

Silviculture Guide to Ecological Forestry

Consultation Companion Document

February 18, 2020



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Background

In December 2018, the Department of Lands and Forestry (the department) committed to revising Nova Scotia's Forest Management Guide (the guide) and pre-treatment assessment (PTA) process to place more emphasis on ecological values. Revisions align with ecological forestry practices as described in Professor Lahey's *An Independent Review of Forest Practices in Nova Scotia*. A project team was established to conduct this work, comprising staff with technical expertise in the creation and use of forest management guides, forest practitioners, professional foresters, biologists, and Dr. Graham Forbes, an external expert in biodiversity. Dr. Robert Seymour, an expert in silviculture systems, was included on the team in an advisory role.

At the Ecological Forestry Forum held by the department on June 25, 2019, the team began high-level consultations on what stakeholders would like to see in the revised guide, and how they would want to be involved in its development. The team then prepared a discussion paper on proposed policy direction for forestry operations on Crown land and a summary of proposed revisions to the guide. These were shared with a representative group of targeted technical experts and policy stakeholders on August 20, 2019. The discussion paper was also shared with other interested stakeholders for feedback.

This document provides a summary of the approximately 500 comments received from stakeholders, either in person or through written submissions, with an explanation for how they were considered in developing the February 2020 draft of the revised guide. This document addresses most of the comments received; however, the project team carefully considered all comments.

This summary is a companion document to the draft guide and provides additional context for what has been included in the draft, as well as how the department plans to address areas of concern identified by stakeholders through other projects and/or activities as ecological forestry is implemented on Crown land.

Summary: Stakeholder Feedback/Considerations for Development of the Draft Guide

Themes

Stakeholders' feedback on the proposed policy direction and revisions has been categorized into five main themes:

1. Government response to Professor Lahey's *An Independent Review of Forest Practices*
2. Clarity within the revised guide
3. Balancing values over the long term
4. Ecological forestry at the stand level
5. Implementation of the revised guide

Stakeholders also identified strengths and opportunities for improvement within the department's consultation process. These comments have been considered and will be incorporated, where possible, in subsequent plans for consultation on the draft guide.

1. Government Response to Professor Lahey's *An Independent Review of Forest Practices*

Summary of Feedback

- The government's response to Professor Lahey's *An Independent Review of Forest Practices in Nova Scotia* is piecemeal and uncoordinated. The department needs a plan to explain how its ecological forestry projects will be implemented in conjunction with one another.
- Some stakeholders feel the process may be rushed, politically driven, and based on popular opinion, not science. However, others feel that revising the guide to place a priority on ecological values is overdue.

How is the guide being developed in conjunction with other projects to implement ecological forestry?

Government identified and prioritized revising the guide as a key change to begin implementation of ecological forestry on Crown land and to realize changes on the ground as soon as possible. The new guide, however, is not being developed in isolation. Project teams are in place to support development and implementation of key elements of sustainable forest management and ecological forestry (e.g. natural disturbance regimes, high-production forestry, old-growth forest, species at risk, environmental assessment, among others), and their work will continue to influence ongoing revisions to the guide. The guide will be adaptive and revised as new information is gathered.

In December 2018, the Interim Retention Guide was created to act on the government's commitment to implementing ecological forestry by immediately requiring retention in stands that previously had no retention beyond legislated requirements (e.g. Wildlife Habitat and Watercourse Protection Regulations, and Special Management Practices). The Interim Retention Guide will continue to be implemented until the transition to the revised guide is complete. Decisions have not yet been made on when the revised guide will become operational.

Content in the draft guide is rooted in science. The project team reviewed a broad range of scientific research and examined experiences in other jurisdictions to develop a proposal for how best to place a priority on biodiversity and ecosystems in the draft guide. In addition to references in the draft guide, a literature review has also been provided as supplementary material.

2. Clarity within the Revised Guide

Summary of Feedback

- The scope, goals, and objectives of the guide need to be clearly defined and aligned with Lahey's recommendations.
- The audience for the guide needs to be clearly identified.
- Terminology needs to be simple, consistent, and aligned with Professor Lahey's recommendations.

What is the guide aiming to achieve?

The draft guide describes appropriate silviculture and harvesting practices for the ecological matrix zone of the forest where “...conservation and production objectives are both applicable and combined” (Lahey, 2018). As proposed, the draft guide aims to facilitate the practice of ecological forestry on Crown land by promoting long-lived, multi-aged, multi-species forests to maintain and enhance biodiversity and to reduce clearcutting on Crown land. It does so through increased retention requirements in stands that would have been prescribed clearcut treatments in previous versions of the guide, and through enhanced requirements for ecological values in PTA data collection.

Silviculture and harvest practices in the final version of the guide will be required on Crown land. The guide is not required to be followed on private lands but is offered as an example for private landowners.

Professor Lahey’s recommendations are reflected in the terminology used in the draft guide. A glossary is included in the draft guide to ensure consistency in understanding and application of the terminology. The draft also includes a new title, *A Silviculture Guide for the Ecological Matrix*, to better reflect the scope and scale of the contents.

3. Balancing Values over the Long Run

Summary of Feedback

- How will the guide support the transition toward the practice of ecological forestry, balancing ecological, social, and economic values?
- The guide should reflect multi-scale planning (landscape scale in particular) to achieve ecological forestry goals on a broad scale.
- The team should consider economic and operational impacts, including impacts to wood supply, when developing the guide. A deeper understanding of these impacts should be known before the guide is finalized and implemented.
- Traditional uses by Indigenous peoples should be reflected in the guide.

How will the guide contribute to a balanced approach to forest management?

The triad model of forestry aims to balance ecological, social, and economic values across the forest landscape by identifying areas of forested land suitable for conservation, mixed use (ecological matrix), and high-production forestry. Professor Lahey concluded that these objectives should be balanced within a forest management framework that gives priority to the protection and enhancement of ecosystems and biodiversity. This is primarily grounded in the notion that they provide the foundation for a strong, sustainable forest industry over the long term.

As noted in **Dr. Graham Forbes’ paper on the triad model of ecological forestry**, all three zones in adequate proportions are required to meet objectives for all values. The draft guide proposes silviculture and harvesting practices for use within the ecological matrix zone. These practices are designed to maintain and enhance biodiversity while also contributing to wood-supply objectives. Requirements for criteria for the high-production forestry zone are currently under development, in consultation with stakeholders, through a separate but parallel process.

Coordinated analysis and implementation of practices within each of the zones will help us to strike the right balance for forest management that meets the needs of Nova Scotians.

Landscape-level planning is also important to successful implementation of the triad model. The department continues to work on landscape scale planning, which will then be coordinated with implementation of the triad model. The guide is adaptive in nature and can be revised as new information becomes available.

An impact analysis of the proposed requirements in the draft guide is underway and will include impacts to wood supply.

Regarding the incorporation of traditional use considerations, this will be further explored as part of the consultation process that has been initiated on the guide between the department and the Mi'kmaq.

4. Ecological Forestry at the Stand Level

Summary of Feedback

- The guide should provide more active restoration techniques to move toward restoring Acadian Forest ecosystems. However, there are opposing views for how this could be carried out (e.g. clearcutting/planting vs. leaving long-lived intermediate-tolerant [LIT] species).
- There is general agreement that increased retention would maintain and enhance biodiversity. However, some felt that variable retention would have negative implications for soils, nutrients, and tree form.
- Some felt the proposed retention targets would have negative consequences for operations and these consequences should be weighed against ecological benefits. Others felt targets were not strong enough to maintain and enhance biodiversity.
- The revised guide should allow for flexibility at the stand level in terms of harvest treatment, without additional approvals, based on defined parameters and harvest practices that are aligned with ecological forestry, uneven-aged management, and promotion of species diversity.
- Decision keys need to be restructured to prevent preference for clearcuts/even-aged treatments, as per Lahey's recommendations.
- Biodiversity value (e.g. habitat features, landscape connectivity, etc.) requirements in the PTA should be increased, and PTA decision criteria should be revised to reflect ecological forestry. PTA prompts should reflect the assumption that LIT and Acadian Forest conditions are a priority.
- Nutrient budget model (NBM) should be included in the guide as a forestry response to poor soil and to manage soil nutrients.
- The guide should include expected stand development, species composition, and age-class structure of different treatments, dependent on forest type. The guide needs to clearly identify the timeframe considered for treatments and address next steps for each site.
- The guide should support biodiversity and protect species at risk by including additional restrictions on harvest operations reflecting possible impacts to species at risk and other biodiversity considerations (e.g. bird nesting season).

Why retention?

A key objective of the draft guide is to restore LIT species. By prescribing increased retention of LIT species, where they would naturally occur, the guide can help increase the natural regeneration of LIT species by providing shade and retaining trees that will produce seed.

The scientific literature on the benefits of retention for biodiversity is vast and the general consensus is that benefits to biodiversity are directly correlated with retention. Increased retention generally results in a greater number of forest species and higher number of individuals when compared to clearcuts. Another reason for increasing retention is to emulate natural disturbance patterns. The guide will continue to change over time through a process of adaptive management as the work of the natural disturbance regime project team (and other project teams) advances and our knowledge grows and changes.

The draft guide proposes retention levels of 20 per cent, 40 per cent, and 60 per cent+ because they represent a spectrum of retention levels that satisfy minimum biodiversity requirements for a variety of taxonomic groups, and/or provide shade to promote LIT regeneration. The variety of retention levels should provide a range of habitats for species that require open-habitat early-seral conditions, and closed-canopy mid- to late-seral conditions.

In addition to biodiversity needs, the draft guide uses a variety of factors to determine retention targets for a particular stand. These differ depending on which forest group and vegetation type is applicable. Some examples include LIT species, percentage acceptable growing stock (AGS), basal area, windthrow hazard, abundance of existing natural regeneration, age, species content, growing stock, size class, shade tolerance of desired species, natural disturbance, previous treatments, horizontal structure of the stand, and height of stand. Basal area is used instead of crown closure to measure removals, as crown closure is difficult to measure consistently in an operational cruise.

Both merchantable and unmerchantable live trees are included in retention. In addition to providing shade and a seed source for regeneration of LIT species, retention is also important for biodiversity by providing habitat for species through the next regeneration period, providing for in-stand structural complexity and biological legacies, and ecological connectedness with adjacent areas.

How will decision keys change?

The draft guide prescribes multi-aged, multi-species management harvesting methods as a first choice. It proposes increased post-harvest retention levels in all harvests that would have led to clearcut prescriptions in the previous version of the guide. It does so through implementing the irregular shelterwood system to retain mature trees over an extended period to create or maintain multiple age classes. Selection systems will maintain the same level of retention (60–70 per cent) as outlined in the previous guide.

Even-aged clearcut treatments, such as overstory removal, seed tree harvest, and traditional shelterwood, are not included in decision keys in the draft guide. These types of even-aged silviculture systems are, however, discussed to provide guidance to forest managers operating on private land who choose to use even-aged methods, and because many mature stands existing on the landscape are even-aged. Commercial thinning is prescribed in the draft guide as it can be an appropriate partial harvesting prescription for even-aged managed forests (e.g. existing plantations, pre-commercially thinned natural forests).

The PTA system is flexible; it includes user-defined prescriptions that allow licensees to propose alternative prescriptions. These proposals will be reviewed by the department's Integrated Resource Management Team before possible approval to ensure the outcomes of the alternative remain aligned with overarching goals for forestry on Crown land. For example: if the guide prescribes a treatment that is operationally not feasible due to site limiting conditions (ex. steep or rocky terrain), an alternate plan may be proposed.

Which biodiversity characteristics have been added to the draft guide for consideration?

The draft guide includes descriptions of stand and tree characteristics important to maintain and enhance biodiversity. It proposes expanded criteria for PTA, including the introduction of wildlife habitat requirements, such as vertical structure, snags, and coarse woody material, to establish performance targets. The PTA process will be described in greater detail in a revised **PTA procedures document** which will be revised once the revised Forest Management Guide is completed. To ensure that harvest prescriptions are in keeping with nutrient sustainability estimates, harvest mean annual increment (HarMAI) values (total merchantable harvest volume/age of harvest material) must be calculated and compared to the sustainable mean annual increment (SusMAI) tables. If HarMAI is greater than SusMAI for a given vegetation type (VT) and soil type (ST) combination, then harvest plan adjustments must be made. While the draft guide itself does not use the NBM directly, NBM will be used in Crown land planning and will be required on Crown land.

The draft guide also includes descriptions of expected future timing of treatments for each of the silviculture systems prescribed in the draft guide or previous guides (e.g. irregular shelterwood, selection, traditional shelterwood, clearcut) in order to aid in silviculture intervention planning. Timelines for each of the treatments are demonstrated in Figures 10–14 within the draft guide.

Will the guide include special consideration for species at risk?

Special management practices (SMP) for species at risk are not part of the guide but are required on Crown lands and are incorporated within the department's harvest approval process. SMPs are required practices and must be followed. The regional wildlife biologist may recommend modified applications of SMPs at the local site level to achieve the intent of the SMP. A variety of factors could impact the application of the SMP, including the season, topography, hydrology, forest cover, past management practices, land ownership patterns, and other local considerations. New SMPs will be developed and existing ones revised, as required, and will be considered when new species are listed, or when their status and/or recovery plans are revised.

5. Implementation of the Revised Guide

Summary of Feedback

- Implementation needs to be practical, feasible, and realistic for operations.
- Consider implementing the guide on an interim basis to determine economic and ecological impacts and linkages to silviculture funding before finalizing – and waiting until all pieces of ecological forestry have been implemented.
- How will the province measure/monitor impacts of new guidelines?

How/when will the guide be implemented?

The department's primary goal at this stage of the project is to revise the existing guide to place more emphasis on ecological values. Decisions around how and when the guide is implemented will be considered during the next phase of the project in consultation with internal/external experts and stakeholders, and in consideration of other related work underway to implement ecological forestry on Crown land. The department is committed to ensuring that interested stakeholders and users of the guide can meaningfully participate and provide input regarding decisions around implementation.

Factors that influence implementation include training and education, use of technology to improve efficiency and effectiveness, and how the changes will be monitored to support an adaptive approach to achieving ecological forestry. The department is working with researchers to analyze technologies for assessing retention levels in stands, as well as training to support development of ecological forestry concepts as laid out by Professor Lahey.

The Interim Retention Guidelines, introduced in December 2018, will continue to be implemented until the transition to the revised guide is complete.

Summary of Key Proposed Revisions to the Guide

Significant revisions to the existing February 2018 version of the guide are proposed in the draft guide as a result of stakeholder feedback and the government's ongoing commitment to placing a priority on biodiversity and ecosystems within an ecological forestry framework.

Key proposed revisions in the draft guide include

1. expanding consideration for biodiversity with varied retention levels and expanding criteria for pre-treatment assessment (PTA)
2. removing recommendations for following even-aged silvicultural treatments: overstory removal, seed tree, traditional shelterwood systems (uniform and patch). Previous pathways to overstory removal, seed tree, and traditional shelterwood treatments now lead to irregular shelterwood systems.
3. adding requirement for a minimum of 20 per cent (basal area) retention on all sites
4. expanding silvicultural steps and timelines within the guide
5. adding a section on soil health
6. simplifying the content and structure
7. adding a glossary of terms for consistency in application

Next Steps

Consultations on the draft guide will continue, including opportunities for public opportunity to comment on a subsequent draft of the guide.



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