

Saskatchewan Environmental Society Submission for  
Public Review of Saskatchewan Environment's proposed  
"Forest Management Planning Document"

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## **I. Background and Overview**

The draft "Forest Management Planning Document"<sup>1</sup> was released for public review on 14 November 2005. This document, hereafter referred to as the "FMP document", proposes standards for the preparation and submission of Forest Management Plans. New or existing licensees will be required to follow the approved version of these standards when applying for or renewing a Forest Management Agreement (FMA) or a Term Supply License (TSL).

Saskatchewan Environment has proposed forest management planning to "ensure the ecological sustainability of Saskatchewan's forests for future generations and to ensure guiding principles, such as ecosystem-based management, are followed" (p. 1.). The FMP document proposes a standard process for forest management planning activities including public consultation, objective setting, assessing sustainability, forest modelling, and performance monitoring. Saskatchewan Environment intends to enforce adherence to the standards by forestry companies operating under agreements or license with terms greater than 5 years.

The FMP document contains hundreds of proposed standards identified by boxed text, as well as precise formats for tables, graphs and computer files. Reviewing these extensive details is not possible in this brief review.

The entire FMP document was examined, but this review focuses on several small but important sections of the document. Input will be provided on the proposal for forest companies to lead forest management planning efforts (p.13) the proposed exemptions for short term licensees and permit holders (p. 1), the forest management planning guiding principles (p. 11-12), the standard Values, Objectives, Indicators and Targets for Crown forest lands in Saskatchewan (Table 3, p. 51-60) and the basis for silvicultural ground rules (p. 61-63).

## II. Responsibility for Forest Management Planning

It appears that one of the main thrusts of the Forest Management Planning standards is to clearly outline the responsibilities of the Crown, forestry companies, and the public in the forest management planning process. Such responsibilities should be clearly outlined as failure to do so results in unnecessary conflict between the various actors.

There is a temptation for the Crown to off-load responsibility for forest management planning to the forest industry as a cost-savings measure. This may seem rationale as industry is the primary beneficiary of approved forestry operations. However, such a move would be short-sighted.

Few major forestry companies, if any, have lasted much more than a decade or two in Saskatchewan. The Prince Albert Lumber Company was a major producer of lumber beginning in 1905, but was out of business by 1919. Parsons and Whittemore<sup>2</sup> built the Prince Albert pulp mill in 1967, but abandoned the facility in 1982. Simpson Timber<sup>3</sup> set up a stud mill in Hudson Bay in 1965, but abandoned its operations in 1990 citing insufficient wood supply. Weyerhaeuser built a paper mill in Prince Albert in 1986, but is closing it in 2006 due to low paper prices. Forestry company operations in Saskatchewan have been and will continue to be ephemeral. They emerge when both wood supply and prices are high, and vanish when either wood supply or prices are low.

International corporations will continue to make investment and operations decisions based on their ability to turn a profit. New investment decisions may require accounting time frames of up to a decade to recoup capital investment and subsequently generate profits. However, accounting time frames are shorter, a few years at best, for existing facilities. An existing corporate facility is operated only as long as it is profitable<sup>4</sup> or has an excellent prospect of becoming profitable in the immediate future. No forestry corporation in Saskatchewan makes decisions on the basis of a 20-year time frame, let alone on the basis of a time frame equivalent to the life span of a boreal tree.

Given the historic track record of the forest industry in this province, it is irrational to suggest that licensees or potential licensees should lead analyses of long-term sustainability of forest management activities.

Although the responsible department has had numerous name changes<sup>5</sup> the Provincial Crown has been responsible for forest management in Saskatchewan's publicly owned forests since the Natural Resource Transfer Agreement with the Federal Government in 1930. Barring annexation or constitutional change, the Provincial Crown will be responsible for and accountable for forest management for the foreseeable future.

Furthermore, if the Crown continues to play a role as an owner or co-owner of forestry companies, as has occurred throughout most of the history of forestry in Saskatchewan<sup>6</sup>, then under the process proposed in the FMP document, a Crown Department (e.g., Saskatchewan Environment) would be off-loading responsibility for forest management planning to another Crown agency (e.g., Investment Saskatchewan). Thus the provincial government would still

maintain responsibility for forest management planning but through a circuitous route with unclear accountability.

Passing on responsibility for conducting forest management planning to the forest industry is a strategy that appears to be designed to suit forestry mega-projects. But given the current market outlook for Canadian pulp and paper exports and the seemingly endless string of recently closed pulp and paper mills across the country<sup>7</sup>, the likelihood of new mega-projects is decreasing.

Outside of mega-projects, few if any small to medium-sized forestry companies will be able to afford to take primary responsibility for forest management planning following the proposed standards. If the future is one with more small operators and community-based operations harvesting a diversity of forest products (e.g. fuel wood, housing logs, lumber, non-timber forest products, etc.), then forest management planning will likely not occur under the proposed licensee-led process. Allowing forest management activities to occur in the absence of forest management planning is highly undesirable.

In order to conduct forest management planning, an organization requires information and expertise to analyze that information and inform decision-makers. It is in the public interest for this information and expertise to remain within the realm of the Government of Saskatchewan, which has a long-term stake in the state of the Provincial Forest. Thus the Government of Saskatchewan should maintain the capacity to conduct forest management planning, with or without the presence of Weyerhaeuser, Tolko, Mistik Management, MacMillan-Bloedel, Parsons and Whitemore, or other specific industrial interests.

Aside from the fact that the Crown is here for the long-term while the forestry corporations are only here for the short term, there is another more fundamental reason why forest management planning should be lead by the provincial government rather than by the forest industry. Saskatchewan's Forest Planning Manual defines forest management as follows:

"The practice of applying scientific, economic, philosophical, and social principles to the administration, utilization, and conservation of all aspects of forested landscapes to meet specific goals and objectives, while maintaining the productivity of the forest" (p. viii).<sup>8</sup>

Forestry companies may be able to contribute knowledge and expertise in "scientific" and "economic" principles related to "utilization", but they do not necessarily have particular competence to determine what "philosophical" and "social principles" should be applied in the "administration" and "conservation of all aspects of forested landscapes".

More specifically, "philosophical" considerations (e.g., priority of maintaining ecosystem integrity, preference to maintain forests as a public resource, requirements for increasing social equity) are the realm of the provincial government, not the forest industry. A forest industry representative can not provide the lead in philosophical matters. This is an issue to be determined by the provincial government through a public consultation process. Similarly, it is not appropriate that "social" and economic sustainability objectives (e.g., distribution of training opportunities, jobs and contracts among forest communities over time) are decided in the private realm.

"Administration" and governance for publicly-owned forest ecosystems subject to use for hunting, trapping, fishing, gathering, oil and gas development and mining in addition to forestry, is clearly the responsibility of the Provincial Crown. Likewise, the primary responsibility to deliver on the "conservation" of all elements of forest ecosystems (e.g. biodiversity for non-tree as well as tree species, watershed services, biogeochemical cycling and other ecological processes) also resides with the Crown.

Industry can play a large role in specific areas related to their operations such as protecting genetic diversity of commercial tree species and protecting landscape characteristics through the spatial and temporal arrangement of cutovers. Forest management, given its broad definition in the Forest Planning Manual, should be about more than determining where the next cutover is and how that site will be regenerated.

Only the Crown has the right to determine what philosophical conservation principles are to be applied for ecosystems within the Provincial Forest. Only the Crown has the right to determine what goals related to social equity or socio-economic development are to be achieved through the administration of publicly-owned forest resources. Thus, only the Crown should lead forest management planning.

An argument could be made that the Crown would still retain decision-making authority even if the industry conducts a forest management planning exercise. The provincial government can determine whether a forest management plan is accepted or sent back to the drawing board. However, in order to make decisions in the public interest, the Crown would need to have the expertise and capacity to evaluate the forest management plans submitted by the forest industry. If Saskatchewan Environment is not actually conducting forest management planning then how does its staff obtain the experience necessary to evaluate a forest management plan?

Issues related to biodiversity, ecosystem services, and socio-economics are central to the mandate of the Government of Saskatchewan, but they are only of secondary or tertiary interest to forestry corporations. Who then, the Crown or the industry, would be most motivated to collect the best data, hire the best expertise, and utilize the best analytical models or tools to aid in forest management planning related to these issues? If the Crown transfers the job of forest management planning to the forest industry, it will gradually lose its human capacity (e.g., experienced and knowledgeable staff) and its ability to collect and maintain relevant data.

Off-loading the responsibility for conducting forest management planning to the forest industry is not in the public interest.

The 2004 Ontario Forest Management Planning Manual<sup>9</sup> allows the Ministry of Natural Resources to be the party responsible for forest management planning. Having Saskatchewan Environment taking a lead role in forest management planning would be preferable to off-loading this responsibility to the forest industry.

*Recommendation:*

*A. Forest Management Planning must occur for Crown forest lands regardless of the fits and starts of private, public-private joint ventures, or public forestry operations occurring on these Crown forest lands. Forest management planning includes numerous aspects that are of primary interest to the public and the provincial government (e.g. forest ecosystem integrity, social and economic long-term sustainability) but only of secondary or tertiary interest to forestry corporations. The Provincial Crown should be responsible and accountable for forest management planning and should play the lead role.*

The forest industry should be included as a partner in forest management planning, recognizing that some industry partners that are here today will be gone tomorrow, and that new industry partners, large or small, may emerge at any time.

Private corporations are in business to generate profits. If forest management planning is paid for only by forestry companies, then the interests of the forestry companies will drive the process. Short term access to timber and fiber resources will likely be paramount, trumping issues related to other forest uses (e.g., trapping, ecotourism) and other forest values (biodiversity, protected areas, social and economic sustainability).

It is unreasonable to ask licensees to lead and therefore pay the greatest cost for forest management planning if the exercise is designed with the primary objective of maintaining "ecosystem integrity and health" (p. 11). It is the Provincial Crown that has the custodial responsibility for the environment over the long term. Use of tax dollars to conduct forest management planning is important if the plans are actually going to encompass all forest values. If the public contributes to the cost of forest management planning through taxation, then the public interest for a range of forest values (e.g. wildlife, watersheds, non-timber forest products, trapping, tourism, etc.) will have equivalency in the process with the primary interests of the forestry companies (e.g. timber and fiber production).

*Recommendation:*

*B. The public should contribute to the cost of forest management planning through the expenditure of general revenues to ensure that the public interest related to non-timber values is not subservient in the planning process to corporate interests in timber values.*

### **III. Exemptions for Term Supply Licenses of Five Years or Less.**

There FMP document provides no explicit reason why forest management planning should be applied only to forestry activities occurring under agreements and licenses with terms of greater than 5 years.

Developing onerous standards for forest management planning for FMA areas and TSL areas with terms greater than five years, with no planning requirements for other areas, simply serves as a disincentive for the forestry industry to operate under FMAs and TSLs with terms greater than five years. In the absence of intense competition for the wood supply, TSLs of five years or less or other administrative arrangements would seem very attractive given the reduced onus to pay for forest management planning.

If the goal is ecosystem-based management, then it must be recognized that harvesting and associated activities have the same impact on the forest ecosystem whether they occur under one administrative arrangement (FMAs, TSLs > 5 years) or another (TSLs <= 5 years, other permits). All forest management activities should be subject to the forest management planning process.

*Recommendation:*

*C. Forest management planning should be conducted by the Province of Saskatchewan for all publicly-owned forest lands available for wood supply. After a phase in period of not more than five years, no forestry activities should be approved until forest management planning has been completed and decision-makers have decided that such forestry activities are in the public interest. Term Supply Licenses with terms of five years or less or other short term permits should not be exempt from the requirements of forest management planning.*

The proposal to do forest management planning only for new FMAs and TSLs and for renewals of FMA and TSLs presents a continuity problem. Over the past few decades, the boundaries for the administrative areas (e.g. FMLAs, FMAs, TSLs) have been ever-changing, making it very difficult to assemble data (e.g. area logged, area burned, area planted, age class structure, etc.) for any specific geographic area. In Ontario, the Ministry of Natural Resources pre-defines management units where forest management planning is to occur.<sup>10</sup> This is the preferred approach.

*Recommendation:*

*D. A system of pre-defined spatial units for forest management planning should be used, and these spatial units should remain consistent over time, allowing continuous use of the same data sets regardless of the opening and closing of mills and the alteration of FMA or TSL area boundaries.*

#### IV. Guiding Principles

The Forest Planning Manual<sup>11</sup> provides definitions for objectives and standards as follows:

"An objective states a desirable forest practice or future condition of a forest resource or forest use, which is attainable through actions of the licensee...." (p. iii).

"A standard is a specific measurable activity, result or unit of measure. Good standards are measurable, scientifically sound, operationally feasible, linked to management objectives, and integrated with other standards" (p. iii).

Each proposed standard in the FMP document is not linked to a specific objective. However, in lieu of an objectives-standards hierarchy, Saskatchewan Environment has proposed a set of guiding principles "to be reflected in the planning processes conducted for Crown forest lands in the Province". Since these guiding principles steer the development forest management planning standards, they require careful scrutiny.

The eight guiding principles listed under the heading of ecosystem-based management are highly laudable. These guiding principles reflect a fresh approach to forest management and decision-making in Saskatchewan. The focus on whole ecosystems rather than individual resources, the importance of ecosystem integrity, the need to base decisions on science, the value of long-term sustainability for renewable resources, and the recognition that the human economy depends on its supporting ecosystem are fully supported. The challenge will be to ensure that guiding principles such as "maintain ecosystem integrity and health as the prime management objective" are actually followed.

For example, if ecosystem integrity and health is the prime management objective, then the leader of the process should be an individual working for an organization whose prime mandate is ecosystem integrity and health. This would not be a forest industry staff person. Surely the prime interest of a forest industry staff person is economic provision of the wood supply to a mill for the period in which that mill is profitable. Even for Saskatchewan Environment, it is not clear that the lead government representative would have to be from the Forest Service, and could not be from the Resource and Environmental Stewardship Division or the Planning and Risk Assessment Division.

*Recommendation:*

*E. The forest management planning process should be led by an individual or group of individuals with knowledge of, expertise in, and accountability for, ecosystem integrity and health given that this is the prime management objective.*

The guiding principles under the headings Sustainable Forest Management are also laudable. The emphasis on sustainability, future generations, ecological processes, biodiversity, and emulating patterns created by natural disturbances are fully supported. In guiding principle 5 under this section, the term "forest management" appears to be used in a manner inconsistent with the definition in the Forest Planning Manual. If, by definition, forest management includes

"the administration, utilization, and conservation of all aspects of forested landscapes", then it is incorrect to distinguish between a primary focus and an additional need to consider all forest values.

The guiding principles under the heading Open Consultation and Collaboration with Stakeholders, Aboriginal People and the Public are also fully supported<sup>12</sup>.

The guiding principles under the heading Social and Economic Sustainability are far weaker than those under the other headings. Guiding principle one under this heading is a mere statement of fact rather than a statement of principle:

"Forests provide substantial commercial benefits, including timber, non-timber forest products, water and tourism, and significant non-commercial benefits, for example; wildlife, recreation, aesthetics, traditional land use, and wilderness value"(p. 12).

*Recommendation:*

*F. Guiding principle #1 under the heading Social and Economic Sustainability should be changed as follows:*

*1. Forest should be managed so as to provide commercial benefits, including timber, non-timber forest products, water and tourism, and significant non-commercial benefits, for example; wildlife, recreation, aesthetics, traditional land use, and wilderness value in perpetuity.*

The second guiding principle is very unclear. Stating that "the distribution of these benefits is a key aspect of social equity" provides no guiding direction on how forest management planning should play a role in progress towards social equity.

*Recommendation:*

*G. Guiding principle #2 under the heading Social and Economic Stability should be changed as follows:*

*2. The distribution of benefits from forest management should increase social equity.*

This also raises a larger question about what type of forest production should be encouraged, and to what ecological, social and economic ends.

The Province of Saskatchewan is currently embarking on a green economy initiative. To this end, the government should be encouraging the production of durable forest products over disposable forest products (e.g. furniture over disposable cups). If sustainable forest management is to contribute to the development of a sustainable society as a whole, then movement away from the world of disposables should be encouraged.

Another related aspect is that a sustainable economy would encourage production and use of forest products with low energy and chemical inputs rather than products with high energy and

chemical inputs (e.g. 2 x 10 lumber over I-beams manufactured with almost as much glue as wood chips). High energy inputs often results in increased greenhouse gas emissions (unless bioenergy is used) and high chemical inputs results in pollution either at the time of manufacturing or at the time of product disposal.

Part of moving towards a green economy involves full-cost accounting and assessing the environmental impacts of the entire production-transportation-consumption-disposal loop. Looking at the production of forest products in isolation may give false indication of whether sustainability is actually being achieved.

*Recommendation:*

*H. The following guiding principles should be added under the heading Social and Economic Sustainability to ensure that sustainable forest management contributes to a sustainable society and a green economy.*

*4. Production of durable long-lasting forest products should take precedence over production of disposable forest products.*

*5. Production of forest products requiring low energy and chemical inputs should take precedence over production of forest products requiring high energy and chemical inputs.*

*6. Achieving sustainability will require adoption of full-cost accounting and assessment of the environmental impacts of the entire production-transportation-consumption-disposal loop.*

The guiding principles listed under the heading Adaptive Management and Continual Improvement require some clarification. The first guiding principle gives the impression that scientific knowledge of forest ecosystems will continue to expand spontaneously. This is not true. Increasing scientific knowledge of forest ecosystems requires investment of personnel and resources. In a previous submission related to the management of dwarf mistletoe<sup>13</sup>, it was clear that scientific knowledge of the value of mistletoe brooms as wildlife habitat was far greater in other jurisdictions (e.g. Oregon, Colorado) than it was in Saskatchewan. This is because research had been funded in these jurisdictions and not in Saskatchewan. The selection of research questions is a key step in adaptive management. For example, studying the effect of dwarf mistletoe on jack pine yield and studying the effect of dwarf mistletoe on jack pine yield and wildlife habitat will likely provide different management recommendations.

*Recommendation:*

*I. The first guiding principle under the heading Adaptive Management and Continual Improvement should be changed as follows:*

*1. The Government of Saskatchewan and its partners (e.g. licensees, Government of Canada, etc.) are to maintain or increase investments in applied research to expand scientific knowledge of forest ecosystems, ecosystem dynamics and effects of human activity.*

Learning through monitoring performance during a licensee's term is overemphasized. There will only be limited learning opportunities that can be gained from looking at 7 years of forest management activities given that forestry is practiced over rotation ages of 7 or more decades. Furthermore, opportunities to apply knowledge gained during a licensee's term will be limited because few Saskatchewan forest management corporations last through several consecutive terms.

If Saskatchewan Environment acknowledges the historical changes in the array of corporate players active in the Saskatchewan forestry industry and acknowledges that there will continue to be a flux of these corporate players in the future, it is then imperative to apply knowledge gained from previous terms, even if the previous licensee was a different corporate entity than the current licensee. This is another reason why the Government of Saskatchewan needs to lead management experiments rather than off-load them to a corporate entity that will likely not remain in the province long enough to apply the results from the experiment.

*Recommendation:*

*J. The Adaptive Management and Continual Improvement guiding principles need to be modified to emphasize the desirability of the Government of Saskatchewan serving as a leader in learning activities and as a reservoir for knowledge so as to provide continuity despite the ever-changing mix of corporate licensees.*

## V. Values, Objectives, Indicators and Targets.

The concept of a core set of values, objectives, indicators and targets (VOITS) established by the Government of Saskatchewan is both reasonable and necessary.<sup>14</sup> Since these VOITS are a keystone component of the forest management planning, each requires careful scrutiny, in some cases more than can be provided herein.

First, to clarify concepts and terminology, it is worth reviewing the difference between prescriptive and evaluative indicators:

"Prescriptive indicators are used in harvest planning to stipulate the future condition of the forest. Evaluative indicators test whether the future forest condition achieved the ultimate objective. For example, assume that the goal of forest management is to maintain current levels of biodiversity (i.e. no net loss of species, no declines in abundance of species)... In this case, prescriptive indicators ... would include the amount, severity, spatial pattern, and frequency of harvest specified to mimic natural disturbance activities. Evaluative indicators are then used to test whether the resulting forest condition achieved the desired objective: maintaining biodiversity. These evaluative indicators could be measures of species richness and abundance, for example.... For reference, note that prescriptive indicators are often referred to as compliance indicators since they are really nothing more than a check on what activities were promised. Evaluative indicators measure the response of the system to the management activities, and are often referred to as effectiveness indicators.... Note that ... indicators are nothing more than the units of measure used by objectives. Thus the terms evaluative and prescriptive can apply to objectives as well."<sup>15</sup>

A successful monitoring framework requires careful selection of both prescriptive and evaluative indicators. Use of prescriptive indicators alone without validation through evaluative indicators requires a leap of faith. It presumes that prescribed management actions will result in intended effects on forest ecosystem values.

For the indicators relative to all criteria, it is not possible to evaluate the targets presented in Table 3. Either targets are undefined and will only be defined during the forest management planning process (i.e. "targets(s) set by approved management strategy") or targets relate to standards which have yet to be released for public review by Saskatchewan Environment (e.g. NDE standards #1 through #5). An excellent set of indicators for sustainability can easily be undermined through the selection of weak targets.

This situation is less than satisfactory from a public review perspective. The limited information provided was used to conduct a review of the indicators, but a complete evaluation was impossible given the uncertainty around targets. Some indicators that are supported in this review may have that support revoked depending on the targets chosen.

Criterion 1. Conservation of the biological diversity of Saskatchewan's forests.

Criterion 1.0 and Objective 1.1.1.1 reads word for word the same despite the differences in the definitions for criteria and objectives.

The five indicators listed under Element 1.1 Ecosystem Diversity are difficult to evaluate. The indicator "area by development type and age class" could be applied very precisely if many development types are identified by the licensee, or could be applied very loosely if only a few development types are identified. Clearly, too few development types will result in this being a poor indicator. Too many development types will result in targets that are impossible to achieve.

*Recommendation:*

*K. Given that the objective is "conservation of biological diversity", and this is a primary responsibility of the Province of Saskatchewan and only a secondary concern of licensees, then Saskatchewan Environment should prescribe the array of development types used for this analysis. Further, the array of development types tracked and conserved should include specific classes for different disturbance types which resulted in stand initiation.*

For example, not only do we need to conserve young jack pine stands somewhere in the landscape, but we need also to conserve young fire-generated jack pine stands somewhere in the landscape. Young fire-generated stands which were not salvage logged are structurally very different from young jack pine stands generated by harvesting, site preparation and/or planting. The latter usually contain less dead biomass and vertical structure and more microtopography (tire ruts) and exotic species.

One of the greatest inadequacies of forestry in Saskatchewan has been white spruce regeneration. White spruce does not reproduce naturally after logging with the same success rate as other conifers such as black spruce and jack pine. Silvicultural intervention to regenerate white spruce often results in white spruce dominated softwood stands rather than the white spruce dominated mixedwood stands that were originally harvested on many sites. Unmixing the mixedwoods has negative consequences for forest wildlife. Mixedwood stands have higher bird diversity than either hardwood or softwood stands and contain species not found in either pure hardwood or pure softwood stands.<sup>16</sup>

*Recommendation:*

*L. Indicator 2 under Objective 1.1.1.1 should be split into two indicators, one for white spruce dominated mixedwood forest types and one for white spruce dominated forest types.*

The third, fourth and fifth indicators refer to "old provincial forest types" but this term is not defined. The Forest Planning Manual defines old growth, but not "old provincial forest types", and the definition of old growth does not specify a precise age after which a stand is classified as old. A definition of "old provincial forest types" based on too young an age would invalidate this indicator.

These three indicators appear to be prescriptive indicators that are not associated with any complementary evaluative indicators. Conservation of old stands may be an end in itself, but is more likely designed to maintain specific structural or functional stand attributes such as large live trees and large standing snags for the bigger cavity nesters (e.g. goldeneyes, pileated woodpeckers, barred owls), structural support for long-lived organisms such as treebeard lichens, and functional roles such as carbon sequestration.<sup>17</sup> Appropriate evaluative indicators for determining whether old forest structures and processes are sustained might include the density of large cavity nesting bird species (number of pairs observed per unit area with standard effort), and the ecosystem carbon density (Mg/ha for live biomass + dead biomass + soil).

*Recommendation:*

*M. The purpose of maintaining old forest types is to maintain structural and functional attributes of past and current old forest types. Therefore, these attributes will have to be identified explicitly as evaluative indicators and will require direct monitoring as a check on the effectiveness of the prescriptive indicators.*

In addition to the difference between prescriptive and evaluative indicators, there appears to be some indicators that are to be monitored in real time while other indicators are to be modelled rather than monitored. This leads to confusion. Is a specific indicator designed for the purpose of modelling to evaluate alternative management strategies a priori, or is it designed for monitoring over time to assess performance a posteriori?

*Recommendation:*

*N. All indicators should be classed as prescriptive or evaluative and as to whether they are to be modelled ahead of time or monitored following management actions.*

Indicator 6, for example, contains an explicit statement that assessment is through modelling. Indicator 17, for example, contains an explicit statement that assessment is to occur through compliance inspections.

Objective 1.3.1.1., no loss of natural genetic diversity, is excellent. However, the indicators used are not sufficient to assess whether genetic diversity is likely to be lost.

Indicator 8, "% of area planted using improved seed", is entirely inappropriate unless the target is fixed at zero percent. This may be a prescriptive indicator to evaluate forestry management actions from a purely silvicultural point of view if use of improved seed is desired. However, it is not necessary to plant any area using improved seed if the objective is to prevent the loss of natural genetic diversity. If a licensee sets a target of planting 10% of cutovers with improved seed (or worse yet with exotic species), then the licensee is not managing to prevent the loss of natural genetic diversity.

*Recommendation:*

*O. Indicator 8, “% of area planted using improved seed”, is inappropriate and should be dropped from the list of required indicators unless the target is fixed by an enforced standard of zero percent.*

Indicator 7, "% area regenerated using wild/natural seed sources as meets SE standards", is too vague. There should be a target for the percent of area naturally regenerated using seed sources on the site or immediately adjacent sites. If natural regeneration follows natural disturbance, or logging with adequate residuals, natural genetic diversity should be perpetuated. Any use of nursery stock, even within seed zone boundaries, will potentially result in loss of natural genetic diversity. Two studies of white spruce in Saskatchewan showed reduced genetic diversity (e.g. percent of polymorphic loci, expected heterozygosity, or number of alleles per polymorphic locus) between wild populations and plantation/orchard populations.<sup>18</sup> In addition, both studies found decreased allelic richness when wild populations were compared to plantation or orchard populations.

Even without efforts at tree improvement, wild seed collection strategies, germination conditions in the nursery, water and fertilizer supplementation, culling processes and numerous other factors affect the ultimate genetic makeup of plantation stock and lead to potential divergences from wild populations.<sup>19</sup> Geographic distance is not necessarily the only or most important factor affecting the genetic makeup of a population across the forest. There are also potential differences between wet sites and dry sites and between individuals with different phenotypic characteristics (e.g., growth rate, phenology) within a seed zone.

Use of genetic material from within a SE approved seed zones is better than use of genetic material from outside of a SE approved seed zone.<sup>20</sup> However, the results for this prescriptive indicator do not necessarily provide evidence that natural genetic diversity is being maintained.

An alternative prescriptive indicator would track the area of land regenerated spontaneously using seed sources native to the site of the disturbance.

*Recommendation:*

*P. Indicator 7 should be revised as follows:*

*7A. % of area naturally regenerated following fire or logging in the absence of artificial seeding, planting, or other additions of propagules from outside the site.*

This is a prescriptive indicator for an objective that should also be assessed with an evaluative indicator. Genetic diversity at regenerated sites is best assessed in comparison to wild forests in protected areas using modern PCR techniques.

*Recommendation:*

*Q. An evaluative indicator for the Objective 1.3.1.1., "no loss of natural genetic diversity" should be added as follows:*

*7B. At least once every five years, genetic material from stands regenerating after logging or salvage logging (including natural regeneration and artificial regeneration treatment groups) should be compared to stands regenerating after natural disturbances in protected areas (control group) using PCR methods and parameters such as percent of polymorphic loci, expected heterozygosity, number of alleles per locus, and allelic richness.*

The prescriptive indicator (#7A) could be assessed using data for all post-disturbance sites. To keep costs manageable, the evaluative indicator (#7B) need only be done for a subset of species on a subset of sites.

Criterion 2.0 Ecosystem Condition and Productivity

Objective 2.1.1.1 refers to maintaining the rates of biological production in forest ecosystems. Obviously, large declines in productivity as a result of human-induced ecological degradation are undesirable. However, increases in productivity as a result of human interference may also be unjustifiable from an ecosystem-based management point of view. The imposition on all regenerated stands of free-to-grow standards that are not based on natural ecosystem conditions represents an alteration in the rates of biological production. Classically trained foresters have a bias towards fast-growing stands. But not all stands in nature are fast-growing. For example, some stands regenerate at a high density and do not self-thin. These dog-hair spruce or dog-hair pine stands were quite common in the natural forest prior to the initiation of industrial forestry. Such stands are part of the natural range of variation for forest productivity and should not be eliminated. These stands may be undesirable from a maximum yield forestry perspective, but may play some important role from an ecosystem or landscape perspective.

*Recommendation:*

*R. Indicator 12, percent of harvested areas regenerated and assessed as free-to-grow by the standards indicated in the management plan, should be eliminated unless scientific evidence is provided that the free-to-grow standards encompass the natural range of variation for stand regeneration.*

Maintaining ecosystem integrity and maximizing timber/fiber production are two separate variables, and two variables can not be maximized at the same time. In order to maintain ecosystem integrity by emulating natural disturbances it may be necessary to perpetuate a diversity of stand conditions some of which may be outside of the parameters currently defined as free-to-grow from a yield perspective.

Indicators 13 and 14, distance in km of roads established and percentage of the productive forest landscape converted to roads, respectively, are inadequate indicators. Unless the targets are set to zero, the incremental loss of forest area to roads would be allowed on a continual basis.

*Recommendation:*

*S. Indicator 13 should be changed as follows:*

*13. Distance in km by RTA, Class 1, 2, and interblock 3 roads established each year minus the distance in km by RTA, Class 1, 2, and interblock 3 roads retired and rehabilitated (i.e. returned to productive forest landbase) each year.*

*The target for Indicator 13 should be a negative difference (km roads established < km roads rehabilitated).*

*Indicator 14 should be changed as follows:*

*Percent of the productive forest land base converted to RTA, Class 1,2, and interblock 3 roads each year minus the percentage of the productive forest land base rehabilitated from RTA, Class 1,2, and interblock 3 roads to productive forest land each year.*

*The target for Indicator 14 should be a negative difference (percent of landscape converted from productive forest to roads < percent of landscape rehabilitated from roads to productive forest).*

Historically, roads have accounted for the greatest losses to the productive landbase, because it was formerly very difficult to lease Provincial Forest land for other purposes. However, it appears that restrictions have been lifted over the past decade. Numerous private ventures have now leased or purchased Crown lands to establish businesses such as golf courses, subdivisions, motels, and tourism operations. In addition, the increasing prices for oil and gas may be leading to increases in seismic lines and well-head disturbances in forested areas.

*Recommendation:*

*T. Consideration should be given to establishing an indicator which tracks all human-induced losses and gains to the forest land base.*

### Criterion 3.0 Soil and Water

For indicators 15 through 18 there should be minimum sample sizes specified along with a randomized sampling strategy to ensure that adequate data is collected.

*Recommendation:*

*U. For indicators evaluated by sampling a subset of harvest blocks or other sites, sampling strategies and minimum sample sizes should be prescribed prior to the evaluation period.*

The indicators for soil and water are difficult to evaluate due to the references in the indicator wording to provincial and/or FMA standards that, in most cases, do not yet exist.

### Criterion 4.0 Role in Global Ecological Cycles

Indicator 19 is a repeat of indicator 14, and should be changed as proposed above. However, this indicator is not sufficient to track changes in carbon stocks across a forest management area. Changes in the age class structure and the disturbance regime can result in substantial changes in carbon stocks.<sup>21</sup> For example, salvage logging following fire will remove a large portion of the carbon within a stand that would otherwise persist on the site for several decades as snags and downed logs.

*Recommendation:*

*V. Supplementary indicators should be added to track predicted changes in carbon stocks (through modelling) and actual carbon stocks (through monitoring) for the forest management area with the target of maintaining or increasing total carbon stocks.*

### Criterion 5.0 Economic and Social Benefits

Objective 5.1.1.1, "maximize the economic benefits derived from the forest without compromising the integrity of the forest ecosystem", is not consistent with ecosystem-based management. As long as your objective is to maximize economic benefits, the integrity of the ecosystem will be sacrificed.

*Recommendation:*

*W. Change Objective 5.1.1.1. as follows:*

*"Derive economic benefits from the forest without compromising the integrity of the forest ecosystem".*

The indicators related to Objective 5.1.1.1. are all prescriptive indicators with no corresponding evaluative indicators. The assumptions are that economic benefits are proportional to:

- wood flow between mills
- area harvested, and
- area salvage logged.

There was no definition of "economic benefits" in the Forest Planning Manual or the proposed FMP document. The latter document reflects a very narrow vision of economic benefits. As such, the set of indicators presented is very weak.

This set of indicators does not track the number of jobs within the FMA or TSL area within the forestry sector and within other sectors. From the public's perspective, this is likely one of the most obvious economic benefits to be sustained. Employment should be both modelled and monitored directly. Mistik Management's Sustainable Forest Management Plan<sup>22</sup> contains economic indicators that track parameters such as the number and spatial distribution of employment and contract opportunities, as well as workforce composition.

A more fundamental concern is the lack of recognition that forest ecosystems have economic values irrespective of harvesting and wood flows to mills. A recent Canadian study concluded that "for the year 2002, the non-market value of boreal ecosystem services is 2.5 times greater than the market value of boreal natural capital extraction".<sup>23</sup> To assume that economic benefits are directly proportional to extraction rates is faulty thinking more commonly associated with maximum yield management rather than ecosystem management or adaptive management.

*Recommendation:*

*X. The indicators and targets related to Element 5.1, economic benefits, needs to be thoroughly re-examined.*

Value 5.2.1, fair distribution of benefits, is laudable, but the objectives and indicators related to it do not actually assess whether benefits are distributed fairly. The establishment of an advisory group with annual meetings does not in guarantee fair distribution of benefits.

Objective 5.2.1.1 relates to other forest uses, but there are also concerns about distribution of benefits within the forestry sector. For example, what is the magnitude of the profit exported to foreign shareholders versus the sum for royalties and fees that are paid to the Provincial Crown and remain in the province?

With regards to other forest uses, advisory committees should not be perceived as an end unto themselves. If an advisory committee is a means to another end, then that end should be tracked directly with an evaluative indicator.

*Recommendation:*

*Y. Any unfairness in the distribution of benefits from forest management activities that is perceived by the public or stakeholders needs to be clearly identified and then tracked using indicators and targets.*

For example, if independent operators perceive that they are being relegated to sites with poorer yield or quality, then an indicator should be set up to compare yield and quality between cutovers harvested by the FMA holders and cutovers harvested by independent operators. If trappers perceive that logging activities in fur blocks cause reductions in fur harvests then indicators should be established to track fur harvests in fur blocks with and in fur blocks without forestry activities. Only when issues of perceived unfairness and relevant indicators and targets are explicitly identified will real problems be quantified and misconceptions (false problems) be cleared up.

Indicators 26 to 29 related to Objective 5.3.1.1., maintain or enhance benefits, suffer from the same faulty logic as those for Objective 5.1.1.1. The indicators appear to be a set of economic efficiency indicators and their relationship to Element 5.3, "sustainability of benefits", is unclear. For example, let's examine Indicator 26, "total volume of harvest (m3) by harvest block compared to the total projected volume by harvest block" (p.58). If Weyerhaeuser's "total volume of harvest (m3) by harvest block" had been a greater or lesser proportion of the "total projected volume by harvest block", would the pulp and paper operation have been sustained for a longer period of time?

*Recommendation:*

*Z. The indicators and targets related to Element 5.3, sustainability of benefits, needs to be thoroughly re-examined.*

Criterion 6.0 Society's Responsibilities

Indicators 30, 32 and 33 are extremely weak. The targets are mere licensee invitations for Aboriginal communities, local communities and local stakeholders to participate in Public Advisory Groups. These are again prescriptive indicators without corresponding evaluative indicators. Invitations alone will not necessarily result in the corresponding values (i.e. respect for Aboriginal and Treaty Rights, sustainable forest communities, and involvement of stakeholders in FMP development) being upheld.

Objective 6.3.1.1. is inadequate. In order to achieve the Element 6.3 and Value 6.3.1, sustainable and resilient forest communities, much more than involvement in forest management planning will be required. Resilience should be conceived as resilience to the loss of the licensee's operation. As has been outlined previously, a short history lesson shows that it is inevitable that current and prospective licensees will at some time in the future pull out and cease their operations in the FMA or TSL area. Forest communities should make enough gains during a licensee's tenure to allow it to survive and prosper after the licensee closes its operation. Forest community sustainability should therefore be measured in terms of training and education opportunities, job creation both within and outside the forestry sector (e.g. non-timber forest products), housing developments, economic diversification, growth of value-added processing, maintenance of traditional economic activities (e.g., hunting, fishing, trapping), and development of arts and culture.

*Recommendation:*

*AA. VOITs for Elements 6.1, 6.3 and 6.4 require thorough reconsideration to develop indicators that provide a better measure of whether aboriginal and Treaty Rights, forest community well-being and resilience, and fair and effective decision-making are actually achieved.*

Indicator 35, the number of educational opportunities made available to staff and the public, is inadequate for gauging whether decision making is actually informed. The assumption made here is that all information useful to decision-making is held by the licensee, that this information is best made available to the public through undefined "educational opportunities", and that the number of such "educational opportunities" is a measure of the effectiveness of educational efforts and provides insight into whether decision-making is informed or uninformed.

*Recommendation:*

*AB. Element 6.5 and corresponding VOITS should be changed as follows:*

*Value: 6.5.1 Current information about forest ecosystems and forest management is made available to the public and decision-makers.*

*Objective 6.5.1.1 Ensure that information about forest ecosystems (including ecological and socio-economic data) and forest management activities are collected in an unbiased manner and distributed to the public.*

*Indicator 35. Reports summarizing performance relative to VOITs are released annually.*

## **VI. VOIT Performance Monitoring and Reporting**

The FMP document proposes self-reporting on VOITs by licensees, with independent audits every five years (p. 107). This assumes that the licensee is the correct organization to collect data on all VOITs. If a forest management is defined as in the Forest Planning Manual (see p. 3 above), then forest management planning VOITs should be established for all aspects of forest ecosystems including those that may be of more interest to other organizations than to the licensees.

For some VOITs, it may be desirable for Saskatchewan Environment or a publicly funded but independent third party (e.g., an Aboriginal organization, a non-profit organization such as the Prince Albert Model Forest, or a non-government organization such as Nature Saskatchewan) to actually collect and report the data.

An independent body such as a provincial Environmental Commissioner or independent monitoring group could also be considered for monitoring and reporting performance for all VOITs developed through the FMP process. An analogous example would be the BHP Independent Environmental Monitoring Agency that monitors the environmental effects of the Ekati diamond mine in the Northwest Territories.

### *Recommendation:*

*AC. Consideration should be given to alternatives to licensee self-reporting on performance relative to VOITs. Alternatives to be considered should include monitoring by Saskatchewan Environment, another government agency (e.g. independent Environmental Commissioner), other third party organizations (e.g., Aboriginal organization, non-profit forest sector or environmental non-government organizations) or a new organization (e.g. independent monitoring agency set up under the FMA agreement and funded by all parties).*

## VII. Silvicultural Ground Rules

The concept of Silvicultural Ground Rules as conceived in this standards document is problematic. The proposed standard is:

"For each silvicultural ground rule, applied to development types, the most commonly applied silvicultural treatment combination(s) used on the license area must be identified, as well as acceptable alternative treatment combinations. Acceptable alternative silvicultural treatment combination(s) for a given SGR must produce the same end result in terms of yield curve/future forest condition as would be expected to be achieved from the most commonly applied silvicultural treatment combination(s)." (p.62).

Restricting silvicultural treatments to those that produce at least the same yield as established treatments might be consistent with a maximum yield management approach but it is not consistent with an ecosystem-based management approach. If this standard is enforced by Saskatchewan Environment, then yield concerns will trump all other issues, and the tenets of ecosystem-based management will be violated.

*Recommendation:*

*AD. The standard for silvicultural ground rules (p. 62) should be altered to remove the requirement for all acceptable silvicultural treatment combinations to result in the same yield curve.*

If Saskatchewan Environment manages for the whole system rather than for a single resource, it is not only probable but inevitable that yield sacrifices will have to be made to make gains for other ecosystem components (e.g. wildlife habitat or biodiversity conservation).

## **VIII. Summary and Conclusions.**

Saskatchewan Environment advocates an ecosystem-based management approach which is laudable. However, it is unacceptable to off-load leadership and responsibility for the process of ecosystem-based management to a private company or public/private consortium primarily interested in the temporary generation of profits from harvesting forests, manufacturing forest products and selling them on international markets. Saskatchewan Environment should lead forest management planning for Crown forest lands, because the history of forestry in Saskatchewan shows that corporations rarely stay active in the province for more than a decade or two.

The proposed guiding principles of forest management planning are quite strong, but require improvement to ensure that forest developments promote a sustainable society as well as a sustainable wood supply. Great efforts will have to be made by all participants in forest management planning to ensure that the guiding principles of ecosystem-based management are actually followed throughout the process. Otherwise decisions will continue to be dominated by short-term economic considerations.

In several places within the proposed Forest Management Planning document, forest ecosystem concerns appear to be subservient to maximum yield considerations. The concept of silvicultural ground rules and some of the indicators and targets appear to reflect the measures from the old maximum yield approach forced into the ecosystem-based management VOIT framework. Parts of the document need to be reworked to eliminate the classical forestry bias and move further forward into the era of ecosystem-based and adaptive management.

Far too often prescriptive indicators are recommended to monitor performance without corresponding evaluative indicators necessary for assessing the effectiveness of prescriptive approaches. Data gathering to assess performance relative to objectives, indicators and targets is proposed to be done exclusively by licensees, with independent auditing every five years. Consideration should be given to sharing monitoring among Saskatchewan Environment, the licensees, other third parties (e.g., Aboriginal organizations, non-government organizations) or even to the creation of an independent monitoring agency under Forest Management Agreements to be funded by all parties.

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- <sup>1</sup> Saskatchewan Environment Forest Service, 2005. Forest Management Planning Document: DRAFT. [http://www.se.gov.sk.ca/forests/forestmanagement/FMPStds\\_Draft7\\_prnov14.pdf](http://www.se.gov.sk.ca/forests/forestmanagement/FMPStds_Draft7_prnov14.pdf)
- <sup>2</sup> Parsons and Whitemore is a company established in 1853 and still in business today.
- <sup>3</sup> Simpson Timber is another company still operating in the U.S.A.,
- <sup>4</sup> Operations must either be profitable or be subsidized by government so that they appear profitable.
- <sup>5</sup> For example: Department of Natural Resources, Department of Northern Saskatchewan, Department of Tourism and Renewable Resources, Saskatchewan Parks and Renewable Resources, Saskatchewan Parks Recreation and Culture, Saskatchewan Environment and Resource Management, and Saskatchewan Environment.
- <sup>6</sup> Numerous forestry ventures in Saskatchewan have been and continue to be owned or co-owned by the Crown, e.g., 100 % Crown-owned Saskatchewan Forest Products operated mills in Bodmin, Hudson Bay, Prince Albert, Carrot River and other locations throughout the latter half of the 1900s and also formed partnerships with private companies (e.g. SaskFor-MacMillan), the Prince Albert pulp mill was 30% owned by the Crown when it opened in 1968 and was 100% owned by the Crown between 1982 and 1986, Meadow Lake OSB and Meadow Lake Pulp are currently owned 25% and 50%, respectively, by the Crown (Investment Saskatchewan).
- <sup>7</sup> Weyerhaeuser Canada, 2005. Pulp and paper mill closures in Canada (2003-2005). Leader 4(5):11.
- <sup>8</sup> Saskatchewan Environment, 2005. Forest Planning Manual. [http://www.se.gov.sk.ca/forests/forestmanagement/FMPStds\\_Draft7\\_prnov14.pdf](http://www.se.gov.sk.ca/forests/forestmanagement/FMPStds_Draft7_prnov14.pdf)
- <sup>9</sup> Ontario Ministry of Natural Resources, 2004. Forest Management Planning Manual for Ontario's Crown Forests. [http://www.mnr.gov.on.ca/mnr/forests/public/publications/fmpm\\_04/FMPM\\_2004.pdf](http://www.mnr.gov.on.ca/mnr/forests/public/publications/fmpm_04/FMPM_2004.pdf)
- <sup>10</sup> Ontario Ministry of Natural Resources, 2004. Forest Management Planning Manual for Ontario's Crown Forests. [http://www.mnr.gov.on.ca/mnr/forests/public/publications/fmpm\\_04/FMPM\\_2004.pdf](http://www.mnr.gov.on.ca/mnr/forests/public/publications/fmpm_04/FMPM_2004.pdf)
- <sup>11</sup> Saskatchewan Environment Forest Service, 2005. Forest Planning Manual [http://www.se.gov.sk.ca/forests/forestmanagement/FMPStds\\_Draft7\\_prnov14.pdf](http://www.se.gov.sk.ca/forests/forestmanagement/FMPStds_Draft7_prnov14.pdf)
- <sup>12</sup> The second guiding principle under Open Consultation (p.12) ends in "and" as if there is a third guiding principle under this heading, however no such third guiding principle is articulated.
- <sup>13</sup> Typha Environmental Research, 2005. Saskatchewan Environmental Society Submission for the Public Review of Saskatchewan Environment's proposed "Dwarf Mistletoe Standards and Guidelines". Saskatchewan Environmental Society, Saskatoon, SK.
- <sup>14</sup> VOITs are a keystone component of the proposed forest management planning process. The very fact that Saskatchewan Environment has proposed a mandatory set of VOITs, rather than letting a licensee determine its own set of VOITs, is indicative of the fact that Saskatchewan Environment can not off-load responsibility for forest management planning to third parties. Saskatchewan Environment should lead the forest management planning process.
- <sup>15</sup> Rempel, R.S., D.W. Andison and S.J. Hannon, 2004. Guiding principles for developing an indicator and monitoring framework. *Forestry Chronicle* 80:82-90.
- <sup>16</sup> Hobson, K.A, and E. Bayne, 2000. Breeding bird communities in boreal forest of western Canada: Consequences of "unmixing" the mixedwoods. *The Condor* 102:759-769.
- <sup>17</sup> For a discussion see for example A. Mosseler, I. Thompson and B.A. Pendrel, 2003. Overview of old growth forests in Canada from a science perspective. *Environmental Reviews* 11:S1-S7.
- <sup>18</sup> Rajora, O.P., 1999. Genetic biodiversity impacts of silvicultural practices and phenotypic selection of white spruce. *Theoretical and Applied Genetics* 99:954-961.
- Godt, M.J.W., J.L. Hamrick, M.A. Edwards-Burke and J.H. Williams, 2001. Comparison of genetic diversity in white spruce (*Picea glauca*) and jack pine (*Pinus banksiana*) seed orchards with natural populations. *Canadian Journal of Forest Research* 31:943-949.
- <sup>19</sup> Morgenstern, E.K. 1996. Geographic variation in forest trees: genetic basis and application of knowledge in silviculture. UBC Press, Vancouver, British Columbia, Canada.
- <sup>20</sup> Use of genetic material from outside of SE approved seed zones should be prohibited, making such an indicator unnecessary.
- <sup>21</sup> Kurz, W.A., M.J. Apps, S.J. Beukema, and T. Lekstrum, 1995. 20<sup>th</sup> Century carbon budget of Canadian forests. *Tellus* 47B:170-177.
- <sup>22</sup> Balisky, A. 2005. Mistik Management Ltd. Sustainable Forest Management Plan (CSA Z809-2). Mistik Management Ltd., Meadow Lake, SK.
- <sup>23</sup> Anielski, M. And S. Wilson, 2005. Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems. Canadian Boreal Initiative and Pembina Institute.