LP Canada Ltd.

Swan Valley Forest Resources Division

STANDARD OPERATING GUIDELINE

BIODIVERSITY

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STANDARD OPERATING GUIDELINES (SOG's)

1.0 General Overview

LP Canada Ltd. (LPC) is committed to working closely with surrounding communities that may be affected by forest management operations and to ensuring orderly development of the forest resource to accommodate all forest values.

Originally LPC included a group of Standard Operating Procedures (SOP's) in Section 9 of the 10 Year Forest Management Plan (FMP). With the subsequent development of an Environmental Management System (EMS) for the Swan Valley Operations, it is appropriate to adapt the original SOP's into a complimentary set of Standard Operating Guidelines (SOG's) within the EMS.

LP Canada Ltd. is committed to the implementation of ecosystem based management within FML #3 and is presently developing the required infrastructure. This includes the development of an ecosystem based resource inventory, adjustments to planning and operational practices and the research necessary to achieve a better understanding of the ecosystems present and the processes occurring within them.

1.1 Sustainable Forest Management (SFM)

The Canadian Council of Forest Ministers (CCFM) began a process in 1993 to define measure and report on the forest values Canadians want to sustain and enhance. The CCFM, along with technical and scientific advisors to lend support, consulted with officials and scientists of federal, provincial and territorial governments, experts from industry, the academic community, non-governmental organizations, the Aboriginal community and various other interest groups. The results of these consultations were documented in *Defining Sustainable Forest Management: A Canadian Approach to Criteria and Indicators* (1995). The development of these criteria and indicators (C & I) was an important step in meeting Canada's domestic commitments on sustainable forest management.

The purpose of the Criteria and Indicators are to provide a common understanding and scientific definition of sustainable forest management in Canada. Together they form a framework for describing and measuring the state of our forests, forest management practices, values and progress towards sustainability. This information is then used to develop forest management policy and to determine areas where research is required to fill information gaps and develop new technologies. The C & I approach not only recognizes that forests are ecosystems but also realizes forests provide a wide range of social, economic and environmental benefits to Canadians and realizes the necessity of public education and participation in the process of sustainable forest management.

There are six criteria relating to sustainable forest management. Each criterion has been broken down into 27 elements to yield 83 indicators to help track progress in

achieving sustainable development and social, economic and environmental objectives. The six criterion of SFM are:

- Conservation of biological diversity.
- Maintenance and enhancement of forest ecosystem condition and productivity.
- Conservation of soil and water resources.
- Forest ecosystem contributions to global ecological cycles.
- Multiple benefits of forests to society.
- Accepting society's responsibility for sustainable development.

LPC is striving towards sustainable forest management, as defined by the above criterion, in its forest management practices. These SOG's are a partial fulfillment of SFM. The Stakeholders Advisory Committee plays an integral role in the public participation, contribution of societal values and knowledge dissemination component of SFM. Pre-harvest surveys, permanent sample plots, ecological monitoring and research programs contribute to SFM by providing baseline data, site specific ecological information and enable LPC to identify areas where more information is required.

1.2 Objectives of the SOG's

The EMS and SOGs provide a framework for the company to achieve and maintain a particular standard, as set out in these documents, as well as in the approved 10 Year FMP, Environment License 2191E and the FML #3 Agreement.

- The government's objectives will be met by the forest management planning process described in the EMS and the SOGs.
- Provide direction to LPC for planning, implementing and monitoring timber harvest operations on the forest management area.
- Outline the planning and operating standards of Ecosystem Based Management for timber harvest, road development, reclamation and integration of timber harvesting with other forest uses.
- Describe the planning and submission requirements for timber harvest operations.
- The EMS and SOGs are dynamic enough to provide sufficient flexibility to accommodate most site conditions. The principles in the EMS and SOGs are considered to be the normal expectations for harvest operations.
- The EMS and the SOGs are expected to be applied using sound judgment based on practical experience and technical competence.
- The EMS and SOGs provide documentation, structure and accountability associated with a particular activity.

Ecosystem based management refers to the development of management systems that attempt to simulate ecological processes with the goal of maintaining a satisfactory level of diversity in natural landscapes and their pattern of distribution in order to ensure the sustainability of forest ecosystems and forest ecosystem processes (Canadian Council of Forest Ministers, 1997).

The SOGs are unique to FML #3. They have been developed with specific reference and compliance to Federal and Provincial legislation, regulations and guidelines, and the requirements and conditions of the FML #3 agreement signed in September 1994, with the Province of Manitoba. They are also consistent with the requirements as set out in Environment Act License 2191E issued to LPC in 1996.
Many of the provisions, options and approaches in these SOGs may be considered for other jurisdictions, but they cannot be considered as a precedent for those jurisdictions. These provisions are based on concerns and conditions specifically related to operations within FML #3. They take into account potential future uses. They are an interrelated set of provisions, and not stand-alone solutions.

The EMS and SOGs ensure LPC meets or exceeds government regulations. They cannot, however, be considered a final position. Rather, they are part of a dynamic plan that will adapt or adjust as determined by legislation or societal attitudes, interests and concerns. As the SAC will assist LPC throughout the years in operational planning, ongoing review of the EMS and SOGs will be part of LPC's adaptive management planning.

2.0 General Habitat Management Objectives and Guidelines

Sound wildlife habitat management attempts to maintain viable habitat for wildlife species throughout a designated area. All areas within FML#3 are subject to the following management objectives and guidelines.

2.1 Biodiversity Objectives

Biodiversity objectives to be met are:

- To manage wildlife habitat biodiversity at a coarse-filter or landscape-level;
- To maintain, or enhance, the biodiversity of terrestrial and aquatic communities and associated ecological processes;
- To maintain or enhance the integrity and diversity of riparian habitats and/or established aquatic buffer zones;
- To manage forest management activities in order to minimize disturbance on wildlife habitat;
- To report and protect critical habitat for plant and animal species considered at risk, threatened, or endangered in each area.

With the support of current research, LPC has established a set of standard operating guidelines for biodiversity that will be used throughout FML 3 during forest management activities. As new information and research becomes available, LPC will adapt guidelines and specifications to ensure biodiversity objectives are continually met.

2.2 Variable Retention

Variable retention is the maintenance of structural elements of the original forest in order to facilitate the conservation of both vegetation and animal biodiversity. Various structural elements of the forest include large live or dying trees, standing dead trees or snags, woody debris, understory vegetation, such as shrubs, herbs and mosses. Depending on forest management objectives for each cutblock, some of these structural elements can be maintained individually or as combined elements in forest patches or clumps.

2.2.1 Live Trees

Large diameter live and dying trees provide habitat for a number of animal species. The retention of large diameter trees in cutblocks provides short-term habitat requirements for canopy-loving species and long-term habitat requirements for primary and secondary cavity dependant species. Through time as the regenerating forest grows, live trees retained from the original harvest become future sources of snag and coarse woody debris habitat. Many species of birds, insects, amphibians, reptiles, small mammals and some fur-bearing species depend on snag habitat for all or part of their daily life requirements. Therefore, the planning and implementation of live trees is essential for the conservation of biodiversity in harvested areas over time.

2.2.2 Dying or Standing Dead Trees (Snags)

Standing dead trees in various stages of decay provide habitat for a variety of animal species. Specifically, there are differences in trees used for nesting and trees used for feeding. Primary cavity nesters, which excavate a new cavity each year, usually select living or partially dead hardwoods for nesting purposes. Most feeding by these birds occurs on partially dead or fully dead hardwood and softwood trees. Bole diameter and tree height are important characteristics of cavity tree selection and appear to vary with each species of bird. Most cavity dependent mammals are secondary cavity users (i.e. they use existing tree cavities). Snags also contribute to woody-debris recruitment which provides habitat for animal species living above and below the forest floor. The maintenance of snag structure in harvested areas is critical when managing for biodiversity due to the assortment of habitats snags can provide through time.

2.2.3 Coarse Woody Material

Coarse woody material also provides habitat to a myriad of forest animal species. Coarse woody material is used as cover habitat, feeding habitat, nesting and breeding habitat and also provides for suitable microclimates. In aquatic habitats, woody material is a source of nutrient inputs over time, and is also used as cover and nesting habitat for a variety of fish species. Through the maintenance of snag structure and methods used to log and delimb trees, an adequate source of coarse woody debris can be left in harvested areas.

2.2.4 Understory Vegetation

The maintenance of understory vegetation such as immature softwood, shrubs, herbs and mosses is also critical in achieving biodiversity objectives within a harvested area. Understory vegetation provides for structural variability offering a multitude of habitats, as well as providing for more microclimatic conditions both in terrestrial and aquatic environments.

2.3 Distribution of Variable Retention within Cutblocks

Implementing in-block retention strategies can be achieved by simply adjusting the density and spacing of the structural elements of the forest that need to be retained (Sougavinski and Doyon 2002). Two methods for accomplishing this are:

1. Dispersed Retention (Single Tree) – which refers to a uniform distribution of retained structural elements across a harvest block, and

2. Aggregate Retention (Wildlife Tree Patch) – which refers to the distribution of patches containing a combination of retained structural elements within the harvest block.

The two methods described can be used alone or can be combined in order to maintain landscape connectivity once the stand is harvested. Aggregate or patch retention provides for structurally diverse islands with a climatologically moderated habitat. Dispersed or single tree retention can provide stepping stones between these islands.

LPC is currently conducting forest operations in order to maximize landscape connectivity by combining the dispersed and patch retention strategies. The following guidelines provide a planning and operational framework in order to achieve wildlife habitat diversity within harvested areas of FML 3.

2.4 Operating Guidelines for Wildlife Habitat Biodiversity

- In cutblocks larger than 10 ha, 8-12 trees/ha on average per block, will be retained as wildlife trees, as a minimum requirement. Wildlife trees are live or dying trees that should be a minimum of 25 cm diameter at breast height (dbh). Smaller trees can be left when no larger diameter trees are present within the stand. Retention of large trees, over 45 cm dbh, is encouraged in order to provide the most suitable trees for a variety of cavity-dependent birds and mammals.

- Trembling aspen and balsam poplar are the preferred tree species for cavity nesters. However, white birch and various conifer species should be retained to provide feeding cavities, escape cover, and contribute to biodiversity within the block. Conifer cavity trees not only provide thermal and security cover but also contribute to long-term snag structure as the regenerating forest stand reaches maturity. Non-merchantable trees (trees with a high degree of stem rot, trees that would be difficult to process due to growth form, etc.) should be retained for wildlife trees where possible. Retention of only white birch trees is not adequate for wildlife tree habitat provision due to the possible die-back of birch following harvest. They are also not a preferred species for cavity nesting. Wildlife trees are retained within a cutblock not only to provide habitat for the present, but more importantly to provide snags over the next 30-40 years as the stand regenerates.

- An aggregation of wildlife trees, dying and/or standing dead trees (snags), and understory vegetation must be retained in patches of varying sizes across the cutblock (Table 1). Patches can be retained around low lying wet areas, softwood understory, along inoperable slopes, and along in-block streams and swales. In block situations where these attributes are not present, LPC may designate patch location on the ground prior to harvest. Patches must be left undisturbed by logging equipment unless otherwise directed by LPC and the Province of Manitoba.

Table 1. Patch Size Classes (adapted from Sougavinski and Doyon 2002).

Patch Class	***Patch Size (ha)***	***Approximate Number of Trees***
Small Patches	.01 to.14	5 – 70
Medium Patches	.141 to .26	71 – 125
Large Patches	>.26	>125

- Wildlife trees should be distributed throughout the block, both as single trees and in clumps (clumps are also defined as wildlife tree patches, see Table 1). Since most cavity users are territorial, it is important to retain a relatively uniform distribution of cavity trees throughout each block. On larger cutblocks (defined as cutblocks larger than 10 Ha), where present, clumps of mature mixed deciduous and conifer species should be retained. Trees that are retained to provide support for softwood

understory protection, biodiversity, stream buffers, line of sight buffers, buffers around nests, mineral licks or other significant features will be considered to contribute to the provision of wildlife trees and in-block structure.

- Wildlife tree patches in larger blocks will be retained to provide habitat diversity. To maximize the effectiveness of these leave areas, activities associated with logging operations will be kept to a minimum where possible. Leave areas should be located within 400 m of contiguous forest to encourage utilization. For instance, pine marten have been found to avoid large areas of open habitat and rarely venture more than 500-1000 m from uncut forest areas.

- LPC recognizes that many wildlife species depend heavily on snags and downed woody debris. LPC will strive to maintain snags for foraging habitat and wildlife trees to provide nesting opportunities in its operations, recognizing that it must first consider the safety of its contractors and conform to Manitoba Workplace Safety and Health regulations. LPC staff will promote the maintenance of snags and wildlife trees with the public, its contractors and Manitoba Workplace Safety and Health. In situations where the retention of snags could be dangerous for other forest workers, snags can be topped at approximately 2.0-2.5 m in height.

- Leave patches, in addition to other forest structure retained, should be no more than 400 m apart to provide cover for wildlife, unless hunting concerns can be mitigated using alternative methods, such as slash dispersal on roads, berms, gates, and/or legislated road closures.

- To encourage the use of cutovers by wildlife and to mitigate hunting pressures, cutblocks should be designed to reduce long, unobstructed lines of sight. Retention of structure by single stems and patches of trees (wildlife tree patches) or topographic features such as small hills can be left to facilitate this.

- Snags and coarse woody debris provide habitat for many species and are necessary to sustain elements of biological diversity. Silvicultural practices that maintain abundant coarse woody debris are encouraged. In order to provide large pieces of decaying wood within cutblocks, trees are topped and limbed at the tree stump. In areas where slash loading is a concern, the provision for coarse woody debris may be waived.

- In designated harvest blocks small piles of tops and limbs and slash debris will be retained within block boundaries between 50 m and 100 m from dense softwood stands to provide habitat for small mammal species. This provision is established to help maintain known pine marten populations, as well as to contribute to the maintenance of stand wildlife biodiversity.

- Small merchantable stands surrounded on at least three sides by meadow, shrub lands, or streams and lakes may be excluded from logging operations and left as cover or mature forest cover.

- During planning, block design will ensure forested corridors are retained for wildlife movement between various seasonally used habitats.

- All post-harvest activities will be consistent with habitat and wildlife management, objectives, and guidelines.

3.0 Forestland Raptors and Herons

Where raptor or heron nests are located and confirmed, the following guidelines will apply. Raptors use habitats ranging from bottomland to upland sites and from mature stands to recent clearcuts. In this respect, forest management and raptor habitat management are not in conflict. The key to maintaining a diversity of forestland raptors is to maintain a mixture of forest types at a large enough scale in various successional stages. Great blue herons also deserve special management considerations because they are colonial nesters that rely on large, mature forest stands close to the aquatic habitat where they feed. Great blue herons prefer stands of tall trees for nesting. A colony site will be reused and should continue to support herons as long as the site and birds remain undisturbed, and adjacent wetlands remain productive.

3.1 Eagles

When a tree with a large raptor nest is identified during a Pre-Harvest Survey, an uncut buffer of 20 m should surround it.

Nest management for bald eagles and golden eagles involves concentric buffer zones centered on the nest site (Figure1), each with forest management activities that become less restrictive at greater distances from the nest. Buffer zones encompass a radius of 400 m around an eagle nest. An inner zone with a radius of 100 m is maintained as a sanctuary where only those actions essential to protect the site are permitted, and must be conducted during the non-nesting period (early September to late January). Single-tree selection or small patch cutting is permitted in the second zone of 100-200 m from the nest if conducted during the non-critical period when the birds are in residence. Care should be taken to maintain all potential nest and perch trees within this zone. In the outer zone, 200-400 m from the nest centre, all activities are again curtailed during the nesting period (April to August), but there are no timber-harvesting restrictions other than preserving roost trees or potential nest trees.

3.2 Herons

Management of great blue heron colonies involves buffer zones similar to those recommended for eagles (Figure 1). The inner zone should extend 100 m from the edge of the colony. Within this zone, and within the colony itself, there should be no tree harvesting or disturbance except that essential to maintaining the colony and the site. Any such activities must be conducted during the non-nesting period from early September to late January. Recreational activities of all forms are prohibited during the nesting period, from early April to late August, within the colony and inner zone.

In the second zone of 100-200 m from the edge of the colony, limited selection or patch cutting can occur during the non-nesting period. Care must be taken to protect all potential nest trees and ensure their wind firmness. Within the outer zone of 200-400 m from the edge of the colony, high disturbance activities such as road construction, harvesting, and site preparation, are prohibited during the nesting period.

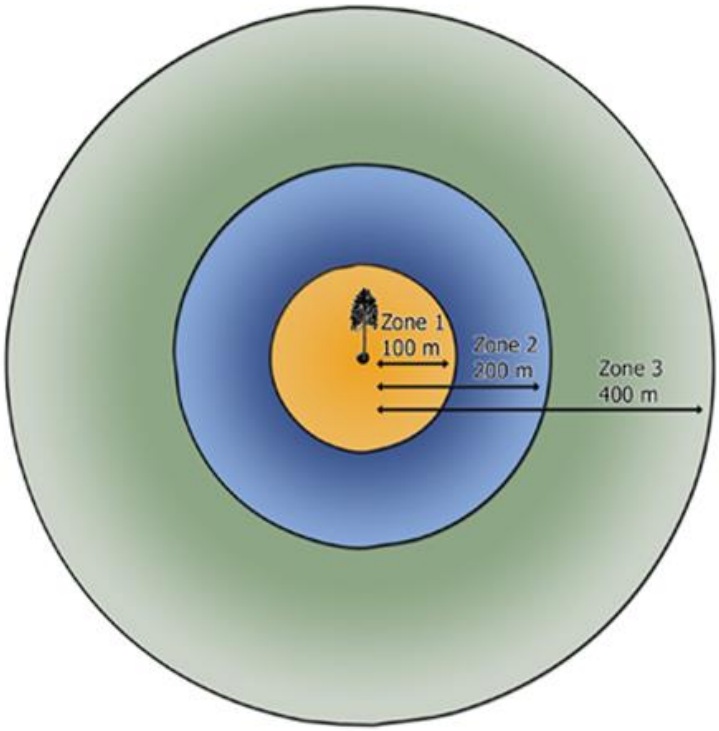

Figure 1. Nest management zones for bald eagles and great blue herons.

4.0 Aquatic and Riparian Habitats

There are several types of aquatic and riparian habitats in FML#3, all of which require certain levels of protection. Riparian habitat may have to be managed differently for each site. Before the AOP review, all riparian habitats in the vicinity of harvest blocks will be identified and specific management options set for each. Riparian habitats are important for a variety of species such as furbearers, small mammals, birds and large game.

The objectives specific for aquatic and riparian habitat protection are:

- To allow free and unobstructed fish passage through stream crossings so that fish may migrate to spawning, rearing, feeding, over wintering, or other critical areas without harmful delay.
- To protect stream bottom and banks from accelerated erosion processes to minimize disturbance to fish and fish habitat.
- To avoid impairment to the physical condition of fish and their habitats which may result from the introduction of hazardous construction materials or any deleterious substance into the stream community.
- To protect habitat diversity and any unique and seasonally critical habitat commonly associated with riparian and aquatic areas.
- To prevent the harmful alteration, disruption or destruction (HADD) of aquatic habitat
- To maintain navigability as necessary

Guidelines specific to construction of stream crossings are presented in the Roads and Major Structures SOG. However, all the applicable objectives in this section are in addition to those specified in that SOG. The following guidelines apply primarily to logging operations near all aquatic habitats in FML#3:

- Buffers will be retained along rivers, creeks, lakes, critical wildlife habitat (nests, mineral licks) and along specific roads. However, these may be managed (selectively harvested, tended and reforested) where the condition of timber warrants and where approval is granted. When buffers are designed, consideration will be given to the intended function of the buffer over the long-term. Buffers deteriorate as trees age and decay (breakup), and therefore become susceptible to insect infestations or fire. Fire or insect infestations may spread into an adjacent regenerated area causing further disturbance. Depending on its purpose, the size or width of a buffer may vary. Buffers may be widened from those specified in the guidelines to account for steep slopes, soil types and vegetative cover.

- Standard buffer widths that do not protect enough critical riparian habitat will be widened as required for each site.

- Aquatic habitat includes the area up to the normal high-water mark.

5.0 Specialized and Unique Habitat

Special habitat identified before or during harvest will be maintained and protected to meet wildlife objectives. Plans will be developed which help address management needs for a particular site. Habitats given this special designation may include, but are not limited to, calving sites, mineral licks, caves, colonial-nesting sites, remnant prairies, and meadows. Block boundaries will be moved to exclude these areas from the harvest block, or reserves will be left around these areas in accordance with the *Forest Management Guidelines for Wildlife in Manitoba.* Excluded areas will receive special attention if they provide species with seasonal habitat for the purposes of calving, denning, and winter feeding. Where logging operations are conducted near sensitive areas, attempts will be made to harvest at times that do not coincide with seasonal activities.

6.0 Endangered Plant and Animal Species and Plant Communities

Where a plant or animal species, or plant community in any category under *the Endangered Species Act,* or COSEWIC is identified in FML#3, either before or during harvest, exclusion zones to protect the particular resource will be required. Any species, plant community, or unique feature present in FML#3 that is classified as endangered, threatened, or at risk will be reported and protected.

7.0 Literature Cited

Sougavinski S, Doyon F. 2002. Variable retention: Research findings, trial implementation and operational issues: final version Synthesis Report. Sustainable Forest Management Network, Edmonton, AB. 51 pp.