This is Annex 1 prepared by Algonquin Eco Watch as part of a request for Individual Environmental Assessment for the Algonquin Forest Management Plan 2010.

Annex 1- <u>What Makes Algonquin Park Special?</u>

Figure 1. *This fall view looking northwest along the Algonquin "Dome" shows the two distinct forest ecotypes that occur in the Algonquin Park Forest, with pine-poplar forest to the right (east) and with hardwood-hemlock forest to the left (west).*

<u>Introduction</u>

Algonquin Eco Watch is concerned that many aspects of the 2010-2020 Algonquin Park Forest Management Plan will lead to decreasing sustainability and diversity within the Algonquin Park Ecosystem. Following is a summary of issues that we believe if taken as a whole should lead to the initiation of an Individual Environmental Assessment (IEA).

When the all-inclusive Environmental Assessment of Forest Management was concluded in Ontario in 1994, the Algonquin Park Forest was included, implying that management procedures in Algonquin Park would be the same as for areas outside the Park. What managers failed to recognize at that time is that Algonquin Park is <u>not</u> the same as areas outside its boundaries. The original mandate of the Park was to "… reserve and set apart as 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."[1]. If the Park is treated the same as areas outside its boundaries, then its boundaries become meaningless.

Old Growth

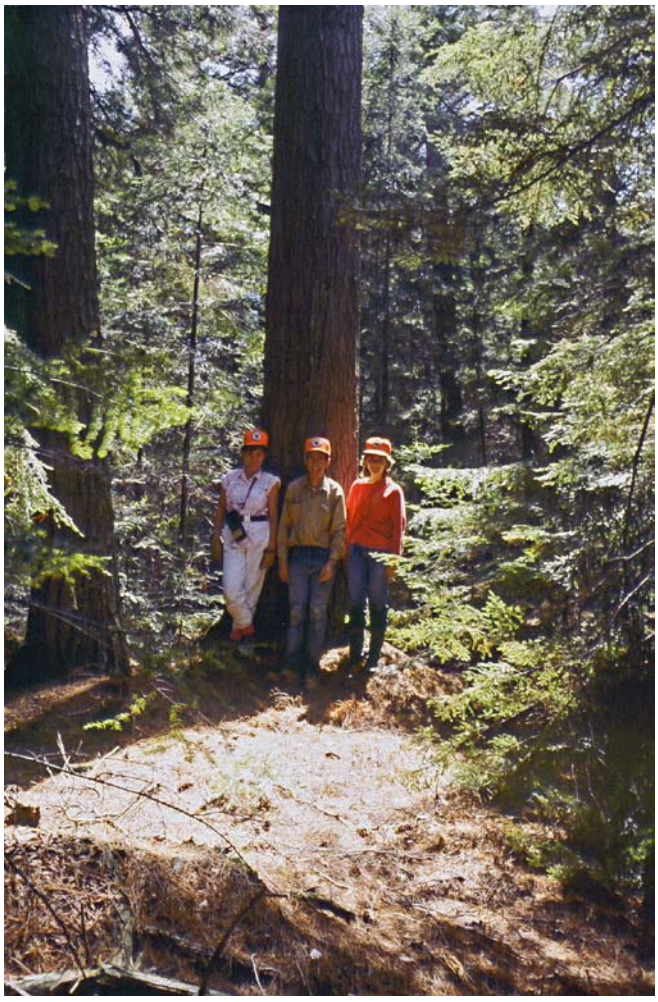

Figure 2. (left). *Old growth white pine on an island in Lake Lavieille, Algonquin Park.*

Subsequent to its formation in 1972-73, the Algonquin Forestry Authority (AFA) decided that no permanent old growth stands would be set aside in that portion of Algonquin Park (AP) where logging occurs. That reasoning is flawed however, for the following reason; that portion of the Park where logging occurs, known as the Recreation/Utilization (R/U) Zone, represents over 70% of the Park, and if properly managed could contribute significantly to the sustainability of species diversity within the greater Park framework. By not providing for permanent old growth stands within the R/U Zone, animal species preferring old growth are confined to those areas within the Park (less than 30%) where logging is not allowed.

The two main harvesting methods employed in the Algonquin Park forest are the uniform shelterwood (US) system in the eastern white pine forest and the single-tree selection system in the western hardwood forest. Under the uniform shelterwood system individual trees are removed over a 4-cut rotation, in a uniform spacing pattern, such that sufficient light will reach the ground to encourage white pine regeneration, but sufficient shade will remain to protect the new growth from weevils. The trees remaining will fill in the canopy spaces left by removal, prior to the next cut, when the canopy will be opened up once again. This gives rise to recurrent canopy openings, which result in loss of cover for wildlife and bird species. In a report titled "Management of Old Growth Pine and Provision of Associated Habitat in Algonquin Park", commissioned by Algonquin Eco Watch, ArborVitae Environmental Services Ltd. (2007), and stated, "The projections show that within 100 years, there will be little pine in the recreation/utilization zone older than 150 years of age. Furthermore, all of the white pine in the recreational/utilization zone will be

[1] An Act to Establish the Algonquin National Park of Ontario. And Report of the Royal [Ontario} Commission on Forest Reservation and National Parks (Toronto: Queen's Printer, 1893, 6.

Figure 3. *At the completion of the uniform shelterwood cycle, much of the remaining white pine will occur as individual trees, unsatisfactory as wildlife shelter, rather than contiguous, undisturbed stands of trees.*

managed according to the uniform shelterwood system, which implies that in the long term there will be few if any old growth pine stands in that zone" – which represents over 70% of Algonquin Park.

Under the single-tree selection system (western AP hardwood forest), individual trees are harvested, leaving a denser canopy than with uniform shelterwood, since this system seeks to regenerate shade-tolerant species, such as hard maple, found predominantly on the western side of Algonquin Park. Owing to the nature of the selection system, all trees in a stand are available for harvesting, depending on their condition, or protection in the case of individual "wildlife nesting/denning trees". This too means that no stands will be left to form undisturbed old growth (see Figure 4).

Algonquin Eco Watch submits that to be effective, old growth must consist of stands of trees well distributed throughout the Area of Operations, that are left undisturbed indefinitely, with the stand size large enough, (say 5-10 ha) to encompass the home range of a variety of small mammals and bird species. Under the present and pending Forest Management Plan(s), this will not happen and as a result AEW submits that the AP Forest will become unsustainable with a resulting loss of diversity.

Figure 4. *The single-tree selection system, as practiced in western Algonquin Park hardwoods, also opens up the canopy, without leaving old growth stands intact.*

The recent submission by the Ontario Parks Board to the minister of Natural Resources, titled "Lightening the Footprint" does recommend increasing protected areas where logging cannot occur. Unfortunately however, the majority of that protection will occur adjacent to canoe routes and appears to be aimed more at "protecting" canoeists from logging operations than at increasing old growth stands. Further, since the majority of protection will occur in riparian (lowland) areas, this will do nothing to increase old growth stands in upland pine (eastern Algonquin) or upland hardwoods (western Algonquin). We therefore submit that as it stands, "Lightening the Footprint" will lessen the likelihood of achieving additional old growth stands in upland areas within the R/U Zone.

By now, it should be obvious that the majority of Algonquin Park, i.e. over 70%, is being managed primarily for wood fibre production and not for maximum diversity in a sustainable ecosystem as it should be. We submit that this is flawed philosophy and are disappointed that Ontario Parks has not taken a more active role in protecting old growth stands within the Recreation/Utilization Zone.

Roads

Many areas that are considered to provide old growth because no logging is permitted within them contain roads, some of which such as Highway 60, the Shirley Lake and Achray Roads are built to high-speed standards. Areas such as these draw bird and animal species that prefer old growth, only to experience linear mortality zones over their entire length, in effect making traps within areas of supposed security. Clute. (1998), in a study conducted along the Frank MacDougall Parkway (Highway 60) through Algonquin Park, in a period of 122 days from May to August, 1997, counted 231 specimens of 43 species dead from vehicle encounters. In addition, the use of de-icing salt (sodium chloride) along Highway 60 and on some interior logging roads attracts many winter birds, such as finches seeking grit in the winter, and many mammals and birds seeking electrolytes, such as sodium salts, during spring and early summer. An average of 20 moose are struck by vehicles along the Highway 60 corridor annually. For these reasons, such areas should not be included when calculating "permanent old growth areas", since they actually pose a threat rather than a benefit.

Figure 5. *This female snapping turtle was killed on the Shirley Lake Road, a logging road in the Algonquin Park interior. Note the eggs on the road.*

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Brook Trout Waters

When roads are constructed in the Park, very often gravel is taken from nearby aggregate deposits in order to build the roads. The removal of gravel from these deposits may adversely affect the groundwater table, negatively impacting adjacent coldwater fisheries.

Algonquin Park arguably supports one of the highest concentrations of self-sustaining brook trout populations in the world. Many of these isolated populations exhibit unique genetic diversity. To succeed, these populations require clear cold-water upwellings (springs) for successful spawning, and inflowing cold-water "nursery creeks" for successful rearing of the young. These conditions are rare and only occur where "lenses" from adjacent aggregate deposits allow groundwater to flow down the resulting gradient. If aggregate withdrawal for road building and maintenance occurs from these deposits and their supporting catchment basins, it may upset the delicate groundwater balance, reducing or stopping the flow to upwellings and nursery creeks. In the case of Algonquin Park each instance is unique, requiring considerably more on-ground research before aggregate removal is allowed to occur or continue. While the AFA and Ont.Pks. have shown interest in researching this problem, Algonquin Eco watch feels that a far greater commitment is needed by both agencies, if this irreplaceable resource is to be sustainable.

Figure 6. (left) *Intense logging around this tiny headwater lake, plus aggregate extraction for road building, is likely to negatively affect the stability of the local water table and the lake's ability to support a self-sustaining brook trout population.*

Figure 7. (left) *Fish such as this brook trout fingerling can escape from predators by spending their first year of life up tiny cold water spring-fed nursery creeks (Curry, 1997). Gravel removal from nearby aggregate deposits can seriously alter essential water flow to such creeks.*

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Loss of Species Diversity

In a report titled"Management of Algonquin Park's West Side Forests and Provision of Associated Habitat", commissioned by Algonquin Eco Watch, ArborVitae Environmental Services Ltd. (2010), stated "We … have found that there have been significant shifts in the relative abundance and age class distribution of most tree species. In particular, compared to the pre-settlement forest, there have been significant documented reductions in:
Red spruce, Larch, American elm, Yellow birch, Eastern hemlock, cedar and White pine…. We also suspect that, in addition to yellow birch, other mid-(shade) tolerant species such as basswood, black cherry and white ash, (which are at the northern limit of their range in the Park) are less common in today's forest than they were previously. While there is little quantitative evidence for this, such an outcome has been documented in northern hardwood forests that have been subject to the application of the single-tree selection system, as Algonquin Park has".

While some tree species have declined from causes such as insect infestation or disease, red spruce, eastern hemlock and white pine have all declined as a result of human poor-management practices. Algonquin Eco Watch submits that it is achievable to re-instate these three species to at least a portion of their former abundance. For that reason we pay them special attention here.

Figure 8. *Stately white pine occurring in open hardwood areas can provide excellent escape cover for sow bears and their cubs.*

White Pine

In addition to comprising the main commercial species on the east side of Algonquin Park, many giant or "Super canopy" white pine used to occur sporadically across the western uplands as well. These trees were systematically removed during early logging days and have never been replaced, either naturally or through silvicultural practices. These were, and remain, extremely important trees from a wildlife and bird perspective, often serving as nesting sites for large passerines, as well as for important "escape trees" for sow bears and their cubs. Thompson (2006) in a paper describing historical changes in white pine abundance in Algonquin Park, stated "Stump and tree densities since the 1800's suggested a mean reduction in the number of white pine trees of 88% from about 3 to >8 pines/ha to <1 pine/ha today in mixed and deciduous stands," Even into the 1960's and '70's foresters sought to "convert and simplify" hardwood stands by removing competing and miscellaneous species, in retrospect a very flawed philosophy. A concerted effort to replace this lost diversity must be instituted

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Figure 9. *This hemlock ridge, cut in the 1960's for the Toronto subway system, still had not regenerated after 30 years, a loss of winter bird and animal shelter.*

Hemlock

Over-cutting in the 1950's and 60's during the building of the Toronto Subway[2], resulted in a significant loss of mature hemlock from Algonquin Park's west side. Hemlock was/is not regarded as a valuable commercial species by the industry, so this was considered to be an opportunity to convert hemlock stands to more commercially valuable hardwood species, such as yellow birch, a very valuable veneer species – another example of flawed philosophy. This in part led to the drastic decline in the Algonquin deer herd during the 1960's and 70's, which in turn led to a significant increase in the Park moose population[3] (Wilton, 1987). Hemlock is a preferred winter cover and browse species for deer, moose and other wildlife species. Because of this, while hemlock may be easily regenerated, browsing prohibits its escape (recruitment) into the overstory. This is resulting in a loss of the hemlock component of the Algonquin Park Forest as older trees topple or are cut, with no younger trees to replace them. Since hemlock does not have a high market value, there has been hesitancy on the part of the AFA and Ontario Parks (Ont. Pks.) to fund silvicultural activities such as summer scarification, which would enhance the likelihood of seed germination[4]. This would greatly enhance widespread hemlock regeneration in good seed years, increasing the possibility of recruitment to the upper story, and the restoration of this important component of the AP Forest

2Hemlock makes excellent shoring timber owing to its moisture resistance.

3A brain parasite, fatal to moose, but not to deer, decreased proportionately with the decline in deer numbers, allowing for a corresponding increase in moose numbers.

4Winter logging operations do not achieve useful scarification owing to the presence of frost in the ground.

Red Spruce

Red spruce, which is very similar in appearance to white spruce gives rise to a superior timber product and as a rule has been inadvertently over-cut within the Algonquin Park Forest. Expertise regarding site requirements and soil type are readily available from Dr. Alan G. Gordon, a recognized expert with regard to this species. The AFA has collected a small quantity of seed and limited plantings are planned. We regard this as a token response however, and feel that a much more concerted effort must be undertaken if this species is to regain its former abundance in the Algonquin Park Forest.

Figure 10. (left) *Past overcutting of Red spruce will necessitate continuous robust planting with Algonquin Park genetic seed stock.*

Calcium Deficiency

Scientific papers (Watmough and Dillon, 2002) published as early as 2002 in well-respected peer-reviewed journals allude to the fact that timber harvesting as well as leaching from acid precipitation, is removing soil calcium from granitic soils, such as occur within Algonquin Park. This will lead to decreased growth rates and yields, necessitating longer rotation periods and may be expected to worsen through time. There is no mention of this work and its ramifications within the 2010-2020 Algonquin Park Forest Management Plan. While there is doubt in some circles regarding these findings, one purpose of Algonquin Park is to conduct research. It is

disappointing that neither the AFA nor Ont. Pks. have seen fit to either pursue this significant line of research or consider it in their growth and yield tables.
In a personal interview with Dr. Watmough at Trent University, on May 19th, 2010, he stated the following:
"Based on our current understanding of calcium weathering in shallow granitic soils, the current combined losses of calcium through harvesting and leaching is likely not sustainable."
Dr. Watmough further states that the following 2 questions must be answered before this problem can be completely understood:
1- Where do trees get their calcium from?
2- What is the long-term supply of calcium through weathering?
To achieve sustainability, the answer to question number 2 must be greater than the combined calcium losses from leaching (stream water flow) and harvesting.

Figure 11. *Sulphur-acid precipitation from such aerial sources as the VALE INCO "Superstack" in Sudbury, has led to calcium deficiencies in downwind granitic soils, such as those found in the Algonquin Ecosystem.*

Down Woody Debris, Value Added, Biomass and Bio Fuels

The recent thinking regarding the expanding use of products remaining after logging operations is not only regarded as a panacea to the logging industry, but has acquired a "green" connotation, which places this concept right up with "motherhood". At this stage, without extensive controlled research, it is virtually impossible to predict what this trend may do to available soil nutrients. The dangers inherent in this thinking could very easily result in further deterioration of expected growth and yield (G&Y), as well as rotation period forecasts.
Algonquin Eco Watch feels that the industry should neither be encouraged nor allowed to remove additional wood-fibre from the Algonquin Park Forest until extensive research has been conducted to establish the possible consequences.

Figure 11. *Removal of down woody debris from the forest floor could result in serious future soil nutrient deficiencies.*

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Summary – Algonquin Park is Special

Algonquin Park should be providing more than just a minimal amount of sustainable diversity, if it is to act as a reservoir and dispersal point for wildlife to outside areas. Also, it should be the Crown Forest that leads the way for other Provincial Crown Forests in innovative sustainable ecosystem management. Unfortunately, at this time, it is not providing that leadership.
Taken as a whole, Algonquin Eco Watch feels that the problems discussed here constitute reasonable and sufficient grounds to treat the Algonquin Park Forest as a "Special Case", well deserving of an Individual Environmental Assessment.

Figure 11. *Algonquin Eco Watch submits that it should be possible to practice good forest management, while still preserving sustainable biodiversity in Algonquin Park, Ontario's Premier Park. If a workable balance cannot be achieved here, then it is unlikely to be achieved anywhere.*

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