size. The site-specific nature of gravel means that leases are often located side by side in a given location. Current policy does not address the cumulative maximum amount of excavation activity that an ecosystem can withstand.

   Three areas of the forest are of particular concern because they contain multiple gravel pit leases. They are Crutwell, Lily Plain, and Round Lake.
3. Generally exploration activities are conducted with a backhoe under a miscellaneous use permit (MUP) and reclamation is not normally required. Though this is generally not an issue, access management issues may arise.
4. Though current reclamation objectives target returning the disturbed site to a productive state as soon as possible, extraction has taken place for decades in the Nisbet Forest. Historically, reclamation efforts have been minimal and at times non-existent. The extent of lost forest productivity from this activity is unknown.

MANAGEMENT OBJECTIVES:

1. Recognizing that sand and gravel are important non-renewable resources required to support community and provincial developments, allow extraction of sand and gravel resources from the Nisbet Forest where appropriate.
2. Ensure that where sand or gravel extraction is permitted, it will be with conditions that ensure minimal disturbance to forest ecosystem functioning (including wetlands, surface water and subsurface water), and other forest values.

MANAGEMENT POLICY:

1. **Exploration activities for sand or gravel:**
    a) When appropriate, must have a reclamation plan that will, as much as possible, return the site and access to pre-development site conditions.
    b) Applications will be considered with the view that a possible lease may follow. As such, the ministry will consider effects of development, possible cumulative effects of additional leases on local forest ecosystem functioning or other forest values.
    c) No new exploration to be permitted in the protected areas.
2. **Sand and gravel leases**:
    a) Proposed development alone or cumulative with other developments in the area must not cause significant or permanent damage to the local forest ecosystem.
    b) When considering new applications for lease in the three identified pressure areas (Crutwell, Lily Plain, and Round Lake), the ministry will consider the effects of cumulative development, will work with existing lessees to have existing pits, or parts of pits reclaimed prior to or in conjunction with the issuing of new leases.
    c) To minimize impacts it is encouraged that open pits should be no larger than necessary for efficient pit operation, with progressive development and progressive reclamation.
    d) Periodic inspections of leases determine if extraction activity is reported accurately, is within lease boundaries, open pits are adequately signed or fenced, safety concerns are addressed, progressive reclamation is occurring, and closure requirements or other lease conditions are met.
3. Theft of small quantities of sand or gravel has not been considered to be a serious issue in the Nisbet. Take enforcement action if significant theft occurs.
4. When possible, consider abandoned gravel pits for inclusion in forest renewal plans.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Review three areas of the forest (Crutwell, Lily Plain, and Round Lake) having multiple gravel leases in the same area to: • To assist in evaluating new lease applications, determine how much disturbance from extraction activity should occur; • Identify (if any) mitigative actions required at these locations, and • Work with existing lessees on reclamation of pits or portions of pits as appropriate.	Ministry of Environment	Priority 1(1-2 years)

Ensure the existing inspection, reporting and monitoring system for approved sand and gravel permits and leases are followed, report on noncompliance.	Ministry of Environment	Priority 1 (1-2 years)
As they are encountered through existing activities, map historical gravel extraction activity sites.	Ministry of Environment	Priority 2 (3-5 years)
Meet with the Ministry of Highways and Infrastructure (MHI) and rural municipalities with gravel leases to develop a policy to address the reclamation of leaving gravel pits in the Nisbet that have been unused for extended periods.	Ministry of Environment	Priority 1 (1-2 years)

2.8.2 PEAT MOSS EXTRACTION

There has been one license issued to extract peat moss in the Nisbet in the past, and it is believed there are limited economically viable peat deposits in the Nisbet Forest.

ISSUE:

1. Excavation of peat moss requires significantly large disturbance areas, and the site recovery period is lengthy. Because the Nisbet Forest is relatively small and fragmented, concerns have been expressed over the possible negative impacts this activity could have on forest wetlands ecosystem functioning, on wildlife habitat and biodiversity as well as on other forest values such as recreation and aesthetics.

MANAGEMENT OBJECTIVES:

1. Manage all dispositions including those for peat moss in ways to minimize impacts and conflict with other users.

MANAGEMENT POLICIES:

1. No new dispositions for peat moss extraction will be allowed in the planning area.

2.8.3 MINERALS, OIL OR GAS

The mineral, oil and gas industries are important to our provincial economy and to local economies. Commodities associated with these industries may include metallic minerals, industrial minerals, gems, coal, oil sand and shale, oil, helium, natural gas and other gases. This plan area has a potential to contain a number of these commodity types, particularly kimberlite-hosted diamonds.

Three distinct activities are associated with the mineral, oil and gas industries: exploration; development (mines, oil and gas production well sites, and related infrastructure); and decommissioning and reclamation. Exploration and development are considered a temporary use of surface land. However, mining and oil and gas extraction may occur over several years or decades before being permanently decommissioned, and may appear to have a permanent effect on the land.

Generally, the early stage of exploration covers large tracts of land and has minimal surface disturbance. Advanced exploration occurs over smaller areas but still cause site

disturbance requiring reclamation. Both mines and oil or gas production wells are site specific, and have an associated high surface impact requiring reclamation. Mine developments can range from a few hectares to several hundred hectares. Oil or gas production wells individually occupy less than 1 hectare. Cumulative impact of production wells can be significant, as they occur in fields (groupings) within which individual wells are spaced at intervals.

Both mines and oil or gas production wells can be subject to The Environmental Assessment Act. Based on set criteria, the ministry may require the proponent to carry out a full Environmental Impact Assessment (EIA) before approvals may be given for development to occur. For mine developments the EIA requires a preliminary reclamation plan and the posting of a financial surety by the company that guarantees the reclamation. The ministry regulates developments under The Environmental Management and Protection Act.

Considerable exploration for diamonds occurs in the vicinity, especially in the Fort a la Corne Provincial Forest. As well, numerous mineral claims cover areas of the Nisbet Forest north of the North Saskatchewan River and in the Steep Creek Block of the forest.

ISSUE:

1. Because of its small size, multiple values and developments already in place, the Nisbet Forest ecosystem (and other forest users) can be negatively affected by mineral, oil and gas development.

MANAGEMENT OBJECTIVES:

1. Recognizing that mineral, oil and gas are important non-renewable resources that support community and provincial economic developments, ensure that oil, gas and mineral developments are recognized as valid uses of Nisbet Forest land.
2. Where development associated with oil, gas or mineral development is permitted, it will be with conditions that ensure minimal disturbance to forest ecosystem functioning (including wetlands, surface water and subsurface water), and other forest values.

MANAGEMENT POLICY:

1. Follow requirements of The Environmental Assessment Act, and The Environmental Management and Protection Act (EMPA) when required.
2. Early and later stages of exploration activities must have a reclamation plan that will, as much as possible, return the site and access to pre-development site conditions.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Information about management zoning for protected or sensitive sites in the Nisbet Forest shall be made available to proponents and to MER for mineral, oil, or gas developments	Ministry of Environment	Priority 2 (3-5 years)
Provide general updates on mineral oil and gas activities to the public advisory committee as appropriate.	Ministry of Environment	Priority 2 (3-5 years)

2.9 RECREATION MANAGEMENT

The Nisbet Forest is close to Saskatoon and Prince Albert, and provides easy access throughout the year for outdoor recreational activities by organized clubs, tourism businesses and individual users. Access to the forest for recreation is an important social use of the forest, but must be within sustainable forest ecosystem limits and in cooperation with other forest users.

Casual use of all terrain vehicles (ATV) is on the rise nationally, and organized events using ATVs in the Nisbet Forest are also increasing.

The ministry has authority to regulate recreation activities through The Provincial Lands Act, The Crown Resource Lands Regulations, and The Forest Resources Management Act. In part, the ministry can make regulations "respecting the granting of leases, permits or any other dispositions conveying the right to enter on, use and occupy a portion or portions of Crown land and prescribing the rents and fees respecting those dispositions".

Municipalities can regulate some recreation activities through zoning under The Planning and Development Act. As well, MHI can prohibit certain recreation activities in certain areas through The All Terrain Vehicles Act, The Operation of ATV on Crown Land Prohibition Regulations and The Snowmobile Act.

Four areas of the Nisbet have been identified as being heavily used for organized cross-country ski trails:

- Eb's Trails in the Macdowall Block: has groomed trails, developed and maintained by the Nordic Ski Club, Saskatoon for hiking and cross-country skiing.
- Macdowall Ski Trails in the Macdowall Block: Trails were started in the late 1980s, but the North Cabin Fire of 1989 burned over the area. Trails are not presently developed or used. The Nordic Ski Club, Saskatoon, has expressed interest in redeveloping the trails for cross-country skiing.
- The Little Red River Ski Trails, in the RM of Buckland and adjacent to the Little Red River Park: Trails were developed and are maintained by the Prince Albert Ski Club for cross-country skiing.
- The Holbein Ski Trails: Trails were developed and are maintained by the Holbein and District Community Club for cross-country skiing.

ISSUES:

1. Historically there have been no areas "off limits" to casual recreation use or organized recreation use activities within the Nisbet Forest. Unlimited public access for all types of recreation to all parts of the forest, and the rising volume of uncontrolled recreation use is a concern for resource management.
2. During development of this IFLUP, advisory committee members did not want to see "exclusive use" of any part of the forest for any single value, but did want to minimize conflict with incompatible recreation uses.
3. Cross-country skiing occurs mainly on existing groomed trails, but is not limited to them. Other passive recreation activities can and do occur on groomed ski trails. Organized cross-country ski clubs have identified that motorized recreation, horseback riding, cycling, dog walking and hunting can negatively affect trails or trail user safety. Cross-

country ski clubs are frustrated over damage to groomed trails from other forest users (particularly ATV use), and would like to see cross-country ski trails protected from other conflicting recreation use.

4. Various trails in the Nisbet Forest are used by individuals and for organized recreation events that are arranged by tourism and/or private horseback riding schools. Some trails north of the Little Red River Park are used primarily for ATV/ horseback riding trails, but no club is responsible for maintenance. Horseback riding associations have raised concerns over motorized recreation vehicles disturbing riders and riding events.
5. Repeated motorized recreation use of a site over a long period of time, during wet conditions, or intensive use over a relatively short period of time (such as organized recreation events or rallies) can be destructive to forest vegetation and cause soil erosion. Particularly vulnerable to motorized recreation use are: sites subject to repeated use after rainfall, in the spring during wet conditions or before vegetation has had a chance to establish; trails developed for cross-country skiing; or areas having a thin duff layer over stabilized sand dunes.
    - There are currently two snowmobile clubs responsible for grooming and maintenance of snowmobile trails - the Saskatoon Snowmobile Club and the Shellbrook Snowmobile Club. Snowmobiling occurs throughout the Nisbet by both club members and members of the public. Snowmobile clubs would like to see trails designated for snowmobile use.
    - ATV, dirt bike and 4x4 truck use activities are increasing in the Nisbet Forest, and so too have the complaints about apparent willful (and/or unintentional incidental) environmental damage associated with these activities. Organized recreation events for ATVs, dirt bikes, and 4x4 trucks are of particular concern due to the damage to the forest floor that can occur from a single event.
6. Campfires associated with recreation use can be a source of wildfire starts, and garbage left in the forest from unrestricted camping activities is a problem for wildlife management, aesthetics and forest health.

MANAGEMENT OBJECTIVES:

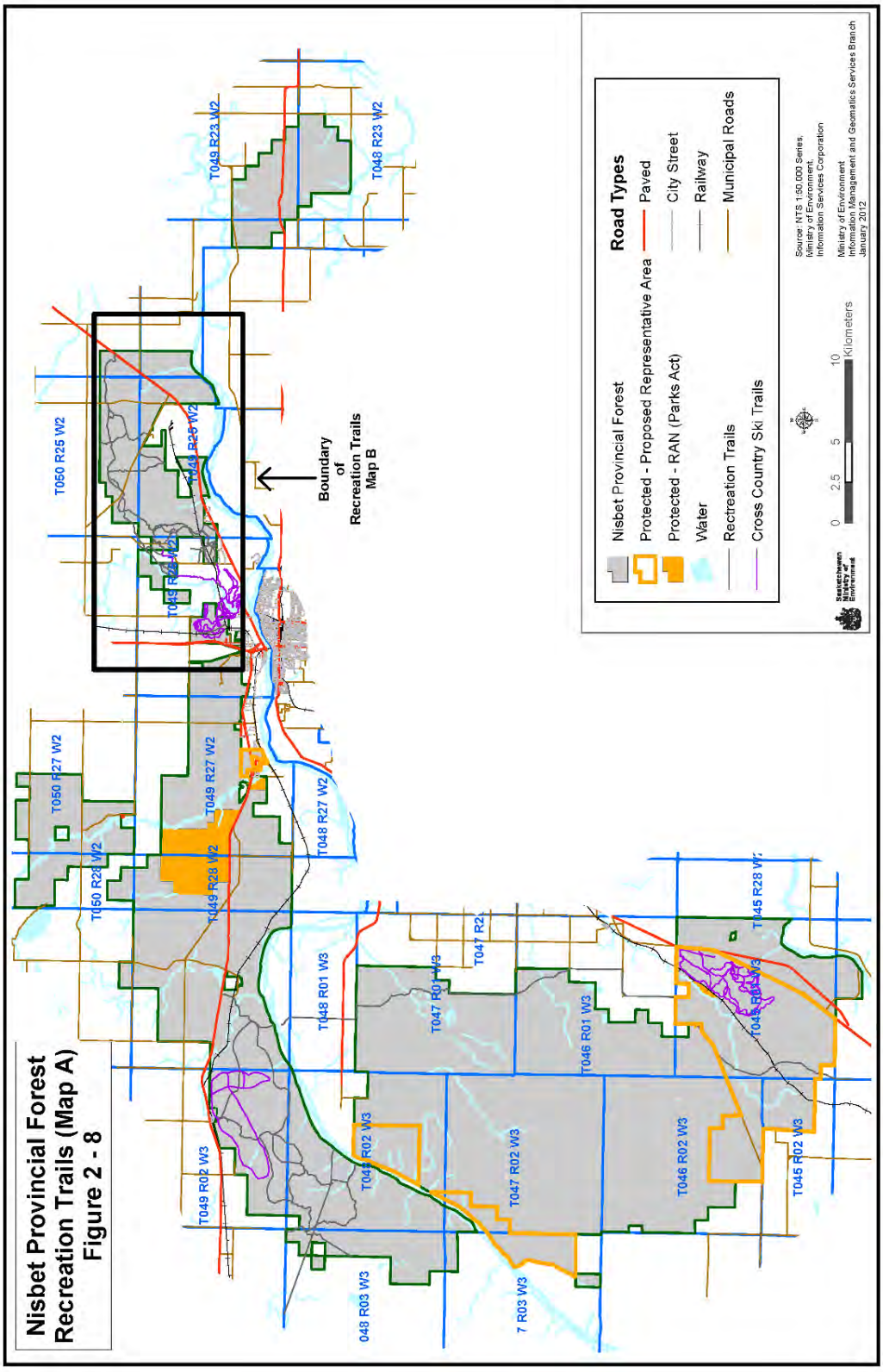
1. Allow environmentally responsible and appropriate access to the Nisbet Forest for various types of recreation.
2. Minimize opportunities for conflict between recreation users, and other users.

MANAGEMENT POLICIES:

1. Positive interaction through consultation and cooperation is encouraged between recreation users and with other forest users to deal with recreation conflicts, rather than relying on provincial enforcement to separate incompatible recreation use.
2. Where appropriate in the protected and sensitive zones (or elsewhere), utilize the road closure provisions of The Forest Resources Management Act as a means to restrict vehicle access.
3. Promote best management practices for ATV rallies.

4. When the ministry considers requests for new recreation trails, existing clearings, trails, and utility corridors should be used where possible. No new clearings are to be created unless other options are not available.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Explore options for educational programs on trail use for all users.	Ministry of Environment	Priority 2 (3-5 years)
Identify areas degraded due to recreation activities, and develop mitigation measures to address problem areas.	Ministry of Environment	Priority 2 (3-5 years)
Review opportunities for management of organized recreation activities with an emphasis on ATV rallies.	Ministry of Environment	Priority 2 (3-5 years)
Develop legislation that will outline controls for ATV's and ATV rallies provincially and in the IFLUP area.	Ministry of Environment	Priority 2 (3-5 years)


Nisbet Provincial Forest
Recreation Trails (Map A)
Figure 2 - 8
Boundary
of
Recreation Trails
Map B
Road Types
Nisbet Provincial Forest
Protected - Proposed Representative Area
Protected - RAN (Parks Act)
Water
Recreation Trails
Cross Country Ski Trails
Paved
City Street
Railway
Municipal Roads
Kilometers
T050 R25 W2
T049 R23 W2
T048 R23 W2
T050 R27 W2
T049 R27 W2
T048 R27 W2
T049 R28 W2
T049 R02 W3
T048 R02 W3
T047 R02 W3
T046 R02 W3
T045 R02 W3
T048 R01 W3
T047 R01 W3
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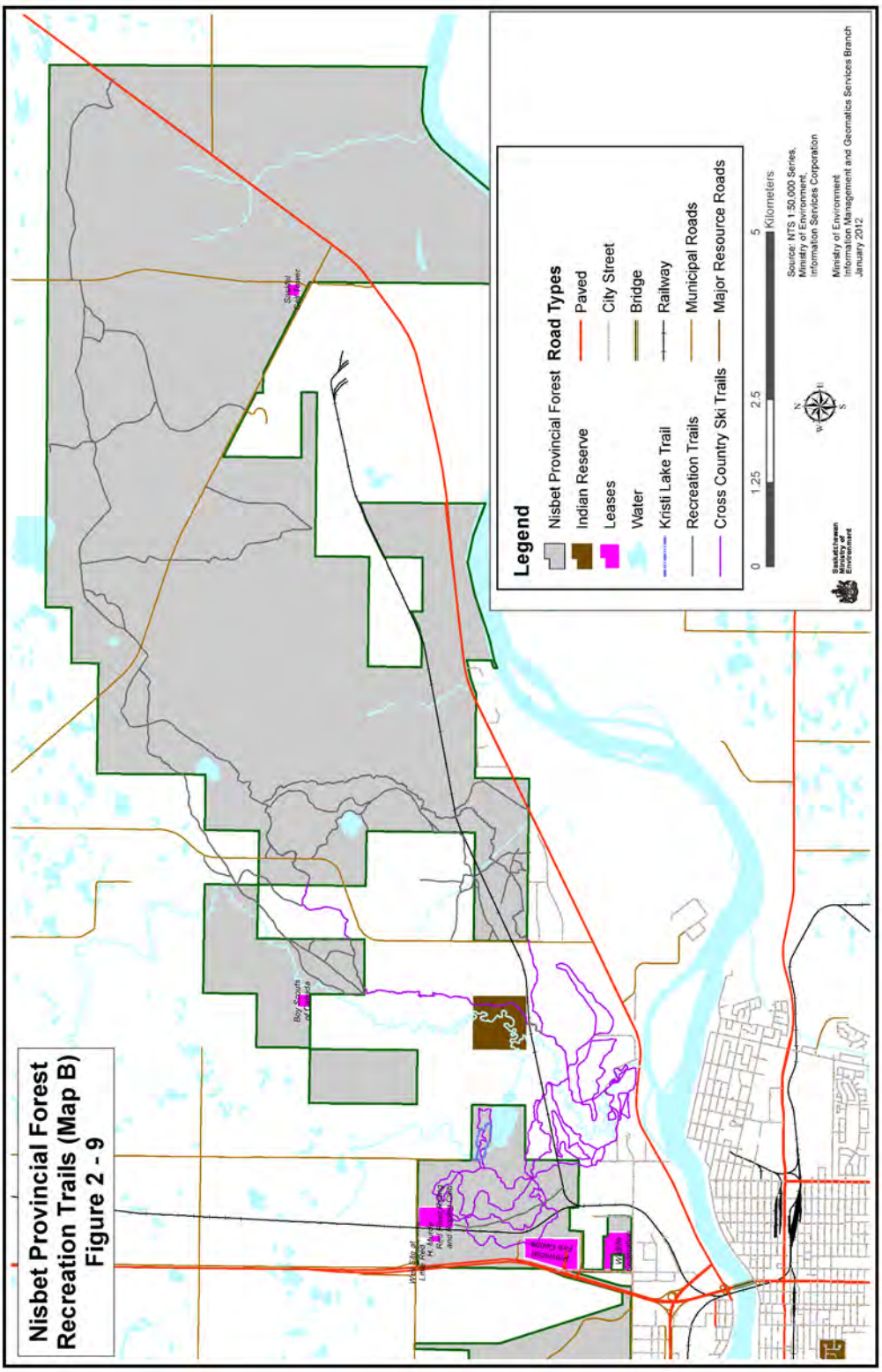
T045 R28 W3


Nisbet Provincial Forest
Recreation Trails (Map B)
Figure 2 - 9
Legend
Nisbet Provincial Forest
Indian Reserve
Leases
Water
Kristi Lake Trail
Recreation Trails
Cross Country Ski Trails
Road Types
Paved
City Street
Bridge
Railway
Municipal Roads
Major Resource Roads
0
1.25
2.5
5
Kilometers
Source: NTS 1:50,000 Series,
Ministry of Environment
Information Services Corporation
Ministry of Environment
Information Management and Geomatics Services Branch
January 2012
Saskatchewan
Ministry of
Environment

2.10 SPECIAL PLACES

Special places in this plan are sites of historical, cultural or archaeological significance.

The Nisbet Forest contains sites of historical significance, historic trails, and archaeological sites, many of them connected with historic water travel routes or stopping places for travel over land. Though TPCS has mapped some sites of a special nature, the likelihood is that many more sites of archaeological value are not yet identified. Designation as "sites of a special nature" provides specific protection for sites having spiritual or ceremonial significance (e.g., burial sites or pictographs), and they are defined in Section 64 of The Heritage Properties Act.

TPCS is responsible for administration and mapping of archaeological sites, including sites of a special nature. No sites are currently designated as "sites of a special nature" in the Nisbet Forest.

Known historic trails in or adjacent to the Nisbet Forest:

- Carlton Trail
- Fort a la Corne Trail
- Green Lake Trail
- North Saskatchewan River (historic water travel route)
- South Saskatchewan River

Known historical or archaeological sites of significance in the Nisbet Forest:

- Tomison's 1779 Hudson's Bay Company post near Callaghan Lake
- Two South Branch House fur trade sites – South Saskatchewan River (one is identified as Parcel A, and is excluded from the One Arrow treaty land entitlement)
- Near Crutwell – stopping place for travelers along historic route (a historic marker on site)
- Old fire tower near Roddick Lake
- Fisher Place (squatters) near Roddick Lake
- Old jail camp (near Crutwell) in the 50s
- Sturgeon Lake Fort along the Sturgeon River (has been washed out, but some artifacts remain in the area)
- Dominion Forest Nursery (Macdowall patrolman's headquarters)

ISSUES:

1. Threats to significant archaeological sites come from uncontrolled digging of artifacts and other disturbances. Because sites are often isolated, it is difficult to protect them.
2. The Nisbet Forest is close to several First Nations and Métis communities. There is a lack of information about the location of Aboriginal cultural sites, and the ministry is not aware of any traditional use study done for the Nisbet that could provide such information.

MANAGEMENT OBJECTIVES:

1. Protect sites of historical, cultural or archaeological significance from activities that may diminish their value.
2. Where possible and appropriate, utilize special places to benefit tourism or ecotourism opportunities.

MANAGEMENT POLICIES:

1. Section 71 of The Heritage Property Act requires finders of artifacts (archaeological or palaeontological objects) to report them within 15 days of discovery. Disposition holders must be advised to note locations where artifacts are found, and report it to Heritage Resources Branch of TPCS.
2. Refer to TPCS's *Screening Criteria for Identifying Archaeologically Sensitive Lands* when considering activities or developments that may disturb the forest soils. Proposals for these activities will be forwarded to TPCS for review for heritage potential prior to approval being granted. Areas most likely to have archaeological artifacts are along the North and South Saskatchewan Rivers, historic trails and along the mouths of rivers and creeks draining into these major rivers (specifically the Sturgeon River).

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Heritage Resources Branch to review developments for their potential to affect previously unrecorded sites of archeological historical cultural significance.	TPCS (Lead) / Ministry of Environment	Priority 1 (1-2 years)
Consult with First Nation and Métis communities on development proposals and where appropriate facilitate the transfer of knowledge on sensitive sites under the The Heritage Property Act.	Ministry of Environment (Lead)/ MTCPS	Priority 1 (1-2 years)

2.11 PUBLIC EDUCATION / INFORMATION/ COMMUNICATION

Currently public information about different aspects of resource management is carried out as needed. There is no overall education program specific to the Nisbet Forest to increase public awareness about forest management, forest stewardship and forest health.

ISSUES:

1. During plan development, ministry staff and the advisory committee identified numerous opportunities where this forest could benefit from greater forest user and general public awareness about forest stewardship, the benefits the forest provides, and impacts of activities carried out in the forest on the forest ecosystem functioning.

MANAGEMENT OBJECTIVES:

1. Communicate benefits the plan area provides, and public responsibilities for stewardship.

MANAGEMENT POLICIES:

1. Provide information to the public when increased public awareness would benefit health and sustainability of the planning area.
2. Educational material should consider highlighting the quality of life the Nisbet Forest provides to local are residents and visitors, and the responsibility the public has to maintain that quality of life.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Use the IFLUP annual reporting process as a means to inform the public of: • activities in the plan area • the quality of life in the plan area, and • the responsibility the public has to maintain that quality of life.	Ministry of Environment	Ongoing
Report on public education/ information for the Nisbet identifying the major plan components, and involve the public advisory committee.	Ministry of Environment	Priority 2 (3-5 years)
When appropriate, partner with municipalities, Aboriginal governments, and/or non-government organizations (such as Ducks Unlimited) to increase public awareness about the importance of a functioning forest ecosystem. This includes aquatic habitats and watershed ecology, and the role of the public as stewards of the forest. Acknowledge the work done by area residents in renewing the forest over time.	Ministry of Environment	Priority 2 (3-5 years)
When possible, engage local schools and local governments about forest stewardship opportunities and management practices in the forest.	Ministry of Environment	Priority 2 (3-5 years)
Provide information to the public on the importance of respecting the needs and concerns of other forest users.	Ministry of Environment	Priority 1 (1-2 years)
Provide information to the public on Forest Stewardship practices, including proper harvesting and renewal practices, road closures.	Ministry of Environment	Priority 2 (3-5 years)
Provide information to the public on the importance or recognizing, reporting, and how to report: • Suspected illegal forest harvesting • Suspected illegal sand or gravel extraction • The locations of heron rookeries, eagle and raptor nests sites, and other unique features.	Ministry of Environment	Priority 2 (3-5 years)

• Archeological finds. • Invasive exotic species. • Wild species at risk. • Illegal garbage disposal and littering.		
Provide information to the public on the availability of and where to obtain existing information regarding: • Trail etiquette that helps all recreation users enjoy the outdoor experience. • The reporting of serious infractions that negatively affect the environment or other users' safety or enjoyment. • Safe recreation trail use practices during hunting seasons. • Trail use that respects management guidelines.	Ministry of Environment	Priority 1 (1-2 years)
Ensure the PAC is involved wherever possible in communicating with and educating their member groups and the general public.	Ministry of Environment	Priority 1 (1-2 years)

3 FOREST MANAGEMENT ZONING

Zoning identifies management areas with different resource management objectives. Management objectives are identified for each broad zone category – protected, sensitive and management zones.

ISSUES:

1. Some types of activities carried out in this multi-use public forest may conflict, and certain allowed activities can threaten sensitive places.

GENERAL FOREST MANAGEMENT ZONING OBJECTIVES:

1. To manage the land and resources of the planning area so as to achieve identified management objectives, and the overall IFLUP plan goal, and to minimize land and resource use conflict. Further objectives are identified for each zone.

GENERAL FOREST MANAGEMENT ZONING POLICIES:

1. See Figure 2-1, Figure 2-3, Figure 3-1, and Figure 3-2 (Forest Management Zoning Maps) and Zoning Table 1-1 which indicates use restrictions.
2. Applicable to *all zones*:
    - Use of any part the forest for any single use is not encouraged/allowed (exception: long term leases).
    - Where a use is identified as "not permitted", it means that the ministry will not issue a license for that use.

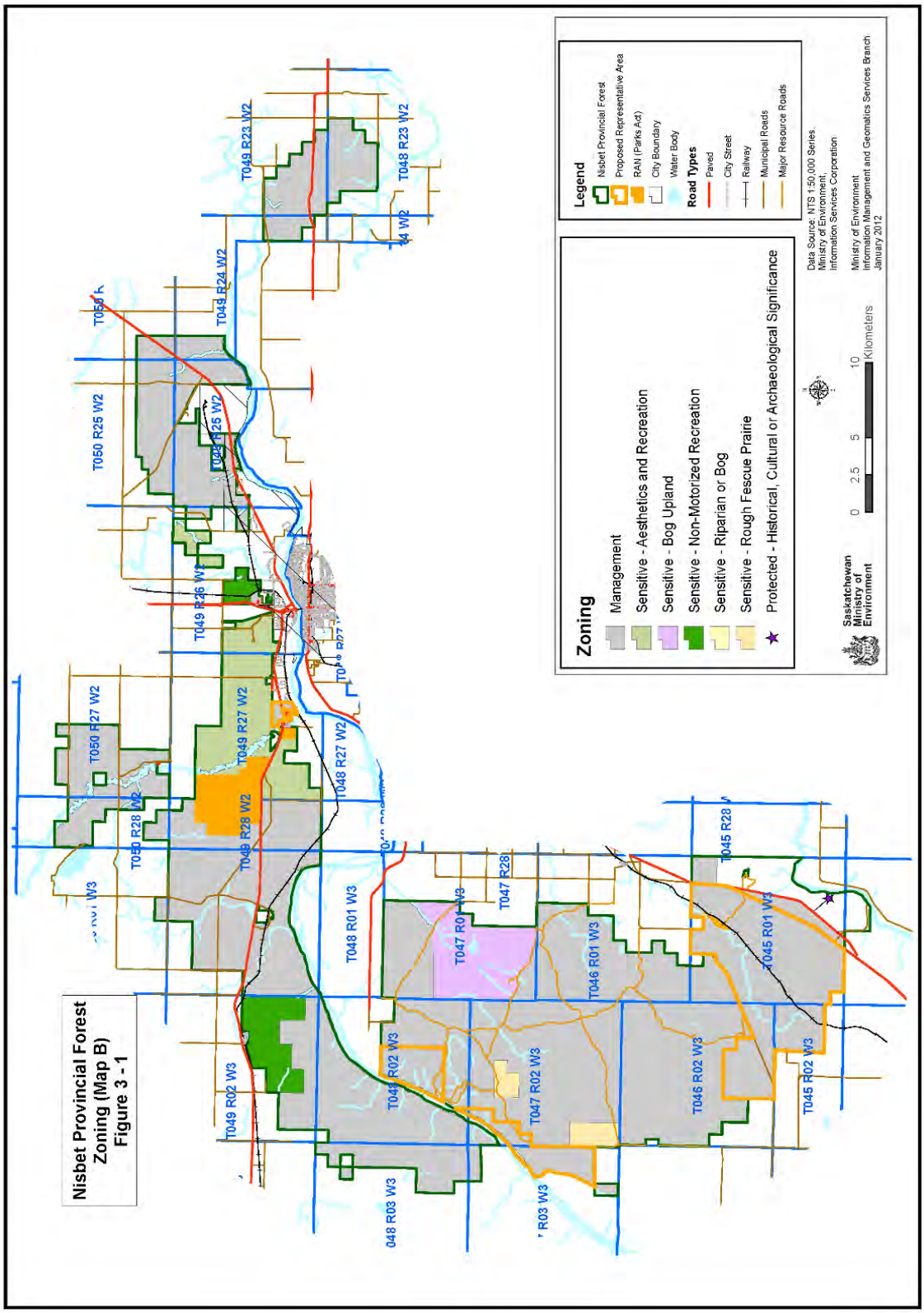
- Where a use is identified as “conditional” the activity may be allowed if it meets stated requirements. The ministry may add license conditions to the conditional use to meet the objectives of the zone.
- Where a use is identified as “permitted” a license or permit may be required, subject to the ministry review and administration requirements.
- Where consultation with other users is required, it does not mean that any existing user has veto power, only that the ministry will be made aware of issues raised, and adjustments may be made to accommodate reasonable concerns.

3. Not recommended in any zone: industrial development (except site specific sand, gravel, oil, mineral or gas), commercial, agricultural (except haying or grazing), residential development, personal recreation or cabin developments, new permanent development, game farming, or new outfitting activities.
4. If an activity or use is not listed in Zoning Table 1-1, it may be allowed subject to this IFLUP; provincial legislation, policy and guidelines; and municipal zoning under The Planning and Development Act.
5. Encourage and work with surrounding land owners and jurisdictions to integrate management across administrative boundaries.
6. Frequency, intensity or timing of activities alone or in combination with others can negatively affect forest ecosystems. Activities that are compatible with identified management objectives will be allowed to the extent that they do not negatively affect long-term forest ecosystem health and will have minimal user conflict.
7. The ministry should encourage surrounding jurisdictions to consider impacts of proposed developments on long term forest ecosystem functioning and other values identified in this plan when considering future development needs that may affect the Nisbet Forest.

FOREST MANAGEMENT ZONE AREA:

ZONE	PERCENT OF TOTAL NISBET FOREST LAND BASE	AREA (approximately)
Protected	15%	12,532 ha
Sensitive	16%	12,805 ha
Management	69%	55,900 ha
Total	100%	81,237 ha

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Review zoning framework with the 5 year plan review as new information compiled over the period may influence the zoning requirements.	Ministry of Environment	Priority 2 (1-5 years)
Provide information on IFLUP Zoning to rural municipalities in the Nisbet forest.	Ministry of Environment	Priority 2 (1-5 years)


Nisbet Provincial Forest
Zoning (Map B)
Figure 3 - 1
Zoning
Management
Sensitive - Aesthetics and Recreation
Sensitive - Bog Upland
Sensitive - Non-Motorized Recreation
Sensitive - Riparian or Bog
Sensitive - Rough Fescue Prairie
Protected - Historical, Cultural or Archaeological Significance
Legend
Nisbet Provincial Forest
Proposed Representative Area
RAN (Parks Act)
City Boundary
Water Body
Road Types
Paved
City Street
Railway
Municipal Roads
Major Resource Roads
Saskatchewan Ministry of Environment
0 2.5 5 10 Kilometers
Data Source: NTS 1:50,000 Series.
Ministry of Environment,
Information Services Corporation
Ministry of Environment
Information Management and Geomatics Services Branch
January 2012
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T048 R01 W3
T047 R01 W3
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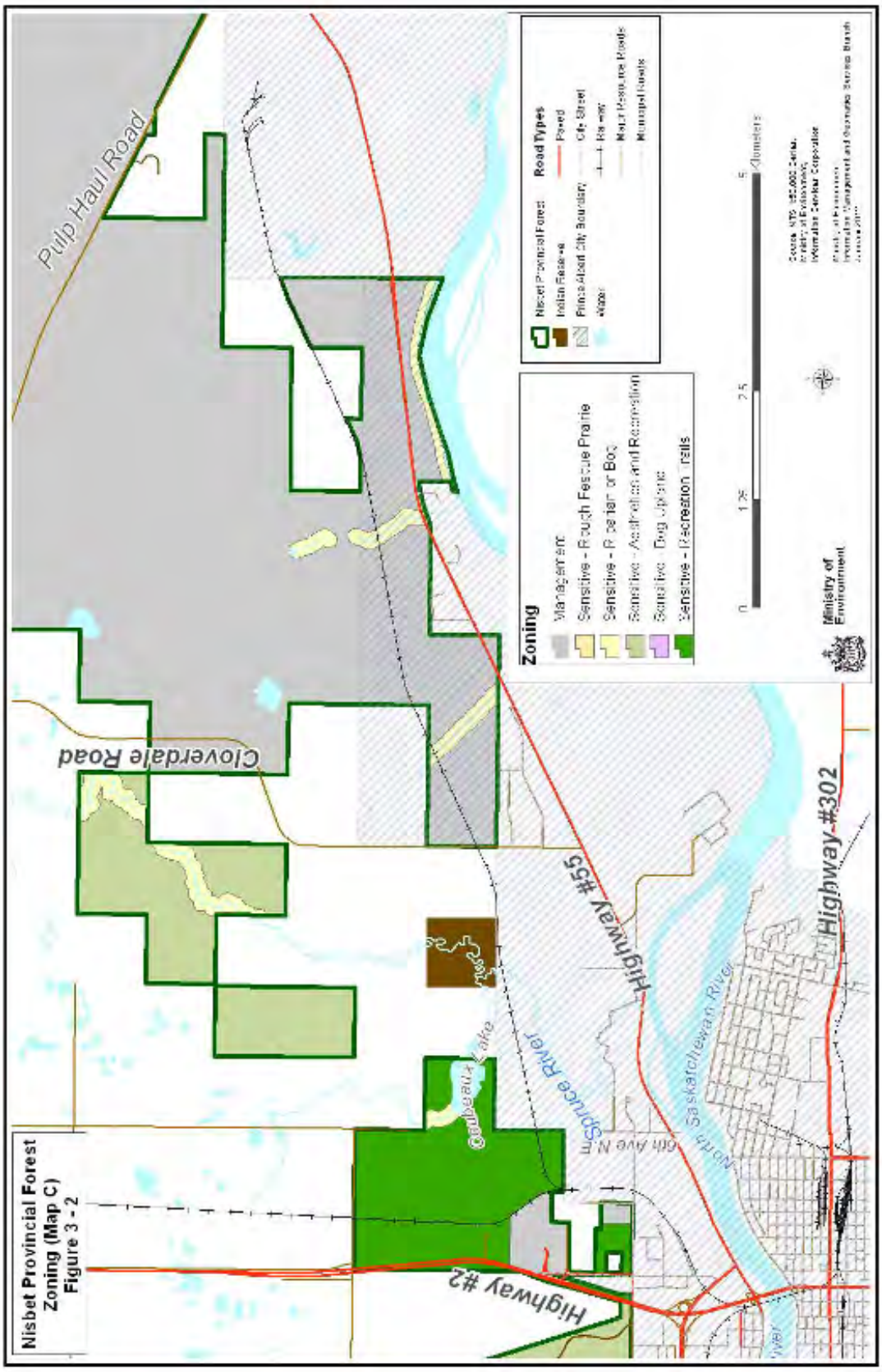
Nisbet Provincial Forest
Zoning (Map C)
Figure 3 - 2
Pulp Haul Road
Cloverdale Road
Highway #2
Highway #55
Highway #302
Spruce River
Saskatchewan River
6th Ave N.W.
Zoning
Management
Sensitive - Rough Fescue Prairie
Sensitive - Riparian or Bog
Sensitive - Aesthetics and Recreation
Sensitive - Bog Uplands
Sensitive - Recreation Trails
Road Types
Paved
City Street
Major Resource Roads
Municipal Roads
Prince Albert City Boundary
Water
Ministry of Environment
0
12.5
25
Kilometers

3.1 PROTECTED ZONE

There are two categories in the protected zone: Provincial Representative Areas; and Sites of Historical, Cultural or Archaeological Significance

PROTECTED ZONE MANAGEMENT OBJECTIVES:

1. The protected zone is intended to protect:
    - Geographic areas that are unique and /or important provincially (such as provincially representative, prairie fescue ecosystems etc); and
    - Areas identified as having significant historical/cultural/archaeological features.
2. Industrial activity or human access to these areas may negatively affect the functioning or significance of the features identified in the protected zone. The greatest level of land use restriction will apply to this zone.
3. These areas are identified using the best available science and information, and are managed to support the identified natural, geographic, historical, cultural or archaeological features in need of protection.

MANAGEMENT POLICIES:

1. Land use activities and developments that involve surface disturbances are highly regulated, or not allowed.
2. Forest management activities in protected management zones will be done only to support or enhance the value identified, public safety, or overall forest ecosystem health and sustainability. When forest management activities or other developments are proposed in this zone, additional public notice is recommended prior to approval.
3. Refer to Zoning Table1-1 for permitted, conditional or not permitted uses.

3.1.1 PROTECTED – PROVINCIAL REPRESENTATIVE AREAS

MANAGEMENT OBJECTIVES:

1. Manage representative areas according to provincial representative areas management objectives.

MANAGEMENT POLICIES:

1. Areas in the Nisbet Forest managed under The Parks Act are designated as part of the Provincial Representative Areas Network (RAN), and are shown on Zoning (Map A) Figure 2-1.
2. Conditional or restricted uses are identified in management plans developed specifically for RAN sites.
3. Additional lands may be considered for designation under the Provincial RAN, subject to ministry and public review.

3.1.2 PROTECTED – SITE OF HISTORICAL, CULTURAL OR ARCHAEOLOGICAL SIGNIFICANCE

MANAGEMENT OBJECTIVES

1. Manage areas for their physical, historical, cultural or archaeological features or significance.

MANAGEMENT POLICIES:

1. Site information for historical and archaeological sites is normally mapped and maintained by TPCS. The internal zoning map shows areas where TPCS indicate Protected Zone is required, and/or areas having a potential for archaeological sites.
2. Ministry mapping can identify location of significant features, reasons for and level of protection needed, and which provincial ministry, Aboriginal government, or municipal government requests zoning protection.
3. There is one area identified in the plan (Figure 2-3) as protected because of its cultural significance: Parcel A, surveyed in the N ½ of Section 2, Twp 45, Rge 1, W3M, surrounded by the One Arrow Reserve. For uses listed in Zoning Table 1-1 as conditional, refer application to Tourism, Parks, Culture and Sport for comment.
4. Refer to Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.2 SENSITIVE ZONE

There are seven categories of sensitive zone: Rough Fescue Prairie; Wild Species at Risk; Riparian; Sensitive Bog Upland; Recreation Trails; Aesthetic & Recreation; and Research.

SENSITIVE ZONE MANAGEMENT OBJECTIVES:

1. This zone is intended to sustain the sensitive value identified. Activities restricted, requiring special management practices, or not allowed in sensitive zones will vary, based on the value identified.

MANAGEMENT POLICIES:

1. Forest management activities in sensitive management zones will be carried out only when considering the value identified and/or overall forest ecosystem health and sustainability and/or public safety. When forest management activities or other developments are proposed, additional public notice is recommended prior to approval.
2. Refer to Figure 3-2 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.2.1 SENSITIVE – ROUGH FESCUE PRAIRIE ECOSYSTEM

The rough fescue prairie ecosystem is a plant community that has been largely overtaken or destroyed by agricultural activity across Canada. Where possible, known areas of

Rough Fescue Prairie were included in Representative Area boundaries and as such, receive protected status accorded to that zone.

MANAGEMENT OBJECTIVES

1. Manage areas confirmed to have rough fescue prairie ecosystems so as to protect or enhance rough fescue prairie ecosystem functioning.

MANAGEMENT POLICIES:

1. These sites should not be disturbed by intensive heavy machine traffic, and should be left to nature for renewal.
2. Management actions that serve to enhance the rough fescue prairie ecosystems may be required.
3. Refer to Figure 3-1 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.2.2 SENSITIVE – WILD SPECIES AT RISK

MANAGEMENT OBJECTIVES

1. Protect areas where provincially and/or federally listed wild species at risk have been confirmed.

MANAGEMENT POLICIES:

1. There are currently no confirmed occurrences of species listed by legislation as "threatened" or "endangered" in the Nisbet Forest. However, there are confirmed sites for species considered as vulnerable, listed with the Conservation Data Centre. These confirmed locations are identified on zoning map Figure 2-3 as "Sensitive -Species at Risk" locations.
2. Refer to Zoning Table 1-1 for permitted, conditional or not permitted uses. Because each vulnerable or provincially protected species has unique habitat requirements, a ministry ecologist / biologist will help determine permitted, conditional or not permitted uses.
3. Where possible, leave these areas to nature for renewal after natural disturbance

3.2.3 SENSITIVE – RIPARIAN

MANAGEMENT OBJECTIVES

1. The intent of this zone is to sustain wetland areas and riparian areas that are sensitive to human use and development. For this plan's zoning purposes, fisheries reserves are considered as riparian zones.

MANAGEMENT POLICIES:

1. Once adopted, if fisheries reserves are removed from the Riparian Harvesting Standards and Guidelines for the Nisbet Forest, this zone will correspond to the new riparian descriptions.

2. Refer to Figure 3-2 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.2.4 SENSITIVE – BOG UPLAND

MANAGEMENT OBJECTIVES

1. Management intent for these areas is to sustain the functioning of bog areas.

MANAGEMENT POLICIES:

1. Minimize changes to the forested upland natural surface water/groundwater regime.
2. Refer to Figure 3-1 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.2.5 SENSITIVE – AESTHETICS AND RECREATION

These areas are located adjacent to the residential developments north and north east of Prince Albert. Consideration will be given to rezoning portions of this area to further enhance the opportunities associated with the zoning for the area.

MANAGEMENT OBJECTIVES

1. These areas are managed for their high recreation and aesthetic value.
2. This zone is intended to minimize disturbances that may reduce recreation enjoyment, aesthetics and safety.

MANAGEMENT POLICIES:

1. Activities normally associated with this zone are cross-country skiing, hiking, interpretive activities, snowshoeing, cycling/mountain biking, horseback riding, walking dogs and motorized recreation.
2. Refer to Figure 3-1 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.2.6 SENSITIVE – RECREATION TRAILS

These areas include cross country ski trails developed by organized clubs prior to this land use plan (see Figure 2-8 and Figure 2-9).

MANAGEMENT OBJECTIVES

1. These areas are managed with extra consideration for aesthetics and non-motorized recreation values. Due to the nature of the trail activity, this zone is intended to provide increased recognition from other forest uses (mainly industrial disturbances or other recreation activities that cause safety or aesthetic concerns), or trail disturbances from other uses (e.g. all terrain vehicles).

MANAGEMENT POLICIES:

1. Activities normally associated with this zone are those identified in Sensitive – Aesthetics and Recreation. Efforts will be made through education and signage to minimize conflict with motorized recreation.
2. Refer to Figure 3-1 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.2.7 SENSITIVE – RESEARCH

MANAGEMENT OBJECTIVES

1. These areas are managed for long-term scientific research and/or monitoring activities and as such should not be disturbed in such a way that continued monitoring is jeopardized.

MANAGEMENT POLICIES:

1. The Forest Management Effects Monitoring Program has sites that are 120 m x 140 m. The sizes of the sites provide sufficient buffering from activities.
2. CFS sites must have a non disturbance (forest clearing) buffer of at least 50 m around them.
3. Consultation with the ministry's Forest Service is required if disturbance activity is proposed in areas close to PSP sites.
4. Refer to Figure 2-3 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

3.3 MANAGEMENT ZONE

MANAGEMENT OBJECTIVES:

1. This zone is managed for multiple uses.

MANAGEMENT POLICIES:

1. Refer to Figure 3-1 and Zoning Table 1-1 for permitted, conditional or not permitted uses.

4 IFLUP IMPLEMENTATION

The ministry recognizes the importance of public participation in implementing, monitoring, assessing and amending this integrated forest land use plan.

The Nisbet IFLUP will be implemented by a number of provincial government ministries. The ministry will lead implementation of the plan, working with its clients and partners to achieve the land use objectives and management actions identified herein. Many of the actions require a collaborative effort; the ministry will continue to work closely with members of the public, First Nations governments, stakeholders and business interests as well as special interest groups and NGOs to move forward on recommended Objectives, Policies and Actions.

While the involvement of all are welcome and will continue to be encouraged, the ministry will create an advisory group to formally assist the ministry with implementation and ongoing assessment and monitoring of the plan. Under the FRM Regulations, the plan must be reviewed on a regular schedule as identified within the plan, to ensure the objectives and actions remain current. In addition to the formal review, efforts identified in this plan will be regularly monitored and assessed.

Members of the advisory group will meet to review implementation plans and to provide advice and guidance to the ministry. This group will also provide an opportunity for First Nations, Métis and communities in the planning area to continue to work with the province to implement the direction forthcoming from the Nisbet IFLUP.

IMPLEMENTATION OBJECTIVES:

1. Implement plan policies and management actions, starting after plan approval.
2. Continue with public consultation after plan approval.
3. Track changes in the land base and land uses as part of the monitoring and review process as a means to amend the plan and keep it current.

MANAGEMENT POLICIES:

1. Continue to assess and monitor implementation of plan.
2. Plan policy and management actions are carried out in accordance with legislation, policy and guidelines, and according to ecosystem-based management principles. Management plans developed by the ministry will incorporate relevant sections of the IFLUP.
3. Activities associated with plan implementation will identify further research, consultation and actions required to achieve the plan's goal. The plan will be amended accordingly.
4. The ministry will work collaboratively with municipal governments, other provincial government agencies and ministries, the federal government, First Nations, Métis and forest users to uphold objectives and management actions in this plan.
5. Monitoring for resource management change as it applies to the planning area, its resources and people will be part of plan implementation. New information will be incorporated into this plan during the plan review process as part of the ongoing commitment to amend the Plan and keep it current.
6. The ministry will oversee a review of the IFLUP with the public committee every five years, and ensure the review is made available to the public.

PUBLIC ADVISORY COMMITTEE DISPUTE RESOLUTION

Land use planning is inherently complex. The process requires that the interests of a range of uses and users be considered. At times, the use of the resource base can lead to differences of opinion between participants and require the application of dispute resolution techniques. Dispute resolution techniques are used often very effectively, to find solutions that satisfy all parties.

Generally speaking, there are two different approaches to handling conflicts or disputes: preventative-based actions and resolution-based actions.

Preventative-based actions are those that focus on early engagement – the objective being to eliminate conflicts or concerns from arising in the first place. Having effective communications and an established process for engaging stakeholders and residents early in the planning process is an essential way of preventing conflicts and concerns from arising.

For everyone involved in developing land use plans, some preventative-based approaches to consider include the following:

1. Ensure there is appropriate representation and participation of stakeholders from communities within the planning area, designating equal responsibility for each representative (or their alternate) to attend each meeting, and to participate meaningfully in discussion and decision-making.
2. Encourage participants to listen attentively to others, and understand that other participants' interests are equally valuable to their own.
3. Encourage all participants to provide information and engage in discussion in a clear, understandable, respectful, and rational manner.

In the event that a conflict or conflicts cannot be resolved through discussion, there is a formal dispute resolution process. The following process describes the resolution-based approach that is in place.

1. Resolution should begin with collaborative problem-solving processes with consensus as a desired outcome.
2. The formation of a regional advisory committee for the Nisbet planning area will assist in resolving disputes and also provide a framework for managing future conflict.
3. The settlement of the dispute (consensus recommendation) would then be forwarded to the appropriate Cabinet Minister(s) for approval.
4. If full agreements are not achieved within the regional advisory committee setting, areas of agreement and disagreement should be recorded, including potential options, and forwarded to appropriate Cabinet Minister(s) for resolution.

MANAGEMENT ACTIONS:	Agency Responsible	Time Frame to Complete
Develop a ministry implementation and monitoring team.	Ministry of Environment	Priority 1 (1-2 years)
Develop a public advisory committee to provide advice to the ministry on: plan implementation, monitoring, assessing, and amending the Plan.	Ministry of Environment	Priority 1 (1-2 years)
Report annually on implementation progress. This annual report will focus on the efforts and achievements of both the implementation and monitoring team and the public advisory committee. Share results with the public through printed reports, and website posting.	Ministry of Environment	Priority 1 (1-2 years)

With the help of the public advisory committee, develop a structured assessment framework prescribing objectives and strategies for monitoring and assessing the results of implementing the plan.	Ministry of Environment	Priority 2 (3-5 years)
Conduct a thorough review every five years as a means to assess progress being made towards the objectives set out in the Plan. Share the results with the public and use the review as a guide for amending the plan.	Ministry of Environment	Priority 2 (3-5 years)

5 LIST OF ACRONYMS/ ABBREVIATIONS USED IN THIS PLAN

ATV – All-Terrain Vehicle

CDC – Conservation Data Centre

CFS – Canadian Forest Service

COR – Commercial Outdoor Recreation

FEC – Forest Ecosystem Classification

FMA – Forest Management Agreement

FMEMP – Forest Management Effects Monitoring Program

FNIFMI – First Nations Island Forests Management Inc.

FRMA – The Forest Resources Management Act

FRM Regulations – The Forest Resources Management Regulations

HVS- Harvest Volume Schedule (for forest products harvesting)

IFLUP – Integrated Forest Land Use Plan

MER – Ministry of Energy and Resources

MHI – Ministry of Highways and Infrastructure

MUP – Miscellaneous Use Permit

NFCA – Northern Fur Conservation Area

NFP – Natural Forest Patterns

Nisbet Forest – Nisbet Provincial Forest

NSR – Not Sufficiently Restocked

NTFP – Non Timber Forest Product

P & D Act – The Planning and Development Act

PESP – Permanent Ecological Sample Plot

RAN – Representative Areas Network

SAR – Species at Risk

SRC – Saskatchewan Research Council

SWA – Saskatchewan Watershed Authority

TPCS – Ministry of Tourism, Parks, Culture and Sport

TSL – Term Supply License

6 GLOSSARY

Aboriginal: includes the Indian, Inuit and Métis peoples of Canada, as per section 35(2) of The Constitution Act, 1982

Adaptive management: an approach to making management decisions about complex and unpredictable systems, including ecosystems, which emphasizes conscious experimentation and continuous learning from the experience. (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

All terrain vehicle (ATV): any self-propelled vehicle designed primarily for off-road way travel on or immediately over unprepared surfaces and includes:

a) amphibious vehicles;

b) ground-effect or air-cushioned vehicles;

c) vehicles with four-wheel drive;

d) motor cycles;

e) motorized snow vehicles and toboggans; and

f) trailers and any other attachment to a vehicle described in this definition. (Source: The Parks Regulations, 1991)

Biodiversity (biological diversity): includes all species of plants, animals and microorganisms and the ecosystems and ecological processes of which they are parts. (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

Casual recreation: generally involves a single user, or a small number (less than five) of users. The recreation activity is not considered to be organized recreation.

Carrying capacity: the average number of livestock that can graze an area for a specific number of days without causing range degradation (Source: The Forest Resources Management Regulations, April 1999)

Commercial outdoor recreation (COR): activity that is primarily non-consumptive, and has a minimal or limited impact on the resource base and takes place on Crown resource land or provincial park land. COR activities refer to the event or endeavor such as hiking, bird watching, canoeing, horseback riding, or snowmobiling. (Source: Commercial Outdoor Recreation Activities and Developments on Crown Resource Land Ministry of Environment Policy #: SLMB 01)

Commercial outdoor recreation (COR) developments: the physical improvements that are constructed to facilitate COR activities such as warm-up shacks, lodges or trails. (Source: Commercial Outdoor Recreation Activities and Developments on Crown Resource Land MINISTRY OF ENVIRONMENT Policy #: SLMB 01)

Consultation: procedures for assessing public opinion about a plan or major development proposal, or in the case of a planning application, the means of obtaining the views of affected neighbors or others with an interest in the proposal.

Consensus: general agreement in principle that does not imply total or unanimous agreement. An agreement reached through consensus may not satisfy each participant's interests equally or receive a similar level of support from all participants, but participants "can live with" the outcome. A lack of consensus indicates differences in opinion.

Crown land: any land vested in the Crown in right of Saskatchewan. (Source: The Forest Resources Management Act, July 1999)

Crown resource land: all lands administered BY THE MINISTRY other than park land within the meaning of The Parks Act but does not include any Crown mineral or Crown mineral lands within the meaning of The Crown Minerals Act (Source: The Forest Resources Management Act, July 1999)

Development: the carrying out of any building, engineering, mining or other operations in, on or over land or the making of any material change in the use or intensity of the use of any building or land. (Source: The Planning and Development Act, 1983)

Dues: any money owed to the Crown pursuant to this Act, the regulations or a license, for rights to harvest forest products. (Source: The Forest Resources Management Act, July 1999)

Ecoregion: a subdivision of the ecozone characterized by distinctive large order landforms or assemblages of regional landforms as expressed by vegetation, soils, water, and regional human activity patterns or uses. Saskatchewan contains 11 terrestrial ecoregions. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Ecosystem: an interdependent system consisting of all the living organisms in a given area, all the physical and chemical factors of their environment and the processes that link them. (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

Ecosystem-based management: the integrated management of ecological systems and human activities to maintain or enhance the health and integrity of an ecosystem, including ecosystem function and structure. (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

Ecotourism: enlightening nature travel experience that contributes to conservation of the ecosystem and economic resources of the host communities. (Source: Saskatchewan Nature & Ecotourism Association. http://www.ecotourism.sk.ca/). Ecotourism is a type or subset of tourism.

Environment: the air, land, water, and all living things, including human beings, as well as the social, economic, and cultural conditions influencing humans and the natural world of which they are part.

Environmental Management System: a system used by an organization to implement environmental policy and to manage environmental aspects.

Event (pertaining to forest harvesting or fire): harvesting events are comprised of one or more disturbance patches and their intervening undisturbed matrix, and are defined (in a GIS sense) by the gross area described by a collection of disturbance patches that are no more than 500m from each other. Disturbance patches beyond 500m from each other are considered to be in separate events. The gross event area is defined as the area of all

disturbance patches and undisturbed matrix. The net event area is just the total area of the disturbance patches. The same rationale applies to fire events. (Source: Natural Disturbance Emulation Standards and Guidelines for the Saskatchewan Provincial Forest - 2006 draft)

Exotic plant: a plant that is not native to provincial forest land, and that: (a) is capable of impeding the growth or survival of native plants; or (b) may have a negative impact on the functioning of the forest ecosystem. (Source: The Forest Resources Management Act, July 1999)

Extirpation: the localized extinction of a species, although the species still lives elsewhere.

Fees: any money, other than dues, including administrative penalties, interest charges and fees for renewal of forest products, reforestation, fire protection and suppression, forest inventory, seedlings and insect and disease control, that is owed pursuant to this Act, the regulations or a license, to: (i) the Crown; or (ii) a forest management fund. (Source: The Forest Resources Management Act, July 1999)

Fisheries reserves: no forest operations for:

a) 90 metres along each side of the N. Sask. River, S. Sask. River, Sturgeon River, Spruce River, on either side of Miners Creek for 1 mile from the N. Sask. River, and around the trout ponds in the Nisbet Trails Rec. Site and Steep Creek.
b) 15 metres for Miner's Creek, Bennett Creek, and all small creeks draining into the North Sask. River.

Fisheries reserves are identified as sensitive zones in this plan's management zoning section and zoning maps.

Fire break: also referred to as a fire guard. Any natural or constructed barrier utilized to segregate, stop and control the spread of fire or to provide a control line from which to fight a fire. This is an area that is generally 20-30 feet wide or more, in which all vegetation is removed down to the mineral soil. A firebreak is reworked and maintained each year prior to the fire season.

Forest management: the practice of applying scientific, economic, philosophical, and social principles to the administration, utilization, and conservation of all aspects of forested landscapes to meet specified goals and objectives, while maintaining the productivity of the forest. Forest management includes the subset of activities known as forest operations, but also involves planning and managing forested landscapes for fish and wildlife, biodiversity, conservation measures, parks, wilderness, recreation, cultural values and aesthetics. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Forest Effects Monitoring Program: a MINISTRY OF ENVIRONMENT monitoring program designed to evaluate the results of forest management activities against the results of natural disturbances. By determining the differences between the results of the two disturbances, forest management practices can be adjusted to mitigate their impacts on the health of the forest ecosystem.

Forest management plan: a long-term plan for the management of a license area. The plan includes the establishment of values, objectives, indicators and targets for

management, assessment of sustainability over a forecasted period of at least rotation age, public consultation and review and a tactical plan to provide for linkage to future operating plans for the area. The Forest Resources Management Act and Regulations in Saskatchewan govern preparation, submission and approval of a forest management plan. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Forest planning manual: one of four provincial manuals. The Forest Planning Manual provides guidance and direction for industrial operations in the management of forest resources on provincial Crown lands.

Forest products: all vegetation on or from forest land or waters on or associated with forest land, whether alive, dead or cut, and includes trees, shrubs, herbs, grasses, mosses, fungi and any parts or components of that vegetation. (Source: The Forest Resources Management Act, July 1999)

Forest resources: all resources and values associated with forest ecosystems, whether biotic, abiotic, social or economic. Includes animals, vegetation, land, water, air and recreational, spiritual and heritage values but does not include any Crown mineral within the meaning of The Crown Minerals Act. (Source: The Forest Resources Management Act, July 1999)

Forest stands: a contiguous aggregation of trees occupying a specific area and uniform enough in species composition, age distribution to be distinguished from an adjacent aggregation of trees. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Forestry: forest management. (see forest management)

Fuel break: a strip or block of land (of varying width) depending on fuel and terrain, in which fuel density is reduced, thus improving fire control opportunities. This can include the removal and renewal of fire susceptible species, which provides an access from which to fight a fire; or it can be the thinning of stands. When stands are thinned, remaining trees are pruned to remove ladder fuels. Most brush, heavy ground fuels, snags and dead trees are removed and an open, park-like appearance is established.

Hardwood (deciduous): a broad-leafed tree, losing its leaves (or a proportion of them) at the end of a season's growth. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Harvest: to cut, pick, gather, collect, accumulate, alter, disturb or remove forest products by any means, and includes the grazing of livestock. (Source: The Forest Resources Management Act, July 1999)

Harvest volume schedule: the maximum sustainable timber volume that can be harvested each year, as determined or approved by the minister, and includes a timber depletion schedule (Source: The Forest Resources Management Regulations, April 1999)

Heritage property:(i) archaeological objects; (ii) palaeontological objects; or (iii) any property that is of interest for its architectural, historical, cultural, environmental, archaeological, palaeontological, aesthetic or scientific value; and (iv) any site where any object or property mentioned in subclauses (i), (ii) or (iii) is or may reasonably be expected to be found. (Source: The Heritage Property Act)

Independent operators: individuals who have been granted permission (a forest products permit) by the ministry to cut timber.

Indicator: a variable that represents the state or condition of a specific objective and element and for which one or more targets are set. It is a quantitative or qualitative variable, which can be measured or described, and which when observed periodically demonstrates trends. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Industrial activity: includes commercial timber harvesting (green or salvage harvesting); forest renewal; commercial harvesting of non-timber forest products, sand and gravel exploration or extraction; mineral, oil, gas exploration or developments; and their associated access roads.

Invasive exotic species: species that are non-native or alien to the ecosystem under consideration, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

Island forests: Canwood, Nisbet, Fort a la Corne and Torch River Provincial Forests.

Landscape: a unit of land defined chiefly by a distinctive combination of landforms and biotic communities, ranging in size from small watersheds to larger topographic regions.

Lease: (issued pursuant to The Provincial Lands Act, or The Crown Resource Lands Regulations) means any agreement creating a legal tenancy between the Crown as landlord and individuals or corporations as tenant in respect of Crown resource land to be used exclusively for a specific purpose. Leases are generally for a 10 to 21 year term.

Licensee: a holder of a licence as defined in The Forest Resources Management Act. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Livestock: cattle and horses as per The Forest Resources Management Regulations

Management strategies: long-term plans of forest management actions designed to achieve economic, social, and ecological goals. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Management unit: an area of provincial forest designated as a management unit by the minister for the purpose of coordinating policies, programs and activities to guide and regulate existing and potential uses of land within that management unit (Source: The Forest Resources Management Act).

Minister (the): The Minister of The Ministry of Environment.

Monitoring: the collection and analysis of data over extended periods of time. It provides information on past and present ecological, social, cultural, and economic trends, and a basis for predictions about future conditions. The monitoring process is an essential component of the process of adaptive management and continual improvement in forest management, providing measurement of progress towards stated objectives. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Natural Forest Patterns (NFP): natural Forest Patterns uses forestry to produce landscapes and harvest blocks that look and function more like the landscapes and disturbance patches created by natural disturbances such as fire. Emulating natural

disturbance patterns is pursued as one important process for maintaining biodiversity and productivity across the managed boreal forest landscape. It is theoretically and practically impossible to exactly replicate the effects of natural forces in the ecosystem. However, moving industrial forestry closer to natural patterns is expected to increase the likelihood that the effects of forestry will become less obtrusive and more benign. (Based on: Natural Disturbance Emulation Standards and Guidelines for the Saskatchewan Provincial Forest - 2006 draft)

Natural Range of Variation (NRV): that range of features found in the natural boreal forest, in the absence of significant human industrial influences. For example, the target natural range of variation in green residuals for forest harvest blocks for the purposes of this standard has been estimated as the range of variation in residuals found within a set of 29 fires, of varying size, from across the southern boreal forest in Saskatchewan. (Source: Natural Disturbance Emulation Standards and Guidelines for the Saskatchewan Provincial Forest - 2006 draft)

Non-timber forest products: for the purpose of this plan means forest products, other than trees, harvested in the Nisbet Provincial Forest for personal, cultural or commercial use.

Non-timber forest value: A value of the forest other than timber. It may include, but is not limited to, biological diversity, fisheries, wildlife, minerals, water quality or quantity, recreation, tourism, culture, heritage, wilderness or aesthetics. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Not sufficiently regenerated (NSR): an individual survey plot, portion of a harvest block, or an entire harvest block that did not meet regeneration assessment standards for the type of survey conducted.

Old growth: a forest ecosystem or stand dominated by old trees that have originated naturally and in which the genetic, species and structural diversities have not been significantly changed by human activity. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Operating plan: means an operating plan required to be approved by the minister pursuant to The Forest Resources Management Act, 1999

Organized recreation: recreation activities that are carried out by a structured organization or entrepreneur, having conditions and rules for a recreation event. This could include, but not limited to pre-registration, planning, advertising, monitoring and working an event. Sponsors may be involved.

Outfitting: in exchange for a fee, financial gain or reward, outfitting includes providing or organizing the following services for clients in connection with angling or hunting:

a) (i) the services of a guide;
b) (ii) equipment and accommodation;
c) (iii) any combination of the services mentioned in subclauses (i) and (ii).

Own use: the removal of forest resources, such as trees and other forest plants, for personal use. The product is not to be used for commercial use.

Peat: partially decomposed organic plant material (usually sphagnum) that has accumulated under saturated conditions. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Permit: (issued pursuant to The Provincial Lands Act, or The Crown Resource Lands Regulations): any instrument, other than a lease, permitting a person to use Crown resource land to be used exclusively for a specific purpose. Permits are for a maximum of one year. Permits can be issued for the same uses as leases, and do not allow for exclusive use.

Provincial manuals: four legislated manuals, prepared pursuant to The Forest Resources Management Act and Regulations. The four manuals – Forest Planning, Forest Operations, Compliance, and Scaling –contain details on objectives, procedures, standards, and guidelines to be followed by an industrial licensee when undertaking forest operations.

Public utility corridor: means the legal right of way for power lines (above or below ground), communications lines (above or below ground), gas lines, water lines, or any other utility lines.

Reclamation: refers to the process of re-contouring and re-vegetating an area to an ecologically or socially acceptable use after natural resource extraction or other development occurs.

Reforestation: means the natural or artificial restocking of an area with trees and includes any activity specified in a license or approved plan that is associated with growing and maintaining trees. (Source: The Forest Resources Management Act, July 1999)

Renewal: means the natural or artificial renewal of any forest product and includes:(i) reforestation; or (ii) any activity specified in a license or an approved plan that is associated with growing and maintaining forest products. (Source: The Forest Resources Management Act, July 1999)

Regeneration: the renewal of a forest, by natural or artificial means or the term used to describe the young forest itself. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Representative Areas Network (RAN): a network of legally designated ecologically important lands and waters, which represent the diversity of Saskatchewan's varied landscapes and biological resources. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Resource trails: trails developed some time ago, but are not currently used for resource development.

Riparian: relating to the banks or shoreline of a river, stream, wetlands or body of water that contains vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas.

Riparian areas*:* riparian areas are interfaces between terrestrial and aquatic ecosystems. Gradients in environmental conditions, ecological processes, and species composition make these areas some of the most structurally and functionally diverse and dynamic

portions of forested landscapes. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Salvage harvest: the harvesting of timber that has been killed or damaged by natural causes, such as fire, wind, flood, insects and disease. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Significant cultural sites*:* sites identified by First Nations or Métis as being associated with the community's cultural practices or beliefs. The land on which these sites are located is rooted in the community's history and is important to maintain the continuing cultural identity of the community.

Significant features: rare or unique physiographic occurrences (e.g. ochre sites)

Significant wildlife habitat*:* wildlife habitat sites that the Ministry of Environment determines are sensitive to certain human activities and/or development.

Silviculture: the theory and practice of controlling the establishment, composition, growth, and quality of forest stands to meet the objectives of management.

Silvicultural keys: descriptions of generally accepted or recommended forest management practices that are based on a series of decisions for defined site conditions and site objectives. They can be considered as "recipes" to assist in assuring a future forest.

Site of a special nature: pictograph, petroglyph, human skeletal material, burial object, burial place or mound, boulder effigy or medicine wheel (Source: The Heritage Property Act).

Site preparation: any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment favorable for survival of acceptable trees. This environment can be created by altering the ground cover, soil, or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides, or a combination of methods. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Soil: the naturally occurring unconsolidated mineral or organic material at least 10 centimetres thick that occurs at the earth's surface and is capable of supporting plant growth. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Softwood (conifer): a tree that usually, but not always, has needle leaves or scale leaves and that bears separate male and female cones. It is usually, but not always, evergreen. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Species composition: a listing of the primary tree, shrub, or herb species that contributes to a given layer of vegetation. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Species diversity: species diversity is the variety and relative abundance of species found within an area.

Stakeholder: anyone who feels that his/her interests will be affected by the outcome of a decision-making process. These interests may be financial, or may include other human values such as natural justice, religious values, ecological principles, or environmental protection.

Stand tending: activities such as thinning, spacing, removal of mistletoe infected trees, and weed and brush control, carried out in already established stands. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Standard: means a specific measurable activity, result or unit of measure established by the minister and described as a standard in a manual established pursuant to section 19.1 of The Forest Resources Management Act.

Stewardship: the individual and corporate responsibility of one generation to maintain the natural inheritance that it has received, both for its benefit and for the benefit of future generations. (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

Stocking rate (for cattle): means the actual number of livestock authorized to graze on a license area for a specific period, which is not to exceed the carrying capacity.

Surety: security; property that a creditor can claim in case of default on (lease) obligations.

Sufficiently regenerated: a state or condition where an individual survey plot, portion of a harvest block, or an entire harvest block meets regeneration assessment standards for the type of survey conducted. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Sustainable use: ecologically sustainable use is human use that ensures the capacity for ecosystems to renew themselves, ensuring continued availability for future generations. (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

Sustainability: the ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Sustainable forest management: management to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social, and cultural opportunities for the benefit of present and future generations. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Term supply license: a license granted by the minister pursuant to section 42 of The Forest Resources Management Act.

Tourism: the occupation of providing information, accommodations, transportation and other services to tourists.

Trail agreement: a type of land disposition. Authorization to use a particular piece of land for a specific use may be negotiated between the Ministry of Environment and another party. A trail agreement could be used for nature trails or recreation trails such as snowmobiling or cross-country skiing. An agreement does not allow for exclusive use, and it would typically be for seasonal use.

Treaty rights: communal rights provided for in treaties made between First Nations of Canada and the Government of Canada.

Treaty land entitlement: treaty land entitlement is a process where the federal and provincial governments of Canada are fulfilling treaty commitments of land made to First Nations. (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Value: a characteristic, component, or quality considered by an interested party to be important (e.g. a healthy forest). (Source: Forest Planning Manual, Saskatchewan Environment, July 2004)

Values at risk: values that have measurable and intrinsic worth (human made or natural) that could be destroyed or damaged by wildfire. This can include human developments such as residential or industrial developments, important natural areas, silvicultural areas and recreation areas.

Vehicle: any conveyance for transporting people or forest products on land, over water or in the air. (Source: The Forest Resources Management Act, July 1999)

Watershed: a discrete geographic area within which all water would drain to a single outlet (Source: *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009*)

Wetland: land where the water table is at, near or above the surface or which is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or "peatlands," and mineral wetlands or mineral soil areas that are influenced by excess water but produce little or no peat (Source: *Federal Policy on Wetland Conservation – Implementation Guide for Federal Land Managers, Wildlife Conservation Branch, Canadian Wildlife Service, Environment Canada. 1996*). Wetlands include bogs, fens, swamps, marshes and shallow water.

Wild species at risk: any native wild species that have been designated and listed by the Lieutenant Governor in Council pursuant to subsection 49(1) as extirpated, endangered, threatened or vulnerable. Source: (The Wildlife Act, 1998)

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8 APPENDICES

APPENDIX 1-1

ADVISORY COMMITTEE PARTICIPANTS

ATV / Recreation: Bev Hinz

Beardy's and Okemasis Band: George Mike

Buckland Cooperative Volunteer Fire Fighters: Jim Miller

City of Prince Albert: Ray Morgan, Greg Zeeben

Ducks Unlimited: Mark Kornder, Gerard Letain, Leah Filson,

Educational: Harold Fisher

Federation of Saskatchewan Indian Nations (FSIN): Chris LaPlante, Ryan Kay

First Nations Island Forests Management Inc.: Ron Burns

Forest Harvesting: Fred Wilkinson, Ross Barton, Noel Lorenson

Forest Tree Planting: Gordon Pocha

General Recreation: Morris Morton, Ken Murray, Pat Bliss, Floyd Schupe, Cameron Kripki, Brent Perasalo,

General Public: Val Drummond, Bente Huntley, Francis Yungwirth, Stan Neufeld, Gordon Mierke, Leo Leduc

Gravel Extraction: Art Wright, Rob Brown (also attended: Bill Barzeele, Ray Bruce, Robert Dewherst, Perry Dmyterko, Boris Mamchur)

Grazing: Garry Sinclair (and trapping), Dennis Neurdorf , Merril Klimik, (also attended: Wayne Steene, Raymond Blakeney)

Holbein Community Club: Cliff Bunt, Barb Soles

Jack Pine Stables: Darlene Mullis, Lawrence Mullis

Métis Western Region 2: Stuart Pocha, Barry Robertson

Métis Nation of Saskatchewan: George Morin

Muskoday First Nation: Ed Bear

Nature Prince Albert: Sandra Jewell, Keith Dodge, Peter Griffiths, Carman Dodge

Nature Saskatchewan: Myron Barton

Non-Timber Forest Products Harvesting: Marie Symes-Grehan, Sylvia Pocha

Nordic Ski Club – Saskatoon: Heather-Dawn Bernhard, Gerhard Freund, George James

One Arrow First Nation: Yvonne Paul, Terry Prosper

Prince Albert Cross Country Ski Committee, Prince Albert Ski Club: Roger Devine, Doug Dietrick

Prince Albert District Planning Commission: Kelly Foisey, Cathy Coles

Prince Albert Wildlife Federation: Bart Smith, Larry Worobetz

R.M. of Buckland: Olive Thoms, Orest Romanchuk, Steve Zurevinski, Harvey Mckeen, Bill Hayes

R.M. of Duck Lake: Raymond Blanchard, Lucien Forseille

R.M. of Shellbrook: Ken Danger

River North Acreage Association: Rene Bourassa

Sask Nature and Ecotourism Association: Joe Hnatiuk, Jackie Carter

Saskatoon Snowmobile and ATV Club: Bill Ziegler, John Popoff

Shellbrook Snowmobile and ATV Club: Murray Tait

Town of Duck Lake: Lance Grosco, Ryan Grosco

Tourism: Noel Jenson, Leo Omani

Wahpeton Dakota Nation: Ken Crowe

Also participated: Bob Potter, Greg Magnisson, Wes Laroque, Dennis Laroque, Les Hunter, Kristine Hirschkorn, Nairn Gilles, James Cathcart, Annette Brockman, Rene Blom, Clynton Vaughan, Raymond Wall, Ben Webster, Paul Jantzen, Dan Barton, Leo Cameron, Martin Donahue, Ron Moniuk, Brent Persalo, Larry Busser, Paul Ross, Doug Barks, Dave Pochailo, Orest Gresiuk

APPENDIX 1-2
OPPORTUNITIES

Early Draft versions of this plan had "Opportunities" listed after the Management Actions. When these "Opportunities" were removed in Draft V-4, the advisory committee requested that they be captured for future reference somewhere in the Plan. This appendix identifies those "Opportunities" as requested.

Note: Some "Opportunities" identified in early draft versions of the IFLUP were incorporated into appropriate Policies or Management Actions. The remaining "Opportunities" are included in this appendix, identified by their relevant section.

1 INTRODUCTION

1.1 PLAN GOAL

1.2 PLAN OBJECTIVE

1.3 THE INTEGRATED FOREST LAND USE PLAN PROCESS

1.4 NOT INCLUDED IN THIS INTEGRATED FOREST LAND USE PLAN (IFLUP)

2 INTEGRATED FOREST LAND USE PLAN

2.1 LAND AND RESOURCE MANAGEMENT – DEVELOPMENT REVIEW

OPPORTUNITIES (1 added to Management actions):

1. All proposed developments administered by other government departments, government agencies and municipalities should follow this development review strategy.

2. All benefits cannot be delivered indefinitely from a single land base. There may be circumstances where choosing one value may have to be made at the expense of another. Engage local First Nations, Métis, municipal governments and the public to assist in identifying forest value priorities.

3. A socio-economic impact assessment would be valuable before a significant government decision (one that could affect citizens' lives, families, community and environment) is made for this forest.

4. Conduct a feasibility study to explore the possibility of having forest land and resources managed by a single body, such as a community forest, with all revenues generated from licensed activities in the Nisbet applied to forest management.

2.2 BIODIVERSITY

OPPORTUNITIES: (3 summarized and added to Management actions)

1. Develop health and integrity indicators for Nisbet Forest ecosystems (aquatic and terrestrial), and report on them.

2. For the review of new development proposals, develop a process for determining cumulative limits on forest ecosystem health and biodiversity for multiple human activities that, combined with natural disturbance events, may negatively affect the functioning of the ecosystem for the longer term. Identify activity/use limits.

3. Obtain more information about plant and animal inventories of the Nisbet. This may be done through partnerships with other levels of government, non-government organizations and/or educational institutions.

2.2.1 PROVINCIAL REPRESENTATIVE AREAS NETWORK

OPPORTUNITIES:

1. Representative areas that include wetlands and or other aquatic habitats could serve as benchmark areas for climate change monitoring.

2.2.2 WILDLIFE

OPPORTUNITIES (one added to Management Actions):

1. Involve local First Nations and Métis to determine extent of hunting activities carried out in this forest.

2.2.3 EXOTIC SPECIES (INTRODUCED SPECIES) AND INVASIVE EXOTIC SPECIES

OPPORTUNITIES (two added to Management Actions):

1. Develop a provincial standard for native seed quality in provincial forests.

2. The Ministry could carry out surveys of recent and historical baiting sites used for hunting activities and bale drop-off sites for grazing activities to determine the extent of exotic species/invasive exotic species that may exist. If the survey results indicate a problem, review provincial baiting provisions for allowing feeding bales to cattle in the forest.

3. Before exotic tree species are planted in the forest, they could be evaluated against a decision tree[1] for introducing woody plants into North America.

2.2.4 WILD SPECIES AT RISK

OPPORTUNITIES (one added to Management Policy):

1. For areas known to have designated species at risk, annually monitor (and record results of monitoring) for species health an extent, and if possible identify human activities that may be negatively affecting the species. Of particular interest provincially is the Ram's-head Lady's-slipper.

2. Identify habitat and management requirements for wild species at risk in the Nisbet.

3. Once locations of fescue prairie ecosystems (and species found in them) are identified, develop a management plan for these areas.

4. Given the sandy terrain in the Nisbet, other ecosystems could be at risk in this forest. There is an opportunity to research other possible ecosystems at risk, and determine if they are present in the Nisbet Forest.

2.2.5 WATER RESOURCES: WETLANDS, RIVERS, LAKES, STREAMS AND GROUNDWATER

OPPORTUNITIES (two combined and added to Management Actions):

1. Developing provincial wetlands mitigation guidelines would assist in better forest management.

2. Saskatchewan Environment may consider developing a provincial "no net loss" of wetlands function policy.

[1] *Predicting Invasions of Woody Plants Introduced into North America.* Reichard, S.H. and Hamilton, C.W. 1997. Conserv.Biol. 11: 193-203

3. Overall forest management for renewal resource development and non-renewable resource exploration and development activities, roads and utilities could be enhanced by obtaining a detailed inventory of information about wetlands, rivers, lakes and streams in the Nisbet. In particular, inventory of wetlands species, types of wetlands; their hydrologic connectivity, and value for wildlife habitat are needed.

2.2.6 CLIMATE CHANCE

OPPORTUNITIES (three added to Management Actions):

1. Identify areas of the forest that are likely to be more susceptible to climate change pressures (e.g. due to site aspect, slope, soils, geographic locations, other). Other possible monitoring: changes to water levels, increases in incidences of forest insects and diseases, in-migration of species from southern ecosystems. Partner with research organizations (e.g. Sask Research Council, Sask. Forest Centre, Prince Albert Model Forest, universities, SIAST) to monitor for climate change.

2. Current provincial biodiversity strategies, policies and practices do not endorse planting of exotics. The Nisbet would be suitable for research into different methods of seeding, planting, site preparation methods, or species that may be best suited to address a changing climate.

3. Research tree species native to the circumpolar boreal forest that could withstand heat and decreased precipitation.

2.2.7 FOREST RESEARCH and MONITORING

OPPORTUNITIES:

1. Identify what aspects of forest management the public, First Nations, Métis and local governments think the Ministry should be monitoring.

2.3 FOREST MANAGEMENT

2.3.1 FOREST HARVESTING

OPPORTUNITIES:

1. Involving First Nations participation in forest management activities can assist with solutions related to access management or other issues identified in this plan.

2. The Ministry Wildlife staff could develop appropriate guidelines for timber harvesting and renewal practices to address issues related to nesting or fledgling birds.

3. Partnerships between educational facilities, and other organizations could be developed to determine historical extent and distribution, white spruce and mixed wood white spruce stands, and compare with current distribution, age and stand types. This information, along with information on other stand types, should be a component of a forest management plan. In the absence of a forest management plan, the information would assist in addressing concerns expressed over possible over-harvest of white spruce over time in the forest.

4. To address concerns with overall future forest health, the Ministry (through the SFC) could review known burn-over areas within future forest inventory to determine if stand densities are within natural variations.

5. Field checks of past burn-over areas should be carried out to determine if these areas are within normal variations for incidence of dwarf mistletoe. If burn-over areas may lead to future forest health issues due to low stand densities, or unacceptable levels of dwarf mistletoe, identify plans to work toward healthy future forest stands in these areas.

2.3.2 FOREST INVENTORY AND HARVEST VOLUME

OPPORTUNITIES:

1. For white birch, evaluate past harvest areas to assess for health and renewal. Determine the historical extent and distribution of white birch and compare with the current extent and distribution. Identify assumptions made about renewal and natural succession, and how assumptions are tested.

2. Educational institutions could partner with the Ministry and other organizations to identify and test HVS assumptions for renewal, natural succession and mixed wood stands, and project future white spruce, white birch and mixed wood stands.

3. The Ministry should consider the possibility of a reduced timber supply due to climate change, how this may affect forest management in this forest, and how the local economy might cope with reduced timber limits.

4. Investigate if detailed mapping of timber harvest activities with GPS units, and the submission of these boundaries with forest product permit numbers, could support a direct linkage for comparing actual volumes of timber harvested with the forecast volume from HVS. This could assist in testing HVS assumptions.

5. SFVI standards for inventory do not sufficiently capture detailed wetlands information. The Ministry could partner with educational, non-government organizations (such as Ducks Unlimited), or other organizations to obtain this information.

2.3.3 FOREST RENEWAL

OPPORTUNITIES:

1. Develop provincial standards for using/not using herbicides in the provincial forest.

2. Develop provincial strategy/standards/guidelines for prescribed burns.

2.3.4 FOREST INSECT AND DISEASE MANAGEMENT

OPPORTUNITIES:

1. Consider including insect and disease biodiversity issues as a component of the forest management effects monitoring program.

2. Identify insect species that may be a future problem for this forest (such as Mountain Pine Beetle), and what (if any) corresponding management action is recommended.

2.3.5 NON-TIMBER FOREST PRODUCTS

OPPORTUNITIES (moved to Management Policies):

2.3.6 GRAZING

OPPORTUNITIES (one moved to Management Actions):

1. Assess forest inventory to determine lands that are not suitable for livestock grazing in the Nisbet. The intent is to have information available for staff when assessing new applications for grazing.

2.3.7 HAYING

OPPORTUNITIES:

1. The Ministry could obtain information (monitoring over time) on nesting birds in haying areas of the Nisbet. In particular, those nesting after July 1st (the earliest allowed date for haying activities), and which could be negatively affected by haying activities should be identified.

2.4 WILDFIRE MANAGEMENT

OPPORTUNITIES (#7 partially covered in Management Actions):

1. FireSmart principles could be demonstrated in the Nisbet (interpretive trails, signs, other), or the Ministry could partner with municipalities and First Nations communities to showcase FireSmart principles used in subdivisions.

2. Research opportunities to showcase different fuel management alternatives.

3. Carry out a survey of the residents near the forest to determine which methods of fuels management may be more acceptable.

4. Place FireSmart conditions on all dispositions within the Nisbet Forest.

5. Require a burning permit to start a fire for recreational purposes in the Nisbet Forest.

6. SaskPower works with the Ministry to identify opportunities to meet other plan objectives such as fuel breaks. There may be opportunities to clear trees beyond power line rights of way to serve as fuel breaks in appropriate areas.

7. For areas of forest that are outside of the Nisbet Forest, a Community Wildfire Protection Plan is recommended for local jurisdictions (city, rural municipality, First Nations). In addition, the following are recommended to minimize wildfire risk:

- Create local bylaws and programs to reduce the risk of damage to life and property from wildfire. These jurisdictions can use results from wildfire threat analysis in determining wildfire risk on forested lands outside of the provincial forest.
- Refer to the publication "*FireSmart*", *Protecting Your Community from Wildfire*, by Partners in Protection when discussing wildfire assessments, solutions and mitigation, emergency measures and local land use planning.
- Consider road closures to reduce potential wildfire starts.
- Saskatchewan Environment and local fire departments should provide recommendations to municipal and First Nations governments on new proposals for development if they are to be located near the forest.
- For new developments near the Nisbet Forest, ensure alternate escape routes are incorporated in subdivision design.

8. Saskatchewan Highways mows the side slopes of all highways once per season. The entire highway right of way is mowed on a 4-6 year rotation. Mowing generally occurs after July 11 of the year. Advisory committee suggestions were to reduce fire risk by requiring mowing ditches a minimum of once per year after nesting season is over.

Opportunity exists to research statistics for fire starts along highway right of way that would illustrate the need to increase mowing frequency.

9. Forest Engineering Research Institute of Canada (FERIC) has carried out research in northern Alberta indicating that mowing in the fall may reduce fire spread and intensity more so than spring mowing[2]. Recommend further research into fall, rather than spring mowing to reduce fire risk.

2.5 ACCESS MANAGEMENT

OPPORRTUNITIES:

1. On a regular basis, the Ministry could meet with municipalities to develop a strategy to reduce incidences of garbage dumping in the forest.

2. Partner with municipal governments to develop appropriate fire management, access management and garbage management policies and strategies.

3. The Ministry and municipalities could work together to develop complementary Ministry policies and municipal bylaws that would restrict access to meet objectives as identified in IFLUP strategies.

4. Partners with recreational user groups to develop and implement a public information program to increase awareness about the damage to the environment from vehicle use in the forest.

2.6 COMMERCIAL OUTDOOR RECREATION, TOURISM and ECOTOURISM

OPPORTUNITIES:

1. The Ministry currently does not support a registry or issue dispositions or permits for COR activities, as is done for outfitters. The Ministry does, however, encourage registration of ecotourism operators through accredited non-government organizations such as Saskatchewan Nature and Ecotourism Society. In the event that circumstances change, a registry of COR in the Nisbet would assist in better forest management decisions, and a better understanding of the level and extent of the activity, cumulative impacts and pressure areas.

2. Through municipal development plans, municipalities could identify suitable COR activities that may occur within the Nisbet Forest, suitable areas for the activities to be carried out, and economic social and benefits associated with such development.

[2] *Results of Experimental Burns on Grass Plots with Mowing Treatments, Slave Lake, Alberta*. Baxter, Gregg. FERIC. May 2006. http//fire.ferric.ca

3. Municipalities could work together with the Ministry to develop a Commercial Outdoor Recreation plan for the Nisbet, and promote the Nisbet as a place for COR activities that would be within sustainable ecosystem limits and would integrate other Nisbet Forest IFLUP strategies. Initial steps could involve building on past tourism strategies and regional tourism initiatives such as the 1987 Heart of the Old North West Strategy[3]. Identify activities or areas likely to be important or utilized for COR, such as historical trails or sites for cultural tourism opportunities, abandoned railway lines (some now owned by rural municipalities) for recreation opportunities.

4. Quantify economic benefits of COR activities in the Nisbet to gain a better understanding of the economic contribution the forest provides.

2.7 OUTFITTING

OPPORTUNITIES:

1. None identified.

2.8 LAND DISPOSITIONS OR SALES/PUBLIC UTILITY CORRIDORS/ROADS

OPPORTUNITIES (#1 partially covered in Management Actions):

1. Potential recreation or tourism opportunities exist for the abandoned Crutwell rail line (title is with the RM of Prince Albert and RM of Shellbrook) passing through the Nisbet, or for other abandoned rail lines, highways and roads that are the responsibility of rural municipalities. During plan development discussions, the Nisbet Advisory Committee supported the idea (if both landowner and the Ministry are willing) that title to the abandoned rail line be transferred from municipal ownership to provincial Crown land.

2. Municipalities should engage their citizens in the preparation of planning and development plans affecting Nisbet Forest lands.

3. Determine the extent of loss to Nisbet Forest land base due to human development (sale, roads, and utility corridors) over time. This information can be used as a basis for future land use decisions, illustrating pressure areas, and fragmentation over time.

4. Determine how much “development” (cumulative, all types) the Nisbet Forest land base can sustain while remaining a healthy, functioning forest ecosystem.

[3] Tourism Saskatchewan: hhtp://www.sastourism.com/

2.8.1 SAND OR GRAVEL EXTRACTION

OPPORTUNITIES (#1 partially captured in Management Actions):

1. Map historical gravel extraction activity sites in the Nisbet to determine the extent of lost forest ecosystems productivity. Site inspection would be required to determine if actions are required to restore forest ecosystem functioning.

2. The Ministry could review trespass reports and/or complains (theft of gravel) over time to determine type of problems (area/volume/frequency) and action required to address them.

2.8.2 PEAT MOSS EXTRACTION

OPPORTUNITIES:

1. A detailed wetlands inventory would assist in identifying peat resources in the Nisbet.

2.8.3 MINERALS, OIL OR GAS

OPPORTUNITIES:

1. None identified.

2.9 RECREATION MANAGEMENT

OPPORTUNITIES:

1. A certain level of disturbance to the forest and soils is expected from any recreation activity. Overall forest erosion from motorized recreation can be reduced with properly designated and managed trails. Preventing negative impacts to the forest ecosystem can be done by making sure there is a system to report erosion problems associated with recreation use that the Ministry can deal with, and/or designating a responsible third party (such as a motorized recreation organization) to monitor and manage recreation trails and associated signs.

2. Ministry policy and legislation could be strengthened to require an environmental damage deposit for recreation trails and organized recreation events so as to provide funds for possible mitigation requirements.

3. Recognizing that general use of ATVs for recreation is on the rise, it is recommended that an organized club take responsibility for ATV trails in the Nisbet.

4. If provincial legislation and/or policy is amended to allow for restricting motorized recreation is approved trails in protected or sensitive zones, amend this plan's Appendix 4 (zoning map) to identify areas where motorized recreation should be restricted.

5. If provincial legislation and/or policy is amended to allow for licensing organized recreation events (rallies), amend this plan's Appendix 4: Zoning to identify areas where organized recreation events should be restricted.

6. Partner with municipalities and Sask Highways and Transportation to strengthen enforcement options to restrict motorized recreation activities and/or general access within Protected or Sensitive management zones.

7. If Lands Branch, the Ministry amends policy and/or legislation to allow for recreation trail dispositions and restriction of recreation vehicles from certain zones in the Nisbet, organized clubs could take responsibility for maintenance, signs and closure of recreation trails used for ATVs, horseback riding, dog walking, cycling, hiking and running. The advisory committee believes that if clubs take responsibility for recreation trails, recreation user conflicts will decrease, recreation use will be safer, and there will be fewer opportunities for environmental damage to protected or sensitive zones.

8. Explore possible recreation opportunities for Scott Lake, Callaghan Lake and Lobstick Lake.

9. ATV licensing through Saskatchewan Government Insurance (SGI) would help with identification of problem recreation vehicles.

2.10 SPECIAL PLACES

OPPORTUNITIES (partially captured in Management Actions):

1. Engage local First Nations and Métis communities to provide better information about aboriginal traditional, cultural and current use and knowledge of the forest.

2.11 PUBLIC EDUCATION/INFORMATION/COMMUNICATION

OPPORTUNTIES (15 were moved to Management Actions):

1. Develop a public education/information strategy for the Nisbet. The strategy might focus on the following areas:

Forest Stewardship:

a) For all dispositions (permits, licenses, leases, other) issued, raise awareness about the links between forest use and ecological functioning.

b) Direct the public to areas suitable for cutting firewood; identify areas where they should not cut.

c) Provide information about why we regulate activities in the forest.

Recreation:

a) Prepare informational materials for recreation activities – such as safety precautions for hikers during hunting season, inform people where you are going and estimated time of return, safety around logging operations, code of ethics for recreation in the forest, pack it in – pack it out, minimize environmental impact.

b) Inform recreation users about wildlife needs during sensitive periods – areas to avoid.

Forest Health:

a) Communicate what the Ministry means by a "healthy forest" and identify appropriate forest management actions needed to achieve this.

b) Communicate negative effects on the forest ecosystem; loss of public revenue and other consequences from theft of sand and gravel in the forest.

c) Partner with municipalities and First Nations governments to develop strategies to address dwarf mistletoe and fire issues on lands adjacent to the Nisbet Forest. Strategies should recognize and address forest health on private lands and the risk to safety if these issues are not addressed.

3 FOREST MANAGEMENT ZONING

OPPORTUNITIES (one was moved to Policies, one was moved to Management Actions):

3.1 PROTECTED ZONE

3.1.1 PROTECTED – PROVINICAL REPRESENTATIVE AREAS

3.1.2 PROTECTED – SITE OF HISTORICAL, CULTURAL OR ARCHAEOLOGICAL SIGNIFICANCE

3.2 SENSITIVE ZONE

3.2.1 SENSITIVE – ROUGH FESUE PRAIRIE ECOSYSTEM

3.2.2 SENSITIVE – WILD SPECIES AT RISK

3.2.3 SENSITIVE – RIPARIAN

3.2.4 SENSITIVE – BOG UPLAND

3.2.5 SENSITIVE – AESTHETIC AND RECREATION

3.2.6 SENSITIVE – RECREATION TRAILS

3.2.7 SENSITIVE – RESEARCH

3.3 MANAGEMENT ZONE

4 IFLUP IMPLEMENATION STRATEGY

APPENDIX 2: LAND LEASES

Lease Holder	Purpose	Area of Lease
RM of Shellbrook	Holbein Sewage Lagoon	12.1 ha (30 acres)
Holbein and District Community Club	Ball Diamond and Booth	2.83 ha (7 acres)
Sask Wildlife Federation	Building and Archery Range	19.7 ha (48.7 acres)
Scouts Canada	Building and Grounds	17 ha (42 acres)
Northern Canada Evangelical Mission	Church Site	1.1 ha (2.72 acres)
Natural Resources Canada	Prince Albert Satellite Station	410 ha (1013 acres)
City of Prince Albert	Prince Albert Landfill	(selling approx 310 ha)
Harry Mudry	Sewage Lagoon (serving the Whispering Pines Trailer Court)	2.4 ha (5.9 acres)
Red River Riding and Roping Club	Riding Arena	17 ha (42 acres)
Sask Tel	Cellular Tower	3.5 ha (8.6 acres)
Sask Tel	Equipment Storage	.14 ha (.35 acres)
Par Place	Commercial Hall	23 ha (56.8 acres)
Kachurs Country Club (administered by Parks)	Campground (Sturgeon River Recreation Site)	24.3 ha (60 acres)
Prince Albert Pistol and Rifle Club	Gun Range (Nisbet Trails Recreation Site)	97.1 ha (240 acres)

APPENDIX 3 - HARVEST VOLUME SCHEDULE

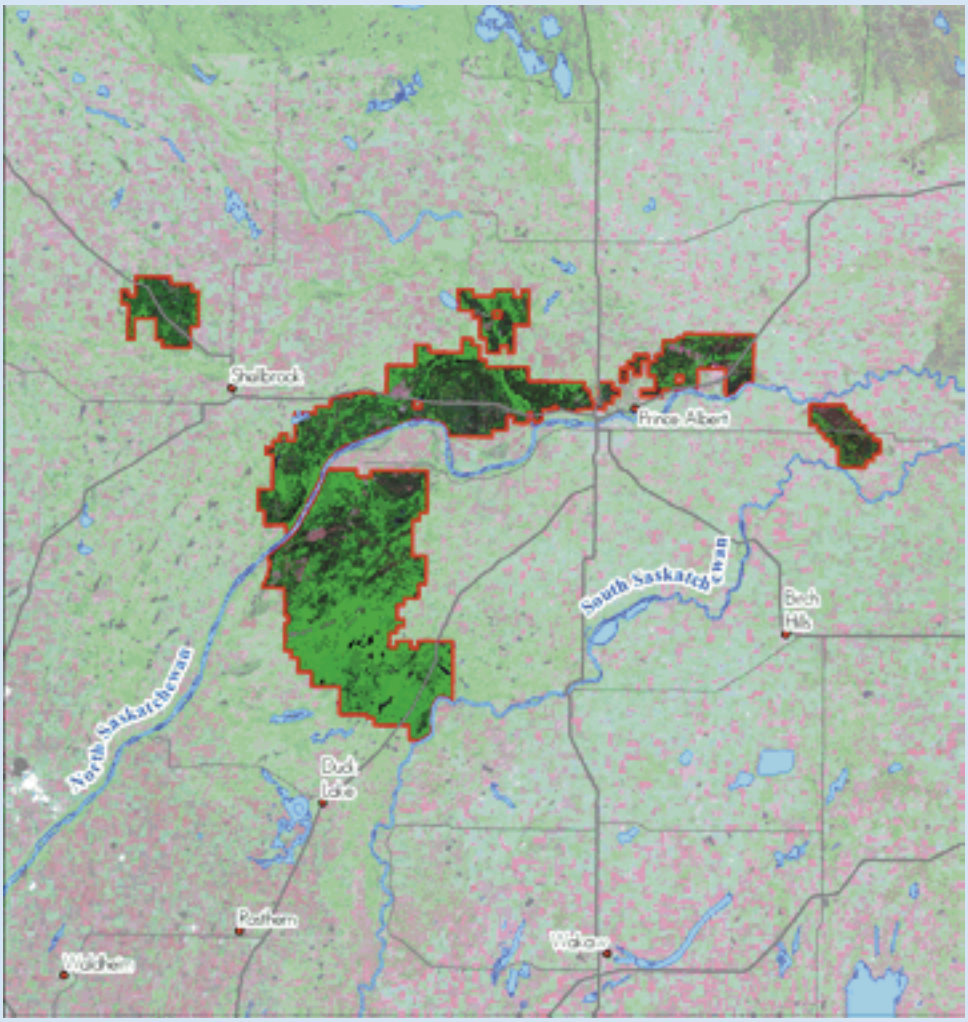
Sustainable Harvest Levels in the Nisbet Island Forest

Note: The analysis as outlined in this appendix was written prior to the final zoning as identified in this IFLUP. Some numbers in the report do not correspond with the HVS numbers listed in the Plan. All processes were reapplied with the new area numbers to calculate the HVS as shown.

Sustainable Harvest Levels in the Nisbet Island Forest

Brendan Hemens

Forest Inventory & Resource Analysis Section



Saskatchewan Environment Forest Service

Saskatchewan Environment

Introduction

The Saskatchewan Environment Forest Service (SEFS) is committed to the sustainable management of forest resources. The Forest Resources Management Act specifies that every Integrated Forest Land Use Plan (IFLUP) will include a harvest volume schedule (HVS) calculation. The HVS, which is equivalent to an annual allowable cut (AAC) when it provides the legal limitation to harvesting, provides the basis for subsequent sustainable harvest calculations by Forest Management Agreement (FMA) and Timber Supply License (TSL) holders whose area tenure overlaps the IFLUP area. Currently, the HVS calculated for the Island Forests provides SEFS area foresters with the limits of sustainable harvesting, and thus constitutes an AAC. It also provides direction on the appropriate make-up of harvested stands in terms of development types and age class, often referred to as the profile.

This report discusses the inputs, assumptions, and results associated with the HVS for the Nisbet Island Forest.

Improvements over past analyses

This analysis improves upon previous analyses in several ways.

The forest inventory was generated from 1991 aerial photography, making it relatively new in Saskatchewan's holdings, and newer than the inventory used in previous Nisbet analyses.

Yield curves were generated from the province's 3P temporary sample plot database. The yield curves were generated by ecoregion; the Island Forests are in the Boreal Transition ecoregion. This reduced the potential bias of previous analyses that were based on survey zones, which in the case of the Island Forests included a large northern forest component, and may have provided unrealistically inflated estimates for the Nisbet. 4,168 temporary sample plots were used to create the Boreal Transition yield curves.

This analysis was conducted using a modern forest estate modelling process, essentially identical to that process used in most of Canada, as well as much of the United States and the southern hemisphere. This process improves upon previous growing stock-based calculations by making harvesting assumptions explicit and directly incorporating non-timber values into the analysis.

Non-timber values were incorporated explicitly into this analysis by the incorporation of zone-based harvest exclusions and an old forest constraint.

More realistic sustainable harvest volumes were calculated by excluding types generally considered non-merchantable. Stands that were severely infected with dwarf mistletoe were considered separately for the sustainable harvest calculation. This supports the setting of separate harvest levels for mistletoe and non-mistletoe stands, as well as setting a target for mistletoe rehabilitation.

To reflect harvesting preferences, the model's substitution of one type (e.g., black spruce) for another (e.g., jack pine) was controlled over the model forecasts.

Land Base Description

The forest inventory used in the analysis was generated from 1991 aerial photography that was interpreted by SEFS staff.

The Nisbet Island Forest encompasses an area of 83,205 ha of land. Of this, 69% or 57,458 ha is considered productive forest, dominated by jack pine and aspen types, and of that, about 42,500 ha are considered both potentially merchantable and within area zoned for timber harvesting. Table 1 shows the composition of the forested landbase by development type, density class, and operability. Note that tamarack-leading types were not considered merchantable in this analysis.

Development types are a way of grouping stands

Table 1. Area and operable growing stock by development type and density class.

	Area by density class (ha)		Total area	Proportion of total area (%)	Area eligible for harvest (ha)	Ratio of harvest-eligible to total area (%)	Operable Growing Stock (m^3)	Proportion of total operable growing stock (%)
Development Type	**Low**	**High**						
H-bP	4	103	107	0.2	48	45	11,063	0.15
H-tAbP	-	417	417	0.7	300	72	98,532	1.32
H-tA	3,381	21,024	24,405	42.5	19,610	80	4,657,396	62.60
H-wB2	9	70	79	0.1	71	90	5,059	0.07
HS-tAjP	197	839	1,036	1.8	927	89	127,046	1.71
HS-tAsP	40	663	703	1.2	628	89	53,936	0.72
SH-sPtA	109	616	725	1.3	656	90	120,725	1.62
SH-jPtA	791	1,240	2,031	3.5	1,614	79	79,072	1.06
S-bS	149	2,830	2,979	5.2	2,514	84	253,499	3.41
S-bSjP	11	106	117	0.2	105	90	19,513	0.26
S-jPbS	72	355	427	0.7	377	88	118,923	1.60
S-jP	4,411	16,084	20,495	35.7	14,167	69	1,478,986	19.88
S-wS	585	1,747	2,332	4.1	1,610	69	416,382	5.60
S-tL	396	1,210	1,606	2.8	1,376	86	NA	NA
Total	**10,155**	**47,304**	**57,459**		**44,003**	**77**	**7,440,132**	

based on their species composition in a manner that simplifies the forecast of their future yield of timber volume. These forecasts are called yield curves. Besides species composition, other inputs affecting timber yield include site index, density, and mistletoe infection. Figure 1 shows a map of species composition as used in the wood supply analysis.

The age class structure (Figure 2) is largely a result of large recent fires, and fires about 80-90 years ago. Note that the assumed species composition of forest in the 10-year old age class is a function of regeneration assumptions as well as actual observation. The current age class structure suggests that our ability to sustain a given level of timber harvest will largely be limited by the rate at which we can use current mature wood before it begins to decline and break up, and the length of time it will take for current regeneration to become operable for harvest in the future. Age class is mapped in Figure 3.

Site class was determined as a function of drainage and texture. About 25% of the productive forest was considered to be site class 1 (most productive), with 38% in site class 3, and 37% in site class 4 (least productive). Methods used to fit yield curves for this ecoregion resulted in no area identified as belonging to site class 2.

Figure 4 displays the management zones described in the IFLUP, and includes a table of areas and harvest eligibilities. The proposed representative area was included for harvesting in most scenarios conducted in this report, but was excluded from harvesting in some scenarios to help decision makers understand the impact of creating a new representative area, and also to assist subsequent reaction if the area is indeed designated.

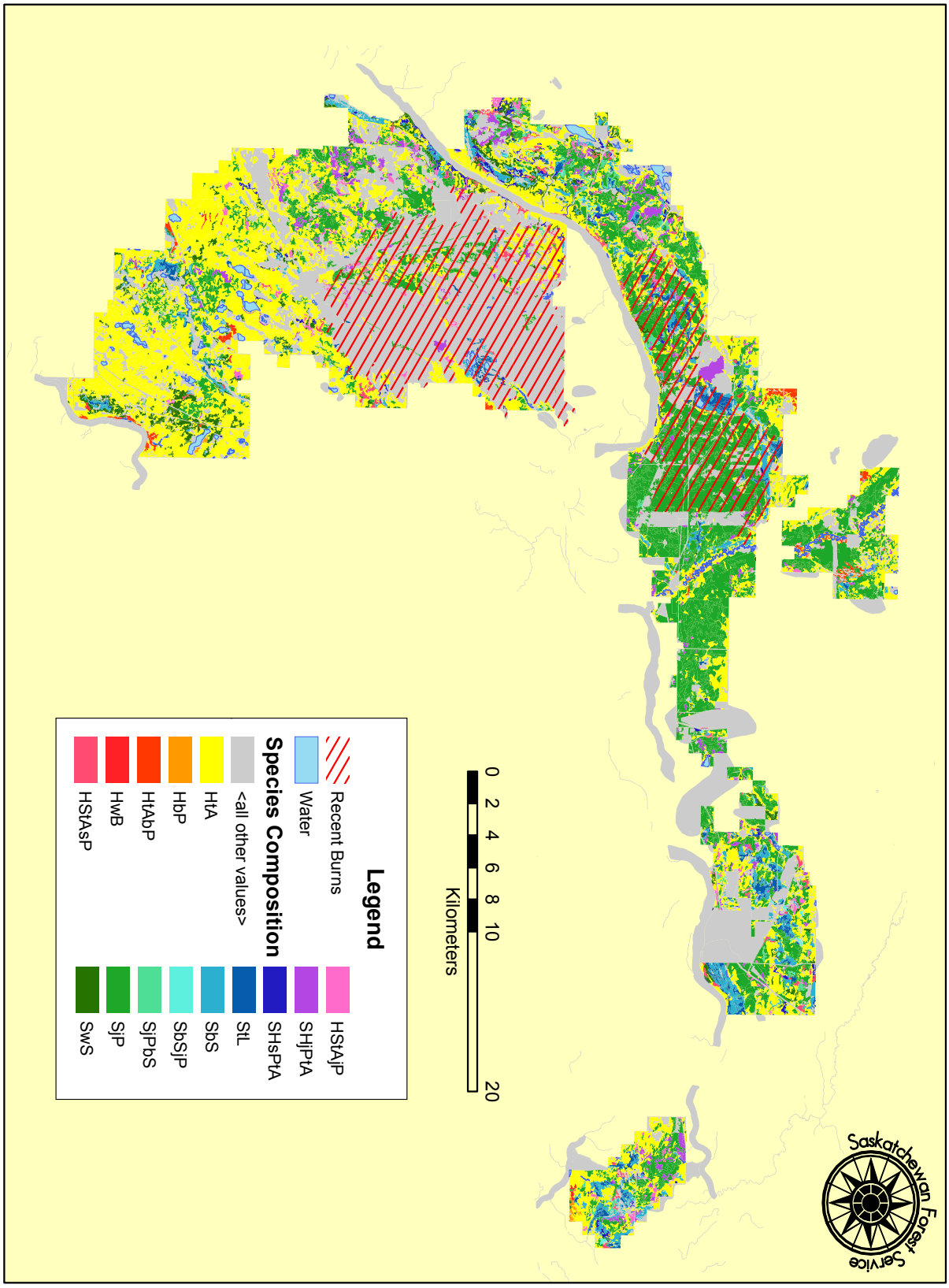


Figure 1. A map showing the species composition of the Nisbet forest, based on the development types used in the wood supply analysis.

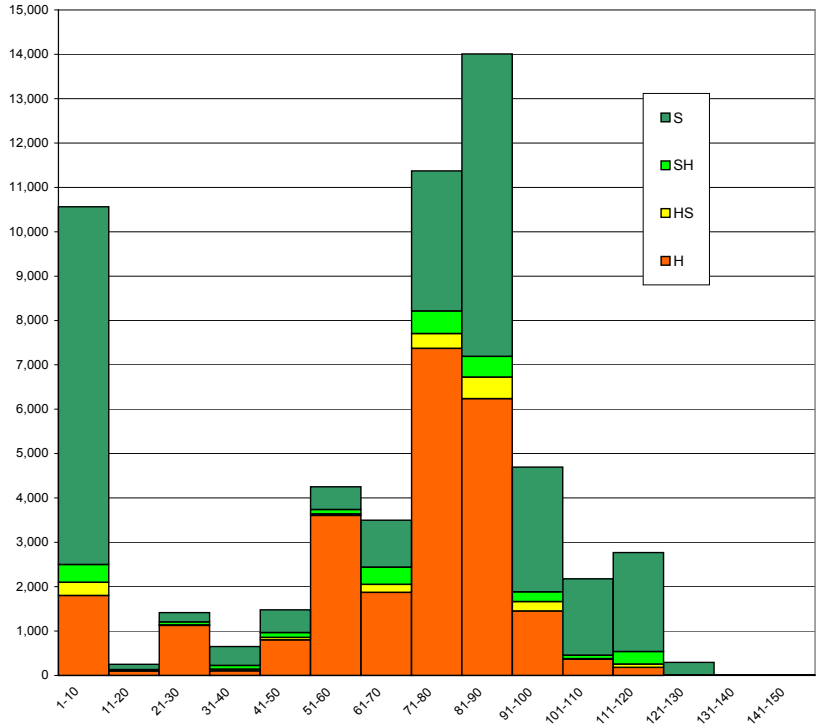


Figure 2. A graph showing the area by age class, broken up by coarse cover type. S=Softwood, H=Hardwood.

Riparian areas were identified using the National Topographic Series 1:50,000 streams and water bodies spatial data. 15 meter, 30 meter, and 90 meter buffers were assigned based on stream class and water body size. In total, an area of 621 ha of forested area was excluded. This is over and above the 938 ha zoned as 'Sensitive Riparian or Bog' in Figure 3.

The 1991 inventory was updated by overlaying the boundaries of fires and harvesting since 1991, and resetting the age of affected stands to 0. Burned stands were also assigned a special identifier, to support special regeneration consideration in the model. Areas shown in the inventory as being productive but with an unknown regeneration status after recent burns, were identified as 'bare' in the model to support another regeneration assumption described later in this report.

Yield curves

The yield curves used in the model were developed from the SEFS's 3P temporary sample plot database. '3P' refers to the sampling methodology used to collect the information. A temporary sample plot is measured only once, as compared to a permanent sample plot, which is fixed spatially and measured repeatedly over time. The yield curves were developed by ecoregion to provide an ecological basis for their construction, and include forecasts based on product size (e.g., logs vs. pulp). 4,168 plots were available for the Boreal Transition ecoregion. These plots were used to develop the yield curves used in this analysis. Table 2 shows the development types for which yield curves were generated, and some associated information.

Plantation yields were assumed to be the same as high-density natural types, with no in-block retention. Yield curves for white spruce and jack pine plantation types were included, but only in certain scenarios.

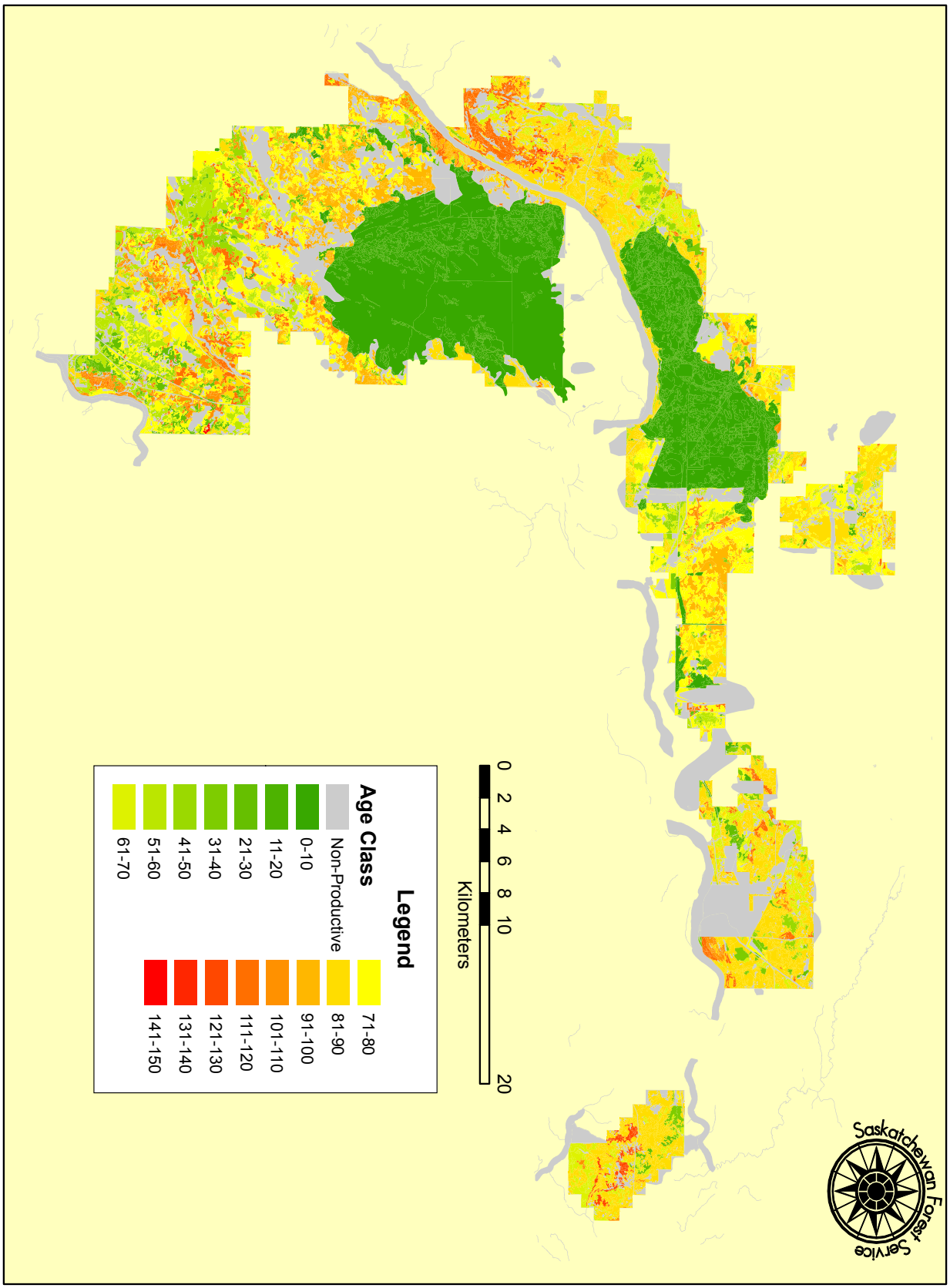


Figure 3. A map of the Nisbet forest, showing the current age class of the forest stands. The information includes recent fires and harvesting.

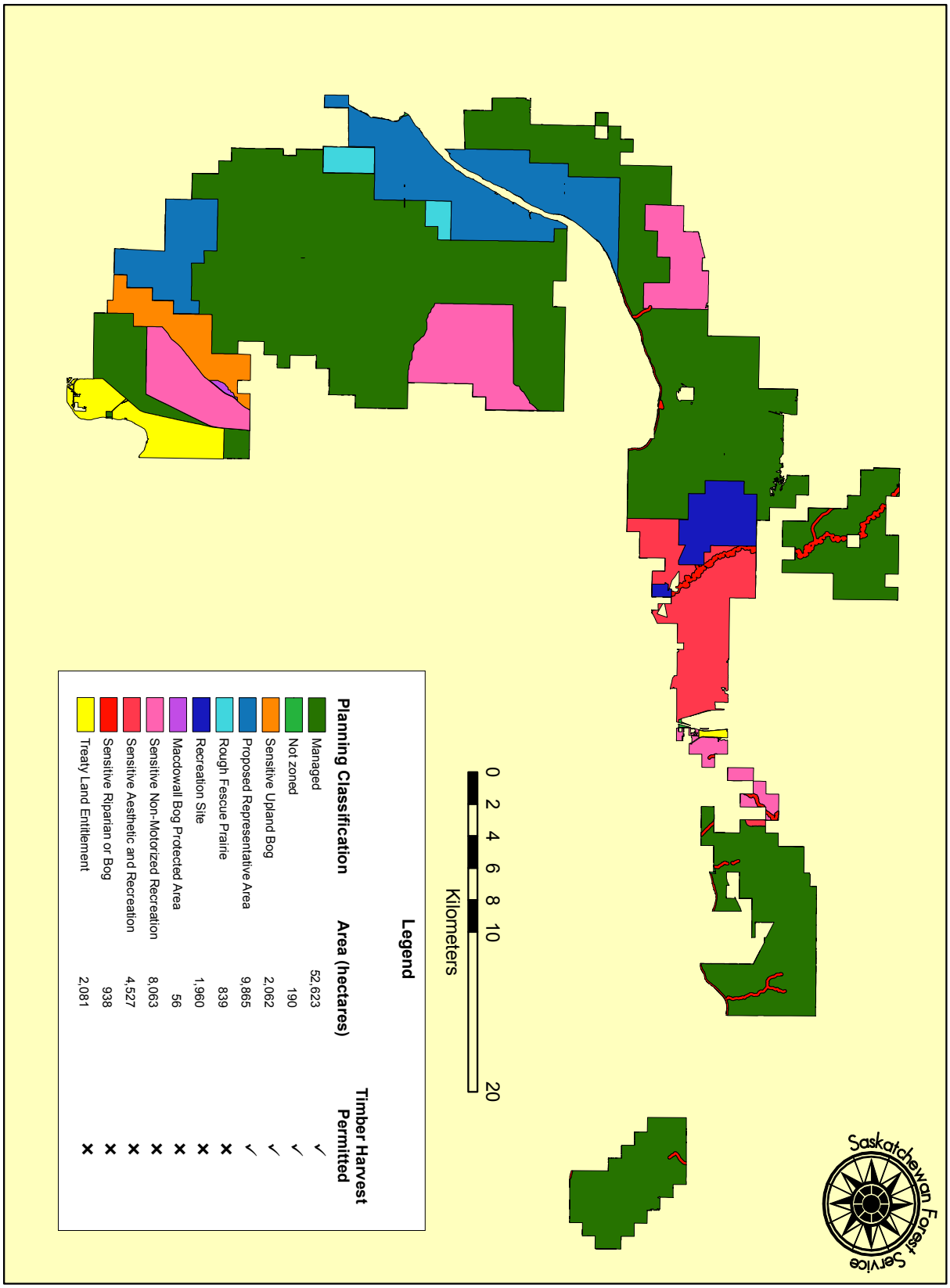


Figure 4. A map showing the zoning as it was interpreted and used in the wood supply analysis. Note the mapped area of each zone, and their harvest eligibility.

Table 2. The development types used to forecast yields in the wood supply analysis. Break-up age defines when the stand is assumed to break up and regenerate in the absence of fire or other disturbance. The minimum age of operability is the assumed earliest age at which stands may be harvested (see the text for other restrictions). Non-commercial describes types that were excluded from harvesting and the wood supply.

Development type	**Broad Cover Group**	**Primary Species**	**Secondary Species**	**Break-up age**	**Minimum age of operability**	**Non-commercial**
H-bP	Hardwood	bP	tA, bP, wB	120	50	
H-tAbP	Hardwood	tA	bP	140	50	
H-tA	Hardwood	tA	tA, wB	140	50	
H-wB2	Hardwood	wB	tA, bP, wB	130	70	
HS-tAjP	Hardwood-Softwood	tA, bP, wB	jP	140	75	
HS-tAsP	Hardwood-Softwood	tA, bP, wB	wS, bF, bS, tL	170	90	
SH-sPtA	Softwood-Hardwood	wS, bF, bS, tL	tA, bP, wB	170	90	
SH-jPtA	Softwood-Hardwood	jP	tA, bP, wB	140	75	
S-bS	Softwood	bS	wS, bF, bS, tL, jP	180	95	Low (AB) density stands excluded
S-bSjP	Softwood	bS	jP	180	85	
S-jPbS	Softwood	jP	bS	180	85	
S-jP	Softwood	jP	wS, bF, jP	140	75	Severely infested stands excluded
S-wS	Softwood	wS, bF	wS, bF, bS, tL, jP	170	90	
S-tL	Softwood	tL	wS, bF, bS, tL, jP	160	NA	All tL leading types excluded
Species	**Common Name**	**Latin Name**				
bP	balsam poplar	*Populus balsamifera (L.)*				
bS	black spruce	*Picea mariana* (Mill.) BSP				
jP	jack pine	*Pinus banksiana* (Lamb.)				
sP	aggregate of white spruce, black spruce, balsam fir, and tamarack					
tA	trembling aspen	*Populus tremuloides* (Michx.)				
tL	tamarack	*Larix laricinia (Du Roi)* K. Koch				
wB	white birch	*Betula papyrifera* (Marsh.)				
wS	white spruce	*Picea glauca* (Moench) Voss				

Based on Brandt *et al.* (1998)[1], a 40% volume reduction was applied to jack pine stands severely infested with dwarf mistletoe (*Arceuthobium americanum)*. The temporary sample plots used to construct the yield curves for this analysis were measured in the early 1980s. Thus, it is likely that they captured some of this impact already, resulting in a double-accounting here that is conservative in its implications for wood supply.

Forest estate model assumptions

A number of biological and management assumptions are incorporated into the forest estate model used to calculate the sustainable harvest level.

Transitions

Transitions are the expectations of future stand development after a stand-initiating disturbance, such as clearcut harvesting or stand break-up.

It was assumed that after clearcutting, stands revert to their pre-harvest type. A regeneration delay of 15 years was used based on consultation with SEFS staff and local loggers. It is commonly perceived that stands have a denser hardwood component after clearcutting; this is not reflected in this assumption. Currently, PSP information or post-harvest sampling information is not available to support alternative assumptions. Many boreal stand types (e.g., black spruce, jack pine, pure aspen) are not sensitive to this assumption. However, it is likely that mixedwood sites are.

It was assumed that after natural stand break-up, stands revert to their pre-harvest type, at age 10 years. Stands are given this 10-year 'headstart' to reflect the fact that stand volume never truly drops to zero - advance regeneration makes up an important component of stands that are allowed to reach a stage past commercial maturity.

[1] Brandt, J.P., R.D. Brett, K.R. Knowles, & A. Sproule, 1998. Distribution of severe dwarf mistletoe damage in west-central Canada. Canadian Forest Service, Northern Forestry Centre, Edmonton, Alberta. Special Report #13.

Where areas have burned recently and the pre-burn development type was known, this type was assumed to regenerate. Where the pre-burn type was not known, it was assumed that 50% of the area regenerates to a jack pine type, and the rest regenerates to aspen, reflecting the current dominance of those types in the Nisbet. In all recently burned areas, a 20 year regeneration lag was assumed.

Operability

Operability defines what stands are eligible for harvest, and when.

It was assumed that all stands are accessible for harvesting. The opposite case might be represented by a group of commercial quality stands in the middle of a large bog area; it may not be economically reasonable to build a road to those stands, unless their volume warrants the expense. This assumption is probably not unreasonable, especially given the dense road network and the long winter season.

Slope was not assessed, as those familiar with the area suggested it was not an important consideration.

To be eligible for harvest, stands had to have at least 60 cubic meters of merchantable timber per hectare, and be at least a minimum age. The ages used were based on the Prince Albert Forest Management Agreement Area forest management plan, and were confirmed with Bruce Walter of the SEFS.

Planted types were assumed to be operable earlier because of density control.

Some types were considered non-commercial for this analysis, including severely mistletoe-infested jack pine stands. These exclusions are described in Table 2.

Ecological targets

The only ecological target considered, besides those managed by zoning, was old forest. The

area of forest in softwood, hardwood, and softwood-hardwood mix types was determined. A goal was placed on the model to ensure that 7% of the area in each of those types was maintained at all times. The term 'goal' means that the model would try as hard as possible, even if it means no harvesting, to achieve those target old forest levels.

Fire reserve factor

A fire reserve factor is incorporated in some jurisdictions to represent the volume likely to be lost to fire over the forecast period. It is typically applied as a percentage reduction of the modelled sustainable harvest level. In other jurisdictions, including Saskatchewan, conventional wisdom holds that it is better to use the modelled harvest level, and recalculate the wood supply after major fires. Factors in support of this include frequently high volume recovery rates for salvage operations and the recovery of burned forest to a productive condition.

Modelling completed by Saskatchewan Environment has shown that a fire reserve factor provides little protection against future fluctuations in wood supply, that are more than offset by the wood supply reductions necessary to achieve that protection.

Scenarios

A scenario is a wood supply forecast where certain parameters are set to reflect a given set of management assumptions. These assumptions can have a profound effect on the outcome. It is useful to define several scenarios to help explore the different management possibilities and their ramifications for different forest values.

Scenarios used in this analysis are described in Table 3. Some explanation of the terminology used will probably help. "Even flow" means maintaining a specific harvest level from period to period during the forecast, and is often considered indicative of economic sustainability. It does not, in itself, have any particular ecological meaning. A tolerance of 10% was specified in all even flow scenarios, meaning that it can actually vary by that small amount, which is generally consistent with normal harvest variation.

"Maximize" is a linear programming term, and describes the model objective. While all the objectives are focused on maximizing some component of timber volume, it is important to understand that this maximization is subject to all other rules, targets, and constraints, including those introduced by zoning. This would be similar to talking about maximizing your personal wealth. First, you must pay your debts and taxes, then you can invest in growth opportunities.

"Total volume" under harvest objective means softwood and hardwood volumes combined. "Coniferous sawlog volume" means the softwood sawlog volume, to a 10 cm top using 2.6 m log lengths.

Since the main representative area in the Nisbet hasn't received final approval, it is considered 'proposed'. To assist decision makers, we have included scenarios with that area included and excluded from harvesting.

Post-harvest succession references the transition assumptions described earlier. "Status quo" refers to the assumption that stands regenerate to their pre-harvest condition after harvest. The planting assumption in scenario #8 refers to a scenario that essentially eliminates the assumed regeneration lag, and replaces some hardwood area with softwood plantations.

Results

Table 3 provides the harvest level results for each of the scenarios.

The most salient result is fhe large impact of the old forest maintenance requirement. The current age class structure of the forest (Figure 2) and the break-up ages for the different development types, as well as the dearth of area in the younger

Table 3. Wood supply analysis scenarios and harvest level results for the Nisbet forest.

Scenario number	Targets	Harvest objective	Regeneration lag	Burn lag	Post-harvest succession	In-block retention	Old forest retention	Proposed RAN	Softwood Logs	Softwood Pulp	Hardwood
1	Even flow of hardwood and softwood (+/- 10%)	Maximize total volume harvested	15 years	20 years	Status quo	3%	None	Included for harvesting	21500	3400	43800
2	Even flow of hardwood and softwood (+/- 10%); species mix controls	Maximize total volume harvested	15 years	20 years	Status quo	3%	None	Included for harvesting	17500	2800	43200
3	Even flow of hardwood and softwood (+/- 10%); species mix controls	Maximize total volume harvested	15 years	20 years	Status quo	3%	7% retention by area	Included for harvesting	10500	1700	41300
4	Even flow of hardwood and softwood (+/- 10%); species mix controls	Maximize coniferous sawlog volume harvested	15 years	20 years	Status quo	3%	7% retention by area	Included for harvesting	10700	1600	39100
5	Even flow of hardwood and softwood (+/- 10%); species mix controls	Maximize coniferous sawlog volume harvested	15 years	20 years	Status quo	3%	7% retention by area	Excluded from harvesting	9500	1400	34000
6	Even flow of hardwood and softwood (+/- 10%); species mix controls	Maximize coniferous sawlog volume harvested	15 years	20 years	Status quo	3%	None	Included for harvesting	17600	2600	41500
7	Even flow of hardwood and softwood (+/- 10%); species mix controls	Maximize coniferous sawlog volume harvested	15 years	20 years	Status quo	3%	None	Excluded from harvesting	15400	2300	17700
8	Even flow of hardwood and softwood (+/- 10%); species mix controls	Maximize coniferous sawlog volume harvested	15 years	20 years	Plant 100 ha/yr	3%	7% retention by area	Included for harvesting	13600	1600	37000

age classes, means that the provision of old forest competes directly with timber harvesting for the next several decades. Thus, it may not be economically feasible to achieve this target.

Other results are presented in more detail over the following pages. However, I will provide my conclusion here.

Conclusion

This set of forecasts represents a realistic and responsible picture of wood supply from the Nisbet forest given different sets of management assumptions reflected in each scenario.

Current harvests vary quite widely year to year, and only reached about 16,000 m3 of softwood in 1999 (not counting the salvage harvest in 2003); hardwood harvests have only ranged as high as about 5,000 m3. Thus, we might conclude that consideration should only be given to the softwood sawlog-focussed scenarios (4-8) until a large consumer of hardwood fibre appears.

Also, given the historically low softwood harvest relative to the forecast levels here, the harvest levels accounting for old forest (3,4,5, and 8) may be considered achievable.

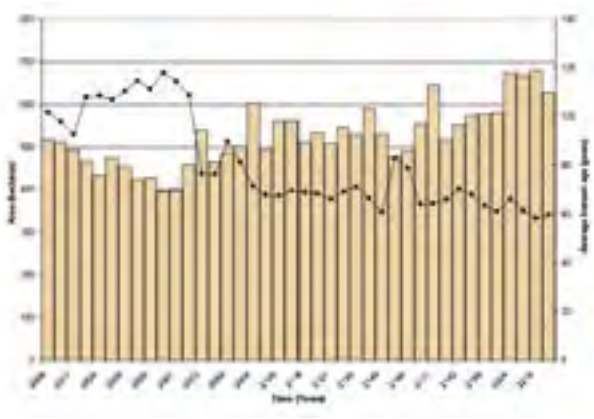
The harvest opportunity from the proposed representative area represents about 12% of the harvest level. In other words, the wood supply cost of designating the proposed representative area would be a 12% reduction in wood supply.

These harvest levels also represent a significant decrease from the last calculation completed in the 1980s. These levels were 35,743 m3 for softwood, and 28,910 m3 for hardwood. There are many reasons for this, including the reduction in harvestable area due to zoning, the loss of operable growing stock due to large fires in the 1990s, and the incorporation of a signficant reduction to mistletoe-infested jack pine stands.

Graphic Results

Scenario 1

Average area harvested (bars) and average harvest age (line) during the 200 year forecast.

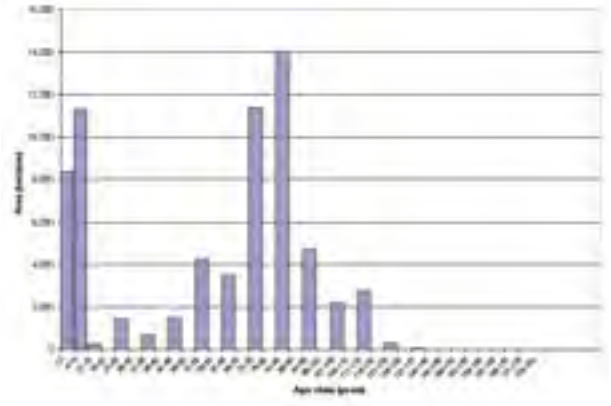


These pages display some pertinent forest dynamics related to the forecast wood supply for each scenario. It is important to note that the harvest levels and areas are based on 5-year periods, not annual levels. This is because the model has a 5-year time resolution.

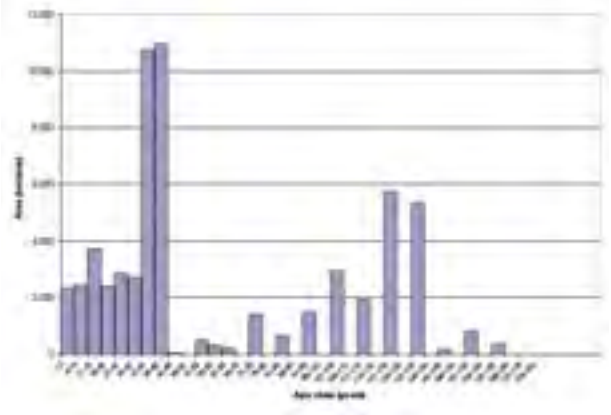
The gaps in the age class structure in the graphs on the right reflect the fact that the inventory was aged in 10-year increments. As stands are harvested in each 5-year modelling period, the age class structure smooths out, except for unharvestable stands. Using a 5-year modelling time step improves the resolution of future harvest levels based on managed stands.

Periodic harvest level relative to operable growing stock levels.

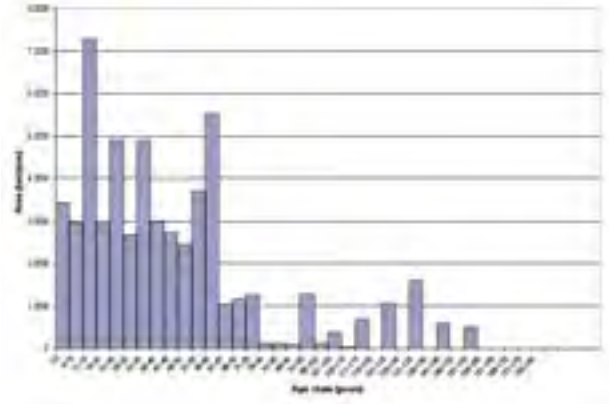
Age class structure at the beginning of the forecast.



Age class structure after 50 years of harvesting.

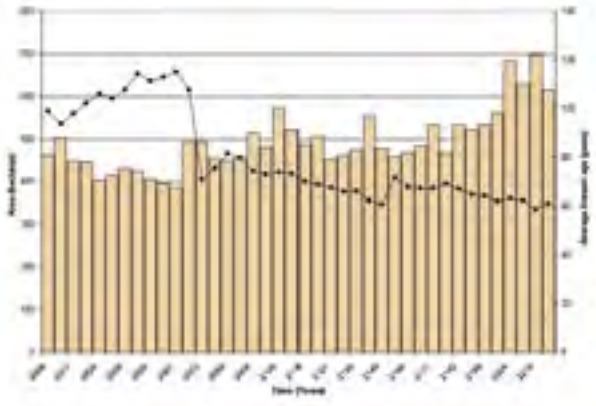


Age class structure after 200 years of harvesting.

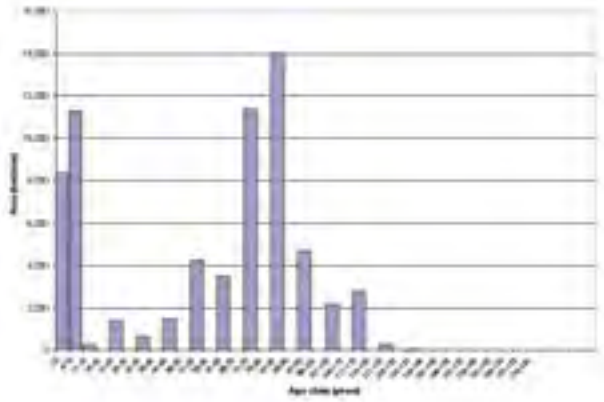


Scenario 2

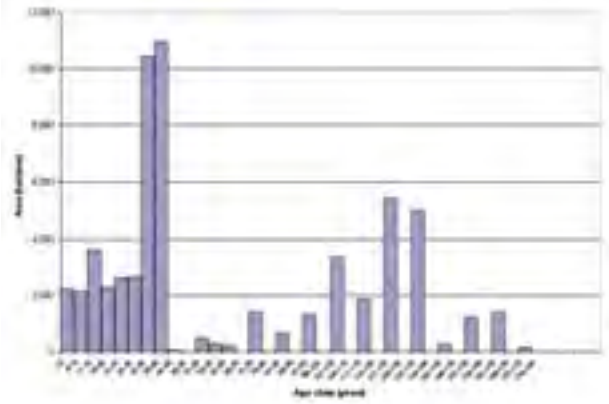
Average area harvested (bars) and average harvest age (line) during the 200 year forecast.



Age class structure at the beginning of the forecast.

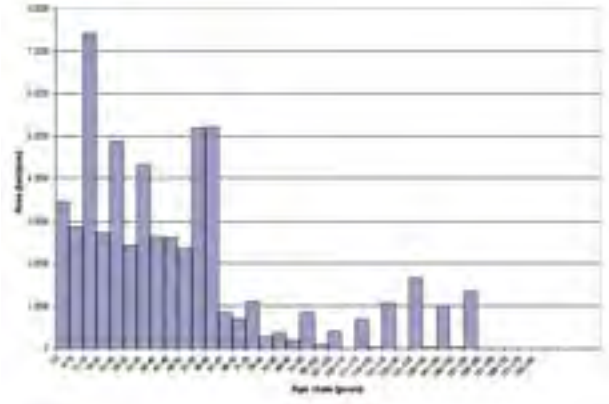


Age class structure after 50 years of harvesting.



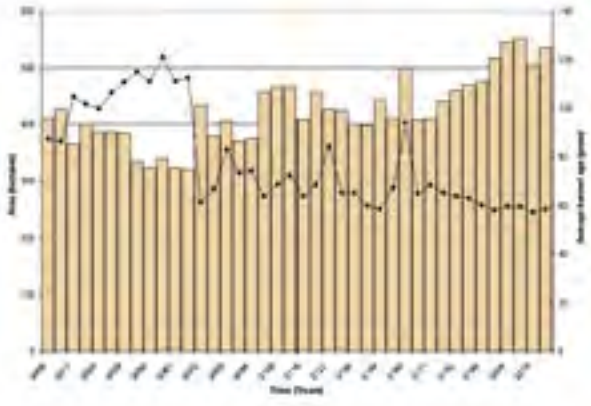
Periodic harvest level relative to operable growing stock levels.

Age class structure after 200 years of harvesting.

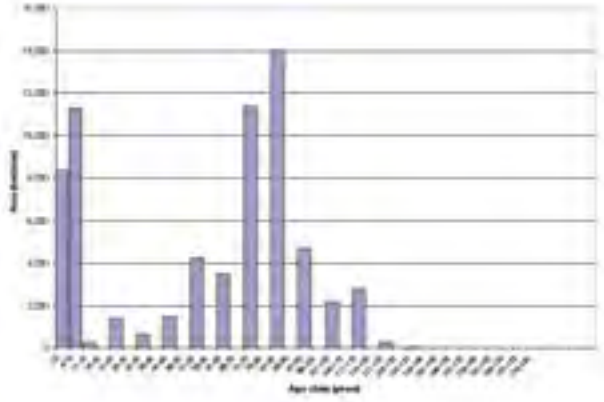


Scenario 3

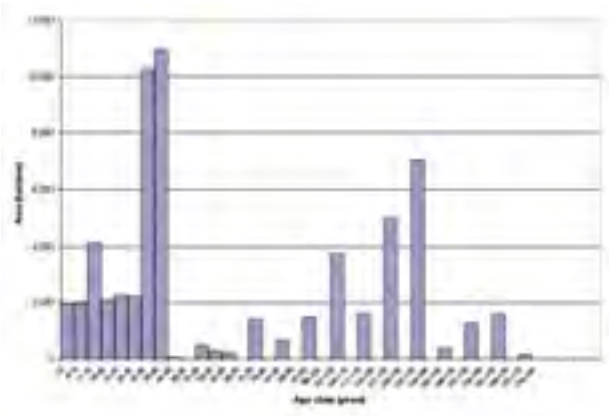
Average area harvested (bars) and average harvest age (line) during the 200 year forecast.



Age class structure at the beginning of the forecast.

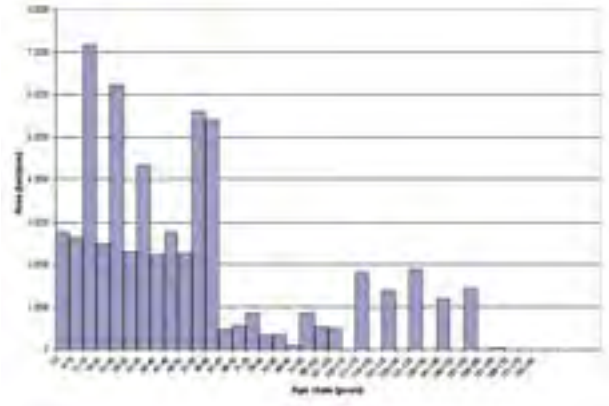


Age class structure after 50 years of harvesting.



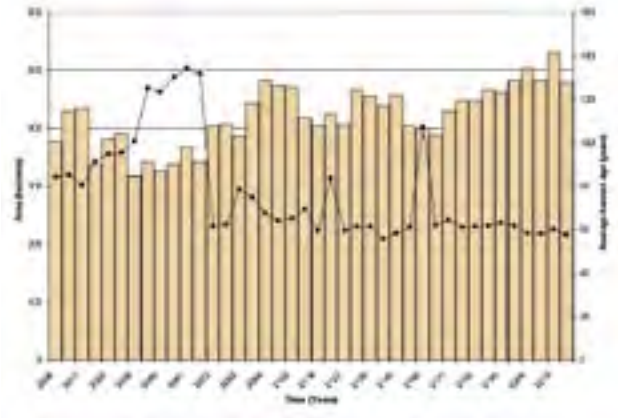
Periodic harvest level relative to operable growing stock levels.

Age class structure after 200 years of harvesting.

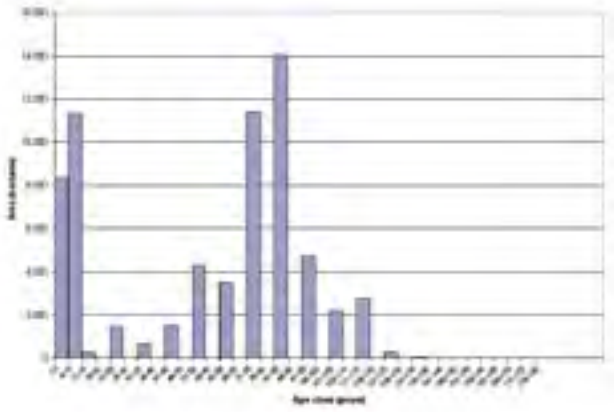


Scenario 4

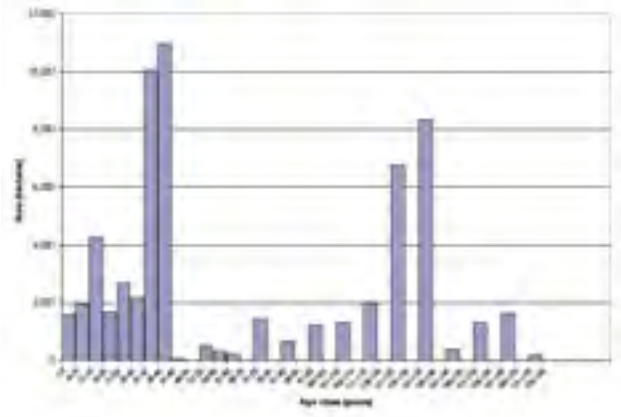
Average area harvested (bars) and average harvest age (line) during the 200 year forecast.



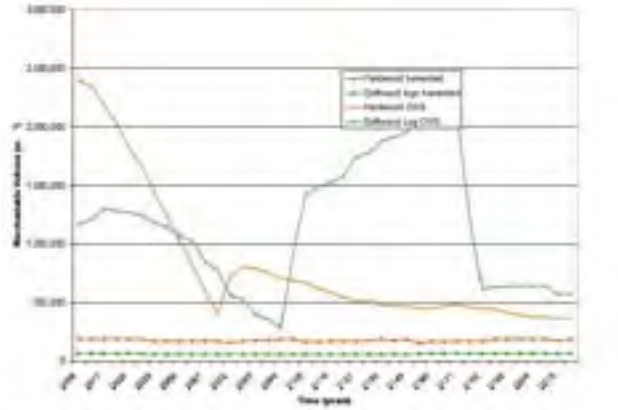
Age class structure at the beginning of the forecast.



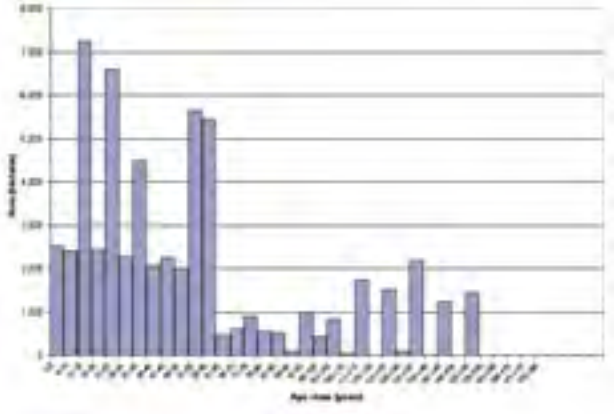
Age class structure after 50 years of harvesting.



Periodic harvest level relative to operable growing stock levels.

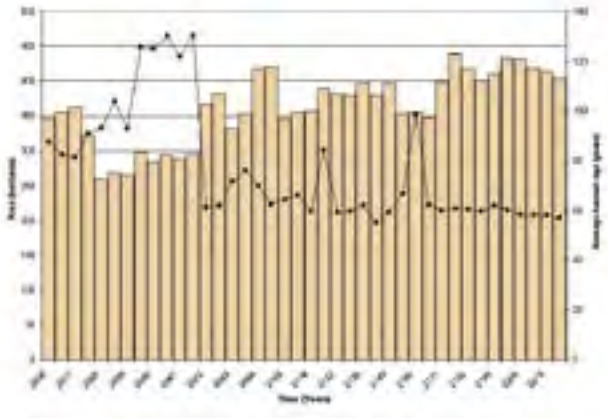


Age class structure after 200 years of harvesting.

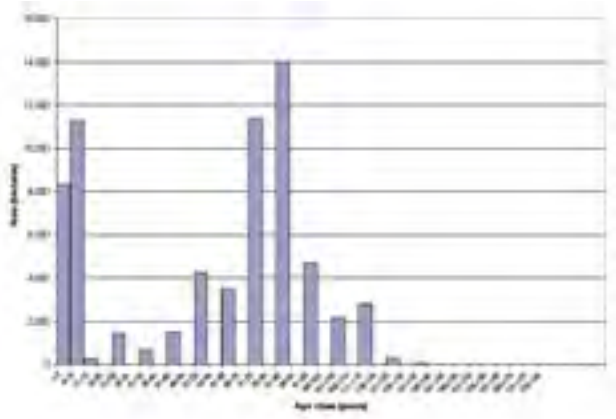


Scenario 5

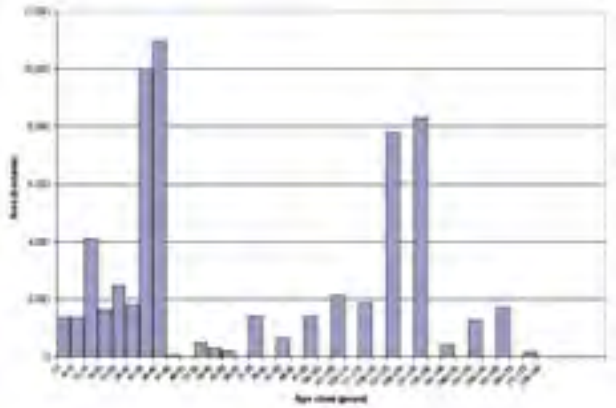
Average area harvested (bars) and average harvest age (line) during the 200 year forecast.



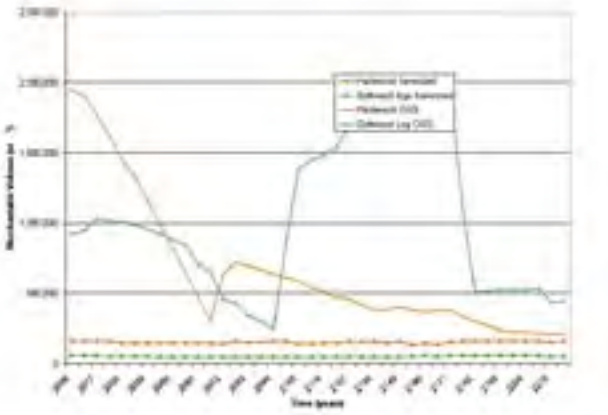
Age class structure at the beginning of the forecast.



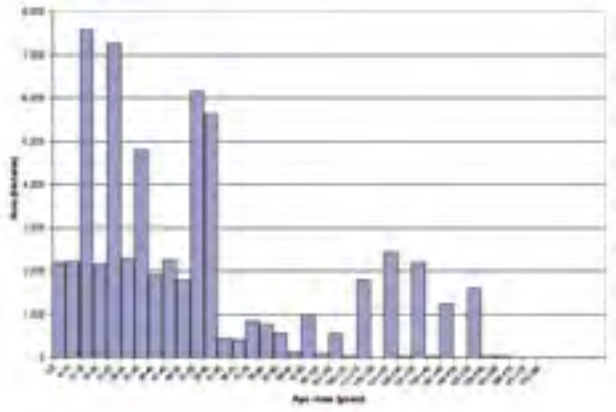
Age class structure after 50 years of harvesting.



Periodic harvest level relative to operable growing stock levels.

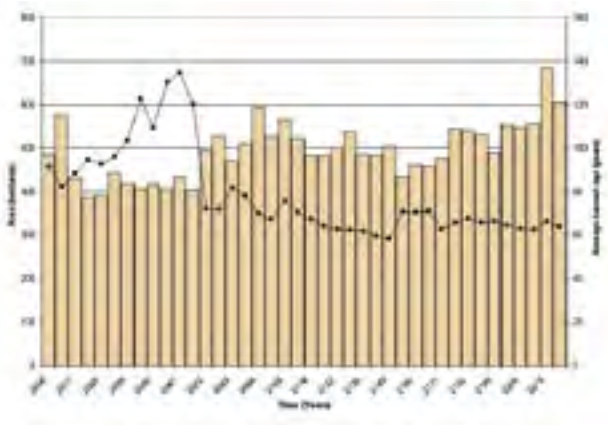


Age class structure after 200 years of harvesting.

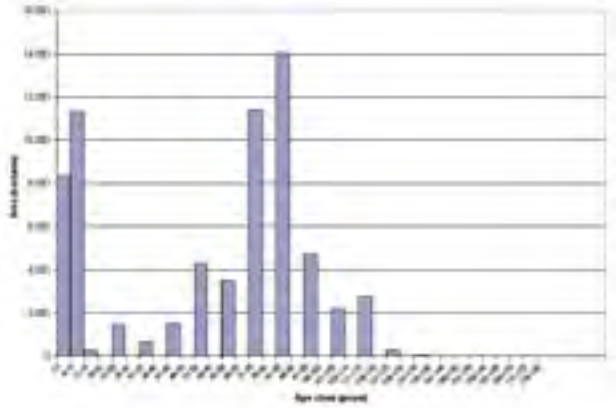


Scenario 6

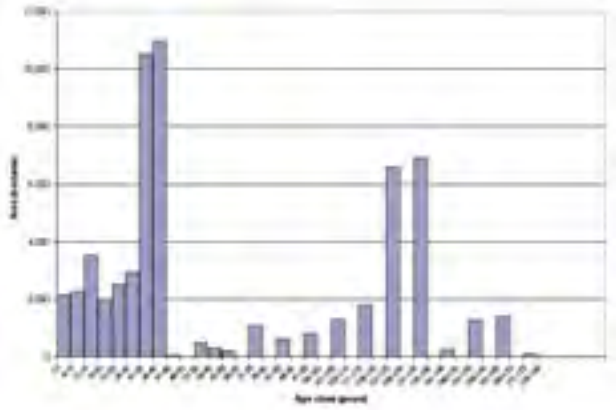
Average area harvested (bars) and average harvest age (line) during the 200 year forecast.



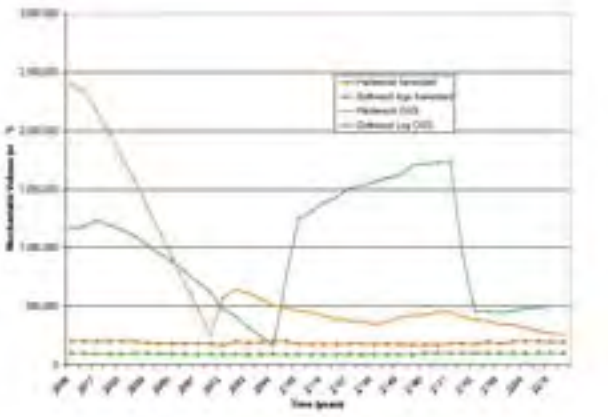
Age class structure at the beginning of the forecast.



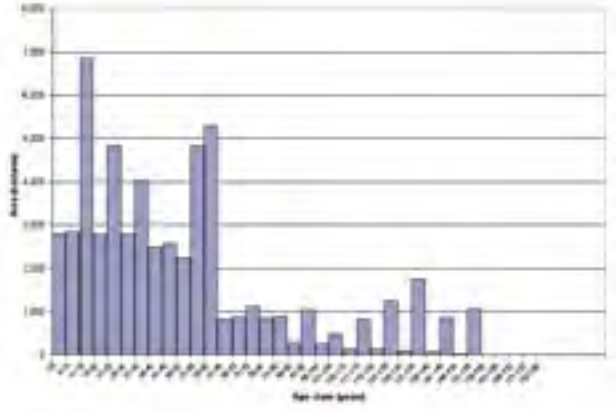
Age class structure after 50 years of harvesting.



Periodic harvest level relative to operable growing stock levels.

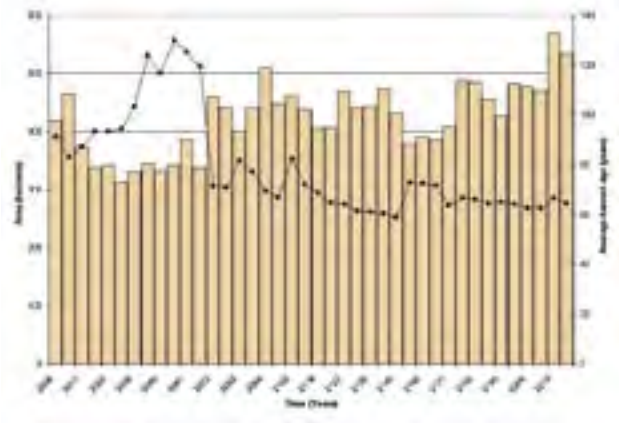


Age class structure after 200 years of harvesting.

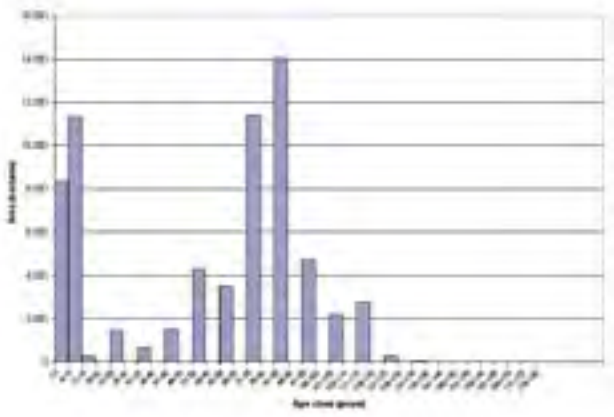


Scenario 7

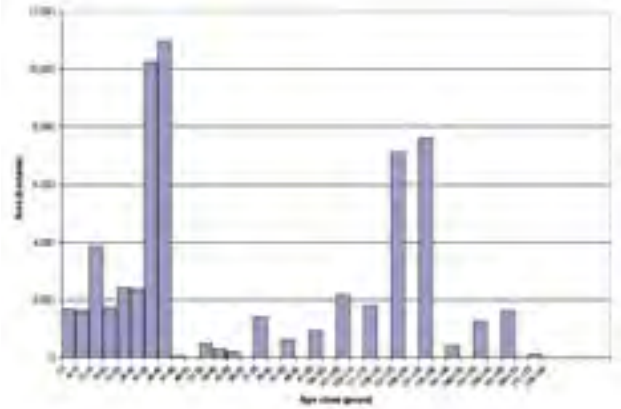
Average area harvested (bars) and average harvest age (line) during the 200 year forecast.



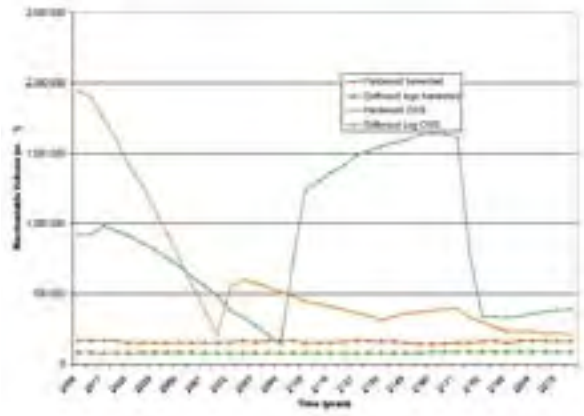
Age class structure at the beginning of the forecast.



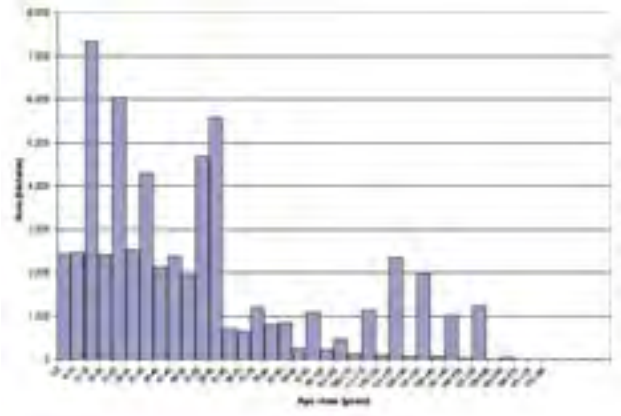
Age class structure after 50 years of harvesting.



Periodic harvest level relative to operable growing stock levels.

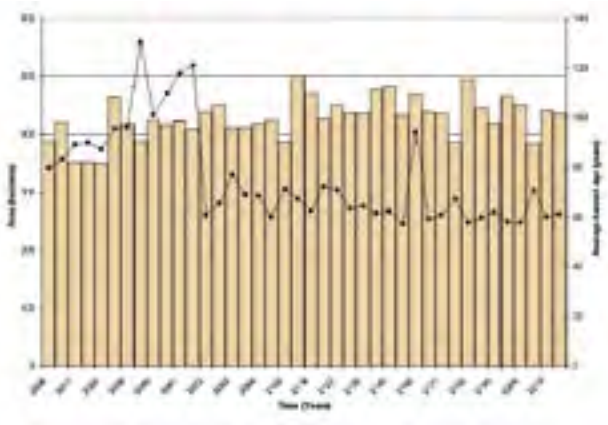


Age class structure after 200 years of harvesting.

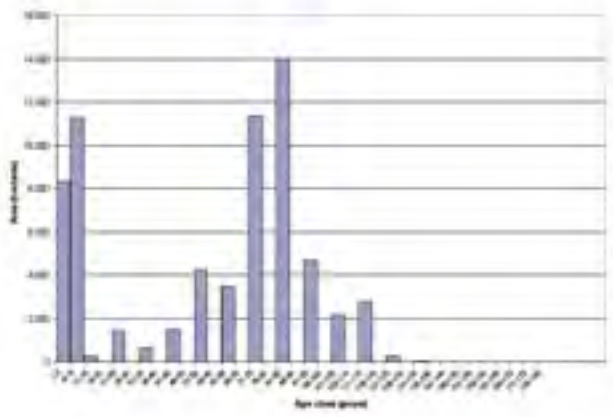


Scenario 8

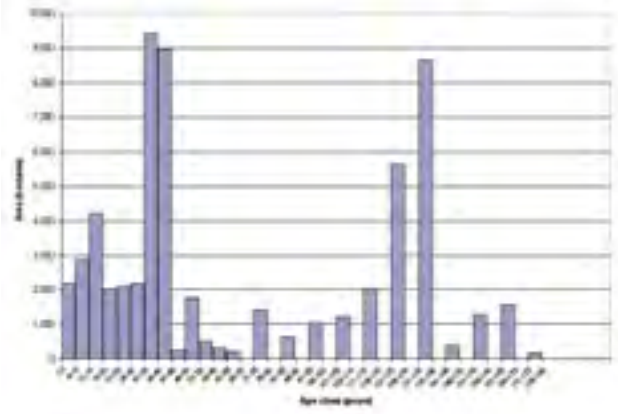
Average area harvested (bars) and average harvest age (line) during the 200 year forecast.



Age class structure at the beginning of the forecast.



Age class structure after 50 years of harvesting.



Periodic harvest level relative to operable growing stock levels.

Age class structure after 200 years of harvesting.