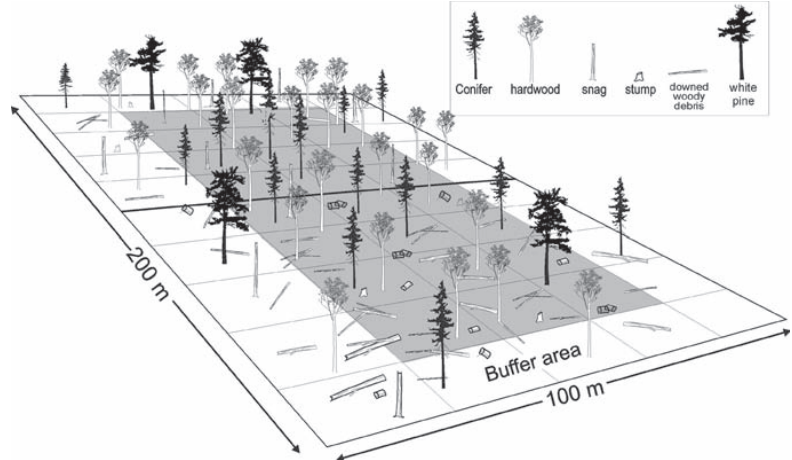


Forest industry adopting NEBIE intensive forest management framework

By Lisa J. Buse

When OFRI research scientist Wayne Bell began establishing a network of research plots across Ontario in 2001 to study silvicultural intensities, he did not foresee engaging in major terminology discussions or influencing forest industry's management planning approach.



“I’ve always been frustrated by the lack of consistency in defining silvicultural intensities and treatments,” Bell states. “After many years of effort by many individuals, helped along by the *Ontario Forest Accord*, the Ministry of Natural Resources has agreed on definitions of intensity for silviculture. Now we can work towards operational applications based on these definitions.”

Jeff Leach, Tembec silvicultural specialist based in Kapuskasing, recently adopted the NEBIE framework as a means to incorporate silvicultural objectives in the forest management plan under development for the Romeo-Malette Sustainable Forest License. Leach emphasizes, “The NEBIE framework has provided a way of organizing our silvicultural objectives and treatments by intensity level. The network benchmarks the intensities and provides a common language for communicating about silvicultural practices, a framework within which to apply treatments consistently, and a meaningful way to track treatment effects through time.

“When we do our planning, we have results from the plot network to point to,” he continues. “As well, I see the network as providing a reference point to tie in other aspects of forest management, such as species- and site specific yield curves for managed stands.” (*Yield curves* are projections of how stand volume will grow over time.)

What is the purpose of the NEBIE plot network?

“Past silviculture research has studied the effects of individual treatments, such as stock type, vegetation management, or thinning, on specific stages of forest crops,” Bell explains. “Although results of this research have been used to develop silviculture guides, many uncertainties exist, making it difficult to apply the results to growth and yield predictions.

“What’s different about the NEBIE plot network is that rather than studying the effects of individual treatments in the short term, we are looking at how eight common forest types respond to treatment portfolios over the longer term. These treatments range from letting nature take its course to using typical silviculture practices to applying more intensive practices. Hence the acronym *NEBIE*, which stands for **n**atural disturbances and **e**xtensive, **b**asic, **i**ntensive, and **e**lite levels of Silviculture – the range of intensities being studied across the managed forest area of Ontario.”

The NEBIE approach is similar to the TRIAD approach used in B.C. and Quebec, which recognizes natural, extensive, and intensive treatments. With TRIAD, all artificial regeneration efforts are considered intensive, but NEBIE recognizes four levels of investment – extensive, basic, intensive, and elite.

According to Bell, NEBIE researchers are not only determining the effects of natural disturbances and the range of silvicultural practices on forest crops, including tree survival, growth, wood quality, and genetic diversity, but are also monitoring effects on other aspects of the forest, such as microclimate, soil moisture and nutrient cycling, vegetation diversity, and wildlife habitat.

“We hope to provide forest managers with a complete picture of the pros and cons of their management efforts by forest type,” Bell emphasizes. “Ultimately, we are aiming to develop a defensible database to accurately forecast allowable cut while maintaining the ecological and economic viability of Ontario’s managed forests.”

Why do we need a NEBIE Plot Network?

NEBIE supports current ministry priorities including:

- Ontario’s biodiversity strategy – by tracking how various forest management intensities affect native and invasive non-native plant species
- Provincial wood supply strategy – by monitoring 640 permanent growth plots in eight forest types to help improve managed stand yield curves that are linked to current practices and can be applied in forest management planning
- Silviculture strategy – by developing clear definitions and common standards for silviculture intensities and related practices
- Biofire policy – by monitoring the environmental effects of removing biomass in various forest types

Jeff Leach cites more operational applications: “What industry needs is *just-in-time* delivery of forest products. As the landbase available for forestry shrinks, we’re looking to results from the NEBIE network to help us plan for specific products within a given timeframe, sustainably produced to meet our forest management objectives and certification criteria. Data from science-based plot networks such as NEBIE, combined with enhanced forest resource inventories and spatial models, will help to get us there.”

Bell points out that they ensured that the study sites are within a short drive of a major centre. Al Stinson of the ministry’s Southern Science and Information Section has worked closely with the Canadian Ecology Centre-Forestry Research Partnership (CEC-FRP) since NEBIE’s inception, and he reports that he often uses the site near North Bay. “The network plots are great for tours – an easy way to explain the complexities of forest management to audiences such as attendees of the CEC-FRP annual teacher tours, visiting delegations, and students,” Stinson says. “We visit the site regularly for workshop and conference field tours.”

The network is also available to other researchers. For example, in partnership with Nipissing Forest Resource Management, OFRI research scientist Tom Noland has established Canada yew on the elite treatment plots on the North Bay site. “We jumped at the opportunity to establish a newly developing non-timber forest product on a semi-operational site,” he says. “We hope to document that more than just wood fibre can be produced on these sites, to diversify and hopefully increase their economic potential.”

What have we learned so far?

The network of 160 two-hectare plots is beginning to yield information. For example:

- ***Natural forest diversity:*** Pre-harvest species diversity ranged from 72 species in the jack pine-black spruce forest on sand near Sioux Lookout to 244 species on the 100-year-old mixed white pine site near Petawawa. No alien species were found on any of the sites prior to harvest.
- ***Coarse wood volumes:*** Pre-harvest volumes ranged from 16 metric tonnes per hectare on a 91-year-old forest near Timmins to 64 metric tonnes per hectare on a 112-year-old forest near Kapuskasing; both were conifer mixedwood forests that originated from burns.
- ***Pre-harvest merchantable volumes:***
 - Petawawa (white pine, red pine, sugar maple mixed): More than 300 cubic metres per hectare
 - Timmins and Kapuskasing (mixedwoods): About 225 cubic metre/hectare
 - Sioux Lookout (jack pine-black spruce) and North Bay (hard maple): About 180 cubic metres/hectare
 - Thunder Bay (aspen mixedwood) and Wawa (birch mixedwood): Less than 150 cubic metres/hectare
 - Dryden (mixedwood): 65 cubic metres/hectare

What are the next steps?

All of the pre-treatment data have been collected. All but two sites (Wawa and Thunder Bay) have been harvested, and regeneration treatments have or are now being applied. Bell and his partners will summarize pre-treatment data to provide a baseline for comparing future treatment effects. They are starting to collect posttreatment data to quantify the effects on tree growth, plant diversity, coarse wood, and soils. Look for a project establishment report in early 2008.

For more information about the NEBIE plot network, visit the *Research* page of OFRI’s website (ofri.mnr.gov.on.ca) or contact Wayne Bell at (705)946-7401, wayne.bell@ontario.ca. To get a copy of *Is Intensive Forest Management a Misnomer? An Ontario-Based Discussion of Terminology and an Alternative Approach*, call the OFRI publication request line at (705)946-2981, ext. 271, or e-mail information.ofri@ontario.ca.