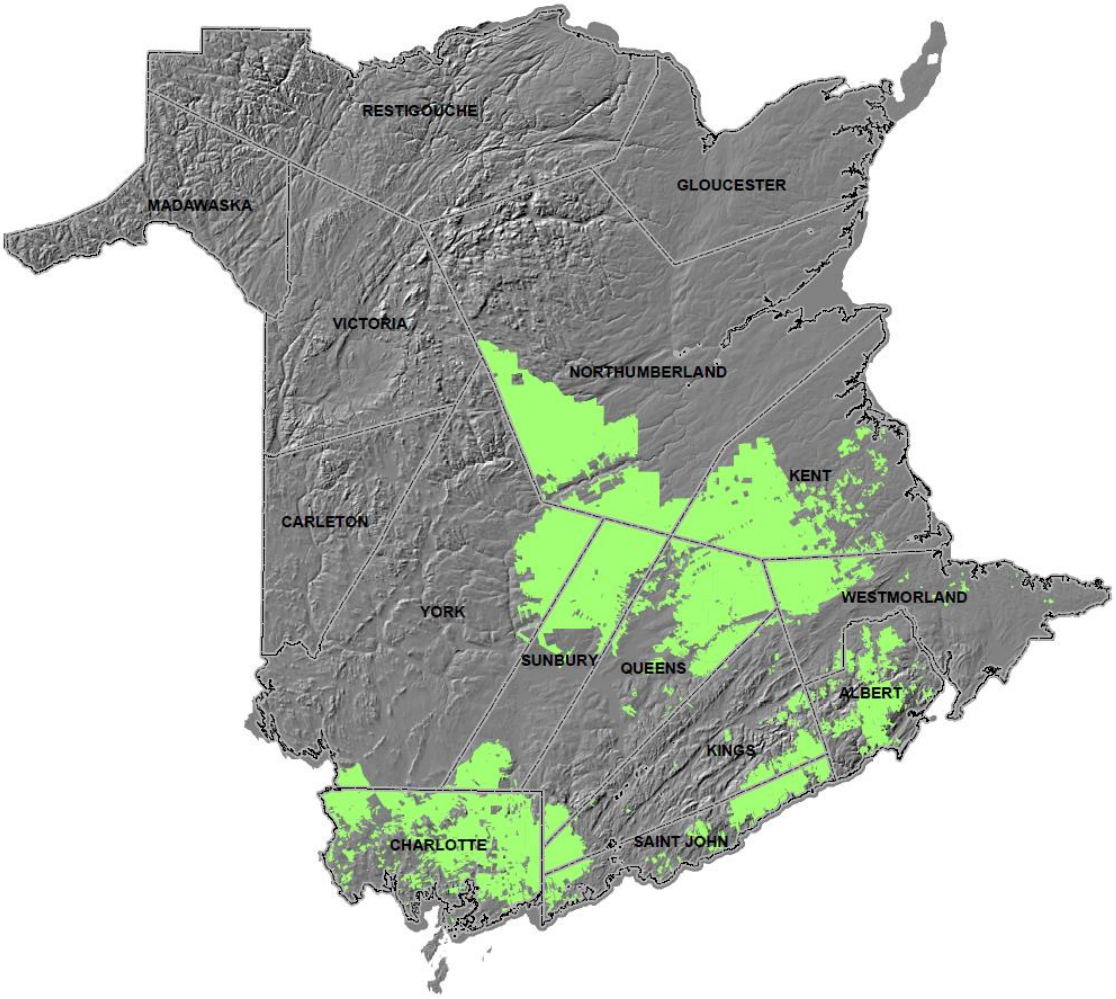
Forest Management Plan
Crown License 6/7
2022-2046



Submitted May 7th, 2024. V-2.0

Prepared and submitted by J. D. Irving, Limited on May 7th, 2024, to the New Brunswick Department of Natural Resources as required under the New Brunswick Crown Lands and Forest Act.

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EXECUTIVE SUMMARY

This document outlines the key elements of the 2022-2046 forest management plan for New Brunswick Crown timber licenses #6 and #7, collectively known as License 7 or the Queens-Charlotte-Fundy License. The key outputs from this management plan are summarized in Table i.

Table i. Summary of annual allowable cut (m^3 and hectares/year) and silviculture treatment (hectares/year) by zone and species group for the Queens-Charlotte-Fundy Crown License.

Management Activity	**2022-2026**	**2027-2031**
Total Harvest Volume (m^3/year)		
Spruce-fir & jack pine	1,268,000	1,700,000
White Pine	88,000	88,000
Hardwood	457,000	400,000
Total m^3/year	1,813,000	2,188,000
Harvest Area (Hectares/year)		
General Forest	10,640	13,750
Conservation Forest	3,000	3,500
Total Hectares/year	13,640	17,250
Silviculture (Hectares/year)		
Planting	4,500	6,000
Pre-Commercial Thinning	500	500
Total Hectares/year	5,000	6,500

The Annual Allowable Cut (AAC) levels are calculated based on the net merchantable volume from product definitions (bolts) and associated utilization assumptions as outlined in Appendix I. The AAC is expected to align with Schedule F allocations and JDI's NB Industrial Plan.

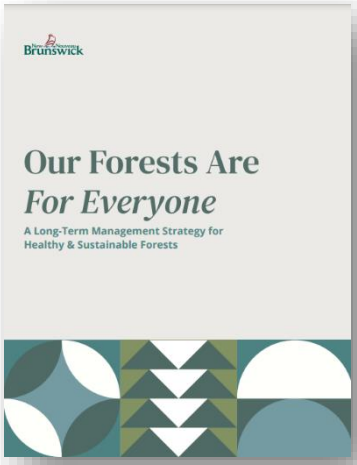
INTRODUCTION

This document outlines the key elements of the 2022-2046 forest management plan for New Brunswick Crown timber Licenses #6 and #7, collectively known as License 7. While achieving the Department of Natural Resources and Energy Development's (DNRED) objectives and requirements, this forest management strategy for License 7 is ecologically sustainable, economically viable and socially responsible.

This is a pivotal management plan for Crown License 7 given J.D. Irving, Limited's (JDI) significant industrial plan objectives, investments, and benefits to New Brunswick's forest sector and economy as outlined to DNR in JDI's Industrial Plan. Specifically:

- The 2022 forest management for Crown License 7 can be characterized as a realization of the vision and strategy set forth for New Brunswick's Crown Lands 40 years ago at the outset of the Crown Lands and Forests Act of 1982.
- This plan successfully accomplishes the goals of improving the value of the Crown Land asset, growing a sustainable wood supply, and increasing lands set aside for conservation.
- An important challenge, outlined in this plan, is the management of silviculture investments made over the last 40 years that have now reached maturity and are showing signs of decline (rot and pest damage), in addition to accessing natural forest harvesting to provide a balanced supply of saw timber products outlined in JDI's Industrial Plan.
- Managing the decline of older previously treated areas on License 7 to mitigate loss of volume and value and ensuring they are properly reforested through silviculture will be crucial over the next 10-15 years.
- This plan leverages the use of silviculture treatments that promote well adapted species as well as active forest management in the natural forest to achieve a resilient, healthy forest that is well positioned for climate change and risk mitigation from wildfires and pest threats.

FOREST MANAGEMENT STRATEGY



In August 2023, DNRED released the 2022 Forestry Strategy for Crown Lands, "Our Forests are for Everyone" (Figure 1). This forest management plan submission reports the elements required for implementation of DNRED's Forestry Strategy on crown License 7, as outlined in the Crown Lands and Forests Act.

Figure 1. New Brunswick's long-term strategy for a healthy and sustainable forest.

All assumptions, data, and results in this plan have been produced by DNRED, except for the following Licensee inputs:

- ❑ Product assumptions (based on actuals)
- ❑ 10-yr harvest treatment schedule (based on forest condition and best practices)
- ❑ White Pine strategy (based on licensee analysis)

FOREST DESCRIPTION

License 7 covers approximately 1,060,300 hectares which are located within ten New Brunswick counties: Northumberland, Kent, Westmorland, Albert, Saint John, Kings, Queens, Sunbury, York, and Charlotte (Figure 2).

The woodlands land base for Crown License 7 was characterized from the digital forest inventory cooperatively maintained by DNRED and JD Irving, Limited. Area and volume summaries by land class and forest type are provided in Tables 1-3 and Figures 3-5.

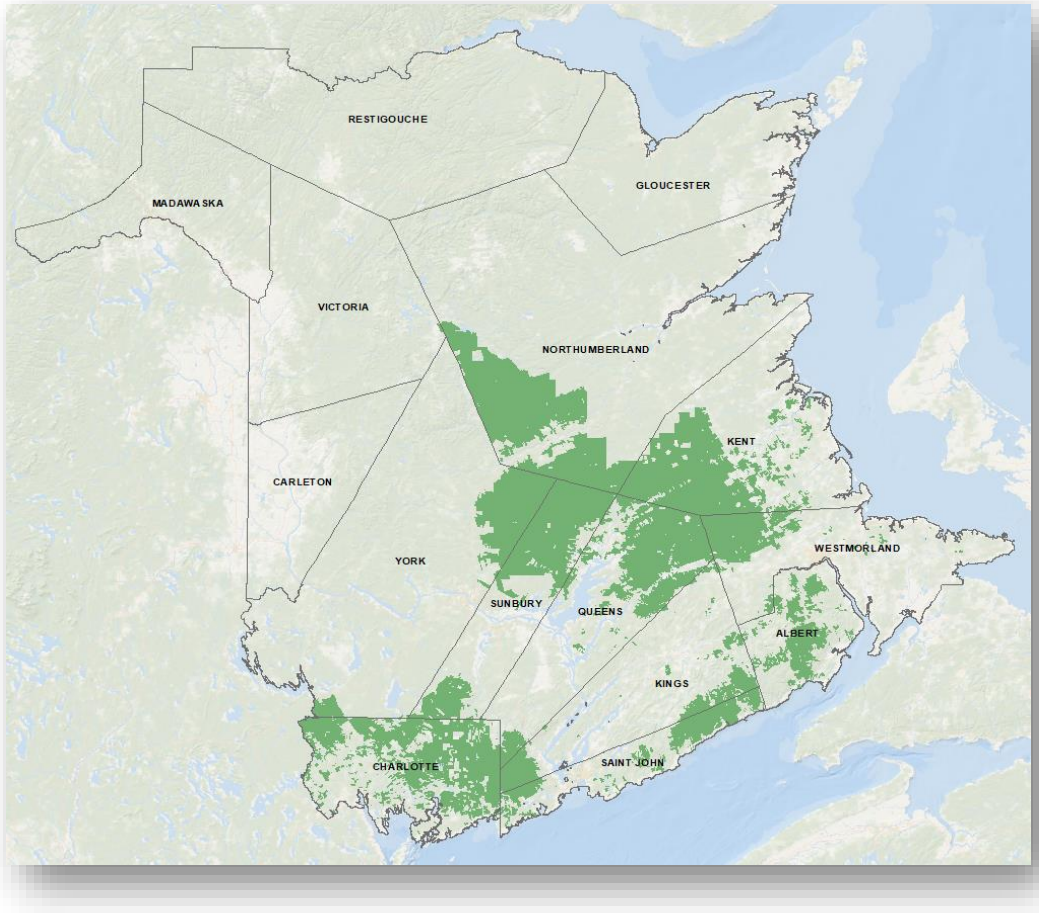


Figure 2: Location of Crown License 7 in central and southern New Brunswick.

Table 1. Crown License 7 area by forest land classification.

Land Class	Hectares	Distribution
Forested	951,027	89.6%
Wetlands	81,100	7.7%
Water	10,500	1.0%
Roads	12,800	1.2%
Utilities	3,200	0.3%
Other	1,673	0.3%
Totals	**1,060,300**	**100.0%**

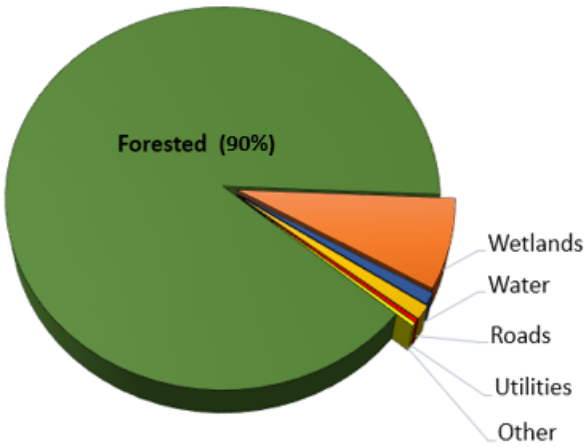


Figure 3. Total area distribution by land class for NB Crown License 7.

Table 2. Crown License 7 productive forest area by stand type.

Forest Stand Type	Hectares	Distribution
Mature Stands	363,221	38.2%
Immature Stands	141,342	14.9%
Natural Regen	130,523	13.7%
Planted Stands	166,084	17.5%
Thinned Regen	149,856	15.8%
Totals	**951,027**	**100.0%**

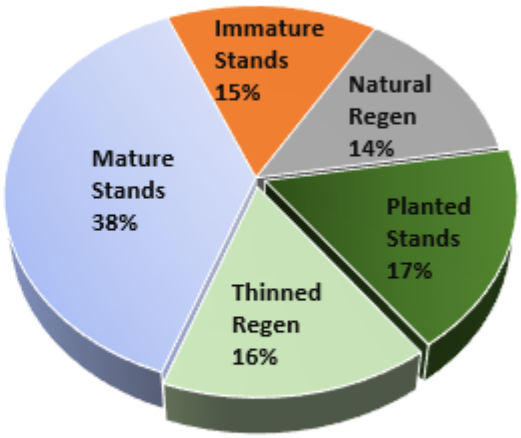


Figure 4. Productive forest by broad stand type for NB Crown License 7.

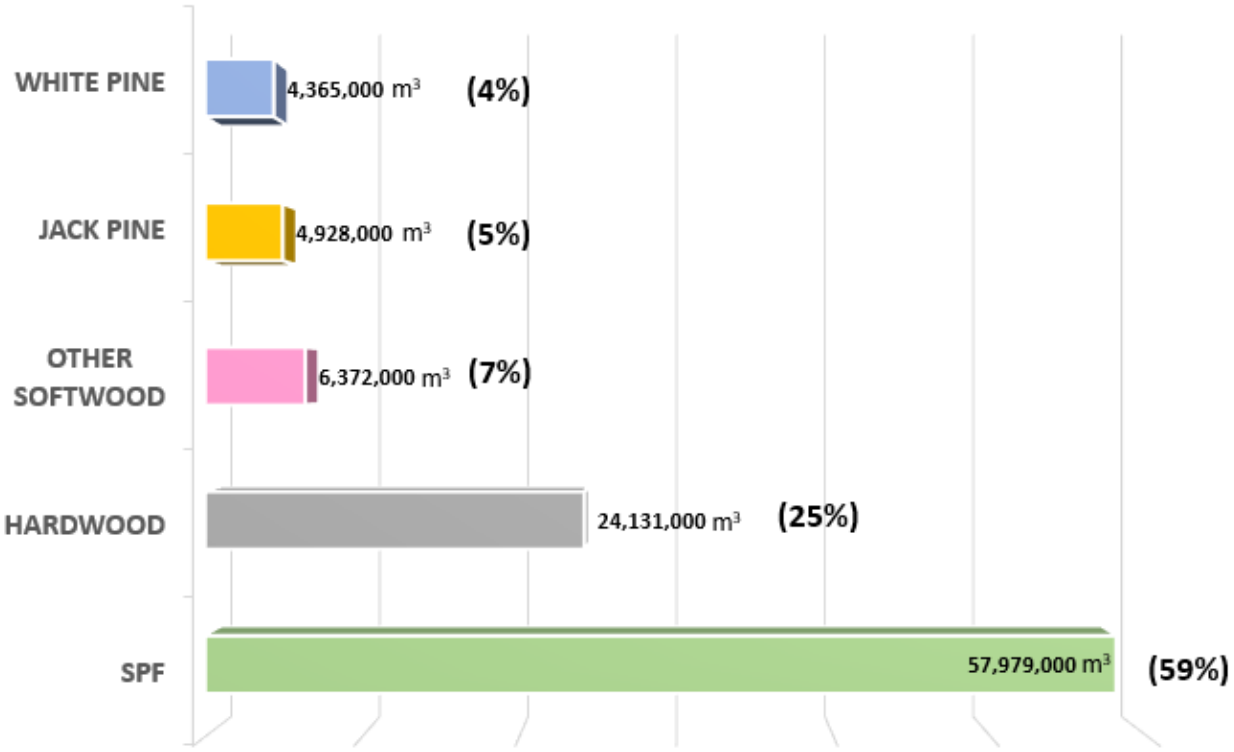


Figure 5: Net merchantable inventory (m3) by species group for Crown License 7 in 2022.

Table 3: License 7 net merchantable inventory by species group over time.

Species Group	2022	2032	2042	2052	2062	2072	2082	2092	2102
Spruce/Fir	57,979,000	60,618,000	62,922,000	65,114,000	66,538,000	67,369,000	67,454,000	66,937,000	66,107,000
Jack Pine	4,928,000	4,631,000	3,251,000	2,698,000	2,536,000	2,668,000	2,793,000	2,794,000	2,643,000
Hardwood	24,131,000	24,126,000	25,404,000	26,863,000	28,357,000	29,942,000	31,422,000	32,688,000	34,179,000
White Pine	4,365,000	4,708,000	5,173,000	5,937,000	6,619,000	7,493,000	8,554,000	10,055,000	11,783,000
Other SWD	6,372,000	6,193,000	6,206,000	6,476,000	6,790,000	7,253,000	7,753,000	8,187,000	8,532,000
Total (m^3)	**97,775,000**	**100,276,000**	**102,956,000**	**107,088,000**	**110,840,000**	**114,725,000**	**117,976,000**	**120,661,000**	**123,244,000**

Silviculture investments from the 1980's-1990's have reached maturity and are starting to decline (Figure 6). They will be prioritized for harvest in the next 10-15 years and will require replanting.

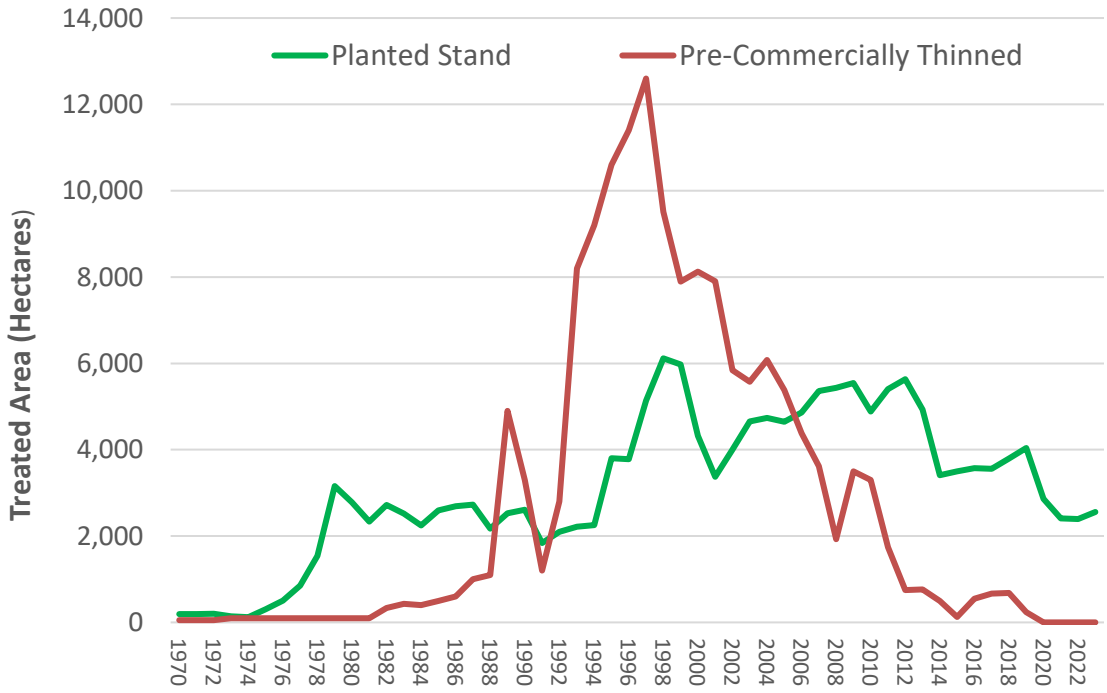


Figure 6: Plantations and pre-commercial thinning activities since 1970.

Balsam Fir dominant thinnings and older plantations (Black Spruce & Jack Pine) will make up most of our wood supply for the next 10-15 years and will require replanting. Planted White Spruce will make up much of our future wood supply in 25^+ years. A summary of the current managed stand landbase on the license is shown in Table 4.

Table 4. Managed stand summary, Crown License 7.

Planted Stand	Hectares	Distribution
Black Spruce	55,500	33%
White Spruce	46,800	28%
Norway Spruce	14,500	9%
Red Spruce	18,200	11%
Jack Pine	25,900	16%
White Pine	2,100	1%
Mix Species	2,800	2%
Planted Total	165,800	100%

Pre-Commercial Thin	Hectares
Thinned SPF	149,600

MANAGEMENT ZONES

A summary of productive forest area on License 7 by forest zone is provided in Table 5 and Figure 7. A more detailed breakdown of the conservation forest can be found in Table 6 and Figure 8.

Table 5. 2022-2026 productive forest area by forest zone.

Forest Zones	Hectares	% of Area
General Forest (70%):		
General Forest (including Operationally Constrained Forest)	664,220	70%
Conservation Forest (30%):		
Protected Natural Areas	83,134	9%
Nature Legacy Sites	94,751	10%
Riparian Buffers	85,050	9%
Other Conservation Forest *	23,872	3%
Total Productive Forest	**951,027**	**100%**

* Other conservation forest = Deer yards, Site Specific Wildlife Habitat, Unique Sites, Old Forest, Recreation sites, etc.

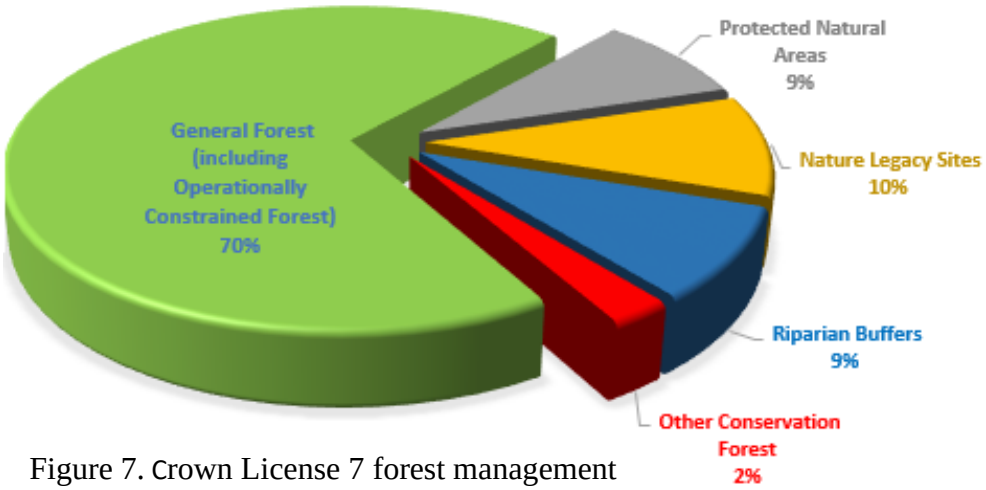


Figure 7. Crown License 7 forest management zones.

Table 6. 2022-2026 License 7 forest zones.

Forest Land Base Zones	Area (Ha)	
Overlapping		
Protected Natural Areas	83,134	
Nature Legacy Sites	94,751	
Riparian Buffers	120,719	
Deer Wintering Yards	46,454	
Site Specific Wildlife Habitat	21,119	
License Defined Unique Sites	1,658	
Old Forest Communities	71,160	
Old Forest Wildlife Habitat	70,314	
Cultural/Recreation Sites	2,592	
Operationally Constrained	32,148	
Non-Overlapping		
Mutually Exclusive Conservation Forest	286,807	(30%)
Working Forest + Operational Constrained	664,220	(70%)
Total Productive Area	951,027	
Total Non-Forest Area	109,273	
Total License 7 Area (Ha)	**1,060,300**	

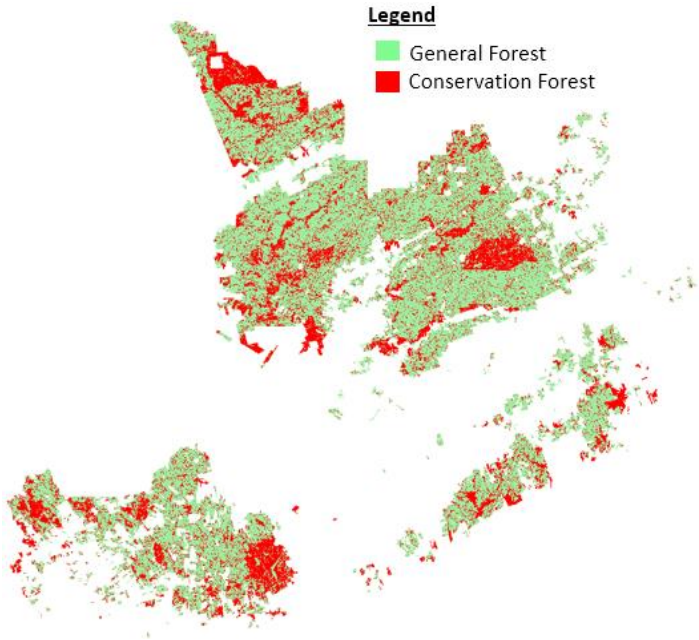


Figure 8. Map depicting the License 7 conservation forest shaded in red.

The 2022 forest management plan for Crown License 7 achieves a significant increase (30% increase) in the conservation forest landbase. In order to satisfy the Crown's goals to further increase conservation in the future while providing a balanced supply of saw timber products outlined in JDI's Industrial Plan, the Licensee has proposed enhancements to the conservation forest strategy for the 2027 management period that will increase conservation to 32% while supplying the wood supply and products required. This proposal is outlined in Appendix II.

RECREATION AND AESTHETICS

Situated near many rural and urban communities, Crown License 7 is home to a vast network of forest roads and recreational trails that are extensively utilized by the public (Table 7).

Table 7. Road network and other point of access.

Access Infrastructure	kilometers
Forest Roads	10,812
Managed ATV Trails	92
Managed Snowmobile Trails	323
Managed Non-Motorized Trails	54

In support of tourism investments made by the Federal and Provincial governments in the Fundy region, the Licensee proposes to maintain aesthetic buffers along highways in the Fundy region. Figure 9 shows the specific aesthetic buffers marked on the map. Buffers will be applied on the ground, based on forest stand conditions and aesthetic considerations.

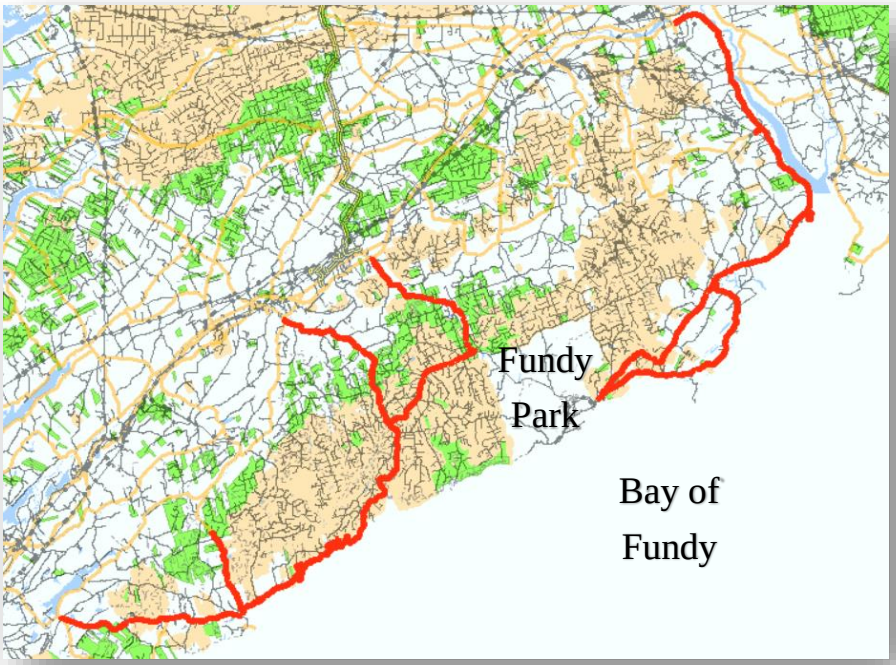


Figure 9. Southern New Brunswick, Fundy Bayshore region.

RESULTS AND STRATEGIC OUTCOMES

Annual Allowable Cut (AAC)

Long term sustainable harvest levels for License 7 for all major species groups are shown in Figure 10. A more detailed breakdown by forest zone for the next 10 years is provided in Table 8. These Annual Allowable Cut (AAC) levels are calculated based on the net merchantable volume from product definitions (bolts) and associated utilization assumptions as outlined in Appendix I. The AAC is expected to align with Schedule F allocations and JDI's NB Industrial Plan.

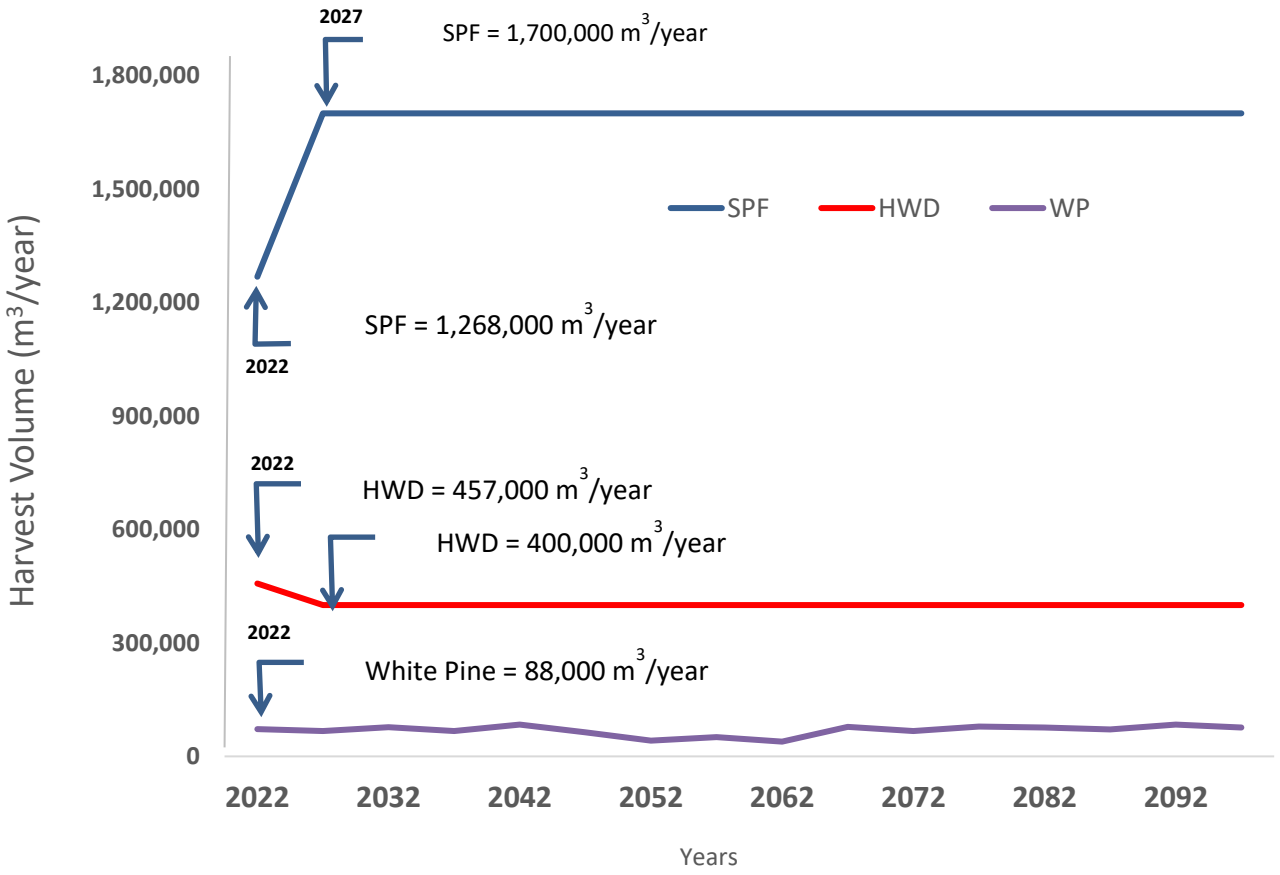


Figure 10. Long term harvest levels (m^3/year) forecasted by Species group.

Table 8: Sustainable harvest levels by major species groups on License 7.

2022-2026*	Harvest Volume (m^3/yr)		
Forest Zones	SPF	Hardwood	White Pine**
General Forest	1,128,000	414,000	76,000
Riparian	15,000	5,000	0
Other Conservation Forest	125,000	38,000	12,000
Total (m^3/yr) Harvested	1,268,000	457,000	88,000

2027-2031	Harvest Volume (m^3/yr)		
Forest Zones	SPF	Hardwood	White Pine**
General Forest	1,535,000	350,000	73,000
Riparian	15,000	5,000	0
Other Conservation Forest	150,000	45,000	15,000
Total (m^3/yr) Harvested	1,700,000	400,000	88,000

** Values for 2022-2026 are intended to start in the 2024 operating year and continue through the 2026 operating year.*
*** White pine harvest volumes are derived from the licensee White Pine Strategy discussed below.*

Conservation forest harvesting will occur as partial harvests in stands eligible for treatment (riparian buffers, old forest communities, old forest wildlife habitats, deer wintering areas, and other conservation areas).

Beyond 2027, there is no future wood supply growth (Figure 10). This will have a significant impact on our ability to remain competitive in the long term and will not meet future Industrial Plan requirements. Additional investments in silviculture in the working forest will be required to achieve a vibrant, resilient, productive forest capable of supporting long term growth.

The distribution of SPF annual allowable cut by pulpwood, studwood and sawlogs over the next 10 years is summarized in Figure 11.

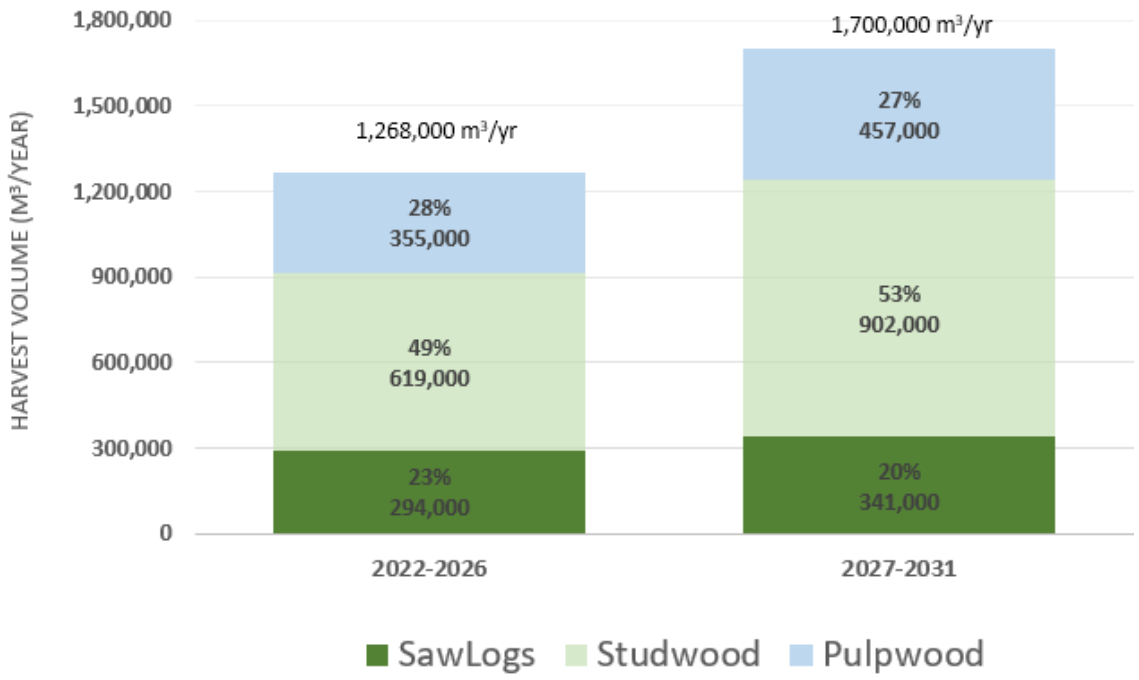


Figure 11. Annual harvested of SPF volume by product group (m^3/year).

Harvest Treatment Levels

The licensee harvest treatment strategy outlined in Table 9 prioritizes the harvest of declining balsam fir pre-commercial thinnings over the next 15 years, while regulating the harvest of natural forest (general forest and conservation forest) over the next 10-12 years.

To mitigate risk, the availability of operationally feasible conservation forest harvesting will be essential to achieving the AAC and product volumes outlined in this plan.

Table 9. Annual harvested area by forest zone and stand type (hectares/year)

	Annual Harvest Area (Ha/yr)	
Forest Zones and Stand Types	2022-2026*	2027-2031
General Forest		
Natural Stands (Cc)	2,300	2,300
Natural Stands (Non-cc)	1,800	1,800
Planted Stands (Cc)	1,340	2,250
Pre-commercial thinning (Cc)	3,800	5,800
Commercial Thinning	1,400	1,600
Conservation Forest		
Riparian Buffers (Non-cc)	500	500
Other Conservation Forest (Non-cc)	2,500	3,000
Area Harvested (Ha/year)	13,640	17,250

* Values for 2022-2026 are intended to start in the 2024 operating year and continue through the 2026 operating year.

SILVICULTURE ACTIVITIES

An important challenge, outlined in this plan, is the management of silviculture investments made over the last 40 years that have now reached maturity and are showing signs of decline (rot and pest damage).

Managing the decline of older previously treated areas on Crown License 7, to mitigate loss of volume and value, and ensuring these stands are properly reforested through silviculture will be crucial over the next 10-15 years.

The silviculture strategy outlined in this management plan aims to build a resilient softwood regenerating forest by replacing species such as Balsam Fir that are susceptible to climate change impacts with more resilient species such as spruce and pine through tree planting and pre-commercial thinning. Annual treatment levels by program (hectares/year) are provided in Table 10.

Other forest types such as tolerant hardwood will be maintained through the use of partial harvest treatments to promote natural regeneration.

Table 10. Annual silviculture levels by program (hectares/year).

Program (Ha/year)	2022-2026	2027-2031
Tree Planting	4,500	6,000
Pre-Commercial Thinning	500	500
Total (Ha/year)	**5,000**	**6,500**

Silviculture activities will be targeted towards harvest areas (managed and natural areas) where regeneration is expected to be insufficient and forest health and resiliency can be improved through tree planting and thinning.

A significant increase in silviculture is expected in the 2022 management plan. Annual seedling requirements by species and year are forecast in Appendix III. Risks to silviculture funding and seedling availability would impact the short-term and long-term wood supply in this plan.

The silviculture area requirements in the 2022 strategy are consistent with the 25-year average on Crown License 7 (Table 11).

Table 11. Silviculture history on crown License 7.

Year of Mgt Plan	Silviculture (Hectares/year)		
	Planting	PCT	Total (ha)
2027	6,000	500	6,500
2022	4,500	500	5,000
2012	3,500	1,000	4,500
2007	5,200	3,600	8,800
2002	4,700	6,200	10,900
1997	3,600	6,300	9,900
1993	3,040	2,700	5,740
25 Year Avg	**4,008**	**3,960**	**7,968**

WHITE PINE STRATEGY

Crown License 7 is home to a vibrant white pine forest that has been managed to promote white pine growth and quality for many years. With recent capital investments in a new and modern white pine sawmill in Doaktown, New Brunswick, JDI has a strong interest in ensuring a supply of quality white pine for the long-term.

Harvest prescriptions that promote white pine growth will be applied based on-site specific conditions, including:

- ❑ Shelterwood prescriptions to promote and protect white pine regeneration, and to elicit a growth response, will be undertaken whenever appropriate.
- ❑ Harvest prescriptions and treatments will protect quality potential future white pine crop trees.
- ❑ Commercial thinning in plantations and pre-commercial thinnings aims to remove lower quality stems to allow the remaining white pine trees to continue growing vigorously.
- ❑ Harvest prescriptions and treatments will protect and promote immature and regenerating white pine trees where feasible.
- ❑ Planting of white pine seedlings where appropriate is included in this forest management strategy.

The Licensee proposes a white pine strategy that prioritizes the working forest to achieve a sustainable supply of habitat availability and white pine forest products. Following decades of harvest and silviculture activities in the white working forest, strong evidence exists that the working forest is providing an abundance of important features for biodiversity such as large size white pine trees. An analysis of large white pine trees is summarized in Appendix IV.

Given the long history of management in the white pine working forest, it is expected that habitat and wood supplies continue to be sustained through active management.

BLOCKING AND NET DOWNS

Annual allowable cut outcomes (m3/year) for the major species groups as reported in Table 8 above are considered net of all reductions associated with within block net downs such as unmapped streams. These AAC's are also considered net of all spatial or timing choice net downs.

Spatial blocking has been provided by applying operability rules to the forest inventory to create ten years of tactical units that are available for harvest. These units will be further refined to ensure that all final mutually agreed upon Crown Operational Outcomes (COO) requirements are met. This refinement of harvest blocks will occur at the annual operating plan (AOP) level. Some of these refinements could include adjustments for adjacency and opening size, legacy and canopy tree retention, working in watersheds or around communities.

UNCERTAINTY & RISK

It is important to identify uncertainties and risk associated with any forest management plan strategy, so that proper monitoring and risk mitigation can be implemented as needed. The 2022 forestry strategy aims to achieve significant increases in both conservation and wood supply while rapidly transitioning to a managed forest.

The uncertainties and risks related to this plan are outlined below and discussed further in this section:

1. Rapid Transition of Harvest
2. Saw Material Supply
3. Policy

1. Rapid Transition of Harvest

- ❑ Short Term (next 10-15 years): The 2022 Forestry Strategy accelerates the rate of transition into the managed. The first cohort of managed forests are becoming operable now, so there is very little empirical evidence about these forests.

- ❑ Long Term (15-30 years): Following the harvest of the mature PCT landbase over the next 10-15 years, the naturally regenerating land base will become an important component of the long-term wood supply. Very little is known about this land base, its yield expectations, product supply, or species composition. Impacts of these uncertainties could have an impact on the short and long term sustainable AAC.

2. Saw Material Supply:

- ❑ As we rapidly transition to a different mix of forest types, there is uncertainty around operability, product merchandizing and utilization. These uncertainties could impact the sustainable supply of saw material, especially larger diameter saw logs.

3. Policy:

- ❑ It is expected that additional policies will emerge over time to manage species at risk and other conservation goals identified by DNRED, however it is unknown what the impact might be to the sustainable wood supply.

- ❑ Given the heightened dependency on tree planting to support the wood supply in this management plan, policy risk around silviculture funding and the availability to use herbicides could cause major disruptions to the sustainable wood supply.

MONITORING & RISK MITIGATION

- ❑ Careful monitoring and prompt risk mitigation will be required to manage impacts that may materialize during management plan implementation.

- ❑ The Licensee will monitor volumes and products throughout the year and identify gaps that will need to be addressed within the current operating year.

- The Licensee will report on actuals compared to Management Plan and Industrial Plan requirements through the Annual Report process and identify gaps that will need to be promptly addressed.

- Licensee will work with DNRED to address gaps, mitigate risk, and undertake analysis to better understand root cause and corrective actions.

CONCLUSION

- This management plan achieves increases in both conservation and wood supply, while proposing enhancements to the conservation forest strategy in 2027 that will see further protection of areas of community importance and drinking watersheds.

- Increases in silviculture investments outlined in this plan are essential for the short- and long-term sustainability of the wood supply and forest resiliency to support a broad range of values.

- The supply of timber products from this plan fulfills the requirements outlined in JDI's approved Industrial plan (Order-in-Council 2023-159), however careful monitoring will need to occur as we transition to a managed forest.

RECOMMENDATIONS

Crown License 7 has a diverse, healthy forest capable of sustaining conservation and wood supply objectives through time. Enhancements to the DNRED Strategy should be pursued to maximize the value of the License 7 forest and reduce risk and uncertainties outlined in this plan.

Below is a set of recommendations:

Enhancements to DNRED Strategy: Competitiveness and Sustainability

1. Establish economic objectives in the DNRED Forestry Strategy that will promote growth, investment, and sustainability of the industry.

2. Increase the long-term health and productivity of the working forest through additional silviculture. This will be imperative for forest sector growth and competitiveness.

Enhancements to DNRED Strategy: Conservation

3. Implement novel approaches to meet conservation goals, such as:

- ❑ Better recognize the role of the working forest in meeting conservation goals.
- ❑ Improve the long-term supply of biodiversity by introducing young and regenerating stands into the conservation forest in exchange for older declining stands that will be allowed to die and pose risk for wildfire, pest outbreaks, and carbon emissions.
- ❑ Evaluate the sensitivity and trade-offs associated with conservation objectives (patch size, large tree requirements).
- ❑ Implement novel approaches to mapping large trees and habitats on the landscape as outlined in the White Pine analysis.
- ❑ Investments in ecology research to better understand biodiversity and the role of conservation strategies (protection and working forest landscapes) to meet DNRED objectives.
- ❑ Implement Licensee proposal for conservation forest enhancements outlined in Appendix II.

Enhancements to DNRED Strategy: Forest Management Planning

4. Implement process and structural improvements into forest management planning:

- Increased transparency and collaboration between DNRED and Licensees
- Enhanced analysis (trade-off analysis, sensitivity analysis, economic analysis, risk analysis) in wood supply and conservation strategies
- Stronger project management, timelines, sign-off, and accountability
- Higher integration of Licensee knowledge and on the ground experience into modeling and analysis

CROWN LICENSE 6/7
2022-2046
FOREST MANAGEMENT PLAN

Appendices

APPENDIX I

Forest Product Specifications

The Annual Allowable Cut (AAC) is calculated based on the net merchantable volume from product definitions (bolts) and associated utilization assumptions as outlined in Appendix I. The AAC is expected to align with Schedule F allocations and JDI's NB Industrial Plan.

Species	Product	DIB (Min) Top Size (cm)	DIB (Min) Top Size (inch)	(m) Lengths	(feet) Lengths	Max Rot	Forks	Sweep/Crook	Other	(cm) Bark Thickness
SPF	Logs	$16^{.5}$ | $20^{.3}$	$6^{.5}$" | $8^{.0}$"	5 | $3^{.76}$	$16^{.4'}$ | $12^{.3'}$	25% (of diameter)	None	1/3 (of Vol)	None	1.00
	Studs	$11^{.1}$	$4^{.4}$"	$3^{.14}$ | $2^{.84}$ | $2^{.54}$	$10^{.3'}$ | $9^{.3'}$ | $8^{.3'}$	0%	None	None	None	0.75
	Pulpwood	$10^{.0}$	$3^{.9}$"	$2^{.5}$	$8^{.2'}$	50% (of Vol)	None	n/a	None	0.60
	RWB	$7^{.1}$	$2^{.8}$"	$2^{.44}$ (min)	8' (min)	n/a	n/a	n/a	n/a	0.60
Hwd	Veneer	$25^{.1}$	$9^{.9}$"	$2^{.60}$ (min)	$8^{.5'}$ (min)	0%	None	n/a	None	
	Logs	$23^{.1}$	$9^{.1}$"	$2^{.60}$ (min)	$8^{.5'}$ (min)	0%	None	n/a	None	
	Pulpwood	$7^{.1}$	$2^{.8}$"	$2^{.44}$ (min)	$8^{.0'}$ (min)	50% (of diameter)	None	n/a	None	
WP	Logs	$25^{.4}$	$10^{.0}$"	$2^{.54}$	$8^{.3'}$	n/a	None	n/a	None	
	Logs	$20^{.3}$	$8^{.0}$"	$3^{.14}$ | $3^{.75}$ | $4^{.40}$ | $5^{.00}$	$10^{.3'}$ | $12^{.3'}$ | $14^{.4'}$ | $16^{.4'}$	n/a	None	n/a	None	
	Pulpwood	10.0	3.9"	2.44	8'	50% (of Vol)	None	n/a	None	
	Pulpwood	7.1	2.8"	2.44	8'					
Ce	Saw	19.1	7.5"	2.54	8.3'	0%	20%	n/a	None	
	Fencing	11.1	4.4"	1.92	6.3'	10% (of diameter)	10%	n/a	None	
	pulpwood	10.0	3.9"	2.44	8'					
	pulpwood	7.1	2.8"	2.44	8'					
Rp| He | Ta	Logs	21.0	8.3"	3.76	12.3'	n/a	None	n/a	None	
	Pulpwood	10.0	3.9"	2.44	8'	50% (of Vol)	None	n/a	None	
	Pulpwood	7.1	2.8"	2.44	8'					

* Biomass defined as ---------> Branchs/tops/defect

AAC = NMV = Schedule F

Utilization Assumptions:

- 15cm stump height
- 25% rot on SPF sawlogs
- Cull from form defects

APPENDIX II

Licensee Proposal for Conservation Forest Enhancements in 2027

There is an opportunity to enhance the conservation forest landbase on Crown License 7 in 2027 to satisfy the Crown's goals to further increase conservation while providing a balanced supply of saw timber products outlined in JDI's Industrial Plan through the following measures:

1. **Increase Conservation Forest**. The Licensee has engaged in several public stakeholder sessions in communities around License 7. There was strong feedback from communities about the importance of Crown Land and its contribution to the local economy, recreation, aesthetics, tourism, and clean drinking water. The Licensee proposes to:

    (i) Create additional conservation forest to conserve areas of community importance and sensitive areas around communities, and
    (ii) Create additional conservation forest to conserve drinking watersheds and wellfields that supply drinking water to communities.

2. **Actively Manage Selected Conservation Forest Areas.** Active management of selected conservation forest can enhance the long-term sustainability of biodiversity while supplying an important wood supply. The use of non-clearcut treatments will promote regeneration and multi-aged stand structures that will ensure a long-term supply of biodiversity values while allowing the partial removal of timber in the short term. The introduction of conservation tools such as OECM's (Other Effective Area-Based Conservation Measures) can be utilized in Conservation land bases such as the Nature Legacy sites to promote active management and long-term sustainability of biodiversity and wood supply.

This proposal aims to expand the conservation forest to 32% by 2027, while also ensuring a sufficient timber supply to support the objectives set forth in JDI's Industrial Plan:

	2022-2026		2027-2031	
Forest Zones	**Hectares**	**Distribution**	**Hectares**	**Distribution**
General Forest:				
Working Forest (including Operationally Constrained Forest)	664,220	70%	649,353	68%
Conservation Forest:				
Protected Natural Areas	83,134	9%	83,134	9%
Nature Legacy	94,751	10%	78,190	7%
Nature Legacy (OECM)	0	0%	16,561	3%
Community Areas & Conservation Watersheds	0	0%	17,820	2%
Riparian Buffers	85,050	9%	82,097	9%
Other conservation forest areas	23,872	3%	23,872	3%
Total Productive Forest (Ha)	**951,027**	**100%**	**951,027**	**100%**

APPENDIX III

Annual seedling requirements by species by year:

Species Planted	Actuals			Planned	
	2014-21	2022	2023	2024	2025-2032
Black spruce	492,166	349,140	77,640	0	324,000
White spruce	3,098,416	1,515,120	2,216,220	4,000,000	5,616,000
Red spruce	1,576,796	1,848,900	1,157,220	500,000	2,808,000
Norway spruce	718,518	99,729	304,380	0	-
White pine	241,782	763,560	724,626	1,000,000	1,404,000
Jack pine	194,329	419,580	396,900	600,000	648,000
Total Seedlings	**6,322,006**	**4,996,029**	**4,876,986**	**6,100,000**	**10,800,000**

APPENDIX IV

White Pine - Big Tree Analysis

The Licensee collaborated with experts to develop a novel approach to mapping big trees in the white pine forest.

This approach leveraged the canopy height model to identify big white pine trees (≥30 m in height and ≥30cm DBH) in the white pine softwood forest (WPSW) in the general forest, conservation forest, and old forest (OFC/OPIH) land base zones (Figure 12).

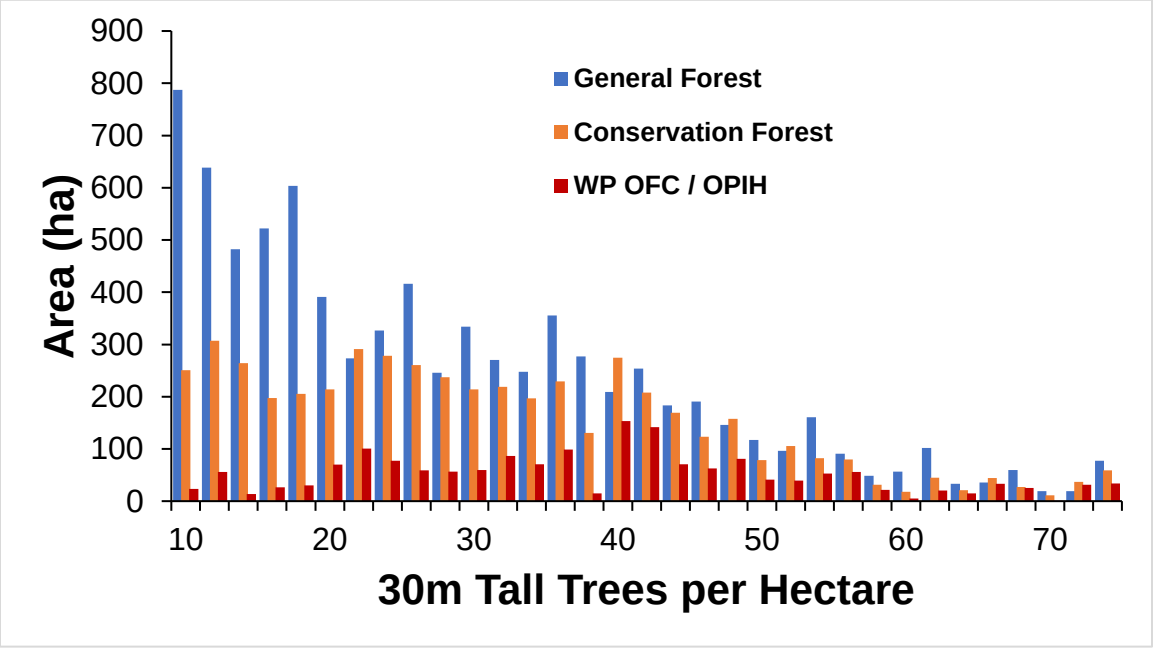


Figure 12. White pine tree height distribution.

There is sufficient supply of large white pine trees in the general forest and conservation forest to meet DNRED's objectives for old forest types. The mapped old forest types (OFC, OPIH) in the DNRED Strategy were considered eligible for harvest in this submission.

DNRE objectives for old white pine forests on License 7 include 2,732 hectares of Old Forest Community (OFC-WP) and 2,779 hectares of Old Pine Habitat (OPIH).

The Table below illustrates that these targets for white pine are being met in the general forest and conservation forest.

Big tree analysis results.

Forest Zone	Stands with > 10, 30m tall trees / ha		Stands with > 30, 30m tall trees / ha	
	Area (ha)	# of Trees	Area (ha)	# of Trees
General Forest	7,282	228,260	3,383	147,393
Conservation Forest	4,815	159,091	2,560	111,568
WP OFC / OPIH	1,705	66,281	1,216	55,637
Total	**13,803**	**453,632**	**7,159**	**314,597**

There is an opportunity to apply this methodology to other old forest targets to achieve a more balanced plan that meets conservation and wood supply goals.