



FRONTLINE

policy perspectives

RIPARIAN HARVESTING POLICY

NOTE 2

GLFC SCIENCE INFLUENCING FOREST POLICY



Riparian buffers can result in “donuts” of un-harvested forest around waterbodies.

THE CHALLENGE

Riparian habitats are the important transition zone between terrestrial and aquatic environments. They help to regulate the flow of water, nutrients, biomass and sediments between the two ecosystems and create critical habitat for a variety of terrestrial and semi-aquatic species. In virtually all jurisdictions across Canada, these areas receive special forest management prescriptions, often in the form of restricting harvest through the application of buffers, to protect aquatic systems from upland forest disturbance.

Approaches to forest management have evolved in the past two decades, with many jurisdictions across North America now recognizing the importance of planning and managing forests at a larger, landscape scale. When planning the design of industrial forest management activities, some jurisdictions, such as in the province of Ontario, even attempt to mimic the age classes, arrangement and size of forest disturbances that would be expected by natural processes common to Canadian forests, such as wildfire and defoliating insect activity. The underlying tenet of such forest management approaches is to consider the cumulative impacts of forest harvesting and silvicultural practices on the arrangement, age classes, and biodiversity of an entire forested ecosystem.

Given the paradigm shift to landscape-based forest management throughout North America, the suggestion has been made that systematically applying riparian buffers during forest harvesting operations actually contributes to unnatural landscape patterns, resulting in “donuts” and “ribbons” of unharvested forest, which typically consist of older, shade-tolerant tree species. Considered at a landscape scale, the cumulative effects of applying these riparian policies may significantly skew age-classes and patterns of residual and future forests relative to what would be expected to occur normally as a result of natural disturbances.

SCIENCE INFLUENCING POLICY

Three long-term, multi-agency research projects conducted in Ontario by Great Lakes Forestry Centre (GLFC) scientists are investigating how forest harvesting operations can have an impact on the ecological integrity and water quality associated with riparian areas. Their research is contributing to the review of riparian forest management strategies and policy across North America, including in Ontario, where a comprehensive forest management policy review and revision initiative is currently underway.

The Esker Lakes Research Project (ELRP), located in Ontario's boreal forest, was established to evaluate the effectiveness of current provincial riparian policies that require slope-based buffers ranging from 30m to 90m in width during forest operations. GLFC research at ELRP has largely focused on soil and soil-water nutrient cycling through riparian areas following upland forest harvesting, and although on-going, has already demonstrated a range of impacts that different silvicultural systems (e.g., full-tree vs. partial-tree harvesting) can have on riparian and ecosystem carbon pools. GLFC research at ELRP has also highlighted the limitations associated with developing riparian buffers solely based on slope, suggesting that the width of buffers should also be contingent on stand characteristics and soil types to facilitate the maintenance of terrestrial nutrient cycling and water quality.

The Turkey Lakes Tolerant Hardwoods Ecosystem Research Project (TLP) is another collaborative research initiative led by GLFC scientists. Research at TLP has included studies to determine whether mechanized forest harvesting of tolerant hardwoods can be conducted without riparian buffers and without adverse effects on the ecosystem. A range of ecosystem processes, such as stand structure and function, soil and nutrient cycling, and water yield and quality were intensively studied before and after forest harvesting operations, allowing researchers to study the effectiveness of riparian areas to mitigate the potential impacts of upland forest harvesting. Some study results, such as fine sediment deposition in streams following harvesting treatments, have highlighted both the potential benefits and the null effects that riparian buffers can have in mitigating environmental impacts.

The White River Riparian Harvesting Impacts Project (WRRHIP) is an on-going GLFC research project located in the boreal mixedwood forests of Ontario. At this site researchers are studying the ecological benefits, environmental impacts and operational feasibility of partial harvesting within riparian areas. This detailed and collaborative study involves partially harvesting riparian buffers and measuring the impacts on the surrounding forest conditions and nutrient cycles, hydrology and soil chemistry, in-stream productivity and habitat, and songbird communities. The results from WRRHIP will be used to evaluate whether partial harvesting within riparian buffers is compatible with the environmental protection objectives of provincial guidelines, and if so, whether 'modified-harvest' riparian buffers could be a viable option for managing riparian zones to sustain riparian ecological function, improve stand and habitat quality, and increase access to wood supplies.



Riparian forest being partially harvested during a GLFC research

BENEFITS TO CANADIANS

Canada has a long-standing reputation of leading in the development of science-based forest management policies; policies that serve as the cornerstone of sustainable forest management. Riparian forests protect water quality and fisheries habitat, regulate nutrient cycles, and provide critical habitat for numerous wildlife species, yet research studying the responsible management of these forested areas has historically been lacking. The riparian research conducted by GLFC scientists is helping to inform forest management regulators across North America as they develop alternative, science-based management strategies and policies that will allow for the continued environmental benefits of riparian areas, provide for a more ecologically representative forested landscape, and potentially improve access to merchantable wood supply.

KEY POLICY CONSIDERATIONS

GLFC riparian research contributes to the development of alternative forest management techniques and strategies, and helps to fulfill requirements of the federal Minister of Natural Resources under the Department of Natural Resources Act, which seeks to enhance the responsible development and use of Canada's natural resources and the competitiveness of Canada's natural resources products.

As a signatory to Canada's National Forest Strategy, 2003-2008, NRCan-CFS supports the management of Canada's natural forests using an ecosystem-based approach that maintains forest health, structure, functions, composition and biodiversity.

Ontario's Crown Forest Sustainability Act requires the emulation of natural disturbances and landscape patterns during forestry operations. The riparian research conducted by GLFC scientists will help provincial forest managers meet this legislated obligation.

GLFC's riparian research is contributing to the review of forest management policy in Ontario, including revisions to the Natural Disturbance Pattern Emulation Guidelines, the Timber Management Guidelines for the Protection of Fish Habitat, and the Code of Practice for Timber Management Operation in Riparian Areas.



GLFC researchers monitor the aquatic biota of a boreal forest stream following partial harvest experiments within riparian forests.

SUGGESTED READING

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ISSN 1915-9560

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