GPI Atlantic

Genuine Progress Index for Atlantic Canada / Indice de progrès véritable - Atlantique

**MEASURING SUSTAINABLE DEVELOPMENT**

**APPLICATION OF THE GENUINE PROGRESS INDEX TO NOVA SCOTIA**

# **GPI***ATLANTIC* RESPONSE TO QUESTIONS FROM ANDREW HOWARD, KPMG

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## GPI Atlantic response to questions from Andrew Howard, KPMG.

1. **How did you derive the age class distribution for the 1958 inventory data? The age classes given in the 1958 report are different from those you give in Volume 1. How did you convert the data?**

*The age classes cited in the l958 inventory were reported differently than in the subsequent inventories. Instead of 20-year intervals such as 21-40, 41-60 etc, they were classified in 10-year intervals -- 30, 40, 50 etc. In l958, age classes 40 and 50 combined span 36-55 years and therefore roughly correspond with the 41-60 age class. Thus, the data from l958 were used in Figure 1 of Volume 1 in this way:*

*21-40 corresponds roughly with the 30 age class in the 1958 inventory (26-35) {6.3%}*
*41-60 corresponds with the 40 and 50 age classes (36-55) {34.5%}*
*61-80 corresponds with the 60 and 70 age classes (56-75) {34.3%}*
*81-100 corresponds with the 80 and 90 age classes (76-95) {16.4%}*
*101 + corresponds with the 100, 110, 120, and 126+ age classes (96 +) {8.7%}*

*In other words, these age classes correspond only roughly, but this kind of difficulty is inevitable when comparing forest inventories. GPI Atlantic followed the advice of other researchers in recognizing that such comparisons are, nonetheless, the only means to track likely changes in age class. Thus, in l972, researchers at Environment Canada who were charged with the task of comparing the l958 inventory with the l972 inventory had this to say about making such comparisons: "Comparing the results of two forest inventories is a hazardous undertaking. Nevertheless a comparison* ***is essential*** *since it gives at least some indication of changes that have taken place in the intervening years. Data from a forest inventory is not perfect but it is the best information possible and hence serves as a guide to help reach forest management objectives."*
*(Stewart, J.V., M.R.C Massie, K.L Runyon, J.H Smyth. l972. The Forest Resource of Nova Scotia. Its Utilization and Potential. Forest Economics Research Institute. Environment Canada. Ottawa. page 16)*

2. **Why in figure 7 of Vol. 1 do you show a figure for the 0-20 age class for 1958? The 1958 report does not give a figure for this age class.**

*The footnote for Figure 7 references the l965-71 forest inventory which is where the 0.5% estimate for the 0-20 age class came from. There is no mention of that age class in the l958 inventory, and this lack of data for that age class is reflected in both Figures 1 and 3– where we did not include any data for the 0-20 age class for l958. However, in order to construct a pie chart (Figure 7) it was necessary for the numbers to add up to 100%. For this reason we used the l965-71 figure of 0.5% as, chronologically, the nearest possible estimate for the 0-20 age class, and we referenced that 1965-71 forest inventory in the footnote below the figure. We recognize that the footnote to Figure 7 should have stated this more specifically. In order to avoid confusion, future updates of the GPI Forest Accounts will add to the footnote under Figure 7 the following phrase: "Because the 1958 forest inventory did not provide an estimate for the 0-*

*20 age class (as reflected in Figures 1 and 3 above), this pie chart uses the 0.5% estimate from the 1965-71 forest inventory in its stead to provide the nearest available estimate for that age class."*

3. **We spoke about your choice to not use the PSP data. Do you know that there are two sources of PSP data, one for inventory purposes and the other for growth and yield measurements?**

*According to Ken Snow, Manager of Forest Inventory at the NSDNR, published and accessible PSP data prior to the most recent report (l994-l998) were used to measure periodic annual increments. The most recent report, titled Nova Scotia Forest Inventory Based on Forest Inventory Permanent Sample Plots Measured between l994 and l998, used data from 1,923 PSP sample plots to measure age class distribution, volume, and species composition, in addition to periodic annual increments. However, this was the FIRST time the PSP data were published and available in this way. According to Mr. Snow, the PSP data for age class and species composition have always been collected and do exist, but they had not been published and are not available. GPI researchers did ask to see the PSP data for age class and species composition prior to l994 but were told that it was not possible to access these data. There was very little "choice" involved in the matter. Therefore, as we discussed when we met in person, and as we explained on pages 22-24 of Volume 1 (section 6.3.1), it was not possible to reconcile the latest PSP data for age class and species composition (the only PSP data at our disposal) with earlier inventories to develop a historical trend. As section 6.3.1 makes clear, we did try to reconcile the latest PSP data with earlier forest inventories* ***and*** *with the GIS data from the most recent inventory, based on all the published information available to us, and we came to the conclusion that "there is a consistent trend…in several forest inventories that sharply contradicts the PSP estimates." In sum, developing a historical trend for age class and species composition using PSP data alone was impossible since these data prior to l994 were not published or available. If such data were to be made available by the NSDNR, GPI Atlantic would gladly use them in future Forest Accounts updates in addition to the currently available data.*

4. **What exactly do you mean in the graphs where it says "non-reserved"? Does this mean that all federal land is always excluded from your figures?**

*According to Ken Snow of the NSDNR, "non-reserved" forest land is land that by law or policy is available for harvest or forest crops. It is a term found in many federal publications, but is generally not used in provincial literature. The term is used in the National Forestry Database Program. Therefore, land that is "reserved" is land that is not available for harvest or forest crops. "Reserved" and "non-reserved" lands can apply to either private or Crown land, but generally it refers to Federal or Provincial Crown land. Table A6 in the l999 inventory, for instance, reports on all forested land in the province, "reserved" and "non-reserved" land. In Figures 10, 11, 12, and 13 of the GPI report, "non-reserved" generally refers to all forested lands except Federal land. There are two exceptions to this. Please see answer to question #5 for a detailed explanation of the inclusion/exclusion of Federal lands from the totals used in the Figures in sections 7.1.2 and 7.2.2 of the GPI Forest Accounts.*

*In short, all Federal lands were always excluded from the reported totals except in the case of the l979-89 inventory where Kejimkujik National Park was included in the age class Table (2) and in the l958 inventory where Kejimkujik National Park was included throughout the report, more specifically in the age class Table 9 and species composition Table1-F. In the case of these two inventories, it was determined that any additional area and volume attributable to Kejimkujik National Park would be very small and have a negligible impact on the trend lines created in the GPI report Figures.*

5. **Data from the 1976 to 1985 and the 1979-1989 inventories excluded federal lands. How did you adjust the figures to make them comparable to the other inventory reports?**

*The l976-85 inventory does exclude all Federal lands from totals. But the l979-89 inventory differs in that the species composition Table (4) excludes all Federal lands, but the age class Table (2) excludes only a portion of Federal lands – the Cape Breton Highlands – but includes Kejimkujik National Park. The l958 inventory excludes the Cape Breton Highlands and the area north of the park, but includes Kejimkujik National Park. The l965 –71, l970-78, l975-82, and l999 inventories include Federal land in the area and volume totals for age class and species composition, but since Federal land area and volume amounts were reported separately (often on the same Table), it was possible to subtract them from the totals. For instance, the area and volume values reported in the GPI report for the l999 inventory for age class and species composition were derived by subtracting the Federal land area and volumes from the totals. As a result, all reported totals exclude Federal land. The same was done for the l965-71, l970-78, and l975-82 inventories. In sum, all Federal lands were always excluded from the reported totals except in the case of the l979-89 inventory for age class where Kejimkujik National Park was included and in the l958 inventory for both age class and species composition where Kejimkujik National Park was included. In both these cases (l958 and l979-89) the additional area and volume attributable to Kejimkujik National Park were determined to be very small and to have a negligible impact on the trend lines reported in the GPI report Figures.*

6. **Can you give me the page #s and table #s that you used from the various inventory reports to generate your graphs for age class distribution and species composition?**

*<u>Age Class Distribution:</u>*
*l958 Table 9 (pg. 55)*
*l965-71 Table titled: "Gross Merchantable cubic foot volume by age class, cover and ownership for Nova Scotia for l965-71 Inventory." (could be "Table 4", but the number is obscured in the photocopied report located in the DNR library)(no page given)*
*l970-78 Table 14 (page 17)*
*l975-82 Table 2 (no page given)*
*l976-85 Table 2 (no page given)*
*l979-89 Table 2 (no page given)*
*l995 Table A3 (no page given)*

*<u>Species Composition</u>:*
*l958 Table 1-F (pg. 77)*
*l965-71 Table 6 (e) (no page given)*

*l970-78 Table 22 (page 25) and Table 21 (Federal Land)(page 24)*
*l975-82 Table 4 (no page given)*
*l976-85 Table 4 (no page given)*
*l979-89 Table 4 (page 5)*
*l995 Table A6 (no page given)*

7. **Page 30 of vol 1, first paragraph, you cite Hawboldt and Bulmer (1958) - can you tell me where in this citation does it say that the Province had already lost most of its primary forest?**

*The citation on page 30 is not a direct quote from Hawboldt and Bulmer but a summation of a trend described in the document. The inventory states that "the forests standing in l958 are the end result of the building up and tearing down of trees over the centuries," and notes that larger trees "have become nearly exhausted." Since 'primary' forests are ones that have never been logged, these citations alone indicate that primary forests were already largely gone in NS by 1958.*

*Additional text and information that support this conclusion:*

*(i) The l958 inventory refers to observations made by Dr. Fernow in l910. At that time he stated that "Anything that will make a 2X4 inch stick is being cut."*

*(ii) The age class distribution table on page 55 of the inventory (Table 9) indicates that most forest in the province at the time fell under the 40, 50, 60, 70 age classes – 36 to 75 years old, which would not be the case if most NS forest were primary forest.*

*(iii) "This process of selectively removing [or high-grading] large timbers of preferred species has quite naturally resulted in a different forest structure. In an area which has enjoyed a sawlog economy, almost exclusively, the demand has been great for larger trees. These have become nearly exhausted, and it has become necessary to accept smaller and smaller stock. The long term result has been harvesting of stands before they were mature, prior to their rotation ages." (page 56)*

*(iv) The inventory again refers to Fernow, who, referring to the province's forests stated: "It is now largely in poor condition, and is being annually, further deteriorated by abuse and injudicious use, because those owning it are mostly not concerned in its future, or do not realize its potentialities. To arrest further deterioration and to begin restoration is the present duty of those who have the continued prosperity of the Province at heart." Then the l958 inventory states: "Fernow's remarks of l910 are no less apt in l958. The forest conditions have deteriorated considerably since, making the 'conservative' and 'recuperative measures' even more imperative now." (page 62)*

*(v) The inventory also describes the forest resource in NS in l958 as being "in danger of being exhausted." (page 65)*

8. **You also cite Hawboldt and Bulmer (1958) saying that the forests had suffered greater insect damages due to loss of diversity. Where in the citation does it say this?**

*GPI Atlantic has checked this reference, and it appears to be in error. The references to species diversity and insect damages are all in Section 8.1.2, particularly pages 69-71. References cited in that section include Su et al. (1996), Crawford and Jennings (1989) and Crawford et al. (1983), but not Hawboldt and Bulmer (1958). Therefore, there appears to have been a mistake on page 30 in attributing the diversity-insect damage relationship to Hawboldt and Bulmer, when the citation should have been attributed to references in section 8.1.2. The one sentence noting that "forests had suffered greater insect damages due to the loss in diversity" will therefore be removed from that section (page 30) in future updates of the GPI Forest Accounts, and that conclusion, along with the discussion of that subject, will be confined to section 8.1.2. Other references on page 30 to the Hawboldt and Bulmer (1958) report are noted in answer to the question above. GPI Atlantic appreciates Dr. Howard's assistance in identifying that mistake.*

9. **Figure 32, vol 1 - There are published data on cut levels for the period 1992-1996 (NS Dept. of Finance, 1997 and later). Why wasn't this source used to calculate jobs per 1000 m3?**

*Figure 32 might conceivably have been more precise if we had used harvest amounts for each year from the Dept. of Finance Statistical reviews (1997 and later). However, the accuracy of those numbers prior to l998 is questionable in light of the acknowledged difficulty the NSDNR had to keep track of the wood being cut on private lands. It was this predicament that led to the creation of the Registry of Buyers, a source for much of the later and most recent data used in the Statistical Review as well as in the figure in question. Prior to the creation of the Registry of Buyers, the Statistical Review relies on the NSDNR's Nova Scotia Forest Products Directory. In addition to information provided to us by Ken Snow of the NSDNR, GPI Atlantic used the Registry of Buyers and the Position Paper (l997a) which pointed squarely at the problem of overcutting on private land, and which also included a section on the "Trends in Harvesting" (pages 5-6). As noted on page 58 of the GPI report (volume 1): "The Registry of Buyers should certainly allow for more precise estimates of actual harvest levels than have been available to date." In other words, while GPI Atlantic relied on other data sources, as clearly cited and documented in the footnote to Figure 32, there is no resulting contradiction with data from the NS Statistical Review. In fact, the data available in the Statistical Review, (l997, in particular), support the observations made by GPI Atlantic regarding the trend toward increasing levels of harvest and the simultaneous decline in jobs per unit of biomass.*

10. **Top of page 122, vol 1, where did you learn that APEC includes construction activities at sawmills and pulp and paper mills as direct employment?**

*We learned this from Peter Woolaver of the NSDNR. On October 26, 2001, he wrote: "The APEC study reports forestry sector employment at over 13,000. Personally, I feel this is a bit of an overstatement because I would not include the construction related activity at sawmills and pulp and paper mills as the forestry sector (I would classify it as indirect employment)…(forest related government employees, trucking of logs and wood products, suppliers of forestry*

*equipment and Christmas trees and maple syrup production were all included in the forestry sector by APEC.)"*

*These figures are also in keeping with the Ian Spencer report (l997), which was also prepared for the NS Forest Products Association. Spencer calculated 13,000 direct jobs as well, which included all of the categories Woolaver lists above.*

**11. Did you ask Patrick Brannon about inclusion of government employees, trucking, suppliers of forestry equipment, Christmas trees, and maple syrup in their estimate of direct forestry labor?**

*No. Linda Pannozzo's discussions with Brannon focussed on the double counting of the indirect jobs. The information on the inclusion of these categories came from Peter Woolaver (NS Department of Natural Resources) – direct quotation cited above.*

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1. **Is the citation for MacAskill (1999) correct? The York University Library has no record of this thesis.**

*This was actually a Major Paper in partial fulfillment of a Masters degree. It is not at the York University Library (the citation in the GPI report does not say it is in the Library) – it is in fact located in the Faculty of Environmental Studies at York University. The paper was completed on April 28, l999. The citation should read: MacAskill, G. l999. Sustainable Forest Management in Nova Scotia. MES Major Project. York University. North York, instead of "MES thesis." This correction will be made in future updates of the GPI Forest Accounts.*
To confirm this, contact *Janet Morrison: Faculty of Environmental Studies. (416) 736-5286.*

2. **Where in the NRTEE (1997) report on private woodlot management in the Maritimes does it say "poor and uncoordinated record-keeping rendered current harvesting statistics highly inaccurate and that actual harvesting levels likely exceeded official estimates"?**

*This reference to the National Round Table report (in section 8.1.1, section a, page 58, volume 1) is not a direct quote, but a summation of a conclusion in the NRTEE report. Here are some direct quotes from that l997 NRTEE report that lead to this conclusion:*

*(i) "Provincial governments establish annual allowable cuts based on their estimates of sustainable production, but often have no reliable way to measure actual harvests and have no regulatory authority to enforce the limits once they are set." (page 8)*

*(ii) "Stakeholders have repeatedly questioned the accuracy of the harvest figures, since it is believed that current harvest rates are underreported." (page 11)*

*(iii) "There is no precise mechanism for reporting harvest rates on private woodlots. Yet this is essential information at a time when demand for forest products is increasing." (page 12)*

(iv) *"Consultations by the NRTEE reveal that government, industry, environmental and community leaders agree that current harvesting activity on Maritime private woodlots is unsustainable."*

(v) *"Nova Scotia probably has the least reliable information on the amount of wood harvested or its markets." (page 4)*

*Actually, the line you refer to above can be summarized by much of pages 8-9, 12-13, and 18, in the NRTEE (1997) report.*

3**. Where did you get the data on the AAC run with reported silvicultural activities used in figure 14? There is no reference cited. What about the sources of data for the other series shown in figure 14?**

*1) "softwood harvest" : Annual harvest of softwoods.*
*Reference: National Forestry Database, Canadian Council of Forest Ministers, Ottawa, Table 5.2.A, 1998.*

*2) "AAC with no silviculture": Annual allowable cut for Nova Scotia based on no silviculture, later referred to as the "passive management strategy," after clearcutting.*

*Reference: Nova Scotia Department of Lands and Forests Presentation to Royal Commission on Forestry; NSDLF, 1983. ALSO: Peter Neily, Nova Scotia Status Report, Fig. 7, pg. 42 in: Timber Supply in Canada, Challenges and Choices, Conference Proceedings, Natural Resources Canada, Canadian Forest Service, November 1994.*

*3) "AAC with silviculture": Annual allowable cut based on specified "Intensive" levels of planting, pre-commercial thinning and commercial thinning predicted by Department of Natural Resources SAWS (Strategic Analysis Wood Supply) simulation model. (These are primary silviculture treatments, which directly effect future softwood production estimates.)*

*Reference: Bailey, R.E. An Approach to Increasing Sustainable Yields in Nova Scotia; N.S. Dept. of Lands and Forests, 1991. Also in: Peter Neily, Nova Scotia Status Report, Table 6, pg. 43 in: Timber Supply in Canada, Challenges and Choices, Conference Proceedings, Natural Resources Canada, Canadian Forest Service, November 1994.*

*4) "AAC with actual reported silviculture": Annual allowable cut derived from actual reported yearly levels of planting, pre-commercial thinning, and commercial thinning compared to silvicultural treatment levels required to achieve SAWS "Intensive scenario" Model AAC predictions. Figures are derived by multiplying the annual level of treatments actually performed by the average per hectare AAC softwood volume increase attributable to "Intensive" SAWS model predictions. For example, SAWS model estimates require 14,700 hectares of planting, pre-commercial thinning, and commercial thinning treatments to increase softwood AAC levels 1,200,000 $m^3$. Therefore 1,200,000$m^3$ divided by 14,700= 81 $m^3$ per hectare of planting, pre-commercial thinning, and commercial thinning completed. Failure*

*to achieve the required levels of silviculture would therefore reduce SAWS predicted AAC to "actual" AAC.*

*References: Peter Neily, Nova Scotia Status Report, Table 6, pg. 43 in: Timber Supply in Canada, Challenges and Choices, Conference Proceedings, Natural Resources Canada, Canadian Forest Service, November 1994. (Intensive scenario AAC predictions)*

*Personal Communication: Jorg Beyler, Nova Scotia Department of Natural Resources, March 12, 1997. (NSDNR reported silviculture treatments).*
*Also: NFD, CCFM, l998 (Nova Scotia planting, pre-commercial thinning, and thinning treatments. (1970-96)*

*Nova Scotia's Forest Management Strategy; pg. 6, NSDNR, July 1994.*
*(level of silviculture treatment to meet "intensive" model predictions.)*

4. **Where in the NRTEE (1997) report mentioned above do they warn that Maritime woodlots may be on the verge of collapse analogous to that in the ground-fishery?**

*Pages 3 and 12. The citation you are referring to (cited in the GPI report, Volume II and also on page 16 of volume 1 – section 5.1) is on page 3 of the NRTEE report, in the Executive Summary.*

**5. What is the full citation for the NS Dept. of Lands and Forests Royal Commission on Forestry (1983)?**

*Department of Lands and Forests. l983. Submission to the Royal Commission on Forestry. Halifax.*