

High Production Forestry in Nova Scotia

Phase 2 Guidance for Implementation

In response to recommendations outlined in
An Independent Review of Forest Practices in Nova Scotia

January 2023



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Department of Natural Resources and Renewables
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Introduction

The Province of Nova Scotia is embarking on a new vision for forest management on Crown lands. This vision focuses on a paradigm shift for sustainable forest management, with an emphasis on using nature as the building block for decisions about the maintenance of all values associated with the forest. These values include biodiversity, forest products like timber, ecological services and cultural values like recreation.

The Department of Natural Resources and Renewables is implementing this new vision which stems from [An Independent Review of Forest Practices in Nova Scotia](#) (Lahey, 2018). This two-year, in-depth review of forestry practices, that included consultation with stakeholders and the general public, provided recommendations for transforming Nova Scotia's forest management approach on Crown land. It sets the foundation for ecological forestry through implementation of a triad zoning model on Crown land that's managed under the Crown Lands Act and other public land under protected areas legislation.

One zone of the triad model is the high production forest zone where timber production is the priority to support the forest products sector and provincial economy. This document reviews steps taken to develop government's approach to this zone and outlines key directions for implementation, effective January 17, 2023.

Triad Model of Ecological Forestry

The triad model considers and accounts for multiple and conflicting demands by partitioning the forest into different zones so that all values are met, although they are not necessarily all met in all zones. In situations where all values cannot be simultaneously met, the triad model avoids conflict by establishing different zones for different values and purposes.

This approach is similar to zoning used in towns and cities to meet residential, commercial and industrial requirements. The challenge in this approach is to define the right amount of area and the right locations for each zone so that the desired levels of all forest values are met.

The complete rationale for the triad model is detailed in the review of forest practices. In simple terms, there are three zones in this model:

- the **conservation zone** is where biodiversity is conserved and natural processes are allowed to function; this zone includes old-growth forest on Crown land that's conserved under the Old-growth Forest Policy, provincial parks, protected areas managed under Environment and Climate Change's legislation and areas that are being conserved without legal designations (such as pending protected areas)
- the **ecological matrix or mixed use zone** (the largest zone) is where biodiversity is prioritized with a mixture of conservation and a limited amount of timber is harvested using lower intensity practices that follow the [Silvicultural Guide for the Ecological Matrix; this zone is entirely on Crown land](#)
- the **high production forest zone** (the smallest zone) is where the focus is on quickly and efficiently growing high quality timber products to support the forestry sector and provincial economy, particularly in rural areas; this zone is entirely on Crown land

Each zone is indispensable and of equal importance. Effective implementation of the triad model requires all three zones to exist in adequate sizes to meet all values.

The high production forest zone is important for Nova Scotia's economy. The production of primary and secondary forest products supports the livelihood of many Nova Scotians. In many communities, primarily rural, it is a significant economic driver that supports many direct and indirect jobs and services. The high yields expected from high production forestry on Crown lands will help ensure an adequate supply of forest products to support this sector and the economy.

At the same time, biodiversity is the priority on 90% of land in the triad. More than a third of it is protected in the conservation zone and more than half of it is prioritized for biodiversity in the ecological matrix or mixed use zone where low intensity, ecologically appropriate forest management practices are applied.

High Production Forestry Phase 1 - Development

In 2019, the department conducted several rounds of public and stakeholder consultation on high production forestry. With this input coupled with recommendations from the review of forest practices, the department's project team, which includes expertise from both within the department and academia, developed its approach and criteria for high production forestry, outlined in detail in the July 2021 [High Production Forestry Phase 1 Final Report](#).

This report included the various considerations for selecting appropriate areas for a high production forest management model on Crown lands. Using provincial forest inventory analysis, the report predicted that 246,000 hectares or about 13% of Crown land may be ecologically suitable for this style of forest management and noted that this number may decrease upon further assessment.

The report included analysis for ensuring a sustainable timber supply and informing key decisions on how much Crown land to make available for high production forestry. It also outlined the next steps to implement the high production forest zone of the triad.

High Production Forestry Phase 2 - Implementation

Criteria for high production forest zone

The goal of the high production forest zone is to produce high-quality spruce timber that can supply sawmills and the entire forest products supply chain across Nova Scotia. As outlined in the phase 1 report, high production forestry will only be permitted on certain types of Crown lands using selection criteria which first prioritizes biodiversity. Three key criteria are being used to identify area potentially suitable sites for inclusion in the high production forest zone.

First, the zone should not include any land where conservation and non-timber values are prioritized. Therefore, designated and pending protected areas, old-growth forests, sensitive forest ecosystems or wildlife habitats and wildlife special management zones will not be considered. In addition, Crown lands where high production forestry would conflict with cultural values will not be considered.

Second, the zone should not include rich ecosites that commonly support tolerant hardwood forests. The conversion of such sites to cultivated spruce tree farms is ecologically inappropriate.

Third, in the areas that remain after applying the first two criteria, the land must be capable of supporting fast conifer (spruce) tree growth in order to achieve the long-term goal of this zone. That means it must have the inherent soil fertility and drainage characteristics to make it conducive to such growth. Using Nova Scotia's Forest Ecosystem Classification System, tolerant spruce ecosite conditions (AC 10 and 11) were used as the benchmark and target for suitable areas.

Size of high production forest zone

The phase 1 report considered how much Crown lands ought to be committed to the high production forest zone. Following the criteria above, there are about 246,000 hectares of Crown lands in Nova Scotia that are potentially suitable for high production forestry. This would be about 13% of the triad.

However, because biodiversity is of such high importance, as much land as possible is being dedicated to the conservation and matrix zones. Therefore, the high production forest zone will be capped at a maximum of 10% of the triad. By setting this cap, both biodiversity and economic goals can be achieved.

With 10% of the triad dedicated to high production forestry (currently 185,000 hectares), a sufficient supply of primary forest products will be available to the forest products sector in Nova Scotia in the short term (about 359,000 green metric tonnes of softwood per year).

Further, within 35 years, yields could be significantly increased from that land base to create long-term opportunities for investment and growth in the sector. Once fully implemented, the high production forest zone is expected to generate more than 1 million green metric tonnes per year of high-quality spruce timber.

The overwhelming balance of land in the triad is committed to prioritizing biodiversity in the other two zones. The conservation zone currently accounts for about 630,000 hectares or 35% of the triad) and is expected to grow as the province adds to its protected areas or identifies more old-growth forests for protection. The ecological matrix or mixed use zone currently represents about 1 million hectares or 55% of the triad) and may decrease if some lands are identified for long-term protection and are moved to the conservation zone. The high production zone may grow in hectares if more land is acquired but it will never be larger than 10% of the triad. This means 90% of Crown and protected areas land will always be committed to the two zones that prioritize biodiversity.

Identifying sites for high production forest zone

With the criteria and maximum size of the high production forest zone established, the next step is to identify specific sites for their potential viability to include in the zone. The department is doing this by considering Crown lands in each of the province's 39 ecodistricts.

Ecodistricts are distinct ecological units based on features such as climate, elevation, topography, bedrock formation, and vegetation. Their boundaries do not align with administrative boundaries such as counties or municipalities.

An Integrated Resource Management screening process is being used to assess each ecodistrict at the landscape scale. This is a desktop analysis using existing information about each ecodistrict.

Sites in each ecodistrict that do not meet the criteria for being suitable for high production forestry are removed from consideration. In other words, sites that have known land use values that conflict with high production forestry, such as biodiversity, cultural, recreation or other land use commitments, are being eliminated from consideration.

Next, the ecodistricts are assessed in terms of their existing planted forests and abandoned agriculture lands (ie fields). These types of lands are being prioritized because they are already in a managed condition and tend to have suitable conditions for high production forestry. Some areas of planted forest or abandoned fields are not suitable for high production forestry. These sites are removed from consideration when they are:

- Sites that are within 100 metres of the conservation zone

- Known locations for species at risk or within associated buffers
- Critical wildlife habitat areas
- Areas with extreme wind exposure (including ecodistricts along the Atlantic coast and in the Cape Breton highlands)
- Isolated parcels that are too small and/or not economically viable
- Sites with rare or sensitive ecosystems
- Areas with poor soil fertility or drainage

This process is being applied to all ecodistricts across the province. This work is underway and will continue throughout 2023. As assessments are completed, maps and information about potentially suitable sites are being released to Crown land licensees.

The licensees must then conduct field verifications of each site using a specially designed pre-treatment assessment process tailored for high production forest sites. The primary focus of the field verification is to confirm a site's suitability for high production forestry using forest ecosystem classification as a basis for decision making. Field verification can also identify key biodiversity features or other values not previously captured during landscape (ie desktop) analysis.

Licensees will use this information to develop harvesting and silviculture proposals for sites that they've confirmed are suitable and submit them to the Department of Natural Resources and Renewables. Proposals must go through the full Integrated Resource Management review process for harvesting timber on Crown land, which includes opportunity for local public knowledge about sites to be captured and considered. Through this process, the department will decide whether to classify the sites as included in the high production forest zone. If not, they will become part of the matrix or mixed use zone.

Once all existing planted forests and abandoned fields have been assessed across the province, if there are not enough of these types of sites to reach the 10% target for the high production forest zone, future site selection could expand. Other potential land could include naturally regenerated and managed forests. These other lands would never come from the conservation zone. They may come from the matrix or mixed use zone or through new acquisitions.

Initial sites for high production forest zone

The identification process outlined above has been applied to three initial ecodistricts, one in each region of the province. Sites that are likely suitable have been identified in each. These first three ecodistricts are:

Eastern – Ecodistrict 360 - located in Guysborough and Antigonish counties

- Total ecodistrict area – 99,765 hectares
- Crown and protected areas lands – 43,140 hectares
- Existing conservation zone – 12,100 hectares
- Existing planted forests and abandoned fields being considered for high production – 4,605 hectares

Central – Ecodistrict 380 - located in Colchester and Pictou counties

- Total ecodistrict area – 128,100 hectares
- Crown and protected areas lands – 27,180 hectares
- Existing conservation zone – 9,920 hectares
- Existing planted forests and abandoned fields being considered for high production – 3,535 hectares

Western – Ecodistrict 740 - located in Lunenburg, Queens, Annapolis and Kings counties

- Total ecodistrict area – 247,635 hectares
- Crown and protected areas lands – 30,045 hectares
- Existing conservation zone – 6,245 hectares
- Existing planted forests and abandoned fields being considered for high production – 1,255 hectares

These sites total 9,395 hectares of potentially suitable area to be confirmed by licensees through their field verifications. Combined, these sites total about 0.5% of land in the triad. Maps showing these sites are available in Appendix A.

As noted above, the landscape level assessment process is being applied to all ecodistricts across the province. This work will continue throughout 2023. As assessments are completed, maps and information will be released to Crown land licensees. Sites will also be shown on an online [high production forestry map](#).

Full implementation of the high production forest zone will take decades. The department estimates that each year for the next 35 years, licensees will establish about 5,000 hectares of Crown land in the zone.

This means they will harvest the existing timber followed by site preparation with specially designed equipment to prepare ideal soil and site conditions for replanting with spruce seedlings. They will tend the crop of seedlings through its development and eventually harvesting again in 30 to 50 years. Tending is expected to include applying herbicide and using saws to thin out unwanted, naturally regenerated trees during the establishment stages. As the trees mature, commercial thinning will be a commonly used harvesting method. Eventually the site will be completed harvested and the cycle will begin again.

The zone will be fully implemented once 10% of the triad is being actively managed for high production forestry.

Long-term Success for High Production Forestry

Forest managers plan their operations for the long-term – many decades into the future. Therefore, they need some certainty about their ability to conduct high production forestry on Crown land and ensure a return on their investment. Government is committed to the triad model for the long term, as well as providing clarity on the total amount of Crown land available for this purpose and the process for identifying specific sites.

Although herbicide has not been used as a forest management tool on Crown land in Nova Scotia since 2010, the regulated use of herbicides as a high production forestry management tool was discussed and supported by the Independent Review of Forest Practices. To successfully achieve high yields of spruce saw timber forest products in short rotations of 30 to 50 years, a robust and intensive tree farming model will be required. Similar to crop management in agriculture, core requirements for tree farming in the high production forest zone include soil amendments, soil preparation, superior seed and seedling stock, and management of competing vegetation. Without these tools, the predicted yields and the associated economic returns outlined in the phase 1 report will not be attainable.

Herbicide has traditionally been used via ground and aerial applications to prevent the negative impact that competing, naturally regenerating vegetation has on seedling growth and their ability to survive and grow to merchantable size in the shortest possible period of time. Typically, herbicide is

applied to a tree crop once, after seedlings have been planted, and there are no other applications during the decades that it takes for the crop to reach maturity. In some cases, a preparatory application may be required prior to planting to eliminate already established vegetation including weeds and grasses.

While concerns about use of herbicides in forestry are acknowledged, all pesticides (ie, herbicides, insecticides, fungicides, etc) used in Canada are subject to rigorous and ongoing science-based assessments before they are approved for use by [Health Canada](#). In Nova Scotia, approvals for use are issued by the Department of Environment and Climate Change. They monitor approval holders closely and will revoke an approval if they know a product is not being used in accordance with the regulations.

Herbicide will be allowed in the high production forest zone, as recommended in the Independent Review of Forest Practices. However, government will not provide any funding for herbicide. Licencees are encouraged to minimize the use of herbicide by using innovative practices such as precision mechanical tree planting combined with microsite application of both herbicide and fertilizer. As these and other practices, including those that do not require herbicide, become more commonplace and feasible, they will significantly reduce the required volume of herbicide and ultimately eliminate the need for broadcast applications. The department is looking at how it can support the industry by researching new practices.

Conclusion

The triad model of ecological forestry is truly transforming forest management on Crown land in Nova Scotia. While the triad model does not apply to private lands, it can serve as an example for private landowners to apply on their woodlands.

This model balances multiple competing values by dedicating appropriately sized zones to different purposes. Ensuring a long-term, sustainable supply of timber for the forest products sector is one of these important values for Nova Scotia families, communities and the economy.

As outlined above, Crown land will supply forest products from both the ecological matrix and high production forest zones, with no timber being produced from the conservation zone. Ultimately, biodiversity is the priority on 90% of the triad.

The department deeply appreciates the input and collaboration with stakeholders and the general public to advance this transformation of forest management in general, and to help craft the new approach for high production forestry in particular. The insight received has been invaluable to establish the direction and plot the course for implementation.

Through the careful balance being built through the triad model, both biodiversity and economic interests can co-exist, helping ensure sustainable prosperity for all Nova Scotians.

APPENDIX A – Initial sites for high production forest zone

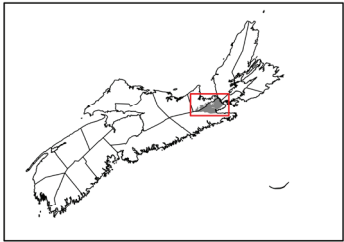
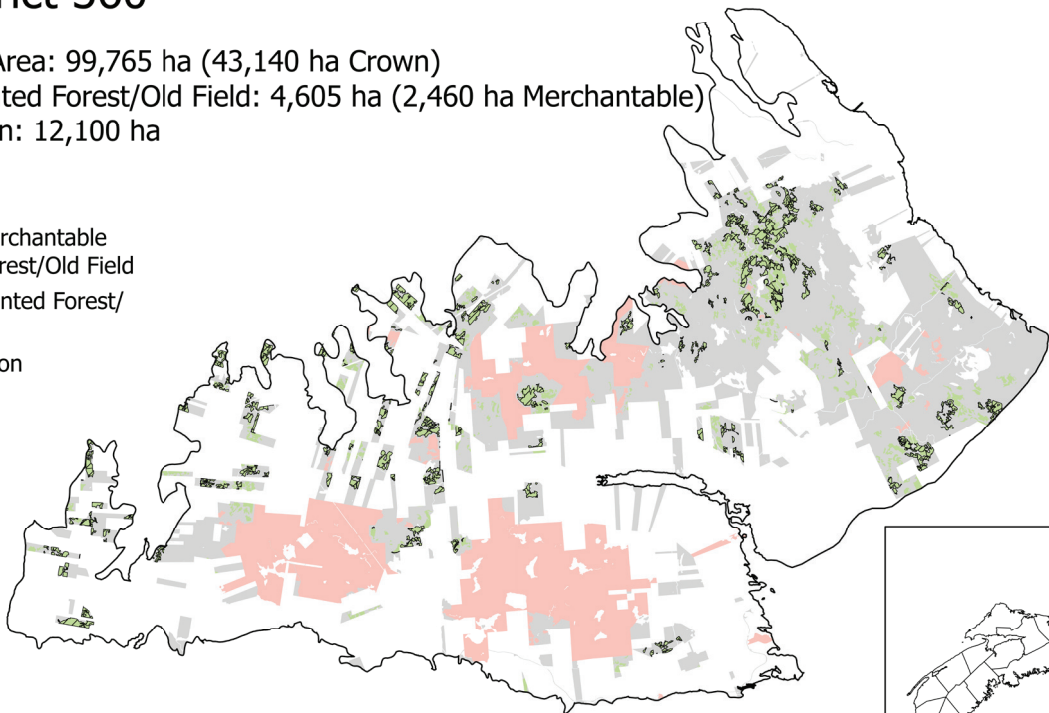
The following maps show sites that may be suitable for high production forestry in the first three initial ecodistricts that the department has assessed. Licensees will conduct field verifications to confirm their suitability for high production forestry.

Ecodistrict 360

Ecodistrict Area: 99,765 ha (43,140 ha Crown)
Eligible Planted Forest/Old Field: 4,605 ha (2,460 ha Merchantable)
Conservation: 12,100 ha

- Eligible Merchantable Planted Forest/Old Field
- Eligible Planted Forest/Old Field
- Conservation
- Unzoned

0 2.5 5 7.5 10 Kilometers








Ecodistrict 380

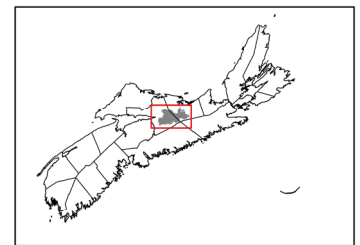
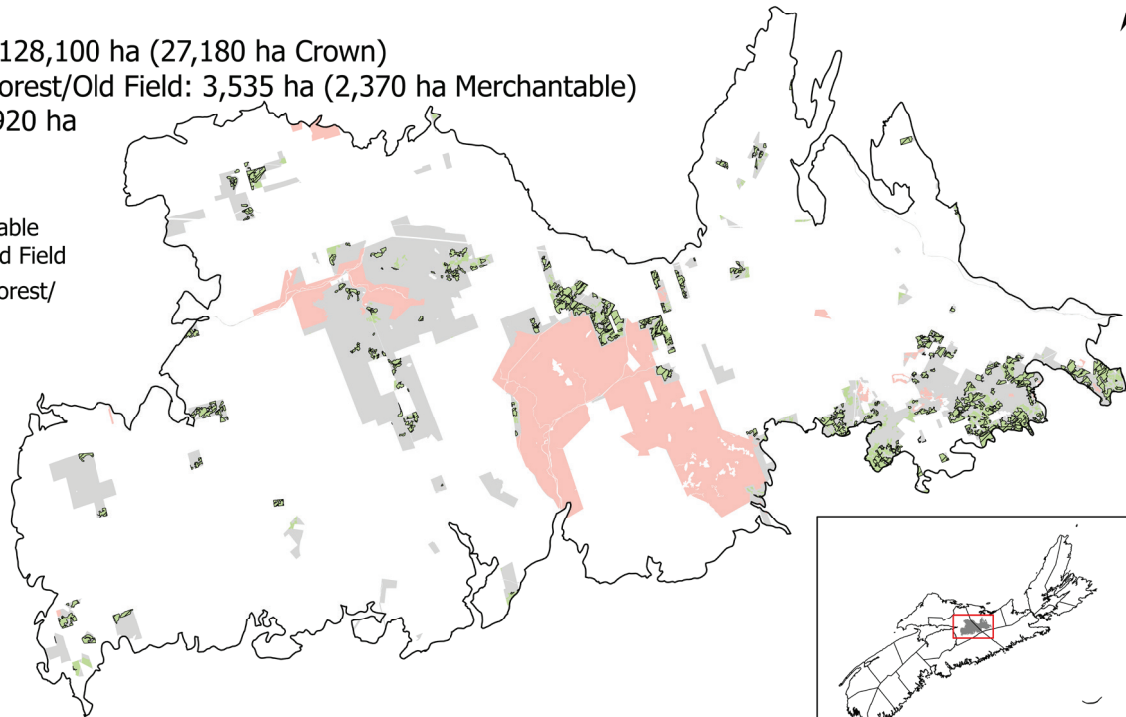
Ecodistrict Area: 128,100 ha (27,180 ha Crown)

Eligible Planted Forest/Old Field: 3,535 ha (2,370 ha Merchantable)

Conservation: 9,920 ha

-  Eligible Merchantable Planted Forest/Old Field
-  Eligible Planted Forest/Old Field
-  Conservation
-  Unzoned

 Kilometers
0 2.5 5 7.5 10








Ecodistrict 740

Ecodistrict Area: 247,635 ha (30,045 ha Crown)

Eligible Planted Forest/Old Field: 1,255 ha (935 ha Merchantable)

Conservation: 6,245 ha

-  Eligible Merchantable Planted Forest/Old Field
-  Eligible Planted Forest/Old Field
-  Conservation
-  Unzoned

 Kilometers
0 5 10 15 20

