Chapter 2: Report of Past Operations

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2. REPORT OF PAST OPERATIONS

2.1. Report of Past Operations Summary

This Report of Past Operations is part of the background information assembled in the preparation of the Forest Management Plan. This summary of previous forest management activities in Forest Management Licence #3, includes natural disturbances, road construction, water crossings, access management, harvest areas, harvest volumes, renewal activities, road decommissioning, research and monitoring. These previous activities include softwood Quota Holders, such as Spruce Products Ltd., hardwood Quota Holders, and Louisiana-Pacific Canada Ltd. hardwood operations.

This Report of Past Operations acts as a point of reference from the year 2006, which was the submission of the previous Forest Management Plan for Forest Management Licence #3 (FML #3). Annual Reports for FML #3 from 2006 to present are the main source of information for this chapter. Other sources of fibre outside of FML #3 are not covered in this report, including Crown wood that was harvested on Forest Management Units 12 and 14 (Porcupine Mountain Provincial Forest) under the authority of the Mountain Quota Holder Forest Management Plan for that area.

Natural disturbances, such as forest fires, insects, and disease, have not significantly affected FML #3 since 2006. However, in June of 2012, a significant wind event caused the blowdown of approximately 14,300 ha of forest on the north end of the Duck Mountains. Beaver flooding continued to have a significant effect on the landscape but is not mapped or quantified.

Over a ten-year average, 20% of forest roads utilized were comprised of newly constructed roads, while the remaining 80% of roads were pre-existing access. All new forest roads were decommissioned, but existing access was maintained. Access management of roads was a continued focus. Water crossing structures were prescribed on a site-specific basis and risk-ranking.

The area harvested by Quota Holders (softwood and hardwood) and Louisiana-Pacific Canada Ltd. was below average, mostly due to the 2007-2009 recession. Likewise, harvest volumes were below average, contributing to an undercut of both hardwood and softwood, from 2006 to present.

All harvest areas were regenerated either through natural regeneration (vigorous hardwood root suckering) or by the planting of conifer seedlings. Tree planting of conifer seedlings averaged 1.1 million seedlings per year. Areas that were difficult to access for tree planting used a helicopter to transport both seedlings and tree planters. The practice of caching seedlings under a pile of snow has been discontinued in favour of the helicopter.

Through various research and conservation partnerships, ecological, social and economic elements of Sustainable Forest Management have been advanced. Ducks Unlimited Canada provided significant knowledge about the distribution and characteristics of boreal wetlands and waterfowl, forest roads and wetland crossings, and the significance of carbon storage in wetlands.

2.2. Natural Disturbances

Natural disturbances that occurred within the Forest Management Licence # 3 area include fire, blow down, insects, diseases, and beaver flooding.

2.2.1. Fire Summary

One of the most common natural disturbance agents in Manitoba was forest fire. In the period from 2006 to 2019, there have been few fires (Table 2.1). Some years have fires, some years have no fires. There have not been any recent catastrophic large fires (*e.g.* 50,000 ha or greater).

Table 2.1 Fire history in Forest Management Licence 3 from 2006 to 2019 (source: Province of Manitoba).

	Area (ha) by cover group							
Fire Year	**Hard wood**	**Soft wood**	**Mixed wood**	**Non Forest**	**Non Productive**	**Potentially Productive**	**TOTAL area (ha) burnt by Year**	**Percent of FML #3 burnt per year**
2006	24.5	39.3	51.0	175.4	16.0		**306.2**	0.003%
2007	178.4	29.9	15.5	2,382.9	8.1		**2,614.8**	0.025%
2008	151.8	6.1	34.6	2,375.6	0.8	157.6	**2,726.4**	0.027%
2009	239.0		7.9	20,063.8	13.6	7.6	**20,331.8**	0.198%
2010							**-**	0%
2011	118.5			6,754.4			**6,872.9**	0.067%
2012	420.5		19.9	5,142.0	81.1	89.9	**5,753.4**	0.056%
2013							**-**	0%
2014	23.4			37.1			**60.5**	0.001%
2015	1,387.4	9.9	4.8	996.4	176.6	11.7	**2,586.7**	0.025%
2016	107.3	0.3	23.8	2,434.2	26.7		**2,592.2**	0.025%
2017		12.8		0.3			**13.2**	0.000%
2018	100.5	3.9	9.4	206.1	3.8		**323.7**	0.003%
2019			0.2	0.1			**0.3**	0.000%
Cover Type totals	**2,650.7**	**85.5**	**157.5**	**40,361.9**	**322.7**	**266.8**	**43,858.3**	0.427%

The location of these infrequent and small fires are shown in Figure 2.1.

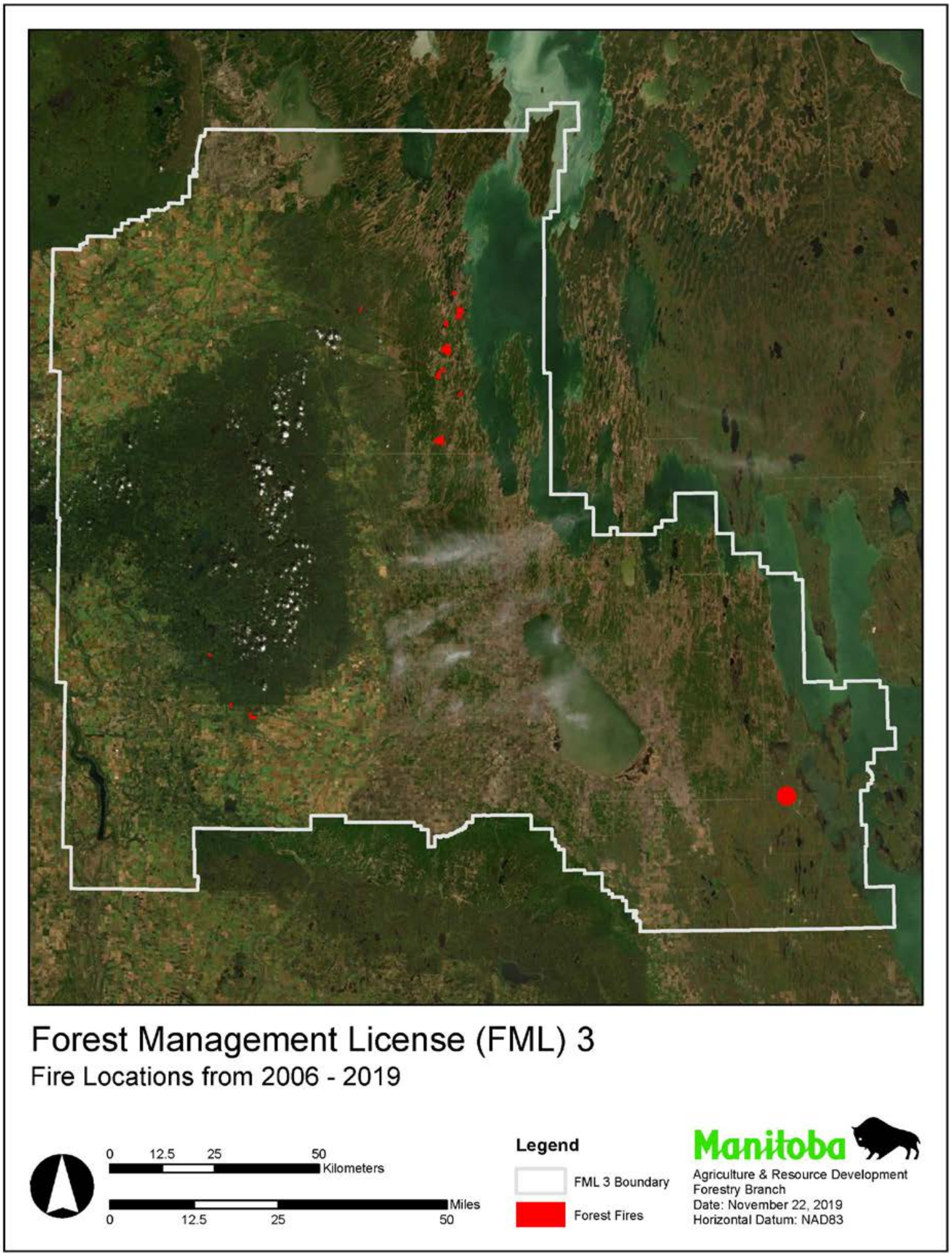

Figure 2.1 Forest Management Licence 3 fire locations from 2006 to 2019 (Province of Manitoba).

2.2.2. Blowdown

In June 2012 a windstorm occurred in the northern portion of the Duck Mountain area (Figure 2.2). Large areas of forest were affected, and aerial photography was captured in fall 2012. Delineation of the affected areas began at the end of 2012 and into 2013. While the degree of impact varies from minor to severe, within FMU 11 approximately 6,000 hectares were affected and in FMU 13 approximately 8,300 hectares were blown down.

Smaller windstorms have occurred in the licence area since 2002 but have not been mapped.

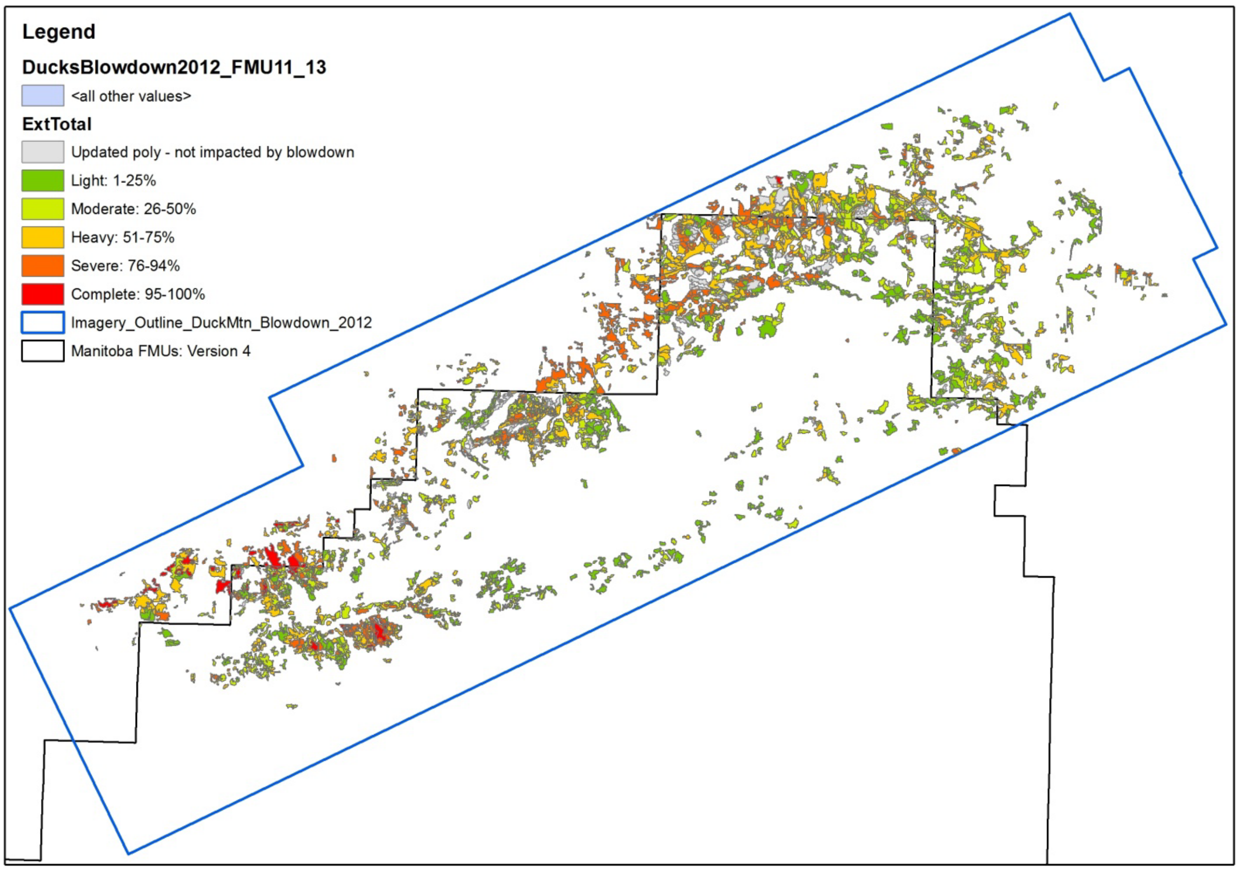

Figure 2.2 **Northern portion of Duck Mountain Provincial Forest, illustrating severity of impact of the June 2012 blowdown event (Sustainable Development).**

2.2.3. *Insects Summary*

Forest insects are a natural part of boreal ecosystems in endemic or low levels. Typically, these low insect levels only defoliate a portion of a tree, and do not cause mortality in whole stands of trees. However, epidemic or extreme levels of forest insects cause noticeable damage to single trees and stands of trees.

Forest insect monitoring, mapping, and control is a provincial responsibility of the Manitoba government. The Province mapped the defoliation or death of trees and stands of trees, rather than the forest insects directly. The Province maps the stands in which defoliation and or tree death is related to significant insect infestations.

Annual aerial monitoring for major forest insects is performed by the Province of Manitoba. Aerial surveys are flown 27 km apart, on north-south transects (Figure 2.3). Major forest insect damage mapped in FML #3 included: spruce budworm (*Choristoneura fumiferana*); jack pine budworm (*Choristoneura pinus*); and forest tent caterpillar (*Malacosoma disstria*). There was significant mortality of larch trees, which triggered additional monitoring for eastern larch beetle (*Dendroctonus simplex*) from 2010-2014. Many mixed conifer stands of black spruce and larch are now mostly black spruce, due to mortality from the eastern larch beetle.

Spruce budworm population levels remained low to moderate, until a recent outbreak in the south-western part of the Duck Mountain. Planners and the provincial government are modifying harvest plans to attempt to minimize the white spruce mortality that spruce budworm can cause.

Jack pine budworm levels in the Western Region were negligible. Small pockets of jack pine budworm were evident on the northwest and northeast fringes of the Duck Mountain Provincial Forest.

Forest tent caterpillar increased in population in 2013, peaking in localized areas across FML #3 in 2016. Some areas of FML #3 have seen moderate to severe levels of defoliation by this native insect. This defoliation has continued over FML #3 until 2016 but is expected to decline.

Other insects exist in the forest, such as Poplar borer (*Saperda calcarata)*; root collar weevils, and various shoot weevils. However, none of these insects caused severe damage to large areas of forest. None of these insects caused enough damage to be able to map their effect on the forest.

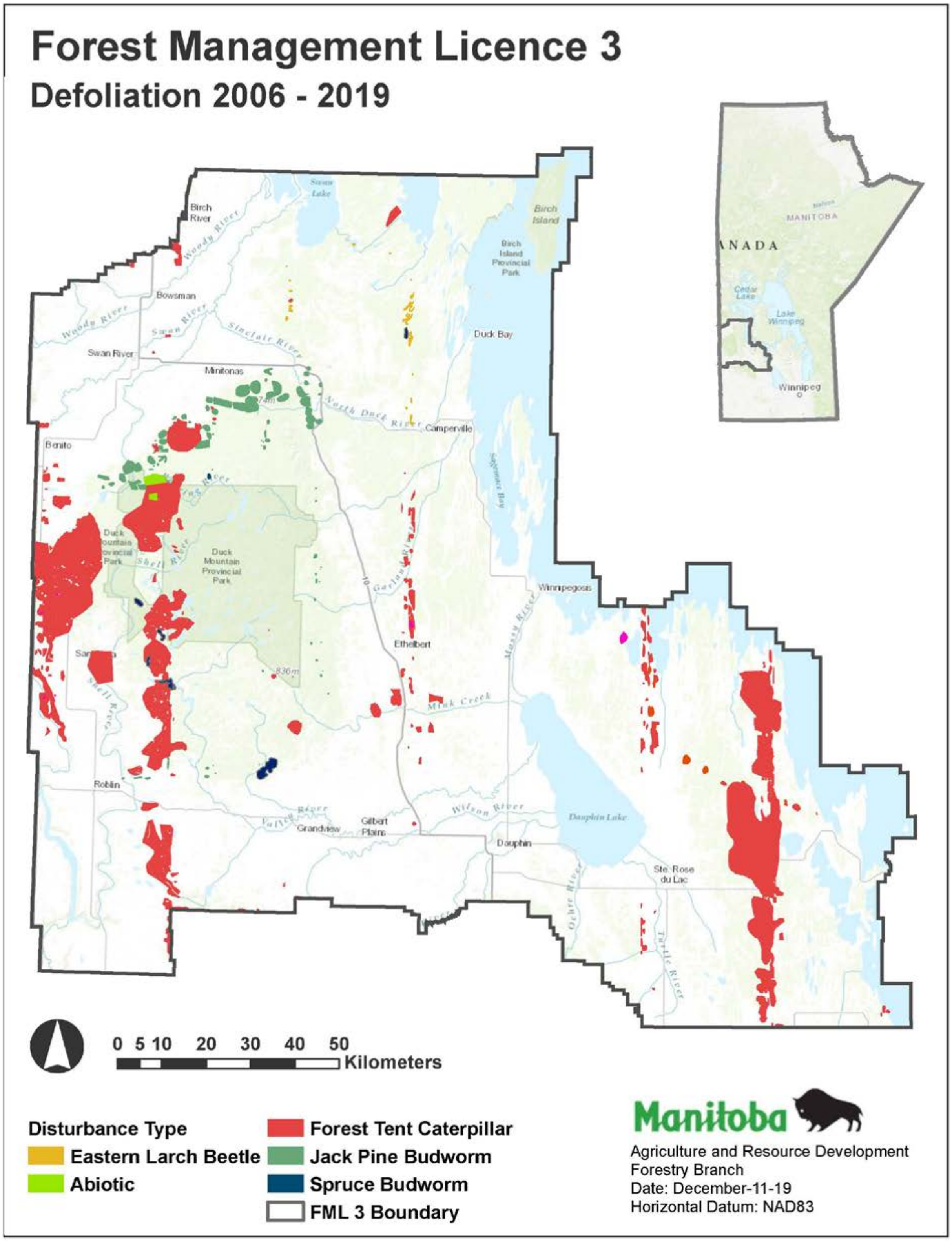

Figure 2.3 2006 to 2019 insect defoliation mapping in FML #3 (Province of Manitoba).

2.2.4. Disease Summary

Similar to forest insects, if forest diseases are at a low level, only individual trees are affected or die within stands of many trees. During the 2006 to 2019 period in FML #3, forest diseases did not cause widespread stand mortality, and were not mapped by the provincial government.

There are many different diseases in the forest. The more prevalent and common forest diseases in FML #3 include:

- Red ring rot or white pocket rot (*Phellinus pini);*
- Yellow Stringy Rot (*Perenniporea subacida*);
- Aspen trunk rot (*Phellinus tremulae*) evidenced by conks on older aspen. Aspen trunk rot was very common and widespread across FML #3;
- Hypoxylon Canker (*Hypoxylon mammatum*) kills individual aspen trees, and was also widespread;
- Armillaria root rots (*Armillaria ostoyae, Armillaria calvescens, and Armillaria sinapina);*
- Eastern dwarf mistletoe (*Arceuthobium pusillum*) and Jack pine dwarf mistletoe (*Arceuthobium americanum*); and
- Western Gall Rust (*Endocronartium harknessii*) in the center of the Duck Mountain.

2.2.5. Beaver Flooding

Beavers (*Castor canadensis*) have both positive and negative effects on boreal ecosystems. The active beaver feeding zone along waterways kills aspen for food but releases white spruce from competition. Beaver dams flood parts of the forest, changing the landscape and creating habitat that can be used by fish, waterfowl, shorebirds and amphibians (Kavanagh 2006). Negative effects include flooding upland forest, blocking streams, and contributing to excessive water run-off when dams break.

2.3. Road Construction, Access Management, and Decommissioning

Road construction can have a significant effect on the forest landscape. Measures were put into place to reduce new road construction by utilizing active or pre-existing roads and trails wherever possible. While existing or traditional access routes have remained open, newly built roads were managed and closed through slash roll-back, berms, and/or gates. In cases where an existing road was upgraded for the purposes of harvesting operations, the road was closed after use and returned to its original access condition.

2.3.1. Road Location

Road locations are shown on the map (Figure 2.4). Forestry roads were located to connect to the existing road network. The agriculture area has a grid road network on a one mile by two-mile grid. Less forestry roads needed to be located in the agricultural area, due to ample existing road access. In the Duck Mountain Provincial Forest, existing roads (*e.g*. highways #366 and #367, Sarah Lake Road) were utilized. Temporary forest access roads were located that connect to the pre-existing road network.

Several criteria were taken into consideration when forest roads location are designed:

- topography
- location and types of watercourses and wetlands,
- proximity to lakes and unique features,
- critical wildlife habitat locations,
- location of existing roads and trails
- cultural features or other protected areas
- number of cut blocks to be accessed
- season of use
- other users

Once a road location was planned, the road right-of-way was ground checked to ensure that the proposed road location would not conflict with any of the criteria.

Forest access roads were constructed on stable soil types. Roads were also located away from major waterbodies and watercourses, where possible, to minimize potential effects on aquatic habitats. Forest areas known to support unique or critical habitats were avoided, as were any sensitive cultural heritage sites. To minimize forest disturbance, the number of cut and fill operations were minimized. Roads were constructed on natural benches, moderate slopes and ridges, wherever possible.

When constructed, forest road ditches were directed into the adjacent forest vegetation, in order to minimize the potential for sediment to be transported directly into any watercourse. The forest vegetation filtered sediment carried by surface runoff. Exposed soil material in road ditches was stabilized using surface roughening techniques and seeding. All debris accumulated through road clearing and construction operations was stored away from any watercourse or waterbody to prevent this material from potentially entering these areas.

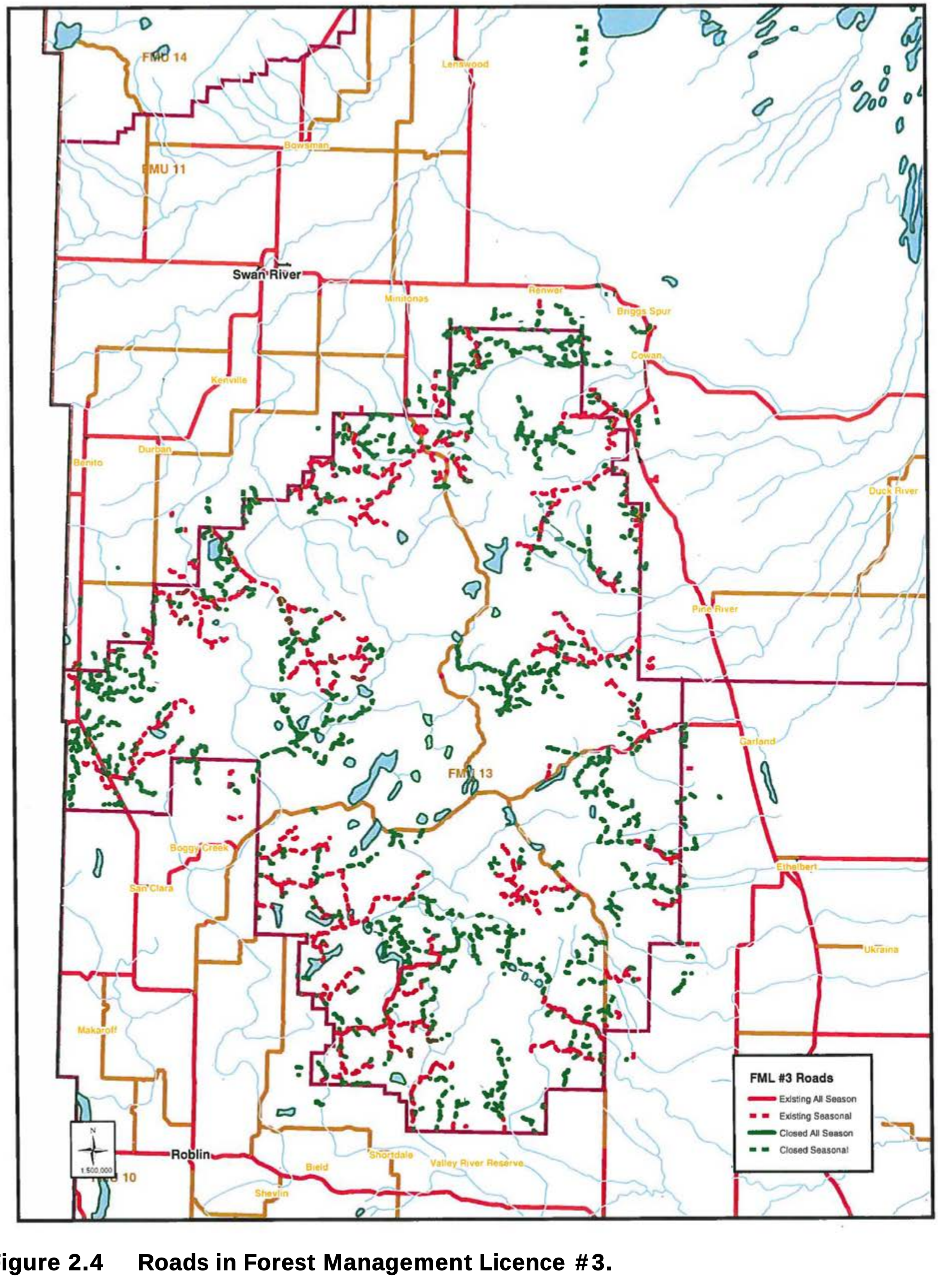

Figure 2.4 Roads in Forest Management Licence #3.

2.3.2. Road Construction Description

The following road definitions were used in FML #3 for season of road use:

All-Season – an all-weather road. Roads in this group require precut rights-of-way before roads are constructed. These roads may include ditching and graveling.

Dry/Frozen – clay base road, sections of dry/frozen roads may need ditching and graveling. Traffic ceases on these roads after a significant rainfall and must wait for the road to dry out. Low grade roads with some grade work and ditching where necessary and may include gravel.

Frozen – winter only roads across wet areas (can only operate when road was frozen). Little to no development occurs with frozen roads.

2.3.2.1. *Right of Way Clearing*

The width of road Right-of-Ways (ROWs) were determined by road construction and maintenance needs and by site specific environmental considerations. The following factors influenced ROW clearing widths:

- Visual screening for wildlife and aesthetics.
- Need for road grade drying.
- Unstable and difficult terrain for construction.
- Safety concerns.

The organic horizon and herbaceous vegetation was maintained on the approaches adjacent to the watercourse crossings, where possible. Top soil was piled apart from logging debris and used for road and landing reclamation, where feasible.

Road construction was avoided within 100 m of the high-water mark of any permanent stream, and 30 m of an intermittent stream or natural spring. In situations where construction could not be avoided, careful planning was used to minimize the potential for erosion and sedimentation. Associated road construction activities such as borrow pits, landings, camp and storage sites in buffer zones were minimized.

2.3.2.2. *Road Construction*

Road back slopes had a regular profile from the top of the cut to the bottom of the ditch with no hanging banks or sharp cut ditches. Ditches were constructed to the same grade as the road and be sufficiently deep to drain the subgrade unless limited by topography.

The number of borrow pits and gravel pits developed for road construction and maintenance were kept to a minimum. The use of existing gravel pits was a priority. All gravel pits required the appropriate permits from the Province of Manitoba. Gravel pits were not located near groundwater source areas.

Run-off ditches and other erosion control devices were installed during road construction and were maintained to:

- Minimize water movement and erosion along ditches, on the road surface and on cut-and-fill slopes.
- drainage was provided as required, for water from springs or seepage areas.
- ditch drainage into directly into watercourses was avoided, instead water was directed from the Right-of-Way into the surrounding vegetation in as short a distance as possible.

Final erosion control measures were installed after road construction. These measures included re-vegetation, seeding, establishment of silt fence, and removal of unstable fill material. Site disturbance was minimized during road construction to reduce the extent of reclamation required during road abandonment.

2.3.2.3. *Road Useage*

Typically, wood was hauled out of the cutblock on an in-block road, then hauled on a short bush road (either an upgraded existing road or a new road) to the existing road network. The harvesting of both hardwoods and softwoods were done simultaneously to enhance road utilization. The roads were used to haul both softwood and hardwood at the same time, which resulted in a shorter haul period and allowed for quicker road decommissioning.

A summary of road construction by road class is outlined in Table 2.2 and Figure 2.6. It should be noted that the majority of newly constructed roads were closed on an annual basis, following completion of harvest and renewal operations. As a result, the total road lengths include roads that have now been closed – therefore the information is on the amount of construction that occurred, rather than the extent of the currently existing road network.

Figure 2.5 In-block road construction.

Table 2.2 Annual road construction.

	EXISTING ROADS				NEW ROADS				
Year	**All Season**	**Dry Frozen**	**Frozen**	**Sub total**	**All Season**	**Dry Frozen**	**Frozen**	**Sub total**	**GRAND TOTAL (km)**
2006-2007	17.7	128.9	42.3	**188.9**	0.0	76.3	56.9	**133.2**	**322.1**
2007-2008	141.0	39.9	47.8	**228.7**	20.1	7.1	29.9	**57.1**	**285.8**
2008-2009	83.9	14.9	31.7	**130.5**	9.5	7.5	14.6	**31.6**	**162.1**
2009-2010	62.5	24.2	12.0	**98.7**	6.1	4.1	7.1	**17.3**	**116.0**
2010-2011	106.4	34.1	14.0	**154.5**	3.4	18.0	10.1	**31.5**	**186.0**
2011-2012	93.8	26.0	18.0	**137.8**	2.2	7.2	6.0	**15.4**	**153.2**
2012-2013	71.6	34.5	25.8	**131.9**	2.5	15.3	5.3	**23.1**	**155.0**
2013-2014	65.5	61.3	16.8	**143.6**	0.0	22.8	2.5	**25.3**	**168.9**
2014-2015	60.7	62.3	32.5	**155.5**	0.8	24.7	10.8	**36.3**	**191.8**
2015-2016	56.4	58.9	15.9	**131.2**	0.0	10.8	11.2	**22.0**	**153.2**
2016-2017	46.5	68.2	16.3	**131.0**	0.0	13.7	7.2	**20.9**	**151.9**
2017-2018	41.6	97.1	37.9	**176.6**	0.0	20.5	10.7	**31.2**	**207.8**
2018-2019	**56.4**	**64.8**	**45.8**	**167.0**	**0.0**	**10.5**	**16.1**	**26.6**	**193.6**
Totals	**904.0**	**715.1**	**356.8**	**1,975.9**	**44.6**	**238.5**	**188.4**	**471.5**	**2,447.4**
			Existing roads	**81%**			New roads	**19%**	

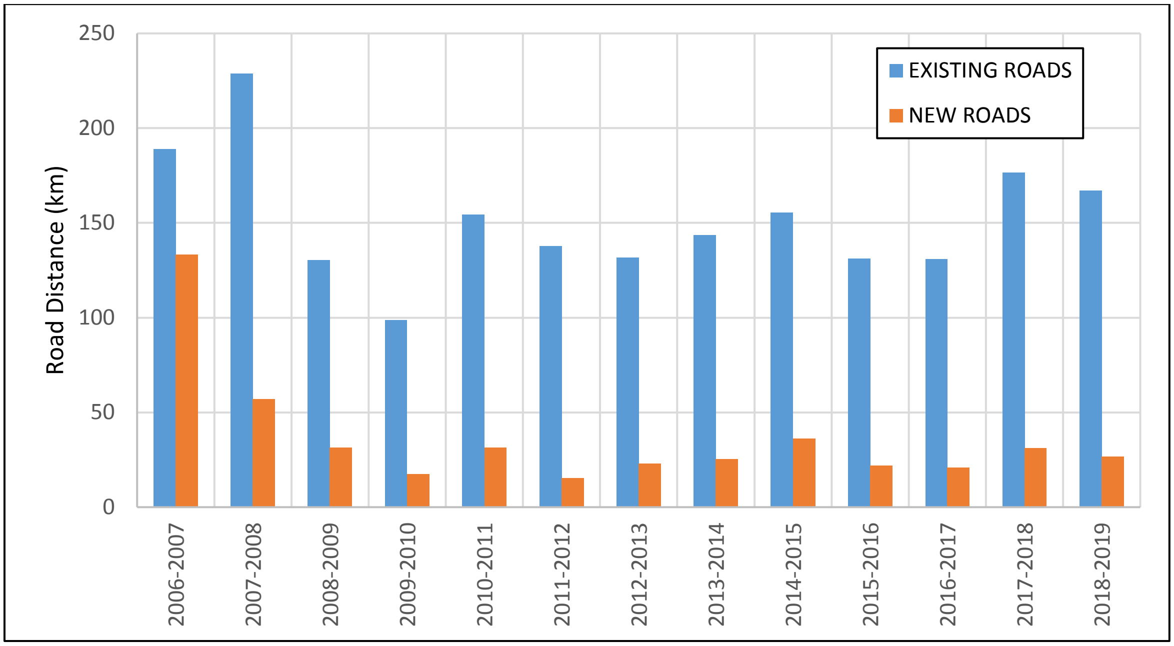

Figure 2.6 Existing road usage and new road construction in FML #3.

In cases where follow-up silviculture activities were prescribed, a temporary road closure was constructed until the scarification equipment and planting contractors had completed their work. These areas were promptly closed following the completion of silvicultural activities. Temporary closures were also used in areas if harvested wood was decked at the landing in tree lengths, until slashed and hauled following road restriction periods.

2.3.3. Road Status

The road status of existing all weather and seasonal access forestry roads are referred to as existing when they are open (solid or dashed black lines on map - Appendix 1). The majority of roads used to haul wood are existing roads. The minority of roads used to haul wood are new roads.

Roads that were decommissioned are considered closed. Closed roads are depicted by a green line on the map (Appendix 1). The majority of roads closed and decommissioned were seasonal roads, and a small percentage of closed roads were all-weather roads.

2.3.4. Access Management

Ungulate populations (moose, elk, and deer) are sensitive to increased hunting pressure that typically follows unmanaged road access. To protect ungulate populations, logging road access was managed by using a variety of methods (Figure 2.7) including:

- temporary road closures, such as dirt berms
- long-term road closures, such as removal of a culvert or bridge
- road decommissioning
- roll-back of slash and organic matter back onto the road
- gates
- combinations of the above-listed techniques

Figure 2.7 Access management examples including road closures or crossing removals.

2.3.5. *Road Reclamation and Decommissioning*

Most forest roads were short-term and were decommissioned after harvest (Figure 2.8). New roads were closed when harvest and renewal activities were complete (Table 2.3). Existing access was returned to its' previous use (*e.g.* an ATV trail would be restored to ATV access only).

Figure 2.8 Road decommissioning being carried out in a harvest block (left); decommissioned road (right).

Table 2.3 Road decommissioning metrics in FML #3.

	Temporary Road Closures					Decommissioned Roads					
Year	**All Season**	**Dry Frozen**	**Frozen**	**in block**	**subtotal**	**All Season**	**Dry Frozen**	**Frozen**	**in block**	**subtotal**	**GRAND TOTAL (km)**
2017-2018	0.0	2.7	0.0	0.0	**2.7**	0.0	21.4	0.0	105.8	**127.2**	**129.9**
2018-2019	0.0	67.5	55.9	16.9	**140.3**	0.0	1.5	5.9	93.0	**100.4**	**240.7**
Totals	**0.0**	**70.2**	**55.9**	**16.9**	**143.0**	**0.0**	**22.9**	**5.9**		**227.6**	**370.6**
			Annual average (km)		*71.5*					*113.8*	*185.3*

Note that road decommissioning tracking didn't begin until 2017-2018

2.3.6. Road Decommissioning Success

Upon closure and decommissioning of roads, areas are returned as close to their original state as possible, and included:

- Removal of watercourse and drainage structures;
- Re-contouring to an acceptable land form;
- Cross-ditching to disperse runoff and suspended sediments into vegetated areas;
- Rollback of retained clearing debris and stripped topsoil;
- Re-vegetation or reforestation or both; and
- Following winter operations, windrowed grader banks of snow may be pushed back at identified locations to prevent spring runoff from forming channels/gullies in roadbed.

Roads that met the above-listed guidelines were considered successfully decommissioned.