# ALGONQUIN PARK

# *Restoring Nature's Place*

How we can end logging in Algonquin Park, protect jobs and restore the park's ecosystems

ALGONQUIN PARK WATCH

A PROGRAM OF THE WILDLANDS LEAGUE

*A chapter of the Canadian Parks and Wilderness Society*

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*The Wildlands League is dedicated to the protection of Ontario's wilderness and natural areas and to the encouragement of the sustainable use of natural resources.*


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Cover: Barron Canyon Nature Reserve, Algonquin Park.


Cover printed on Sandpiper 100% post-consumer recycled paper.

Inside pages printed on Reincarnation FSC, which contains 50% post-consumer waste, 25% pre-consumer waste and 25% virgin fibre from forests certified under the Forest Stewardship Council system. This paper, produced by Lyons Falls Pulp and Paper, uses wood from the Haliburton Forest & Wildlife Reserve near Algonquin Park.

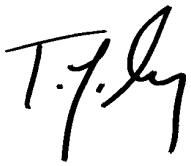
# Preface

This discussion paper has been developed to help in drafting the next steps in bringing the wild back to Algonquin Park.

Algonquin Park "re-wilding"efforts really began with the establishment of the very first white pine nature reserves over 40 years ago. These efforts accelerated markedly in the late 1960s when the newly formed Algonquin Wildlands League, and many others, began calling for more protection for the park. Since then, many positive changes have taken place: New forestry practices have been introduced under the auspices of the Algonquin Forestry Authority; about 20% of the park has been protected from logging; a park management plan has been developed (Ontario's first); and infrastructure such as rail lines and cottage development has been curtailed. These changes have occurred in parallel with increased understanding of natural ecosystems. Increasingly, the public, government agencies and industry value wild places as benchmarks for watching how nature makes decisions when left to its own devices. It is now time for the next steps in translating our evolving knowledge of nature into reality in Algonquin.

We have written this document with a desire to be solution-oriented in efforts to find a way to phase-out logging in Algonquin Park. The report starts by raising and answering basic ecological questions. It then moves on to offer ideas about how we could have a future where all of Algonquin Park is truly protected. These suggestions are by no means exhaustive and are not presented as an end point in the discussion, but rather as a beginning.

An opportunity awaits Algonquin Park and Ontario as we begin the next millennia. Will we build on the efforts of the past 40 years and make a final and historic effort to return the wild to Algonquin?



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# Executive Summary

ALGONQUIN PROVINCIAL PARK is the largest protected area in South-central Ontario, covering 7,633 square kilometres. Almost three-quarters of the park's area, however, is open to industrial logging and related activities, such as road construction and gravel quarrying. This logging disrupts the park's natural communities. The effects of logging in the park include:

- regeneration problems for several tree species;
- disturbance to wildlife;
- habitat fragmentation;
- alien-species invasion (currently, there are more than 200 alien species in Algonquin);
- roads acting as physical barriers to the movement of animals and plants, impairing species reproduction and regeneration;
- human access made easier by logging roads leading to illegal uses (i.e. poaching) in Algonquin's interior;
- sedimentation of streams and wetlands;
- destruction of glacial features by gravel quarrying;
- impaired wilderness experiences for visitors.

One of the largest impacts of industrial forestry is the accompanying wildfire suppression program, designed largely to protect commercial timber supplies. Fire has played a key role in the evolution of Algonquin's forests and its suppression has had the greatest ecological impact on the park's natural communities. (Included in this report is a comparison of the effects of fire and other natural disturbances versus the effects of silvicultural techniques that try to mimic natural disturbances.)

This report discusses how timber harvesting and related activities are undermining Algonquin's role as a protected area. It further considers how a logging phase-out could take place in Algonquin in order to restore the park to its proper role of protecting natural systems and species. The report also acknowledges and describes local economic concerns associated with a logging phase-out and puts forward suggestions for the development of a phase-out framework that builds on existing economic trends and initiatives and that is job neutral or positive for surrounding communities. Elements include:

- strategies for increasing secondary and tertiary jobs from the regional timber supply outside of the park;
- a community transition and Algonquin forest rehabilitation fund using the Algonquin Forestry Authority's $6.9 million accumulated surplus (as at March 31, 1998);
- forest-harvesting techniques that could improve logging practices outside the park and that would also improve both the quantity and quality of timber in the area;
- initiatives to ensure that opportunities to increase tourism-sector employment benefit local communities;
- value-added industries that provide more employment and profit;
- development and enhancement of ecotourism opportunities;
- a fire-management plan that would allow some naturally occurring fires to burn in the park while protecting property and human life.

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# Introduction

## Quick Facts

- largest park in South-central Ontario at 7,633km²
- officially opened as a park in 1893 at 1,466 km²
- only 22 percent of the park is protected from logging (nature reserve, natural environment, development, historical and wilderness zones)
- represents southerly limit of wolf range in Canada
- only park in Ontario open to logging

ALGONQUIN PARK is the only Ontario provincial park in which logging is still permitted. As the largest park in the most developed part of the province, it also represents a unique opportunity for us to protect a large-scale example of the rich forests that once covered Southern Ontario.

While many people associate Algonquin Park with wilderness, only 22 percent of the park is actually protected from logging. Outside of the park's protected wilderness and nature reserve zones, and with the exception of natural environment, historical and development zones, logging can and does take place year-round in the park. There is growing evidence that this industrial activity is having a negative impact on the park's forests and wildlife, which in turn is leading to a growing number of questions about whether timber harvesting is really the best use of such a large, ecologically significant area.

## A Brief Natural History of Algonquin Park

Algonquin Park lies on the southern edge of the Canadian Shield. It sits atop one of the shield's highland domes and ranges from 200 to 500 metres above sea level. This height of land forms the headwaters for such major rivers as the Magnetewan, Petawawa, Bonnechere and Oxtongue.

Algonquin Park is separated geographically into western uplands and eastern lowlands . This difference in elevation has caused vegetative and climatic variations: The east side enjoys 105 frost-free days per year, for example, while the west side has approximately 84. The park's geography also leads to a windward and leeward phenomenon that ensures higher precipitation levels on the west side and a rain-shadow effect on the east side.

*Algonquin is known for its wildlife, including moose*

The forests of the uplands are primarily made up of hardwood tree species such as sugar maple, yellow birch and American beech. Mixed in with these are eastern hemlock, black cherry and ironwood (hop-hornbeam). Before logging began in the park, giant white pines could be found towering above these hardwoods.

In addition to being warmer and drier, the east side has sandier soils, thanks to outwash plains left by the last

glaciation. White pine are well adapted to these environmental conditions and therefore thrive to a much greater extent on Algonquin's east side than they do on the west side.[1]

These sandy outwash plains also support large stands of red and jack pine, the latter being rare on the west side. In addition, pure stands of red oak grow along the east side's rocky ridges.

Researchers have discovered that the hardwood communities that dominate the west side of the park are characterized by relatively low fire frequency and a higher moisture content.[2] The east side's white, red and jack pine stands are maintained by higher frequencies of wildfire and the low moisture regime typical of this area.

## Algonquin's Geography

- the park lies at the southern edge of the Canadian Shield
- covers highlands that range from 200 to 500 metres above sea level
- the west and east sides are separated by these highlands resulting in different microclimates: the west side is colder and wetter and the east drier and warmer
- the western forests are primarily made up of hardwoods such as sugar maple, yellow birch and beech, and conifers such as hemlock and white spruce
- the park's eastern forests are made up mainly of softwoods such as red, white and jack pine and hardwood such as white birch and poplar
- historically, fire played a significant role in maintaining the park's white, red and jack pine communities.

Algonquin is also well known for its wildlife. The park is home to approximately 45 mammal species, 80 bird species, 49 fish species, 30 species of reptiles and amphibians and an unknown number of invertebrates. The park's bear, moose and deer are well known to visitors and its gentically unique wolf population is Canada's most southern (for more wolf information, contact the Wildlands League). Rare species found in the park include red-shouldered hawk, Cooper's hawk and wood turtle. Algonquin also contains Southern Ontario's largest remaining complex of native trout fisheries (brook and lake trout). Lake trout occur in 149 lakes and brook trout in 240 lakes.

Many of the ancestral environmental conditions in Algonquin remain as they have for thousands of years: Individual tree death, windfall, animal predation, and floods all continue to occur. Fire, however, is one agent of change and renewal that has been significantly altered through suppression.

# Logging in Algonquin Park



*Logging in Algonquin, circa 1800s*

### Human History: A Legacy of Logging

Logging in Algonquin began in the 1830s to provide timbers for the English Navy. The park's biggest pines were cut, squared and taken back across the Atlantic, but within 70 years the seemingly inexhaustible big pines had been almost entirely logged out. However, just as the "Square Timber Era" was ending, demand grew for lumber to build settlements in the relatively treeless American midwest.

By the end of the 19th century, there was growing citizen concern about the pace of cutting throughout Ontario and about the decline in the province's forests. At the same time, the lumber industry itself was becoming increasingly concerned about the impact of land clearing by settlers on timber supplies and river levels.

In 1893, the Ontario legislature passed an act to create Algonquin National Park. This new park covered 1,466 square kilometres and was to provide, "a public park, and forest reservation, fish and game preserve, health resort and pleasure ground for the benefit, advantage and enjoyment of the people of the Province".[3]

The name was changed to Algonquin Provincial Park in 1913 in keeping with its provincial jurisdiction.

With the development of railroads and then trucks, the focus of logging in Algonquin widened from the easily water-transported softwoods to hardwoods as well. By the 1920s a substantial hardwood industry had become established, supplied by the sugar-maple and yellow-birch forests of the park's west side.

As logging became more mechanized — as trucks replaced horses (1930s) for hauling, chainsaws replaced axes (1940s), and mechanical skidders (1950s) replaced horse teams in the woods — a new era of industrial logging began. These new machines increased the speed at which trees could be cut, contributing to an increase in the volume of wood cut while continually reducing the number of workers required to cut it (a trend that continues to this day).

In an attempt to control the rapid removal of trees from Algonquin, a series of harvest limits were imposed in the 1950s, including diameter limits and the less frequently used method of selective tree marking. However, conflict was also growing between loggers and recreationists, whose numbers were increasing rapidly as a result of the construction of Hwy. 60 in the mid-1930s. The controversy peaked from the mid-1960s to the early 1970s.

## A Short History of Logging in the Park

- logging began in the early 1830s and continued relatively unchecked for the next 100 years
- conflict between logging and other park uses peaked in the late 1960s as recreational use and environmental awareness exploded
- in 1974 the Ontario government, trying to resolve some of these conflicts, developed the Algonquin Park Master Plan (APMP)
- the APMP created the Algonquin Forestry Authority (AFA), which is a Crown corporation responsible for all logging and associated activities within the park

### The Algonquin Forestry Authority

In order to address these conflicts between the logging industry and other park users, the Ontario government developed the Algonquin Park Master Plan (APMP) in 1974. The plan was designed to alleviate conflicts by separating the various park-user groups in both time (such as by prohibiting logging near high-use areas during peak-use periods) and geographic area. The first major feature of the plan was the classification of the park into specific land-use zones, each of which have their own specific management goals. There are six zone designations altogether, only three of which provide complete protection from development activities and logging: Nature Reserve, Wilderness, and Natural Environment Zones. Together, these zones cover only 1,287 square kilometres of the park. These areas are roadless and closed to sport hunting and motorized vehicles, including motor boats and all-terrain vehicles.

A second major feature of the master plan was the creation of a Crown corporation known as the Algonquin Forestry Authority (AFA). This Crown corporation was put in charge of all logging in the park and replaced the patchwork of timber licences that were then held by 20 different logging companies.

MINISTRY OF NATURAL RESOURCES; APM NO. 968 (ALGONQUIN PARK 1910)

*Algonquin's giant pines were quickly logged out*

The AFA follows the same provincial guidelines and legislation that apply to all other forestry operations on Ontario Crown lands. Within the park itself, the Management Plan documents the areas or zones in which logging can take place. The AFA is responsible for all logging and logging-related activities such as road and bridge construction, along with forest renewal and maintenance. (The AFA sells the timber it cuts to mills located in the vicinity of the park and uses this sales revenue to pay for logging activities and staff.) While public consultation is conducted as with any other forest-management plan, current legislation requires only consideration, not action, for public comments received during the planning process.

### Park Plans

The Algonquin Park Master Plan governs land use in Algonquin Park by designating different zones for different uses. It also sets out approved methods of timber cutting and road construction. The Forest Management Plan (FMP), in turn, is responsible for determining what areas will be logged over the 20-year life of the plan, when logging will take place, what forest-regeneration work is required and what roads will be built.

## The Process of Logging Algonquin Park Today

Algonquin Park is currently logged using three different methods:

DAYNA SCOTT

*Clearcut with seed trees in a red-pine stand*

i) clearcutting
ii) selection cutting
iii) shelterwood cutting

i) **Clearcutting**: Clearcutting is the cutting of an "entire standing forest area over a considerable area at one time..."[4] This may or may not involve leaving behind seed-bearing trees to re-seed and regenerate the area. Clearcutting can take the form of a progressively expanding cut within a stand or it can be done in adjacent strips or blocks that are cut in rotation over a series of years.

The clearcut method is not the dominant harvest method in Algonquin — it accounts for about two to three percent of the total annual cut. It is carried out in stands of poplar, jack pine and birch. The average size of Algonquin's clearcuts is usually under five hectares with the largest permitted being 25 hectares.

ii) **Selection cutting**: Selection cutting is carried out in forest areas where the trees are different ages (called "uneven-aged forest stands"). These are usually dominated by shade-tolerant species such as sugar maple and beech. It is "the removal of mature and/or economically undesirable trees individually or in small groups at relatively short intervals."[5] The selection system is used to remove some economically undesirable trees in order to allow the desired trees to grow in an environment of reduced competition. Once the economically desirable trees have reached a marketable age, they will be cut and sold.

iii) **Shelterwood cutting**: Shelterwood cutting, unlike the selection system, involves the cutting of stands of similar-age trees. Mature trees are removed in two or more cuts and natural regeneration is expected to occur under the shelter of the trees that are left on the site after the initial cut. The first cut (known as the preparatory cut) involves the logging of small patches to open gaps in the canopy, thereby giving shade-intolerant species the light they need to grow. The second cut, three to five years after the first, is known as the seed cut and involves cutting about half of the trees. This increases the chances of survival for the shade-intolerant trees while not completely ignoring the needs of shade-tolerant species. In Algonquin, the third cut (known as the first removal cut) takes the commercially valuable trees of up to 120 years of age. The final cut, known as the residual cut, occurs approximately 20 years later and removes trees 140 years old and older. In Algonquin this system is carried out in varying numbers of cuts (up to four) in conifer stands with the removal of shade-tolerant hardwoods occuring at the same time.

## Where Do Algonquin's Trees Go?

According to the 1995-2015 Timber Management Plan, the AFA sells Algonquin's timber to the following companies:

- Tembec Forest Products Incorporated - Mattawa
- Tembec Forest Products Incorporated - Huntsville
- Agawa Forest Products Limited (Domtar Inc.)
- McCrae Lumber
- Murray Bros. Lumber Company
- Commonwealth Plywood Company Limited
- Herb Shaw and Sons Limited
- Carson Lake Lumber
- Stone Container Incorporated
- Columbia Forest Products

If the AFA has wood to spare after meeting the needs of these companies, timber will be sold to an additional five companies:

- Ben Hokum and Sons Limited
- Gulick Forest Products
- George Stein Limited
- Lavern Heideman and Sons Limited
- Grant Forest Products

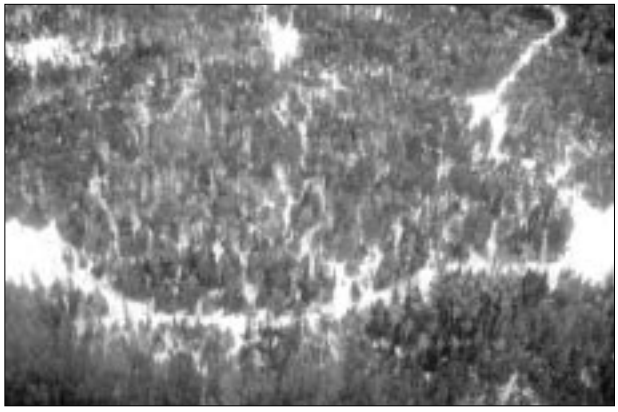
According to the AFA, Algonquin Park supplies roughly 40 percent of the wood used by the 10 mills that are the primary recipients of the park's timber. It is difficult to calculate precisely how many jobs are directly linked to logging in the park, but it is likely that the equivalent of approximately 1,000 full-time jobs are generated by park logging.

The expected use of Algonquin's wood harvest for the 1995-2000 period of the 1995-2015 TMP is as follows:[6]

| **Sawlogs** | **Pulp** | **Veneer** | **Utility poles** |
|---|---|---|---|
| *Species used* | *Species used* | *Species used* | *Species used* |
| white pine<br>red pine<br>jack pine<br>spruce<br>balsam fir<br>hemlock<br>maple<br>yellow birch<br>white birch<br>beech | hemlock<br>maple<br>beech<br>birch<br>poplar | yellow birch<br>white birch<br>oak | red pine |
| **Total harvest for sawlogs**:<br>1,002,340 $m^3$ | **Total harvest for pulp**:<br>822,850 $m^3$ | **Total harvest for veneer**:<br>38,000 $m^3$ | **Total harvest for poles**:<br>74,500 $m^3$ |

## Effects of Logging in Algonquin Park

Industrial logging is a highly intrusive activity and its effects, both direct and indirect, are changing the face of Algonquin Park. Some of the problems caused by logging include:



*Winter aerial view of Algonquin forests. White areas are roads and landings built for logging*

### Tree Species with Regeneration Problems

More than one-fifth of Algonquin Park's most common tree species are having difficulties reproducing or growing to maturity.

The Forest Management Plan for Algonquin Park has cutting and regeneration prescriptions for 18 of Algonquin's 34 native tree species. Five commercially exploited species — white pine, red pine, jack pine, hemlock, and yellow birch — are experiencing problems, either in regenerating or in growing into mature overstorey trees. Red oak, which is not targetted for cutting in the park, is also experiencing regeneration problems.

The reasons for these problems are specific to each species — some are related to the rate of logging and renewal techniques used and some are due to the suppression of fire.

(i) **White pine** is cut using the shelterwood cutting system. The prescription for renewal is largely natural regeneration, but depending on the site, renewal may also entail site preparation such as turning up the earth (scarification) to expose the bare mineral soil and/or planting. White pine start producing seeds as early as 15 to 20 years of age and continue to produce seed for up to 250 years. The optimum years for seed production are from 50 to 150. Good seed years occur every three to five years while lighter crops may be produced in intervening years. Cones take two years to develop.[7]

Once released from the cones, seeds require overwintering and then temperatures of 20-30 ° C combined with sufficient moisture and oxygen in order to germinate. To stimulate germination, the forest floor (the seedbed) should be partially shaded, have a minimum of leaf litter and ground-level vegetation and some mineral soil exposed. The sprouting seedling will need at least 20 percent full sunlight to thrive. Partial shade however, is required for protection against blister rust and pine weevilling. (Both blister rust and pine weevilling can damage and kill the trees.[8])

*White and red pines are not regenerating well after logging.*

For white pine, regeneration problems involve a combination of factors. While white pine is cut using the shelterwood system today, in the past it was primarily clearcut. White-pine regeneration requires a mixture of sunlight and shade which can be provided only by an intact overstorey (forest canopy). Because clearcutting provides no overstorey protection, the young white pine are often attacked by weevils or blister rust or out-competed by fast-growing hardwoods.

The second factor involves fire. Light surface fires burn off the accumulation of dry matter (litter) that builds up on the forest floor. By removing this litter, the fire not only exposes the bare mineral soil, but also allows light, heat and moisture to penetrate the seed bed. As well, without fire, white-pine saplings often lose out in the aggressive competition for light, moisture and space from shade-tolerant hardwoods. According to the Ontario Forest Research Institute (OFRI), "Fire is the major disturbance factor that favours the establishment and development of white pine."[9]

Fire suppression in Algonquin has allowed forest litter to build up to levels that interfere with the regeneration of white pine and has also allowed hardwoods to dominate the forest canopy.

(ii) **Red pine** occurs in relatively pure stands. Like white pine, red pine is managed under the shelterwood harvesting system, although on specific occasions it may be clearcut (leaving seed trees). The preferred renewal technique is natural regeneration with some site preparation such as scarifying the soil or planting. The technique used depends upon the specific attributes of the site.

Reproduction of red pine is similar to that of white pine, except that good seed crops occur only every three to seven years and large crops only every 10 to 12 years. The environmental conditions required for regeneration are similar to those for white pine — exposed mineral soil, adequate moisture and light and temperatures conducive to germination and growth. The differences occur in the levels of each requirement. Red pine are less tolerant of shade than white pine and need about 35 percent full sunlight in the early stages of development, increasing to 65 percent once they grow above the ground-level vegetation.[10]

Today, 95 percent of the red-pine stands in Algonquin are in the seedling and mature stages of development.[11] Regeneration problems arise because of a lack of light fire that would not only burn off the forest litter, but would also provide temperatures that would aid cones in opening (they will also open in direct hot sunlight). In addition, light surface fires could help to reduce understorey competition.

Fire suppression in the park has enabled a substantial quantity of litter to build up and has created significant hardwood competition, both of which are impeding the regeneration and growth of red pine.

(iii) **Jack pine** is managed under the shelterwood and clearcut systems, depending on the specific attributes of the site. Renewal systems overlap with those used for white and red pine: natural regeneration with site preparation and plantings are both used, again depending on the site.

In May or June, jack-pine flowers will appear with the cones ripening in September of the following year. Seed fall then begins that autumn and may continue intermittently for several years. For jack-pine cones to open, there must be enough heat to melt the resin that keeps the cones closed. Temperatures of approximately 45-50$^{O}$ C are required.[12] Such high temperatures are usually caused by crown fires. Seedling establishment requires an adequate moisture supply, partial shade and exposed mineral soil. Once established, the species is quite shade-intolerant and does best in open sunlight conditions.[13]

A comparison of 1958 and 1978 Forest Resource Inventory (FRI) figures shows a 26 percent decline in the area of jack pine in Algonquin Park.[14] Currently, 65 percent of jack-pine trees in the park are more than 70 years old.[15] Field research has also revealed that jack pine is being replaced by poplar and white pine. The cause of this decline lies in our history of fire suppression.

**A Problem with Pines**

Concern about the lack of sufficient pine (red, white and jack) regeneration has recently persuaded the Ministry of Natural Resources that current regeneration techniques are inadequate. As a result, the 1995-2015 FMP calls for a joint MNR and AFA plan on pine management, to be known as the Pine Tactical Plan. While it is important that this serious problem has been recognized, it raises an equally important question about whether parks are really the place where we should be experimenting with logging practices.

A much better role for parks is to serve as living laboratories that can help us understand natural processes. In the case of the pines, we are already well aware of the root of the regeneration problem — fire suppression — and this should be the focus of any tactical plan.

(iv) **Hemlock** stands are managed under both the shelterwood and selection-cut silvicultural systems. Regeneration is largely dependent on natural processes with some mechanical site preparation, again depending on the specifics of the site.

Hemlocks can live more than 600 years and can reach 24 metres in height.[16] They begin to produce seeds at 30-50 years of age and will continue to do so as long as they are not severely shaded. Hemlocks produce good seed crops every two to three years in mature stands. Seedling establishment is quite precarious as the seeds are very small

and do not germinate easily on sites that do not have some exposed soil. Hemlock seedlings prefer a seed bed that is a mixture of mineral and organic soil. They also germinate on old hemlocks that have fallen to the ground and are decomposing (these are known as nurse logs). The trees and saplings grow best in somewhat shadier environments, but do require some degree of canopy opening in order to thrive.[17] Seedlings are susceptible to being smothered by litter fall from shade-tolerant hardwoods (i.e. sugar maple with its countless flat leaves) and their roots are vulnerable to drying out due to their shallow rooting systems.

## A Close-Knit Family: Wildlife and Algonquin's Softwoods

- the red crossbill has a specialized bill capable of prying open pine cones to get at the seeds
- the pine warbler is so dependent on white pines that they will actually ignore other tree species even though they have an ample supply of insects
- there are at least 44 species of insects that feed on white pine alone
- blackburnian and black throated green warblers are highly dependent on hemlock groves for sustenance
- hemlock groves provide excellent cover for deer and moose during winter's deep snow
- raptors, such as osprey, build their nests in large, old trees that reach above the forest canopy (so-called super-canopy trees).

Hemlock, unlike the pines, is not having problems getting seedlings established. This species' problem arises from its seedlings' inability to mature into the sapling stage and to reach adulthood. Currently, 85 percent of the hemlock forest area in Algonquin is 161 years or older, with only 0.2 percent of the total hemlock area in the regeneration stage.[18]

According to some researchers, it has been 120 years since the last group of hemlock seedlings successfully moved into the overstorey in the park.[19] This lack of sapling maturation has been attributed to

overbrowsing by ungulates (hoofed animals such as deer and moose) that seek out hemlock groves for both food and shelter. This is especially true in winter, as hemlocks form a dense canopy that reduces snow depth and creates slightly higher temperatures. The overbrowsing problem has been compounded in Algonquin by an increase in ungulate numbers, particularly deer, due to the ample supply of young green growth that occurs after logging.

In fact, white-tailed deer are essentially invaders in the park that have been drawn to it only since logging started to make huge quantities of browse available. Under a natural fire-driven regime, the amount and type of browse available in the park would be quite different, making it much less attractive to deer and thus possibly reducing the browsing of hemlock.

(v) **Yellow birch** is rarely seen in pure stands. It is normally found growing among other hardwoods such as sugar maple, beech, basswood and hemlock. Yellow birch is mainly found on the park's west side with the majority of the other hardwoods. Although it has been classified as a common tree in Algonquin's hardwood forest, the species is having regeneration problems, problems that have been known since the 1940s when yellow birch was first targetted to manufacture plywood for WWII aircraft. It was noted at that time that in some areas 97 percent of the yellow birch were over 100 years old[20] and yet these older residents did not appear to have any younger offspring.

*Young yellow birch have become scarce in the park's hardwood forests.*

Two of the causes of the yellow birch's failure to regenerate stem from management techniques used in the park since logging began in the mid-1800s. Combined with the birch's own physiological features, these techniques have produced regeneration problems.

Yellow birch produce thousands of tiny seeds every three years. These seeds are dropped at the onset of cold weather through to early winter. The tiny size of these seeds makes it extremely difficult for them to root through leaf litter. Historically, autumn ground fires would burn the thick litter layer exposing a seedbed for the yellow birch, which would sprout the following spring. Once established, the seedlings need adequate light in order to compete with other hardwoods.

Like hemlock, yellow birch is also suffering from overbrowsing by white-tailed deer — deer favour the wintergreen flavour of its foliage. During the deer population peak from the late 1800s to the early 1960s in Algonquin, it is believed that yellow-birch regeneration was nonexistent.[21] Today with a decrease in deer numbers and intensive effort put forth by the AFA there is some yellow-birch regeneration, but whether this will result in seedlings being able to reach maturity remains to be seen.

## Red Oak: Fire-Dependent Hardwood

Although red oak is relatively scarce in Algonquin, it is found on the park's drier, warmer east side. The tree is well adapted to the prolonged dry periods that occur periodically on the east side because of its ability to shut down its metabolic system during dry spells.

Algonquin Park represents the northerly limit for red oak in Ontario. Studies done in the Bancroft district just outside the park have documented a change from red oak to more shade-tolerant species in some forest stands. (Red oak is shade-intolerant.) It appears that species such as sugar maple, beech and ironwood are beginning to dominate the understorey in these red-oak stands and will soon move into the oak overstorey.[22]

Red-oak seedlings need open sunlight to mature. Without fire, the oak saplings do poorly in the shade created by the older oak canopy and by competing

### Algonquin's Scarce Resident: Red Oak

- In Algonquin Park, red oak is at the northern edge of its range and is found in isolated stands on the park's east side.
- Without wildfires, red oak has trouble regenerating under the more shade-tolerant hardwoods.
- Oak acorns are especially important to bears as they prepare for winter hibernation.
- Red oak acorns are high in carbohydrates, fats and proteins. They provide an important food source for ruffed grouse, northern bobwhites, ring necked pheasants, red headed woodpeckers, blue jays, crows, white-breasted nuthatches, brown thrashers, rufous sided towhees and common grackles.

shade-tolerant species in the understorey. This has led some researchers to believe that fire suppression and the resulting decline in red oak may threaten biodiversity on red-oak sites.[23]

Bears, for example, rely heavily on ripe autumn acorns to gain fat for hibernation. This food supply is critically important and could be part of the reason that bears would appear to be more numerous on the east side of Algonquin where the oaks are also found. [24] In addition, numerous bird species rely on red oak, either for the acorns or for insects that are associated with the tree. [25]

## Changes in Forest Structure, Age Diversity and Genetics

Another effect that logging has on the forest community is to change the structure, species composition and age-group make-up of the forested landscape. Research has pointed out that, "logging inevitably changes the composition and structure of the regenerating forest. Rarely is the composition of the incoming forest, particularly hardwoods, the same as that of the forest removed."[26]

One of the largest changes caused by logging in Algonquin's forests has been a change in their structural and age-class diversity. Huge old white-pines were once scattered throughout the park's hardwood forests. The crowns of these trees extended well above the hardwood canopy and they were important refuge trees for bears and nest sites for raptors such as hawks and osprey. Now these "super-canopy" trees are scarce, having long been targetted for cutting. Current logging methods are unlikely to retain or re-create forest stands featuring these super-canopy giants.

The suppression of fire has also tilted the overall composition of the park's forests toward older stands where there is little ongoing natural regeneration of fire-dependent species. For example, younger stands of jack pine are becoming increasingly uncommon in Algonquin's forests (52 percent of the pines are over 80 years of age). Yet in mixed jack- and white-pine stands, shelterwood cutting only promises to make this situation worse by favouring the regeneration of the more shade-tolerant white pines over the sun-loving jack pines.

*Algonquin's pine forests need fire to successfully regenerate.*

Under a natural fire regime, the park landscape would feature a mix of young, mature and very old forest. Logging tends to flatten out this age mix by constantly taking out trees on the cusp of maturity and generally narrows the age range found in the park's forests.

Forest diversity — whether its forest structure, species mix or age — is maintained by change. This change in composition can be caused either gradually by natural succession or be caused rapidly by natural events such as windthrow and fire. Logging also produces a rapid change in species composition, but it lacks the ecological attributes of natural disturbances (i.e. fire, wind, pest infestations and old-tree death - see page 15 for more details).

The reaction of wildlife populations to these different forms of disturbance demonstrates the difference between natural changes and those caused by logging. Wildlife have had millenia to adapt to the changes caused by natural forces, and wildlife diversity and overall forest diversity rarely declines significantly in the face of such disturbances. Logging, however, can suddenly (in evolutionary terms) simplify the ecosystem, altering the structure, food sources and breeding sites that wildlife need for long-term survival.

A reduction in genetic diversity is another risk of logging. The genetic diversity of a tree, a stand of trees or of a forested region is linked to that population's ability to adapt to environmental change. It has been determined that forest productivity and health will decline when genetic diversity is reduced.[27]

A study of eastern white pines in Northeastern Ontario found a serious reduction in genetic diversity when two white-pine stands were partially cut. The study found that shelterwood harvesting led to a reduction in the genetic diversity in seedlings that grew up in the logged stands (when compared to the parent trees). This was thought to be a result of the fact that logging, unlike sub-canopy fire, removes the adult trees before they have an opportunity to pass their genes on to the next generation.

The researchers also found that the loss of diversity was greatest in uncommon genetic characteristics. Such uncommon traits are often the building blocks for resistence to new diseases or adaptation to new conditions, such as a warmer climate. [27b]

## Disturbance to Wildlife

Harvesting of timber has played a role in the extirpation of certain forest inhabitants. For example, the red-shouldered hawk, once a common resident of Southern Ontario, is now a provincially rare species and is seldom seen in Algonquin, which it once frequented.[28] Although some wildlife may temporarily vacate a disturbed area, returning after logging has ended, others, like the red-shouldered hawk, will not return.

MICHAEL PATRIKEEV

*The wood thrush requires undisturbed forest interior habitat*

The red-shouldered hawk usually seeks out nesting areas in mature hardwood forests situated near watercourses. The nesting period, which includes territorial establishment, egg-laying and chick-rearing, extends from the beginning of March to the end of July. However, when activity such as logging occurs in the vicinity of a nest, it is usually abandoned.[29]

In addition, when selection harvesting (the predominant form of harvesting in hardwoods) results in the conversion of a relatively mature uneven-aged forest to an even-aged younger forest, the suitability of nesting habitats for the red-shouldered hawk may decrease.

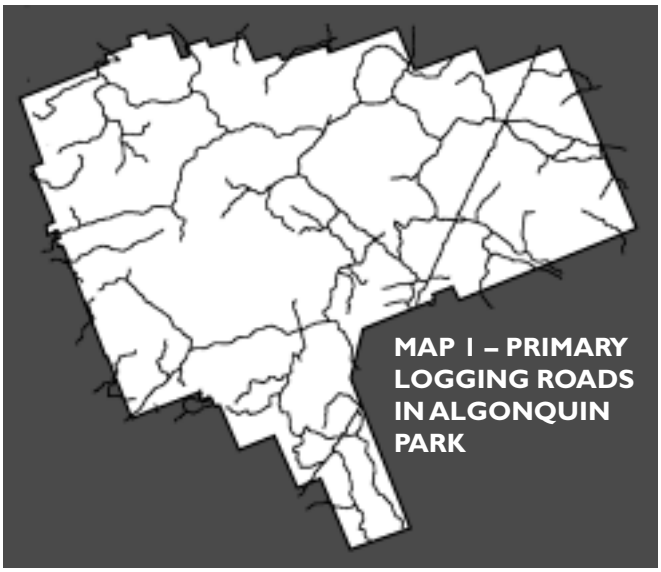
As a result of the declining red-shouldered hawk numbers in the park, a monitoring program has been set up along with a series of guidelines for forest management that may facilitate its return to Algonquin Park. For example, one of the guidelines sets out a no-cut reserve, extending approximately 150 metres from the nest trees in order to ameliorate the problem.

The red-shouldered hawk is not alone in its sensitivity to disturbance, however. Studies have shown that other birds of prey can also be affected by logging activity. For example, one study found that 80 percent of goshawk nests were abandoned when logging occurred in the vicinity. It was also found that there was an almost total lack of goshawk reproduction (with a 94 percent drop in the number of young born) where logging had taken place. This was observed in an area where selection cutting was the dominate form of timber removal, even with buffer zones around nests.[30]

The decline in red-shouldered hawks in the park is only one of many examples of how logging can imperil natural communities. The goshawk example, although not from the park itself, is indicative of what could happen or might already be occurring within the boundaries of Algonquin Park.

## Roads

There are more than 2,000 kilometres of permanent logging roads in Algonquin Park, a distance equivalent to the drive from Toronto to Winnipeg. In fact, there are more kilometres of logging roads in Algonquin than there are kilometres of canoe routes. Meanwhile, from 1990-1995, 103.9 km. of primary and secondary roads were constructed to facilitate future logging operations; the 1995-2000 TMP calls for another 28.6 km. of primary and secondary roads to be constructed.[30b]



**MAP 1 – PRIMARY LOGGING ROADS IN ALGONQUIN PARK**

Map 1 illustrates the primary logging roads in the park. It is clear from this map that there is a large road network in the park, yet it actually omits many of the smaller roads, including tertiary roads. In Algonquin, most of the road system is permanent because of the repeated-entry logging methods used and because of the need to access sites for silvicultural work.

Logging roads are built to accommodate the weight of heavy equipment and large trucks carrying heavy log loads. The roads are extremely durable, long lasting and strong — the equivalent of unpaved county roads.

Whether a road is old, and being covered in by early colonizing species, or is a busy permanent road, it can damage the park's ecosystems. In fact, the extensive road network that results from logging is one of the biggest differences between the impacts of logging and fire. Simply put, fires do not leave roads.

These are some of the impacts of road construction on the park:

**(i) Edge Effect and Habitat Fragmentation**

One of the most significant effects of roads is their ability to fragment habitat and alter the characteristics of interior forest habitat. Habitat fragmentation is the division of intact, continuous habitat into patches. On a global scale, habitat fragmentation is now the leading cause of species extinction.[31] Depending on the degree of habitat fragmentation, there are a number of associated effects.

One of the quantifiable consequences of habitat fragmentation is known as "edge effect". Edge effect results from the transition zone that extends into the forest from an open area. Alternatively, it can be described as, the influence of external environmental/biological factors on interior conditions of a habitat. Although edge effect is a natural phenomenon occurring with abrupt changes in soil type, topography or geomorphic differences and microclimate changes, when it results from human-induced activities it is usually damaging to the inhabitants of interior communities. These forest fragments can discourage the movement of both large and small creatures, isolating sub-populations and resulting in a decline in the gene-pool diversity.

TIM GRAY

## Roads to Ruin

- more than 2,000 km of logging roads penetrate Algonquin Park - equivalent to the distance between Toronto and Winnipeg
- roads are associated with the negative consequences of edge effect and habitat fragmentation
- there are more than 200 alien plants that have been introduced into the park by humans
- the gypsy moth colonized the American Pacific Northwest via logging roads and has made its way into Algonquin's rare red oak
- access by humans into interior lakes via logging roads facilitated the introduction of the rusty crayfish, an exotic species from the United States

Many bird species are particularly susceptible to edge effect and are often unable to inhabit a highly fragmented forest as they require interior area for nesting and feeding and protection from predators. The black and white warbler and the wood thrush are just two such species living in Algonquin.

Corresponding to an increase in edge habitat is the increase in sunlight, temperature and exposure to wind. This produces higher rates of evapotranspiration and drier, hotter soils. Plant species that are adapted to these conditions, along with the wildlife that follows, are not usually found in areas of complete forest cover such as Algonquin. In colonizing new areas of edge habitat, these species may become predators of native species or compete for nutrients and space with the area's native inhabitants.

For example, cowbirds have spread east from Western Canada following the increase in edge habitat created by agriculture.[32] As in other areas of Central Ontario, cowbirds have successfully moved into Algonquin Park.[33] Cowbirds are nest parasites that lay their eggs in other bird species' nests, such as those of warblers, vireos, finches, flycatchers and thrushes. When the cowbird and resident eggs hatch, the cowbird chicks, because they are larger and more aggressive, eat more of the food delivered by the host parent birds. This makes it very difficult for the original species' chicks to survive.[34]

**(ii) Invasive Species**

More than 200 alien plants have been introduced into Algonquin Park by humans.[35] Roads facilitate the movement of these invasives as well as provide habitat for new colonizing species.

An example is purple loosestrife.[36] Purple loosestrife is a particularly harmful invader because of its quick and fecund reproductive strategy and the fact that there is no known North American-native organism that preys on the plant. It successfully out-competes many marsh plants that native fauna depend on for food and habitat and has taken over many nutrient-rich wetlands in North America.[37]

Another confirmed invasive into Algonquin is the gypsy moth, an especially destructive exotic from Europe. In the American Pacific Northwest, this pest dispersed into new forest areas via logging roads.[38] The gypsy moth has already left a defoliated stand of the park's rare red oak in its wake in Algonquin.[39]

MICHAEL PATRIKEEV

*Cowbird egg (speckled) in a veery nest.*

**(iii) Barriers**

In addition to fragmenting forests, roads also create barriers for plants and wildlife. For plants, roads may act as barriers to seed dispersal. Plant seed dispersal occurs with the help of either birds, mammals or the wind. For many animals, especially small ones, roads become uncrossable barriers that impede movement between forest areas. Some birds and mammals are sensitive to the open areas created by roads — it is known that many species of small vertebrates and invertebrates rarely or never cross roads, even two-lane roads that are closed to public traffic.[40] This lack of migration between gene pools may lead to inbreeding.

In some instances, wildlife attempting to cross roads are killed by motorized traffic. Total wildlife mortality on Algonquin's logging roads is unknown, but for the Hwy. 60 corridor it is estimated that as many as 30 moose are killed each year.[41]

**(iv) Access by Humans**

Logging roads provide people with additional routes into the interior of the park. Areas once only accessible by canoe or by foot are now open to motorized vehicles. Ever-increasing lengths of logging roads and inadequate funding for policing facilitates poaching and illegal access. Of special concern is the unauthorized use of logging roads to reach interior lakes, which may in turn result in overfishing or the accidental introduction of an invasive species through illegal live bait dumping or other actions.

Algonquin Park's interior lakes are home to some of the healthiest native brook and lake trout populations in Southern Ontario. They have been protected by their remoteness and, subsequently, the low intensity of fishing. The growing network of logging roads in the park, however, increases the probability of non-native species being introduced or game-fish populations being over-fished.

The introduction of one exotic species by humans into Algonquin's aquatic environment has already occurred. The rusty crayfish, a species native to Ohio, Indiana and Illinois, was found in Lake Travers in 1989.[42] This species outcompetes native crayfish and eats almost anything — including insects, snails, and weed beds — that would normally support fish populations. In its invasion of the northern states, the rusty crayfish has caused the demise of perch and pickerel in many lakes.

Recent efforts to remove bridges and roads by the AFA are a good first step toward reducing access.

**(v) Sedimentation of Streams and Wetlands**

The sedimentation of streams, rivers and wetlands is caused by road and bridge construction and by culverts placed under roads. This increase in sediment loads results in the alteration of stream temperature, water quality, nutrient cycling, streamwater turbidity, dissolved-oxygen content and overall habitat structure. During road construction, especially bridge-building, heavy machinery can erode sand, gravel and other materials into nearby water courses. As well, the placement of bridge supports adjacent to and in waterways facilitates the movement of materials into the stream or river from the banks.[43]

DAYNA SCOTT

*Rusting, eroding culvert on Algonquin logging road.*

As roads are worn down by trucks and heavy machinery, gravel and sediments can slide into the water system. These sediments alter streamwater clarity, as fine particles reduce light penetration, and decrease the primary productivity of aquatic vegetation. In addition, the coarser sediments have an abrasive effect on stream life, including juvenile fish. The larger sediments can also cover or disturb critical breeding habitat of fish.

Across smaller rivers, instead of constructing a bridge, the AFA may build the road over a culvert. Problems with culverts arise when they get plugged or the river swells and the culvert is unable to channel the increased volume of the river. The river will consequently overflow the culvert and wash out the road above it, transporting the road's gravel and materials, including heavy metals, downstream. Flooding erodes stream banks and the river's bottom and any other physical feature that may be in its path.

The park's 1990-97 forest audit report found a number of problems arising at road crossings due to the improper installation of culverts.[44]

During the summer of 1999, staff from Wildlands League and Sierra Legal Defence Fund conducted a

field investigation of forest industry compliance with standards and guidelines for water crossings and Areas of Concern stream protection buffers within Algonquin Park. It was found that 39% of water crossings contained problems such as blocked culverts and/or impairment of fish habitat. Further information is contained in the published field report.[44b]

**(vi) Construction and Materials**

To obtain the gravel needed to build the thousands of kilometres of logging roads in Algonquin, gravel pits are dug throughout the park. Not only are these gravel pits aesthetically offensive, they also destroy the glacial and geological features that the park is meant to protect and that are also prime sites for some forest species.

*Gravel pits destroy glacial features the park is meant to protect*

We know as well that some tree species often do not have high survival rates after being disturbed by road construction. Hemlock is one such species. Its roots are sensitive to disturbance and it often dies after nearby road construction: Dead hemlocks line logging roads in Algonquin.

The building of tertiary roads into stands and actual operations in the stand also involve the use of heavy machinery and equipment that can compact the forest soil bed. Soil compaction leads to reduced water infiltration, higher runoff rates causing soil erosion and the subsequent sedimentation of streams and wetlands. Ruts caused by skidders can channel water causing significant soil erosion, which can be exacerbated by slope steepness and length. One of the most significant problems is loss of topsoil from logging sites, which decreases site productivity and impairs aquatic ecosystems when soil enters streams and wetlands.[45]

**(vii) Recreational Impacts**

Impacts on our recreational experiences may not be of the same level of concern compared to the ecological repercussions of logging roads on Algonquin Park. For hikers and canoeists however, logging roads do impinge on the quality of their wilderness experience and logging trucks travelling at high speeds pose a safety hazard to both humans and animals. For many, Algonquin Park invokes a feeling of wilderness and epitomizes what it means to "get away". Yet when cresting the top of a hill or finishing a long portage, visitors are not always rewarded with a wild landscape, but instead are met with the empty, dusty expanse of a logging road.

Roads create swaths of ecological disruption. It has been stated that road density is one of the most accurate measures of a region's ecological health.[46] In fact, "the lower the road density, the more likely you are to find a healthy representation of native species...such as gray wolves, lynx, wolverines, pine marten, goshawks, wood turtles and deep woods indigenous plants."[47] Some of these species, such as the wolverine and the wood turtle, are on Canada's list of species at risk.

## Natural Disturbance vs. Logging

It is often argued by forest managers that logging "mimics" or "emulates" fire as a forest-renewal mechanism. But when the differences between logging and fire are examined is this found to be the case ?

Fire tends to kill many of the trees in a forest, but some trees may be left behind to reseed a site. Mature white pines, for example, can survive around fire because of their thick bark and their height, which often places their crowns above the flames. Some logging practices may also leave trees behind, but logging results in significantly different impacts — removing some genetic material and nutrients, compacting soils and leaving roads, and creating noise, disturbance and unnatural edges and barriers.

After a fire, habitat for different species is also provided by dead standing trees or by ones that have fallen to the ground. Standing dead trees also help hold soil in place and, as they decay, provide further organic ingredients for soil and humus formation.

More important, however, are the nutrients that this decomposing organic matter provides for vegetation regrowth. Decomposition of organic matter provides a continuous supply of recycled mineral elements crucial to plant growth. Logging, by comparison, removes large portions of the trees and their nutrients even though it may leave some wood debris or even seed trees behind.

## An agent of evolutionary change

While natural disturbance is important as an agent of renewal for a particular species and/or for local stand composition, it should also be considered in the larger context as an agent of evolutionary change. Natural disturbance plays a major role in the evolution of everything from micro-organisms to the tallest trees in a forest.

Fire, over the long term, is a natural selection force producing fire-adapted species. As trees live to reproduce after a fire, they can pass along the genetic characteristics that allow them to survive in the presence of fire. Logging and fire suppression, however, alter this process of natural selection to one where our actions determine the genes and species favoured for survival. In this way, logging not only differs from fire in its immediate effects, but also in its long-term effect on the succession and species composition of the forest.

GARY MCGUFFIN

*Algonquin's pines have become adapted to fire.*

The long-term presence of fire in a forest ecosystem can, for example, cause the development of fire-avoidance or fire-embracing strategies by trees. Fire-resistors live through the fire to breed in the future while fire-embracers have evolved strategies to ensure reproduction at the time of a catostrophic fire that kills all the adult trees.

Fire avoidance has developed in red- and white-pines because the repeated occurence of low-intensity fires in these pine forests has favoured trees with genes that lead to the development of thick, fire-resistant bark. Many of these trees survive the fire and pass on their genes to their offspring.

Jack pine, on the other hand, is a species that embraces fire — the tree's seed cones are designed to open after a hot fire has swept through a stand killing the adult trees, but leaving ideal soil and light conditions for new seedling growth. Jack pines have developed this adaption over a very long period in response to the presence of fire. Over evolutionary time, this adaption has become a dependence. Fire as a natural disturbance is a driving force in the long history of evolutionary change.

## Soil conditions

Logging can be especially hard on soils. The use of heavy machinery and equipment, often results in soil erosion, compaction and degradation, especially on slopes and loose soils. Natural disturbance, on the other hand, improves soil conditions by adding ash-borne nutrients or nutrients from decaying vegetation. Fire also has the ability to heat and break rocks, a process that aids soil formation. Over time, minerals and soil particles will be weathered out of these broken rocks and added to the forest system. Such results do not occur after logging.

Foresters have sought to replicate the litter-clearing ability of fire by using scarification. Scarification is the process of turning up the soil to penetrate the leaf litter on the forest floor. Although this method is successful in exposing the mineral soil, it does not release the nutrients that are bound up in the litter. Fire not only removes the litter layer, it also releases the mineral elements that were bound in the tissues of the organic matter covering the forest floor.

Fire also cleanses the forest of pathogens, diseases and fungi. The heat of a fire can kill pathogens, such as root rot and insects. While pest infestations are a natural part of the forest life cycle, fire plays an important role in curbing or regulating such outbreaks. Although logging may physically remove some of the pathogens and pests that infest trees, for the most part these elements tend to survive logging operations.

These are just a few of the major differences between fire and logging. For more on this subject, see the Wildlands League's Ecology Fact Sheet Series #2, *Forests, Fires and Logging: Setting the Record Straight* .

## Logging Should Be Phased Out of Algonquin because . . .

- Algonquin's forests are being fragmented and, in places, their species composition and structure are being altered
- five of Algonquin's 26 most common tree species are having trouble regenerating
- logging could lead to a loss of genetic diversity in Algonquin's forests
- wildlife is disturbed or even driven out by industrial forest operations; red-shouldered hawk extirpation has been linked to the disturbances associated with logging and the species is now listed as vulnerable on Canada's list of endangered species
- logging roads facilitate poaching, alter microclimates, increase edge effect on habitat and are pathways for disruptive alien species
- fire suppression is causing fire-dependent species such as red and jack pine, red oak and yellow birch to be displaced by other species
- evolutionary processes may be in the process of being altered by logging and the lack of fire
- the park's role as an ecological benchmark, as a place where natural processes can evolve and where people can enjoy and learn about nature, is being compromised

# A Framework for Phasing Logging out of Algonquin Park

Removing logging from Algonquin Park can be done, but will require us to address two important challenges. The first is to develop a a logging phase-out plan that includes a strategy for maintaining employment levels in local communities. The second challenge involves returning natural renewal processes to Algonquin's forests.

Returning natural processes to Algonquin Park requires action in three areas. A first priority is the re-establishment of fire as an agent of natural disturbance and renewal. The active removal and rehabilitation of roads and water crossings will create an ever-increasing area where motorized access is restricted. Finally we must develop mechanisms for the active rehabilitation of degraded forest areas. These new initiatives, combined with natural processes still present — such as windthrow, insects, disease, floods and habitat modification by animals — will help to hasten the return of the wild to Algonquin's forests.

The other challenge — avoiding community disruption while we phase-out park logging — requires a more multi-faceted strategy. Outlined below are a series of potential components that could help local communities adjust to the loss of wood volume and primary forestry jobs from within Algonquin Park.

The objective of this outline is to start a discussion of how to build on the Algonquin region's natural assets and successes so that we can improve the quality of life in the region. It does not reject the significance of logging and milling jobs, nor suggest that such industries should not be part of the region's future. It does, however, demonstrate that it is possible to work toward a future where Algonquin Park makes a greater contribution to local and provincial prosperity without being logged.

## Returning Natural Processes to Algonquin Park

### 1. Model Fire Management Plan for Algonquin Provincial Park

**Goal**

The goal of an Algonquin Park Fire Management Plan would be to reinstate fire in the park as the major agent of change and renewal for its vegetative communities.

**Objectives**

The objectives of the plan would include:

- perpetuation of the park's diversity of ecosystems
- protection of life;
- protection of property; and
- protection of the park from large unnatural conflagrations.

**Implementation**

i. **Zoning**

The first stage of fire-management planning would be to assign one of three zones to all areas of the park.

- In the first zone fire will not be prescribed and wildfires will not be allowed to burn. For example the area along Hwy. 60 and organized campgrounds, cottage areas, camps and resorts would qualify for zone one classification.

- The *second zone* would be a zone in which fire staff would make a decision about whether or not to let a fire burn, depending on certain factors. Areas in this zone might include portions of the recreation-utilization zones and the nature reserves.
- The *third zone* would be the area of the park where fire will be prescribed and natural fires allowed to burn, with decisions based on a list of criteria. The wilderness zones and nature reserves may qualify for this zoning.

The perimeters of these three zones could largely follow natural fire breaks such as rivers, lakes and wet areas or human-made breaks. (Fire breaks are barriers that would likely stop a fire from continuing in a certain direction). Backburning (setting fires in front of the wildfire so that when the fire reaches that spot it dies out because its fuel has already been consumed) could also be used to keep fires within zones. One of the most obvious places to have a let-burn zone in Algonquin would be in the wilderness zones. The Lavielle-Dickson wilderness zone provides a good starting point — it is relatively far removed from the high-use Hwy. 60 corridor and has few canoe routes transecting it. It also has natural fire breaks in the form of Lavielle and Dickson lakes and the Petawawa and Crow rivers.

*Wet areas act as natural fire breaks*

**ii. Controlling and Managing Fires**

Techniques such as prescribed burning could be used to lower fuel loads and reduce fire hazards. Such burns could also be used to control the unwanted spread of fire to either a no-burn zone or an area of high recreational use.

**iii. Criteria**

The criteria used to decide whether to let a fire burn would be developed in the form of a decision key. The key would consider issues such as the location and size of the fire, risk posed to people and property, likely social and economic impacts and the larger regional context. This series of assessments would lead to a final decision to either let a fire burn, use modified suppression actions such as containing or steering the fire, or to extinguish it.

Reintroducing fire into Algonquin Park will involve a commitment from not just park staff, but from the public who visit the park as well. A high priority must be placed on public education and awareness about the role of fire in the park and about personal safety. Fire has been successfully re-introduced into other provincial and national parks, including Quetico and Pukaskwa. Together, park staff and visitors can develop a commitment to seeing fire reinstated into its natural role as an agent of ecological change and to proceed in a considered, progressive manner.

## 2. A Road Removal Strategy for Algonquin Park

**Goal**

The goal of a road removal strategy for Algonquin Park should be to increase the area of the park, as quickly and as ecologically soundly as possible, that is inaccessible by roads.

**Objectives**

Catalogue the location and condition of all roads, culverts and bridges in the park and develop a plan that:

- identifies areas where road access poses the greatest risk to park values and developing a plan to create short-term (i.e. while logging continues) roadlessness in these areas.
- identifies all river and stream crossings that could be made immediately impassable through changes to crossing structure (installation of temporary bridges, etc.)
- identifies areas, as part of the logging phase-out plan, where road access could be removed with the least impact on logging activity.

Develop methodologies for road, bridge and culvert removal that:

- ensure stable road beds are established on streamsides after culvert and bridge removal
- minimize erosion into streams during culvert and bridge removal
- provide the most effective assurance that removal sites cannot be breached by motor vehicles.

### 3. Active Forest Rehabilitation

**Goal**

The goal for forest restoration in Algonquin Park should be to return to the forest species composition, age class structure and structural composition of the pre-logging forest.

**Objectives**

- identification of the composition, age-class structure, and structural diversity of the pre-logging forest
- development of effective strategies to achieve a return to natural conditions
- development of innovative restoration techniques for different forest values
- employment of forestry staff in the implementation of restoration plans

## A Communtiy Focused Plan for Phasing Logging Out of Algonquin Park

**Algonquin Park Community Transition Plan Goal**

The goal of an Algonquin Park Community Transition Plan is to ensure that there is a net job and quality of life gain for communities in the region as a result of a phase-out of logging in Algonquin Park.

**The Challenge**: **Logging, Mills and a Changing Economy**

The current significance of the Algonquin Park wood supply to forest-product companies in surrounding communities should not be underestimated. Ten mills obtain from 15% to 90% of their wood supply from the park. (On average, these 10 mills receive more than 30%[1] of their supply from the park.) Total employment in all the mills that receive some part of their wood supply from Algonquin Park is estimated at 1,800 people. A further 280 people work directly in logging-related activities in the Park.[2]

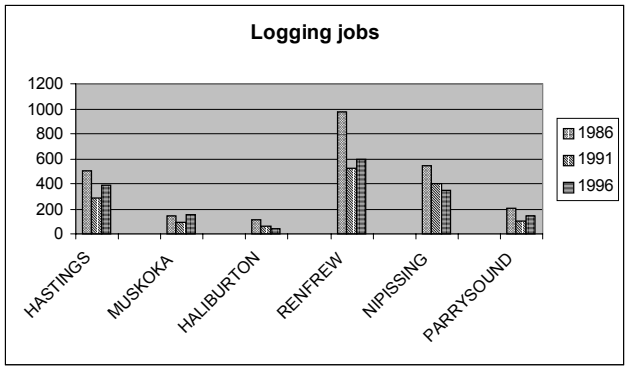
Although significant in themselves, these figures are best examined relative to the size of the overall workforce in the communities where these jobs are found. Algonquin Forest Authority data indicates that the jobs of about 2,200 people are partially or wholly dependent on wood cut in Algonquin Park. This total represents about 1% of the 220,690 people 15 years and older in the labour force in communities in the areas surrounding the park.[3]

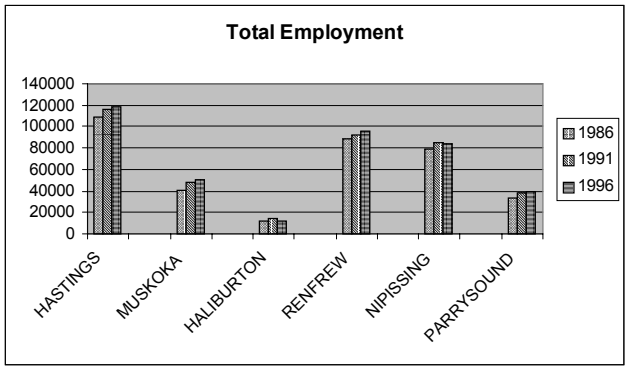
*Visitors to Algqonquin spend millions in the region*

By comparison, other industry sectors in communities surrounding the park provide significantly more employment. For example, 12.7% of the labour force in the area is employed in the manufacturing sector, 7.9% in government services, 6.7% is employed in educational services, 10% in health and social-services industries, 8.1% in construction, and 7.9% is employed in the accommodation, food and beverage industries.[4]

These facts illustrate that the economies of the communities in the region have a wider degree of diversity than one might expect. This diversity should aid any efforts to develop alternative employment while logging is being phased out of the park.

Employment patterns in the Algonquin region also reflect long-term provincial trends. In the last 30 years in Ontario, jobs in the logging sector have decreased by 40%. From 1965 to 1990, logging-sector employment




dropped from 10,824 to 6,485 workers.[5] From 1989-1994, there was a 24 % drop in direct logging-industry employment alone.[6] This decrease has come despite increases in cut levels. Job losses in the forestry industry can be traced directly back to industry trends of machines displacing workers and companies consolidating their operations in fewer plants with fewer workers processing more trees.

The recent history of regional employment in the logging and forestry sector around Algqonquin is in keeping with this trend. Between 1986 and 1996, the six counties and districts that surround Algonquin shed 33% of the jobs found in the logging and forestry industries .[5b,5c] However, it is interesting to note that these same counties experienced an overall net job gain of 12% during this same period (see figures above). This data re-enforces the observation that while forestry employment is diminishing, the overall employment prospects for people in the region are improving.

## The Opportunity: A Diversified Economy Based on the Natural Environment

At the same time, recent studies have also shown that rural areas with economies that are not based primarily on resource extraction, especially those that have high-quality environments (e.g., well forested, abundant wildlife) have higher per-capita incomes and lower rates of unemployment than resource-extraction communities. A 1997 study[7] found, for example, that between 1986 and 1991, 99% of new jobs created in Southwestern Alberta were in industries not related to resource extraction. During the same period in an adjacent area of British Columbia, only primary resource-extractive districts lost employment.[8]

Another example comes from the Greater Yellowstone Region of the U.S. west.[9] The area's extractive industries once employed one-third of all the area's workers. By 1989, however, only one in ten jobs in the area was associated with forestry or mining. The remainder of the area's employment came from various industries that had been attracted by its natural environment and recreation potential. Some of the area's leaders have stated that the "preservation of a high-quality natural environment [is the] key to strong, diversified economic growth in areas once almost completely dependent on resource extraction activities".

A diversity of new initiatives, and new approaches to older ones, including forestry, can lead to a more stable and prosperous future. As we move toward a knowledge-based economy, companies are more and more able to set up shop anywhere there is a phone line. Huntsville, adjacent to Algonquin Park, has already seen a number of businesses — including London Telecom and Edward Jones Investments — move into the community because of the quality of life and healthy environment it offers.[10]

Clearly, the future belongs to those communities that can develop diversified economies. The region surrounding Algonquin is on the right track, but we need to explore how to include a protected Algonquin Park in this emerging economy.

## Getting There: Elements of A Phase-Out Plan

The best way to ensure that an Algonquin Park logging phase-out adds to the quality of life in the region is to identify the major areas where negative impacts may require mitigation and areas where we can build upon existing positive social and economic trends.

### i. Supporting the Forest Industry

The existing forest industry will be the sector most impacted by removing logging from Algonquin Park. Impacts, however, can be reduced or eliminated by efforts to maintain wood supplies from other sources and through investment in new technologies that require less wood. Below are some ideas of how we could implement both of these strategies.

**a)** ***Maintaining wood flow.*** This task will be relatively easy for some mills and more difficult for others. The key to success will be to focus efforts on maintaining required wood flow while exploring ways to replace wood types that will become less available as the phase-out proceeds.

i) *private land silviculture improvements.* Private land contributes significantly to the total volume of wood available in the region (approximately 40%).[10b] A number of harvest systems are used, with some landowners choosing to manage carefully and sustainably while others undertake practices that erode the long-term quality of the forest. The poor-harvest situation has become severe in some areas and recently municipalities have passed by-laws restricting the worst of these practices. A coordinated effort by the forest industry, local citizens and municipalities to require that forest management on private lands adhere to Crown land standards (or better) could stop and reverse the current decline in wood quality. In the medium to long-term, such a step would also increase the quantity of quality sawlogs available to industry. Local and provincial tax incentives can be used to provide incentives to landowners while financial penalties could be imposed on those who ignore the requirements.

ii) *re-assignment of abandoned licences.* Market forces including aquisitions, mergers, changing product demand and other factors sometimes lead to mill shutdowns (the former Stone-Consolidated mill in Arnprior is a recent example). When this happens in the Algonquin region, all licences held by the mill on Crown lands outside the park could be re-assigned to the remaining mills, thus increasing the wood supply for these continuing operations. If a mill received increased volume in this manner, wood volume the mill received from Algonquin should be correspondingly reduced. If a mill receiving wood from Algonquin closes, their harvest area should be converted into a natural environment or wilderness zone area. Allocations from the park should not be reassigned to remaining mills and new volumes should not be made available.

iii) *modification of Crown land silvicultural standards.* Many forest areas in the Algonquin region have been poorly logged in the past. Many of these forests were formerly dominated by valuable softwoods such as white pine or spruce, but now contain higher proportions of white birch, poplar or red maple. Such forest areas often go unharvested because of the lack of markets for these hardwood species. These stands could be harvested in a manner that favoured the regeneration of the softwood species by adjusting stumpage rates to reflect the restoration nature of the logging taking place. As a result, more sawlogs would be made available and the future forest in these areas could contain a softwood component more like the original forest.

*Mills should be encourged to manufacture more valuable products that use less wood.*

***b) Adding Value.*** The key to adding value to wood products in the region will be to reduce reliance on high volumes of high-quality wood. Some strategies include:

i) *substitute plentiful species for the rare.* Softwoods such as white pine have traditionally been milled for dimensional lumber while high-quality hardwoods like yellow birch have been used to produce veneers. New technology is making it possible to produce lumber and veneers from poplar and white birch (Buchanan Forest Products operates a poplar lumber mill in Northwestern Ontario). A move to substitute these more plentiful species will help to stretch a smaller overall wood supply.

ii) *low-volume wood, high engineering or labour* content. Increasingly, wood products are being engineered to exact and consistent specifications for the building industry. Composite beams, engineered panels and other products use small dimension and/or wood waste to produce new products. In the future much or most of the value in products will come from the ideas contained in the product rather than the high volumes manufactured. Towns in Northwestern Ontario, for example, are currently working to attract a new engineered floor-joist company to their region. Communities in the Algonquin region should consider similar efforts.

Other companies are adding more value to wood by taking it much further toward a finished end product before exporting it from the region. In the Algonquin region, the local company Madawaska Doors Inc. of Barry's Bay employs 95 people and uses approximately 400 m3 of wood per year.[11] Contrast the number of jobs produced by Madawaska Doors with a typical pulp mill — 233 jobs in the door plant versus 2.4 jobs in the pulp mill per 1,000 cubic metres of wood consumed. Multi-layer hardwood flooring,

log cottages, window frames, trusses and panelized wall sections are among the new building and consumer wood products that could be developed in the Algonquin region and shipped to nearby Southern Ontario and U.S. markets.

*iii) closed loop manufacturing*. Business is increasingly seeing the value of using the waste of one industry as the raw material for another. Such an approach makes good sense in the forest industry where sawmills and veneer mills produce vast quantities of waste sawdust and wood chips. The new medium-density fibre (MDF) board plant in Pembroke is an example of a move to use this material in the Algonquin region. It consumes 350,000 m3 of wood waste annually and employs 88 people full time.

*iv) mill upgrades and conversions*. Mills that are out of date and inefficient, consume rare wood types or produce products with low value per unit can sometimes be upgraded and retooled to produce a new product. A few years ago, the Tembec mill in Huntsville retooled to produce hardwood flooring. This upgrade saved 90 jobs. Also, the veneer mill in Wilberforce has recently undergone modernization. Similar opportunities may exist in other facilities.

ANDREA MAENZA

*Menominee First Nation's forest*

**2. Supporting Other Initiatives in the Region**

i) *Community Forestry*. Typically forest licences are controlled by forest-product companies. But the creation of Community Forest Boards provides an opportunity for a greater diversity of interests and experiences to be involved in forest planning, which, in turn, makes it possible to think more creatively about the range of social and economic activities that could take place in the forest. Long-running examples of community forestry exist: The Menominee forest, on Menominee First Nation's lands in Wisconsin is an example of a successful community-controlled forest — the timber inventory on the Menominee lands is higher now than when cutting started over 100 years ago. Closer to home, and right on the border of Algonquin Park, Westwind Forest Management has recently been established as a citizen and industry-controlled Community Forest Board to manage Crown lands in the Bracebridge and Parry Sound areas for multiple benefits.

ii) *Alternative Forest Industries*

Forests can provide us with many more products than wood. They can provide food (e.g., mushrooms, nuts and maple syrup), herbs and medicines and crafts (baskets, wreaths, garden arbors, twig furniture, etc.). Multi-million dollar markets exist for many of these products and in some instances these alternative forest industries can prove more profitable than timber harvesting. For example, a 1995 study in the Ottawa Valley's Renfrew County estimated that the potential value of the area's annual wild mushroom harvest at $80/hectare. If the same area were cut for pulpwood the estimated annual return would only be $56/hectare.[12]

We could also use materials from forest tending, such as pre-commercial thinnings, for craft industries such as making wreaths or garden furniture in order to offset the costs of this forest-improvement work.[13] To make the most of these industries, however, we must integrate their needs into forest planning. If we do, such alternative uses can become a healthy part of an area's forest-based revenue stream.

iii) *Tourism and Ecotourism*

One of the fastest-growing industries worldwide is tourism. Algonquin Park is no exception, with almost one-million visitors a summer from all over Canada and the world. Visitors to Algonquin spend more than $75 million per year in the park.[14] Within 40 kilometres of the park, an additional $41 million is spent (OMNR).

The district of Muskoka has already recognized the economic potential of its proximity to Algonquin and has established a non-profit organization called Muskoka Tourism. Its job is to market the region as a tourist destination while emphasizing the area's proximity toAlgonquin Park. Muskoka brings in $300 million annually in tourist dollars and tourism is responsible for half of all jobs in the district.[15]

Ontario's tourism industry already rivals the forestry industry for export earnings: In 1994, the forest industry earned $3.8 billion in export earnings while tourism earned $3.4 billion.[16] Areas surrounding Algonquin Park have the potential to attract large numbers of visitors. By restoring and maintaining the

area's natural landscape, this sector can grow.

Local communities, however, do not have to rely on one type of tourism alone. Some area communities have already developed local tourism initiatives, such as studio tours. These tours draw visitors to an area, project an interesting regional image and create a richer cultural environment for residents. Similarly, festivals, dogsled races, fishing derbies, fall-colour tours and other activities tied to natural attractions and the outdoors help bring visitors back again and again and promote a sense that the area offers lots to see and do. And what often begins as small community intiatives can blossom into something bigger: The state of New Hampshire, for example, calculates that fall-colour tours pump $700 million (U.S.) Into the state's economy every year. [17]

iv) *"new" industries.*

The spectacular and rapid changes in telecommunications, travel and global-trade patterns have drastically altered assumptions about where industries and people will choose to locate. Old truisms that small to medium-size companies will always choose Mississauga over Huntsville or Oakville over Bancroft no longer seem valid. The example of London Telecom moving to Huntsville and Cobra racing cars being manufactured in Bancroft (with 10 to 14 new jobs in the offing)[18] provide some recent proof. Southern Ontario is growing rapidly and the quality of life, infrastructure, and low cost of locating in the Algonquin region offer compelling reasons for business to locate here.

### Who Pays?

Bringing about a successful transition in Algonquin's role from a source of timber to a true protected area will depend as much on vision and planning as dollars. Many of the steps outlined above are cost-neutral, and rely instead on creating business conditions that will naturally lead to growth in new economic sectors — sectors that are already expanding.

That said, there will still be a need for seed or start-up funds that can trigger or leverage larger marketplace forces and private investments. A community-transition fund could, for example, quickly be established by transferring the $6.9 million dollars in retained income currently held by the Algonquin Forestry Authority to a fund overseen by a community board. It could be further developed over the period of the phase-out by directing the AFA's yearly surplus to the fund rather than to provincial general revenues. In 1997-98, for example, the AFA paid more than $1 million dollars into Ontario's Consolidated Revenue Fund.[19]

There is a recent precedent for the establishment of such a fund. In 1999, the Living Legacy Trust was established and given $30 million by the provincial government to help with the implementation of its Lands for Life program. The fund has an independent Board of Directors and a mandate to assist the forest industry and communities as they adjust to (and take advantage of) Ontario's new protected areas.

GARY MCGUFFIN

## Conclusion

By practicing sustainable forestry, giving communities increased opportunities to manage their forests, diversifying economies and getting all possible value out of wood harvested, we can protect Algonquin Park, have healthy forests and healthy human communities. The Algonquin Park region is capable of supporting its communities without logging in the park. A sound community-transition plan combined with sustainable forestry outside of the park, value-added industries, alternative forest industries, and tourism initiatives can make it possible for us to truly protect Algonquin Park and live prosperously.

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Kill the Myth, Not the Wolf: A wolf conservation strategy for Algonquin Park and region

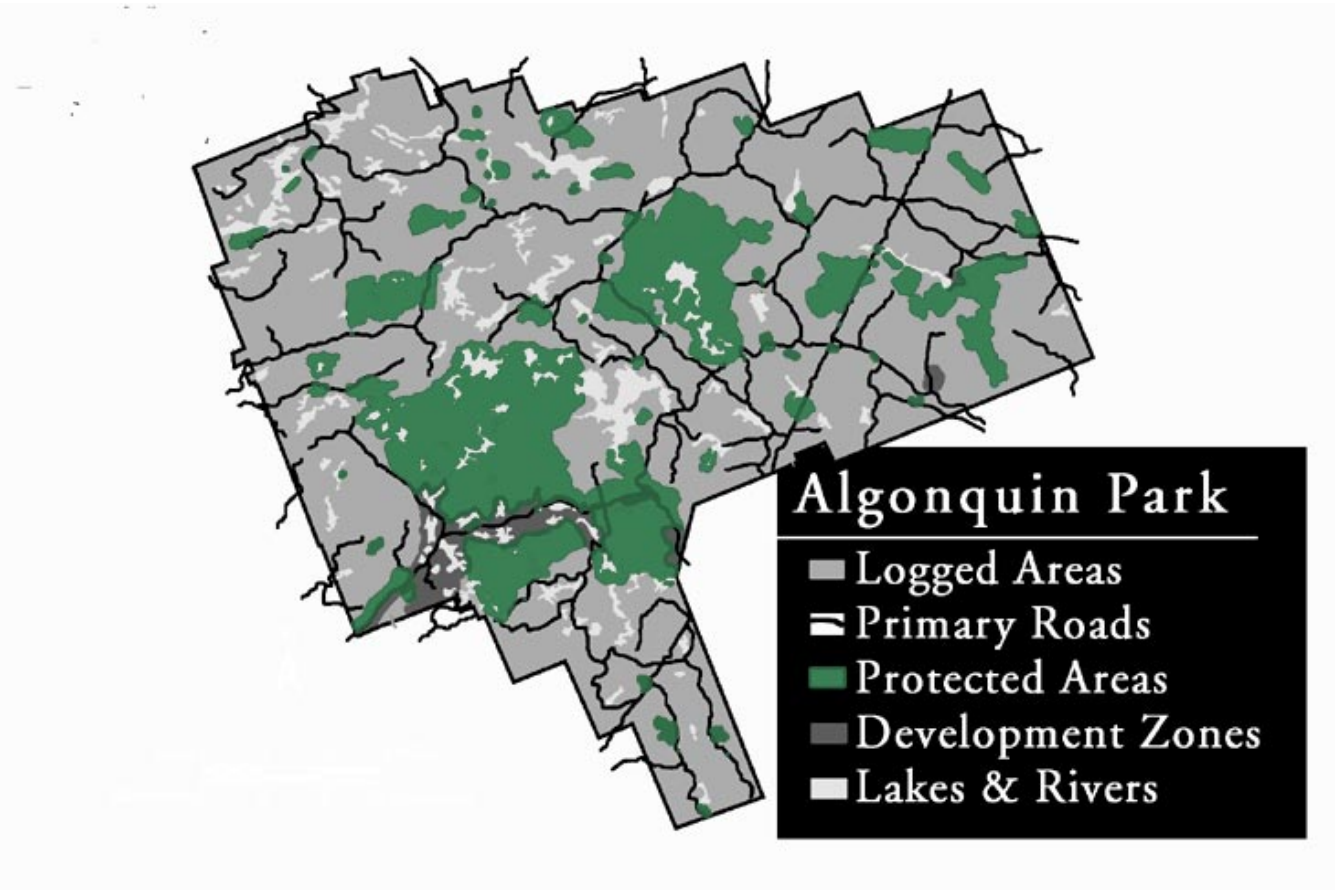
Forest Diversity-Community Survival: Forestry fact sheet series (10 fact sheets)

Ecotourism Fact Sheet #1: Profiting from Parks

A Sense of Place: People and communities on the road to a new Northern economy

Planning for Prosperity: How Ontario can protect 15-20% of the land, maintain wood flow to mills and create 8,000 new jobs

*These publications are all available from the Wildlands League. Please see the back cover for contact information or check our website, www.wildlandsleague.org.*




## Further information

We welcome your comments on this report and your thoughts on restoring natural processes and values in Algonquin. Please contact us:

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