

## 1.0 Annex 2 –Flawed Models are Used in Writing the Plan

Unfortunately, at the heart of the model used to create the Algonquin Forest Management Plan is a flawed component that has been shown to be inaccurate in independent studies conducted by independent research scientists. The papers that report the findings are referenced here and can be verified because they are part of the open ecological literature.<sup>12</sup>

Modern forest management plans have to be created using computer models. The complexity of the forest, the varied forest products that can be produced from the forest and the variation of modern markets, mean that it is essential that a high-quality computer model be used to prepare a forest management plan. However, the habitat matrix deep in the model is flawed and leads to erroneous conclusions.

A good example of how the models used in the Forest Management Plan (FMP) distorts reality concerns the wildlife species Pileated Woodpecker. This is a common woodpecker that occurs throughout the Park using a variety of habitats and frequently nests in old growth pine and hemlock forests. In their plan for the Park the plan author contends that in the absence of forest management, the population of these woodpeckers would actually **decrease**. This is a truly bizarre result, produced by the flawed computer model. The plan authors contend that if all logging stopped in the Park, the habitat for this species would decline. No ornithologist would support that finding, and indeed no one knowledgeable about bird ecology was asked about this finding. In fact if all logging stopped in the Park the habitat for this bird would increase.

Unfortunately, the logging plan for the Park reduces the habitat for this woodpecker even more. And more unfortunately, several other wildlife species are treated in the same way with the same result.

The example of the pileated woodpecker is just one example of how the planners use a tool that is flawed and has been shown to be flawed. By reasoning that the habitat for this bird would decline, whether logging occurred or not, they justify the logging plan that reduces the habitat for this bird even more.

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1 Research Scientists at the Canadian Forest Service, published a paper in the Forestry Chronicle titled "A test of Ontario's Habitat Suitability Matrix as a forest management planning tool for forest birds, Vol. 83, No. 6, page 570-579. This paper represents a major effort to test the habitat matrix embedded in SFMM and used throughout the Province in Forest Management Planning.

2 Maxie, A. J., K. Hussey, S.J. Lowe, K.R. Middel, B.A. Pond, M.E. Obbard and Brent Patterson. 2010. A comparison of forest resource inventory, provincial land cover maps and field surveys for wildlife habitat analysis in the Great Lakes-St. Lawrence forest. 86: 77-85

A sustainable logging plan for Algonquin Park would not reduce the habitat for Pileated Woodpeckers or other wildlife in the Park. Over a long period, the amount of wildlife habitat should remain stable, if the management plan is carefully created and is sustainable. However, with the flawed management model used in this Plan, it is impossible to create a good plan.

## **2.0 Technical Explanation**

The flaw in the plan is revealed through the inconsistency between the amount of Pileated Woodpecker habitat that will be present in the new Plan, and the projected development of the forest over time in the Natural Benchmark scenario. This is shown in Figure 1, which is copied from the Long Term Management Direction document (LTMD) and illustrates the concern for inappropriate basic assumptions using Pileated Woodpecker as an example; although the same concern exists for other species in the plan. Figure 1 shows that there are approximately 250,000 hectares of Pileated Woodpecker habitat in the Park at the start of the plan in 2010. However, in the absence of management, represented by the heavy blue line, the LTMD projects a loss of habitat for this species of about 50,000 hectares, a loss of 20 percent, over the first four periods before it stabilizes at just above 200,000 ha. This graph is clearly illogical given what is known about the habitat requirements of the species. If forest management ceased in the Park, the habitat for this species would increase, not decrease.

These woodpeckers use a variety of habitats, including both mature and old growth stages. If forest management stopped, the habitat for these birds would increase based on the current classes of stands in the Park. The Proposed Management Strategy (PMS7) reduces the habitat for this species even more, although it does not violate the 75% rule, imposed this year for the first time in forest management planning (See Annex 4).

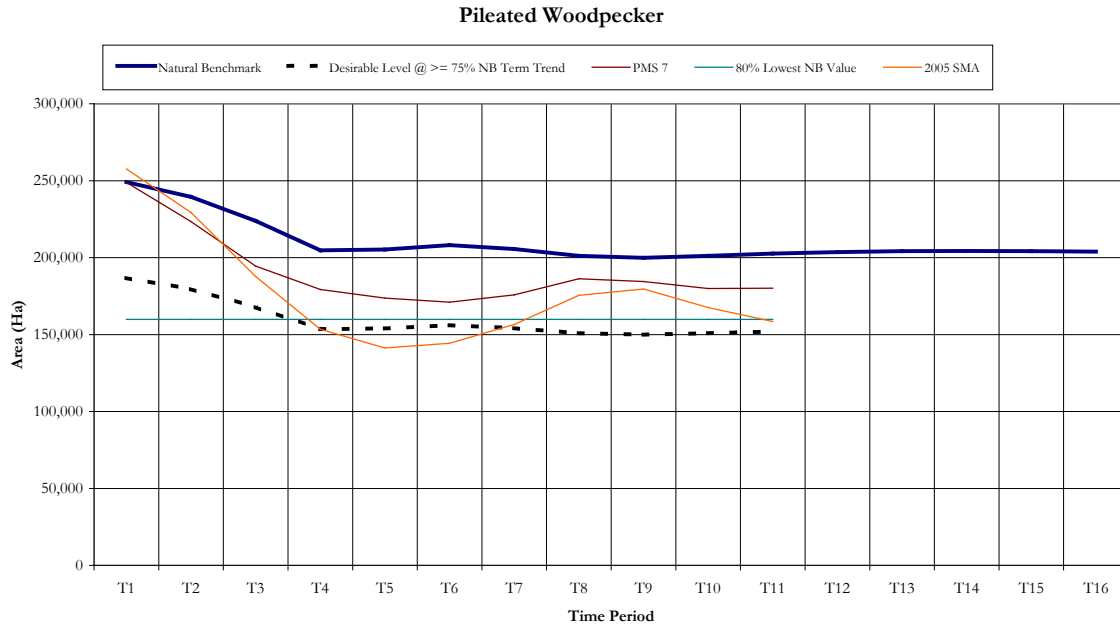


Figure 1. Planned level of Pileated Woodpecker habitat and benchmarks. This figure is copied from the Long Term Management Direction prepared as part of the Algonquin Forest Management Plan.

## What Went Wrong

Algonquin Eco Watch wrote to the Plan Author and Joe Yaraskavitch and expressed concern about this problem in January 2009. We received the following reply from Joe Yaraskavitch:

“The graphs presented for Pileated Woodpecker, American marten and Bay breasted Warbler are showing that preferred habitat according to the matrix for these species would change over time in the natural benchmark scenario. Both pileated wood pecker and American marten preferred habitat declines slightly and then levels off – *this initial decline is caused primarily by forest stands succeeding from an older two-storey condition to younger age-classes over the first few model terms and moving out of preferred habitat status.*”

Algonquin Eco Watch believes that this problem is rooted in faulty assumptions regarding the development of stands that are within the more advanced stages of the Shelterwood harvest sequence.

In the “Base Case and Assumptions, Checkpoint 3,” the Analysis Package for the 2010 Plan provides a detailed explanation of how the Natural Benchmark was calculated for the 2010 Plan, including for the white pine forest currently in the two story stages of the Uniform Shelterwood management approach. On page 90 of the Analysis Package document, the table identifies that more than 17,000 ha of older managed pine are assigned to the 25 and 35 year age classes. However, having a considerable number of large remnant pine in them, these stands will be unlike any 25 – 35 year old pine stands originating from a stand-removing disturbance. Since pine are generally deep rooted and

long lived trees, the older managed stands will retain large pine for many years and it is in our view not appropriate to class these stands as immature or juvenile stands. Similarly, the table on page 91 of the base model document identifies that almost 11,000 ha of MWUS that has received the first Shelterwood cut is assigned to the 25 and 35 year age classes. Area in the LCUS and SFUS forest units that has received its first cut is treated similarly; FMP-6 indicates that there is a total of 15,000 ha in these two FU's that have received a seeding cut.

The base model reports that the approach taken for PWUS was also taken with the ORUS and HDUS forest units, however these latter two forest units are managed according to a two-cut Shelterwood system and it is not clear why they were dealt with differently than the other forest units which are also managed on a two-cut Shelterwood system. FMP-6 indicates that upwards of 20,000 ha in the ORUS and HDUS have received seed cuts. The shifted area in the LCUS, SFUS, MWUS and PWUS forest units explains 43,000 ha of the purported decline in PIWO during the first four plan periods, and it is not clear whether assumptions made regarding the seed cut area in the ORUS and HDUS forest units also contribute to the decline of PIWO habitat.

Algonquin Eco Watch feels that the declines in PIWO, marten and Bay-breasted warbler habitat shown in the FMP natural benchmark run are probably being caused by the assumptions regarding the development of stands in the shelterwood harvest sequence. Algonquin Eco Watch believes that these assumptions are not accurate reflections of stand development patterns. The result of these assumptions is to depress the amount of habitat for these species that must be maintained in the 2010 FMP, since the plan targets call for providing at least 75% of the habitat that is provided in the natural benchmark run. An artificially low level of habitat in the benchmark run translates directly into an inappropriately low level of habitat in the plan, with impacts not only on the three species mentioned above but also has implications for plan targets regarding forest structure and habitat provision for many other species.

We know that the issue of modeling the “natural” development of stands that have entered the shelterwood treatment sequence is difficult; it has given rise to other issues that we have identified. For example, in a paper written by Norm Cottam over a year ago, it was clear that the assumption that the T- stage would revert back to early successional forest in the absence of management was wrong. Dr David Euler reviewed this paper about a year ago and expressed his concern as follows:

“In a paper which addressed the issue of errors in the Algonquin Forest Management Plan, Cottam<sup>3</sup> explained how the SFMM model treated Pileated Woodpecker habitat and showed why habitat for this species was reduced. On page 3 in the last paragraph, he points out that a “modeling constraint” limits the amount of time that shelterwood stands remain in the T stage after human management stops. Translated from the forestry jargon, this means that the model assumes that 20 years after human management stops,

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<sup>3</sup> Cottam, Norm 2007. Habitat supply projections for Pileated Woodpecker and Black-backed Woodpecker in the Natural Benchmark Scenario for the Algonquin Park 2005-2010 Forest Management Plan, December 11, 2007, typescript.

all the Pileated Woodpecker habitat in shelterwood managed stands dies and returns to early succession stages. As Cottam points out on page 4, “This approach likely underestimates the supply of PIWO habitat as T stage forest would probably remain suitable habitat for a longer period of time.”

### A Better Approach

Algonquin Eco Watch would like to see an analysis from the planning team that sets out quantitatively and in detail why the amount of pileated woodpecker habitat declines in the natural benchmark run. If our assessment is correct that the cause is largely due to assumptions regarding the treatment of stands that have received intermediate shelterwood harvests, our proposed remedy is to modify the assumptions in the Base Model and Long Term Management Direction to more accurately reflect the actual ecology of the forest in the absence of management or to override the plan targets that are related to the flawed projections. While white pine stands that have received a first removal cut are unlikely to become even-aged stands in the future, we anticipate that the regenerating stand would form part of the canopy but there would be numerous supercanopy old white pine present – in effect, the two story nature of the stand would persist. Many of the stands in other forest units that have received the seed cut would revert to stands similar to the present forest or multi-aged stands with a wide range of tree species present. This change would have an impact on all of the wildlife graphs, and probably some of the old growth graphs, depending on the definition of old growth. Figure 2 illustrates what Algonquin Eco Watch contends is a more ecologically accurate projection of Pileated Woodpecker habitat in the event that forest management stopped in Algonquin Park.

There is an abundant ecological literature that supports this position, including the Master’s Thesis on Pileated Woodpeckers completed in the Park by Peter Bush. This line could easily be created in the SFMM modeling environment by changing the assumptions that stands that have received intermediate shelterwood harvests would quickly revert to early successional if forest management was halted in the Park. For example, during the 100 years of this plan, much of the white pine that has received its first removal cut would be expected to move into an old growth stage and stay there for some 100 to 200 years.

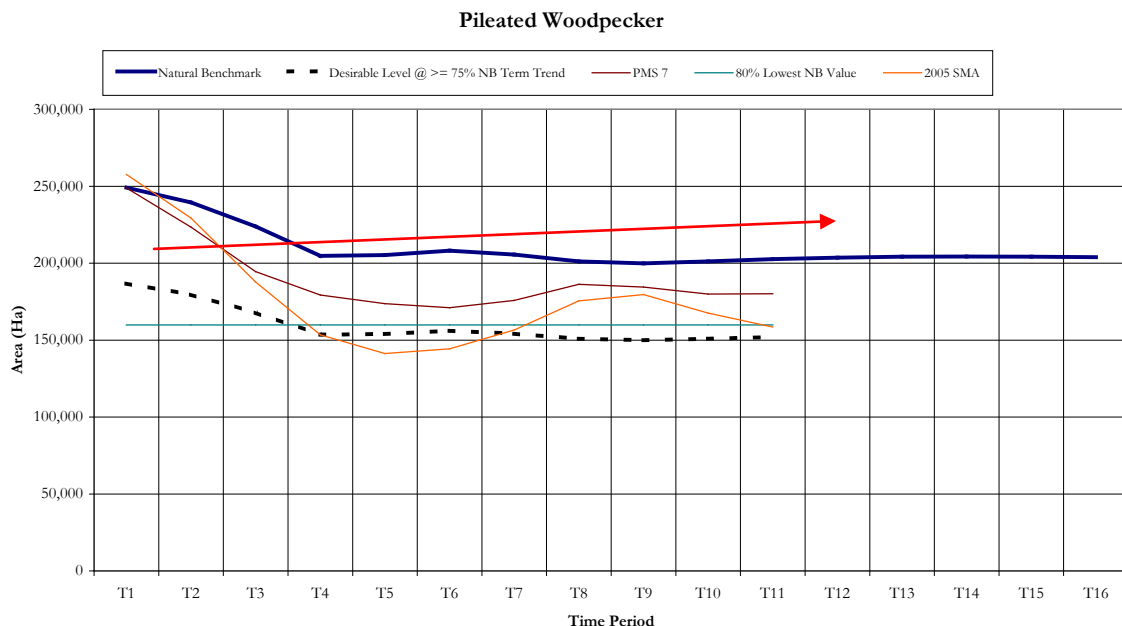


Figure 2. An ecologically appropriate trajectory of Pileated Woodpecker habitat if forest management ceases. (Indicated by the red line, inserted by Algonquin Eco Watch).