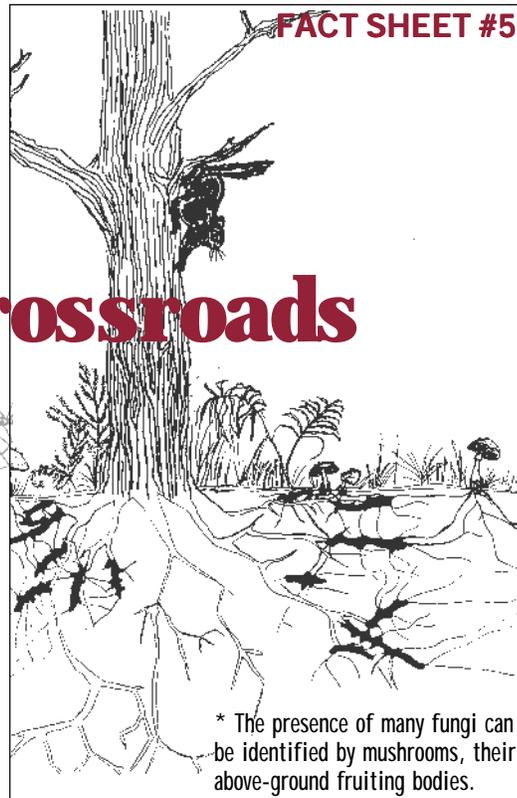


The State of Ontario's Forests

Biodiversity at the Crossroads



MANY FUNGI ARE CRITICALLY IMPORTANT FOR TREES, extending filaments from tree roots through the forest soil and assisting in the uptake of nutrients.* Probably under 5% of the world's fungi has yet been identified¹⁰ and this fungal diversity is thought to be concentrated in temperate forests like those in Ontario. Careless forest management practices can damage or destroy these little-understood living soil elements.



* The presence of many fungi can be identified by mushrooms, their above-ground fruiting bodies.

ILLUSTRATIONS BY NANCY SICILIANA

Ontario's forests have changed dramatically over the last two centuries, with many tree species in decline and significant amounts of the forest landscape now fragmented and simplified (see *Fact Sheet #4* for details). These changes have created problems in wood supply for the province's forest industry, but the effects do not end there. The province is also facing the possibility of a profound loss of biological diversity — diversity that is the underpinning of our economy and quality of life.

A forest is more than trees. It is a complex association of herbaceous and woody plants, mammals, birds, insects, bacteria, fungi, soil micro-organisms, and many other living organisms. None of these life forms exists in isolation; they are part of an intricate web where each element supports and is nurtured by other elements.

These relationships are at risk as Ontario experiences a dramatic — and accelerating — rate of change toward younger, more divided and less varied forests.

Disappearing old-growth Habitats at risk

Relatively old, undisturbed forests offer critical habitat for plants and animals that young forests are unable to provide. They will often have a range of canopy layers that provide varying microclimates of temperature, air movement and moisture. Trees in different stages of decay (dying trees, standing snags and rotting logs) are rich sources of nutrients and shelter.

Recent studies in Sweden and Germany indicate that old-growth forests develop extremely complex, mutually beneficial relationships with fungi and lichen.¹ Undisturbed European forests support literally hundreds of different species of fungi, while younger forests contain only 25 to 50 species.² This evidence suggests that the loss of Ontario's old-growth forests could irreparably harm the critical, but little-understood relationships between trees and soil micro-organisms.

The effects of overcutting commercially valuable tree species can echo throughout the forest

continued next page

This is the fifth in a series of fact sheets examining the economic links between healthy forest ecosystems and sustainable communities in Ontario. This issue looks at the threats to Ontario's biological diversity (particularly the rich and varied life forms that make up its forest ecosystems) and the implications of this decline for forests and human communities.

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ecosystem. Decimation of the province's large white pines represents the loss of nesting habitat favoured by over 75% of bald eagles and osprey and a loss of the cub-refuge-tree of choice for over 90% of foraging female black bears.³ Similarly, the decline of mature conifer forests in northern Ontario threatens the preferred habitat of many mammals and birds, including white-winged crossbills, boreal owls, broad-winged hawks, three-toed woodpeckers, ovenbirds, red squirrels and American martens.⁴ Some of these species are critical to the forest ecosystem; their loss would have a cascading impact on other inhabitants and processes essential for a healthy forest.⁴

Forest Fragmentation

Islands of diversity in oceans of disturbance

Forest fragmentation is a growing concern throughout the province as networks of roads, urban developments, logging operations and other human disturbances carve many natural forests into smaller and more isolated pieces. The resulting islands of wilderness are often too small to maintain healthy gene pools or vigorous populations of plants and animals over the long term.

Disturbed areas as narrow as a roadway or hydro corridor can fragment forest ecosystems, interfering with normal forest functioning to such an extent that "a band of about 400 metres on either side of the route is effectively lost".⁵ They can discourage large mammals and pose a formidable barrier to multitudes of small, slow-moving life forms that live at or below the forest floor.

Logging roads are a particular problem. These road networks are rapidly expanding into remote wilderness areas in order to reach a declining timber supply. Once built, they continue to provide

avenues for hunters, anglers and others into previously unreachable wilderness — increasing the strain on formerly well-protected plant and animal communities. It has been recognized for decades that even moose, with a preference for the young growth associated with cutovers, often undergo sharp density declines in recently logged areas because of the heavy hunting pressures associated with new roads.⁶

Shifting the Natural Balance

Populations in crisis

The rapid rate of large-scale human change to the forest landscape endangers the survival of some species, while promoting a destabilizing population explosion in others. White-tailed deer, for example, were once confined to a small area in southern Ontario. Because deer do relatively well in disturbed areas, their numbers have mushroomed in response to land clearing, widespread logging and road building into wilderness areas. They now range as far north as Thunder Bay and beyond.

This spiralling population has serious impacts on other forest inhabitants, both animal and plant. Deer carry a brainworm that is potentially fatal to moose. As the numbers of formerly rare deer

APPARENT FORE

■ Forest cover distrib

THE FRAGMENTING IMPACT OF ROADS
HUMAN DISTURBANCES: Many birds require undisturbed habitat in the depths to breed successfully. Interior woodland the winter wren, wood thrush and the black warbler prefer nesting sites in the order metres from the forest edge; otherwise they are vulnerable to predators and nest parasites (eg. raccoons, foxes and cowbirds) that favour woodland edge and forest openings.

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APPARENT FOREST COVER

REAL INTERIOR FOREST HABITAT*

ation

■ Interior forest 300m from edge

S AND OTHER
nd animals
of the forest
birds such as
ck-and-white
of 300



With this in mind, the above maps of a section of southern Ontario compare the APPARENT forest cover (left) with the REAL habitat available to interior woodland species (right) when roadways and other permanent openings are taken into account. Even where substantial wooded areas exist, only tiny, isolated patches of critical interior habitat are actually available.¹¹

Based on satellite imagery and computer modelling developed by Ontario Hydro 's Geomatics Section.

**300 metres from edge*

expanded in areas such as Algonquin Park, moose populations became infected and suffered severe dieback. At the same time, while logging removed much of the mature yellow birch from the area, deer had an appetite for the new growth; the result was the virtual elimination of all young yellow birch seedlings from the park.⁷

In response to the declining availability of certain forest habitats, many plant and animal species are undergoing similarly profound changes

in their populations. However, work has barely begun on identifying and monitoring many of the organisms affected. We do know that between June 1989 and January 1993 the number of Ontario species officially listed as Rare, Threatened or Endangered rose from 63 to 76 — an increase of 20%.⁸

While much of this species decline is concentrated in southern Ontario (a region where little natural forest habitat remains), the threats to biodiversity are real for the remainder of the province as well. The continuation — indeed, acceleration — of widespread clearcut logging (see *Fact Sheets #1,2,3*) and the ongoing loss of habitat throughout Ontario's productive forest landscape points to a crisis of mounting proportions for central and northern Ontario. For many species (the secretive lynx, for exam-

ple), difficulties in population monitoring mean that we may not recognize the extent of the problem until it is too late.

Timber "Management"

Risking Ontario's biodiversity capital

Science still does not understand the complexities of how forest ecosystems work. We can not "manage" the forest with certainty because we do not know exactly how the pieces fit together. But,

continued next page

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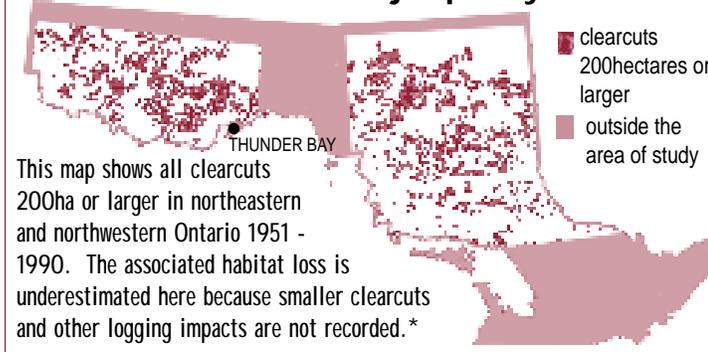
**Complete references available upon request*

Biodiversity at the Crossroads from page 3

despite this lack of understanding, Ontario's forests are being drastically changed in ways that alter the balance of once-stable systems and threaten the survival of many species whose roles in the forest we do not yet — and may never — comprehend.

As Ontario residents, our economic well-being depends on the forests for far more than timber. Healthy forest ecosystems purify our air and water. In addition, they provide herbs for medicines and food, wild genetic stock to invigorate our agricultural crops, animals for meat and fur, natural areas both for the tourism and recreation industries and for our own quality of life. Some of these benefits have been quantified in dollars terms; Ontario residents, for example, spent \$2 billion on wildlife-related activities in 1991.⁹ Other forest benefits

Clearcuts of Northern Ontario: habitats in jeopardy



either do not have an obvious monetary price tag or they have simply been taken for granted.

Biodiversity is the fundamental capital that sustains our economy and our quality of life in Ontario. A key

element in restoring and maintaining this diversity is to protect an adequate and representative portion of each of the province's 65 different natural regions — allowing portions of the varied communities of plants and animals in these regions to continue their natural functioning free from the major disturbances of logging, mining and hydroelectric development.

Our future depends on safeguarding the diversity of our forests. Biodiversity is the real wealth, of the forest that we — and our children — can not AFFORD to lose.

Produced by the **Wildlands League** through its Forest Diversity ♦ Community Survival Project, this series seeks to promote constructive dialogue between resource-dependent communities and forest conservation advocates (see *Fact Sheet #1* for more details). We hope the information will be useful in developing economically sound approaches to forest stewardship in Ontario that can help to ensure sustainable economies and sustainable communities. To date, topics in this series include:



- **Ontario's Forest Industry:**
 - #1 *Where Have All the Loggers Gone?*
 - #2 *Cutting the Future Out of Prosperity?*
 - #3 *A New Appetite in the Forest*
- **The State of Ontario's Forests:**
 - #4 *Undercutting Our Natural Capital*
 - #5 *Biodiversity at the Crossroads*
- Upcoming:
 - Greening Ontario's Forest Economy*

Forest Diversity ♦ Community Survival is a project initiated by the **Wildlands League**, and financially supported by the Richard Ivey Foundation and Ontario Hydro. For more information, mail or fax this coupon.

I would like to know more about:

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The Wildlands League, an Ontario chapter of the Canadian Parks and Wilderness Society, has been working for more than 25 years to promote forest protection and sustainable forest management practices in the province.

FACT SHEET # 5