

IS CANADA THE BRAZIL OF THE NORTH?

How can anyone condone the cutting of old growth forests? How can the clearcutting of precious forest land be permitted, when the status of the environment is so precarious? There are probably many people who ask these very questions, and who regard foresters and forest product companies with disgust.

The practice of extracting resources from the land for our benefit has always been part of the human society. In fact, it is part of our evolution and success as a species. It is best to view ourselves as part of nature, and not as a special or as a separate entity. The solutions to the problems we encounter with respect to forestry, and to its impact on the environment, will come from appreciating this relationship. We need to find the balance between use and abuse, and not by viewing ourselves as superior, or even as parasitic upon the environment.

The two views presented in this feature are by no means a complete range of the views on forestry practices, but do show part of the existing controversy. The first section includes various articles reprinted from "Brazil of the North", published by Canada's Future Forest Alliance. The second section is a compilation of two articles written by Gordon L. Baskerville, of the Faculty of Forestry at UNB.

Canada, the Brazil of the North:

Controversy rages over whether Canada can appropriately be called the Brazil of the North. Politicians and the forest industry hotly contend that this title is the language of extremists. Several have traveled to Europe to assure concerned buyers of Canada's wood products that all is well in Canada's forests. Yet even as they speak, they are up to their eyeballs in a flood of information that exposes their claims as untrue.

Global warming, erosion, loss of biological diversity, shattering of native cultures, and swindling economic support bases are some of the impact which Brazil and Canada share because of deforestation. Some of these impacts will affect people around the world.

The greatest difference between the forest policies of Brazil and Canada is that, in Brazil, the desperation of population growth and poverty have been the driving factors, whereas in Canada the greed of multinational corporations and their ability to tyrannize over the public by virtue of their wealth and political influence have been the central cause. Millions of Canadian citizens do not think this difference is flattering and do not want this situation to continue. Polls have shown they are willing to pay for increased environmental protection, but the federal and provincial governments ignore them.

We don't ask that the cutting of Canada's forest stop. But we do ask that the rate of cutting be reduced to a level which is sustainable over the long term and will allow our depleted forest to be restored. This must be based on an accurate inventory of the forest across the country. Clearcutting must be replaced by ecologically sensitive methods of logging, such as selection logging. We also ask that Canada meet its stated goal of preserving 12% of the country, including an adequate and proportional amount of old-growth forest.

What's happening to Canada's forest is a crisis of national and international proportions.

Industry and government critics of the "Brazil of the North" campaign argue that Canadian deforestation is different because the wood is utilized and the forests are replanted. There is also massive wood waste in the clearcutting of Canada's forest, but there are many other similarities. Consider the following:

Size of Canada: 9.9 million square kilometers
 Size of Brazil: 8.5 million square kilometers
 Percent of Canada covered by forest: 45%
 Percent of Brazil covered by Amazon rainforest: 41%
 Hectares of forest cleared in Canada in 1988 (latest figures available; 1990 will be similar or higher): 1,021,619
 Hectares of Brazilian Amazon cleared or burned in 1990: 1,382,000
 Amount of productive Canadian forest that is now either

barren or "not sufficiently restocked" after clearcutting: 10.3%
 Amount of Brazilian rainforest that has disappeared: 12%
 Estimated number of Indians & Metis in Canada's boreal forest: 100,000
 Estimated number of Indians in the Amazonian forest: 170,000
 Amount of forest officially protected in Canada: 2.6%
 In Brazil: 9.4%

"About one million hectares of Canada's forests are logged annually; after planting, reseeding, and natural revegetation, 18-25% remains without trees, with a consequent temporary loss of habitat for forest species."

Valhalla Society News:

Acres of Replanted Seedlings Do Not Make a Forest
 Clearcutting means the land is totally stripped of forest. The biological functions of living forest have been annihilated. It will take 60-100 years or more before these trees are useful to the forest industry again. It would take longer than that to fully restore its biological functions.

The Old-growth Forest is Coming to an End in Canada
 Some of the eastern provinces have virtually no original forest left. Others have only scraps. The federal government says British Columbia has only 9.3% of its commercially viable old-growth forest left.

Canada's Forest is Being Permanently Reduced in Volume
 The old-growth trees currently being cut may be 200 to 1,000 years old, up to ten feet in diameter and soar 250 feet into the air. Some estimates suggest the volume reduction from old-growth to harvestable second-growth will be 20-60%, depending upon the type of forest. Forest volume is a measure of forest jobs; it's also a measure of carbon storage space for offsetting global warming.

Replanting Does Not Necessarily Mean Regrowth
 Some areas, such as those with high altitude, steep slopes and shallow soil, should never have been clearcut. Some of these areas have been replanted three, four, or five times without success. Global warming, ozone depletion, and acid rain are expected to make this problem worse.

Canada's Commercial Forest is Being Reduced in Area
 According to a federal government report, about one million ha of Canada's forests are logged annually and, after planting, reseeding, and natural revegetation, 18-25% remains without trees. In the last ten years, an area in Canada the size of former East Germany has been stripped of its forest. Every year, an area the size of Prince Edward Island fails to regenerate itself and may never do so. As the



shift to second-growth brings a drastic reduction in the volume of forest on a given area of land, more and more area will have to be denuded each year to keep mill productivity and profits arbitrarily high.

The Biological Legacy of Canada's Forest is Being Drastically Reduced

The aim of silviculture in Canada has not been to replenish natural forests, but to create tree plantations, which differ from natural forests in many ways. Important steps in the natural progression by which nature builds soil fertility have been bypassed. Many kinds of plants and animals that play important roles in forest processes have been eliminated through destruction of habitat and poisoning with insecticides and herbicides. Too few species of trees are planted, and these come from limited genetic stock. Because these plantations lack genetic, species, and age diversity, an increasing number of scientists are alarmed at the

possibility that they could be destroyed on a massive scale by insects, disease, or other factors. The government speaks of increasing tree growth through "intensive silviculture". This would intensify the problems caused by replacing natural forests with tree plantations.

Native Cultures are Being Shattered
 Over 100,000 native Indians and Metis depend upon the boreal forest of northern Canada for their livelihoods. This is the last large reserve in North America where native Indians maintain the last shreds of their cultural heritage in lifestyles closely dependent upon the land.

The Status in New Brunswick by Marc Spence

If forest policies are not improved, Canada's future forests could look like the industrial-pulp plantations that now dominate New Brunswick's landscape. New Brunswick has been stripped of its forest cover and thousands of hectares of clearcuts are planted with seedlings of a single tree species. These are engineered tree farms, a degraded remnant of the diverse and unique natural Acadian forests that flourished here for thousands of years.

Clearcutting is not limited to 100 hectare blocks (contrasting sharply with the past 1,000 hectare blocks) with equivalent size "leave blocks" where logging will be delayed. But 100 hectares is still a major chunk of land to strip bare.

These monoculture plantations lack the genetic and species diversity of natural forests, making them ideal breeding grounds for disease and insect infestations, easy victims of acid rain and the effects of climatic change. They are unsuitable for many of the animals and birds that thousands of years of evolution selected to thrive here. There is virtually no ancient forest or old-growth left standing except in a few small areas that are not well defined or protected. Less than 1% of the province is currently protected in national and provincial parks and ecological reserves.

Thirty percent of New Brunswick's forest land is managed by over 30,000 small woodlot owners, who must compete for markets with the large companies. Logging on private woodlots has not been much better than on Crown or company forests, but because the forestry practices have been less intensive, these forests are less disturbed. In fact, half of the private woodlots have not been logged, which means there are still some forests where alternative, sustainable practices could be tried as a significant number of these woodlots are representative of the province's nine forest ecoregions.

Logging has increased dramatically in the last 40 years. The forest industry has over-cut by nearly a million cubic meters per year. Industry plans systematically to convert all the natural forests to monoculture plantations across the entire province.

Pulp plantations are made up of only five conifer species (the 27 other native tree species are ignored) which will be logged on short rotation schedules of less than 60 years. This intensive management requires continual infusions of pesticides, biological agents, and fertilizer. While it appears obvious that the long-term sustainability of New Brunswick's forest is at risk, some government and industry "experts" claim that it will be possible to double the province's wood production after the next five decades.

It is understood that in achieving the state of nirvana known as integrated forest resources management, we don't want to use those motorcycles called clearcutting, or, herbicides, or, whatever. Yet, if you examine statements about the future forest we are said to be creating, you will discover there is no measurable description of what that forest will look like when we are finished, or, whether the changes we are making are leading to irreversible change in the structure and pattern of the forest.

The fundamental problem is that, as a society, we seem to be incapable of defining where we want to be, independently of the tools we are willing to use to get there. The inability to define the ends to be reached, without reference to the tools to be used, is a serious problem. It means that we really do not know what end state of the environment we are going to reach. In fact, we do not even need a defined objective state for the environment because our goal is to use/not use certain tools.

In these circumstances, it is not surprising we have few measures of progress that relate to the state of the environment itself, and that we do not know if we can get the original natural systems back if we don't like what happens as a result of our management designed primarily by specifying goodness/badness of tools. In short, our society discusses forest resources management without reference to cause-effect mechanisms as these actually operate in the forest.

Canada, NOT the Brazil of the North:
 (the following is an edited version of two articles; some text had to be omitted due to space restrictions)

Clearcutting, motorcycles, and other problems in forest resources management
 by G.L. Baskerville

A modern parable
 To illustrate a general problem in our society, I will begin by describing some of the goals, and some of the actions for a trip I will be taking. Listen carefully because there will be two skill testing questions at the end.

So I will take a trip.
 -and I will not travel on a motorcycle
 My trip will help me respect the intrinsic values of culture in all forms.

-but I will not sit through any loud rock music.
 My trip will enhance my recognition of the various value systems in our society.

-but I will not travel in areas where police protection is suspect
 My trip will help me understand the role of local communities in our culture.

-and I will avoid going by air, as that minimizes contact with local culture
 My trip will be executed with due consideration for public health and safety.

-I definitely will not travel by motorcycle as motorcycle accidents are a burden on public health costs
 My trip will help me learn economic evaluation of options.

-I will not buy anything until I have found the best price
 My trip will contribute to the development of essential life survival skills in Canada.

-I definitely will not go by motorcycle - you know those things are really dangerous - I fell off one once and could tell you all about it

In the course of my trip I will abide by all federal and provincial regulations
 -and I will not use a motorcycle.

Now the skill testing questions. First does anyone know where I will be when I get there? Second, does anyone know if it will be possible for me to get back from there, should it turn out I don't like the place?

Those are reasonable questions, but the answers cannot be found in the good words that described my trip. My goals are warm and cozy, but do not define an end point in a manner that would permit you to reference them in the real world. Equally, my comments on how my goals will be accomplished emphasize things I would not do, rather than what I would do.

Like my trip, contemporary discussions of natural resource systems management are often built around goals that are soft and comfortable, but which could never be shown to be measurably achieved. Such discussion are a strange mixture of vague statements of arcane principle, and, repetitive emphasis about not using some specific tools. Despite pervasive environmental and sustainable development rhetoric in our society, we do not have the faintest notion where we are taking natural systems.

Structure of the problem.

Canadian approaches to environmental sustainability, and particularly to sustainable forestry, are fixated on means, to the virtual exclusion for substantive consideration of the ends to be achieved. That is, there is much talk about what we should not do locally, but not much in the way of rigorous biological reasoning with respect to where our actions, from time to time, and from place to place, will take a whole forest landscape over a time horizon of 80+ years into the future.

It is understood that in achieving the state of nirvana known as integrated forest resources management, we don't want to use those motorcycles called clearcutting, or, herbicides, or, whatever. Yet, if you examine statements about the future forest we are said to be creating, you will discover there is no measurable description of what that forest will look like when we are finished, or, whether the changes we are making are leading to irreversible change in the structure and pattern of the forest.

The fundamental problem is that, as a society, we seem to be incapable of defining where we want to be, independently of the tools we are willing to use to get there. The inability to define the ends to be reached, without reference to the tools to be used, is a serious problem. It means that we really do not know what end state of the environment we are going to reach. In fact, we do not even need a defined objective state for the environment because our goal is to use/not use certain tools.

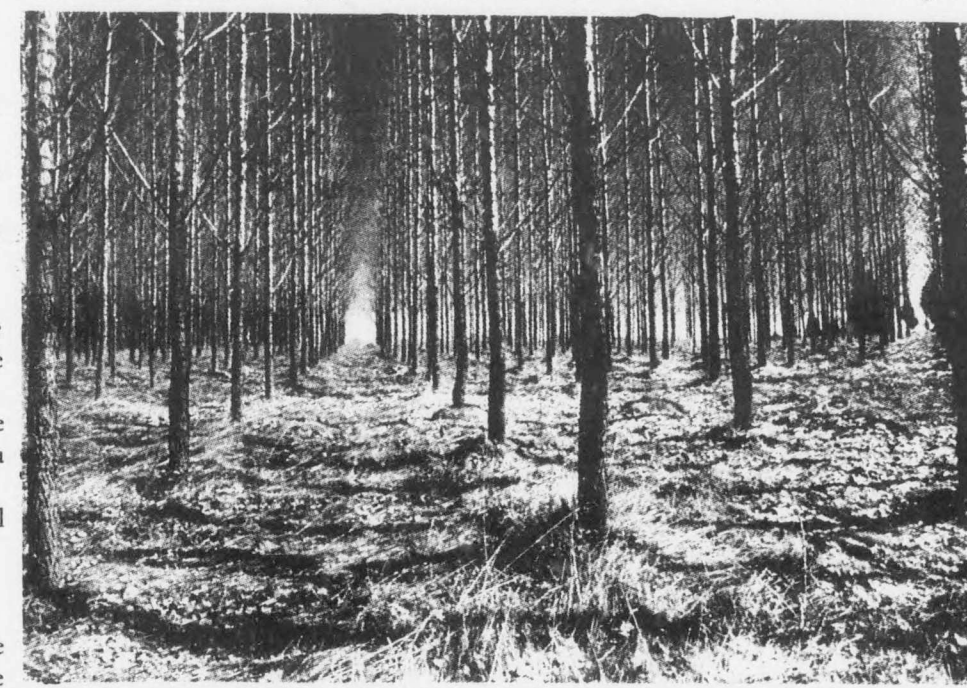
In these circumstances, it is not surprising we have few measures of progress that relate to the state of the environment itself, and that we do not know if we can get the original natural systems back if we don't like what happens as a result of our management designed primarily by specifying goodness/badness of tools. In short, our society discusses forest resources management without reference to cause-effect mechanisms as these actually operate in the forest.

Some basics of forest dynamics

As a stand of trees develops over time, the availability of values in the stand changes. Young softwood stands may have value as summer habitat for deer, but have no value as winter habitat. Immature softwood stands may have high value in terms of fibre,

but offer little in the way of sawlog value. Mature softwood stands may offer value both as winter habitat for deer and as quality sawlog material. The point here is that as a stand changes, the values available in the stand, in whatever form, also change. This is because the stand structure, stand microclimate, and even the forest floor, all change through time.

In some cases the temporal pace of change is so slow that humans think the stand is not changing. That comfortable notion un-



essarily complicated communication, because a biological system such as a stand is always changing.

Given the above, stand silviculture can be defined as control of "...there is much talk about what we should not do locally, but not much in the way of rigorous biological reasoning with respect to where our actions will take a whole forest landscape over a time horizon of 80+ years into the future."

development in a stand, in order to achieve some set of values at a specific location over time. Forest management can be defined as control of the spatial pattern of stand conditions (values) across a whole forest, in order to achieve some set of values across the forest over time.

That seems simple enough, but as always there is a catch. Silviculture, by intervening in natural stand dynamics for purposes of enhancing any one value, alters the availability of stand values other than the one being targeted. Equally, forest management, by intervening in forest dynamics through harvesting, silviculture, fire protection, etc., alters the availability of forest values other than the one being targeted. A silviculture tool may simultaneously be good for regeneration, and bad for aesthetics, it can be the reverse of that, and, it can be both at different places at the same time.

Therein lies most of the grief with respect to the evaluation of silviculture and its role in the management of forest resources.

There is a tendency, in this case to merely prevent the offending action, rather than restating the forest level goal and start over. Alteration of the action set by constraint during implementation, confounds evaluation. When there is an attempt to protect a value that was not defined in the forest goal, by altering silvicultural actions aimed at other values that were defined, we find ourselves trapped in the mode of "I will not travel by motorcycle".

Some clearcut issues

To put this in a more specific context let's examine some issues that surround local use of the silvicultural action of clearcutting. Size How big is big? Tomorrow you will see some big clearcuts, and you will also see some big areas of natural mature softwood forest. If you look at the natural stands carefully you will find they are all between 70 and 80 years old from release within a range of - 5 years. That is not a plot by Joe O'Neil, that is the reality of this forest. The trees were there before 1920, but they were small seedlings, mostly less than a foot in height, growing under a mature fir-spruce stand not unlike the one that is there today.

This situation means that some time before 1920 all the present mature forest must have looked pretty much like a clearcut. In this case, the big cutter was made by the spruce budworm. About 50% of the softwood forest in New Brunswick was harvested by a budworm outbreak in the period 1913-19.

Historically, natural dynamics in this softwood forest centered on very large natural disturbances that were far apart in time - budworm, or large fires. There were also lots of little disturbances in between the big ones - things like windfall, bear stripping, small

fires, and so on. The norm in nature, however, was large areas of stands of a common origin because the natural system is adapted to large scale disturbance. One can conclude that size of clearcut should not be an issue if our reference point is natural system dynamics.

If society wants a natural forest pattern, then good harvesting approaches will mimic those in nature. In that case, we must alter the process of cutting to allow a post cut successional development equivalent to that of nature. Here again it is not the motorcycle of mechanical logging (or whatever) we should target, but rather the conditions needed to achieve the desired stand response.

What is right?
 If goodness lies in mimicking nature, the conclusion of an ecological analysis of this situation would be that harvesting should remove all the mature fir, and most of the mature spruce, from stands on an area of the New Brunswick lowlands of the order of three-quarters of a million hectares in about five annual cuts of one hundred and fifty thousand hectares each, and then leave the forest alone for 30 to 50 years. The harvesting technique should be one that results in the same post disturbance developmental pattern as when budworm harvests.

The main problem, however, is that because the focus is on the motorcycle of large clearcuts, no reasonable effort is being made to measure the other values (wildlife populations, aesthetics, etc.) to track their response to the changing forest pattern.

Note carefully here. I am not saying big clear cuts are good, or, bad. Nor am I saying that small clear cuts are good, or, bad. I am saying that in this case, our fixation on local tools, rather than on forest level dynamics, and forest level goals, is rapidly resulting in highly unnatural pattern in this forest. If society wants that unnatural forest pattern, then small clear cuts are good - that is, if the conditions that actually result are those desired by society, or at least not undesirable. If society wants to mimic nature, then the small clear cuts are bad.

Conclusion

The message I am trying to get across is that as a society, we need a lot more attention to real cause-effect connections in matters of the environment, and a lot less emphasis on simplistic good/bad designations.

Despite considerable strengths in technology and design there is risk that over a generation we may fail locally, or, extensively, in dealing with such fundamental issues as sustaining the productive capacity of our natural systems. My contention is the problems are more social than technical.

Simply put, contention is that the means used must be consistent with the ends claimed. Consistency is required above all in dealing with biological cause and effect, but also in social matters. The consistency that I would like to see is between the biological effect of the means used in managing a natural system, being identified as direct causes of the ends espoused for that natural system.

Our goals for this forest in terms of small clearcut size and in terms of species mix are anthropocentric and counter to nature. Perhaps that is because society really wants that type of forest. Perhaps it is because humans have a shorter life span than do trees. Perhaps it is because very few people actually spend enough time in the fir-spruce forest to discover its natural dynamics. Perhaps it is because we, as a society, have evolved an elaborate mythology with respect to forest dynamics, a mythology that it is seriously lacking in ecological realism.

The foregoing is not an attempt to rationalize clearcutting, far from it. I merely used that tool as an example to demonstrate that contemporary approaches to natural resources management are based more on not using some tools now (not riding motorcycles) than they are on systematically achieving measurable goals in the forest over a time horizon of 80+ years in the future.

Setting goals for natural systems independently of the tools we might use to achieve those goals will not be easy. It is intellectually demanding, because it requires an understanding of natural system dynamics over very long time horizons and across large geographic areas, and because it inevitably forces tradeoffs amongst goal desires.