

Manitoba Conservation and Water Stewardship
Forest Practices Guidebook

**PRE-HARVEST
SURVEY GUIDELINES**

Revised: Friday, October-03-14

Manitoba Conservation
Forest Practices
Guidebook

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First Published: January 2003

Revised: 2014

Valid until: 2019

Manitoba Conservation Forest Practices Guidebook

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2014

Developed by Manitoba Conservation and Water Stewardship

The following organizations are acknowledged for their contributions:

Tolko Industries Ltd.

LP Canada Ltd.

Spruce Products Ltd.

Copies of this publication are available at:

<http://www.gov.mb.ca/conservation/forestry/practices/guidelines.html>

or contact:

Forestry Branch
Manitoba Conservation and Water Stewardship
200 Saulteaux Crescent
Winnipeg, Manitoba
R3J 3W3

The public is encouraged to send any comments and/or recommendations to
forestguidelines@gov.mb.ca.

Preface

Manitoba Forest Practices

This guidebook is part of Manitoba Conservation and Water Stewardship's Forest Practices Initiative. It provides essential Manitoba Forestry Branch direction for resource managers, timber operators, natural resource officers and auditors conducting or assessing forestry activities.

A primary goal of the initiative is to advance best practices using guidelines and standards for sustainable forest management activities in Manitoba. These guidelines present alternative procedures or standards that can be applied to satisfy principles the guidelines are based on. Guidelines are then used to develop prescriptions. Specific guidelines are enforceable when included as conditions of an operating permit or work permit. Forest practices guidebooks ensure all forest resource values are appropriately addressed for the full range of forest activities.

Forest practices guidebooks are references available for resource managers, timber operators, natural resource officers and auditors. Others include provincial guidelines, forest management plans, operating plans and standard operating procedures, which are developed independently by each forest industry company.

Committee membership consists of members from Manitoba Conservation and Water Stewardship branches, one regional resource manager, one forest industry member from each Forest Management Licensees, Spruce Products Ltd and the Department of Fisheries and Oceans. Standing invitations have been extended to the Forest Industry Association of Manitoba (FIAM) representing quota holders, the Manitoba Model Forest and Ducks Unlimited. Committee members co-operate in a consensus-seeking manner to develop forest practice guidebooks.

Each guidebook has a complete set of guidelines for a specific forest practice, pertinent references to science, legislation, policy, agreements and licences, as well as recommendations for the planning, implementation, monitoring and enforcement the forest practice.

The recommendations, as much as possible, are:

- measurable
- practical
- based on scientific evidence, traditional knowledge and collective experience
- flexible and applicable in a variety of ecological conditions
- clearly presented for consistent interpretation and application
- supported by technical terminology and definitions

Forestry practices in Manitoba are continuously monitored and appropriately amended when necessary. Guidebooks are reviewed every five years or earlier, if required.

Guidebooks can be found on the Manitoba Conservation Forestry Branch website:

<http://www.gov.mb.ca/conservation/forestry/practices/guidelines.html>

The public is encouraged to submit comments and recommendations to forestguidelines@gov.mb.ca.

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Pre-Harvest Survey Guidelines

Purpose

This document provides operational guidelines for the collection of information on forest values and other related values during pre-harvest surveys within proposed blocks. The survey information collected will be used to develop block summary forms that contain site-specific harvest and forest renewal prescriptions for operating plans. Forest management licensees and others responsible for planning harvest activities in Manitoba will use recommendations contained in this document.

Background

A pre-harvest survey (PHS) is an important component of sustainable forest management and a requirement of recent *Manitoba Environment Act* licences issued by Manitoba Conservation.

During the forest management planning process, identified blocks must be investigated to confirm timber resources and identify non-timber values. Each block, and when required, the area within 100 metres of the block, will be assessed to mitigate impacts of forest management activities on sensitive sites, waterways, wetlands, wildlife travel corridors and wildlife habitat.

PHS data are summarized and incorporated on block summary forms. Block summary forms accompany each proposed cut block in the operating plans. Many sources of other information also contribute to plans and prescriptions. Aerial photographs, topographic maps, other surveys, personal experience and information provided by Manitoba Conservation are regularly used. While a PHS does not include direct recommendations for site-specific prescriptions, all the information listed is used by forest planners to help develop site-specific prescriptions. Survey results should be included where appropriate in block summary forms.

The information on timber and other resource values collected during a PHS will be used to develop harvest and renewal prescriptions that:

- maintain site productivity
- reduce resource use conflict
- mitigate potential negative impacts
- make operations more efficient/effective
- conserve biodiversity
- contribute to sustainable forest management

Information collected during the PHS may also enhance or correct existing resource information and enable comparisons of pre- and post-harvest conditions. Not all information collected during a PHS will be presented in block summary forms. Some information may be inconsequential and will not warrant presentation, while sensitive information such as archaeological finds will not be made public. At this time, data collected during a PHS are not necessarily considered a source of baseline data for research or long-term monitoring. Future changes to standardize methods may help provide baseline data for research and monitoring. Pre-harvest survey methods are of a general nature and may not meet research data collection requirements.

Timing

Pre-harvest surveys should be performed prior to including a block in an operating plan (OP). Surveys should be conducted between May and September to capture information during a range of seasons and migration times. Based on projection blocks in the OP, the integrated resource management team may request surveys done at a specific time to capture information on a specific value (ex: ladyslippers, karst features). Local knowledge and information should be used to determine times and locations. Some blocks located in wet, remote areas cannot be efficiently surveyed during this period. These sites could be surveyed in early spring or late fall in the absence of snow when the sites are still relatively accessible.

Design and Methods

Each proposed block should be subdivided to identify discrete forest stand types or ecological units to survey. The number of PHS plots to be established is determined by the size of the block to be surveyed (Table 1). Different sampling intensity may be used if approved by Manitoba Conservation.

Table 1. Minimum number of pre-harvest plots to be established.

Size of Strata	< 5 hectares	6 - 10 hectares	11 - 25 hectares	26 - 50 hectares	51 – 75 hectares	76 + hectares
No. of Plots	2	3	4	6	8	10

Establishing or exceeding the minimum number of plots is intended to adequately collect information on the majority of elements included in the PHS. Due to the vastly different nature of the elements being surveyed, the confidence of survey results may be better or poorer than desired for some elements.

If the proponent is planning to harvest in the riparian management area (RMA), a pre-harvest survey should be done in the RMA.

In mixed forest stands with softwood understorey, more plots per hectare may be required to provide sufficient confidence in survey results. In addition to establishing PHS plots, surveyors should investigate greater portions of the entire block.

Pre-harvest survey methods proposed by each forest management licensee will be vetted through Manitoba Conservation.

Pre-Harvest Survey Elements

This section of the PHS guidebook identifies the essential elements on which information is collected during a PHS. The purpose of collecting information on each element is described and the specific items that must be collected during a PHS are indicated. Whether data is to be collected only at the PHS plots, or at and between plots, is also indicated. The information that must be presented for each proposed cut block in a block summary form is also shown. Block summary forms are required within OPs and for any proposed OP amendments. Strategies to deal with specific concerns will be indicated on the block summary; however, general strategies are indicated in forest management plans.

The PHS elements include:

- mensuration data
- vegetation communities (V-Types)
- soils
- understory trees
- competitive plants
- special concern, threatened and endangered (SCTE) species
- forest health
- wildlife evidence (sign)
- snags
- geographic and physical features
- heritage resources
- forest and other resource values
- waterways and wetlands

Mensuration Data

Purpose

The purpose of collecting mensuration data is to provide estimates of the volume and products (ex: pulpwood, sawlogs) in blocks for company plans.

Components of PHS:

- data to be collected at plots
- use provincial species codes
- record height measurements to the nearest 0.5 metre
- record tree ages

Required in Block Summary Form:

- species composition based on per cent cover
- average height of the canopy of each tree species
- average age for each tree species with comments for multi-aged stands
- timber volumes (m³/ha) for each tree species

Vegetation Communities (V-Types)

Purpose

The purpose of collecting vegetation community information is to enable the classification of the vegetation community of a forest stand for potential forest management applications and treatments, and to help determine the appropriate forest renewal standard for the V-Type or block.

Components of PHS:

- Data will be collected at plots.
- Use the Manitoba Forest Ecosystem Classification System for Manitoba (Zoladeski *et al* 1995).
- The location of plots will be mapped in some form (geographic information systems, paper maps, photos).
- The V-Type for each plot will be determined.

Required in Block Summary Form:

- V-Type information will be summarized for the block.
- V-Types are to be listed in descending order from the most to the least frequently encountered.
- Estimate the percent area of the proposed block occupied by each V-Type.
- Indicate the appropriate renewal objective for the whole or parts of the block.

Soils

Purpose

The purpose of collecting soils information is to incorporate data on erosion and/or rutting potential into the planning, implementation and scheduling of harvest and renewal activities. Soils information is also used to help determine soil productivity and species suitability for forest renewal.

Components of PHS:

- Data will be collected at plots focusing primarily on surface soils most affected by operations.
- Identify risks of excessive site disturbance.
- General soil descriptions will be based on surface soil moisture, texture classes, organic horizon depth and coarse fragment percent.
- Map locations of PHS plots at which soils have been examined.
- It is recommended that surface soils be examined at every V-Type change.

Required In Block Summary Form:

- V-Types and the soil types related to them should be reported together.
- List the soil types that are important operationally.

Understorey Trees

Purpose

The purpose of collecting understorey information is to identify acceptable softwood advanced regeneration and potential hardwood competition so that the appropriate softwood understorey protection measures may be prescribed, consistent with the *Protection of Softwood Understorey in Mixedwood and Hardwood Forest* guidebook for Manitoba (guidebook is currently under review).

Components of PHS:

- Data will be collected at plots.
- All tree species will be recorded.
- Height classes consist of < 3 m, 3 m to < 6 m, 6 m to < 10 m, .
- The number of stems per hectare in each height class will be calculated.
- Wind firmness of understorey in the 6 m to < 10 m and classes will be calculated.
- Leaf-off aerial photography may be used to supplement plot information for mixed wood blocks.

Required in Block Summary Form:

- stems per hectare for each understorey tree species
- stems per hectare in each height class
- a description of the distribution of understorey trees throughout the proposed block
- recommended understorey protection strategy (see *Protection of Softwood Understorey* guidebook)

Competitive Plants

Purpose

The purpose of collecting competitive plant information is to estimate the potential competition for regenerating tree species, and identify potential opportunities to restrict line of sight in conjunction with other site features to protect wildlife and maintain wildlife habitat.

Components of PHS:

- Data will be collected at plots.
- Record presence of competitive plants (alder, hazel, willow, rose, raspberry, mountain maple, thistle, grass and poplar potential).
- Map dense area of plants > 3 m in height that have the potential to restrict line of sight.
- Per cent cover and other measures are optional.

Required in Block Summary Form:

- Indicate the presence of competitive plants and/or identify opportunities for plants to be retained for the purpose of restricting line of sight.

Special Concern, Threatened and Endangered Species (SCTE)

Purpose

The purpose of identifying and collecting information on SCTE species and habitat is to make managers aware of their presence so that they can be protected in compliance with federal and provincial acts and regulations.

Components of PHS:

- Data will be collected at, and between, plots.
- Check *Species at Risk Public Registry* at: www.sararegistry.gc.ca/default_e.cfm prior to submission of OP for species listed and protected under the *Species at Risk Act*.
- Use species defined as endangered by the *Manitoba Endangered Species Act*.
- Regularly consult with Manitoba Conservation Data Centre (MCDC) at:
<http://www.gov.mb.ca/conservation/cdc/index.html>
- When SCTE species are observed, identify their habitat and complete a MCDC plant source feature/element occurrence field form available at:
<http://www.gov.mb.ca/conservation/cdc/report.html>

Required in Block Summary Form:

- Due to the sensitive nature of specific information, it will not be included in OPs but will be conveyed to the IRMT and incorporated during planning and treatment prescriptions.

Action Required:

If SCTE species are found, notify the MCDC and local IRMT

Manitoba Conservation Data Centre
200 Saulteaux Crescent, Box 24
Winnipeg, Manitoba R3J 3W3
Tel: 204-945-7743
Fax: 204-945-3077

<http://www.gov.mb.ca/conservation/cdc/report.html>

Forest Health

Purpose

The purpose of collecting forest health information is to identify forest diseases and insects that have the potential to affect future forest growth. Diseases and insects may be of interest throughout the province or only in a specific region. Operational harvesting or renewal treatments will be considered in the development of management strategies to address site-specific forest health concerns.

Diseases and Insects of Concern:

- jack pine dwarf mistletoe
- spruce dwarf mistletoe
- western gall rust
- hypoxylon canker
- hardwood stem decay
- stem cankers of conifers
- brown cubical rot
- white pocket rot
- armillaria root disease
- yellow stringy rot
- spruce and jack pine budworm
- poplar wood borer
- root collar weevils

Components of PHS:

- Data is collected at and between plots.
- Record specific disease or insect species at each plot and/or between plots.
- Record general forest health rating for each forest disease and insect.
- Map locations of dwarf mistletoe and root disease infection centers.

Required in Block Summary Form:

- forest health concerns (by disease or insect and hazard rating) from province
- general forest health rating
- prescription and mitigation, if harvest plan affected

Forest health concerns, arising from the PHS, that are deemed to be of a significant nature by the forest licence holder or Manitoba Conservation, may be assessed by Manitoba Conservation for the purpose of making appropriate pest management recommendations. For more information, including data collection procedures, refer to the document, *The Forest Health Requirements for Pre-Harvest Assessment Guidelines* (Manitoba Conservation 2002).

Wildlife Evidence (Sign)

Purpose

The purpose of collecting wildlife evidence is to document the presence of wildlife and wildlife habitat use that may require attention during planning and operations.

Components of PHS:

- data will be collected at, and between, plots
- collect and map the location of:
 - mineral licks and springs
 - colonial nesting sites
 - eagle and osprey nests
 - high-use wildlife travel corridors (down to mineral soil)
 - active large mammal dens
 - snake hibernacula
 - bat caves
 - native grass meadows
 - active large stick nest
 - exceptional or special observations

Required In Block Summary Form:

- Due to the sensitive nature of this information, it will not be included in OPs, but will be conveyed to the IRMT and incorporated during planning and treatment prescriptions.

Snags

Purpose

The purpose of collecting snag information is to identify the number of snags present in the block. This information will help determine the choice of harvest equipment (safety concerns) and the potential to provide wildlife habitat.

Components of PHS:

- Data will be collected at plots.
- Record number of snags per hectare by diameter, class and species.
- Map concentrations of snags within the proposed block.

Required in Block Summary Form:

- Calculate the number of hardwood and softwood snags per hectare.

Geographic and Physical Features

Purpose

The purpose of collecting geographic and physical feature information is to provide information for the planning of harvest and renewal prescriptions. This information is used to prescribe the appropriate harvest season, equipment and buffers for each block and will identify where line of sight may be a significant concern.

Components of PHS:

- Collect appropriate information between plots and at plots.
- Map slope, topography, sinkholes, karsts, non-operable areas, regeneration, residential and commercial lots, intensive public recreation areas and sites, and other significant features.

Required in Block Summary Form:

- Record presence of sinkholes and other significant features.
- Map areas to be avoided.

Heritage Resources

Purpose

The purpose of collecting heritage resource information is to document it so it can be protected while planning and implementing harvest and renewal activities.

Components of PHS:

- Training in the identification of culture and heritage resources will be used to help recognize potential indications of heritage resources such as graves, tools, artifacts, petroglyphs, pictographs, thunderbird nests, chert and soapstone. Contact an archaeological assessment services manager (204-945-1830) to make training arrangements. Often a local person will be available to provide training. Additional information can be found on the Manitoba Culture, Heritage, Tourism and Sport (CHTS) website at www.gov.mb.ca/chc/hrb/index.html.
- Map and record all evidence of potential heritage resources between or at PHS plots.

Required in Block Summary Form:

- Due to the sensitive nature of this information, it will not be included on block summary forms in OPs, but will be conveyed to the IRMT and incorporated during planning and treatment prescriptions.

Process

The proponent supplies a digital copy and shape files of their Operating Plan to Forestry Branch (FB). FB sends a CD of the Operating Plan to Historical Resources at the address below and the Operating Plan is review for known heritage resources. If there are concerns, the Historical Resources will contact FB.

Action Required:

- Report findings of artifacts or heritage sites to:
Manitoba Culture, Heritage, Tourism and Sport
Historic Resources Branch,
Main Floor, 213 Notre Dame Avenue,
Winnipeg, MB. R3B 1N3
Phone: 204-945-2118
Fax: 204-945-2384
Toll free in Manitoba: 1-800-282-8069 ext. 2118
Email: hrb@gov.mb.ca

Further investigation by CHTS to confirm significant heritage resources may be required. Significant heritage resources will require protection.

Any discoveries of human remains must be reported to the RCMP.

Excerpts from *The Heritage Resource Act*

[46](#) Every person who finds an object that is or that the person believes to be a heritage object, or remains that are or that the person believes to be human remains, shall forthwith report the find to the minister and shall not handle, disturb or do anything to the object or the remains except in accordance with such requirements as the minister may prescribe.

[51](#) No person shall destroy, damage or alter any heritage object, whether or not the person is the owner thereof, or any human remains.

[52](#) No person shall remove a heritage object from the province, whether or not the person is the owner thereof, except pursuant to a heritage permit and in accordance with such terms and conditions as may be prescribed by the minister and set out in or attached to the heritage permit.

Forest and Other Resource Values

Purpose

The purpose of collecting information on forest and other resource values is to identify features to consider while planning, implementing harvest and renewal activities.

Components of PHS:

- Map and record features encountered by the surveyor at or between plots, such as trap line activities, cabins, trails, baits, tree stands, claim posts, portages, fuel and boat caches or research plots.
- Identify exceptional trees or plants, which may require protection or provide seed sources.

Required in Block Summary Form:

- Map and record information available to the planner such as commercial/sport fisheries, eco-tourism enterprises, canoe routes, recreational lakes, wild rice operations and outfitter operating areas.
- OP maps will include designated and protected areas, proposed ecological reserves and other proposed protected areas.
- Indicate the mitigation prescribed to protect resource values.
- Map and record all land-use activities including, but not limited to, cabins, trails, baits, tree stands, fuel and boat caches, claim posts, portages and research plots (only to be used in discussion with the IRMT).

Waterways and Wetlands

Purpose

The purpose of collecting waterways and wetlands information is to map and indicate the presence of previously unidentified waterways and wetlands.

Components of PHS:

- At, and between plots, map and classify waterways such as streams, intermittent streams, ephemeral drainage and beaver floods.
- Map and classify wetland features such as marshes, fens, swamps, bogs, shallow open water, or riparian areas.
- PHS plots may be established in wetlands.

Required in Block Summary Form:

- Record or map new or previously unknown waterways and wetlands in or adjacent to the block.
- Indicate the mitigation strategy to protect waterways and wetlands in and adjacent to the block.

Appendix 1 – Legislation

The Species at Risk Act

The *Species at Risk Act* (SARA) was proclaimed in 2003. The act protects wildlife species at risk in Canada. Within the act, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was established as an independent body of experts responsible for identifying and assessing species considered to be at risk. This is the first step towards protecting species at risk. Subsequent steps include COSEWIC reporting its results to the Canadian government and the public, and the Environment Minister's official response to the assessment results. Species that have been designated by COSEWIC may then qualify for legal protection and recovery under SARA.

www.sararegistry.gc.ca/default_e.cfm

The Committee on the Status of Endangered Wildlife in Canada

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was established in 1977 to provide Canadians with a single, scientifically sound classification of wildlife species at risk of extinction. COSEWIC began its assessments in 1978 and has met each year since then to assess species. COSEWIC uses a process based on science, [Aboriginal traditional knowledge](#) and [community knowledge](#) to assess the risk of extinction for species. Its process is thorough, independent and transparent.

www.cosewic.gc.ca/eng/sct6/sct6_6_e.cfm

The Manitoba Endangered Species Act

[The Endangered Species Act](#) ensures the protection and enhances the survival of threatened and endangered species in Manitoba. The act also enables reintroduction of extirpated species into the province, and designates species as threatened, endangered, extirpated or extinct. This legislation may be applied to any mammal, bird, reptile, amphibian, fish or plant, living or dead. The act is binding on the Crown and Crown agencies and applies to all lands in Manitoba. A species is not protected until it has been declared by regulation under the act to be threatened, endangered, extirpated or extinct.

www.gov.mb.ca/conservation/wildlife/legislation/endang_act.html

The Manitoba Conservation Data Centre

web2.gov.mb.ca/conservation/cdc/index.php

Appendix 2 – MCDC Plant source feature/element occurrence field form

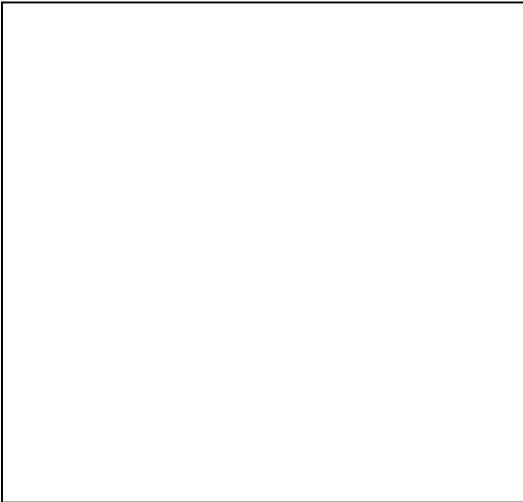
**MANITOBA CONSERVATION DATA CENTRE
Plant source feature/element occurrence field form**

SCIENTIFIC/Common Name: _____

SURVEY DATE (YY-MM-DD): _____ OBSERVER/SURVEYOR : _____

DIRECTIONS (Driving or hiking directions and/or list prominent topographic features): _____

GPS Point (s) name (s)	Latitude (deg, min, sec)/ Northing	Longitude (deg, min, sec)/ Easting	Datum and UTM zone



Diagram/map – attach map if necessary

Confidence extent: Y - Confident that the full extent of element occurrence (EO) is known.
 N - The full extent of the EO is **not** captured by the EO Representation.
 ? - Uncertain if the full extent of the EO is known.
 If 'no' or '?' , estimated area of potential habitat: _____

PATCH/POPULATION DESCRIPTION (area/size of occupancy and density i.e. landscape distribution): _____

NUMBER OF INDIVIDUALS COUNTED: _____ ESTIMATED POPULATION SIZE: _____

FLOWER COLOR: _____

POPULATION CONDITION (DISEASE, DAMAGE, ETC): _____

VEGETATIVE (ex: suckers): _____ %, FLOWER: _____ %, FRUIT: _____ %

ASPECT: _____ SLOPE: _____

MOISTURE: MESIC XERIC HYDRIC

LIGHT EXPOSURE: FULL SUN PART SHADE FULL SHADE

PARENT MATERIAL: _____ SOIL/SUBSTRATE: _____

LOCAL LANDFORM (ex: slope position, gully, etc): _____

REGIONAL LANDFORM: _____

DOMINANT PLANT COMMUNITY: _____

EXOTIC/INVASIVE SPECIES: _____

OTHER ASSOCIATED TAXA: _____

LANDSCAPE CONTEXT (surrounding fragmentation/connectivity, abiotic factors and ecological processes ex: hydrology/succession): _____

THREATS/STEWARDSHIP (land uses, disturbance, management/protection comments): _____

OWNER: _____

OWNER COMMENTS: _____

PHOTO NUMBERS/DESCRIPTIONS: _____

SPECIMENS COLLECTED: _____

COMMENTS: _____

Send form to:
Attention: Botanist
Manitoba Conservation Data Centre
Box 24, 200 Saulteaux Crescent
Winnipeg, Manitoba R3J 3W3
Fax : 204-945-3077 Phone : 204-945-7743
Email : wildlife@gov.mb.ca

Glossary

Advanced regeneration – The young tree growing under an existing stand before it is logged. If advanced regeneration survives the logging operation it may form an initial part of the new stand (Dunster 1996).

Operating Plan (OP) – Plan prepared and submitted annually or every two years by timber operators describing how, where and when to develop roads, harvest timber and complete renewal of the forest. OPs describe the integration of operations with other resource users, the mitigation of the impacts of logging, the reclamation of disturbed sites and the reforestation of harvested areas.

Bog – Bogs are peat-covered wetlands (peatlands) in which the vegetation shows the effects of a high water table and a general lack of nutrients. The bog surface is often raised, but if it is flat or level with the surrounding wetlands, it is virtually isolated from mineralized soil waters. Hence, the surface waters of bogs are strongly acid and the upper peat layers are extremely deficient in nutrients. Peat is usually formed in situ under closed drainage and low oxygen. The thickness of peat exceeds 40 cm. Cushion-forming sphagnum mosses are common, along with heath shrubs. Trees may be absent; if present, they form low, stunted trees open-canopied forests (National Wetland Working Group 1997).

Block – The geographic area of trees scheduled for harvest or other treatment (ex: cut block, spray block) (Dunster 1996). In this guideline, it refers to the area in which the pre-harvest survey is performed for forest management activities (Forest Practices Committee 2001).

Buffer – An area of land that reduces the impacts of adjacent activities on the critical area (Dunster 1996). Buffer strips along a trail could block views that may be undesirable. Buffers may be set aside next to wildlife habitat to reduce abrupt change to the habitat.

Chert – A rock resembling flint and consisting essentially of fine crystalline quartz or fibrous chalcedony. Used by Aboriginal people to make arrowheads, axes and other tools.

Colonial nesting sites – A location where selected species of birds nest in colonies either on the ground or in trees. Ex: pelicans nest in colonies on the ground and blue herons nest in colonies in trees.

Cut block – An area defined on the ground and planned for harvest, usually in one season.

Environment Act Licence – A licence to operate a development (as defined in *The Environment Act*), issued to the proponent of the development by the director responsible for *The Environment Act*, with such specifications, limits, terms and conditions as the director deems necessary to ensure effective environmental management of the development.

Ephemeral drainage – A stream that flows briefly only in direct response to precipitation in the immediate locality and whose channel is at all times above the water table (Dunster 1996).

Fen – Fens are peatlands characterized by a high water table, but with very slow internal drainage by seepage down very low gradient slopes. The oxygen saturation is relatively low but higher than in bogs. A slow moving water table is enriched by nutrients from upslope material and thus fens are more minerotrophic than bogs. The thickness of peat generally exceeds 40 cm. The vegetation in fens usually reflects the water quality and quantity available, resulting in three basic types: graminoid fens without trees or shrubs, shrub fens and treed fens (National Wetlands Working Group 1997).

Forest Management Licence (FML) – An area-based agreement between the province and a company that provides a long-term fibre supply to a wood-using industry in exchange for accepting many forest management responsibilities including planning, allocating, supervising and administering both timber depletions and forest renewal activities.

Forest practices – Activities that are conducted in the forest during all stages of forest management operations. Examples are surveys, harvesting, road construction and silviculture.

Forest renewal prescription – A detailed plan for returning a harvested area to productive forest.

Geographic Information Systems (GIS) – A computer-based tool for mapping and analyzing events and objects on the landscape.

Guidebook – A collection of policies, guidelines, procedures and standards related to a specific forest practice.

Guideline – Procedures or standards that can be applied to satisfy the principle upon which the guidelines are based. Specific guidelines are enforceable when identified on work permits.

Heritage resource – any work, or assembly of works of nature or of human endeavour, that is of value for its archaeological, palaeontological, pre-historic, historic, cultural, natural, scientific or aesthetic features, and may be in the form of sites or objects

Integrated Resource Management Team (IRMT) – A regional team organized to review natural resource issues and comprised of members of Manitoba Conservation (Forestry, Wildlife and Ecosystems Protection, Regional Operations, Lands, Parks and Natural Areas) and Manitoba Water Stewardship (Fisheries and Water Quality).

Intermittent stream – A stream in contact with the groundwater table that flows only at certain times of the year, such as when groundwater table is high or when it receives water from springs or from some surface source such as melting snow. It ceases to flow above the streambed when losses from evaporation or seepage exceed the available stream flow (Dunster 1996).

Karst – Describes landforms and processes associated with dissolution of soluble rocks, such as limestone, marble, dolomite, or gypsum; characterized by underground drainage, caves, and sinkholes (Dunster 1996)

Line of sight – The distance that can be seen until the view is obstructed. The obstruction can be vegetation or topography.

Manitoba Forest Ecosystem Classification System (FEC) – A system for classifying the commercial forest areas of Manitoba. The system consists of 33 vegetation types and 22 soil types that are identified using keys.

Marsh – Marshes are wetlands that are periodically inundated by standing or slowly moving water and hence are rich in nutrients. Marshes are mainly wet, mineral-soil areas, but shallow, well-decomposed peat may be present. Marshes are subject to a gravitational water table, but water remains within the rooting zone of plants for most of the growing season. Waters are usually neutral to slightly alkaline and have relatively high oxygen saturation. They are characterized by emergent vegetation like reeds, rushes or sedges (National Wetland Working Group 1997).

Mineral licks – Terrestrial sites used by big game animals as a source for essential minerals as both macro and trace elements.

Mitigation – Actions taken during the planning, design, construction and operation of works and undertakings to alleviate adverse effects on the land base.

Non-operable areas – Areas within the operating area where the physical features of the landscape make timber harvesting inappropriate.

Other related values – All forest related values that are not derived from timber harvesting and the subsequent production of forest products.

Petroglyphs – Rock carvings (carved into large rock masses) created by Aboriginal people to represent ideas, events or activities (Dunster 1996).

Pictograph – A number of different techniques used by Aboriginal people to visually represent ideas, events or activities (ex: rock paintings) (Dunster 1996).

Policy – A set of decisions, methods, or actions designed to fulfil predetermined objectives (Dunster 1996). A deliberately chosen course of action. Policy in this document refers to governing principles and corresponding procedures and standards of the provincial government.

Procedures – A step or series of steps, taken to put into practice a policy or guideline.

Regeneration – The renewal of a forest or stand of trees by natural or assisted means, or the stand of young trees under 1.3 m high that results (Dunster 1996).

Riparian area – Riparian area (RA) means an area of land on the banks or in the vicinity of a water body, which due to the presence of water supports, or in the absence of human intervention would naturally support, an ecosystem that is distinctly different from that of adjacent upland areas (*The Water Protection Act*). For operational purposes, the RA will end at the edge of the merchantable forest. No forestry activity will be permitted within the RA.

Rutting potential – Refers to the susceptibility of an area to be damaged by the repeat passage of machinery.

Sink holes – Depression formed as underlying limestone bedrock is dissolved by groundwater. Sinkholes vary greatly in area and depth and may be very large. The two main varieties are those caused by the collapse of a cavern roof and those caused by the gradual dissolving of rock under a soil mantle (Encyclopedia Britannica online 2007).

Slope – The angle at which a planar surface is inclined relative to the horizontal (Dunster 1996).

Snags – Any standing dead, partially dead or defective tree at least 3 m tall (Dunster 1996).

Soapstone – A soft stone having a soapy feel and containing talc.

Special Concern, Threatened and Endangered Species (SCTE) – Classifications of the status of species populations as determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

- **Special Concern (SC)** – Indicates any indigenous species of fauna or flora that is particularly at risk because it has low or declining numbers, because it occurs at the fringe of its range or in restricted areas, or for some other reason, but is not a threatened species.
- **Threatened (T)** – Indicates any indigenous species of fauna or flora that is likely to become endangered in Canada if the factors affecting its vulnerability do not become reversed.
- **Endangered (E)** – Indicates any indigenous species of fauna or flora that is threatened with imminent extirpation or extinction throughout all or a significant portion of its Canadian range.

Standards – Descriptions of targets or goals used to measure the success of procedures. They may be general or specific.

Strata – A stand of trees with similar species composition, height, age, site and crown closure. Strata may also describe one or more stands with similar characteristics.

Sustainable forest management – Management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for the present and future generations (CCFM 2000).

Swamp – Swamps are wetlands where standing or gently moving waters occur seasonally or persist for long periods, leaving the subsurface continuously waterlogged. The water may also be present as a subsurface flow of mineralized water. The water table may drop seasonally below the rooting zone of the vegetation, creating aerated conditions at the surface. Swamp waters are usually neutral to moderately acid, and show little deficiency in oxygen or mineral nutrients. Their substrate consists of mixtures of mineral and organic materials, or woody, well-decomposed peat deposited in place. The vegetation may consist of dense coniferous or deciduous forest, or tall shrub thickets (National Wetland Working Group 1997).

Thunderbird nest – A spiritual site where Aboriginal people have gone to seek visions. The site is usually constructed of rocks in a circle.

Understorey trees – The trees growing under the canopies of the other larger adjacent trees (Dunster 1996).

Vegetation types (V-Type) – The classification assigned to a forest stand using a dichotomous classification key. The key is primarily based on the presence and abundance of vegetative species. The vegetation type is used in the Manitoba Forest Ecosystem Classification System.

Wind firmness – An indication of the ability of the softwood understorey to withstand significant winds after the overstorey has been removed.

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