

NSR and British Columbia's Reforestation Crisis

THE AREA OF INADEQUATELY STOCKED FORESTLAND IN BRITISH COLUMBIA IS today larger than at any point in the history of forest management. In fact, this area known in forestry parlance as NSR or Not Satisfactorily Restocked is nearly three times greater than it was 25 years ago when the provincial and federal governments embarked on concerted efforts to address what was then a reforestation challenge of the first order.

The province's chief forester sets the stocking standards that are the benchmark by which foresters manage forest renewal. The number and density of healthy seedlings on a site will determine whether or not it is NSR.

There are two types of NSR: inventory gross NSR and silviculture net NSR. Provincial government inventory specialists, most working under contract to the province, classify the land and determine inventory gross NSR. In theory, provincial silviculture staff take inventory gross NSR land classifications, factor them for natural regeneration, for accessibility and operability, and for potential return-on-investment (ROI), netting out all low (and often poor) sites to determine silviculture net NSR. (This is the area deemed economically feasible and practicable to plant.)

The public record (see Table 1) for areas of inventory gross NSR and silviculture net NSR and for areas disturbed by wildfire and pests is found in the Forest and Range Resource Analysis (1984), in forest ministry annual reports, and on various forest ministry websites. The 2010 edition of *The State of British Columbia's Forests* also provides information. All are unhelpful in providing a complete portrayal of total NSR and the reforestation challenge.

The inadequacy of that public record is dramatically illustrated by Chart 1, in which the NSR impact of vast areas of disturbance by mountain pine beetle and fire (red area) is not being captured in the forest ministry's inventory gross NSR (blue area) and in the silviculture net NSR area identified as being economically feasible to plant (green area).

Such a trend line for silviculture net NSR (green area) stands in stark contrast to what provincial and federal government forest scientists say. For example, David Coates of the Ministry of Natural Resource Operations (MNRO), a renowned author-

Year	Wildfires – Area Burned (ha) Annual data (no area overlap)	Pests – Area Affected (ha) Generic data (area overlap)	MPB + Fire – Area Affected (ha) Cumulative data ⁽¹⁾	Inventory Gross NSR (ha) Not Stocked (NSR, NCB, DSD)	Silviculture Net NSR (ha) Backlog + Current NSR
1955 ⁽²⁾				4,801,409	
1976				3,888,034	
1984				3,386,928	738,000
1988-89	11,482	688,526		3,779,000	1,972,151
1989-90	25,380	392,180		3,836,000	1,862,853
1990-91	75,781	679,785		3,836,000	1,968,864
1991-92	30,914	787,074		3,785,000	1,529,480
1992-93	30,452	1,301,053		3,617,000	1,362,407
1993-94	4,709	1,367,000		3,242,000	1,290,233
1994-95	30,370	511,701		3,016,000	1,050,611
1995-96	48,080	287,017		2,964,000	956,988
1996-97	14,952	24,808		2,844,000	827,938
1997-98	1,870	DNA		2,752,000	752,732
1998-99	71,769	2,352,175		2,826,000	687,241
1999-00	13,989	3,729,741	2,313,781	2,779,000	642,207
2000-01	16,407	3,545,876	3,504,892	2,762,000	642,529
2001-02	9,762	3,912,649	4,490,974	DNA	633,903
2002-03	20,471	4,009,051	5,467,829	DNA	603,193
2003-04	265,053	7,709,594	7,304,338	DNA	570,461
2004-05	220,518	10,618,639	9,476,472	DNA	611,055
2005-06	34,588	11,388,422	11,359,620	DNA	654,781
2006-07	139,265	11,818,680	12,560,517	DNA	696,240
2007-08	29,440	12,784,194	14,259,381	DNA	725,528
2008-09	13,211	9,642,872	15,239,440	DNA	750,431
2009-10	242,170	13,246,896	17,261,754 ⁽³⁾	DNA	722,731

Table 1. NSR statistics and areas disturbed by wildfire, by pest and by MPB and fire combined (NSR: province; all TSAs; all sites; and Crown land 62).

DNA stands for: data not available.

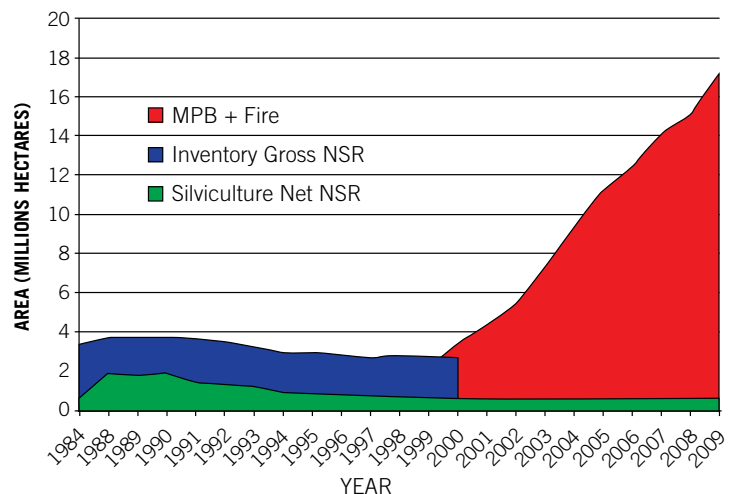


Chart 1. Public record for inventory gross NSR, for silviculture net NSR and for MPB and fire combined (NSR: province; all TSAs; all sites; and Crown land 62).



Interest

By Anthony Britneff, RPF (Ret)

[1] Ministry of Forests, Mines and Lands. MPB cumulative area estimates are based on the 1999 to 2009 provincial aerial overview of forest health and on output from the BCMPB projection model (version 7).

See <http://www.for.gov.bc.ca/hfp/health/overview/overview.htm>
<http://www.for.gov.bc.ca/hre/BCMPB>

[2] Brown, R.G. 1995. "Public influence on reforestation in British Columbia". Victoria, B.C. Ref. to Sloane Report 1956

[3] Between 1999 and 2009, the MPB had affected 16.3 million hectares and wildfire had burned 1.0 million hectares (Source: Ministry of Forests, Mines and Lands). The total cumulative area of forest mortality for all pests might be as large as 18 million hectares since fiscal year 1989.

ity on secondary structure in forests that have been attacked by mountain pine beetles in north central BC estimates that:

... 20 to 25% of the area affected had very low levels of stocking and would be considered NSR by just about any criteria. Another 40 to 50% of the area is stocked with green trees but depending on species suitability criteria and well-spacing criteria may or may not be NSR. Some 25 to 30% is clearly well stocked.

A study by forest health staff with the province of Alberta concluded that in British Columbia 40 to 70% of the area disturbed by mountain pine beetle is not sufficiently stocked with healthy numbers of living trees.

The reader must bear in mind that much of this research and estimation would be unnecessary if the provincial forest inventory were not out-of-date, unreliable and grossly under-funded.

Finally, ministry Forests For Tomorrow staff surveyed only 360,000 hectares of forestland disturbed by the 2003 and 2004 fires and by the mountain pine beetle and found 240,000 hectares of NSR (Times Colonist, June 12, 2010) of which a paltry 26,680 hectares have been replanted.

So what might the true NSR picture be? To answer that question it is important first to estimate the present total (inventory gross) NSR area. Such an estimate can draw on the following:

1. The inventory gross NSR on the forest ministry's books for fiscal year 2000/01, but not updated since, is 2.762 million hectares.
2. 70% of the area burned by wildfire from 1998/99 to 2009/10 [0.7 x 1,076,643], adds another 753,650 hectares to the area of inventory gross NSR.
3. 30% of the area infested by mountain pine beetle from 1998/99 to 2009/10 [0.30 x 16,256,880] is similarly considered inventory gross NSR, which adds another 4.877 million hectares to the total.
4. An estimated 200,000 hectares of inventory gross NSR from small-scale salvage logging conducted since 2000/01 and on which the provincial government waived the logging companies of reforestation responsibilities. This NSR area could be greater.
5. Finally, an estimated 0.5 million hectares of additional inventory gross NSR from other forest health disturbances incremental to endemic losses and attributable to climate change.

The numbers above give an estimated total (inventory gross) NSR area of 9.1 million hectares. From 1988 to 2000, the average ratio of total (inventory gross) NSR to silviculture net NSR is 3:1. If a more conservative ratio, say 4:1, were applied to the estimated total NSR area of 9.1 million hectares, the estimated area of silviculture net NSR economically feasible for tree planting would be 2.3 million hectares.

In summary, this article concludes that:

- The estimated areas for inventory gross NSR and silviculture net NSR are 9.1 and 2.3 million hectares, respectively; and,
- The public interest is not being served through the provincial government's wholly inadequate responses to forest inventory and reforestation.

So what needs to happen? This author believes that the provincial government should undertake these immediate steps:

1. Write enabling legislation for the new Ministry of Forests, Land and Natural Resource Operations that clearly sets out its purpose and functions.
2. Restore to the *Forest Act* the chief forester's responsibilities for the conducting and maintenance of a periodic forest inventory and for reforestation and restoration of forestlands disturbed by fire, wind, disease and insects.
3. Restore funding to all forest stewardship functions including research. Suggested minimum annual budgets would be \$25 million for forest inventory and \$100 million for silviculture and reforestation.

Anthony Britneff, RPF (Ret) recently retired from a 39-year career with the BC Forest Service where he held senior professional positions in the inventory, silviculture and forest health programs.

References

Coates, David. Personal communication (January 10, 2011)

Cerezke, H.F. 2009. "Climate Change and Alberta's Forests". Forest Health Section, Forestry Division, Alberta Sustainable Resource Development. Page 44

Woods, A.J., Heppner, D., Kope, H.H., Burleigh, J. and MacLachlan, L. 2010. "Forest health and climate change: A British Columbia perspective". The Forestry Chronicle, Vol. 86, No. 4