



Indicator 2.3.2 Forest Conversion

[1] Foothills Model Forest value

The forest landbase: i.e., land within the Foothills Model Forest (FtMF) landbase that is forested (and considered productive).

[2] Objective

To conserve the productive forest landbase.

[3] Statement of indicator

Additions and deletions to the forest landbase (total percentage of area changed).

[4] Indicator measure

This indicator provides a summary of the forested land within the landbase that has been converted to a non-forested use, or non-forested land that has been converted back to forested land. Examples of forest land being converted to non-forest use include forest land that has been developed for permanent structures such as roads, pipelines, power lines, mines, well-sites, and gravel pits. Conversely, non-forested land (both industrial land and natural features such as brushy meadows) can also be converted to forested land by the processes of reclamation, rehabilitation, and regeneration (primarily thorough planting trees).

[5] Rationale for indicator

a. Significance of indicator to landscape-level management

Productive forest land (i.e., land that is capable of growing trees) is one of the most important resources that we manage, both at the landscape level and the stand level – there is a finite supply, so we must manage this resource very carefully. Activities such as road-building, open-pit mining, and pipeline construction reduce the area of forested land; therefore, they must be measured, coordinated, and impacts mitigated, wherever possible.

With this indicator, the issue of cumulative impacts becomes an important consideration. On its own, a single impact may have only a small effect on the forest landbase. However, when multiple impacts are considered across all the other users of the landbase, the cumulative landscape-level effect can be significant.

In measuring this indicator, the objective is to be aware of the amount of land on the Foothills Model Forest landbase that is being

converted to uses not compatible to growing trees. Because of economic benefits such as those associated with the oil and gas and coal-mining industries, it is unrealistic to expect all land to remain in a completely forested state. It must be understood, however, that much of this conversion is temporary, and that rehabilitation efforts can return the land to productivity at a future date.

resources, at some point these non-renewable resources will be deleted. Then, as the footprint of these industries is reclaimed, the productive forest landbase will begin to increase again. Keeping track of the losses and gains in the infinite forest landbase helps to identify trends and allows for changes in management activities to be made thus ensure conversions to non forest uses are maintained within threshold levels.

b. Meaning of indicator

This indicator reveals trends in the change in size of the forested landbase as industrial activity occurs; trends showing significant reductions in the landbase over time should be cause for concern for maintaining sustainability for forest values.

c. Relation of indicator to Foothills Model Forest and to sustainability

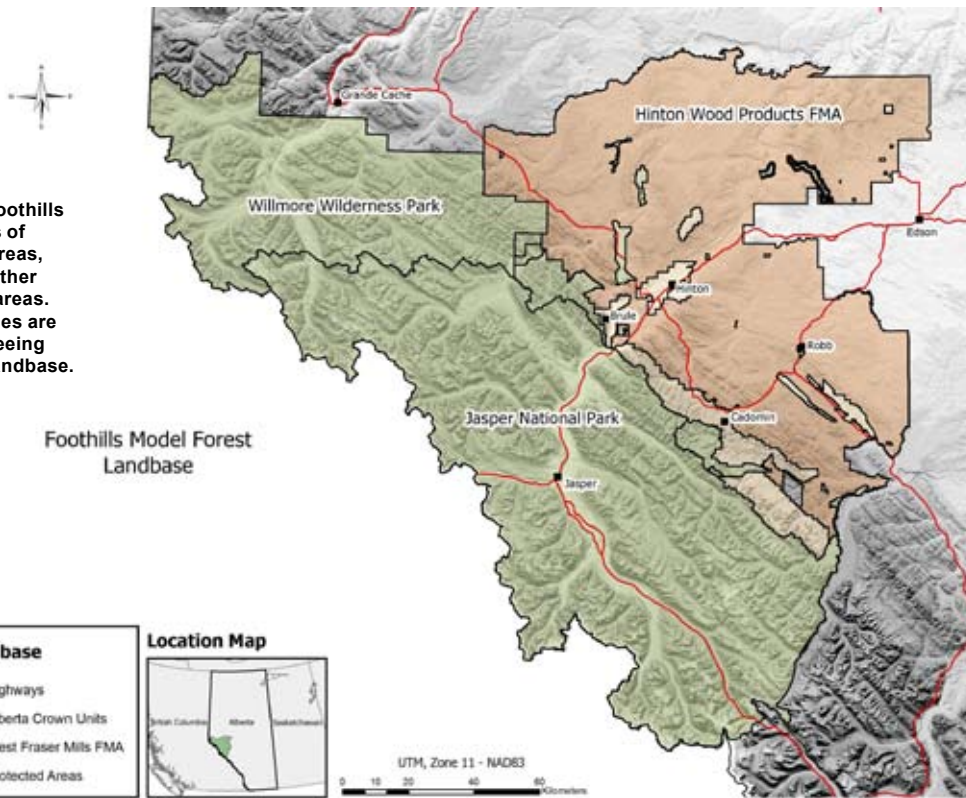
This indicator is a very important measure of sustainable forest management. While loss of forest land may continue as the oil and gas and mining industries exploit underground

[6] Current status of indicator

The landbase of the FtMF consists of the Hinton Wood Products’ Forest Management Area (which also has a number of provincial protected areas embedded within it), Jasper National Park, and Willmore Wilderness Park (Figure 1). It also includes some smaller provincial Crown forest management units and the Hinton Training Centre’s Cache Percotte Training Forest. Each of these areas has one main agency responsible for the overall coordination of the development within that landbase.

Figure 1 - Foothills Model Forest Landbase

The landbase of the Foothills Model Forest consists of two parks protected areas, an FMA, and several other special management areas. Three different agencies are responsible for overseeing development on the landbase.



Hinton Wood Products, a division of West Fraser Mills Ltd., is the licensee within the boundaries of the FtMF and is responsible for all forest management activities. However, approval for all projects is provided by Alberta Sustainable Resource Development (ASRD). For Jasper National Park, Parks Canada is the coordinating agency, while for Willmore Wilderness Park (and other smaller provincial protected areas within the FtMF landbase), Alberta Tourism, Parks, and Recreation is the responsible agency. ASRD is responsible for the Cache Percotte Training Forest and the remaining Crown management units.

The sections below summarize the amount of forest land that has been converted to non-forest land, and the amount of non-forest land converted back to forest land, for each of the four landbase types in the FtMF.

Hinton Wood Products FMA

Industrial activities carried out by Hinton Wood Products and other commercial users can reduce the productive landbase through road-building, seismic exploration for oil and gas, pipeline construction,

and well site development. When these industrial dispositions are no longer required, it is desirable to have them reforested where appropriate, and returned to a productive forest state as quickly as possible. However, not all returned industrial lands are appropriate for reforestation, as they may be located in wetlands, on barren rock, or in other non-productive ecotypes. Also, in certain areas, some of the current ecotypes classified as non-productive were actually previously forested, and can in fact be reforested again with the appropriate treatment – this is called afforestation.

In order to ensure that the minimum amount of forest land is converted to non-forest land, Hinton Wood Products has developed a number of initiatives to coordinate development with other industrial users in the FMA landbase. Table 1 outlines the deletions and additions to the Hinton FMA since 1998 due to forest conversion. Although forestry and oil and gas deletions are combined in one column, the vast majority of the land conversion since 2000 has been due to oil and gas activities (e.g., pipelines, well-sites, etc.)

Table 1 – Forest Landbase Conversion:Hinton FMA (2000 - June 2006)

Year	Deletions/ Additions	Industrial (ha.)*				Crown uses (ha.)				Total change	Total FMA landbase (ha.)	Net Change (ha.)
		Forestry	Oil and Gas	Mining	Sub-total	Special places**	Indian Reserve**	Other	Sub-total			
1999						0	0	Starting net landbase		985,446	0	
2000	Deletions	0	-855	-271	-1,126	-10,123	0	-5	-10128	-11,254	974,192	-11,254
	Additions	0	132	0	132	0	0	0	0	132	974,324	-11,122
2001	Deletions	-11	-1,246	-565	-1,811	0	0	-1	-1	-1,812	972,512	-12,934
	Additions	0	131	0	131	0	0	0	0	131	972,643	-12,803
2002	Deletions	0	-1,630	0	-1,630	0	0	-18	-18	-1,648	970,995	-14,451
	Additions	0	88	0	88	0	0	0	0	88	971,083	-14,363
2003	Deletions	-10	-1,737	0	-1,737	0	0	0	0	-1,737	969,346	-16,100
	Additions	0	277	0	277	0	0	0	0	277	969,623	-15,823
2004	Deletions	0	-2,693	-486	-3,179	0	0	0	0	-3,179	966,444	-19,002
	Additions	0	316	0	316	0	0	0	0	316	966,760	-18,686
2005***	Deletions	0	-2900	-1762	-4,662	0	0	-144	-144	-4,806	961,954	-23,492
	Additions	0	146	0	146	0	0	7	7	153	962,107	-23,339
Total change (ha.)		-21	-9,971	-3,084	-13,055	-10,123	0	-161	-10,284	-23,339		
% change		0%	-1.01%	-0.31%	-1.32%	-1.03%	0%	-0.02%	-1.04%	-2.37%		

* These are forest landbase conversions (some temporary and some permanent)

** “Special Places” are areas that have been protected by provincial legislation under the Alberta government’s Special Places 2000 program (an initiative to increase protected areas in the province). These are not forest land conversions, but are deletions from the FMA.

*** This covers the timeframe from June 15, 2005 to June 14, 2006 (this timeframe is the same for every year in the table). This information is based on the FMA anniversary report that is generated by the Alberta government.

Jasper National Park

Jasper National Park (JNP) has not experienced any significant forest conversion since the last Local Level Indicator (LLI) report issued by the Foothills Model Forest (2000). However, JNP acknowledges there has been some very minor land conversion – for example, involving some unofficial trail systems -- but as these are similar to game trails it is probably not appropriate to include them they really can't be counted. However, in 2007 a major new pipeline was being constructed adjacent to Highway 16 through JNP, which resulted in some forest conversion.

Alberta Tourism, Parks, and Recreation

Alberta Tourism, Parks, and Recreation, a ministry of the provincial government, is responsible for the management of provincial protected areas within the FtMF. This includes Willmore Wilderness Area, as well as the smaller provincial protected area adjacent and within the Hinton FMA, such as Switzer Provincial Park, Sundance Provincial Park, and the various provincial recreation areas (campgrounds). Since the last LLI report, there has been no reportable forest conversion within the provincial protected area network of the FtMF landbase.



Alberta Sustainable Resource Development

Alberta Sustainable Resource Development reports on forest conversion within the FtMF landbase that is outside the Hinton FMA, Jasper National Park, and the provincial protected areas. This primarily means forest conversion within the Crown Forest Management Units adjacent to the Hinton FMA and JNP, as well as the Cache Percotte Forest near Hinton. Table 2 outlines the forest conversion within the ASRD's reporting areas.

Table 2 – Forest Landbase Conversion:Hinton FMA (2000 - June 2006)

Year	Deletion/ Additions	Industrial (ha.)*			Total change	Total FMA landbase (ha.)	Net Change (ha.)
		Oil and Gas	Mining	Other			
1999	Deletions	-2104		-63	-2,166	162,060	-2,453
	Additions				0	162,060	-2,453
2000	Deletions	-15		-424	-439	161,621	-2,892
	Additions				0	161,621	-2,892
2001	Deletions	-7		-25	-32	161,589	-2,924
	Additions				0	161,589	-2,924
2002	Deletions	-9		-48	-58	161,531	-2,982
	Additions				0	161,531	-2,982
2003	Deletions	0		-159	-160	161,371	-3,142
	Additions				0	161,371	-3,142
2004	Deletions	-4		-24	-28	161,343	-3,170
	Additions				0	161,343	-3,170
2005	Deletions			-973	-973	160,370	-4,143
	Additions				0	160,370	-4,143
2006	Deletions	-30		-346	-375	159,995	-4,518
	Additions				0	159,995	-4,518
Total Change (ha)		-2,169	0	-2,062	-4,231		
% Change		-1.34%	0.00%	-1.27%	-2.61%		

* These are forest landbase conversions (some temporary and some permanent)

[7] Interpretation

As expected, the protected area portions of the FtMF landbase (Jasper National Park and the provincial protected areas) experienced nominal levels of forest conversion. However, portions of the FtMF landbase not within the protected area network have undergone a higher degree of forest conversion. The data show that deletions of forested land related to oil and gas have increased significantly since 2000 (the time of the last LLI report). This correlates with an overall increase in oil and gas activity on the Alberta landscape during a time period when the price of oil and gas rose dramatically.

[8] Rationale for allowable variance (threshold)

There is no allowable variance for this indicator.

[9] Analytical considerations

a. Calculation of indicator

The measure is calculated as follows:

$$\text{Conversion of productive landbase (\%)} = \frac{\text{Net productive forest land (ha.)}}{\text{Total Area of Landbase (ha.)}} \times 100$$

b. Special considerations

It should be noted that the calculation does not take into account landbase attributes such as water and rock (the indicator is productive forest land (i.e., land that is capable of growing trees).

[10] Responsibility

The following organizations are responsible for monitoring, collecting, and reporting on forest conversion data: Hinton Wood Products, Alberta Sustainable Resource Development, Alberta Tourism, Parks, and Recreation, and Jasper National Park (Parks Canada).

[11] Monitoring

Annual reporting of forest conversion is currently carried out only by Hinton Wood Products, as part of their annual Stewardship Report. This report is available on their website (www.westfraser.com/hintonforestry). None of the other organizations currently report annually on forest conversion, although this information is tracked.

It is anticipated that moving forward; forest conversion will now be monitored and reported on by all relevant organizations in this Local Level Indicators report. This indicator could be calculated on an annual basis in relation to measuring and managing the forest landbase conversion footprint.

[12] General discussion

Forest conversion is a critical consideration when evaluating sustainability and therefore, is an important indicator. The loss of productive forest land to non-forest uses results in a landscape that has less capacity to sustain the flow of environmental goods and services (water, habitat, fibre, etc.) However, while analysing this data, one must also keep in mind that not all forest conversion is permanent. In other words, areas reported as being converted from forest land to non-productive land may still be returned to productivity at a future date. With proper rehabilitation techniques, well sites, roads, mines, and pipelines all may be converted back into productive forest land. The oil and gas industry has a significant impact on the landbase in the short term, but in the long term after oil reserves have been depleted, the infrastructure required to access them (e.g., pipelines, well sites, roads etc.) can be reclaimed and brought back into productivity.



This satellite photo clearly shows that many small forest conversions can have a large cumulative effect. The lighter patches are areas where the forest has been converted to non-forest uses