



CANADIAN FOREST SERVICE

Science HIGHLIGHTS

FOREST MANAGEMENT POLICY

Can forest management sustain biodiversity by mimicking the natural forest?

Managing forest ecosystems as integrated systems is leading to better forest management policies

Forest ecosystem management is an emerging school of thought that says in order to maintain ecological processes and biodiversity over the long term, forests must be managed in a more holistic way. The many proponents of forest ecosystem management all share a common goal—to preserve biodiversity and ecosystem integrity by establishing and respecting ecological targets. Targets must be measurable and backed by scientific data. An example of a forest ecosystem management target would be to retain a certain percentage of mature and old forests over a specific area.

“We establish targets, and then these targets are linked to management practices and strategies that maintain biodiversity. These targets can be modified to suit different stakeholders, but any tradeoffs are made on the understanding that they may affect the ecological integrity of the forest,” says Sylvie Gauthier, a research scientist at the Canadian Forest Service–Natural Resources Canada. She is based in the Laurentian Forestry Centre in Québec City.

Natural disturbances like fire guide forest ecosystem management

Gauthier played an important role in establishing the scientific basis of forest ecosystem management. Her research showed that in boreal forests of Eastern Canada the average fire interval exceeds 100 years, leading to large areas of old-growth forest. Once this fact was established, it became easier to demonstrate that forest management policies needed to take a more varied natural approach if biodiversity was to be preserved.

Today, linking the impact of natural disturbances like fire and pests to forest ecosystem management strategies is proving to be an important way to meet targets for biodiversity and ecosystem integrity. By establishing guidelines based on natural disturbances, forest ecosystem management strategies minimize differences between natural forest conditions and those generated by forest harvesting and management.

For example, a fire not only kills trees, it also burns some of the organic matter on the forest floor. This creates good conditions for certain tree species to re-establish and grow well after a fire. “Harvesting removes the trees but doesn’t disturb the soil. So we advocate prescribed burning or scarification to disturb the

Overview

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A forest ecosystem mindset is taking root at several forestry companies across Canada.



Old growth stand in Quebec’s boreal forest

organic matter on the forest floor in order to maintain the productivity of the forest,” Gauthier says.

Focusing on frequency, size and severity of natural disturbances is key to forest ecosystem management

Gauthier and her colleagues focus on three elements of natural disturbances to help set targets for sustainable forest management—frequency, size and severity—to reduce the differences between natural landscapes and those that are managed.

Frequency or “return interval” describes the time between natural disturbances. For example, fire return intervals vary greatly between and within regions, depending on factors like natural features and climate. Conversely, traditional harvesting policies tend to be regularly scheduled, which usually eliminates the old forest part of the natural landscape.

Size is another important disturbance variable. Large or small areas may be affected by a fire or insect infestation, but fires tend to be far from one another. Harvesting is typically conducted over uniformly sized areas and cut blocks are close together.

Severity or intensity is another important way to compare forest ecosystem management to more standard harvesting regimes. Forest ecosystem management strategies aim to reduce these differences—notably by varying harvesting intensity levels and return intervals so a less uniform, more natural forest composition is preserved.

A holistic approach to forest management is gaining a wider following

A forest ecosystem mindset is taking root at several forestry companies in Manitoba, Ontario and Quebec. This holistic approach integrates ecological principles into the practices of forest management in several jurisdictions across Canada. “These principles are also helping companies to get their third-party forest certification, which is very important for the reputation and international competitiveness of Canadian forest industries,” Gauthier says.

She remains committed to providing workshops and technical papers to help forest managers and government policy makers take a holistic approach to managing Canada’s forests. “More diverse forests are healthier and better able to withstand emerging pressures like climate change. Ecosystem management is the best way to allow managed forests to keep playing their historical ecological role and also remain economically productive.”



Experimental fire at Sharpsand Creek in Ontario

