Sustainable Forest Management

2015 Facts & Statistics

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Agriculture and Forestry

Reforesting Harvested Areas

Forests are a renewable resource. Reforestation is the process of re-establishing trees removed during harvesting. Forest managers help ensure that newly established forests will meet specific objectives.

Reforestation has been the law in Alberta for over 30 years. The requirements for reforestation exist in the *Forests Act*, Timber Management Regulation and forest management agreements. Companies are required to start reforestation activities within two years of completing timber harvesting. These reforestation activities follow approved plans and are designed to meet legislated reforestation standards.

To keep the forest land in a productive and healthy condition, forest managers use both natural and artificial methods to regenerate harvested areas. "Leave-for-Natural" (LFN) reforestation (Figure 1) uses the forest's natural regeneration process to establish new trees. "Artificial reforestation" involves planting or sowing reforestation material, such as seedlings (Figure 2) or seeds brought into the harvested area.

All tree species native to Alberta can regenerate naturally from seed. The amount of seed produced differs by tree species and varies year to year. Natural seed sources are unpredictable, and forest managers cannot rely upon seeds as the only method to ensure prompt reforestation of harvested areas.

Many deciduous tree species, such as trembling aspen, can regenerate by sprouting new shoots from the stump, or from roots running just beneath the forest floor. Forest managers refer to the production of new trees from non-seed sources as vegetative reproduction.

Lodgepole pine, Alberta's official tree, often holds its cones and seeds on the tree for upwards of 10 years. Thus, the seed supply from these harvested trees is often more than sufficient to reforest areas following harvest.

Forest managers use artificial reforestation methods to promptly reforest a harvest area

Figure 1. A Leave-for-Natural pine stand after harvesting

where vegetative reproduction is not an option, or where trees have insufficient seed. Preparing the site and soil for successful seed germination and seedling growth is often required first.

One artificial reforestation method involves planting nursery-raised seedlings, similar to transplanting plants from a greenhouse to a garden. These seedlings are grown from seeds collected from the same location that they will be planted into. Another method involves scattering seeds. Both of these methods are normally practiced in forests dominated by coniferous trees, such as white spruce, black spruce, balsam fir, subalpine fir and lodgepole pine.

Figure 2. Nursery-raised spruce seedlings

Alberta Government

Statistics

Tables 1 and 2, and Figures 3 to 8 show the prescribed reforestation methods used between May 1, 2014 to April 30, 2015. The majority (72.87%) of the area, mostly in the Upper Athabasca, Upper Peace and Lower Peace regions, was reforested by planting seedlings.

The Leave-for-Natural method was used for 26.18 per cent of the harvested area with the majority in the Lower Peace, Upper Athabasca, and Lower Peace regions. Only 0.95 per cent of the total harvested area, mostly in the Upper Peace Region, was seeded.

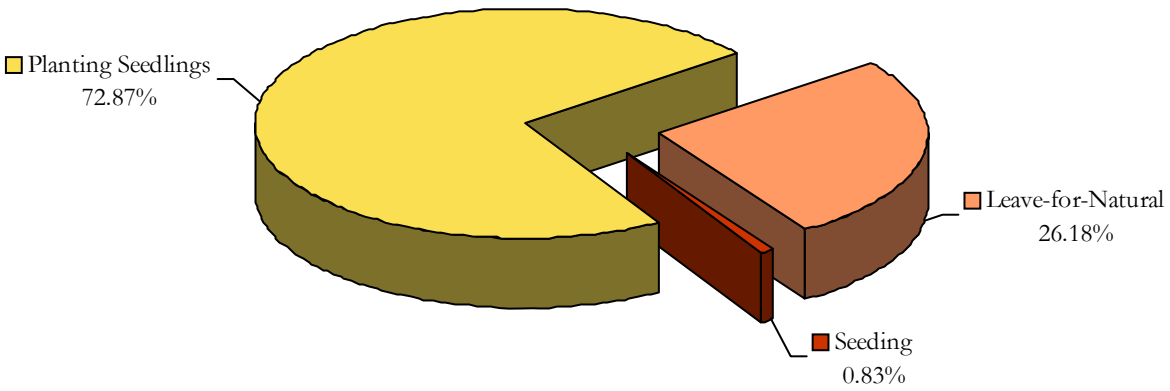
No harvested area was reforested and reported for the Red Deer Region as it is mainly comprised of non-forested private land.

Table 1. Harvested area reforested on Alberta public land by method, 2014/15[1]

Land-use Framework Planning Region (LUF)	Planting Seedlings (ha)	Seeding (ha)	Leave-for-Natural (ha)
Lower Athabasca	1,886	0	2,711
Lower Peace	9,658	0	5,779
North Saskatchewan	5,809	228	339
Red Deer	0	0	0
South Saskatchewan	1,618	19	0
Upper Athabasca	20,221	179	6,408
Upper Peace	18,412	346	5,456
Provincial Total	**57,604**	**753**	**20,693**

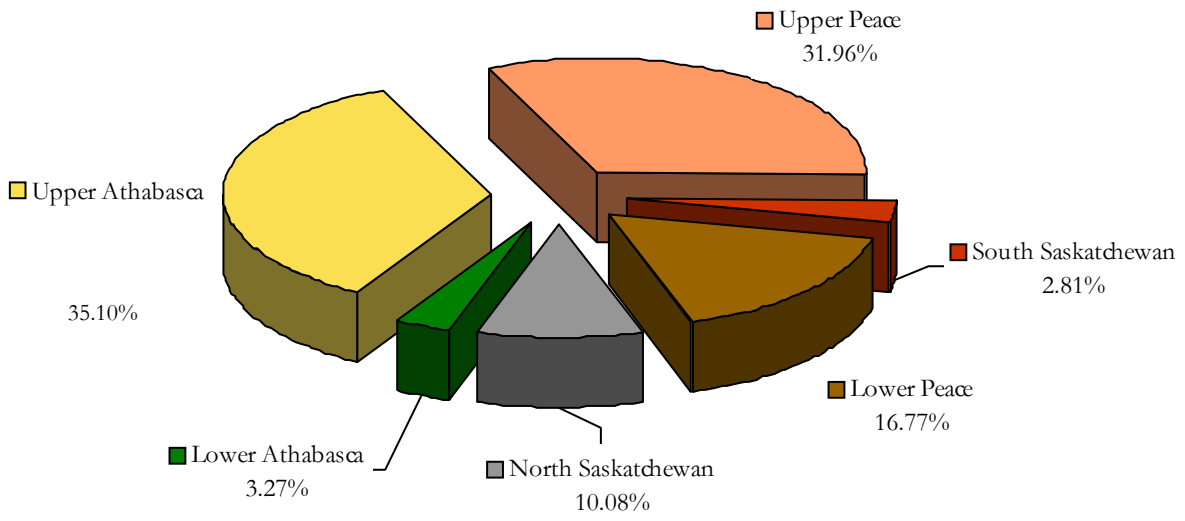
[1]The areas are preliminary and have been rounded to the next nearest hectare.

Figure 3. Percentage of harvested area reforested on Alberta public land by method, 2014/15



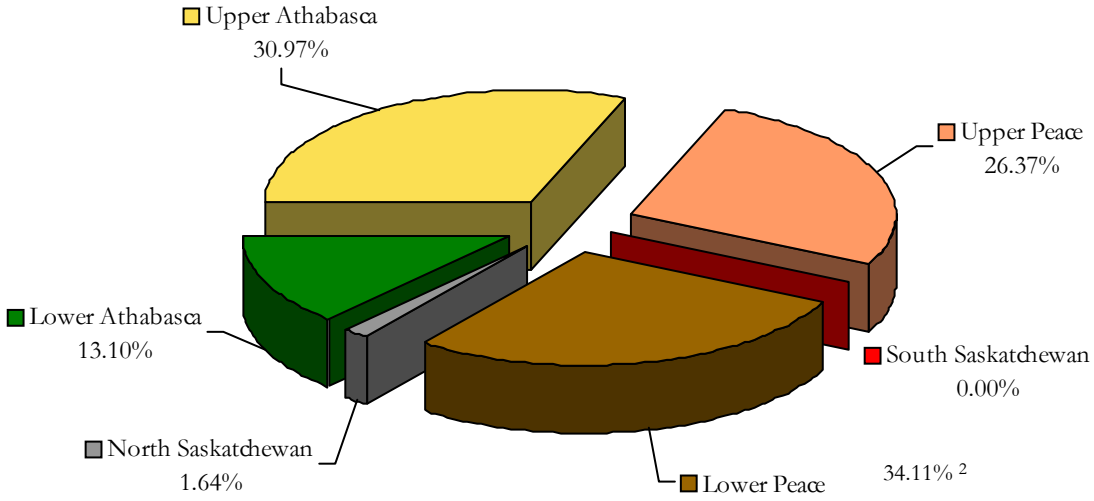
Statistics cont'd

Figure 4. Percentage of harvested area reforested by planting seedlings on Alberta public land by Land-use Framework Planning Region, 2014/15[1]



[1]Excludes Land-use Framework Planning Regions with no harvested area reforested by planting seedlings.

Figure 5. Percentage of harvested area reforested by Leave-for-Natural on Alberta public land by Land-use Framework Planning Region, 2014/15[1]



[1]Excludes Land-use Framework Planning Regions with no harvested area reforested by Leave-for Natural. [2] Rounded to add up to 100%.

Statistics cont'd

As shown in Table 2 and Figures 6 to 8, over half (53.70%) of the number of seedlings planted were spruce species. Most spruce was planted in the Upper Peace and Upper Athabasca regions. Spruce species (45.91%) were planted mostly in the Upper Athabasca and Lower Peace regions. A total of 0.19 per cent of all seedlings planted in 2014/15 were other species including true firs, Douglas fir, tamarack larch, white birch, balsam poplar and trembling aspen. The majority of the other species planted were in the Upper Peace Region.

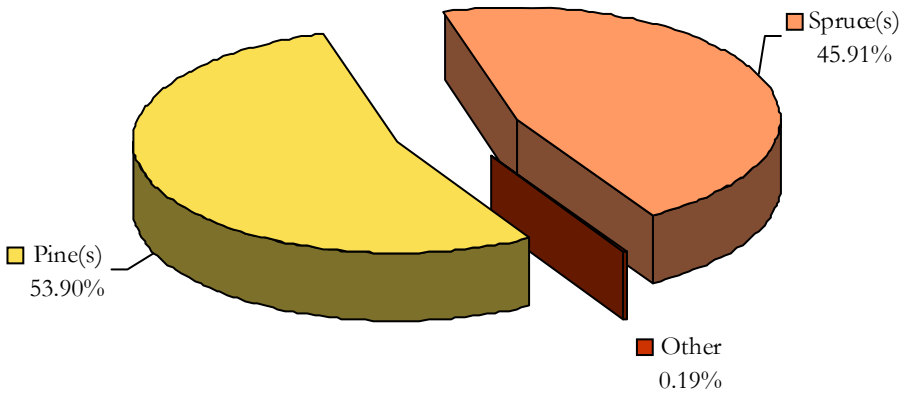
No planted seedlings were reported in the Red Deer Region as it is mainly comprised of non-forested private land.

Table 2. Number of seedlings planted in harvested areas on Alberta public land by tree species group, 2014/15[1]

Land-use Framework Planning Region (LUF)	Pine(s) [2]	Spruce(s) [3]	Other [4]
Lower Athabasca	578,515	1,816,545	0
Lower Peace	3,456	13,090,801	8,142
North Saskatchewan	5,784,960	2,425,909	0
Red Deer	0	0	0
South Saskatchewan	1,118,055	980,180	0
Upper Athabasca	17,931,636	12,875,358	0
Upper Peace	18,944,384	6,591,710	146,920
Provincial Total	**44,361,006**	**37,780,503**	**155,062**

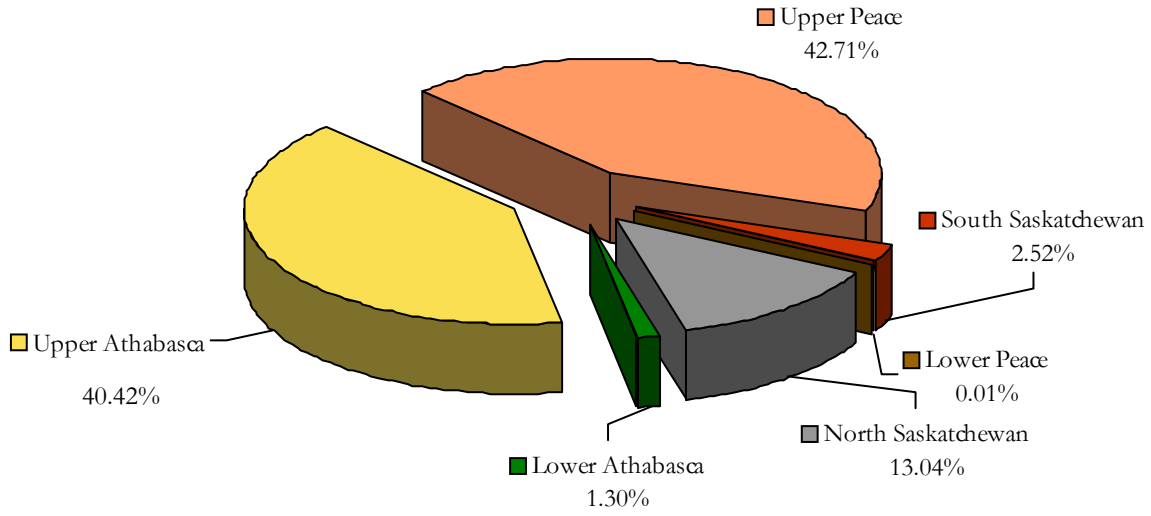
[1]The numbers are preliminary. [2]Pine(s) includes all pine species; [3]Spruce(s) includes all spruce species; [4]Other includes all other minor species including true firs, Douglas fir, tamarack larch, white birch, balsam poplar and trembling aspen.

Figure 6. Percentage of seedlings planted in harvested areas on Alberta public land by tree species group, 2014/15



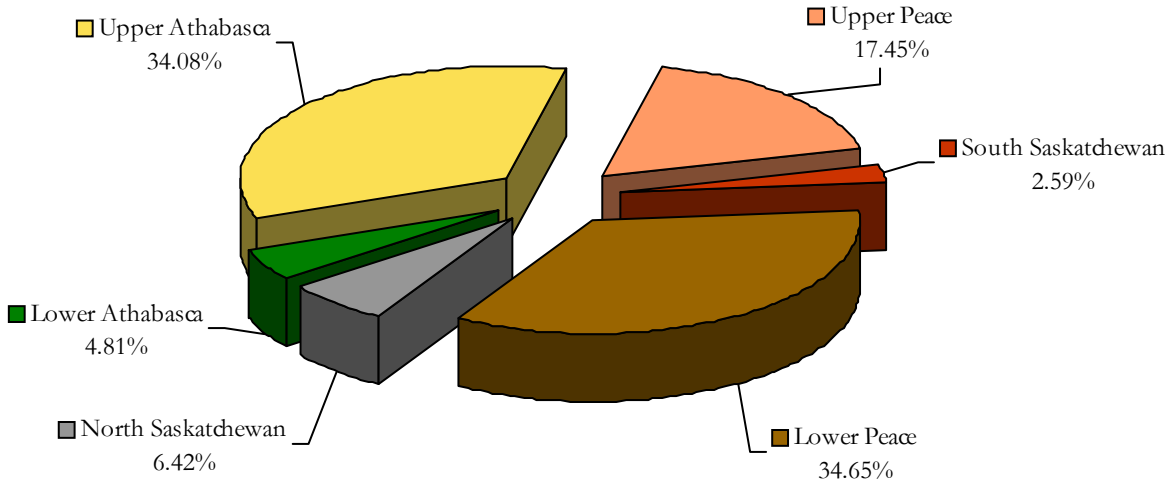
Statistics cont'd

Figure 7. Percentage of pine seedlings planted on Alberta public land by Land-use Framework Planning Region, 2014/15[1]



[1]Excludes Land-use Framework Planning Regions with no pine seedlings planted.

Figure 8. Percentage of spruce seedlings planted on Alberta public land by Land-use Framework Planning Region, 2014/15[1]



[1]Excludes Land-use Framework Planning Regions with no spruce seedlings planted.

Historical Trends

Table 3 and Figure 9 show the harvested area that has been reforested from 2008 to 2015 by using either LFN or artificial reforestation methods with seedlings or seed.

The total area planted with seedlings in 2014/15 is similar when compared to previous three years. In the recent years, low demand for forest products has resulted in reduced areas being harvested and reforested. Today, forest managers rely more on planting seedlings as it better ensures rapid reforestation of harvested areas relative to the slower LFN method. Using site preparation techniques to create desirable planting sites and experienced tree planters who select good growing locations all help the trees establish and grow.

In contrast, forest managers did not use seeding methods over large areas of Alberta (Table 3). Seeding methods require much more seed than the amount used when planting seedlings in an area. This is because some seeds fail to germinate, some die before their roots find suitable soils, and some seed is eaten by birds, mice and squirrels. Consequently, only small numbers of seeds grow to become the next generation of forest.

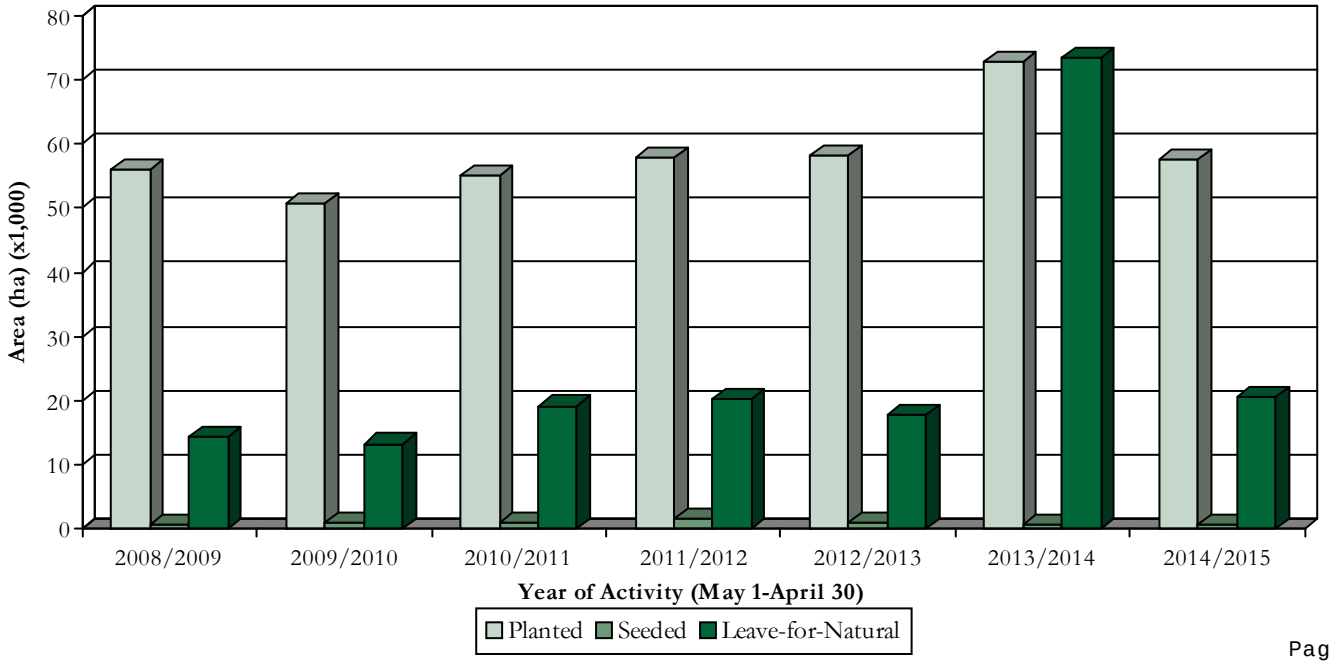
Table 3. Harvested area reforested on Alberta public land by method, 2008-2015[1]

Year (May 1 -April 30)	Area planted with seedlings (ha)	Area seeded (ha)	Total area planted and seeded (ha)	Leave-for-Natural (ha)
2008/2009	55,953	595	**56,548**	14,229
2009/2010	50,855	1,074	**51,929**	13,224
2010/2011	55,034	993	**56,027**	19,139
2011/2012	58,051	1,684	**59,735**	20,193
2012/2013	58,302	834	**59,136**	17,874
2013-2014	72,774[r]	751[r]	**73,525**[r]	23,856[r]
2014/2015	57,604[p]	753[p]	**58,357**[p]	20,693[p]

[1]The areas have been rounded to the next nearest hectare.

[r]=Revised results; [p]=Preliminary results

Figure 9. Harvested area reforested on Alberta public land by method, 2008-2015



Historical Trends cont'd

The area where LFN reforestation methods were used remained relatively constant over the reporting period. Forest managers use these methods in harvested areas where planting and seeding methods are not needed to achieve reforestation objectives.

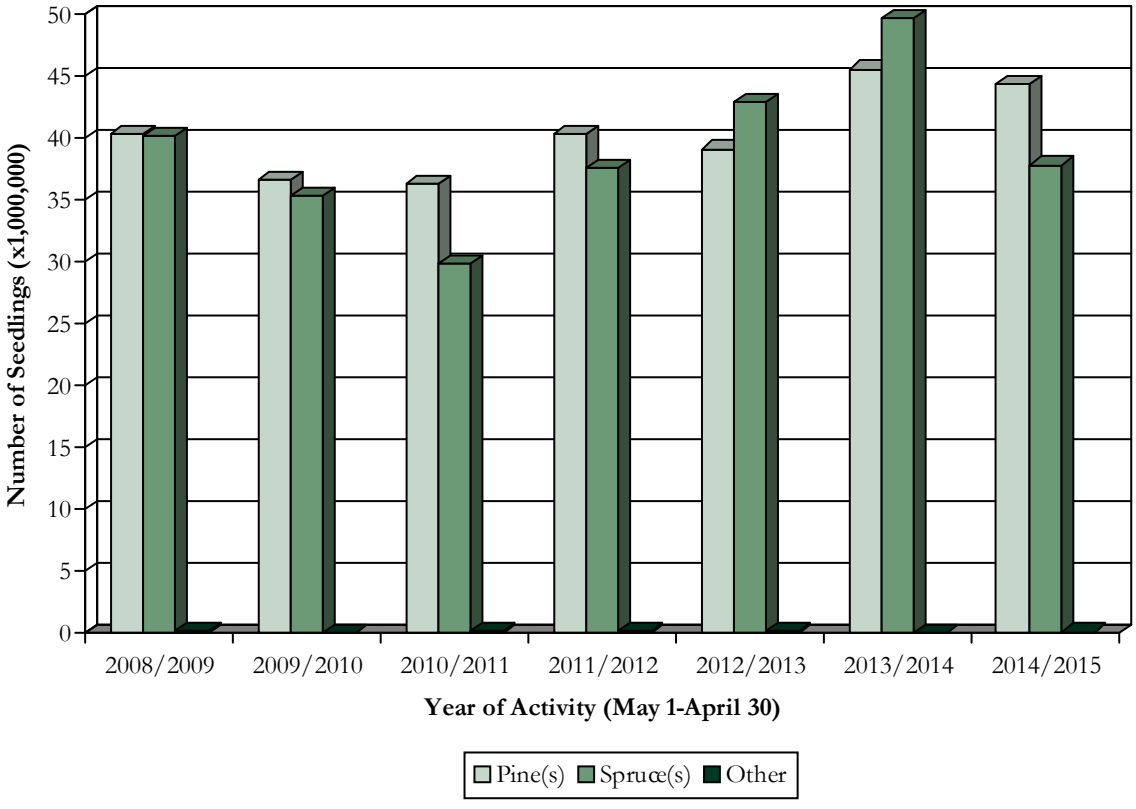
As shown in Table 4 and Figure 10, coniferous trees, mostly pine and spruce, were the predominant types of trees planted in Alberta from 2008 to 2015. Forest managers planted relatively small amounts of other coniferous trees and some deciduous trees in Alberta.

Table 4. Number of seedlings planted in harvested areas on Alberta public land by tree species group, 2008-2015

Year (May 1–April 30)	Pine(s)[1]	Spruce(s)[2]	Other[3]	Provincial Total
2008/2009	40,243,445	40,067,618	207,872	**80,518,935**
2009/2010	36,562,368	35,266,396	100,965	**71,929,729**
2010/2011	36,285,980	29,874,878	237,904	**66,398,762**
2011/2012	40,334,304	37,501,468	225,230	**78,061,002**
2012/2013	39,084,549	42,849,870[r]	190,518[r]	**82,124,937**
2013/2014	45,505,640	49,557,737	103,300	**95,166,677**[r]
2014/2015	44,361,006[p]	37,780,503[p]	155,062[p]	**82,296,571**[p]

[1]Pine(s) includes all pine species; [2]Spruce(s) includes all spruce species; [3]Other includes all other minor species including true firs, Douglas fir, tamarack larch, white birch, balsam poplar and trembling aspen. [r]=Revised results; [p]=Preliminary results

Figure 10. Seedlings planted in harvested areas of Alberta public land, 2008-2015



Future Outlook

Prompt reforestation following harvesting is a key factor to ensure the sustainability of Alberta's forests. Planting (Figure 11) is likely to continue being the primary means of reforesting coniferous dominated sites. However, it is likely that forest managers will use LFN reforestation methods for an increasing proportion of lodgepole pine harvested areas. Forest managers will continue to plant substantially less deciduous trees than coniferous trees, as natural reforestation processes in deciduous and/or mixed forests typically result in prompt and well-reforested areas.

Figure 11. A planted spruce tree