

HEADWATER PROTECTION AND THE ALGONQUIN ECOSYSTEM

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ABSTRACT

Four of seven major rivers that flow off the Algonquin Dome, in south central Ontario, Canada, have headwaters outside Algonquin Park, and are therefore not afforded the same protection as the other three major rivers that originate within the Park. Since three of the four rivers that have headwaters outside Algonquin Park flow through the Park, sub-standard water quality and variable quantity can be introduced into the Algonquin Park Ecosystem from external sources. While efforts to gain fully protected status for all headwaters on the Algonquin Dome met with some success during the recent “Lands For Life” initiative, definitions resulting from that exercise still allow for development which will lead to future water quality and quantity impairment.

1.0 INTRODUCTION

Algonquin Provincial Park (45° 39', 78° 39'W) is located in south central Ontario, on high country between Georgian Bay (Lake Huron) and the Ottawa River, and is approximately 7314 km² in area. Precipitation from moist air rising up the Algonquin Dome, as a result of prevailing westerly winds off Georgian Bay-Lake Huron, gives rise to seven major rivers (1). Four of those rivers (Magnetawan, Amable du Fond, Petawawa and York) have their headwaters outside Algonquin Park and three (Muskoka,

Bonnechere and Madawaska) originate within the Park. Since the Amable du Fond, Petawawa and York Rivers source outside Algonquin Park, but flow through the Park, water quality and/or quantity changes introduced at the headwater level, will affect the Algonquin Park Ecosystem. There are at least 20 minor watersheds located outside Algonquin Park that drain into rivers, which flow through the Park (2). For this reason, Algonquin Eco Watch defines the Algonquin Ecosystem as “All of Algonquin Park, plus all drainages that source outside the Park, but flow into it”. The recent Ontario Government “Lands for Life” initiative, recognized and classified headwater areas, but failed to provide sufficient regulation to ensure their perpetual protection. This paper explores, with examples, some of the possible ramifications of Ontario’s new Land Use Classification system and how it may affect the Algonquin Ecosystem.

2.0 BACKGROUND

Headwaters may be described as the uppermost reaches of a drainage or flowage system, and take the form of surface water (above ground), or ground water (below ground) sources. While all water originates from precipitation, either in the form of rain or snow, surface water sources usually are stored in areas such as bogs, swamps, fens, or marshes, that act like giant sponges, from which flow can occur over extended periods. Ground water usually is stored below the earth’s surface in rock formations, and may emerge as surface springs, or seeps, which are groundwater upwelling either on land or in the water (3). Ground water sources are more likely to retain their cold temperatures, i.e. “about 5⁰C in winter to <15⁰C in summer” (4), whereas surface water tends toward greater temperature variation, depending on ground cover and air temperature. Generally, unless first appearing as cold water springs, - an unusual phenomenon -, headwaters are

singularly unimpressive; a quality that often leads to underestimating their importance. Anomalies occurring at any point in a drainage system will affect the system downstream. Anomalies occurring at the headwaters, however, will affect a drainage system over its entire length.

The protection of headwaters involves the understanding of several branches of science, such as fisheries biology, geology and hydrology.

3.0 LAND USE

Since the coming of Europeans to North America there has been a tendency to regulate and manage land in straight lines. Divisions such as lots and concessions, and boundaries such as townships and parks are good examples of this. The natural movement of plants, animals and water, however, is oriented to land form which is oriented toward, and indeed often the result of, water flow. Therefore, the most logical way to manage land would appear to be on the basis of watersheds. For this reason, Algonquin Eco Watch includes all inflowing drainages as part of the Algonquin Ecosystem. Further, Algonquin Eco Watch feels that while some forms of land management are compatible, i.e. sustainable, with good watershed protection, others are not.

3.1 COMPATIBLE LAND USE

Hunting and Trapping

Hunting and trapping are tightly controlled and managed in Ontario (5,6). While these pastimes may be considered consumptive in nature, they are sustainable (renewable) and pose no threat to water quality or quantity, with the possible exception of permanent structures such as hunt camps or trapper's cabins located along waterways.

Logging

Comprehensive standards and guidelines apply equally to all aspects of forest management in Ontario today, including areas inside and outside Algonquin Park (7).

While special harvest conditions must often be imposed in headwater areas, it is possible to conduct sustainable (renewable) logging in such areas, provided that the special conditions are rigidly applied.

3.2 NON-COMPATIBLE LAND USE

Lakeshore Development, or, Cottaging

While cottage subdivisions are non-consumptive in nature, characteristically accelerated eutrophication is associated with this type of permanent development (8,9). While this phenomenon may decrease proportionately downstream, owing to increasing watershed flow volume, headwater lakes, being the furthest upstream, have the lowest flushing rates in the watershed, and are therefore more prone to, and slower to correct, negative trauma. In addition, self sustaining brook trout lakes are often synonymous with headwaters, in that they possess seeps, or upwellings of cold water through gravel substrate, over which brook trout will spawn, and also into which tiny cold water streams flow, known as brook trout nursery creeks (3). Brook trout fry will spend their first year of life up such creeks. Permanent development on these lakes not only has a detrimental effect on water quality, but also tends to result in declining brook trout populations through exploitation and increased human activity.

Mining, Including Aggregate Extraction

Flowing water, like trees, fish and wildlife populations, is generally considered to be a renewable natural resource. Provided that the source remains unaltered, the flow

(quantity), while fluctuating seasonally, may be expected to continue unabated indefinitely. Even if physical and chemical aspects (quality) become altered, this can be corrected provided that the quantity remains unchanged. Minerals, like petroleum and natural gas are non-renewable natural resources in that they are not self-perpetuating like water, trees, fish and wildlife. In instances where mineral or aggregate removal (mining) coincides with the loss of geological-physical structures that store and supply surface and ground source water, then the water issuing from that source becomes a non-renewable natural resource. If that location happens to be a headwater, then that entire drainage will be negatively affected in perpetuity, from both a quantity and quality standpoint.

An open-pit graphite mine located immediately outside the west boundary of Algonquin Park, at the headwaters of the Magnetawan and Tim Rivers illustrates this argument.

Deepening of the open pit, below the level of adjacent headwater lake basins is causing seepage from those basins, through fissures into the pit (10,11). This water is then pumped over the height-of-land into the south branch of the Magnetawan River, rather than flowing naturally into the headwaters of the north branch of the Magnetawan; thus altering flow in two drainage systems. Removal of overburden from the rock dome capping the open pit, with the ultimate removal of the dome itself will alter both surface and ground water storage capacity at this headwater location forever more. Chemical and biological testing has indicated that this mining operation has negatively affected the brook trout fishery in adjacent Graphite Lake (12).

4.0 LANDS FOR LIFE

Beginning in the fall of 1997 the Province of Ontario initiated the process known as “Lands for Life”, aimed at establishing a code for future provincial crown land use

planning, through public consultation (13). Meetings took place in the Great Lakes – St. Lawrence Planning Area during 1998, in which the public were invited to discuss a series of scenarios developed by the planning team, as a result of discussions with an invited group of special interest factions. In July of 1999, John Snobelin, Minister of Natural Resources, released the final document entitled “Ontario’s Living Legacy” (14), a new provincial land use strategy.

4.1 ALGONQUIN ECO WATCH PARTICIPATION

During the public participation phase of Lands For Life, Algonquin Eco Watch made two presentations to the Great Lakes – St. Lawrence Round Table. The first presentation dealt with the importance of protecting headwaters outside Algonquin Park that flow into the Park. The second presentation dealt with the matter of compatible versus non-compatible land use practices within headwater drainages, and was intended to indicate that with few exceptions, most practices are acceptable in these areas.

Further, Algonquin Eco Watch directed three letters to the Hon. John Snobelin, and one letter to the Chairman of the Great Lakes – St. Lawrence Round Table during that period, commenting on various aspects of the developing strategy.

4.2 LANDS FOR LIFE – THE RESULTS

The final document, “Ontario’s Living Legacy”, created four areas adjacent to the Algonquin Park boundary in the “Enhanced Management Areas” category, which are classed as “natural heritage, i.e. E67N”. The document identifies “E67N” as “Algonquin Provincial Park Headwaters”, and describes the 4 enhanced management areas (EMA’s) thus; “These enhanced management areas have been established to protect the headwaters

of Algonquin Provincial Park”, but, “it is not the intent of this policy to manage these lands as potential future additions to ... the Park”.

The document further states that “existing and improved guidelines for access road planning and construction and aggregate extraction will be implemented to protect water quality”, and “mineral exploration and development are permitted within this designation, ... recognizing that controls and monitoring will need to be applied ...”.

The document further states, “...for this EMA ... only major watershed boundaries have been mapped. Further planning will identify watershed boundaries for lower order watercourses flowing into the Park”.

The document does not mention cottage subdivision development with relation to these enhanced management areas.

5.0 DISCUSSION

- The Lands For Life initiative is felt to have been a timely and worthwhile exercise. In spite of extreme time constraints, the members of both the Great Lakes-St. Lawrence Roundtable and (especially) the Provincial Planning Team met their deadlines, while at the same time maintaining focus on the job at hand. For many members of the public, Lands For Life was in some ways like trying to catch a train that has already left the station. It did however allow many groups with diverse interests to “state their case”.

- Algonquin Eco Watch was gratified to learn from the final document, “Ontario’s Living Legacy”, of the creation of Enhanced Management Area “E67N”, which promises to (ultimately) afford a level of protection to (all) headwaters sourcing outside Algonquin Park, but flowing into the Park. Data gathering and documentation by Algonquin Eco

Watch on the Tyne Creek Watershed (2), and the headwaters of the Magnetawan and Tim Rivers, substantiates the need for such protection.

- While all Algonquin in-flowing headwaters were not identified, or given the designation “E67N” in the initial document, “Ontario’s Living Legacy” promises that this will be done. Algonquin Eco Watch will be carefully monitoring progress in this regard.

- It is stated in “Ontario’s Living Legacy, p117-118” that “existing and improved guidelines for access road planning and construction and aggregate extraction will be implemented to protect water quality” – but with no mention made of “quantity”. The removal of large quantities of aggregate from such geographic formations as drumlins or eskers may very well negatively affect not only water quality, but quantity as well. This should not be allowed in headwater areas.

- Algonquin Eco Watch is strongly opposed to the allowing of mineral exploration and development of any kind within EMA’s (present and future), designated under the ID “E67N”.

6.0 RECOMMENDATIONS

- 1** Assuming that there will be a final Land Use Strategy document arising from the Lands For Life and “Ontario’s Living Legacy” exercises, Algonquin Eco Watch recommends that all headwaters flowing into Algonquin Park be identified and designated appropriately in that final document.
- 2** Based on the concept that the best land use planning is accomplished on a watershed basis, Algonquin Eco Watch recommends that all the watersheds referred to in recommendation #1, ultimately be incorporated into Algonquin Provincial Park.

Permanent structures located within these watersheds could be “grandfathered” out through time.

- 3 Based on examples presented herein, Algonquin Eco Watch feels that mining exploration and development are definitely incompatible with headwater protection, and therefore recommends that these activities not be allowed within EMA’s (present and future), designated under the ID “E67N”.
- 4 Based on discussion presented herein, Algonquin Eco Watch recommends that no lakeshore development, and/or, cottaging be allowed on headwater lakes, since these activities that may prove detrimental, particularly when the lakes involved are small, have a low flushing rate, and may possess self-sustaining brook trout populations.

7.0 ACKNOWLEDGEMENTS

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