Mackenzie

Sustainable Forest Management Plan

Mackenzie SFMP

CANFOR

2013 - 2014 Annual Report

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1.0 Introduction

This Annual Report of the Mackenzie Sustainable Forest Management Plan covers the reporting period of April 1, 2013 to March 31, 2014. This annual report is solely reporting the efforts of Canadian Forest Products Ltd. operating under Forest License A15384 within the Mackenzie TSA. In late 2012, BCTS opted out of this plan after a 6 year partnership between the 2 parties. It is noted that mention of BCTS is removed from the plan. Some of these changes were made to allow Canfor to have similar indicators across many plans and allow the corporate level to easily compare annual reports across the many DFAs the company manages. Other changes were merely housekeeping in nature and to better focus indicator statements to align with provincial regulations. These minor changes to the plan will not change the operational practices of Canfor.

The CSA Standard provides SFM specifications that include public participation, performance, and system requirements that must be met to achieve certification. These specifications were the framework for the development of the Mackenzie SFMP. Canfor has existing management systems that contribute to the overall SFM strategy. These may include existing management systems such as ISO 14001 Forest Management Systems, standard work procedures, and internal policies.

One of the public participation strategies suggested in the CSA SFM Standard is the formation of a local group of interested and affected members of the public to provide input on an ongoing basis. This strategy provides the base for the formation of a Public Advisory Group (PAG) whose purpose is to achieve CSA standard's public participation requirements. A PAG was initially developed to assist with the development of the SFMP, this group is maintained to date and meets regularly to discuss changes to the plan when necessary as well as to discuss licensee performance and review audit results etc. A wide range of public sector interest groups from within the Mackenzie Forest District were invited to participate in the SFM process through the PAG. After completing the Terms of Reference in January 2006, the PAG established the SFMP Criteria and Elements Performance Matrix with the SFMP being completed in June of 2006. It is important to note, the Mackenzie SFMP is a working document and is subject to continual improvement. Over time, the document will incorporate new knowledge, experience and research in order to recognize society's environmental, economic and social values. For example, PAG involvement during 2010-11 was critical in updating the SFMP from the CSA Z809-02 to the CSA Z809-08 standard. Starting in 2012 we began field tours on the DFA to connect the plan to operations and have received great feedback from the PAG on the importance of making this connection.

This Annual Report summarizes Canfor's performance in meeting the indicator targets outlined in the SFMP over the Mackenzie Defined Forest Area (DFA). The DFA is the Crown Forest land base within the Mackenzie Resource Management District and the operating areas of Canfor, excluding woodlots, Community Forest, Parks, Protected Areas and private land. The intent of this Annual Report is to have sustainable forest management viewed by the public as an open, evolving process that is taking steps to meet the challenge of managing the forests of the Mackenzie DFA for the benefit of present and future generations.

The following Table summarizes the results for the current reporting period. For clarification of the intent of the indicators, indicators, objectives or the management practices involved, the reader should refer to the Mackenzie Sustainable Forest Management Plan Document.

1.1 List of Acronyms

Below is a list of common acronyms used throughout this annual report. For those wishing a more comprehensive list should consult the Mackenzie Sustainable Forest Management Plan.

AAC – Annual Allowable Cut
BCTS – BC Timber Sales
BEC – Biogeoclimatic Ecosystem Classification
BEO – Biodiversity Emphasis Option
BWBS – Black and White Boreal Spruce
CFLB – Crown Forested Land Base
CSA – Canadian Standards Association
CWD – Coarse Woody Debris
DFA – Defined Forest Area
ESSF – Engelmann Spruce Sub-alpine Fir
FMG – Forest Management Group

FRPA – Forest and Range Practices Act
FSR – Forest Service Road
GIS – Geographic Information System
LOWG – Landscape Objective Working Group
LRMP – Land and Resource Management Plan
LU – Landscape Unit
MoFR – Ministry of Forest and Range
NCI – North Central Interior
NDT – Natural Disturbance Type
NDU – Natural Disturbance Unit
NHLB - Non-Harvestable Land Base
OGMA – Old Growth Management Area
PAG – Public Advisory Group
PFI – Peak Flow Index
RMA – Riparian Management Area
RMZ – Resource Management Zone (landscape-level planning)
RMZ – Riparian Management Zone (riparian management)
RRZ – Riparian Reserve Zone
SAR – Species at Risk
SBS – Sub-Boreal Spruce
SFM – Sustainable Forest Management
SFMP – Sustainable Forest Management Plan
SWB – Spruce Willow Birch
THLB – Timber Harvesting Land Base
TOR – Terms of Reference
TSA – Timber Supply Area
VIA – Visual Impact Assessment
VQO – Visual Quality Objective

1.2 Executive Summary

Of the **48** indicators listed in Table 1, **43** indicators were met within the prescribed variances, **4** indicators are pending due to incomplete information, and **1** indicator was not met within the prescribed variances.

Table 1: Summary of results for the 2012-13 Reporting Year.

Indicator Number	Indicator Description	Target Met	Pending	Target Not Met
1	Old forest		√	
2	Interior forest		√	
3	Biodiversity reserve effectiveness	√		
4	Productive forest representation	√		
5	Patch size		√	
6	Coarse Woody Debris	√		
7	Wildlife Trees	√		
8	Riparian Management area effectiveness	√		
9	Sedimentation	√		
10	Stream Crossings			√
11	Peak Flow Index	√		
12	Road re-vegetation	√		
13	Road environmental risk assessments	√		
14	Species within the DFA	√		
15	Sites of Biological Significance	√		
16	Soil Conservation	√		
17	Terrain Management	√		
18	Reportable Spills	√		
19	Site Conversion	√		
20	Permanent Access Structures	√		
21	Communication of planned Deactivation Projects	√		
22	Regeneration Delay	√		
23	Free Growing	√		
24	Prioritizing harvest of damaged stands	√		

Indicator Number	Indicator Description	Target Met	Pending	Target Not Met
25	Harvest Volumes		√	
26	First-order Wood Products	√		
27	Local Investment	√		
28	Contract Opportunities for First Nations	√		
29	Satisfaction (PAG)	√		
30	Input into Forest Planning	√		
31	Public and Stakeholder Concerns	√		
32	Access to SFM Information	√		
33	SFM Educational Opportunities	√		
34	Heritage Conservation	√		
35	First Nations Input into Forest Planning	√		
36	First Nations Concerns	√		
37	Non Timber Benefits	√		
38	Safety Policies	√		
39	Accidents	√		
40	Signage	√		
41	Forest Area by Species Composition	√		
42	Proportion of Genetically Modified Trees in Reforestation Efforts	√		
43	Dispersed Retention Levels	√		
44	Investment in Training and Skills Development	√		
45	Level of Direct and Indirect Employment	√		
46	People Reached through Educational Outreach	√		
47	Protection of Identified Sacred and Culturally Important Sites	√		
48	Understanding the Nature of Aboriginal Rights and Title	√		
	Totals	**43**	**4**	**1**

1.3 SFM Performance Reporting

This annual report will describe the success in meeting the indicator targets over the DFA. The report will be available to the public and will allow for full disclosure of forest management activities, successes, and failures. Canfor has reported performance within its operating areas. Canfor is committed to work together to fulfill the Mackenzie SFMP commitments including data collection and monitoring, participation in public processes, producing public reports, and continuous improvement.

2.0 SFM Indicators, Targets and Variances

Indicator 1   Old forest

Indicator Statement	Target and Variance
Percent of blocks that are within LU/BEC Groups that meet prescribed old-growth targets.	Target: 100% Variance: 0%

This indicator was chosen to monitor the amount of old forest within each Landscape Unit (LU) group. It is assumed that maintenance of all seral stages across the landscape will contribute to sustainability because doing so is more likely to provide habitat for multiple species as opposed to creating landscapes of uniform seral stage. Emphasis is placed on old forest because many species use older forests and the structural elements found therein (e.g. large snags, coarse woody debris, and multilayer canopies). These structural elements are difficult to recreate in younger forests. The targets for old forest are taken from the approved Mackenzie TSA Biodiversity Order.

Old Forest:

Landscape Unit	BEC Group	Number of blocks	Target % of Old Growth	Actual % of Old Growth	Number of Blocks that meet Old Growth Targets	Result
Philip	2	1	9			
	4	5	11			
Blackwater	2		9			
	4	35	11			
	5	10	0			
Gaffney*	2	4			4	
	4	12			12	
Eklund*	5	1			1	
Manson River*	2	1			1	
	4	2			2	
	Total Blocks	71		Total Blocks that meet target		

Source: Mackenzie LOWG Analysis.
Indicator Discussion: The 2013-2014 Analysis for old and old interior forest is being completed by the BCTS and has not been completed yet. The work has been delayed and is now planned to be completed by the end of 2014 (December).
In the 2013/14 reporting year there were 71 blocks harvested in 4 LUs. *Gaffney, Eklund and Manson River LU's contain spatially defined OGMAs, therefore there are no targets for old growth as it is spatially defined and protected. These blocks automatically meet the objective.

Indicator 2   Interior Forest

Indicator Statement	Target and Variance
Percent of blocks that are within LU/BEC Groups that meet prescribed Interior Old targets.	Target: 100% Variance: 0%

Interior forest conditions refer to a situation where climatic and biotic characteristics are not significantly affected by adjacent and different environmental conditions (e.g., other seral stages, other forest or non-forest types, etc.). This indicator is important because provision of habitat for old-forest dependent species (see Indicator #1) can only occur if old forests are not significantly affected by adjacent environmental conditions. Historically, natural disturbance events such as fire, insects, and wind led to diverse landscapes characterized by forests having these interior old forest conditions. Thoughtful planning of harvesting patterns can minimize "fragmentation" of the forested landscape and help create interior old forest conditions. Furthermore, the intent of this indicator is to have interior old forest conditions represented within all ecosystem types to further enhance

ecosystem resilience. The targets for interior old are taken from the approved Mackenzie TSA Biodiversity Order.

Interior Old

Landscape Unit	BEC Group	Number of blocks	Target % of Old Interior	Actual % of Old Interior	Number of Blocks that meet Old Interior Targets	Result
Philip	2 4	1 5	10 10			
Blackwater	2 4 5	35 10	10 10 0			
Gaffney*	2 4	4 12			4 12	
Eklund*	5	1			1	
Manson River*	2 4	1 2			1 2	
	Total Blocks	71		Total Blocks that meet target		

Source: Mackenzie LOWG Analysis

Indicator Discussion: The 2013-2014 Analysis for old and old interior forest is being completed by the BCTS and has not been completed yet. The work has been delayed and is now planned to be completed by the end of 2014 (December).

In the 2013/14 reporting year there were 71 blocks harvested in 4 LUs. *Gaffney, Eklund and Manson River LU's contain spatially defined OGMAs, therefore there are no targets for old interior as it is spatially defined and protected. These blocks automatically meet the objective. ~~There were 53 blocks in LUs without OGMAs and they met target as well.~~

Indicator 3   Biodiversity Reserve Effectiveness

Indicator Statement	Target and Variance
Percentage of blocks and roads harvested that do not comply with Orders which legally establish protected areas, ecological reserves, or OGMAs.	Target: 0% Variance: 0%

Landscape level biodiversity reserves/ Protected Areas are areas protected by legislation, regulation, or land-use policy to control the level of human occupancy or activities (Canadian Standards Association, 2003). These include legally established Old Growth Management Areas (OGMAs), parks, ecological reserves, and new protected areas. As forestry activities may occur near these areas the chance exists for unauthorized harvesting or road construction to happen within these sites. The OGMAs in Mackenzie do allow for certain, small amounts of disturbance where necessary. Please see SFM plan for more information on this.

Biodiversity Reserves

Signatory	Number of Blocks and roads harvested			Blocks and roads harvested that are within protected areas, ecological reserves, or OGMAs	%in DFA
	Blocks	Roads	Total		
Canfor	71	110	181	0	0%

Source: GIS query.
Indicator Discussion: If OGMAs are harvested, this will be summarized here, but not reported as a violation of this indicator.

Indicator 4   Productive Forest Representation

Indicator Statement	Target and Variance
Total hectares logged in rare and un-common ecosystems.	Target: 0 ha Variance: 0%

Maintaining representation of a full range of ecosystem types is a widely accepted strategy to conserve biodiversity in protected areas and is suggested for landscapes managed for forestry. Most species, especially those for which knowledge is sparse or absent, are best sustained by ensuring that some portion of each distinct ecosystem type is represented in a relatively unmanaged state. Unmanaged stands act as a precautionary buffer against errors in efforts intended to sustain species in the managed forest.

This is the first year to report on this indicator in this fashion. Reported are the past 3 years of harvesting in rare and uncommon ecosystems according to an analysis of all ecology units harvested. The table below shows all of the ecosystems which are considered to "rare" or "un-common" as well as the amount in hectares harvested over the past three years.

Rare and Un-common Ecosystems

Rare Ecosystem	Amount harvested by year in hectares		
	2011	2012	2013
SBSvk\03	0	0	0
SBSWk1\05	0	0	0
ESSFmv3\06	0.6	4.7	0
ESSFmv2\06	0	0	0
ESSFmv4\05	0	0	0
BWBSdk1\09	0	0	0
BWBSdk1\07	0	0	0

Source: GIS analysis of all Site Plans harvested.
Indicator Discussion: GIS analysis identified that there were no overlaps with blocks harvested during the reporting period and the rare eco GIS layer.

Indicator 5   Patch Size

Indicator Statement	Target and Variance
Percentage of blocks harvested that meet the prescribed patch size target ranges or are trending towards the target range.	Target: 100% Variance: -30%

Patches often consist of even aged forests because most are the result of either a natural disturbance such as fire, wind or pest outbreaks, or from harvesting timber. Patches may be created through single disturbance events or through a series of events (i.e. a combination of natural disturbance and harvesting). Mature forests and younger forest patches represent a land base created from a history of disturbances, natural and otherwise. As such, forest stands and patches are often composed of a variety of species, stocking levels and ages. Currently, forest management practices have reduced the occurrence of many natural disturbance events, such as wildfire. In the absence of natural disturbance, timber harvesting is employed as a disturbance mechanism and thus influences the distribution and size ranges of forest patches in the same fashion as historical natural disturbance events. Harvesting activities serve to mimic natural disturbance events characteristic within the Mackenzie DFA. Past social constraints associated with harvesting and resulting patch size have lead to fragmentation of the landscape beyond the natural ranges of variability, which has developed over centuries from larger scale natural disturbance. In order to remain within the natural range of variability of the landscape and move toward sustainable management of the forest resource, it is important to develop and maintain patch size targets based on historical natural patterns. This indicator will monitor the consistency of harvesting patterns compared to the landscape unit group and the natural patterns of the landscape.

Patch Size

Signatory	Number of Blocks Harvested	Blocks harvested that meet or trend towards prescribed patch size target ranges	Percent
Canfor	71		

Source: Mackenzie LOWG Analysis Results.
Indicator Discussion: Blocks that are harvested for pest or disease (salvage) are considered to have met patch, as harvesting for forest health reasons takes precedence over patch size targets. Through the Landscape Objectives Working Group (LOWG) more precise data has been provided by adjacent licensees (BCTS, Conifex, MK Fibre, Three Feathers Consortium) and the LOWG is jointly managing Landscape Biodiversity. The 2013-2014 Patch analysis is being completed by BCTS and has not been completed yet. The work has been delayed and is now planned to be completed by the end of 2014 (December).

Indicator 6   Coarse Woody Debris

Indicator Statement	Target and Variance
The percent of blocks harvested that exceed coarse woody debris requirements.	Target: 100% Variance: 0%

Coarse woody debris (CWD) as a habitat element provides: 1) nutrients for soil development, 2) structure in streams to maintain channel stability, 3) food and shelter for animals and invertebrates, and 4) growing sites for plants and fungi. Past forestry practices have encouraged the removal of CWD from sites for a number of economic and/or safety reasons, presumably to the detriment of biological diversity. We use this indicator following harvesting to quantify CWD retained in blocks, wildlife tree patches, riparian areas, and in areas of un-salvaged timber. Within the NHLB we assume that natural processes will result in the maintenance of appropriate levels of CWD.

Post-harvest CWD levels will be measured as a standard component of either the silviculture survey or residue and waste survey. The interim target for CWD was taken from the FRPA *Forest Planning and Practices Regulation, Sec. 68* default requirements (BC. Reg 14/2004). Although the PAG members felt that this number was inadequate to protect this element of biodiversity, they recognized that insufficient information exists to determine either the amount of CWD left behind after harvesting or the amount of CWD that occurs in natural pre-harvest stands. Even so, we expect significantly more CWD than the target is retained after harvest and have committed to developing a more comprehensive CWD strategy pending availability of more data supporting a new CWD regulation.

Coarse Woody Debris

Signatory	Number of Blocks harvested	Number of blocks harvested that exceed CWD requirements	%in DFA
Canfor	71	71	100%

Source: Final harvest inspections, Incident Tracking Systems.
Indicator Discussion: This indicator applies to blocks only. Canfor completed an assessment of CWD retention on post-harvest blocks in 2013. This assessment was completed by Wildlife Infometrics. A series of surveys were conducted resulting in a statistically valid characterization of retained CWD on sites harvested within the previous 5 year period in the ESSF and SBS BGC zones. The evaluation showed that all of the blocks satisfy the minimum required CWD volume as identified by FRPA and the Mackenzie SFMP.

Indicator 7   Wildlife Trees

Indicator Statement	Target and Variance
Percentage of cutblocks that meet or exceed wildlife tree patch requirements.	Target: 100% Variance: 0%

Stand level retention, including wildlife tree patches, is managed by Canfor in the DFA on a site-specific basis. During the development of a cut block, retention areas are delineated based on a variety of factors. Stand level retention generally occurs along riparian features and will include non-harvestable and sensitive sites if they are present in the planning area. Stand level retention also aims to capture a representative portion of the existing stand type to contribute to ecological cycles on the land base. Retention level in each block is documented in the associated Site Plan, recorded in the signatories' respective database systems and reported out in RESULTS on an annual basis.

Wildlife Trees

Signatory	Total Number of Cutblocks Harvested	Number of Cutblocks Harvested exceeding WTP requirements	Overall %
Canfor	71	71	100%

Source: Site Plans
Indicator Discussion: WTP targets come from Canfor's approved Forest Stewardship Plan and are specific to ecotype and Landscape Unit.

Indicator 8   Riparian Management Area Effectiveness

Indicator Statement	Target and Variance
The percentage of forest operations consistent with riparian management area requirements as identified in operational plans and/or site plans.	Target: 100% Variance: 0%

Riparian features found in the field are assessed during the block lay-out stage to determine its riparian class and associated RRZ/RMZ/RMA. Appropriate buffers are then applied, considering other factors such as operability and wind firmness. Prescribed measures, if any to protect the integrity of the RMA are then written into the Site Plan. The target is a legal requirement. The target value of 100% has been established to reflect this and to ensure that all riparian management practices, specifically RRZ designation and management, continue to remain consistent with the pre-harvest operational plans.

Riparian Management

Signatory	Number of Forest Operations with Riparian Management Strategies identified in Operational Plans				Forest Operations Completed in Accordance with riparian management requirements	%in DFA
	Roads	Harvest	Silviculture	Total		
Canfor	110	71	6	187	187	100%

Source: Site Plans, Incident Tacking Systems.
Indicator Discussion:

Indicator 9   Sedimentation

Indicator Statement	Target and Variance
The percentage of identified unnatural sediment occurrences where mitigating actions were taken.	Target: 100% Variance: -5%

Sedimentation occurrences are detected by forestry personnel during stream crossing inspections, road inspections, silviculture activities, and other general activities. In addition, Canfor supervisors routinely fly their operating areas annually following spring freshet to look for any such occurrences. While in some situations the sites may have stabilized so that further sedimentation does not occur, in other cases mitigating actions may have to be conducted. This may involve re-contouring slopes, installing siltation fences, re-directing ditch lines, grass seeding, or deactivating roads.

Sedimentation

Signatory	Number of identified unnatural sediment occurrences	Number of identified unnatural sediment occurrences with mitigating actions taken	% in DFA
Canfor	3	3	100%

Source: ITS
Indicator Discussion: During construction of a spur road in block BUR011 excess road material was pushed down to the road junction with the existing road and across the existing road (ITS-MK-2014-1103). The material ended up on top of the dense snow plowed off of the road earlier under which a stream was located. The material was removed from on top of the stream down to clean snow. The site was also inspected in the spring and no further actions were required.
There were two instances where temporary bridges were removed during the winter and the erosion control measures were not adequate. During the spring follow-up assessments they were identified to require additional erosion control measures and the work was completed. (ITS-MK-2014-1136 and ITS-MK-2014-1195).

Indicator 10   Stream Crossings

Indicator Statement	Target and Variance
Percentage of stream crossings appropriately designed and properly installed and/or removed.	Target: 100% Variance: -5%

Forestry roads can have a large impact on water quality and quantity when they intersect with streams, particularly by increasing sedimentation into water channels. Sediment is a natural part of streams and lakes as water must pass over soil in order to enter a water body, but stream crossings can dramatically increase sedimentation above normal levels. Increased sedimentation can damage spawning beds, increase turbidity, and effect downstream water users. When stream crossings are installed and removed properly, additional sedimentation may be minimized to be within the natural range of variation. Erosion control plans and procedures are used to ensure installations and removals are done properly. To calculate the success of this indicator it is important to ensure that a process is in place to monitor the quality of stream crossings, their installation, removal, and to mitigate any issues as soon as possible.

Stream Crossings

Signatory	Number of Stream Crossings			Number of Stream Crossings			% Total
	Installed	Removed	Total	Appropriately designed and properly installed	Properly removed	Total	
Canfor	21	13	34	21	11	32	94%

Source: Incident Tracking System, Supervisor Communication.
Indicator Discussion: An issue was noted which resulted in some sedimentation in 2 streams in block 4901 and block 4916, this was a result of improper erosion control measures at the time the bridges were removed during the winter months. (ITS-MK-2014-1136, ITS-MK-2014-1195)

Indicator 11   Peak Flow Index

Indicator Statement	Target and Variance
Percent of watersheds containing approved or proposed development with Peak Flow Index calculations completed.	Target: 100% Variance: 0%

The peak flow index is an indicator that indicates the potential effect of harvested areas on water flow in a particular watershed. The H60 is the elevation for which 60% of the watershed area is above. The ECA or "Equivalent Clear-cut Area" is calculated from the area affected by logging and the hydrologic recovery of that area due to forest re-growth. After an area has been harvested, both winter snow accumulation and spring melt rates increase. This effect is less important at low elevations, since the snow disappears before peak flow. Harvesting at high elevations will have the greatest impact and is, therefore, of most concern. As a result, areas harvested at different elevations are weighted differently in the calculation of peak flow index. Most hydrologic impacts occur during periods of the peak stream flow in a watershed. In the interior of British Columbia, peak flows occur as the snowpack melts in the spring.

With PFI calculations now complete, the watersheds will next be evaluated to establish the watershed sensitivity and thereby the PFI risk (low to high). With the PFI risk ratings established, harvesting plans will have to consider the impact harvesting will have on the watershed in which it occurs. The goal, in watersheds with a high PFI risk rating, is to either postpone harvesting, or refer to a qualified registered professional for a detailed review.

Peak Flow Index

Licensee	Number of watersheds with harvest activities in the DFA	Number of those watersheds with Peak Flow Index calculations	Total % DFA
Canfor	17	17	100%

Source: GIS analysis – See Appendix 1 for a table with the current Peak Flow Index status of all watersheds Canfor was active in during the harvest period.
Indicator Discussion: Sensitivity calculations were completed in 2010 and 2011 for the majority of the watersheds we are/will be active in.

Indicator 12   Road Re-vegetation

Indicator Statement	Target and Variance
Percentage of road construction or deactivation projects where prescribed re-vegetation occurs within 12 months of disturbance.	Target: 100% Variance: -10%

This indicator was chosen as a way to assess our ability to minimize or at least reduce the anthropogenic effect of forest roads on adjacent ecosystems. In keeping with the common assumption of coarse-and medium-resolution biodiversity, our underlying assumption with this indicator was – re-vegetating roads will reduce the potential anthropogenic effects that roads have on adjacent ecosystems by minimizing potential for silt runoff or slumps, the amount of exposed soil, the potential for invasive plants to become established, and returning at

least a portion of forage and other vegetation to conditions closer to those existing prior to management. Typically Canfor vegetates and mulches stream crossings which show a potential for erosion, as well as any other sections of road deemed necessary by Forestry Supervisors.

Road Re-vegetation

Signatory	Total Number of Projects Where Re-vegetation is Prescribed	Number of Prescribed Re-vegetation Projects Completed within 12 months of disturbance	% in DFA
Canfor	23	23	100%

Source: Licensee tracking systems, Supervisor communication.
Indicator Discussion:

Indicator 13   Road Environmental Risk Assessment

Indicator Statement	Target and Variance
Percentage of planned roads that have an environmental risk assessment completed.	Target: 100% Variance: -10%

Environmental risk assessments provide an indicator of "due diligence" in avoiding accidental environmental damage that has potential to occur from forest development in conditions of relatively unstable soil. Through the implementation of risk assessments, we expect to maintain soil erosion within the range that would normally occur from natural disturbance events under unmanaged conditions. Our assumption was – the more we can resemble patterns of soil erosion existing under unmanaged conditions, the more likely it will be that we do not introduce undue anthropogenic effects, from road construction, on adjacent ecosystems. The completion of environmental risk assessments on roads is completed by field staff during road layout. The assessments highlight areas of special concern that may require professional geotechnical or design work.

Road Environmental Risk Assessment

Signatory	Total Number of roads constructed	Number of constructed roads with environmental risk assessments completed	% in DFA
Canfor	110	110	100%

Source: Genus
Indicator Discussion: All layout is signed off by the person conducting this work as well as their supervisor in the layout package Certification Statement.

Indicator 14   Species within the DFA

Indicator Statement	Target and Variance
Percentage of blocks and roads harvested that adhere to management strategies for Species at Risk, Ungulate winter ranges, and other local species of importance.	Target: 100% Variance: -10%

Fundamental to the correct identification of species and habitats is the incorporation of appropriate management strategies where forest activities have the potential to impact species and habitats. Identification of those animals, invertebrates, bird species, vascular plants, and plant communities that have been declared to be at risk is crucial if they are to be conserved. Appropriate personnel are key staff and consultants that are directly involved in operational forest management activities. By implementing training to identify species within the DFA the potential for disturbing these species and their habitat decreases. Maintaining all populations of native flora and fauna in the DFA is vital for sustainable forest management, as all organisms are components of the larger forest ecosystem.

There are various sources to draw upon when developing the comprehensive list of species that are legally protected or species of importance within the DFA. The list of species in Appendix C includes species from the following sources:
1. Species at Risk Act
2. Legally established Ungulate Winter Ranges
3. Local species of importance.

Incorporation of local species of importance recognizes potential species that are not legally protected. Local species of importance can be proposed by First Nations, PAG members, the licensees, or by members of the public.

Species within the DFA

Signatory	Number of Forest Operations that coincide with Species at Risk, Ungulate Winter Ranges, or other local species of importance as identified in Operational Plans				Number of Forest Operations with Species at Risk, Ungulate Winter Ranges, or other local species of importance as identified in Operational Plans that adhere to specific management strategies.	% in DFA
	Roads	Harvesting	Silviculture	Total		
Canfor	0	0	0	0	0	100%

Source: Site Plans

Indicator Discussion: During the reporting period Canfor did not have any blocks with management strategies pertaining to Species at Risk, Ungulate Winter Ranges or species of concern.

Indicator 15   Sites of Biological Significance

Indicator Statement	Target and Variance
Percentage of blocks and roads harvested that adhere to management strategies for sites of biological significance.	Target: 100% Variance: 110%

Sites of biological significance include areas that are critical for wildlife habitat, sensitive sites, and unusual or rare forest conditions or communities. Specific management strategies may be required to ensure that these sites are maintained within the DFA. This indicator will ensure that specific management (fine filter) strategies are developed to conserve and manage sites of biological significance. Many types of sites of biological significance are sufficiently known to allow the development of special management areas, or prescribe activities that will appropriately manage these areas. The management strategies will be based on information already in place (e.g., National Recovery Teams of Environment Canada, IWMS Management Strategy), legislation (provincial and national parks), Land and Resource Management Plans (LRMPs), and recent scientific literature. Management strategies will be implemented in operational plans such as site plans to ensure the protection of these sites. Training of appropriate personnel in the identification of these sites of biological importance is critical to the management and protection of these sites. Appropriate personnel include key signatory staff and consultants that are directly involved in operational forest management activities. Having appropriate personnel trained to identify sites of biological significance will reduce the risks of forestry activities damaging these sites.

This indicator evaluates the success of implementing specific management strategies for sites of biological significance as prescribed in operational, tactical and/or site plans. Operational plans such as site plans describe the actions needed to achieve these strategies on a site specific basis. Once harvesting and other forest operations are complete, an evaluation is needed to determine how well these strategies were implemented. Developing strategies and including them in operational, tactical and/or site plans are of little use if the actions on the ground are not consistent with them. Tracking this consistency will ensure problems in implementation are identified and corrected in a timely manner.

Sites of Biological Significance

Signatory	Number of Forest Operations with Sites of Biological Significance Management Strategies Identified in Operational Plans				Forest Operations Completed in Accordance with Identified Strategies	% in DFA
	Roads	Harvesting	Silviculture	Total		
Canfor	0	0	0	0	0	100%

Source: Site Plans

Indicator Discussion: During the reporting period Canfor did not have any blocks or roads that had management strategies pertaining to sites of biological significance.

Indicator 16   Soil Conservation

Indicator Statement	Target and Variance
Percentage of forest operations consistent with soil conservation standards as identified in operational plans and/or site plans.	Target: 100% Variance: 0%

Conserving soil function and nutrition is crucial for sustainable forest management. To achieve this, forest operations have limits on the amount of soil disturbance they can create. These limits are described in legislation in the Forest Planning and Practices Regulation, section 35. Soil disturbance is defined in this SFM plan as disturbance caused by a forest practice on an area, including areas occupied by excavated or bladed

trails of a temporary nature, areas occupied by corduroy trails, compacted areas, and areas of dispersed disturbance. Soil disturbance is expected to some extent from timber harvesting or silviculture activities, but these activities are held to soil conservation standards in Site Plans (where they are more commonly known as "soil disturbance limits"). The Site Plan prescribes strategies for each site to achieve activities and still remain within acceptable soil disturbance limits.

Soil information is collected as a component of site plan preparation, and soil conservation standards are established based on the soil hazards for that block. To be within those limits there are several soil conservation strategies currently used. Forest operations may be seasonally timed to minimize soil disturbance. For example, fine-textured soils such as clays and silts are often harvested when frozen to reduce excessive compaction. EMS prework forms require equipment operators to be aware of soil conservation indicators outlined in the site plans. Once an activity is complete the final inspection form assesses the consistency with site plan guidelines. If required, temporary access structures are rehabilitated to the prescribed standards. Road construction within blocks is minimized, and low ground pressure equipment may be used where very high soil hazards exist.

Soil Conservation

Signatory	Number of Forest Operations			Forest Operations Completed in Accordance with Soil Conservation Standards	% in DFA
	Harvesting	Silviculture	Total		
Canfor	71	6	77	77	100%

Source: Site Plans, ITS, Harvest Inspections.
Indicator Discussion: There were no instances where operations were not consistent with targets for soil conservation set out in site plans.

Indicator 17   Terrain Management

Indicator Statement	Target and Variance
The percentage of forest operations consistent with terrain management requirements as identified in operational plans and/or site plans.	Target: 100% Variance: 0%

Some areas subject to forest operations occur on slopes that warrant special terrain management requirements in operational plans (usually the site plan). These unique actions are prescribed to minimize the likelihood of landslides or mass wasting. Terrain Stability Assessments (TSA) are completed on areas with proposed harvesting or road development that has been identified as either unstable or potentially unstable. The recommendations of the TSA are then integrated into the site plan or road layout/design and implemented during forest operations.

Terrain Management

Signatory	Number of Forest Operations with Terrain Management Requirements Identified in Operational Plans				Forest Operations Completed in Accordance with Requirements	% in DFA*
	Roads	Harvesting	Silviculture	Total		
Canfor	0	0	0	0	0	100%

Source: Site Plans
Indicator Discussion: During the reporting period there were no operations harvested which had special requirements for terrain management.

Indicator 18   Reportable Spills

Indicator Statement	Target and Variance
The number of FMS reportable spills.	Target: 0 Variance: < 5

Canfor uses the Emergency Response and Preparedness Plan (EPRP) to prevent, manage and report spills. Canfor's Fuel Management Guidelines also apply to managing and preventing spills. Reportable spills are entered into ITS where they are tracked.

Reportable Spills

Signatory	Number of EMS Reportable Spills

	Petroleum Products	Pesticides	Antifreeze	Battery Acid	Grease	Paints and Solvents	Total
Number of spills	1	0	0	0	0	0	1
Amount (L)	80						80 Litres

Source: ITS
Indicator Discussion: During the reporting period there was 1 spill which was approximately 80L of diesel fuel. See ITS-MK-2013-0933 for more details.

Indicator 19   Site conversion

Indicator Statement	Target and Variance
The percent of gross land base in the DFA converted to non-forested land use through forest management activities.	Target: <5% Variance: 0%

In addition to maintaining the resources necessary for sustaining the resiliency of forest ecosystems, a stable land base within which productive capability is assessed is also required. In order to assess the maintenance of the productive capability of the land base, this indicator specifically tracks the amount of productive land base loss due to various non-forest uses. Removal of the productive land base occurs as a result of permanent access structures, including roads, landings and gravel pits, as well as converting forested areas to non-forest land use, such as range, seismic lines and other mineral exploration.

Conversion of the landbase to non-forest land also has implications for carbon sequestration. A permanent reduction in the forest means that the removal of carbon from the atmosphere and carbon storage will be correspondingly reduced. The data that is required for monitoring is the number of hectares of productive forest area lost due to conversion to a non-forest use.

Site Conversion

Signatory	Total CFLB	Area Converted to Non-forest Land	Percent of THLB Area
Canfor	1,309,271	10,840	0.83%

Source: GIS analysis
Indicator Discussion:

Indicator 20   Permanent Access Structures

Indicator Statement	Target and Variance
The percentage of gross cutblock area occupied by total permanent access structures.	Target: <5% Variance: +1%

This indicator indicates the amount of area developed as permanent access structures (PAS) within cutblocks, in relation to the gross area of the blocks logged during that period. Limits are described in legislation in the Forest Planning and Practices Regulation, section 36. Permanent access structures include roads, bridges, landings, gravel pits, or other similar structures that provide access for timber harvesting. Area that is converted to non-forest, as a result of permanent access structures and other development is removed from the productive forest land base and no longer contributes to the forest ecosystem. Roads and stream crossings may also increase risk to water resources through erosion and sedimentation. As such, minimizing the amount of land converted to roads and other structures protects the forest ecosystem as a whole.

Permanent Access Structures

Signatory	Total Gross Cutblock Area	Total Cutblock Area in Permanent Access Structures	Percent
Canfor	3692.6	104.7	2.8%

Source: Site Plans
Indicator Discussion: This is a calculation using all of the blocks that had active harvesting during the reporting period.

Indicator 21   Communication of planned Deactivation Projects

Indicator Statement	Target and Variance
Percentage of off-block road deactivation projects that are communicated with applicable First Nations and Stakeholders.	Target: 100% Variance: -10%

The forest is utilized by a variety of users. Access to the forest resource is important to First Nations, stakeholders, and the general public. Deactivation of off-block access roads can limit or remove access to the forest for other users. Where the signatories need to deactivate off-block roads, communication of their intention is required. Our assumption with this indicator is simply that – by increasing communication regarding signatory deactivation plans among stakeholders, we can increase the efficiency of access to resources. For the purpose of this indicator, stakeholders include trappers, guides, private land owners, and woodlots.

Communication of Planned Deactivation Projects

Signatory	Number of deactivation projects communicated to First Nations and Stakeholders	Total number of deactivation projects completed	Percent
Canfor	0	0	100.0%

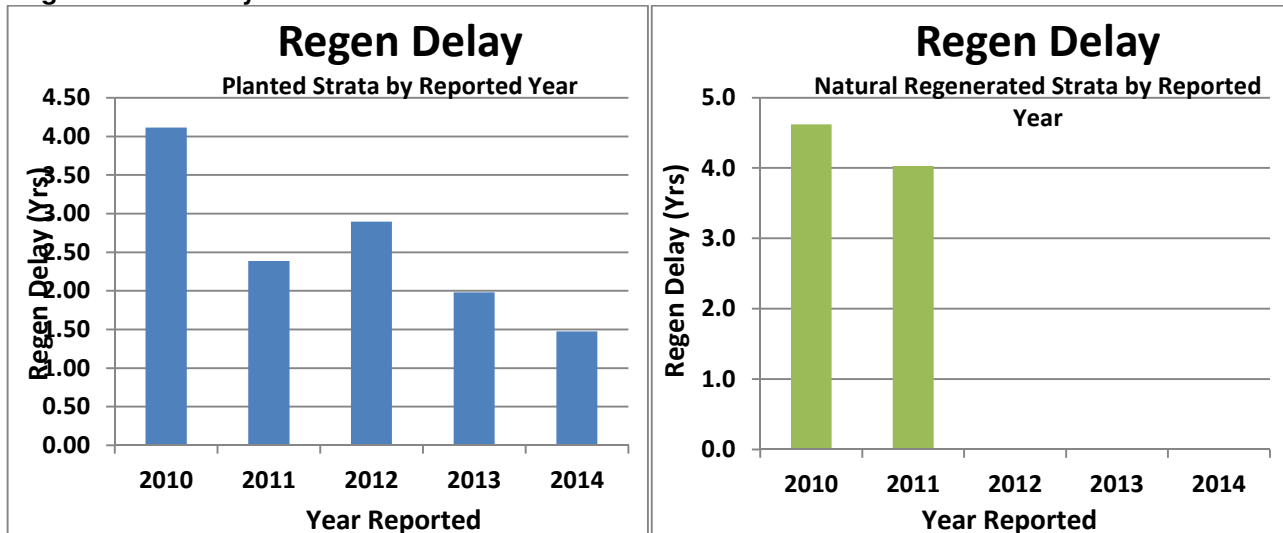**Source:** Signatory communication records

Indicator Discussion: There were no major de-activation projects completed by Canfor during the reporting period.

Indicator 22   Regeneration Delay

Indicator Statement	Target and Variance
The regeneration delay, by area, for stands established annually.	Artificial Regen: <4yrs Natural Regen: <7yrs Variance: +/- 5%

Regeneration delay is defined in this SFM plan as the time allowed in a prescription between the start of harvesting in the area and the earliest date by which the prescription requires a minimum number of acceptable, well-spaced trees per hectare to be growing in that area. There is a maximum permissible time allowed and comes from standards developed and/or approved by government. The regeneration delay period is usually within four years where planting is prescribed and seven years where the stand is expected to reforest naturally. Operationally, it is desirable to reforest as soon as possible post-harvest and the majority of blocks artificially regenerated (e.g. planted) meet regeneration delay within 2 years. Ensuring that all harvested stands meet the prescribed regeneration delay date within the specified time frame is an indication that the harvested area has maintained the ability to recover from a disturbance, thereby maintaining its resiliency and productive capacity. It also helps to ensure that a productive stand of trees is beginning to grow for use in future rotations. The current status of this indicator was derived from a review of signatories' records for the reporting period.

Regeneration Delay

Source: Canfor Resources database.

Indicator Discussion: Included previous years as well to show trends where they exist.

Indicator 23   Free Growing

Indicator Statement	Target and Variance
The % of block area that meets free growing requirements as identified in site plans.	Target: 100% Variance: -5%

A free growing stand is defined in this SFM plan as a stand of healthy trees of a commercially valuable species, the growth of which is not impeded by competition from plants, shrubs or other trees. The free growing status is somewhat dependent on the regeneration delay date of a forest stand and could be considered the next reporting phase. A free growing assessment is conducted on stands based on a time frame indicated in operational plans. The late free growing dates are established based on the biogeoclimatic classification of the site and the tree species prescribed for planting after harvest.

In order to fulfill mandates outlined in legislation, standards are set for establishing a crop of trees that will encourage maximum productivity of the forest resource (BC MOF 1995b). The free growing survey assesses the fulfillment of a Licensee's obligations to the Crown for reforestation and helps to ensure that the productive capacity of the forest land base to grow trees is maintained. Continued ecosystem productivity is ensured through the principle of free growing. This indicator illustrates the percentage of block area that meets free growing obligations across the DFA.

Free Growing

Signatory	Number of hectares Required to Meet Free Growing During Period	Number of hectares declared Free Growing	% in DFA
Canfor	4459.9	4459.9	100.0%

Source: Resources.
Indicator Discussion: During the reporting period there was 105 Standards Units due for free growing, of these they all were declared before the date.

Indicator 24   Prioritizing harvest of damaged stands

Indicator Statement	Target and Variance
Percentage of area (ha) harvested that are damaged or considered a high risk to stand damaging agents.	Target: 100%. Variance: -20%.

Damaging agents are considered to be biotic and abiotic factors (fire, wind, insects etc.) that reduce the net value of commercial timber. To reduce losses to timber value it is necessary to ensure that if commercially viable timber is affected by damaging agents, that the timber is recovered before its value deteriorates. At the time of this SFMP's preparation, the most serious stand damaging agent in the Mackenzie DFA is the Mountain Pine Bark Beetle, which has killed millions of mature, commercially viable lodgepole pine. Prioritizing infested stands for treatment can contribute to sustainable forest management in several ways. Removing infested trees can slow the spread of beetles to adjacent un-infested stands and allow Licensees to utilize trees before they deteriorate. Also, once harvesting is complete the area can be replanted, turning an area that would have released carbon through the decomposition of dead trees into the carbon sink of a young plantation.

Treating areas with stand damaging agents will provide other societal benefits. Burned and diseased killed stands may be aesthetically unpleasing, and their harvesting and reforestation will create a more pleasing landscape. Windthrown stands restrict recreational use and can foster the growth of insect pests such as the spruce bark beetle. Thus, prioritizing areas with stand damaging agents for treatment will help to maintain a more stable forest economy and achieve social benefits through enhanced aesthetics and recreational opportunities.

Prioritizing Harvest of Damaged stands

Signatory	Number of hectares harvested in the stands considered a high risk to stand damaging agents	total number of hectares harvested during the reporting period	% in DFA
Canfor	2881	3275	88.0%

Source: Site plans, cruise compilations.
Indicator Discussion: Calculated using net area to reforest (NAR). 71 blocks harvested 6 of those had less than 40% net pine at the cruise, therefore were not deemed to be salvage.

Indicator 25   Harvest volumes

Indicator Statement	Target and Variance
Actual harvest volume compared to the apportionment across the DFA over each 5-year cut control period.	Target: 100%. Variance: +/- 10%.

To be considered sustainable, harvesting a renewable resource such as timber cannot deteriorate the resource on an ecological, economic or social basis. It is expected that certain resource values and uses will be incompatible; however, a natural resource is considered sustainable when there is a balance between the various components of sustainability. During Allowable Annual Cut (AAC) determination, various considerations are examined including the long term sustainable harvest of the timber resource, community stability, wildlife use, recreation use, and the productivity of the DFA. The AAC is generally determined every five years by the Chief Forester of British Columbia, using a number of forecasts to assess the many resource values that need to be managed. On behalf of the Crown, the Chief Forester makes an independent determination of the rate of harvest that is considered sustainable for a particular Timber Supply Area (TSA).

The harvest level for a TSA must be met within thresholds that are established by the Crown. By following the AAC determination, the rate of harvest is consistent with what is considered by the province to be sustainable ecologically, economically and socially within the DFA. As stated above, the Chief Forester makes a determination of the rate of harvest for a particular TSA. The licensee then by law must achieve the AAC within the specified thresholds. Each truckload of wood is assessed and accounted for at a scale site if the cutting permit is billed as "scale-based" and if the cutting permit is "cruise-based" the timber is billed according to the volume in the timber cruise. The MFLNRO uses this information to apply a stumpage rate to the wood, and monitors the volume of wood harvested and compares it to the AAC thresholds.

The volume of timber actually harvested within the DFA will be determined annually by a review of MFLNRO timber scale billing summaries for the period of January 1st to December 31st each year, on an annual basis. Canfor will report the volumes harvested for the current cut control period they are in.

Harvest Volumes

Signatory	Volume Harvested						5 year Apportionment	Percent of 5 year cut in DFA
	Year 1	Year 2	Year 3	Year 4	Year 5	Total		
	2013	2014	2015	2016	2017			
Canfor	864,132						5,414,520	

Source: Cut control letters, Harvest Billing System

Indicator Discussion: 2013 is the beginning of a new cut-control period and Canfor expects that at the end of that period the entire cut will be harvested. Canfor's annual allowable cut (AAC) is 1,082,904 m3. In 2013 Canfor cut 80% of the annual allocation.

Indicator 26   First-Order Wood Products

Indicator Statement	Target and Variance
The number of first-order wood products produced from trees harvested from the DFA.	Target: 5 Variance: -2

This indicator helps to show how forest management activities can contribute to a diversified local economy based on the range of products produced at the local level. Forest management's contribution to multiple benefits to society is evident through this indicator, as well as an indication of the level of diversification in the local economy. First order wood products are often used to supply value-added manufacturers with raw materials for production, such as pre-fabricated house components. These provisions help to maintain the stability and sustainability of socio-economic factors within the DFA. By ensuring a large portion of the volume of timber harvested in the DFA is processed into a variety of products at local facilities, the local economy will remain stable, diverse, and resilient.

First-Order Wood Products

Signatory	Sawlogs	Pulp Logs	House logs	Lumber	Custom cut lumber	Trim Blocks	Pulp chips	OSB strands	Hog	Wood shavings	Plywood	Veneer	Pole Logs	Railway tie logs	Sawdust	Instruments	Finger joint	Total
Canfor	1	1	0	1	0	1	1	0	1	1	0	0	0	0	1	0	0	**8**

Source: Canfor: Site Superintendent communication/contractor communications.
Indicator Discussion: Primary and by-products sold to other local manufacturing facilities were counted

Indicator 27   Local Investment

Indicator Statement	Target and Variance
The percent of money spent on forest operations and management on the DFA provided from local suppliers.	Target: 30% Variance: -5%

Forests provide many ecological benefits but they also provide substantial socio-economic benefits. In order to have sustainable socio-economic conditions for local communities associated with the DFA, local forest related businesses should be able to benefit from the work that is required in the management of the DFA. Furthermore, for small forestry companies to contribute to and invest in the local economy there must be assurances that there will be a consistent flow of work. In the same way that larger licensees depend on a secure flow of resources to justify investment in an area, small businesses depend on a sustained flow of opportunities to develop and invest in the local community.

Local is defined in this SFMP as the communities of Mackenzie, McLeod Lake, Germansen Landing, Manson Creek, Tsay Keh Dene, and Fort Ware. The total dollar value of goods and services purchased within the local communities will be calculated relative to the total dollar value of all goods and services used. This calculation will be used to derive the percentage of money spent on forest operations and management of the DFA from local suppliers. Woodlands employee salaries are considered goods purchased where the employee lives within the local area and therefore contribute to community stability.

Forest Operations and Management consider all money spent within the signatory's woodlands departments, excluding stumpage. Harvesting and road building costs, where applicable, will be included in the total.

Local Investment

Signatory	Money spent in local area on Forest operations and management	Total money spent on forest operations and management	% in DFA
Canfor	$21,544,432.15	$47,056,673.68	45.8

Source: Accounting records
Indicator Discussion: Local spending includes logging, road building and maintenance, silviculture activities, woodlands related purchases at local vendors, staff salaries, etc.

Indicator 28   Contract Opportunities to First Nations

Indicator Statement	Target and Variance
The number of contract opportunities with First Nations within the DFA.	Target: >5 Variance: -2

This indicator is intended to monitor the impacts of forest industry and government activities on the ability of First Nations to access forestry related economic opportunities. At present, this indicator is not intended to assess how successful First Nations are at taking advantage of the opportunities. Canfor has explored forestry related opportunities with First Nations in the past. Capacity amongst the First Nations to take advantage of opportunities will likely have to be addressed in order for available opportunities to be acted upon. This indicator tracks the existence of opportunities available.

Contract Opportunities to First Nations

Signatory	Contract Opportunities	Total for DFA

	Employment	Road Building & Deactivation	Other Volume Purchased	Logging	Silviculture Forestry	Other Contracts	Management Services	
Canfor	0	0	0	3	5		0	**8**

Source: Signatory contract records.
Indicator Discussion:

Indicator 29   Satisfaction (PAG)

Indicator Statement	Target and Variance
The average overall percent of the PAG's satisfaction with PAG meeting process.	Target: 100% Variance: -20%

The PAG is one of the key elements of public involvement in the SFM process. The Mackenzie PAG provides guidance, input and evaluation during development of the SFMP. It is also instrumental in maintaining links to current local values and forest resource uses within the DFA. Therefore, it is important that Canfor has a positive and meaningful working relationship with the PAG. This indicator will use an average of the PAG meeting evaluation forms to determine the level of satisfaction of the PAG with the public participation process.

Following all PAG meetings to date, PAG participants completed meeting evaluations. One question is in the PAG meeting evaluation form to address this indicator which asked participants "What is your overall satisfaction with the PAG process?" This indicator is specific to responses to question 11 during the reporting period.

PAG Satisfaction

Mackenzie DFA SFM Plan Public Advisory Group Meeting Evaluation Question			
Meeting Date	Score out of 5	Percent	Variance (from 100%)
August 21, 2013	3.7	74%	26.0%
March 19, 2014	4.4	88%	12%
Overall Score =		81%	19%

Source: PAG satisfaction surveys
Indicator Discussion:

Indicator 30   Input into Forest Planning

Indicator Statement	Target and Variance
The number of opportunities for the public and/or stakeholders to provide meaningful input into forest planning.	Target: 6 Variance: -2

Forestry activities can impact a wide section of the public and individual stakeholders within the DFA. This indicator was designed to monitor the signatory's success at providing effective opportunities to residents and stakeholders to express concerns and be proactively involved in the planning process. This involvement may include the identification of areas of interest, definition of the nature of their interest in the land base, and any specific forestry activity that may impact their specific interests. This process ensures that when forestry activities are planned, information is exchanged in an effective and timely manner, so as to resolve potential conflicts before they occur. This process will help to identify the public values, interests and uses of the forest that will be considered within the signatories planning framework.

Stakeholders include the following forest sectors; trappers, guide outfitters, water license holders, range tenure holders, woodlot owners, private land owners, other licensees, and specific government agencies. Opportunities for input into forest planning will be offered to stakeholders where their tenured area coincides with the signatories planned activities.

Input into Forest Planning

Opportunity	The Number of Opportunities For Public And Stakeholders
	Canfor
FSP ads	
FSP letters to stakeholders	
LRMP meetings	
PMP original ads	
PMP letters to stakeholders	1
PMP signage	
Other ads (deactivation plans)	
Field tours	2
Newsletters	
Open houses	2
PAG Meetings	1
Documented meetings	6
Documented phone calls/emails	
Information Sharing	2
TOTAL	**14**

Source: Signatory database/tracking systems.
Indicator Discussion: Canfor had many correspondences with members of the public including trappers, guides, general public as well as First Nations throughout the reporting period. Two open house meetings were held in Manson Creek and Germansen Landing.

Indicator 31   Public and Stakeholder Concerns

Indicator Statement	Target and Variance
The number of operational concerns raised by the public and/or stakeholders that are considered and incorporated into operational and/or tactical plans.	Target: 100% Variance: -10%

All signatories solicit feedback for their public forest management plans in the DFA. As mentioned in previous indicators, public involvement is an important aspect of SFM as it promotes inclusiveness in how Crown forests are managed. Considering a diverse range of opinions and concerns will result in operational forest management decisions that consider views other than those of the forest industry. A forest industry that respects public and stakeholder input will maintain the support of the public, creating a more economically stable and open forest economy. Operational concerns from the public may be provided in many ways, including written letters, e-mails, or faxes received by Canfor. There may also be written comments made during an in-person or telephone meeting between a staff member and the person providing comment. This indicator will compare the number of operational concerns that have been acted on relative to the total number of operational concerns raised.

Public and Stakeholder Concerns

Signatory	Number of concerns brought forward that have been considered and incorporated into operational plans	Number of operational concerns brought forward	Percent
Canfor	2	2	100%

Source: COPI
Indicator Discussion: Two concerns were from trappers. One concern was around harvest timing and the other was regarding ribbons identified in his trap line area that he was not aware of.

Indicator 32   Access to SFM information

Indicator Statement	Target and Variance
The number of opportunities provided annually for access to SFM related documents.	Target: 3 Variance: 0

With this indicator we intend to monitor our effort to ensure effective and comprehensive distribution of the SFMP, annual reports, and audit results for the Mackenzie DFA. In order to gain trust and confidence in the SFMP process, it must be an open and transparent process. By ensuring access to the Plan, annual reports, and audit results, the results of our efforts in achieving sustainable forestry and continuous improvement can be clearly seen and monitored by the public, stakeholders, and First Nations. In this manner, the public, stakeholders and First Nations can hold the signatories accountable for achieving the desired results and have confidence that forest resources are being managed sustainably.

Access to SFM Information

Opportunity	The Number of Distribution/Access Opportunities
Newsletters	
Open houses / Trade Shows	1
SFM & PAG Meetings	2
Website	1
Distribution of SFM information	
TOTAL	**4**

Source: Signatory database and tracking systems, planning forester documentation.
Indicator Discussion:

Indicator 33   SFM Educational Opportunities

Indicator Statement	Target and Variance
The number of SFM educational opportunities and interactions provided.	Target: 2 Variance: 0

This indicator was designed to monitor the signatories' success at providing training and educational opportunities in sustainable forest management. SFM relies on residents and stakeholders making informed decisions on forest management. To achieve this, it is incumbent on the signatories to ensure the public are sufficiently informed about SFM to make the choices we request of them. The indicator is intended to ensure that the signatories provide the required opportunities for residents and stakeholders to learn about SFM. It is anticipated that educational opportunities will come in the form of open houses, public presentations, PAG meetings, the Mackenzie Trade Fair, and field tours of the signatory's operations.

SFM Educational Opportunities

Opportunity	The Number of SFM Educational Opportunities
Field tours	1
Newsletters	
Open houses	
Presentations	
PAG Meetings	1
Trade Shows, etc.	1
TOTAL	**3**

Source: Planning forester documentation.
Indicator Discussion:

Indicator 34   Heritage Conservation

Indicator Statement	Target and Variance
Percentage of forest operations consistent with the Heritage Conservation Act.	Target: 100% Variance: 0%

The protection of cultural heritage values assures they will be identified, assessed and their record available to future generations. A cultural heritage value is a unique or significant place or feature of social, cultural or spiritual importance. It may be an archaeological site, recreation site or trail, cultural heritage site or trail, historic site or a protected area. Cultural heritage values often incorporate First Nation's heritage and spiritual sites, but they can also involve features protected and valued by non-Aboriginal people. Maintenance of cultural heritage values is an important aspect to sustainable forest management because it contributes to respecting the social and cultural needs of people who traditionally and currently use the DFA for a variety of reasons.

The indicator is designed to ensure that operational plans with identified strategies to conserve cultural heritage values have those strategies implemented on the ground. Tracking the level of implementation will allow Canfor to evaluate how successful this implementation is and improve procedures if required.

Heritage Conservation

Signatory	Total Number of Forest Operations that have associated sites protected under the Heritage Conservation Act (pre 1846)				Number of Forest Operations Completed in Accordance with the Heritage Conservation Act	Percent
	Roads	Harvesting	Silviculture	Total		
Canfor	0	0	0	0	0	100.0%

Source: Site plans.
Indicator Discussion: There were no cultural or heritage areas noted in any of the blocks harvested during the reporting period. One block harvested within the reporting period had an AIA completed on the block with no archaeological sites identified.

Indicator 35   First Nations Input into Forest Planning

Indicator Statement	Target and Variance
The number of opportunities for First Nations to provide meaningful input into our planning processes where active operations are within their respective traditional territories.	Target: >/= 2 per First Nation Variance: 0

This indicator was designed to list and report out on all documented opportunities provided to First Nations people to be involved in forest management planning processes. Incorporation of First Nations people and their unique perspective into the forest planning process is an important aspect of SFM. This indicator will contribute to respecting the social, cultural and spiritual needs of the people who traditionally and currently use the DFA for the maintenance of traditional aspects of their lifestyle. The Mackenzie SFM PAG is a process designed to identify public values and objectives within the DFA. Within the PAG process, First Nations has been identified as an important sector for representation.

First Nations Input into Forest Planning

Opportunity	Signatory	First Nation							
		Tsay Keh	Kwadacha	Takla Lake	Nak'az dli	McLeod Lake	West Moberly	Saulteau	Half way River
Operational planning referrals	Canfor	2		2	2	2	2		2
Open house style meetings	Canfor								
AIA Referrals	Canfor			2	4	1	4		4
Trade shows	Canfor	1	1	1	1	1	1	1	1
Formal operational meetings	Canfor								
Pest Management Prescriptions Meetings and referrals	Canfor				1	1			
FSP referrals / consultation	Canfor								
TOTAL		3	1	5	8	5	7	1	7

Source: Signatory communication records, COPI.
Indicator Discussion: Communication was in the form of information sharing for block planning, AIA referral as well as information sharing of the NIT. The Kwadacha and Saulteau First Nations were only identified to have been contacted once during the reporting period. Canfor has not been and does not plan to be harvesting within these First Nations traditional territories in the recent past or in the near future.

Indicator 36   First Nations Concerns

Indicator Statement	Target and Variance
Percentage of operational concerns raised by First Nations that are considered and incorporated into operational and/or tactical plans.	Target: 100% Variance: -10%

Incorporating management strategies into the planning process in order to resolve issues raised by First Nations leadership is a key aspect to sustainable forest management. This indicator contributes to respecting the social, cultural heritage and spiritual needs of people who traditionally and currently use the DFA for the maintenance of traditional aspects of their lifestyle.

Forest planning can include information sharing for both operational and tactical plans. The FSP process is an example of operational plans referred to First Nations. AIAs, operating plans, block and road referrals, and annual operating maps are examples of tactical plans that may be referred to First Nations. Active forest operations are considered to be current harvesting, road construction, and mainline deactivation projects, planned vegetation management projects, as well as forest planning of new blocks and roads.

First Nations Concerns

Signatory	Number of concerns brought forward that have been considered and incorporated into operational plans	Total number of operational concerns brought forward	Percent
Canfor	1	1	100%

Source: Signatory communication records and operational plans.
Indicator Discussion: A First Nation identified a concern regarding visuals on a lake within one of their reserves. One First Nation identified concerns with harvesting within a large general area, however did not provide any specific sites/areas/features within the larger general area therefore we were unable to incorporate the concern into operational plans.

Indicator 37   Non-timber Benefits

Indicator Statement	Target and Variance
Conformance with strategies for non-timber benefits identified in plans.	Target: No non-conformances for site level plans Variance: 0

For the purpose of this plan non-timber benefits include; resource features, range features as well as visual quality. Resource features are elements that have a unique importance because specific ecological factors exist in combination at one place and don't often occur similarly elsewhere. Examples of resource features are caves, karst, recreation sites or crown land used for research to name a few. These features are generally considered to have value to society so we assume that through conservation of these features we are contributing to social value. Range features are often used by ranchers to allow livestock to feed and thus very important to the ranching industry. Conservation of these areas will help to assure their availability in the future. Examples of such features include naturally occurring grass lands, naturally occurring barriers which contain livestock to a specific area as well as any area that a rancher has grazing or hay cutting permits on, or identified areas that may be suitable for such permits in the future. Visual quality is managed in order to maintain areas of perceived beauty within the DFA.

The signatories currently plan and design their activities and/or blocks so as to manage or adequately protect non-timber benefits when they become known. Once a non-timber benefit becomes known, means of managing or protecting the feature are either iterated in the operational plan or tactical and/or site plans. These requirements are tracked and managed by Canfor as well as by the Compliance and Enforcement branch of the MFLNRO.

Signatory	Number of blocks and roads harvested with non-timber benefits identified in the site plan	Number of blocks and roads harvested with non-timber benefits whereby the associated results and strategies were not achieved	Variance
Canfor	0	0	0

Source: Site plans.

Indicator Discussion:

Indicator 38   Safety Policy

Indicator Statement	Target and Variance
Written safety policies in place and full implementation are documented.	Target: 1 Variance: 0

Each signatory has a written safety policy in place which is reviewed by the safety committee a minimum of once every year and revised as necessary and approved by management. If an incident occurs the cause of the incident is determined and recommendations are put forward. These recommendations may result in a change to a specific policy. Annual audits will be conducted and Action Plans developed for any item that requires attention detailing the person responsible for the item and the deadline for completion.

Safety Policy

Signatory	Written Safety Policies in Place and Implementation Documented? (Y/N)
Canfor	Y

Source: Canfor OH&S Manual and Occupational Health and Safety Statement.
Indicator Discussion:

Indicator 39   Accidents

Indicator Statement	Target and Variance
Number of lost time accidents in woodlands operations.	Target: 0 Variance: 0

Health and safety of forest workers and members of the public is an important quality of life objective that is essential to SFM. Canfor considers employee and public safety as a primary focus of all forestry related operations. Evidence of this high priority can be seen in various company mission statements and individual safety policies. This indicator was developed to track and report out on the number of lost time workplace accidents that occur within Canfor's Forest Management Group (FMG). Operations conducted outside the woodlands division and field operations have been excluded from this indicator; however Canfor promotes safety in all aspects of forest management operations. Two types of workplace accidents are the most common within the forest industry including lost time accidents (LTA) or incidents where medical aid or treatment was necessary but no loss of work time was experienced by the employee. Through this indicator, only LTA will be tracked and monitored.

Accidents

Signatory	Number of Lost Time Accidents
Canfor	0

Source: Signatory safety records
Indicator Discussion:

Indicator 40   Signage

Indicator Statement	Target and Variance
The percentage of operational activities in place that have the appropriate signage in place during the activity, and removed following the completion.	Target: 100% Variance: -20%

People value being informed of most activities that take place on public lands including those associated with industrial forestry. Signage establishes a standard for safety and otherwise helps inform public about the nature and extent of industrial activity. Conversely, if signage is not kept current, credibility of the signs declines resulting in a potential safety hazard. With this indicator we will monitor our commitment to making information about our activities current and available to those traveling the roads and trails of the Mackenzie DFA.

Signage

Signatory	Number of completed operational projects requiring signage where the signs were posted during the activity	Number of Completed operational Activities requiring signage	Percent

	and removed following completion		
Canfor	71	71	100%

Source: Operational staff communication.
Indicator Discussion: This is managed almost exclusively by our logging contractors. Signs are posted for safety reasons during active operations, and the appropriate signs are removed when operations are complete.

Indicator 41   Forest Area by species composition

Indicator Statement	Target and Variance
Percent composition of forest type (treed conifer, treed broad leaf, treed mixed) >20 years old across DFA.	Target: Maintain baseline ranges and distribution into the future (measured every 5 years) Variance: +/-1%

Tree species composition, stand age, and stand structure are important variables that affect the biological diversity of a forest ecosystem - providing structure and habitat for other organisms. Ensuring a diversity of tree species within their natural range of variation, improves ecosystem resilience and productivity and positively influences forest health. Reporting on this indicator provides high level overview information on area covered by broad forest type, forest succession and management practices that might alter species composition.

The different stand types will be run using GIS analysis and VRI data. The baseline data was revised in 2013 after the DFA changed as a result of BCTS operating areas being removed from the DFA. Subsequent analysis will be done every 5 years in an effort to eliminate any bias from short term trends on the land-base, and to allow for the periodic updating of data sources. The indicator will be considered to have been met if the area for the 5 year reporting window maintains its area spread within 1 percent of baseline areas.

Analysis Year	Treed Conifer	Treed Broadleaf	Treed Mix
2013 (baseline)	90%	3%	7%
2014	90%	3%	7%

Source: GIS analysis of VRI data.
Indicator Discussion: There was little change in the values with the removal of BCTS from the plan.

Indicator 42   Proportion of genetically modified trees in reforestation efforts

Indicator Statement	Target and Variance
Regeneration will be consistent with provincial regulations and standards for seed and vegetative material use	Target: 100% conformance with the standards Variance: 0%

One of the primary management objectives for sustainability is to conserve the diversity and abundance of native species and their habitats. Silviculture practices that promote regeneration of native species, either through planting or other natural programs assists in meeting these objectives. The well-being and productivity of future forests is dependent upon the structure and dynamics of their genetic foundation.

Seed used in Crown land reforestation that is consistent with provincial regulations and standards ensure regenerated stands are genetically diverse, adapted, healthy and productive, now and in the future. Suitable seed and vegetative lots must also be of a high quality and available in sufficient quantities to meet the specific stocking and forest health needs of a given planting site.

Regeneration will be consistent with provincial regulation and standards for seed and vegetative material use. Target - 100% conformance with the standards (0 percent variance). The Chief Forester's Standards for seed use allows for up to 5 percent of the seedlings planted in a year to be outside the seed transfer guidelines. In addition, there is an avenue in the standards to apply and receive approval for an Alternative Seed Use Policy. This built in variance and flexibility with the standard is why there is no acceptable variance in the target of the SFMP indicator.

Signatory	Total Number of Seedlings Planted in Compliance with Legislative Requirements	Total Number of Seedlings Planted	Percent
Canfor	3,260,785	3,260,785	100%

Source: Internal databases.
Indicator Discussion:

Indicator 43   Dispersed retention levels

Indicator Statement	Target and Variance
Percent of blocks meeting dispersed retention levels as prescribed in the site plan/logging plans	Target: 100% Variance: 0%

Operationally, harvest plans often include retention of dispersed trees such as snags, large live trees, deciduous trees, stub trees and understory trees. Dispersed retention provides stand level complexity and long term recruitment of coarse woody debris. Harvest value and ecological value can be optimized by selecting the variety of tree types (e.g., species, size, live and dead, etc.) that have high ecological value and low economic value, and through the number of trees retained.

Signatory	Total Number of Blocks Meeting Dispersed Retention Levels Defined in Site Plan	Total Number of Blocks Harvested	Percent
Canfor	71	71	100.0%

Source: Internal databases, and Incident Tracking Systems.
Indicator Discussion:

Indicator 44   Investment in training and skills development

Indicator Statement	Target and Variance
Training in environmental and safety procedures in compliance with company training plans.	Target: 100% of company employees and contractors will have both environmental and safety training. Variance: -5%

Sustainable forest management provides training and awareness opportunities for forest workers as organizations seek continual improvement in their practices. Investments in training and skill development generally pay dividends to forest organizations by way of a safer and more environmentally conscious work environment. Assessing whether forest contractors have received both safety and environmental training is a direct way of measuring this investment. Additionally, training plans should be in place for employees of the forest organizations who work in the forest. Measuring whether the training occurred in accordance with these plans will confirm an organizations commitment to training and skills development.

Signatory	Total Number of Employees and Contractors Trained in EMS, FMS and Safety	Total Number of Employees and Contractors	Percent
Canfor	275	275	100.0%

Source: Eclipse, contractor records.
Indicator Discussion: Canfor supervisors train contractor foremen, principals and supervisors on our FMS, SFM and SWPs. It is then the responsibility of the contractor to train all other employees using the materials presented by us.

Indicator 45   Level of direct and indirect employment

Indicator Statement	Target and Variance
Maintain the level of direct and indirect employment.	Target: 265 direct 53 indirect

Forests represent not only a return on investment (measured, for example, in dollar value, person-days, donations, etc.) for the organization but also a source of income and non-financial benefits for DFA-related workers, local communities and governments.

Organizations that harvest at sustainable harvest levels in relation to the allocated supply levels determined by government authorities continue to provide direct and indirect employment opportunities. The harvest level is set using a rigorous process that considers social, economic and biological criteria.

Targets for this indicator are based on 2010 baseline data of actual direct employment. Direct employment includes all staff and contractors paid directly by Canfor. Indirect employment levels are generated using the employment multiplier from the 2000 Timber Supply Review. Indirect employment is difficult to calculate therefore the multiplier is used, and is based on the number of direct jobs. If full-time employment targets are being met it will be assumed that indirect employment targets are also met.

Signatory	Number of Direct Jobs		Indirect Jobs Met (y/n)	
Canfor	2012-13	2013-14	2012-13	2013-14
	313	329	Y	Y

Source: Human Resources documents, contractor communication.
Indicator Discussion: If the amount of direct jobs is met, it is assumed the amount of in-direct jobs will also be met. For this reporting period there was an increase in woodlands employment as volumes harvested increased and silviculture manpower increased but there was a decrease in mill employment. The decrease in mill staff is a result of employees going on long-term-disability, retirements and modernization in the facility.

Indicator 46   People reached through educational outreach

Indicator Statement	Target and Variance
The number of stakeholders and members of the public who took part in an educational opportunity.	Target: 50 Variance: -10

The signatories are committed to working with directly affected stakeholders and members of the public on forest management issues and have a well-established history of participation in community meetings, including local planning processes. The sharing of knowledge and contributes to informed, balanced decisions and plans acceptable to the majority of public. When informed and engaged, members of the public can provide local knowledge and support that contributes to socially and environmentally responsible forest management. Canfor staff provided educational opportunities both at the request of their employer and of members of educational community in Mackenzie. The Participants have held open houses and participated in local trade fairs. Staff have also provided field tours and in class presentations for the local secondary school.

Signatory	Number of stakeholders who attended educational opportunities
Canfor	400

Source: Attendance records from events held.
Indicator Discussion: Tradefair; approx 400 public attendees; and PAG meetings.

Indicator 47   Protection of identified sacred and culturally important sites

Indicator Statement	Target and Variance
Percent of identified Aboriginal forest values, knowledge and uses accommodated in forestry planning processes.	Target: 100% Variance: 0

Efforts have been made to understand which First Nation traditional territories fall within the Plan area and company Defined Forest Areas. Information sharing agreements are made with willing First Nation communities to promote the use and protection of sensitive information.

Planned blocks are shared with Aboriginal communities. Open communication with First Nations that includes a sharing of information enables the participants to understand and incorporate traditional knowledge into forest management options is the means to achieve the objective of the indicator.

The objective will be achieved as the participants become aware of culturally important, sacred and spiritual sites leading to appropriate management of and protection. This will be achieved by specifying measures in

operational plans. The proper execution of plans will provide desired results of First Nations culturally important values and resources. Post-harvest evaluations and other inspections will assess plan conformance.

Signatory	Number of Aboriginal forest values, knowledge and uses brought forward that have been considered	Number of Aboriginal forest values, knowledge and uses brought forward	Percent
Canfor	0	0	100.0%

Source: Internal tracking databases.

Indicator Discussion: In the fall of 2013 Canfor, FLNRO and representatives from the Takla FN met to discuss Canfor's proposed harvesting in the Manson and Germansen Lands areas. A large area was identified as to be no harvesting, however no specific sites were identified within the area. The input was considered, however not included into operational plans.

Indicator 48   Understanding of the nature of Aboriginal Rights and Title

Indicator Statement	Target and Variance
FMG employees will receive First Nations Awareness training as per the FMG Training Matrix.	Target: 100% Variance: 10%

Section 35 of the Constitution Act states "The existing aboriginal and treaty rights of Aboriginal Peoples of Canada are hereby recognized and affirmed". Some examples of the rights that Section 35 has been found to protect include hunting, fishing, trapping, gathering, sacred and spiritual practices, and title. SFM requirements are not in any way intended to define, limit, interpret, or prejudice ongoing or future discussions and negotiations regarding these legal rights and do not stipulate how to deal with Aboriginal title and rights, and treaty rights.

The first step toward respecting Aboriginal title and rights, and treaty rights is compliance with the law. Section 7.3.3 of the CSA Z809-08 Standard reinforces legal requirements for many reasons, including demonstrating that Aboriginal title and rights, and treaty rights have been identified and respected. The reality in demonstrating respect for Aboriginal title and rights, and treaty rights can be challenging in Canada's fluid legislative landscape and therefore it is important to identify these legal requirements as a starting point. It is important for companies to have an understanding of applicable Aboriginal title and rights, and treaty rights, as well as the Aboriginal interests that relate to the DFA.

Both the desire of licensees to comply with laws and open communication with local First Nations requires that company staff members have a good understanding of Aboriginal title and rights and treaty rights.

Signatory	Number of staff who have completed First Nations Awareness training	Total number of staff who require the training.	Percent
Canfor	7	7	100%

Source: Employee training databases.

Indicator Discussion: Of the 8 FMG staff in Mackenzie, only 7 require this training as per the FMG training Matrix, WIM staff are exempt.

Appendix 1

2013-2014 ECA Analysis for Active Watersheds

BASIN NAME	WSHED AREA	SENSITIVITY	MAX_ECA TARGET	CURR_HARV AREA	CURR_ECA ABOVE	CURR_ECA BELOW	CURR_ECA AREA	CURR_PFI	FUTR_HARV AREA	FUTR_ECA ABOVE	FUTR_ECA BELOW	FUTR_ECA AREA	FUTR_PFI
BLACKWATER CREEK	49,382	2	62.5	15,942	6,675	3,562	10,237	21	17,435	7,555	3,562	11,117	23
DES CREEK	3,332	1	74.5	539	263	258	522	16	752	443	258	702	21
EKLUND CREEK	24,587	2	62.5	4,078	135	1,895	2,030	8	5,275	524	1,895	2,419	10
FINAWSD000043	7,689	1	62.5	1,795	1,609	174	1,783	23	2,043	1,692	174	1,866	24
FINAWSD000046	4,961	1	74.5	2,666	2,217	360	2,577	52	2,770	2,156	360	2,516	51
FINAWSD000050	3,401	2	62.5	1,922	955	358	1,312	39	1,991	1,010	358	1,368	40
FRIES CREEK	7,543	2	62.5	2,210	55	762	817	11	2,327	116	762	878	12
GAFFNEY CREEK	49,219	2	62.5	14,606	6,399	6,462	12,861	26	15,505	5,643	6,462	12,105	25
HOLDER CREEK	8,197	1	74.5	3,166	1,604	1,487	3,091	38	3,594	1,811	1,487	3,298	40
MANSON RIVER	62,640	2	62.5	12,348	2,938	4,627	7,566	12	13,890	3,056	4,527	7,683	12
MCDOUGALL RIVER	40,438	1	74.5	7,336	4,555	2,374	6,928	17	8,454	4,307	2,374	6,680	17
NATION RIVER	68,740	2	62.5	18,207	12,565	3,916	16,481	24	20,023	12,649	3,916	16,565	24
NATRWSD000006	6,205	2	62.5	4,256	1,311	456	1,766	29	4,309	1,310	456	1,766	29
PARAWSD000024	2,382	2	62.5	1,292	407	213	620	26	1,329	413	213	626	26
PEACE WILLISTON	543,780	2	62.5	113,331	90,515	2,701	93,216	17	117,549	81,072	2,701	83,772	15
PHILIP CREEK	69,496	2	62.5	22,730	11,288	5,577	16,865	24	26,463	11,890	5,577	17,468	25
STRANDBERG CREEK	18,307	2	62.5	5,147	1,189	975	2,164	12	6,242	1,946	975	2,921	16