Response to the Management Alternatives for New Brunswick's Public Forests

Greater Fundy Ecosystem Research Group

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Introduction

Recently, the New Brunswick Task Force on Forest Diversity and Wood Supply released a report with 8 scenarios for managing public forest in New Brunswick. Each scenario will have very different impacts on the future of biodiversity in New Brunswick Crown land forests ranging from possible extirpation of certain species to increasing the overall protection of biodiversity.

In 2004, the Select Committee on Wood Supply recommended promoting a diverse Acadian forest and forestry management based on the best scientific understanding of forest dynamics. The Select Committee was formed in response to the Jaakko Pöyry report which called for a doubling of wood supply on Crown lands largely through the reduction in conservation lands and by increasing the number of plantations on Crown lands to 40 %. The Select Committee had unprecedented public participation across New Brunswick, including; 13 meetings, 200 presenters and 121 written submissions and 131 form letters. Due to the public concern and expert advice the Select Committee recommended not adopting the "intensive management" recommendations made by the Jaakko Pöyry report.

The Greater Fundy Ecosystem Research Group (GFERG) is a collection of scientists from five universities, with federal and provincial government officials that have done 20 years of research on the impacts of forestry on biodiversity at local and landscape scales. In 2005, The Forest Management Guidelines to Protect Native Biodiversity in the Greater Fundy Ecosystem (GFE) were released[1]. Based upon over 300 peer reviewed scientific publications, this document recommends best practices for forest management to maintain the ecological diversity in southern New Brunswick. Here, we outline our responses to '**Management Alternatives for New Brunswick's Public Forest' (hereafter 'Management Alternatives').**

General Comments

In general, the Management Alternatives report is well done and clearly states the tradeoffs balancing ecological diversity and supplying more wood. However the report had several major weaknesses that may preclude informed decision making:

1) The report is largely non-spatial. This has at three consequences;

    a. The issue of landscape fragmentation is completely ignored. Fragmentation is well known to have impacts on biodiversity. For example, a mature softwood block of 1 ha that is surrounded by 100 ha of clearcut or agricultural field will have very different value to wintering deer than the same 1 ha embedded in 100 ha of mature forest. Four, 40 ha protected areas will have no value to a species with a home range of 50 ha; however, a 160 ha protected block could contain 3 of the same species. The Management Alternatives report does not deal with minimum patch sizes for wildlife habitats when considering the impacts of different scenarios on wildlife. Research conducted in the GFE has found that that song bird occurrence dropped dramatically once the amount of habitat fell below 8 to 28%[2]. Certain species were also negatively affected by reduced patch size. Currently on Crown land patch sizes as small as 2 ha are allowed to be considered as conservation forest[3]. Currently on Crown land patch sizes as small as 2 ha are allowed to be considered as conservation forest[4]. Patch size and the connectivity to other patches must be considered when accessing the impacts of forest management on biodiversity.

    b. The location and size of wildlife habitats and protected areas are key to its conservation value. The Management Alternatives report does state that these protected areas will be located in areas proposed by a World Wildlife Fund-Canada report, but also states that in several scenarios (E, F, B) the increases in protected areas would be too small to meet protected area objectives (page 28). Before we can comment on the biodiversity implications of reducing conservation areas vs. increasing protected areas we need to see maps or at least spatial statistics (e.g., patch size, connectivity) describing the locations.

    c. The final results combine all of Crown land in New Brunswick into one management unit rather than modeling wood supply for

each region or license. This is important since management plans are created based on the 10 licensee areas and ecoregions. Not all regions are equal in the type of wood that they can supply and the types of constraints imposed. This could result in some areas having a much higher percentage of plantations on the landscape than suggested (i.e. the amount of plantations could be much higher than 37% in some licenses). This also applies to the percentage of areas with protected areas. Since none of these results are shown or described spatially it is difficult to measure the impacts on different areas of the province such as in southern New Brunswick.

2) Within the constraints of available information about the future, the report is effective at quantifying tradeoffs. The problem is that such simulation models are *highly dependent* on the quality of the data that goes into them. Because simulations models used in the Management Alternatives report give estimates with high precision (e.g., to the hectare in protected areas or the m^3 in wood supply) this gives the impression of high accuracy. This is not necessarily the case. For example:

    a. Once the scenarios are implemented on the ground the figures for supplying wood may be overly optimistic given unknown future conditions. This is not a problem for scenarios where the Annual Allowable Cut (ACC) is not maximized (A and B), but for those scenarios where the ACC is maximized (D and E) uncertainty has large consequences. The report does make mention of climate change, insect damage, and fire, but does not directly state which scenarios would pose the most risk under these conditions. The report does consider that having management flexibility is important to adapt to change. It would seem to us that converting large areas to plantations is inflexible (difficult to reverse) and dangerous with such uncertainty about future climate and economic conditions.

    b. There is no information available in North America about the ecological consequences of increasing plantations in a region above ~20%. Scenarios D, E, F, and G, thus represent unknown ecological conditions. A large body of research around the world and in New Brunswick has shown that at the scale of individual stands, plantations decrease the biodiversity, especially when combined with clearcutting, scarification and herbicide treatments[5]. Even based solely on tree species, the overall composition and number of tree species decreases after planting[1,4]. This does not promote or maintain the diversity of

the Acadian forest, which was one of the main objectives of the Management Alternatives report.

In southern Sweden, which has similar forest type to New Brunswick, but a much longer history of intensive forest management, the forests have become younger, drier, dense, and contain fewer large dead trees[6]. This is mainly the result of intensive silviculture starting in the late 1800's and provides a clear example of what our forests will look like if put under similar forest management. According to the 2005 Red List of Swedish Species 1,862 forest species are in danger of extinction[7]. Of these species, 60% of red-listed species are dependent on old or dead trees[5]. Also, more of the red-listed species are associated with deciduous and mixed forests compared to coniferous forests[1,5]. A good example of a species at risk is the white-backed woodpecker (*Dendrocopos leucotos*). This species was once widespread in deciduous and mixed wood habitats in southern Sweden and has declined severely in the past decades. In 2007, only 10 individuals were observed and only one successful breeding was confirmed in the whole country[4]. Protection and restoration of the woodpecker's habitat is proceeding at a cost of approximately 32 million (2005-2008 period)[4]. Any adoption of increased plantations must consider measures that would mitigate reductions in biodiversity, such as leaving coarse woody debris (fallen logs), snags, legacy trees, and retention blocks.

c. The data on the amount and location of old growth in NB is poor or non-existent. It is critical that these areas are surveyed before implementing any protected area strategy on Crown lands.

d. Data on the growth potential of plantations is not necessarily accurate (note the frequent downward adjustment of expectations in the plantations in southern New Brunswick culminating in many jack pine plantations being chipped because they were growing slowly and/or were destroyed by ice. As noted in the Management Alternatives report, this is particularly problematic given a rapidly changing climate that could facilitate the spread of invasive or natural pathogens or insects (e.g. mountain pine beetle in western Canada).

3. In New Brunswick forests, we have 106 species of birds, 39 species of mammals, 8 species of amphibians, 4 species of reptiles, 1600 vascular plant and 350 moss species. Numbers are much larger for insects: Butterfly and moth species: 2200, wasps: 5500, flies: 4800, beetles:

~3000[8]. This list is only a small portion of the total diversity. The report is very tree and stand focused; it is assumes that by maintaining certain stand types and tree species that all of the other 99.9 % of biodiversity is protected. This is a dangerous assumption that ignores the complexity of natural ecosystems which includes air, soil and water. For this reason the impacts on biodiversity of different management scenarios should be seen as conservative. Further, animal population viability does not necessarily reflect the percentage of available habitat (note declines in deer in the north despite available habitat). Any selected strategy should be coupled with an intensive monitoring regime (not just for trees, but for ecological 'indicators').

4. The definition for old forest in the 'Management Alternatives' report is misleading. Based on the definition used in the report, a fast growing intolerant stand could reach the old forest category in approximately 50 years and reach the old growth category by 70 years. In reality, this stand may be transitioning into a tolerant mixed-wood stand that is composed of red spruce, sugar maple, beech, and yellow birch. An intolerant stand that is only 70 years old is not considered old in the Acadian Forest[9]. Maximum ages of trees are given in the GFE report and range from 200-800 years for some species[1]. If the report considered just shade tolerant trees (the longer lived species) the amount of 'old forest' would be much lower.

Our main point is that, within the knowledge and modeling constraints provided, the Management Alternatives report is largely sound. However, those constraints are large resulting in substantial uncertainty in modeling outcomes with respect to biodiversity conservation in New Brunswick. The only viable alternative is thus to be very cautious about the chosen scenario; this means that (1) the area covered by plantations should not be maximized, (2) protected areas should be increased (to act as benchmarks for current management), and (3) to the extent possible, the pattern of natural disturbance should be reflected in management.

Overall Recommendations by the Greater Fundy Ecosystem Research Group

1. **Plantations tend to support reduced abundances of native species.** The effects of planting >15% on native wildlife populations is unknown. Therefore the GFERG does not support scenarios that increase planting beyond this amount (i.e., SQ, C, D, E, F, G).

2. **Existing conservation forest on Crown land protects wildlife and water quality.** Forest conservation areas in New Brunswick are areas in which the appropriate forest management is done. Buffer areas around streams protect water quality. This includes not harvesting too close to streams or select harvesting in stands to protect wildlife species. There should be no reductions in forest conservation areas without large increases in protected areas. Therefore the GFERG does not support Scenarios C, D, E, F, and G.

3. **Increase the amount of protected areas in New Brunswick in ecologically significant areas.** New Brunswick currently has the 2nd lowest percentage of protected area of any province in Canada at 3.7%. More protected areas in locations of high biodiversity are needed to properly protect the long term viability of forest species. We recommend scenarios A and B which increase the amount of protected area and maintain conservation areas. Although as noted earlier, the location and size of these protected areas are not covered well in the report. Scenarios which transfer conservation forest to protected areas across the landscape (10-13% protected area scenario (C, D, E, and F)) are a poor and haphazard strategy for protecting biodiversity.

4. **Mature and old growth forests are important for maintaining forest biodiversity.** Mature forests have declined dramatically in the last three decades dropping an average of 1-2% each year[10,11]. Scenario E would have the lowest amount of old forest (31 %) of any scenario. We do not recommend scenarios which would lower the amount of mature forest below 40 %. (Reject Scenario D, E). Scenarios A and B protect existing older forest and allow for more stands to reach older successional stages with increased amounts of snags, coarse woody debris, and multiple canopy layers.

A Comparison of the Scenarios to the GFE Guidelines to Protect Native Biodiversity

Below are several recommendations made in the Forestry Management Guidelines to Protect Native Biodiversity in the Greater Fundy Ecosystem compared with Scenario E.

These were recommendations based on the best research available.

1) In stand replacing ecodistricts 35-40% of the landscape should be maintained in late-successional age classes. ***Scenario E-would have 31% of the forest in old forest condition.***

2) In gap replacing ecodistricts 40-85% of the landscape should be maintained in late successional age classes. Of this 10-12 % should be maintained to have old growth characteristics. ***Scenario E would have 31% of the forest in old forest condition. No forests would remain in old-growth forest conditions.***

3) No more than 15% of the landscape should be under high-impact management (this includes plantations and precommerial thinning). ***Scenario E and D would increase the amount of plantations by year 50 to 37% of Crown land.***

4) Protect the character of the Acadian Forest by preventing harvesting in mixed wood stand types. ***Scenario E would have the lowest amount of mixed-wood and uneven aged forests, which are both characteristics of the Acadian Forest.***

5) Forests should be harvested in accordance with natural disturbance. ***Scenario E has only 34% of the forest is harvested in this way.*** **Over the next 25 years- 72 % of forest harvesting would be done by clearcutting.**

Conclusions

The Management Alternatives Report presents the tradeoffs in adopting different scenarios of managing New Brunswick's Crown land. The fact that New Brunswick can increase wood supply must be balanced against the harm to other values, such as wildlife habitat and water quality. These guidelines were based on the best science available. When compared against the GFE guidelines, Scenarios E and D would be the most damaging scenario for biodiversity because they call for the tripling of plantations on Crown land, increases in forest fragmentation, decreases to mature forest, and at the same time decreases in forest conservation areas. Both scenarios would increase protected areas (by

6% and 9%) at the expense of conservation areas, which does nothing to increase protection of wildlife in New Brunswick.

In a recent public survey done by the University of New Brunswick, the Canadian Forest Service, and University de Moncton revealed that the majority of respondents (in rural and urban areas) cared deeply about protecting the environment on Crown land. In the survey they were responding to the current situation or the "status quo scenario"[12]. Based on these results, I believe the majority of respondents would reject scenario E, if they were surveyed again.

One must think of the consequences of adopting an E-type scenario. Once our diverse forests are transformed into plantations, we predict that ecological restoration will be extremely difficult and costly. Currently, Scandinavian countries are conducting restoration ecology at great cost by artificially creating dead trees in plantations to recreate natural forest conditions.

In conclusion the GFERG recommends the scenarios that protect biodiversity on Crown land- Scenarios A and B.

References

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