THE FOREST UNBUNDLED:
CANADA'S
NATIONAL FOREST STRATEGY and MODEL FOREST PROGRAM
1992-1997

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A dissertation submitted to the Faculty of Graduate Studies
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ABSTRACT

Natural resources policies are now routinely built on the concept of sustainable development. Ecology and ecosystem management theory are central to the task of interpreting and applying it. This dissertation examined the ecological content of two federal forest initiatives, the National Forest Strategy and the Model Forest Program of 1992. At issue were the integration of natural science and material interest into public policy, the role of Canadian structural factors, the direction for Canadian forestry envisioned in the policies and their implied message about the ideal nature-human relationship.

The study employed a qualitative method that combined evidence from documents, interviews and visits to Prince Albert and Fundy model forests. Analysis of the integration of natural science with material interest was framed by policy community theory and the political economy of Canada's natural resources: that of the policies' ecological content by the forest ecology literature. A set of nature profiles was also prepared for the study, ranging from pre-Enlightenment times to today, based on the history of Western science, to identify the philosophy of nature found in the policies and the proposals submitted to the Model Forest Program.

This work concluded that the Canadian forestry situation is the outcome of a complex interplay resulting from a staples-based economy, federalism, close government-industry relations, and the association of elite experts with the dominant industrial

paradigm. Their combined action caused otherwise innovative policies to maintain the traditional timber focus and to endorse a type of ecosystem management permissive of industrialized forestry. The policies' 'postmodernist' nature philosophy did not challenge the dominant paradigm but was shown to continue in the older, atomistic tradition.

Model forests are managed by partnerships of landholders and other interested parties. At both locations, the study confirmed the program's potential to resolve conflicts but found that those without material interests were easily marginalized; further, its voluntary nature kept intact the legal arrangement between the provinces and the industries. In view of this and the fact that the new ecological knowledge has served to uphold the theme of exploitation, any policy change in the forestry community is expected to be limited.

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INTRODUCTION

Environmental and natural resources policy is, among other things, expressive of a particular attitude towards nature and the earth, and in addition advances a hypothesis about the desired form of the human relationship to nature. It is, as the word ecology says, about how we fit into the oikos that is the non-human world. What is this attitude or understanding that we find in current Canadian environmental and natural resources policy? Is there a role for earth science and ecology in policy making and, if so, how are they incorporated into policy? Is the process of incorporation - policy making - selective of the available information? How? What determines the scientific content of policy? Are there constraints on the process? Are there particular factors at play, factors that predispose a certain outcome? And are any of these factors unique to Canada? These questions comprise the point of departure for this study. They also suggested that it is at least in part a policy story about the role and place of science and experts in policy making rather than a scientific story concerned with environmental and natural resources policy.

In settling upon two fairly recent federal forest policy initiatives, namely the National Forest Strategy and the Model Forest Program, both dating from 1992,[1] the initial question about the constraints that shape the content of Canadian environmental and

[1] A new National Forest Strategy was signed 1 May 1998 in Ottawa and the Model Forest Program moved into a new phase in 1997.

resource policy came to revolve around a concern with the specific ecological content or outcome of these two federal policies, with their apparent inconsistencies, with what they say about contemporary nature-human relationships and the direction they would lead us in should they be implemented widely. Most of all, I wondered how one was to make sense of the policies' content in a Canadian context.

Perusal of the literature on Canadian forest history makes clear very quickly the decisive part the country's colonial past has played in the development of forest policy and management. The words "a colonial past" entail much more than the appropriation of this part of the continent by European powers and the replacement of indigenous systems of authority with European ones, and more also than the image of colonists looking over their shoulders to their countries of origin for essential goods, help and direction. In groundbreaking work, Lower (1938), Innis (1956) and Nelles (1974) linked the development of Canada's institutions and the peculiarities of its systems of forest governance to the colonial legacy. In other words, they linked the fact of colonization with the political and economic realities that govern forest policy making in this country and so were able to explain a great deal about it. The political-economic dimension of natural resource policy in general has been given greater depth by others such as Clark-Jones (1987) and Naylor (1980). Likewise, policy analysts have paid much attention to institutional aspects of resource policy making, in particular federalism. So, while there exist extensive literatures on the history and political economy of natural resources and, on the other hand, on governmental (less on societal) institutions, surprisingly few writers

have put the two together, especially in the area of forestry. Hessing and Howlett (1997) is a major exception.

Another dimension of forest policy making is ideological: just what is a forest? For it is not strictly (or even mostly) a scientific question (or a scientifically knowable entity). Forestry science as it emerged in the late eighteenth century was a combination of the new science of fiscal administration and a love affair with quantification. Both were applied to the growth of trees as an economics project. For this reason resource management has less to do with ecology than with the application of ideas about the human-nature relationship. Thus, apart from what *can* be known objectively about forests, the question of what they are is to a very large degree tied to the perception humans have of the forest as well as to the relationship they perceive themselves to have with it. These perceptions are filtered through layers of historical experience and societally influenced values and motivations. By extension, forestry science and forestry scientists are subject to those same cultural factors, and the latters' thinking about forests will consequently prompt them to ask particular questions, to pursue them in a certain way and to consider or select certain strands from the available information. A fair bit of work has been done investigating the historical influences on North American forest ideology, much of it in the context of the Conservation era (e.g. Meine, 1995), such that this aspect is well known. History of science literature dealing more narrowly with Renaissance and Enlightenment thinking (J.R. Jacob, 1994) is important in this regard and recently there has been interest in the postulated transition from a modernist to a postmodernist attitude

in forest management (e.g. McQuillan, 1993). In an invaluable paper, Lowood (1990) connected the origins of scientific forestry to the economic and administrative needs of the European landed gentry. But this type of work, which links institutions and economics with nature ideology and management, is rare. A paper by Sivaramakrishnan (1996) on fire management in colonial Bengal is comprehensive except for the economics aspect; in Canada, Leman (1981) examined the place of the forester in relation to some provincial bureaucracies, Gillis and Roach (1986) asked why forest policies in this country have so often become "lost initiatives," and Sandberg and Clancy (1997) looked at forestry practices in 1920s Nova Scotia under the demands of a staples economy. Unfortunately, discussion from a scientific perspective is normally lacking.

None of these literatures says much about how science is taken up in policy. For this we must turn to a subset of the policy literature dealing with knowledge and learning, but there is little specific information about how the process of incorporation itself works. An example of this is Healy and Ascher (1995) who concentrate instead on the effects new knowledge may have on the policy community. A more useful approach is suggested by the work of Hessing and Howlett (1997) who describe policy making as "an activity of government that fuses knowledge and interests" (9). This allows us to rephrase the question of the integration of science into policy as one of how natural science (knowledge) and power (interests) are brought together in the natural resources policy field and opens up the enquiry to consider the dialectic of mutual influence of politics on science and science on politics. Here Bocking (1997) is instructive for he documents this

exchange in case studies from the USA, Britain and Canada. Relevant also is Haas's (1992) work on international policy co-ordination involving scientific (technical) issues, where an epistemic or knowledge community is influential in showing national governments how to understand them. He argues that experts' possession of knowledge in times of uncertainty gives them policy-making power.

Inquiring into the process that produced the specific ecological content of two Canadian forest policies therefore requires that we integrate several related aspects of an historical, cultural, political and economic nature. In addition, since the policies tackle the operationalization of the concept of sustainable development into guidelines for on-the-ground management, an analysis of the scientific material is also necessary. For this I turned to the scientific and resource management literature.

When I say "science," I mean environmental science, in this case the application of earth science and forest ecology to the problem of landscape level forest management. Since the notion of forests has, as I said earlier, been influenced by many factors of a non-scientific nature, it is inevitable that values should be part of anyone's interpretation of the scientific material. These may be in support of industrial forestry or opposed to it. Part of my concern then in this study, when I speak of the incorporation of certain strands of science into policy, is whether new environmental values have been incorporated into the federal policies or whether the dominant industrial values have been retained.

To answer the questions around the ecological outcome of the National Forest Strategy and the Model Forest Program, I planned an interlayered method based on the

joined use of the two policies. Given the need to integrate the several aspects of resource policy making and the paucity of detailed, empirical studies, a variegated approach was most appropriate.

1- The National Forest Strategy served primarily to assess the ecological content of the policies and what it tells us about our understanding of the nature-human relationship.

2- The Model Forest Program's guidelines and selection process gave insight into the role of forestry experts by showing how they envision sustainable development to work on the ground and further informed me about the characteristics of contemporary nature-human relationships.

3- Interactions between the policy community's attentive public and the network were studied by my visits to two model forests. Since these are artificially constructed communities, the limitations displayed by them were indicative of the institutional constraints upon natural resource policy making and the long-term possibility of change in the policy-making process.

Each of these layers has its own theoretical base, corresponding to one of the areas of literature surveyed above. In the first, natural science predominates, especially forest ecology, but history of science is also important. The second is informed primarily by history of science and secondarily by the natural sciences. Finally, to the third plane of investigation I applied policy community and political economic theory.

The threefold design anchors the study on three levels; it is a triangulation between

policy actors, science and ideas. Triangulation is important to the validity of case study research (Yin, 1988). Methodological and theoretical overlap between these areas strengthens it. Evidence came from documents and from interviews with 46 people (Appendix E). I was also in touch with officials in the federal Forest Service who had been involved with the National Forest Strategy and the Model Forest Program.

One last remark about study design. Although jurisdiction over forested lands rests with the provinces, the focus on federal policy is justified because the topic of enquiry concerns process and therefore cuts across jurisdictional limitations. It is also appropriate because the efforts by the federal government to claim a place for itself when it lacks jurisdiction illustrate well some of the constraints that operate at the policy level. There are two further advantages to working with federal projects: we get a Canada-wide perspective and there is a link to the important international arena that has exerted considerable pressure on the Canadian forestry industry over its management practices.

The premise underlying the present work is that public policy in the field of natural processes embodies the preferred and dominant stance towards nature and its products, a compromise endorsed by society's policy makers in government and industry. The study shows of just what the officially endorsed image consists, comments on its ideal of the human relationship to nature and indicates how external factors have influenced the development of the ecological content in the selected policies.

The argument proceeds as follows. Chapter 2 is devoted to a portrayal of the political landscape governing Canadian forestry and in particular of the terms under which

federal forest policy is made. The first task, however, treated in Part 1, is to present the policy community and network method of policy analysis since its concepts structured my thinking and permeate the work. A brief literature review of the method serves to justify my particular usage of the theory's terminology and to address some shortcomings of relevance to the study. Part 1 ends with a short excursion into the field of policy learning and paradigm shifts because this literature will help with the assessment of the kind of change embodied in the two policy initiatives. Part 2 situates Canadian forest policy making historically and institutionally, with detailed attention to Ottawa's situation and record. These discussions are needed because the subject policies of the dissertation are federal and because, as I said above, we cannot proceed with an analysis of resource policy without grasping the historical and institutional context. This includes a political dimension, evident both in the use of science and in who has access to the land and its resources. The chapter concludes with an appraisal of the place of forest experts in the policy community. As it is mainly forestry experts (together with civil servants, many of whom are also foresters) who wrote the policies in question, we need to know what their position is in the policy community. This prepares the way for the next chapter.

Chapter 3 concentrates on the National Forest Strategy's ecological content; its purpose is to isolate and evaluate the principal ideas that mark the Strategy's take on sustainable development. The scientific and resource management literature used to analyze the Strategy's ecological content explores the tensions between old and new approaches to forest management. The major differences are that ecosystem management

recognizes nature as being in flux and includes humans in the concept of nature. Since this new approach paradoxically may be applied to justify an even stronger industrial ethic, I wanted to know how it had been developed in the Strategy.

In Chapter 4 the attention turns to the Model Forest Program. After describing its goals, guidelines and the process of selection, I use the above analysis to construct a profile of its sustainable development forest management philosophy, its brand of nature ideology. The history of science and forestry augmented by other texts provides the material for a range of profiles of other nature and management philosophies. All are then applied to the problem of classifying the many proposals that were submitted to this program. Apart from further ecological discussion, the development and application of the nature philosophy profiles is my main analytical method. It is from this section's historical and geo-ecological exploration that the metaphor of the unbundled forest emerges.

If Chapter 2 is partly concerned with the politics of environmental science - influences exerted upon it by society - Chapter 4 approaches the politics within science and does so empirically. Their treatment in separate chapters is not a suggestion that the direction in which the influence operates stands alone and works on the other linearly - now this, then that. On the contrary, I will argue that it is difficult to categorically separate the two, precisely because the influence is mutual: nature provides a model for thinking about society, but it is only a partial model. What is accepted from nature's model are those elements that suit elite interests.

To see how the policy community tackles the problem of sharing in the decision making of forest management, chapters 5 and 6 relate the experiences of Prince Albert and Fundy model forests, respectively. Because the composition of the communities was an experiment and therefore brought together many more parties than otherwise would be the case to 'do' forest management together, these chapters show the sort of issues the forest policy community faces and amplify the obstacles in the way of redrawing the policy network map. Ironically, many, though not all, of the complications affecting these communities' dynamics arose from the biases contained in the preferred nature ideology and management philosophy of the federal initiatives. Conclusions follow in Chapter 7.

In light of the purpose of the National Forest Strategy and the Model Forest Program - guiding the Canadian forestry industry towards ecosystemic management - and the heavy penalties the industry (and the Canadian economy) faces on international markets should it fail in this quest, this study points to the significant obstacles in the way of achieving the goal. But we are confronted with something far more serious than economic repercussions, and in view of this I have situated the debate around the ecosystem management of forests in relation to the larger theme of the overall philosophy of nature we hold to. As Robert Harrison (1992:xi) said in *Forests: The Shadow of Civilization*,

> In the history of Western civilization forests represent an outlying realm of opacity which has allowed that civilization to estrange itself, enchant itself, terrify itself, ironize itself, in short to project into the forest's shadows its secret and innermost anxieties. In this respect the loss of forests entails more than merely the loss of ecosystems.

If we are to change, in any meaningful way, our treatment of the forest, it will require a change in our relationship to the forest. More is at stake than even the ability of the planet to maintain itself; what is at stake is a meaningful human-nature relationship that, as Harrison tells us, is also full of the mysteries of human nature. The idea of the forest extends to the forest of the distant, geologic, past contained within the contemporary forest. A philosophy of nature that lets the forest have its past with its own mysteries seems well placed to safeguard both the forest ecosystem and a meaningful human relationship to it.

CHAPTER 2

CONCEPTUALIZING FEDERAL FOREST POLICY

Canadian forest policy has certain features of historical origin that set it apart from that of other countries. These are of a primarily institutional nature but also have a political-economic aspect. The purpose of this chapter is to situate the dissertation questions and Canadian forest policy itself historically and politically and, in general, to build the conceptual framework for the study. For that reason I begin the chapter with a presentation and discussion of the method of policy analysis that has inspired the thinking behind and organization of the present work extensively, namely the policy community approach. But the method is not without shortcomings, especially when it comes to the matter of power in policy networks. The power dynamics in forest policy communities and the relationships of their various actors receive a lot of attention in this work (e.g. in the model forest case studies, chapters 5 and 6), and so I have taken the trouble to address this flaw in particular, but also others. For this I have leaned on the insights of political economy, or the study of power. Policy community theorists have concerned themselves also with the problem of policy change, something that is of interest here as well. Part 1 therefore ends with a brief visit to the relevant literature and issues. Part 2 is a treatment of the factors influencing Canadian forest policy making, a political-economic as well as an historical question. These aspects merge in the forestry expert, and so the chapter closes with a look at the interesting position s/he occupies in the policy community.

PART 1: THE POLICY COMMUNITY THEORY APPROACH TO THE STUDY OF PUBLIC POLICY

Hessing and Howlett (1997) describe policy making as "an activity of government that fuses knowledge and interests" (9). Knowledge (ideas) and interests (power), the two central ingredients of the policy community approach to policy analysis,[1] are what policy actors bring to their task. Of the four most common approaches today (pluralism, public or rational choice, policy networks and communities, and political economy), policy community theory was developed in response to the particular characteristics of policy making at the sectoral (meso) level. Since what is presented here concerns policy decision making in the forestry sector, the policy community approach is relevant. In Canada, much of the groundwork for this method has been done by Coleman, Skogstad and co-workers (e.g. Atkinson and Coleman, 1996; Coleman and Skogstad, 1990a,1990b) and in the forestry field by Howlett and colleagues (Howlett and Rayner *in* Ross, 1995; Howlett and Rayner, 1995). But knowledge and interests also mean access to, or exclusion from, economic power, which is the field of political economy (Hessing and Howlett, 1997).

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[1] A distinction is sometimes made in the public policy literature between policy analysis and policy study, the former referring to the study of policy by governments and research organizations for the sake of practical application and the latter, more academic, seemingly for no sake at all except abstract understanding. Since one of the meanings of 'analysis' is interpretation and examination, and since understanding necessarily precedes prescription and design, with many students of public policy practising both aspects, it would seem that the distinction can be more usefully designated by appropriate qualifiers. In this study, therefore, I shall use them interchangeably, letting the context or descriptive terms such as "design" or "implementation" indicate my meaning.

Here I build on the perspectives of both disciplines.

Policy communities and networks

The policy community approach is usually regarded as structuralist or neo-institutionalist. Howlett and Ramesh (1995) defined institutions as "the structures and organizations of the state, society, and the international system" (51). It is in this view of institutions that structuralism or neo-institutionalism differs from public choice theory (Coleman and Skogstad, 1990a). In the case of public choice, institutions, including those of the state, are seen as setting the rules that structure the game of competitive participation. They "provide incentives for co-operation, reduce the rewards for opportunistic behaviour, and improve the prospects for efficient exchanges" (Atkinson, 1993:28), but are not thought to "determine the values and preferences of political actors" (Coleman and Skogstad, 1990a:4).

In contrast, for policy community theorists, the effect of institutions is to set the cultural and ideological context for policy action. They do not cause the action, as Howlett and Ramesh (1995) explain, but they "affect actions by shaping the interpretation of problems and possible solutions" (27) and by constraining the outcome. The policy community method makes the point that history, culture and a society's "public philosophy" (Manzer, 1985) play a part in shaping and constraining policy and, besides rules, incentives and resources, provide actors with values and expectations.

Operating in the centre field between society and the state, the policy community

approach proceeds from the premise that institutions and individual or group actors interact in the policy process. This is in part the result of maturation in the analytical field where the shortcomings of a polar approach (society *versus* the state) have become evident, in part a function of the changes that have taken place recently in the nature of policy issues themselves such as their internationalization, their increasing complexity forcing governments to rely on others' expertise, or the delegation back to society in the face of budgetary restraint of government responsibilities taken on in the post-Keynesian era (Atkinson and Coleman, 1996; Haas, 1992). But more, the policy community approach means that we can avoid the kind of reductionism that plagues both public choice theory and pluralism[2] in which humans are merely game-playing "rational egoists" (Atkinson, 1993:31), as well as its opposite, determinism, in which the individual is more or less completely moulded by institutional forces. By exploring the middle ground, this analytical method leaves room for ideas and the possibility that learning (change) can take place in a particular policy field (Howlett and Ramesh, 1995). It borrows from pluralism an enthusiasm for spontaneity and consensus building (Pross, 1996) and from public choice the unavoidable truth that humans indeed may and do act out of calculated self-

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[2] Pluralists see public policy decisions as the outcome of competition among individuals, working either alone or in interest groups, in the political arena (Brooks, 1993). As the rational perception of their interest changes, the outcome of political action changes too. The state is seen as a neutral party that can arbitrate disputes.

interest.[3] It theorizes the middle ground (Howlett and Ramesh, 1995), neither exclusively state- nor society-driven but filling the gaps between the state and society (Doern, 1996).

Some issues in policy community theory

In this section I want to broach two sets of issues that crop up in relation to policy community studies. One of these is a set of theoretical criticisms, the other a problem of terminology, itself of relevance to one of the criticisms. Let us begin therefore with this second set.

The problem with terminology stems from the fact that the definitions of the two key concepts in policy community theory, 'network' and 'community,' differ depending on the text, a notable weakness deriving from its largely descriptive or metaphorical usage (Atkinson and Coleman, 1996). According to policy community theory, policy is developed within a sectoral policy community or subsystem, two roughly equivalent terms. By 'policy community' I mean the "actors and potential actors" with a direct or indirect interest in a policy field "who share a common policy focus" (Wilks and Wright, 1987:298), e.g. a product or service, and who "with varying degrees of influence shape policy outcomes over the long run" (Coleman and Skogstad, 1990b:25). The policy community is divided into the sub-government, whose participants make policy, and the

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[3] An example is Harrison's (1996) finding that times of greater salience of environmental matters are also times of greater discord between Ottawa and the provinces.

attentive public, those who would like to but are forced to follow the issue(s) from the sidelines (Pross, 1986).

While the sub-government identifies who makes policy, 'network' means the characterization of relationships in the policy community, "the particular set of actors that forms around an issue of importance to the policy community" (Coleman and Skogstad, 1990b:26). The network is distinguished from the attentive public in that the former is motivated by the attainment of some material interest (some product, often information, or other advantage that would result from the interchange), whereas the latter has a more general membership consisting of those with knowledge in the field (Howlett and Ramesh, 1995). Therefore, members of policy communities "are linked together by epistemic concerns" (129) while networks arise from some type of "regularized interaction" (130) among certain of the community members who, in addition to the shared knowledge base, also have some material interest in common. By contrast, for Coleman and Skogstad material interest and knowledge interest are associated with the policy community as a whole because some, not all, of those with an interest will have influence over policy making; these few are grouped into the sub-government and their interactions are arranged in networks according to style.[4]

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[4] There is a slight loss of shading in Coleman and Skogstad's (1990b) conceptualization of the network since for Wilks and Wright (1987) it denoted "the linking process, the outcome of [the] exchanges" (299) between actors, structured by dependent relations. Van Waarden (1992) preserves this dependence element when he stresses the possibility that "a more enduring linkage pattern based on an interdependence of the various actors" (31) may result in the institutionalization of the networks. Kenis and Schneider (1991)

Policy community studies have been accused of failing to deal with the question of the balance of power for not sufficiently characterizing the power relations among policy actors. That is to say, description of interactions in the policy community has come at the cost of not saying enough about the "content" of the relations or interactions, who holds power and how it is played (Atkinson and Coleman, 1996), since not all interactions are of equal significance in terms of policy outcomes. Networks are classified according to certain of their properties rather than relational content. Thus, Coleman and Skogstad (1990b) employ structural properties, with state capacity and autonomy and sectoral organizational development being critical, and Howlett and Ramesh (1995) describe the network in terms of material interest and regularized interaction among participants, but neither scheme accounts well for the location of power or, as I call it, the power nexus. Although for Coleman and Skogstad (1990b) the sub-government members are the policy makers, it follows from the definition of policy networks ("properties that characterize the relationships among the particular set of actors that forms around an issue of importance to the policy community" [26]) that they are descriptive of the relationships within a sub-government and that these do not necessarily coincide with the sub-government, since

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describe networks as being "those webs of relatively stable and ongoing relationships which mobilize dispersed resources so that collective (or parallel) action can be orchestrated toward the solution of a common policy problem" (36). Howlett and Ramesh's (1995) idea is not dissimilar to Coleman and Skogstad's but the dependence theme is made explicit.

more than one network might arise in a given policy community.[5] The problem, then, is to locate the nexus of power in a schema where any and all relations can be a network and one network is the equal of another. It is of particular import for the very reason that the term 'network' implies that it has depicted the nexus.

Howlett and Ramesh's (1995) model demonstrates a related aspect of this problem

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[5] This is easily illustrated. Supposing for a moment that network and sub-government do coincide, presumably not everyone in the sub-government, the policy-making body, would be involved to the same degree and therefore part of the actual decision making; some actors would be more important than others. In some cases the network will be identical with the power nexus and in others the network will be composed of members of the power nexus as well as of the attentive public. An example of the first case is the concertation network, typical of the forestry sector in British Columbia (Wilson, 1990). In this kind of network, the "considerable capacity" of the state is more than matched by that of the sectoral interest (Coleman and Skogstad, 1990a; 1990b:28). It is made up of only two parties and thus forms a power axis; in corporatism three partners are arranged in a triangular power constellation (labour is often the third party but its influence is limited and varies across the sector). Pressure pluralism, typifying relations in the area of the international forest products trade (Grant, 1990), is an example of the second case; here the state is autonomous though its authority is dispersed, and the other parties are cast in the role of advisors. They may be part of a network, even part of the sub-government, but it is doubtful that, being advisors, they belong to the power nexus. In parentela pluralism, organized interests are attached to the dominant political party which is also in control of the bureaucracy, so that the network and the nexus may well coincide (without forming an axis). The shape of the nexus is also unclear in clientele pluralism, but here, when state authority is not only dispersed but its capacity is also low so that it becomes dependent on societal interests to help it run the policy field, the network and nexus may or may not coincide. Coleman (1988) characterized the British Columbia forestry network as clientele pluralistic, probably because he defined the concertation network as one in which the societal interests operate through one single association (Coleman and Skogstad, 1990b). The down side of this requirement is that a complete disaggregation of the pro-industrial interests results, obscuring the fact that they speak with one voice. More realistically, Grant (1990), who believes British Columbia's "most appropriate paradigm is that of a 'company state'" (120), says that the situation is best summed up as one of corporatism and concertation.

because regularized interaction too allows for the existence of more than one network within the policy community and material interest[6] of itself does not equal power. An example might be a native group in one of the model forests which, having both material interest in the outcome and regularized interaction with other community members (that is, belonging to a network), yet does not possess much power. The same would be true for environmental and feminist groups.

The following discussion may clarify the point. Bruton and Howlett (1992) and Hessing and Howlett (1997) argue for a triadic configuration in resource and environmental policy with the third party being the environmentalists on the basis of their active participation in environmental round tables, and some limited successes in influencing policy planning, such that Wilson (1990) referred to the forestry network style in British Columbia as 'contested' concertation (footnote 5). Government, corporate and environmental groups are the most frequent participants in these round tables, labour and First Nations least (Bruton and Howlett, 1992). But the data also show that, outside of the round tables, labour enjoys greater contact with the corporate sector than do environmentalists (55% and 35% respectively), that labour unions talk nearly as much to environmentalists as they do to industry (44% and 47% respectively) and that natives, who get little attention from either labour or industry (23% and 13% respectively), themselves are in touch with environmentalists slightly more frequently than with the corporate sector

[6] Material interest may include concerns about environmental integrity (Hessing and Howlett, 1997:109).

(44% and 39% respectively). As was the case with American "notables" in Washington, DC (Heinz et al., 1990), Bruton and Howlett also found that most frequent contact for all groups is with themselves; the experience of the round tables has not significantly changed the relational pattern.

The evidence in support of a triadic network on the basis of frequency of contact is therefore inconclusive: unless round tables are taken as the focal point for resource policy making, the third party in the triad could be any one of the four groups. But the round table process has not greatly altered the normal decision-making processes (Bruton and Howlett, 1992) and this too indicates that to consider the process triadic is premature. At best, it may be said to be "emerging" triadic as Hessing and Howlett (1997) occasionally do. The obstacle, as we shall see with the model forests, is institutional. So long as forest industries are the only parties to be in a contractual, legal relationship with the government, they will be the only societal group to make the decisions. For this reason, Howlett and colleagues frequently conclude that changes in material interests will be needed before real change can be expected. At present, the contribution of environmentalists and others to the policy process is to arouse discomfort with the existing one and to widen the agenda with new ideas. Although there have been inroads, there is support for the notion that the strategy of the power nexus is in fact to usurp and contain these ideas (Wilson, 1990; Kerski, 1995). Thus, a pulp and paper spokesman could assure industry members that clear cutting was no longer so controversial, the biggest criticism being that it is not as adequate a management method as others (Pickering, 1997). On a

larger scale, the process of containment also includes the restructuring of economic power, as when the industrial paper-making machine was intentionally invented to appropriate the skills and undermine the power of the paper artisan class by factory owners (Kerski, 1995), and of landscapes, when plantations replace native forests (Kellhammer, 1992). When it comes to cutting the forests, technological changes reduced the dependence of west coast timber industrialists on the skills of the loggers, which had given them a large measure of control over their work, making them, from their employers' point of view, militant and intractable (Rajala, 1993).

To assess the criterion of contact frequency a little further, John Porter's (1965) work on social class and power in Canada can be a guide.[7] Elites are those "who have the power to make the major decisions for the society" (25), a power that is assured through the means of ownership (material interest). This definition is narrower than that of Garrison (1997), who includes among the elites all those whose knowledge may exert influence on environmental policy decisions. The narrower definition allows for a finer, more meaningful, contouring of the power nexus and best accounts for the selectivity of expert interpretation in policy development.

Commenting on labour unions and their lack of ownership, Porter (1965) writes that they have "the whole weight of institution and habit against them" (312). We may say

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[7] Clement (1975) updated and expanded Porter's pathbreaking study, particularly as regards the economic elite. He shows, for example, that during the intervening years the ties between the governing and corporate elites have strengthened and that the latter has become more exclusive.

the same about environmentalists and First Nations.[8] According to Porter, the two most important elites, the corporate and political, enjoy ready access to one another. The economic elite, although not as well represented among the political elite as lawyers are, still makes up the second largest group of upper level provincial and federal positions and, significantly, often knows the political elite personally (Porter, 1965). The ties of friendship and kinship, the recruitment back and forth, the shared educational, ethnic and middle or upper class background of these two groups, produce a homogeneity of values and attitudes Porter called a confraternity of power (1965:522).

This confraternity exists in the British Columbia forestry sector. For example, Wilson (1990) found that industry and government do exchange both lower and higher level personnel. Although environmentalists are party to round table discussions and would therefore seem to share in an important activity of institutional leaders who meet on councils, boards and commissions (Porter, 1965), yet their closest ties are with bureaucrats in ministries peripheral to the lead agency, the Ministry of Forests (Wilson, 1990). This ministry, populated by professional foresters, is on the other side of a cultural and political divide, since environmentalists rarely enjoy ties of kinship and friendship with its ministers and relate poorly to its foresters. Likewise, environmentalists and businessmen do not agree on ideological points (Bruton and Howlett, 1992), while the

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[8] Recent court decisions such as that of New Brunswick's Court of Queen's Bench in November 1997 and of the Supreme Court of Canada's on 11 December upholding rights by Micmac and Gitxsan & Wet'suwet'en respectively to their traditional lands, are bound to have ramifications for natural resources policy networks.

latter not only have access to the entire Ministry of Forests but are linked in a confraternity forged by their shared education and professional values (Wilson, 1990). Wilson (1990) assessed the environmental movement's contribution to forest policy making in British Columbia in this way, that it has affected people's "descriptive and prescriptive beliefs" of the issues without however having upset the Ministry of Forests-industry power axis or taken away its "strong influence over how the wilderness politics issue is defined" (145). It is probably fair to apply Porter's (1965) observation about labour leaders to environmentalists: they are "on the periphery of the over-all structure of power, called in by others when the 'others' consider it necessary, or when the ... leaders demand a hearing from the political elite" (540), which in the case of the environmental movement frequently comes about as a result of direct action. Unlike labour, however, the environmental movement does constitute a real threat to the security of the forestry industry, which the industry and government have taken seriously by engaging in a strategy of mollification (Wilson, 1990), a point to be taken up again in Chapter 4.

At the same time, environmentalists, like union leaders who also lack kinship ties to other elites (Porter, 1965), tend to have influence only under favourable circumstances. Since Canada's economy is so dependent on resource extraction, we can expect and do see opposition to preservationist measures from communities most affected by them (Wilson, 1992; Jones, 1997; Matas, 1997). This class difference is part of the materialist-postmaterialist ideological division and underlines the fact that public interest in environmental issues is contingent upon economic, social and political factors (Bakvis and

Nevitte, 1992). The conservatism of labour is evident in Bruton and Howlett's (1992) report that only 33 percent of this group would support plant closures if pollution problems warranted it (compared to 55%, 50% and 66% of corporate, native and environmental groups respectively).

In sum, undoubtedly the environmental movement has been able to reframe the debate, and may count in addition among its successes measures to protect wilderness and wildlife. These achievements are not unexpected — new voices to the policy process bring new ideas and with them new possibilities (Jacobsen, 1995) — but they should not be overestimated. While its presence has pushed the traditional policy-making elites into accommodating the new voices so that the process may be said to be in transition, it is far from certain that the transition will lead to anything different. Rather, a strategy of containment on the part of the elites is likely to prevent that. Although Garrison (1997) has included environmental experts in his definition of elites, I have preferred Porter's, which is very clear that the key characteristic of elites is that they make the decisions of importance to society. They are joined by privilege, ties of kinship and friendship, common background and a common ideological world view that set them apart from First Nations, labour and environmentalists. Thus, as Atkinson and Coleman (1996) cautioned, the content of the relationships is critical. Sheer frequency of contact should not overshadow content-specific aspects of the relationships. So far, the traditional network in forestry has stood firm. On the factor of material interest, the second most telling indicator of network status for Howlett and others, environmentalists, First Nations and

labour unions clearly are once again on the margins.

In short, although one of the advantages of the policy community method is the ability to identify those who are excluded and those who are included, peripheral participants and observers risk being left out of discussions about networks or, if they are party to some policy decision, being identified with the power nexus, so long as that concept is not equipped to differentiate between the possession of real power and consultative participation.

To conclude this section on terminology, I shall follow Coleman and Skogstad (1990b) and Pross (1986) in the use of the term 'attentive public' to mean all those actors with knowledge *and* sometimes an interest in a policy field who are, nevertheless, normally excluded from the decision-making process. 'Network,' also called power nexus (or 'axis' when just two parties are involved), is reserved for that association of societal and governmental actors whose prestige draws them into the inner sphere of policy-making and whose shared beliefs ensure they are aligned with the dominant world view.[9]

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[9] These actors might be considered a subset of the sub-government which includes in a very loose sense those who "make policy in a given field" as Coleman and Skogstad (1990b) put it but does not isolate the power nexus. In any event, the term should be used cautiously since the boundary of the sub-government is fluid: it may, at certain stages of the policy process, include members of the attentive public. For example, agenda setting, an early stage, may be more open, involving more actors, than the later policy formulation stage (Howlett and Ramesh, 1995), a situation we encounter in the evolution of the National Forest Strategy. Bennett and McPhail (1992) found that non-state, especially business, interests grew more important closer to implementation, after the agenda had been set and issues had been selected. This agrees with Smith (1994) who argues that networks are necessary to the state in order to allow it to implement its policies. If it is at all meaningful, we might say then that a more open network prevails during the agenda

Finally, a discussion of the policy community method must answer the criticisms levelled at it. One of these – the need to accurately portray power relations in the policy community – we have just dealt with. The others are of at least three types and, drawing on articles by Simeon (1996) and Atkinson and Coleman (1996), can be summarized as follows. First is an observation that so far little work has tried to move beyond the domestic sphere to incorporate the international level which increasingly affects how national governments deal with a growing number of policy areas. Available evidence suggests that trade negotiations among nations need to be understood in the framework of domestic policy networks; at the same time, globalization affects how national governments operate. Although the present study may be able to confirm the first point, it will have little to say on the second because those international interests of the forest policy community that have to do with the push for certification in the industry were only marginally considered and trade issues not at all. While the federal programs under examination were certainly inspired by the international factor, my objective was not to examine how this affected relationships in the community.

The second criticism is a concern about the analytical power of the method: it is

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setting stage of the policy cycle, and that it closes up again during later stages. The policy process is not uniformly open or closed; at times the attentive public enters into the sub-government while at other times it is excluded. The implication for the word 'sub-government' is that it is too vague to be of much use, and certainly it should not be equated with the network. Another point against it is its association in the early community/network literature with a triad ('iron triangle') of power brokers in the United States' federal government (Howlett and Ramesh, 1995; Hessing and Howlett, 1997).

good at describing, but can it explain? This doubt applies especially to the area of policy change (or learning), less so to policy continuity.

Lastly, the attempt to disaggregate the state (for example, weak and strong states, state capacity and autonomy) in order to clarify and distinguish between different types of network and the focus upon sectoral dynamics have sometimes led to a portrayal of the state in the pluralist sense as an aggregate of functions or "policy arenas" (Atkinson and Coleman, 1996:203) rather than as an institution shaped by traditions, embodying the aspirations and views of its people(s), capable of directing the content of policy. As Atkinson and Coleman remark, if it were true that the state is nothing but a collection of actors and policy fields, one might expect sectoral factors alone (such as relative integration of interest groups) to explain differences in cross-national policy outcomes. But research on corporatism has pointed to differences due not solely to sectoral factors, but seemingly derived from underlying beliefs, such as equity, in turn related to macro-type realities. Thus, studies undertaken from a policy community perspective must grapple with the effect, if any, of sectoral interactions on higher level policy outcomes (policy change) and, conversely, with the constraints imposed on the policy networks and communities by institutions.

Summary

The policy community method is well suited to the present study. Departing from the premise that policy outcomes are the result of neither society- nor state-driven forces alone, its strength is its ability to unravel society-state interactions, and to do so from empirical study. By linking the analysis with system-level factors, such empirical investigations can add much needed refinement to the macro level, indeed showing the contours of the balance of power more clearly. But more effort needs to be expended on documenting how power circulates among which policy actors in a particular policy field, to consider access to material benefits and participation in the dominant world view. That is to say, a policy community approach must pay attention to the content of community relations. It must also remember that it is elites who make decisions and that their power is related to ownership or material interest. Although third parties such as labour, First Nations or environmentalists contribute to the policy debate, influencing and widening it, and sometimes even are party to decision making, their lack of ownership means they are isolated from the decision-making process compared to the elites. Network discourse must go beyond description and capture the content of relationships by locating the power nexus.

In short, on condition that it deal with its shortcomings as indicated, the policy community approach seems in a particularly good position to facilitate the discussion of policy making (the confluence of knowledge and interests) since it acknowledges the vital contact between policy-making fora, institutions and the rest of society. Before ending

Part I, one more subject needs to be discussed, namely how policy change has been treated in the policy community literature.

Policy paradigms, policy learning and policy change

The question of how policy changes may be approached through the notion of policy learning, associated with the evaluation stage of the policy cycle (Hessing and Howlett, 1997).[10] Learning is seen as a second source for policy change, besides the usual conflict and competition. It is not confined to the evaluation stage of the model cycle, but takes place formally and informally at all stages of the cycle, carried out by members of the attentive public as well as of the network. Learning includes, Hessing and Howlett (1997) write, "intended and unintended consequences of activities" (194) and their immediate and long-term effects, be they negative or positive.

From their review of the literature Bennett and Howlett (1992) isolated three modes of policy learning according to who is doing the learning, what is being learnt and the effect on policy. Thus government learning involves state officials and their programs and results in organizational change; lesson-drawing is an incremental style which takes place within policy networks and focusses on instruments and program improvement; and social learning, which affects policy communities, centres on changes in ideas such that paradigm shift results. Radical change is thought to follow from the injection of new ideas

[10] The stages of the policy cycle are problem identification, policy formulation, identification of measures to be taken, implementation and evaluation (Brooks, 1993).

into the policy debate (Blyth, 1997).

The present study is concerned primarily with the second and third learning types and will consider whether policy communities can steer the dominant policy paradigm of the network into a different direction and, if so, how. Because the term 'paradigm shift' is frequently used to denote the changes in forestry practices being advocated (and sometimes exercised), changes that inform also the National Forest Strategy and Model Forest Program, it is worth our while to look at it a little more closely. The idea of social learning leading to a change in policy paradigm was proposed by Peter Hall (1990) who distinguished it from normal periods of policy making when lesson-drawing is prevalent. The latter refers to incremental changes that take place within an existing policy paradigm – "an overarching system of ideas ... largely taken for granted" that "defines the broad goals behind policy" and the perceived route to their achievement (Hall, 1990:59) – as policy makers fit new findings into their frame of reference. When anomalies cannot be made to fit the established mode of thinking, a new paradigm takes its place. This period of change is characterized by the involvement of politicians rather than bureaucrats who respond to a wider base of public and expert opinion than do bureaucrats. Hence the view that "exogenous shifts in the power of key actors" (Hall, 1990:61) or shocks (Howlett and Ramesh, 1995) are most likely necessary. Jenkins-Smith and Sabatier (1993) also rely on external factors for a resolution of the struggle between paradigms.

The assumed need for external pressures reveals that a paradigm shift is thought to take place between incommensurable theories. This means that choice between them is

arbitrary since, if they are incommensurable, there is no value-free basis on which to evaluate one theory over another, thereby necessitating external pressure to accomplish the change. While a clash between competing scientific ideas is in fact about commensurable ideas, since there is a set of data (their common referent) about which to clash (Collier, 1994), when applied to the question of how policy changes as a result of learning, whim and expediency (economic, administrative and political viability) do enter into decision-making (Hall, 1990). Conflict about how ecological information should be interpreted is therefore a political, not a scientific struggle (Garrison, 1997). Our choice is bound up with ideas (world views and principled or normalized beliefs [Goldstein and Keohane, 1993]) about the human relationship to nature, about wealth, human well-being, and resources – a situation, in short, that may well require external shocks.

A final consideration is how great change needs to be before it can be termed paradigm shift. Hall writes of "a massive overhaul of the existing arrangements" (1990:60). The changes necessary are described by Howlett and Ramesh (1995:193) when they speak of "a significant, though not necessarily total, break from the past in terms of the overall policy goals, the understanding of public problems, the solutions to them, and the policy instruments used to put decisions into effect." Hall enunciated six stages in the process of paradigm shift beginning with (1) a phase of paradigm stability, during which operating procedures are institutionalized; (2) anomalies between the model and reality occur that the existing model cannot explain but can still accommodate; (3) new policies are tried that tinker with the theory but do not displace it; (4) the authority of

the principal representatives of the prevailing model comes under fire and new experts are brought in; (5) a (sometimes long) phase of contestation results during which the wider public becomes involved in the debate and the choice of which model wins is increasingly a political decision; (6) institutionalization of the new paradigm aided by the installation of some senior bureaucratic personnel.

Chapter 4 and the case studies in chapters 5 and 6 will help us assess whether a paradigm shift in the resource policy field may be declared, since the Model Forest Program in particular represents the kind of break Howlett and Ramesh discussed. The idea of setting up inclusive networks was radical, reflecting the willingness of policy makers to pursue a highly experimental path as well as an understanding of obstacles in the way of change. It appeared toward the end of a series of developments akin to Hall's and was marked by the set-up of new institutions that enshrine the new concepts, including, for example, ecosystem management. But does the mere advent of significantly new ideas and institutional solutions entail a change in the underlying world view or dominant paradigm? In Hall's work the shift from one paradigm to the other had to do with different views of the state, from an interventionist (Keynesian) to a minimalist (Monetarist) one, but both nevertheless took place within the same *system* – one that was liberal (or tory which is conservative liberalism), market-oriented and industrialist. In our case, something similar has happened. A significant change has taken place affecting ideas, instruments and institutions without however altering the system context of liberalism, industrialism and anthropocentrism. The acid test of 'true' change in this study

is at the system level: institutional (structures) and political changes are worth a lot but a transformation of our relations to nature needs systemic change, that is to say, a change in world view.

PART 2: SITUATING CANADIAN FOREST POLICY MAKING

As we have seen, studies that employ policy community theory, though a highly suitable tool for policy analysis, may neglect macro conditions and, conversely, by concentrating on institutions, they may neglect the micro level of personal interest. The latter aspect will come to the fore in later chapters when I document the activities of the Fundy and Prince Albert model forests; here I turn to macro variables.

Resource exploitation in Canada has been the topic of study in that political economic tradition known as staples theory. Political economy studies power and its connections to social, cultural, historical, ideological and economic factors (McBride, 1996), so providing a higher order analytical layer which serves as context for resource policy. In Canada, for instance, it is impossible to study policy of any sort without running into the fact of federalism. In this part, this and other institutional elements are discussed by recourse to the colonial legacy permeating the resource policy-making environment.

The colonial legacy and Canadian institutional elements

Colonialism has been the enduring, shape-giving force of Canada's political and economic life. When we look at the prime characteristics of the forestry industry in this country

today - Crown ownership, divided jurisdiction, an export orientation, close government-industry relations, concentration of capital, policy networks closed to First Nations, workers and the general public, a poor environmental record - we see the direct and indirect effects of a colonial regime and its consolidation in the first decades after Confederation. Based on results of the present study, Beyers and Sandberg (1998) ordered these factors together with the influence of the professional forest community[11] into four uniquely Canadian constraints shaping forest policy in this country. Often treated unevenly in the forest policy literature, the thesis adopted here and proposed in that paper is that a stronger, more comprehensive framework for understanding forest policy in Canada emerges when the four factors are brought together. In the following sections I review the three institutional factors, especially the federal role, and end with an examination of the position of the professional forester.

The colonial legacy

Canadian institutions, indeed government itself, find their origin in a staples economy (Innis, 1956). Fish and fur followed by lumber and wheat were the mainstay commodities.

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[11] This influence is conditioned by the structural elements discussed in this part of Chapter 2. However, forestry science is also subject to influence from within the scientific community. This aspect is taken up in Chapter 4 and to some degree in the model forest case studies.

The staples[12] or appropriative (Manzer, 1985) economy developed in part from military necessity (Nelles, 1974), in part from the need of European settlers to find commodities that were in high demand in Europe, valuable enough to offset high overhead costs in transportation (Innis, 1956). Commodity production in turn depended on the existence of European metropolitan centres as remanufacturers and consumers and as manufacturers of materials required by the colonists.

The colonial demand for manufactured goods stimulated industrialization in the mother country and fed the colony's dependence on imports. As Innis explains, this dependence helped ensure that northern North America would remain British. It also fostered the estblishment of a wealthy industrial class whose interests lay with the perpetuation of the staples export economy (Naylor, 1980). Governments of the colonies on both sides of the Atlantic were from the beginning allied with these interests. Thus an early instance of such an alliance was the administration of settlements built to support the trade in cod by fishing merchants who, gaining legal authority from Charles I's 1634 Charter of the Western Adventurers, from March to September held admiralty ranks in the ports of Newfoundland, an authority to which later was added that of civil government (MacNutt, 1965). Likewise, the Hudson's Bay Company, gaining its charter over Rupert's Land in 1670, was a company of Adventurers given full fiscal, administrative and

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[12] Richards and Pratt (1979), quoting Gordon Bertram, defined a staple industry as "based on agriculture and extractive resources, not requiring elaborate processing and finding a large portion of their market in international trade" (305).

commercial control (Morton, 1994; Naylor, 1980). When the company's properties and charter were sold in 1863 to allow for the expansion of the troubled Grand Trunk Railway, the plan was financed with money of the British bankers Thomas Baring and Glyn, Mills and Company. These companies were the financiers of the colonial governments as well, such that indebtedness to the Barings was a common problem for them prior to Confederation (Naylor, 1980). With the Hudson's Bay sale, that vast territory in central and northern Canada was in the hands of "a group of men who had a direct interest in facilitating confederation and accelerating the process of westward expansion" (Easterbrook and Aitken, 1956:346). The cross-over of commercial and political ties in the organization of the fur and lumber trade would have far-reaching effects for Canada. This is easily understandable from the character of the trade. Let us take fur first.

Although the interior component of the trade could be realized with little capital outlay, the organization of the foreign fur trade was expensive, leading to monopolies and requiring a high degree of organization (Innis, 1956).[13] Monopolization was accentuated by a receding resource supply, making collection more difficult and necessitating extra funds. Eventually, as pelts had to be found always farther afield and as a result of

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[13] The foreign fur trade was risky business. Morton (1994) relates that it might take five years before traders could pay off trading goods they had ordered from Britain. Similarly, the lumber export industry had to contend with markets that might be advantageous in the fall when crews left for the bush and at a downturn in the spring when they returned. More than once an entire season's production was left to rot on the wharves (Gillis and Roach, 1986).

competition between the Hudson's Bay and Northwest companies, all the northwestern territories to the Pacific became integrated into the fur trade network of the Northwest Company (after 1821 controlled by the Hudson's Bay Company). The geographical integration produced by the fur trade brought the different regions of Canada together and contributed to the settlement of the boundary with the United States. The boundaries preserved the fur-producing areas of the Canadian Shield and the west and their agricultural supply areas to the south. "The Northwest Company," writes Innis (1956:392), "was the forerunner of the present confederation."

With the depletion of furs, eastern Canada needed other staples to support economic life (Innis, 1956). Attention turned to lumber. Originally a military commodity, supplying the British navy with timber for its ships, during the nineteenth century it became civilian (Nelles, 1974). Curiously, privatization did not generally entail the transfer of non-agricultural lands to private individuals. Forests, having been an imperial resource, were considered to belong to the separate British North American colonies in which they were found and became, upon Confederation in 1867, provincial property (Nelles, 1974). Few provinces have exercised the option of alienating non-agricultural lands and consequently the percentage of Crown ownership of forested lands in Canada is a very high 94 percent (71% provincial, 23% federal, 6% private [Natural Resources Canada, 1996a]). In general, the earlier European settlement took place, the more Crown lands were brought into private ownership (Thompson and Eddy, 1973). This yields a geographic pattern in which the eastern provinces have alienated more land than the

western ones (Ross, 1995).

The organization of the fur trade, including its financial network (the Bank of Montreal was created in 1817 with money from the fur trade and headed by a fur trader [Innis, 1956]), was transferred to the new enterprise. But lumber is a bulky product to transport and required an expensive infrastructure of canals and railroads. This factor increased the need for a strong central government as well as for a centralized banking system. Despite heightened settlement on the prairies and with it wheat production, overhead costs remained high. Confederation, which linked the banking and manufacturing zones of the east with the producing areas of the west, was one answer to the traffic problem (Innis, 1956). Eventually industrialization of the east behind a protective tariff wall and likewise, industrialization of western agriculture together with increased immigration would go some way towards solving the problem of high overhead costs. Mining and pulp and paper industries on the Shield with their year-round production schedules and demand for supplies have been important on this point. But, like the union of the two Canadas in 1840, Confederation was also necessary to stave off a crisis of indebtedness engendered by the extremely costly infrastructure necessary to the export of staples (Naylor, 1980). Regional inequity became a feature of the Canadian economy as the Maritime provinces' wealth was sacrificed to the program of western expansion and central Canada's industrialization, just as in 1840 Lower Canada served as buffer to Upper Canada's insolvency.

An economy committed to staples production and export, always struggling with

debt, led by an elite whose interests lay squarely with colonial merchant and industrial capital, would also remain dependent on foreign investments. John A. Macdonald's National Policy contributed to a bias in industrial development that favoured continued staple extraction. The tariff was supposed to support existing and new manufacturing; it was also meant to attract foreign investors and raise money for the railroads (Naylor, 1980). While it did raise money and increase the industrial base, other manufacturing enterprises died, and the per capita standard of living was reduced, crippling the local generation of wealth and a transition to industrial capital based on secondary manufacturing (Dales, 1966). The tariff and the 1872 Patent Act promoted branch plants that were increasingly controlled from the United States, operating with technologies under license of their American parent firms (Naylor, 1980). What little domestic capital was available went to pay interest on the foreign debt, rather than support indigenous economic growth or value-added manufacturing of the commodities. There was little, writes Naylor, that the economic and political elites would not do to keep the foreign investors happy.

Canadians are therefore caught in an extensive economy, intent on increasing the quantity and not the quality of output (Dales, 1966). One hundred and more years later, we are still one of the most dependent economies in the world. Compared to 25 years ago, exports of raw materials have dropped to 28 percent of GDP from 38 percent and industrial goods, most based on limited processing of natural resources, to 19 percent from 22 percent in 1972, while export of other manufactured goods such as cars and car

parts and airplanes has increased to 50 percent from 35 percent (Little, 1997). This development has fed a debate about whether the staple model still describes the Canadian economy well (Hessing and Howlett, 1997; Naylor, 1980). But most of these latter products are produced at branch plants with American technology and exported to the US. Further, Hessing and Howlett (1997) note that 43 percent of Canada's manufacturing base (a high of 75% in BC and a low of 34.4% for Ontario) is derived from natural resources and that direct and indirect natural resource activity contributes 50 cents of every dollar produced. Thus, despite an increase in the production of industrial goods, "the importance of the export of staples in generating national income, the derivative and dependent nature of its industrial structure, the overwhelming volume of foreign ... investment in that industrial structure, and its assiduous cultivation of bi-lateral agreements with the US" mean we may continue to think of Canada as "a staple extracting hinterland that just happen[s] to [have] achieve[d] large-scale industrialization" (Naylor, 1980:19). Finally, in keeping with the notion that a staples-biased industrial capital has controlled the Canadian economy and politics, it is noteworthy that the designers of the Constitution assigned finances and transportation to Ottawa, two areas well suited to the requirements of the colonial staples trade (Clark-Jones, 1987); forests on the other hand, as property of the provinces, came under their uncontested jurisdiction.

The high infrastructural costs of the staple trade and the interests of its promoters have not been the only forces prompting extensive government involvement in the economic development of the country. Crown ownership of forested land, a second

aspect of the colonial legacy, has added to the closeness of government and industry by generating landlord-tenant relationships that tend to give rise to the closed networks typical of the Canadian forest policy scene (Nelles, 1974). Landlord-tenant relationships have fostered the passive government stance that Leman (1981) observed in three of the forest-producing provinces and that attends the extensive delegation of management planning functions to large companies. Their additional propensity for centralizing the provincial forestry bureaucracy forces field personnel to seek approval for their least actions from high up and, as Leman (1981) said, when guidance comes from above "it often seems more sympathetic to the company than the circumstances seem to merit" (20). Field personnel in these provinces learn not to complain much. In all, companies have been quite successful resisting efforts to make them more accountable or to change (Leman, 1981; Nixon, 1993). The tactic of forcing upper-level approval may be applied intradepartmentally too. Thus British Columbia's Ministry of Forests uses it to delay meetings between foresters in its Integrated Resources Management Branch and those in Operations, which division is then free to "exploit the forest without interference" and is consequently known as "the evil empire" (Nixon, 1993:28).

So far I have discussed two institutional constraints that shape Canadian forest policy: a colonial legacy established the appropriative economy and fostered the high incidence of Crown ownership of forested lands; this in turn led to a second constraint, namely closed industry-government networks. The colonial legacy also laid the foundation for the third institutional constraint, that of federalism. Since the programs in

this study are federal, I shall now examine in detail the effect of federalism, namely the efforts to find a place for Ottawa in forest policy.

The federal role in forestry

The Constitution Act, 1867, assigned to the provinces ownership of and legislative authority over their forests, thus conferring to them complete and undisputed jurisdiction. Up until 1930 the federal government, in order to control settlement (Wetton, 1978), had retained ownership of unalienated lands (and therefore forest management) on the three prairie provinces after their joining Confederation in 1870 (Manitoba) and 1905 (Alberta and Saskatchewan), and Forestry Branch was the equal of its provincial counterparts (Howlett, 1989a). With the natural resources transfer acts of 1930 the prairie provinces took over the task of forest management, the Peace River Block and CP Railway right-of-way lands reverted to BC,[14] and Forestry Branch was left with few forests to administer - those in the Yukon and Northwest territories,[15] on Indian lands, in national parks and on National Defence lands. Ever since, Ottawa's legitimacy in the forestry business has been

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[14] The CPR land was a 64 km-wide strip along the right-of-way; together with the Peace River district block it constituted payment by BC upon its entry into Confederation towards the construction of the rail line (Johnstone, 1991).

[15] Long under the administration of the Department of Indian Affairs and Northern Development, since April 1987 responsibility for the forests of the Northwest Territories has rested with the territorial government; a similar arrangement for those of the Yukon is also planned (Standing Committee on Forestry and Fisheries, 1990). Ownership, however, remains with the federal government (Natural Resources Canada, 1996a).

shaky and Forestry Branch (now the Canadian Forest Service) has been subjected to endless shuffling among departments and reformulations of its role, faring better when forestry is thought to be in crisis, worse when its visibility is low (Johnstone, 1991).

The search for a federal role and with it a national forest policy has been the Holy Grail of the Canadian Forest Service and its predecessors for a century. What is the federal interest? Howlett (1989a) identified it as "a concern for the health, vigour, and continued profitability of the forest industry" (561). Because of the division of powers, Ottawa's claim to rents from forest lands is negligible (Howlett, 1989a) but its share of taxes paid by the forestry sector is not: in 1991 it amounted to 66 percent (of $224 million) (Natural Resources Canada, 1996a). During previous years the federal share had been decreasing steadily to 58 percent (of $688 million) in 1987 from a high of 77 percent (of $96 million) in 1970. The importance of the forest industry to Canada's economic well-being as a whole is also not to be doubted as the following statistics show. The total value-added of manufactured forest products for 1993 was greater than $27 billion, more than any other manufacturing group and greater than that of fisheries, mines and energy combined (Natural Resources Canada, 1996a). Although exports of forest products accounted for 17 percent of the total value of exports in 1980, 16 percent in 1990 and 15 percent in 1994, they contributed substantially to the balance of trade: $11.5 billion to a net trade surplus for all products of $6.9 billion, $18.7 billion to a net surplus of $12.7 billion and $27.8 billion to an overall $23.3 billion surplus respectively. Direct employment in the sector in 1995 amounted to 369 000 or one in 15 jobs, up from

310 000 in 1992 (Natural Resources Canada, 1996a). About 350 communities are directly dependent on the forest industry (Standing Committee on Forestry and Fisheries, 1990). Capital and repair expenditures, a sign of vigour in the industry, were pegged at $2.5 billion for 1980 (Reed, 1980) and, after peaking in 1989 at more than $9 billion, reached $7.1 billion in 1994 (Natural Resources Canada, 1996a).

The obvious importance of the industry to the national economy serves to justify the federal presence in forestry matters (Standing Committee on Forestry and Fisheries, 1990). But given the terms of the Constitution, what the federal role might realistically be remains a source of confusion and is hampered by the difficulty of securing a policy vehicle for delivering its agenda.[16] All this can be seen from the frequency with which the forestry unit has been moved among government departments (Table 2.1) and attendant changes in legislation (Table 2.2), the periodic attempts to define a viable role (Table 2.3), to demonstrate a national presence and forge a general forest policy (Table 2.4), and the fluctuation in budgets and personnel at the Forest Service. So, for example, the Service held 1301 person-years in 1960-61, 1410 in 1961-62, 2181 in 1968-69, 1029 in 1980-81, 1323 in 1985-86, 1342 in 1989-90, 1312 in 1990-91 (Standing Committee on Forestry and Fisheries, 1990), increasing to 1446 in 1992-93 (Auditor General, 1993). Increases and decreases in budgets have been linked to the cyclical patterns of federal-provincial agreements (Standing Committee on Forestry and Fisheries, 1990). For 1982-

[16] Anonymous interview, Prince Albert, June 1996.

YEAR	DEPARTMENT	DEPARTMENTAL UNIT
1884-1936	Interior	Forestry Commission, 1884-1898 Forestry Branch, 1898-1923 Dominion Forest Service, 1923-1936
1936-1950	Mines & Resources	Dominion Forest Service, 1936-1950
1950-1953	Resources & Development	Forestry Branch, 1950-1960
1953-1960	Northern Affairs & National Resources	
1960-1966	Forestry	
1966-1968	Forestry & Rural Development	Forestry Branch, 1966-1969
1969-1971	Fisheries & Forestry	Canadian Forestry Service, 1969-1989
1971-1978	Environment	
1978-1980	Fisheries & Environment	
1980-1984	Environment	
1984-1986	Agriculture	Ministry of State Forestry
1986-1988	Agriculture	Ministry of State Forestry & Mines
1988-1994	Forestry	
1994-now	Natural Resources	Canadian Forest Service

Table 2.1: Administrative history of the federal forestry service. Sources: Johnstone (1991), Canada (1993).

YEAR	ACT (SHORT TITLE)	LOCATION	REPEALS	COMMENTS
1949	The Canada Forestry Act	13 George VI, c8	Dominion Forest Reserves and Parks Act (RS)	
1960	Department of Forestry Act	8-9 Elizabeth II, c41	Canada Forestry Act (RS c24)	
1966	Government Organization Act	14-15 Elizabeth II, c25, ss 26,45	long title, ss 1-5, 12 of 1960 Act	in this form the 1960 Act becomes Forestry Development & Research Act (FDRA)
1989	Department of Forestry Act	38 Elizabeth II, c27		
1989	Forestry Act		s1 of FDRA	
1992	Department of Forests Act	40-41 Elizabeth II, c44	long title	amends FDRA (Forestry Act)
1994	Department of Natural Resources Act	42-43 Elizabeth II, c41	Dept of Forestry Act, c27 (1989) & c44 (1992)	Forestry Act remains in force

Table 2.2: Summary of modern acts governing federal forestry legislation. Source: Statutes (SC) and Revised Statutes (RS) of Canada.

83, budget estimates stood at $57 million, $196 million the following year, and increased gradually to $260 million by 1987-88. They decreased sharply to $160 million in 1990-91 (Standing Committee on Forestry and Fisheries, 1990), then increased again to $240 million for 1992-93 (Auditor General, 1993). With the professed withdrawal of the federal presence in forestry as contained in the 1996 Speech from the Throne (Canada, 1996; Table 2.3), both person-years and budgets were again decreased. As of 31 March

YEAR	FEDERAL ROLE
1899[a]	encourage tree growing; protection of Dominion timber
1931[a]	forest economics to assist industry; silvicultural, fire and forest products research
1949[b]	forest protection; research; undertake agreements with provinces, other departments and people
1958[c]	"to maintain forest experiment stations and forest products laboratories and to provide financial assistance to the provinces to enable them to improve the management of their forests"
1980[d]	"fiscal policy, taxation, industrial regulation & support, regional development, research, statistics, trade & tariffs"; training
1987[e]	pursuit of liberalized trade; coordinate sector viewpoints nationally; fund forest management; aid in employment & education; action on pollutants
1990[f]	research & technology transfer; "enhance industrial competitiveness"; promotion of "wise management, conservation and use"; funding of management; development of "national strategies for the Canadian forestry community"
1990[g]	lead role in "developing a national forests strategy, and convening a national consensus ... to ensure [its] successful implementation"; "initiating & developing a process & a structure for the design, planning & implementation of sustainable development"
1992[h]	"direct or shared responsibility for industrial and regional development, trade, international relations, science & technology, the environment & federal lands"
1993[i]	"direct or shared responsibility for industrial & regional development, trade, international relations, taxation, science & technology, the environment, federal lands, Indian affairs, employment & training, pesticide regulation, national statistics, national parks & fisheries"
1996[j]	"the Government will not use its spending power to create new shared-cost programs in areas of exclusive provincial jurisdiction without the consent of the majority of the provinces"; "the Government is prepared to withdraw from its functions in ... forestry ... more appropriately the responsibility of others"

Table 2.3: Some statements about the federal role in forestry. Sources: a, Johnstone (1991); b, Canada; c, Department of Northern Affairs & National Resources, quoted in Johnstone p. 134; d, Roberts, p. 97; e, Canadian Council of Forest Ministers, pp. 3,4,9,11,12,13; f, Forestry Canada, p. 3; g, Standing Committee on Forestry and Fisheries, pp. 27,33; h, Canadian Council of Forest Ministers, p. 2; i, Auditor General, § 16.10; j, Canada (House of Commons), 4,5.

YEAR	FEDERAL FORESTRY INITIATIVE	COMMENTS
1868	inquiry into hemlock bark trade	export of bark threat to forests and local industry; export duty recommended; no action
1884	appointment of one-man commission to report on protection of forests	commission's mandate enlarged in 1887 to include tree planting question on prairies; Department of Interior ignores report
1899	federal forestry service established	
1906	1st national forest convention, Ottawa	called by Sir Wilfrid Laurier; unsuccessful request for a national forest policy (NFP)
1909	Commission of Conservation	follows agreement at North American Conservation Conference in Washington DC; is to examine questions of conservation and use of resources, collect & publish information, conduct studies, make recommendations; dissolved in 1921
1913	Forest Products Laboratories of Canada	at Montreal, in collaboration with McGill, soon followed by one in Vancouver; McGill centre moves to Ottawa (1927); McGill hosts Pulp & Paper Research Institute of Canada (1928)
1923	Royal Commission on Pulpwood	proposes (1924) a national program of federal-provincial co-operation funding forest management, national forests & research; no action
1943	Subcommittee on Conservation & Development of Natural Resources (Wallace Report)	call for national development board to manage resources (an NFP) not acted upon
1949	Canada Forestry Act	allowed Ottawa to enter into agreements with provinces using spending power
1966	2nd national forest convention, Montebello	NFP promised; no action
1980	3rd national forest convention, Toronto	CCREM to be forum of discussion; no NFP expected
1987	A National Forest Sector Strategy for Canada	CCFM adopts the Strategy, a 5-yr guide for the sector, but does not act upon it
1990	Standing Committee on Forests and Fisheries	seeks to broaden DoF's role
1992	National Forest Strategy & Forest Accord	action plans & evaluation process in place
1992	Model Forest Program	means of implementing 1992 Strategy

Table 2.4: Selected federal forestry policy initiatives. Sources: Auditor General (1993); Howlett (1989a); Johnstone (1991); Parenteau & Sandberg (1995); Roberts (1980); Standing Committee on Forestry and Fisheries (1990). CCREM=Canadian Council of Environment Ministers.

of that year, 11 of 16 Canadian Forest Service facilities were closed, aspects of their work

(such as silviculture, not strictly in the federal mandate but prominent during the years of the federal-provincial forestry agreements) were dropped and the other areas of interest divided among the five remaining centres.[17] Table 2.3 shows the evolution of the federal role. After 1930, when the operational aspect perforce became minimal, the Canadian Forest Service has at times tried unsuccessfully to enlarge its role, with failure due most likely to the reality of provincial jurisdiction (Howlett, 1989a; Johnstone, 1991; Standing Committee on Forestry and Fisheries, 1990). In an attitude reminiscent of the Department of the Environment which habitually exercised fewer rights than it had (Harrison, 1996), Ottawa has been careful to provoke neither the provinces nor bureaucratic sensitivities[18] and has frequently practised restraint. Thus, on the two occasions that a forestry department was created - the first under Diefenbaker, the second under Mulroney - both were given highly restricted mandates which did not even cover forestry-related responsibilities in the hands of other departments such as Indian Affairs and Northern Development and doomed them to a brief life (1960-1966 and 1989-1994 respectively).[19] Likewise, the two national forest sector strategies (Canada, 1981; Canadian Council of Forest Ministers, 1987) (the first under a Liberal and the second a Conservative

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[17] Interview with Michael Newman, Prince Albert, 13 June 1996.

[18] Interview with Frank Oberle, Nanoose Bay BC, 1 May 1997.

[19] The first attempt was certainly occasioned by the promptings of the industry community (Sayn-Wittgenstein, 1963); the second was due perhaps more to electoral reasons but nevertheless also followed a time of greater industry agitation (Howlett, 1989a).

government), begun with the intention to widen the federal role, in the end were strongly reflective of its traditional arena - those areas that did not fall to the provinces by the Constitution or those for which the provinces have relied on federal aid (Howlett, 1989a). In general, it may be said that the role has settled, as Howlett (1989a) noted and we can see from Table 2.3, on assisting this important industry through funding of research, provision of other financial aid, and through international representation and trade enhancement. Of late even this circumscribed role has become more limited with the decision to use the spending power less (Canada, 1996).

As mentioned, Ottawa can justify its interest in forestry on the basis of benefits received from, and national importance of, the industry. Jurisdictionally, it is supported by a combination of shared and full constitutional powers. Thus the Trade and Commerce provision authorizes involvement in the international dimensions of the forest products trade (and until 1982 in interprovincial trade; the federal government, however, retains paramountcy in case of conflict [Moull, 1985]); research and development as well as environmental monitoring are allowed under the Census and Statistics provision (Harrison, 1996), Weights and Measures (Standing Committee on Forestry and Fisheries, 1990) and the spending power (Thompson and Eddy, 1973). The latter also provides the basis for program support to provinces and industries (Woodrow, 1980).

Recently the Standing Committee on Forestry and Fisheries (1990) couched aspirations for a federal role in terms of providing leadership in the stewardship of Canadian forests. The Committee felt a broader part of this nature for the federal

government was in order but, in deference to the provinces, it was to be developed and practised "based on principles of co-operation and collaboration" (84). Nevertheless, its view of Ottawa's jurisdictional rights included a "valid interest" (85) in forestry management derived from a combination of further heads of power and the peace, order and good government clause usually called upon to justify environmental legislation but not forestry policy. The fisheries provision, for example, has been invoked in the past in the case of forest companies polluting water frequented by fish but the Supreme Court stipulated that federal action must show "a direct link between prescribed or regulated activity and protection or conservation of fish" (Lucas, 1987:39). The peace, order and good government power refers to the preamble of section 91 of the Constitution in which the federal government is given the right to legislate on all matters not assigned to the provinces. It applies especially when matters of national public health and safety are at stake. But it is also not without constraints or controversy. Ottawa must be able to demonstrate that the matter is "beyond provincial concern or ability," that is to say, it must be of national concern (Lucas, 1987:39). It has been used successfully in *Regina* vs. *Crown Zellerbach*. In this 1988 decision, the Supreme Court supported the federal claim for control over marine water pollution on account of its extra-provincial and international effects regardless of whether there was direct harm to fish or navigation (a federal head of power) but further said that a matter must be clearly different from a strictly provincial matter and further, its scale of impact must be such that the constitutional division of powers is respected (Harrison, 1996). The decision also cleared the way for the use of the

peace, order and good government clause in national environmental emergencies (Vanderzwaag and Duncan, 1992), but obviously it is of limited relevance to forestry. Another power of potential application to forestry, in the eyes of the Standing Committee on Forestry and Fisheries, is the right to regulate pesticides under shared agricultural jurisdiction, but only so long as forestry produces a crop.

Despite the optimism of the Standing Committee (and of course Ottawa has complete jurisdiction on lands it owns), even this exhaustive list has not secured the federal government a broader role: the fact is that it is severely restricted when it comes to participating in forest management. It is also revealing that the 1992 national strategy does not assign the federal government a role outside the usual parameters (Table 2.3). This is not surprising since it was developed (with public consultation) by the Canadian Council of Forest Ministers, a body on which Ottawa is outnumbered by the provinces but which nevertheless is likely to be "the most plausible institutional forum in which to develop long-term national forest policy" (Howlett, 1989a:footnote 16). Ironically, the Standing Committee, working on a mission statement for the Department of Forestry, also identified Canadian Council of Forest Ministers as the institution that would assist in the search for a vision of Canada's forests (1990:106).

The Standing Committee's assertion to the contrary, it is difficult to support the claim that an environmental stewardship role for Ottawa in forestry matters would broaden its traditional role. It is in fact an outflow of its concern with the health of the industry that has catapulted the federal government into the array of activities of which the

Model Forest Program and National Forest Strategy are two examples.[20] If in 1871 Sir John A. Macdonald, watching the timber pass by his windows in great quantities every day, worried about the future of the industry in the Ottawa valley (Johnstone, 1991), the current expressions of distress about environmental deterioration can be attributed to fear that the environmental movement (European in particular) will seriously hurt exports. This is expressed in a variety of ways, indirectly in documents related to the Model Forest Program (Forestry Canada, no date; 1991a) and more directly in the National Forest Strategy (Canadian Council of Forest Ministers, 1992:29,30-31 [4.12, 4.13]) and a chapter in *The State of Canada's Forests 1993* entitled Trade and the environment: new barriers, new challenges (Natural Resources Canada, 1994). But the most candid statements crop up in interviews. Thus, in the view of one Canadian Forest Service official, the environment must be cared for in order to safeguard economic and social benefits; or, as Oberle said, "we must be accountable to the world in terms of our renewable resources, otherwise they will boycott our products and this affects our social

[20] Ottawa has been prominent on the international scene to make sure Canada is party to negotiations on the development of criteria and indicators for sustainable forest management (Canadian Forest Service, no date). The fact that there is good correspondence between an early Canadian summary of criteria and indicators (Chapter 4, Natural Resources Canadia, 1994) and the Montreal Process adopted at Santiago, Chile, in 1995 shows how successful the Canadian Council of Forest Ministers was (Canadian Forest Service, 1995). With respect to certification of forest products, the Standards Council of Canada, member of the International Organization for Standardization (ISO), was awarded the secretariat of ISO's Technical Committee 207, responsible for environmental management (Abusow, 1995).

and economic well-being."[21]

PHASE (YEARS)	TYPE	PURPOSE	FEDERAL COST ($000)	ADMINISTRATION
I: 1951-1967	General	inventory, protection, access, re-forestation, stand improvement, facilities construction	180 000	provinces; special bilateral agreements by CFS
II: 1967-1974	ARDA & FRED	inventory, protection, access, stand improvement, infrastructure & industry development	no data	Forestry & Rural Development; DREE from 1969
III: 1974-1984	GDA forestry sub-agreements	access, nurseries infrastructure, reforestation	209 287	DREE; CFS from 1982
IV: 1984-1994	ERDA	silviculture, intensive mgmt, R & D, technology transfer		
round 1		reforestation	605 946	CFS to 1988
round 2		stand improvement, integrated resource management & multiple use, human resource development	553 251	regional economic development agencies & Industry, Science & Technology Cda

Table 2.5: Summary of federal-provincial forestry agreements. Source: Canadian Forest Service (1996). ARDA= Agriculture and Rural Development Agreement; FRED=Fund for Rural Economic Development; GDA=General Development Agreements; ERDA=Economic and Regional Development Agreements; DREE=Department of Regional Economic Expansion; CFS=Canadian Forest Service.

[21] Graham Savage, telephone interview, 23 April 1996; Frank Oberle, 1 May 1997.

Despite the historically narrow delimitation of the federal role, we must not underestimate Ottawa's capacity to influence provincial policies as well as the overall direction of the forest economy. To take the first point, the most important route in the post-war era has surely been the federal-provincial agreements made possible by the Canada Forestry Act of 1949 (Table 2.4). "Federal-provincial forestry agreements," noted the Standing Committee on Forestry and Fisheries (1990:60) "are at present the primary vehicle through which the federal government can influence the management, development and conservation of Canada's forest resources." Since their inception in 1951, the agreements, a use of the spending power, have helped fund evolving areas of priority of the federal government (Table 2.4). Table 2.5 provides a summary of this evolution. While protection, access and reforestation were emphasized in the earlier years, the final round of the Economic and Regional Development Agreements, entered into variously around 1990, reflects the growing concern with environmental management. Overall, however, assistance has been directed towards increased use of the 'resource,' a trend probably amplified by placing their administration under regional economic development agencies which made them more "instruments of regional development rather than of national forest policy" (Standing Committee on Forestry and Fisheries, 1990:100).

The Model Forest Program has taken over where the Economic and Regional Development Agreements left off. Because the agreements were still in force at the commencement of the Model Forest Program and because unlike the Model Forest Program they have an origin not in the Green Plan, not all those interviewed were agreed

that the program is a replacement for the Economic and Regional Development Agreements. As the minister at the time, Frank Oberle, explained, however, the focus of concern for Ottawa was no longer with replanting, but with silviculture in order to rebuild the forests.[22] The Model Forest Program, he said, would not have been possible had the agreements continued. It is in any case a clever solution to the problem of how to influence the forestry sector amiably or, in Oberle's words, "deliver the federal mandate," without putting much cash on the table. When compared to the federal-provincial agreements, the Model Forest Program, with its $54 million price tag over six years, is an order of magnitude less expensive than the second round of the Economic and Regional Development Agreements alone over a comparative period. Certainly it employs fewer people, but it seems to have generated more positive publicity for the federal government's presence in forestry and a greater interest in its role in this area than the agreements ever did, at least in those areas where a model forest operates.[23]

The second means of influence has been Ottawa's hand in advancing continentalist policies that favour concentration of the industry by vertically integrated multi-national firms. If a traditional view in policy analysis has it that Ottawa has opposed continentalism while the provinces have embraced it (Richards and Pratt, 1979), the record of progressive development of Canada's staples negates it. In a previous section I argued that the

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[22] Interview, 1 May 1997.

[23] Interview with Michael Newman, Prince Albert, 13 June 1996.

interests of a staples-biased capital led to the marginalization of the Canadian economy as an extensive producer of raw or minimally processed staples indebted to foreign capital. Believing the export of staples to be the best path to development, provincial and federal governments have deliberately pursued policies in which Canadians put up most of the financial and all of the natural capital (through concessions, grants and loan guarantees) and the (generally) foreign company (during this century mostly American but lately also from elsewhere) delivers the industrial capital in the form of skilled labour, management and/or technology needed to process the products enough so as to satisfy minimal manufacturing requirements (Clark-Jones, 1987). Ottawa's powers in transportation and especially finance supported capital accumulation by international forces and a domestic finance-oriented, commercial elite which pursued the continental division of labour. The continentalist bias, argues Clark-Jones, became most intense after the Second World War when the availability of Canadian staples became tied to US cold war defence interests.

In the forest sector, the tactic of financial and industrial division of labour on a continental basis has meant increasing vertical integration or consolidation with attendant monopolization and exclusion of smaller players.[24] In British Columbia, for example, the 10 largest companies held 37 percent of the 1954 Allocated Cut, 59 percent in 1975 and

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[24] Operationally too provincial and federal governments preferred the large enterprises; not only were small ones blamed for the destruction of forests through carelessness and devious settlement practices but they were also held responsible for overproduction (low prices) in lumber and pulpwood (Gillis and Roach, 1986; Nelles, 1974; Clark-Jones, 1987).

69 percent in 1990 (M'Gonigle and Parfitt, 1994); in 1996 they controlled almost 54 percent of Crown timber holdings (Parfitt, 1997). Economically, Crown tenure means logs are not bid for on the open market but are obtained through a stumpage system, on terms historically exceedingly advantageous to the company;[25] in the eastern provinces, where a few companies own large freehold properties, these supplies can be used to undercut the prices for small woodlot owners (Clancy, 1992; Clark-Jones, 1987; Parenteau, 1992). As we shall see, this is one problem faced by Fundy Model Forest woodlot owners in their dealings with JD Irving Ltd.

Certainly, a staples economy need not be a recipe for dependence as Clark-Jones (1987) and Richards and Pratt (1979) pointed out, but the joint federal and provincial pursuit of a continentalist development path has severely hindered the establishment of an indigenous secondary manufacturing sector based on the extraction of staples and yielded instead a volume (extensive) economy in which jobs are lost to capital-intensive technologies and to the failure to add much value before products are exported, and in which environmental costs are high (M'Gonigle and Parfitt, 1994; Williams, 1992). Furthermore, few benefits remain in the resource region. For example, one in five direct jobs on Haida Gwaii is exported to southern British Columbia (Parfitt, 1997). Of the 66.9

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[25] Two examples: in 1959 Stora Kopparberg received from the government of Nova Scotia a 50-year lease over 1.3 million acres for $1/cord (Clancy and Sandberg, 1995:212); large Crown licence holders in BC paid $2/m^3 in 1982, $7/m^3 in 1991, compared to $6 and $16 respectively for participants in the Small Business Forest Enterprise Program (M'Gonigle and Parfitt, 1994:75).

million m^3 cut on public lands in British Columbia in 1991, the direct net income was an appalling $0.13 per m^3 with most forest regions registering a loss (Travers, 1993). This performance compares dismally with the returns of the Ministry of Forests' small business program at the Lumby log auctions, which, although costly to operate, yet pay a net stumpage of $45/$m^3$ (M'Gonigle and Parfitt, 1994:75,79).

Ottawa's recent statements about Canada's place in the global industry on the whole reinforce this interpretation of development. The 1987 Forest Sector Strategy emphasized market access in a free trade setting, "state-of-the-art production technologies" (3) (notorious for their negative effects on employment [M'Gonigle and Parfitt, 1994]), and the maintenance of a fiscal climate favourable to capital investment. Likewise the National Forest Strategy (Canadian Council of Forest Ministers, 1992:28) says that competitiveness depends in part on "increased productivity of forest land, continued technological innovation, a skilled workforce, expanded trade and favourable investment conditions," and the next chapter will explore whether the Model Forest Program breaks with the tradition. While for the National Forest Strategy environmental damage is not acceptable, it does call for expansion of the timber supply (Section 4.7:30). Just how environmentally friendly this may be is a good question in light of the position advanced by the Canadian Forest Service (Natural Resources Canada, 1995:52) that one way to achieve it is to construct more roads into previously inaccessible regions. In fact, besides socio-economic effects, the volume economy in timber has translated into a program of clear cutting, soil loss and above all the liquidation of high volume, high

quality old growth trees. Speaking of the situation in Nova Scotia 60 years ago, Sandberg and Clancy (1997) wrote that foresters were obliged to cut rather than tend forests and that even a degraded forest could be inducted into staples exploitation by downgrading its use from the supply of saw timber to that of pulp wood. Indeed, in an extensive economy where more is always better (Dales, 1966), the claim of sustainability cannot be expected to have much substance, if by the term one means ecological sustainability. Chapter 3 and 4 will examine in more detail the ecological content of the Model Forest Program and the National Forest Strategy; Table 2.5 already demonstrated the priorities of federal aid to the industry in a volume-oriented environment.

So far, the position argued here is that institutional factors previously treated in isolation must be discussed together for a fuller picture of Canadian forest policy. These meso and macro elements are close government-industry relations, federalism, and a political economy marked by the colonial legacy of Crown ownership and an export-oriented staples economy. The federal role, although restricted, is not as innocent as it seems because Ottawa has been able to direct the use and management of Canada's forests quite substantially. As federal programs, the Model Forest Program and the National Forest Strategy will allow us to explore and comment on this and the other institutional constraints as well as on a fourth factor to be discussed next, the role of forestry experts. This rounds out the policy synthesis here begun with the sole caveat that, as indicated in footnote 9 above, in this chapter I shall confine myself to the effects of the above structural elements on foresters and forestry science and to a discussion of the historical

relations between foresters, government and industry, leaving the question of the resolution of differences of opinion within the scientific community and of the wider historical influences exerted on that community for the next chapter.

Forestry experts

The professional forester is the official keeper of the knowledge of forests and so represents the fourth constraint of the analytical framework. Experts are an important outside source of information for governments, especially during periods of policy change, and so actively contribute to a state's policy learning (Haas, 1992; Hall, 1990). Although the contributions of policy analysts and scientists to policy problems may be limited (Baskerville, 1995; Haas, 1992) and academics themselves may be dissatisfied with the hearing they receive, social and other scientists are nevertheless instrumental in influencing and even defining "our social practice and our political struggles" (Pal, 1990:157). They spell out the dimensions of a problem and the potential remedies, and structure the public debate (Haas, 1992; Miller, 1993).

Foresters are difficult to locate in the policy community. They are in a unique position in that in them - individuals and not institutions - knowledge and material interest merge. As employees of government and industry they are part of the policy network, possessing both knowledge and material interest; on their own they belong to the attentive public, possessing only knowledge. On the other hand, because they are consulted by governments and participate in the articulation and design of policies, they belong to a

network. This sentiment finds support in Howlett and Rayner's (*in* Ross, 1995) conclusion that, although foresters may serve as a bridge between the network and the attentive public, "their careers lie within the network itself" (77). The aim of this section is to explore this confluence of knowledge and interest and to locate forestry experts in the Canadian forest policy realm in preparation for a fuller treatment of their role and beliefs later on.

Scholars studying the influence of experts on international environmental policy have called the networks of knowledge-based experts 'epistemic communities.' An epistemic community "is a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area" (Haas, 1992:3). Members of an epistemic community share 1) "normative and principled beliefs" or a world view, an episteme; 2) "causal beliefs" or an understanding of problem definitions and suitable actions; 3) a basis for "weighing and validating knowledge"; and 4) a "policy enterprise" or common interests (3).

Canadian foresters active in forest policy development (condition 4) derive their shared understanding of forestry problems and solutions (condition 2), their basis for evaluating knowledge (condition 3) as well as common values (condition 1) from their education. But where Haas believes that the epistemic communities approach "suggests a nonsystemic origin for state interests" (1992:4) because the ideas the experts bring to decision makers come from the outside and therefore appear to be independent and even

neutral, this, to this writer at least, does not seem evident from Canadian forest history. In this respect, Jacobsen (1995), speaking of the Haas volume, rejected the notion that ideas originating in an epistemic community are ever neutral.

The North American professional forester is a product of the conservation movement at the turn of the twentieth century. The conservation of natural resources was a utilitarian ideology looking for a scientific solution to the decimation of forests then in progress in North America. Scientific or efficient management of forests through land classification, fire protection, proper cutting techniques and silviculture would guarantee use well into the future. As Sivaramakrishnan (1996) noted for scientific forestry in colonial Bengal, in Canada too the colonial legacy in the form of Crown ownership and a staples economy had a significant effect on forestry development. In this country, where the legacy helped create strong industry-government relations, an emphasis on technical efficiency encouraged the new professional foresters to adopt what Nelles (1974:189, 464) called boardroom methods and business thinking. Business ideas favoured a new closed, "industrial, progressive and corporate dominated society," only nominally democratic and "best served by satisfying the concrete needs of business" (Gillis, 1974:15,16). In the professional forester, who represented the progressive ways of a forward looking industrial society, business leaders found a strong voice of support. And predictably, in governments as well. These concurred with industry that wastefulness in the bush was an evil perpetrated by the small operators who without qualms cut when and where they pleased and sent the market crashing, and they therefore favoured the larger

firms (Gillis, 1974; Nelles, 1974). Crown ownership was also a source of support for industry since overhead costs could be kept quite low under a licensing system; besides, ownership of cut-over lands unsuitable for agriculture was a liability. Further, the considerable costs of conservation would fall on the shoulders of government.

The creation of provincial and Dominion forestry branches and departments in the first decades of the century actually consolidated the collusion between government, industry and foresters. The creation of the British Columbia Forest Branch with the Forest Act of 1912 furnishes an example. The branch was established by William Ross, who became Minister of Lands in 1909, with the aid of men such as H.R. MacMillan (founder of the later MacMillan-Bloedel) whom he appointed first Chief Forester of British Columbia, and Overton Price, long-time associate of Gifford Pinchot, America's first professional forester and staunch conservationist (Roach, 1984). The Forest Act, said Ross, was a "sane, business-like policy of conservation" (quoted *in* Roach, 1984:21), in keeping with the advice of his foresters who, as already noted, liked that approach to forest management, thereby "complet[ing] the integration of government with business thinking" (Nelles, 1974:463,464). The timber industry supported passage of the bill which promised, in the words of Thomas Roach (1984:22), "to represent their economic points of view and encourage an increase in the utilization of the resource." With the other provisions of the bill, such as a new type of tenure and fire protection, the Crown in effect took on many of the risks the industry used to suffer, and invoked public ownership to justify it, saying that the generations-long investment in the timber supply "has hitherto

been too long for private owners" (21).

The ties of sympathy between governments, professional foresters and industry continue today. Leman (1981) noted that the Canadian forester's career is far more dependent on the forest companies than the American's and linked this difference to provincial governments' habit of delegating forest planning responsibilities to the industry. Industry, governments and foresters collaborate in other ways. In BC, where primarily Registered Professional Foresters are hired, this has led to a lack of neutrality in the management of the province's forests, so that the Registered Professional Foresters' association (which derives its power to confer the title of Registered Professional Forester from the province) is "a largely silent participant" alongside the companies and the government (Coleman, 1988:158). Wilson (1990) in this regard remarks that industrial and government Professional Foresters have not only their training and values in common, but that the ties are reinforced through common membership in their professional organization. Another organization in which both are active is the Canadian Forestry Association, from its origins a government-sponsored group dedicated to public education ('forestspeak' for the conventional English term 'propaganda,' as Kellhammer [1992] so astutely noted). Significantly, the BC chapter depends on the industry for 77 percent of its revenues (Coleman, 1988).

That foresters and industry understand each other well can be further surmised from a survey conducted by Forestry Canada (1991b): 77 percent of foresters believed that the industry is doing a fair to excellent job in forestry management, especially in fire

control and reforestation (a similar rating for the provincial governments). This is borne out further by the 78 percent (90 in BC) who support clear cutting if we take support for that practice as a fair measure of support for industrial management.

The description of professionals in epistemic communities as having "recognized expertise" and "an authoritative claim to policy-relevant knowledge" (Haas, 1992:3) implies concurrence with the dominant paradigm. The foregoing paragraphs make that explicit. Haas also says (17) that their prestige and sought-after expertise give epistemic community members access to, as well as influence over, the policy decision-making system or network. So, although foresters, as Haas pointed out for economists, need not belong to just the one epistemic community and we may distinguish in Canadian forestry between a group strongly influential and one whose members are far less so, our attention will stay with the former (and we designate it the epistemic community), since they belong to a world whose views are those of the dominant policy paradigm's of industrial forestry. In terms of elite theory, influential intellectuals or experts are traditionalists; a sizeable number, especially in the natural sciences (one third of Porter's [1965] sample *versus* about 14% in the social sciences), enjoys strong links with the bureaucracy (though much less with the economic elite). The positive connection with the bureaucracy, both federal and provincial, is noteworthy. The ability of an epistemic community to "consolidate" its influence within bureaucratic ranks is akin to institutionalizing it (Haas, 1992:4). Recall that Hall's (1990) last stage in the change from one policy regime to another involves the installation of some key bureaucrats whose views are congruent with the new regime.

This installation occurred in the early part of this century in jurisdictions across Canada, including Ontario and, as we saw, BC, as well as in the Dominion government itself (Johnstone, 1991; Lambert and Pross, 1967).

We may conclude that as an epistemic community, professional foresters are in a privileged position in the policy community, having both knowledge and interests to defend and offer to the policy making process. They belong to the technostructure, "a sophisticated communications network of technically proficient specialists that cuts across the lines dividing government and business and in which technical knowledge is the currency of power" (Pross, 1986:49). In Chapter 4 we shall look at this privileged position and its influence on policy making in detail.

In closing, the notion of a confluence of power (interests) and knowledge (ideas) in the person of the forester may be discussed from one more analytical angle. To review, policy community theorists treat those possessing knowledge separately from those who possess both knowledge and material interests. They are assigned different weight in the policy process since members of the second group are part of the network but the first are not. The interaction of these parties around an issue admits new ideas into the policy field that jostle the assumptions underlying ordinary policy making and lead to new strategies and possibly to new network configurations. But there are difficulties with this method when studying the role of the expert precisely because the expert comprises both material interest and knowledge, thus cutting across the attentive public and the network. Haas (1992), for example, thought that policy community studies have not sufficiently examined

the belief systems held by experts nor the degree to which they influence decision making and offered the epistemic communities approach as a solution.

A different approach is taken by discourse analysts. This school criticizes the position of policy community theorists on the grounds that it retains the modernist split between value and fact, between truth and politics (Pal, 1990). It views power or material interest and knowledge instead as always twinned. Discourse analysis therefore makes no distinction between that epistemic community whose views coincide with those of the establishment and the one whose views do not, or between those who only have knowledge to bring to the table and those who also represent vested interest.

It is important to remember that only *some* with knowledge are admitted to the network. The view that power belongs to all because all have knowledge ("there can be no knowledge without power" [Pal, 1990:151]) substitutes individual power for an individual's share in systemic power. Power, says Foucault, whose work Pal's comments depart from, "is exercised from innumerable points, and power comes from below" (Pal, 1990:149). In other words, differential relations to power do not exist in our society, and neither are some ideas more mainstream (and therefore enjoying of greater access to power) than others. There are no victims, no women, no persons of colour, no classes, no dispossessed in this scheme: the relativization of power has removed them. One must ask if there is any point in studying policy at all: if power is an equal factor at every turn, it disappears from the equation.

Although Foucault claimed for himself inductive (i.e. empirical) reasoning, the

conception of power as the inevitable outcome of knowledge suggests rather deductive reasoning. A theme consistently in evidence here is that power and knowledge are not always twinned; the type of knowledge that enjoys power is of a type palatable to the powers that be. Discourse analysis therefore seems to have led us back to the idealism of pluralism. Yes, there is a dialectic of influence and ideas, but not all actors have equal capacity to affect the framework within which policy is made.

The next four chapters relate the findings of the study. Ideas to be carried forward to them from this chapter include: 1) Canadian institutions (Crown ownership of forest lands, closed industry-government relations, federalism) historically have exerted severe pressure upon the forest policy debate; 2) these flow directly or indirectly from the country's colonial past as a staple provider for its imperial parents; 3) the close industry-government relationship has also circumscribed the contributions of forestry experts; and 4) only certain, privileged strands of knowledge become part of the policy landscape.

CHAPTER 3

THE NATIONAL FOREST STRATEGY

The previous chapter demonstrated that forest policy making in Canada is the complex outcome of a set of historical and politico-economic conditions. The position of foresters involved in the policy-making process is not straightforward: they not only have knowledge, a characteristic of the policy community as a whole, but also the type of material interest and prestige that are the hallmarks of the policy network. As members of the network with a stake in its dominant world view, their work and thinking are naturally strongly affected by the constraining institutional factors. This is the point I made in the last part of Chapter 2, that only privileged strands of scientific knowledge can become part of the public policy realm. There is, however, another side to the integration of science into policy. If we call the first aspect describing the pressures society exerts on the scientific community, the politics or political economy of science, this second aspect may be thought of as the politics within science or science politics (Sandberg, in prep.). The scientific community is not homogeneous; its members come from a variety of backgrounds and have trained in a variety of scientific disciplines. As a result, there are many debates and struggles within the forestry expert community about the interpretation of forest-based research and its application to management. This politics within science will be evident in the present chapter and the next as I examine the two policy initiatives that are the subject of this study, though it will be clear that the distinction is anything but

rigid. The influences, that is to say, travel along a two-way street. The overall objective of these two chapters is to further an answer to the question of how the ecological content of the Strategy and the Model Forest Program was arrived at, which is to say, how knowledge and interests are sorted out in the policy process.

The material presented for examination in this chapter consists of documents related to the National Forest Strategy. Produced by the Canadian Council of Forest Ministers (1992), the National Forest Strategy is a guide to the forestry sector on the meaning of sustainable development of forests and indicates in a general way the components of such an approach. The Strategy contains directives of socio-economic content and others more relevant to the physical management of the resource. These latter are the focal point of my attention. The goal is to scrutinize the meaning of sustainable development adopted by the forestry sector, bring to the fore certain problems with it, and set the stage for a treatment of the Model Forest Program.

The analysis of the materials in the present chapter relies mostly on literature in ecology and forestry. As both the Strategy and the Model Forest Program were responses to the changing environment in which the forestry industry operates and shared some of the same objectives, I shall use the next section to locate the two initiatives together in the policy atmosphere of the day.

THE NATIONAL FOREST STRATEGY AND MODEL FOREST PROGRAM IN CONTEXT

During 1990-92 a lot was happening on the national forestry scene: *Canada's Green Plan for a Healthy Environment*, with provisions for forestry and research, was released in December 1990; the Canadian Council of Forest Ministers prepared a new national strategy and the first Forest Accord; and the Canadian Forest Service laid the groundwork for the Model Forest Program. By the spring of 1992 all three initiatives were in place.

These initiatives followed a tradition of federal intervention in support of the forest industry (Howlett, 1989a; Chapter 2 above). They were preceded by international pressures on the industry stemming from various environmental issues such as deforestation, climate change, biodiversity losses and the poor score card of Canadian forestry practices. They also resulted from the globalization of trade and the attendant competition from countries such as Spain and Chile where conditions favour a short growing cycle and costs are low (Godbout and Bouthillier, 1991; Marchak, 1995). At home, environmental, economic and land use worries added their own pressures (Godbout and Bouthillier, 1991; Marchak, 1995). Safeguarding the environment and safeguarding the Canadian economy are linked; thus the National Forest Strategy and Model Forest Program are measures to address the threat coming from the environmental movement. As an official inside the Canadian Forest Service said, "the federal government realized that Canada had to ensure environmental responsibility. Society, environment and economics are the three tenets of sustainability, so the environment must be protected in

order to protect industry's markets."[1] Other countries, thought Frank Oberle, the minister at the centre of this federal activity, are justified in watching what Canadians do with their ten percent of the world's forests.[2] This sensibility is found also in the National Forest Strategy (Canadian Council of Forest Ministers, 1992).

An axiom of environmental management is so-called stakeholder participation (Born and Sonzogni, 1995; McLain and Lee, 1996). It is the keystone of the Model Forest Program and characterizes the genesis of the National Forest Strategy, the related Accord and the Model Forest Program. The use of multi-lateral "stakeholder" discussions as a problem resolution strategy is nothing new on the Canadian environmental policy scene, predating in fact the visit in 1986 by the World Commission on Environment and Development to Canada. In 1984, for example, the Department of the Environment brought together environmental non-governmental organizations, industry, labour and government for discussions that came to be known as the Niagara process (Doern and Conway, 1994). Their work contributed to such diverse projects as the State of the Environment reports and the Canadian Environmental Protection Act.

The climate of consultation that emerged in the 1980s put in place conditions ripe for the creation of the National Forest Strategy and Model Forest Program by building a network of environmentalists, industrialists and government officials committed to the task

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[1] Telephone interview, 23 April 1996.

[2] Interview with Frank Oberle, 1 May 1997.

of exploring the question of sustainable economic activity. Some of those who had been involved in the Niagara process were also active in the National Task Force on Environment and Economy which submitted its report on how environment-economy integration might best be fostered to the Canadian Council of Environment Ministers in 1987. Among the recommendations of the National Task Force on Environment and Economy (1988) was the formation of round tables on environment and economy provincially and nationally, to "bring together senior decision makers to advise First Ministers and other national leaders on the coordination and harmonization of actions to promote environmentally sustainable economic development in Canada" (3). A member of the National Round Table sat on the Model Forest Program's National Advisory Committee charged with the review of the 50 proposals submitted to the program and the selection of the most commendable (Natural Resources Canada, 1993).

Another recommendation of the National Task Force on Environment and Economy (1987) was to use "demonstration projects" in order to explore the "new direction by concrete examples" (4). Attention to the experimental is another component in ecosystem management (Rayner, 1996). The Model Forest Program, alluded to in the National Forest Strategy,[3] satisfies the provision.

Thus by the time the new projects were being developed, the needed infrastructure

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[3] "By 1994, members of the forest community will cooperate to establish working models of sustainable forest management in the major forest regions of Canada" (Canadian Council of Forest Ministers, 1992:section 2.17).

(concept and experience) was in place and naturally extended to them. The turmoil in the industry created a window for their acceptance by the provinces and the federal government and bureaucracy. The current chapter deals with the National Forest Strategy while Chapter 4 takes up the story of the Model Forest selection process.

THE 1992 NATIONAL FOREST STRATEGY

The National Forest Strategy was endorsed and the National Accord, which contains the text of the National Forest Strategy objectives, excerpts from its introduction, and its values, beliefs and goals, was signed at the 1992 National Forest Congress in Ottawa by members of the Canadian Council of Forest Ministers - only Québec did not - and a cross-section of the forestry community. It came five years after the previous national strategy, *A National Forest Sector Strategy for Canada* (Canadian Council of Forest Ministers, 1987), prompted by the pressure on Canadian governments to adopt sustainable development policies, intensifying globalization, the United Nations Conference on Environment and Development planned for Brazil in 1992,[4] and the changing attitude of Canadians towards forest affairs (National Forest Strategy Coalition, no date; Godbout and Bouthillier, 1991). These influences are reflected in the Strategy's stated goal which is "to maintain and enhance the long-term health of our forest ecosystems, for the benefit of

[4] The Accord was a late addition to the development of the National Forest Strategy; it was to be tabled at the Rio "Earth Summit" as a sign that Canada was an environmental leader whose forestry practices were sound (R. Carrow, written comm., 1998; L. Dellert, pers. comm., 1998).

all living things both nationally and globally, while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations" (Canadian Council of Forest Ministers, 1992:iv).

I noted in Chapter 2 that the frailty of the federal claim to a role in this field has hampered every attempt to develop and implement a national forestry strategy. A "general forest policy," periodically called for since the 1906 Canadian Forestry Convention (Table 2.4; Johnstone, 1991:30), has been an unattainable goal. Federal forest policies such as the 1987 strategy have been no more than a "national statement on a comprehensive list of strategic concerns," funded through federal-provincial agreements or some other application of the spending power (Canadian Council of Forest Ministers, 1992:vii).

This is also the case of the 1992 National Forest Strategy. It is a guide to sustainable development for the forest sector, vague in its details on how to implement the principles since the task of implementation remains with the provinces.[5] The Strategy consists of "basic principles and general objectives" intended to "activate" a national dialogue (Godbout and Bouthillier, 1991:4). As for implementation, that of the 1987 agreement, forged after unprecedented consultation in the forestry community, was determined using surveys and a public opinion poll. They showed that some progress had been made on many of the recommendations but that much remained to be done, especially in research and development funding and retraining of displaced workers

[5] No doubt the fact that Québec did not sign the Accord stemmed from determination to protect its jurisdictional turf.

(Godbout and Bouthillier, 1991). The difficulties with implementation are in spite of the Sector Strategy having been a Canadian Council of Forest Ministers creation. If the National Forest Strategy, also a project of the Council, has a chance of faring better, it is because Minister Oberle and his colleagues added some legislative requirements, such as the tabling of annual reports by Ottawa and participating provinces, and because Oberle took the approach of "making the provinces responsible for the national policy" in the sense that "they themselves developed the concept" (including the development of national standards for certification) and that it would be something all would "want to live by."[6] However, whether and to what extent the provinces have endorsed the Strategy remains in doubt (R. Carrow, written comm., 1998). This reluctance may not be due solely to the desire to protect a jurisdictional right but also to a perception that the Strategy was too ambitious ecologically to be practicable (L. Dellert, pers. comm., 1998).

The National Forest Strategy process

The process used in both exercises is similar. The 1987 strategy was built on four national meetings - the Canadian Forestry Forums - and a Forest Congress which was held in 1986. The resulting recommendations with comments by the relevant governments and non-governmental groups were the basis for an early draft written by a special task force composed of deputy ministers and representatives of industry, the forestry profession, academia and environmental and labour organizations. After another review, senior

[6] Interview with Frank Oberle, 1 May 1997.

members of the forest sector participated in the development of the final draft of the strategy to be presented for adoption at the 1987 forum in Saint John (Canadian Council of Forest Ministers, 1987).

Procedurally, the creation of the National Forest Strategy is a replay of the 1987 scenario (National Forest Strategy Coalition, no date; A. Rousseau, pers. comm., 1997; Canadian Council of Forest Ministers, 1992) with yet some important differences. Despite wider consultation for the 1987 document than previously, the great majority involved in writing it were senior people in industry, academe and government (Canadian Council of Forest Ministers, 1987). In 1992 the net was cast much wider but most participants still came from the above three groups. So, for example, at the invitation of the Canadian Council of Forest Ministers, Godbout and Bouthillier of Université Laval set the tone by writing the background paper for participants outlining the issues and developments since 1987. A Workbook (an in-depth questionnaire) was sent out and five regional fora were held, the results of which (including the Strategy's goal) were condensed into a report by a writing team of peers, serving as the basis for the strategy's first draft. It was reviewed at a facilitated workshop in Winnipeg at which government and non-governmental associations were represented. Such a workshop was decidedly new, and a sign that the process leading to the 1992 strategy was intended to be open and inclusive. There were, for example, recreationists, mayors, environmentalists and First Nations attending for the first time (A. Rousseau, written comm., 1998). That the intention was sincere can be inferred from the fact that separate meetings were held to accommodate the grievances of

First Nations participants (L. Dellert, pers. comm., 1998). From the Winnipeg material, augmented by letters and telephone conversations, the writing team developed the final draft. It was presented together with the National Forest Accord for adoption at the National Forest Congress in 1992 in Ottawa.[7]

The National Forest Strategy content

Notwithstanding the new ecological colours of the 1992 Strategy evident in its goal and vision statement, even asserting that the forest ecosystem has value in itself (Canadian Council of Forest Ministers, 1992:11), the content of the two strategies is strikingly similar. In both documents, for instance, sustained yield is the keystone concept. In general, the 1992 document maintains a tone supportive of industrial practices such as clear cutting ("an accepted practice in many countries, ... well suited to certain forests in Canada" [16]) while also pointing to the controversies surrounding them. This mix of support for traditional practices on the one hand and on the other an emergent ecological consciousness is typical of the Strategy. Thus, the section on forest protection recognizes that Canadians desire alternatives to chemical pest management; however, when it comes to fires, there is much less emphasis on prescribed fire than in 1987, a regression considering there has been a lot of research on the role of fire in the intervening years (Knight, 1987; Payette et al., 1989; Whelan, 1995). The section on wood supply in the

[7] The same kind of process has been used for the most recent version which was signed at the national congress in Ottawa on 1 May 1998.

National Forest Strategy is not as explicit as the previous strategy on the matter of age-class distribution (although the synthesis prepared from the consultations is [National Forest Strategy Steering Committee, 1991]), but specifies a preferred approach to old growth befitting the industrial paradigm (see below). A statement on the impact of airborne pollution (in particular acid rain) on forests is no longer to be found in the National Forest Strategy; there is only a resolve to decrease pollutants from pulp and paper manufacturing. The main difference between the 1987 and 1992 documents can be judged from this, that in the earlier one forest wildlife management was an item to be integrated in timber management whereas the National Forest Strategy speaks of the totality of the forest ecosystem as the result of long evolution; consequently biodiversity and natural processes are highlighted. This reflects the realization that environmental issues must be addressed if Canadians are to avoid trouble at home and abroad (Godbout and Bouthillier, 1991) as well as the mixed backgrounds of the participants in the making of the 1992 Strategy (L. Dellert, pers. comm., 1998).

The social aspects of the National Forest Strategy also bear substantial resemblance to its predecessor's. There are two notable exceptions. One is the provision for inclusion of the (affected) public in the forest planning process (interestingly, not the implementation stage, as Godbout and Bouthillier [1991] make clear) because ecosystem management requires it and the decision-making process ideally results in a form of "social contract" everyone can support (Godbout and Bouthillier, 1991:28; Born and Sonzogni, 1995). The second is an overdue recognition of the aboriginal presence, the need for

increased access by First Nations to the resource base, their right to participate in forest management and the need to settle land claims. It is doubtful that the improvement is due to altruism; more likely it is because the "resurgence of native issues" is causing governments and the non-native public a headache (Godbout and Bouthillier, 1991:11). With the Supreme Court decision on Delgamuukw[8] we can expect more of it. Chapter 5 will discuss native participation more.

In general, the text of the National Forest Strategy follows closely the synthesis of the regional consultations. Some noteworthy points of difference are: on the question of the human relationship to the forest, the omission in the final version of the need to "exercise discipline in demands" on the forest and to make no lasting impacts (National Forest Strategy Steering Committee, 1991:7); de-emphasis of the need to determine *minimum* amounts of mature forests and biodiversity to be planned for (18,19); and the promotion of "accurate media reporting" (12) became the promotion of "balanced" information (Canadian Council of Forest Ministers, 1992:12). These (and other) inconsistencies were the result of discussions at the Winnipeg workshop (A. Rousseau, pers. comm., 1997).

The foregoing shows there are two broad categories in the Strategy - environment and society - in line with the World Commission on Environment and Development's (1987) understanding of sustainable forestry (or development). The social component of

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[8] This December 1997 decision said, among other things, that First Nations have title to their traditional lands and must be consulted on decisions affecting those lands (Matas, 1997).

the Strategy is comprised of the strategic themes of public participation, a team approach to research, retraining for the forest workforce, diversification of the industry and an enhanced role for aboriginal people. Its human-centred ethic is obvious from such statements as "Continued economic benefits must be maintained for the communities, families and individual Canadians who depend on the forest, both for their livelihood and way of life" (Canadian Council of Forest Ministers, 1992:5). As this dissertation's particular interest is in the scientific content of forest policy, the next section is devoted to an examination of some of the forest management and stewardship provisions of the National Forest Strategy.

Ecological content of the National Forest Strategy

Ecological aspects of sustainable forestry are expressed in the document in terms of stewardship of the forest environment through ecosystem management. Stewardship recognizes nature's changing character in its adaptation to change (Canadian Council of Forest Ministers, 1992:11) and its "natural resilience" that "ensures the renewal, rejuvenation and diversity of species" (12). It "involves managing forest ecosystems to maintain their integrity, productive capacity, resilienc[e] and biodiversity" (11), meaning that "a wide range of ecological processes where plants, animals, microorganisms, soil, water and air are constantly interacting" (11) must be sustained. Ecosystem management is said to refer "to the integrated management of natural landscapes, ecological processes, wildlife species and human activities" (13) and forests must support "a full range of uses

and values including timber production, habitat for wildlife, and areas allocated for parks and wilderness" (6).

These statements are important for their support of the notion of forest health at the landscape level, the recognition of process (especially the role of microorganisms) and of environmental tolerance limits, and for the acknowledgement that humans are part of nature. Together with the public participation objectives, they locate the National Forest Strategy in the new era of ecological resource management, based on the view of a nature in flux, the commitment to long term planning and an integrated approach respectful of the forest as more than a timber crop (Kessler and Salwasser, 1995; Pickett and Ostfeld, 1995).

Ecosystem management, an abstract concept that suffers from definitional difficulties, is best discussed in terms of its implications for management: it is ecosystem-based, involves ecologically sound human use, mimics natural disturbance regimes, maintains native species in viable populations, operates on large spatial and temporal scales, and is linked to agencies and the public (Galindo-Leal and Bunnell, 1995). The concept, however, does not invariably imply an ecocentric perspective in which the non-human world is valuable in its own right. Resource management, and ecosystem management is no exception, by definition exists to further human objectives. In that sense ecosystem management carries what Fox (1995) calls the trivial meaning of anthropocentrism. But, though particularly sensitive to the environment, ecosystem management may carry the significant meaning of anthropocentrism which conveys a

chauvinistic and imperialistic attitude. Bocking (1997) speaks of two ecological attitudes, one that seeks the preservation of nature and another that aims for efficient management. We can begin to understand this latter problematic side by rereading Arthur Tansley's 1935 paper in which he introduced the ecosystem concept.

Tansley (1935), a botanist at Oxford, argued that communities of plants and animals together with the abiotic environment constitute "one physical system," systems that are "the basic units of nature on the face of the earth" (299). His work laid the foundation for the description of natural processes in terms of energy exchange and element cycling. Energy flow was easily amenable to quantification and lent itself well to inclusion into economics. As a result, the ecosystem notion "brought all nature ... into a common ordering of material resources" (Worster, 1977:302). Nor is ecosystem management's integrated approach innocuous; conservationists such as Pinchot wanted to subject whole watersheds to planning because "[e]very river is a unit from its source to its mouth" (Pinchot, 1910:54) - a sound ecosystemic notion - and "every use to which our rivers can be put, and every means available for their control" (55) must be considered. Only a holistic view can successfully exploit the whole.

Tansley's and other ecologists' work undermined the older view that change in nature proceeds by fixed steps to a determinable end point (stable, balanced nature), leading, in more recent times, to one in which nature is seen as unstable; change, thought to characterize nature more accurately, is understood to be driven by the actions of agents of disturbance such as fire (Pickett and Ostfeld, 1995). This concept of flux is sometimes

espoused as a means to justify human action, regardless of the scale of operation (Callicott, 1991). Ecosystem management that focusses on this type of human-centred "blend" of environmental and human needs in a multiple-use way (Kessler and Salwasser, 1995) is the shallow variety of ecological management known as sustainable development (M. Jacob, 1994); in it, ecology serves the purpose of ensuring "better management and control of the environment for human benefit" (479). Worster (1993) therefore spoke of a "permissive" ecology in which nature is conveniently "lenient toward human activity" (138). The question is whether the anthropocentrism of this approach allows for the long-term sustainability of the evolutionary, landscape-wide processes that maintain forest ecosystems.

In terms of ecological content, the National Forest Strategy states that "forest ecosystems ... have an intrinsic value" (Canadian Council of Forest Ministers, 1992:11), yet the tone of the policy communicates a different sensibility. Its most significant feature is the failure to stipulate that its guidelines are to be applied to *already* managed forests; it would seem that, except for inaccessible regions and wilderness preserves, *all* forests, natural[9] and managed, are to come under the sustainable development regime. This suggests that the vision for Canada's forested wilderness may after all be its wholesale conversion to managed forest – a condition dubbed "forestry nirvana" by Baskerville (1990:27).

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[9] By 'natural' I mean wild or semi-wild forests still subject to landscape-wide processes, having experienced relatively little human intervention.

It may be nirvana from a forester's point of view, but the prospect is detrimental to Canadian forests, and even to the health of the forest industry itself. Before examining the specific content of the Strategy on the issue, it may be useful to discuss a few points of ecology and forest management to give an idea of what is lost when forests are converted to the fully managed state. I shall focus on the question of biodiversity and the integrity of the forest ecosystem, and these and other points will be (re)visited and elaborated throughout this chapter.

The new forestry schools and treatises that began to appear in the second half of the eighteenth century in Germany introduced three principles into forest management: minimum diversity, balanced use of the forests and sustained yield (Lowood, 1990). The key to success lay in how well one could estimate a forest's volume of wood and its growth rates. It became necessary to predict how much wood a stand of a given species under certain conditions would yield and to this end tables were compiled for the use of trained foresters. Thus arose the concept of the *Normalbaum* or standard tree growing in a regulated forest that was simplified as much as possible in order to facilitate production evaluation. The goal of sustained yield, the "greatest possible constant volume of wood," ushered in a system of regulation or silviculture, with rotation age based on long-term predictions of the standard forest's growth cycle.

Today's managed forests, though frequently not as rigidly regulated as formerly, are still patterned on the ideal of a standard tree growing in a regulated forest. Simplification (in composition, structure and function) is the plantation's most prominent

feature (Maser, 1990). But a natural forest is something quite different. Its non-standardized character is, as the following will make clear, associated with unimpaired forest functioning, in turn related to biological diversity, because it is the organisms in their various landscapes and sublandscapes that keep energy moving through their biological communities.

Biodiversity (which operates on four levels of biological organization - genetic, specific, ecosystem or community, and landscape [Harris and Silva-Lopez, 1992; Noss, 1992]) in forests derives from their intergrading patchwork composition and from temporal variation in the form of succession and seasonality of species in a locality.

Forests achieve their patchiness in several ways with climate the most influential force. For example, the closed boreal forests of black and white spruce, jack and lodgepole pine, white cedar, aspen and birch give way to a mixed subarctic open spruce-lichen woodland near the treeline (Heinselman, 1981). In addition to climate, local site variation, including aspect, helps produce a heterogenous mosaic of patches. Differences in soil and water retention, pH, terrain ruggedness, altitude and stream type all contribute to this patchiness (Norse, 1990).

Another factor in the maintainance of a high level of biodiversity in forests is structural diversity. Structural diversity commonly results when trees fall or die standing, forming snags. Logs fallen at an angle to the slope trap sediment on the uphill side and leave refuge cavities on the downhill side (Hammond, 1991); in streambeds they modify channel flow, trapping sediment and forming height differentials for waterfalls (Norse,

1990). As currents lose energy against the logs and scour out sediments, they create pools in which the coarsest material, often gravel, is left behind (Waring and Schlesinger, 1985). The variegated habitat, from well-oxygenated gravel beds to quiet pools, is good for salmonids and many other fish (Norse, 1990). Woody organics also add nutrients to the water as well as food for herbivorous insects and hence carnivorous insects and fish.

Stream sediment modification by logs also creates the right conditions for the development of a structurally diverse riparian zone. Logs elevated above streamflow or flood level can serve as protected sites for seedlings (Hammond, 1991). The sediment accumulated on the banks and channel islands is colonized by shrubs, herbs and trees that dampen flood waters, lessen bank erosion and cool water temperatures, essential for many fish (Waring and Schlesinger, 1985).

Another source of patchiness is genetic diversity. Needles or leaves of individual trees vary in their chemical composition, affecting palatability and susceptibility to disease and insect attack. This variability restricts access by exotic invaders, pathogens and herbivores (Norse, 1990) and the variable responses in turn encourage patchiness.

Variability through time is provided by the important mechanism of succession. In general, this term refers to a sequence of changes in the organisms that grow in or inhabit a particular area. Disturbance or the release of energy in an established forest initiates succession (Norse, 1990). The range of scale of induced changes is great – ice storms, fire, insect outbreaks, individual tree death, the movement of animals or the change in crown structure of old forests, create a variety of impacts. The outcome of disturbance-

induced succession is not fixed. Much depends, for example, on the timing and scale of the disturbance. Outcomes are changed also by fire suppression. Succession therefore has a somewhat unpredictable outcome, depending on climate, soil conditions and type and timing of disturbance.

Adding to the structural diversity of a natural forest is the variation in the age-class distribution of its trees, produced by the uneven timing of gap creation, the replacement of the tree species of one successional phase by another of a later phase and/or the differential growth rates of species. Even when trees colonize large areas after a single catastrophic event, an even-age distribution need not occur. Stands in the Cascade ranges of central Oregon and southern Washington showed an age spread of about 120-140 years and 230 years respectively in Douglas-fir forests initiated between 400 and 500 years ago (Franklin and Hemstrom, 1981). This species can remain the dominant canopy species for 1000 years (Oliver and Larson, 1990), and the process of succession in west-coast stands may therefore extend over millenia.

On the other hand, the boreal forest, the largest after the moist tropical forest (Schindler, 1998), typically has one stratum, the tree canopy, above a ground layer often dominated by the feather-mosses (Carleton, 1991). But poplar can have a tall shrub layer beneath the canopy and balsam fir forms successional sequences with white birch or with aspen-white spruce (LaRoi, 1991). Otherwise, succession as the replacement of one species by another is rare in boreal forests. One result of this is their relative monospecificity. There is nevertheless a between-site diversity due to variation in soil

characteristics (Carleton, 1991; LaRoi, 1991) and fire regime (Heinselman, 1981). But some soils can support several forest types; chance may determine the particular species make-up at a site (Carleton, 1991).

Peatlands are a typical feature of the boreal forest. They are "wetlands that accumulate organic matter" (Kuhry, 1991:30). The water table is high – at, near or even above the surface – leading to a water-logged, oxygen-deficient system that, along with the cool climate and soil acidity, slows decomposition of organic matter, resulting in the net accumulation of organic matter. Boreal peatlands are vital in the global carbon cycle. At 419 billion tons (Gt), it is estimated that they store almost one third of the global soil carbon pool (Schindler, 1998). Other boreal contributions to the earth's carbon pool come from its terrestrial vegetation (64 Gt), soils (247-286 Gt) and lake sediments (120 Gt), for a total boreal carbon storage of approximately 830 Gt. To underscore its importance, this amount comes close to that stored by the world's oceans. Yet the boreal forest is under such threat from human impacts that Schindler (1998) foresees a very much altered boreal landscape in the not so distant future.

By incorporating a multitude of spatial and temporal scales, natural forests, and hardwood forests more so than softwood forests (Harris, 1984), provide habitat diversity that supports a variety of animals. Succession exposes animals to a changing environment. Following a disturbance, a variably sized patch will be in a state of regeneration. Open terrain with herbs, grasses and shrubs predominates. The herbs and shrubs are 'pioneers,' able to become established quickly with their profusion of light seeds and short

reproductive cycles. Many are nitrogen fixers; red alder is an example. Alder can add from 40 to 150 kg of nitrogen per year per ha, though not all of it is immediately available (Norse, 1990). Within a few years seedlings and saplings become established and as they grow into a young forest, the canopy gradually closes. A litter mat develops; temperature and moisture conditions change. Depending on light penetration and the availability of seed, a shade-tolerant understory may develop instead of a shrub story. Thinning of the stand takes place, allowing better growth of the remaining trees.

As the forest matures, individual trees begin to show signs of age, their tops and branches become vulnerable to decay or other injury, insects damage and kill some, lightning and windthrow kill others. As a result, the aging canopy becomes open-textured, snags are produced, coarse woody debris accumulates on the forest floor and in streams, more light reaches the floor and with it herbs and shrubs reappear. The presence of differently-sized and uneven-aged trees provides significant structural variability that is correlated, for example, with bird species diversity (Harris, 1984). Dead wood is a surface for fungi; carpenter ants, termites and certain birds excavate holes in snags making them available for nest-using organisms which themselves cannot produce them. Rot also provides den space at the base of trees and snags. Broken-top trees provide perch and nesting space for raptors while the resulting upturned branches serve as nests for other species. Thus, a forest undergoing natural changes creates, even in even-aged boreal forests, variable structural complexity and a legacy of coarse woody debris to pass on to the next young forest.

With the conversion of old growth to second growth, we may expect disturbed habitat generalists to expand as they gain more habitat while interior specialists lose theirs. British Columbia's forest spiders are a case in point. The most common (39% of all identified forest spiders) show successional turnover (Harding, 1994). The post-clear cut community is rich in diurnal pursuit spiders that inhabit sunny, open areas. They replace forest litter spiders that feed on mites and other insects found in the stable microhabitats of mature to old growth litter. In the early seedling-sapling stage (>10 yr) shrub-colonizing funnel-web and crab spiders appear, followed by others associated with young forests. Decades are needed (variable depending on whether the forest is slow- or fast-growing) before the forest spider community is restored.

Other specialist insects negatively affected by conversion of old to new stands are insectiverous and parasitoid insects living in the moss and litter that accumulate on the branches of old trees. Like forest birds, they are important checks on the populations of herbivorous insects that feed on young, secondary stands.

With the loss of interior habitat, snags, characteristic of mature and old-growth stands and sometimes found in first-rotation secondary growh, are competed for by new, invading species (Harris and Silva-Lopez, 1992). As more of the forest becomes accessible, previously protected animals fall within the range of mammalian and avian predators. The former are a threat primarily to ground nesters and the latter to cavity users. Nest parasitism on song birds by the brown-headed cowbird in open, cultivated landscapes has become a problem throughout much of North America (Harris and Silva-

Lopez, 1992; Harding, 1994).

Edges favour browsers of herbs and berries. Edges are created when disturbance opens up gaps in the canopy. The more severe the transition between edge and forest, the more severe the edge effects, a term that refers to the changes that take place at and near the edge of the open spaces so created. Physical effects of the edge are an increase in irradiation and a change in its angle; increased wind penetration which desiccates the soil, enhances the dispersal of seed of early successional taxa and makes the stand more susceptible to windthrow; increased access to the interior for open area predators; and reduction in interior habitat and its species (Hammond, 1991).

Elevated deer and elk populations are often cited as a desirable consequence of and justification for clear cutting. But the herbivores jeopardize other conservation efforts through browsing, such as the Carolinian remnants around Lake Erie (Reid, 1985) and the oak-hickory forests of the midwestern and eastern United States (Diamond, 1992). There, reverse succession is underway with the invasion of rapidly reproducing, generalist shrubs. Overbrowsing of the forest understory can in turn effect change in the bird community (Alverson et al., 1994).

Unfortunately, even for deer an increase in open range at the expense of old growth is not without problems. Newly cleared land provides forage only for the first years until the new forest canopy closes (<30 yr); this is followed by a period of as much as 200 years during which forage is very low (Norse, 1990). The open canopy of ancient forests achieved after this time once again provides high forage levels, although less than

in the shrub and sapling stages. Old forests offer thermal insulation in summer and winter and in addition intercept much of the snow that in clear cuts accumulates, burying food and making travel difficult. They are the site of an important winter food item for deer and other ungulates, namely slow-growing arboreal lichens associated with the older trees. Thus, while summer forage is enhanced by clear cutting, the lack of interior habitat encourages steeply fluctuating populations, expanding during the summer and succumbing to exposure and starvation in the winter.

Compared to wild or nearly wild forests, Western industrial forest management produces stands characterized by an absence of patchiness, with implications for the productivity and health of forested (and neighbouring) ecosystems. What follows is a partial but typical inventory of problems associated with plantations. Structure, functions and composition of plantations are greatly simplified compared to a true forest.

The herb-shrub, mature and old growth stages are eliminated in favour of the seedling-sapling and two mid-growth stages. This produces an even-aged, closed canopy stand with light penetration limited to such a degree that much of the ground flora is lost. While this happens in natural forests, it is more severe in conifer plantations (Packham et al., 1992). The uniform arrangement of canopies in plantations negatively affects microclimate and water regulation (Norse, 1990; Waring and Schlesinger, 1985).

Elimination of the early and later phases of the forest lifespan translates into short rotation cycles. Even so-called long rotations of 60-120 years (Kimmins, 1992) are short compared to most natural cycles; short regimes seem common only in the boreal and

subalpine regions (Heinselman, 1981). Even in boreal and near-boreal forests where fire is a frequent agent of disturbance, stands exceed the 80-100 years that in many parts of Canada comprise the rotation period (and frequently it is less). For example, 200 years may separate stand-replacing fires in the wet eastern parts of the main boreal forest (Heinselman, 1981). Bergeron and Charron (1994) reported a stand, over 210 years in age, of eastern white cedar and balsam fir in a southern boreal forest of Québec killed by fire 75 years ago. East of Hudson Bay are black spruce 1000 and more years old (Drouin, 1995). In certain parts of the drier western boreal, fire cycles average 100 years (Timoney and Robinson, 1996).

Frequent cutting in plantations puts pressure on the soil system through increased erosion both from road building and the loss of vegetation. Compaction is thought to hinder reforestation (Perry et al., 1989). Maser (1990) recorded soil exhaustion in China and Germany after a very few rotations. The absence of down logs affects slope stability since they act as retaining walls (Hammond, 1991).

Along with erosion problems, nutrient production is affected by the elimination of critical growth phases and short cycles. Nitrogen fixation is carried out by the shrubs and herbs that typically colonize cleared areas and are suppressed on managed plots. Cyanophycophilous lichens on the branches of trees 100 to 150 years old also fix nitrogen (Norse, 1990) but not on plantations since they rarely extend rotation past 120 years (a standard Douglas fir rotation appears to be about 80 years long [Norse, 1990; Franklin et al., 1989]). Bacteria dependent on mycorrhizae, the symbiotic root-fungus associations

that provide trees with phosphorus, nitrogen, water, hormones, chelators and antibiotics in exchange for amino acids, carbohydrates and other compounds (Amaranthus et al., 1989; Perry et al., 1987, 1989), constitute another lost or reduced source of nitrogen since the coarse woody debris that is a common substrate for mycorrhizal fungi in forests is absent from plantations. Norway spruce, a common European plantation conifer, supports only three to five fungal species, far fewer than the 30 to 40 that can be found in Pacific old growth (Hammond, 1991). Further losses of nitrogen are sustained when slash and litter are burned as preparation for the next planting (Norse, 1990). Norse estimated that from several hundred to 1000 kg per hectare (ha) are lost per rotation, depending on the degree to which stands are managed. Energy cycling in plantations is further crippled by a reduction in the variety of soil invertebrates, from bacteria to nematodes, that carry out decomposition. Oribatid mites are correlated with effective decomposition but Spanish pine and eucalyptus plantations support a less diverse mite community than do natural woodlands (Saloña and Iturrondobeitia, 1993).

Although carbon-fixation rates in young forests from about 30 years to maturity (80-100 years) are higher than in older forests, total carbon stored in managed stands is below that of primary forests, perhaps by as much as two thirds (Norse, 1990). Hammond (1991) writes that a "450-year-old Douglas-fir forest stores more than double the total amount of carbon stored in a 60-year-old Douglas-fir forest" (31). Part of the loss is incurred through the burning of slash and the loss of coarse woody debris; in part the difference is due to the fact that 200 or more years are needed before a new forest gains

the carbon-storing capacity of an old one (Hammond, 1991; Harmon et al., 1990).

Spatially, the even-aged management of a regulated 'forest' imposes a regularized mosaic according to age class. There can be as many age classes as the number of years in the rotation or the age classes can be organized in groups of ten years. In a management unit all the stands of similar age may be located in one area or they may be divided over smaller management blocks (Kimmins, 1992). In contrast, I noted above that in natural forests a single cohort of trees, established after a major disturbance, may show a significant age spread among the trees.

Regeneration is often left for nature to accomplish but is commonly supplemented by plantings. Natural regeneration is easy when the next rotation is to consist of species that produce suckers: elm, ash, oak, maple, alder and the tulip tree are examples (Packham et al., 1992). Otherwise, seeds can be carried onto clear cuts by animals or wind, seed trees may be left on a clear cut ('seed tree cut'), or a few understory saplings may be retained as 'advance regeneration' (Kimmins, 1992). But planting from nursery stock may be a surer way of reseeding clear cuts, especially if two- or three- year old seedlings are used. However, other problems are then introduced: the roots of nursery stock can be different from natural seedlings, leading to tree instability and toppling (Kimmins, 1992); fertilization and watering in the nursery makes the seedlings more attractive to herbivores; pathogens have been introduced from nursery stock (Norse, 1990); and genetic manipulation can produce undesirable changes. Thus, the cost of a 4 percent improvement in growth rate in Douglas fir was found to be a 13 percent increase

in seedling frost susceptibility (Norse, 1990). There is also a cost in the form of loss of genetic patchiness. Genetic diversity of plantations tends to be lower than in old forests (Rajora, 1995). Partial cutting in old-growth pine stands in northern Ontario reduced the latent genetic potential of the remaining trees by one half, suggesting that, even when natural regeneration on logged sites is successful, the new stand will be noticeably different from the original stand (Buchert et al., 1997). Loss of genetic diversity in trees is linked to reduced productivity.

Insect outbreaks are "typical" of plantations (Packham et al., 1992). Mortality in fir due to the spruce budworm is higher in spaced (commercially thinned) than in unspaced stands (Attiwill, 1994). Norway spruce and Scots pine plantations in Europe are so highly vulnerable to an array of insects and fungi that cut boles are stripped of their bark to prevent bark beetle infestation (Maser, 1990). Southern US pine plantations have been subject to severe outbreaks of southern pine bark beetle (Franklin et al., 1989). Douglas fir plantations are more susceptible to foliage diseases and to aphids (Franklin et al., 1989). Whereas old growth forests house carnivorous insects and birds, many of which live in cavities in snags, plantations are cut at the point of maturity[10] and have either no snags or very few, and therefore do not benefit from old-growth carnivorous insects and cavity-nesting birds (Cline et al., 1980; Harding, 1994). Thus, the loss of structural complexity with conversion from old to new forests enhances rather than diminishes many

[10] To be taken with a grain of salt since a rotation age of 80 years is rather well short of a lifespan that in a species like Douglas fir can exceed 1000 years (Hosie, 1990). Chris Pielou consequently speaks of the "maturity scam" (*in* May, 1998:35).

insect problems (Franklin et al., 1989). The sheer summer heat associated with clear cuts (10-15°C greater than nearby forested sites in the boreal forest) also kills seedlings (Pomeroy, 1995).

The combined effect of these (and other) factors appears to be an overall decline in productivity of managed forests (Maser, 1990). The immediate gain in productivity that accompanied conversion of deciduous forests to fast-growing coniferous stands in central Europe has been followed by the loss of one or more spruce site classes representing a 20 to 30 percent drop in production over a century and a half. Some high-elevation sites in Oregon and California have failed to regenerate after as many as three and even four attempts (Perry et al., 1989). Of all the factors just noted, the short rotation age of a normalized stand compared to its natural equivalent is among the most important. According to Downing and Weber (1984), aboveground biomass and forest age are the two most powerful predictors of productivity (g dry wt/m^2/yr). So, although old trees exhibit negative growth, these authors found that "forests with large diameter trees yield the highest rate of production for a given age and biomass" (231). "[W]hen the data are standardized," writes Robert Peters (1991), "the annual increases in above-ground biomass harvestable from plantations and natural stands do not differ significantly and the total annual increment in biomass in plantations may even be reduced; no analysis showed plantations to be more productive than natural stands" (194).

With this primer on forest ecology and management, let us now return to the National Forest Strategy and its relevance, if any, to "forestry nirvana" by looking at two

issues the document touches on, namely timber production and the concept of sustained yield with its consequences for old growth.

Timber production

In keeping with the requirements of an extensive, staples-based economy, the goal of the Strategy, to meet "present needs without compromising the ability of future generations to meet theirs" (Canadian Council of Forest Ministers, 1992:3) through judicious stewardship and ecosystem management, is more concerned with quantity than quality (the form forests take). As long as future people have enough timber to meet their needs, we shall have fulfilled our obligation. There is no requirement that the forests felled today be replaced with similar stock, only "with species appropriate to the site" (20), nor that the genetic variation of the site should be carried forward into the next generations (except by encouraging natural regeneration). Tree planting, for example, may "tak[e] advantage of faster growing, genetically improved native species" (16).

The improvement theme is an old one, of course, developed for modern consumption by nineteeenth-century progressive (and Victorian) writers convinced that human engineering is superior to that of nature, since nature "has no economy," is wasteful and inefficient (Worster, 1977:175). There are at least three problems, however, with the introduction of rapidly growing, genetically 'improved' material: the presumption that we can know what genetic material will be needed by future trees; the dilution (and eventual loss) of local adaptations in regional gene pools with resulting genetic

maladaptation; and a cost evident in lower density of wood and greater vulnerability to frost, disease and insects (Quiring, 1996; Norse, 1990). The production of clones from the tissue of a high-value commercial seed embryo through a technique called somatic embryogenesis (a type of vegetative multiplication) is actively pursued by several companies, among them Weyerhaeuser (Kloppenburg, 1988), and by the Canadian Forest Service (Charest, 1996). Yet the practice will make every region planted with the genetically identical seedlings supremely vulnerable to insects and disease (Kloppenburg, 1988).[11]

The preference for quantity can be surmised also from the lack of attention paid to the evolving structure of a natural forest: ensuring that future generations can meet their needs for wood merely requires that the site be able to sustain a succession of crops felled when the trees reach maturity and replenished naturally or with seedlings. This ignores the mature to old phases of succession and, except where natural regeneration succeeds, the herb (regeneration) stage. It also displays a lack of concern for animals dependent on

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[11] Of the roughly 100 million seedlings planted in Ontario every year for the last six or so years (down from 160 million during the late 1980s), at the moment fewer than 10 percent are improved. It is expected that in the near future this number will increase to 50 percent or more. The bulk of the work of the Ontario Tree Improvement Board of the Ministry of Natural Resources is with black spruce and jack pine, and the focus in the first generation has been on selection for growth rate (and stem form in jack pine). Vegetative multiplication through controlled pollination of a few exceptional trees, which in this region would apply mostly to jack pine since black spruce roots easily, will become more relevant in the next five years as the next generations of seed mature (D. Joyce, pers. comm., 1998). In New Brunswick, at JD Irving's Juniper Tree nursery, all the seedlings are grown from improved seed grown at the Parkindale Irving seed orchard (JD Irving, no date).

these stages. Rather than worry about the maintenance of landscape-scale processes, policy makers hope that ecologically-informed management together with silvicultural practices will preserve the soil's fertility "so that [the forest's] natural resilience allows the recovery process to begin immediately after a disruption" (Council of Canadian Forest Ministers, 1992:12). Thus, as long as "human activities ... remain within the tolerance limits of the environment" (3), the conversion of natural to production forests is a process that will not be resisted except where access is a problem. The impoverishment or simplification of ecosystems that results from this conversion is not deemed a transgression of ecological limits.

The discussion around the production issue, in the Strategy and elsewhere in Canadian forest policy documents, is typical of a widespread optimism in the ability of intensive management (primarily silviculture but also, as noted, biotechnology) to dramatically increase productivity (Hirt, 1994) from the current 30-40 percent of presumed potential yield (Godbout and Bouthillier, 1991; Baskerville, 1990).[12] Alas, as I noted earlier, plantations are not more productive than wild forests (Downing and Weber, 1984; Peters, 1991).[13] A consequence of the optimism is that the National Forest Strategy

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[12] Plus interviews with Gordon Baskerville, Frank Oberle and Blake Brunsdon.

[13] It is a disingenuous claim, anyhow, since the secondary forests that replace the originals are known for their 'falldown' effect, a reduction in volume that "accompanies the transition of virtually any wild forest to a managed state" (Baskerville, 1990:27). Even the National Forest Strategy alludes to it (Canadian Council of Forest Ministers, 1992:section 4.5). Perplexingly, Baskerville (1990) writes, "the current production of a wild forest is less than the land is capable of supporting," then proceeds to say that only rarely will the level of growing stock in a managed forest be "as high as that in the initial wild forest,"

does not envision lowering the Annual Allowable Cut, although it is conceded that various non-timber uses may diminish "the land available for commercial timber production" (Canadian Council of Forest Ministers, 1992:28). Silviculture, then, and currently underutilized species should be marshalled to "maintain and expand the sustainable supply of timber from public and private lands" (30). The *State of Canada's Forests* is more blunt. It says, "One way to maintain or expand Canada's timber supply would be to extend road systems into remote areas, thereby adding to the area available for commercial timber production" (Natural Resources Canada, 1995:52). Habitat fragmentation does not appear to be a concern. As for the Strategy, it sees the need to enlarge national "inventories to include a range of resources, including those of non-commercial forests" (Canadian Council of Forest Ministers, 1992:15). Better inventories are needed if we are to know how to proceed with multi-value forest planning (R. Carrow and L. Dellert, written and pers. comm., 1998), but in light of the pressure on the wood supply (to be alleviated by opening up remote areas and by logging 'underutilized' hardwood species) such inventories may well serve to facilitate expansion instead of better management. Thus, although it may not have been the intent of those who wrote the Strategy, Canadians seem poised to make available for use everything that can be, calling to mind a few lines from Little Red Riding Hood (with apologies to the wolf): 'Grandmother, what big ears and eyes you have!' 'And what big teeth you have!' All this machinery, all the

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although the "designed crop" supposedly "captures a higher portion of the land potential through restructuring the forest with controlled harvesting, and through restructuring stands with silvicultural intervention" (27).

new knowledge in effect serve 'the better to eat you up!' The progression from high quality to underutilized or less desirable species is at any rate not new. It is well known from the United States and Canada (Hirt, 1994; May, 1998) and in fisheries too, where the tendency is to fish down the trophic levels to smaller and smaller fish (Pauly et al., 1998). Pinchot (1910) had said that the "first great fact about conservation is that it stands for development" (42); today Canada's National Strategy gives the same message in contemporary form – sustainable forestry is development. I explore this idea a little more in the following section.

Sustained yield, sustainable development and the forest museum

The sustained yield concept also illustrates the Little Red Riding Hood attitude of the sustainable federal forestry initiative in Canada and brings us to my point about the creation of forest refuges in old growth. Sustainable development, says the Strategy, "expands the principle of sustained timber yield ... by including wildlife and fish habitats, watersheds and hydrological cycles, as well as gene pools and species diversity, to ensure that the use of the forest today does not damage prospects for its use by future generations" (Canadian Council of Forest Ministers, 1992:4).

This position, that the core of sustainable forestry is sustained yield, is held by many in the industry, academe and government. For instance, Wiersum (1995) argues that the principle of leaving forests for future generations (sustainable development of forests), part of the eighteenth-century German forestry literature, became operationalized as

sustained yield. Similarly, Alston (1991) defines sustained yield as "economic development of forest resources that meets the needs of the present without compromising the ability of the future generations to meet their own needs" (310). In like vein, Maini (1991) believes that sustainable forestry is broader than sustained yield, being concerned with much more than timber, and in a 1991 paper, C.D. Rannard, the then director of Manitoba's Forestry Branch, wrote that sustainable forestry "is an expanded philosophy to sustained yield" (109). The background paper for the National Forest Strategy naturally takes a similar tack. Godbout and Bouthillier (1991:25) said that "sustained yield is a tool for grasping the complex reality of the forest. ... [It] makes a good partner for sustainable development when it allows for integrated forest management" in which case it is not the same concept as the traditional one. In sum, sustainable forestry would seem to combine a concern for a regulated flow of products with what Hagenstein (1992:34) called the "most intuitive" meaning of sustained yield, namely management "to assure that the biological productivity or capability of the forest resource is maintained."

Regardless of definition ("all variations on the theme," as Rannard says [1991:109]), by far the most serious problem with sustained yield is that it only applies to already converted or 'normal' forests, those that have been put on some sort of schedule that will provide a regulated flow of timber. In old growth forests, where growth is zero and even negative, "sustainable growth [that is to say, a situation in which the rate of cutting balances that of annual growth] is not achieved until 1) all overmature stands have been harvested and regenerated; and 2) an even distribution of age classes has been

achieved" (Schallau et al., 1994:26). This is the argument supporting the liquidation of old-growth forests. Thus, in a sustainable forest based on sustained yield, health is measured by productivity or growth; such sustainable forests are therefore young ones, those in the 'vigorous' growth section of the life curve that have replaced the original older stands.

This is the dilemma facing any plan for sustainable forestry that also endorses sustained yield. Sustainable development of forests is supposed to maintain and even enhance forest processes, but sustained yield requires that mature to old stands first be cut and then replaced by fast-growing seedlings, crippling the ecological process at both ends of the cycle. Statements about old growth in the Strategy illustrate the problem well. On the one hand, the policy advocates ecosystem management which, as we have seen, "refers to the integrated management of natural landscapes, ecological processes, wildlife species and human activities" (Canadian Council of Forest Ministers, 1992:13); on the other hand, old growth, in many parts of Canada an integral part of the forest process, is not productive in the way young forests are. Consequently, the Strategy must adopt an ungainly compromise position: we shall retain as "a natural heritage" (14) "representative old-growth stands ... through designation in protected areas, while in other cases management on longer rotations could safeguard their contribution to the ecosystem" (12). This isolating, museum approach to ecology is warranted because Canadians, we are told, "have a special attachment to old forests" (12) - in other words, an interesting quirk to be indulged paternalistically and not for any ecological reason. M. Jacob (1994)

associates the preservationist (museum style) outlook with that of shallow ecology to which sustainable forestry belongs.

Summary remarks

Both the Little Red Riding Hood production bias and the museum attitude imply the conversion of virtually all of Canada's remaining forests into 'sustainable' tree farms. It is difficult not to think of Kellhammer (1992:22) who speaks of a "sophisticated propaganda campaign aimed at ... attempting to reprogram our basic forest concepts." He suggests that the purpose of such activity is to make sure that Canadians will have no benchmarks left against which to compare the new landscape being wrought by forest companies. Whether or not we share his suspicion, clearly a policy based on sustained yield can espouse sustainability on ecological grounds while taking an approach to the task that ignores basic ecological and geological processes. I shall pick up this point again later. Sustained yield may have evolved to take into account ecological constraints (McEvoy, 1987), but as long as human activity is *not* "nestled in living ecosystems" we shall have "park and forest islands stranded in a sea of anthropogenic change" (Grumbine, 1993:259). Indeed, Rannard (1991) contends that the "traditional management concepts will not be used differently but they will be done in keeping with Sustainable Development-oriented thinking" (111), an explanation that should inspire a good deal of doubt about the potency of the 'new' outlook.

Concerned primarily with human welfare, Canada's blueprint for sustainable

forests, no matter how ecologically sensitive, takes as its point of departure human use. Profoundly anthropocentric, it inverts the actual order of evolution, pretending that natural systems are equivalent to human ones when they pre-date, gave rise to and sustain human existence. Thus, while the National Strategy calls for "sound ecological principles," it misses a fundamental scientific fact, the reality that humanity arose out of nature and did not create it. It is the Little Red Riding Hood approach to sustainability: scientific achievement only serves the attempt to extract a greater yield while making possible an ever widening scale of operation which ensures that natural forests, with the exception of a few museum stands, will have been all 'eaten up.' The selection process for the Model Forest Program, below, will further indicate the perils of this divided philosophy. The National Forest Strategy shows that the new ecological thinking can, as Worster (1993) feared, be interpreted to rationalize a permissive position on human activity. It supports the proposition of the previous chapter that the available scientific information is filtered through the world view of the political and corporate elites before becoming integrated into policy and management practices. The next chapter will elaborate on the theme of a permissive ecology in the service of the dominant paradigm.

CHAPTER 4

THE MODEL FOREST PROGRAM

In the section entitled "The National Forest Strategy and Model Forest Program in context" of the previous chapter, I discussed the policy precedents for the federal initiatives that are the subject of the study. Now I shall address a few other aspects of this kind specifically to do with the Model Forest Program.

The Model Forest initiative is one of a three-part strategy known as the Partners in Sustainable Development of Forests Program outlined in *Canada's Green Plan for a Healthy Environment* of 1990. Along with enhanced scientific research and the expansion of the information base and knowledge, the program aimed to "shift the management of Canada's forests from sustained yield to sustainable development" (Forestry Canada, no date:1), the same goal expressed in the Green Plan. Consistent with the World Commission on Environment and Development's blueprint, the project was to "help forest managers implement ecologically and scientifically sound management practices that simultaneously ensure the economic, social and environmental benefits of our forests to present and future generations" (Forestry Canada, no date:1).

After the release of the Green Plan in December 1990, the Ministry of Forests under Frank Oberle fielded an ambitious platform that brought together the interested parties in regional conferences to produce both the Accord and the National Forest Strategy. At the same time, the Green Plan presented the Minister with a unique

opportunity to infuse new funds into an impoverished and statutorily crippled portfolio and launched, with the consent of the provinces, the Model Forest Program.[1] Oberle wanted to explore the meaning of the new terms in forest management - ecosystem management, environmental forestry, integrated resource management - in the different ecological and geoclimatic regions of Canada. The Model Forest Program was to create, by national competition, working-scale model management areas where a partnership of stakeholders would put ecological forestry into practice, where commercial forestry would co-exist with wildlife, water and fish, where research would be carried out and the most advanced forest management practices applied. These basic criteria for the program were approved by Cabinet (National Advisory Committee on Model Forests, 1992).

As a national project, the Model Forest Program was to reflect the reality that ecosystems do not follow political boundaries; it would provide the kind of co-ordination this fact necessitates and a tie-in to existing international obligations such as the Migratory Birds Convention.[2] If the demonstration areas and the tranfer of technology were successful, all of Canada could become a model forest and Canada a model to the world in steering the transition to sustainable, equitable resource management.[3] In addition, the

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[1] Section based on interview with former Minister of Forests, Frank Oberle, 1 May 1997.

[2] This paragraph based on interview with Oberle, 1 May 1997.

[3] Indeed, the model forests have frequently hosted visitors from around the world. Canada has also sponsored model forests internationally, for example in Siberia. Each of these sites is twinned to a Canadian one.

Model Forest Program offered a way to break with the precedent of continued federal aid to the provinces through the federal-provincial forestry agreements. As Oberle explained, priorities had changed. Instead of catching up on backlog forestry, the message was to manage the forests. Through the Model Forest Program, Ottawa could refocus the work of the nation's forestry research centres on the new priorities by establishing research partnerships with the model forests. Most notably, having reformulated the federal role through the Forest Accord and the National Forest Strategy, the Model Forest Program was the choice vehicle for "the delivery of the federal mandate," and at a price far more congenial than the previous agreements. In fact, financial constraints being what they were, the new program would not have been possible if the agreements had not been phased out. Not surprisingly then perhaps, despite the views of some that it was a "harebrained" idea that the provinces would never accept, for all these reasons Cabinet lent its support.

In this study, I inquire into two areas of the Model Forest Program's first phase (1992-1997): 1) in the current chapter the process of selecting each of the original ten successful submissions is explored in order to clarify 2) how and to what effect the federal government transcribed the idea of sustainable forestry into guidelines for its practice. This will be treated in chapters 5 and 6 where I recount how two of these successful applicants have worked out the program on the ground, affording a good view of the wider forest policy community at work in an experimental set-up. For the selection process, where in addition to documents I have available a second source of empirical

information in the form of interviews, I draw on the history of science literature first, then return to the forest ecology and management literature for the discussion.

THE MODEL FOREST PROGRAM SELECTION PROCESS

Goals of the Model Forest Program

A general statement of the Model Forest Program's goals is that it must help shift the forest industry from a sustained yield to a sustainable development basis. The detailed objectives, as set out in Forestry Canada's (1991a) guide to applicants, are:

- to accelerate the implementation of integrated resource management, a principal concept in the sustainable development of forests;
- to innovate the practice of forest management;
- to test and demonstrate sustainable forestry using the most advanced technology and best available forestry practices.

Guidelines for Model Forest Program proposals

On the direction of the Minister, the Forest Service then recruited a high-profile National Advisory Committee (National Advisory Committee on Model Forests, 1992).[4] Four of the ten members were drawn from academe, two were industry representatives and another two senior Canadian Forest Service officials, serving ex-officio and as secretary.

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[4] Plus interview with Gordon Baskerville, 12 October 1996, Toronto.

This core was augmented with the Executive Director of Wildlife Habitat Canada and a chief of the Algonquin First Nations. Art May, President of Memorial University and one-time President of the Natural Sciences and Engineering Research Council, was its chairman. Its mandate was to design the competition, evaluate the proposals and convey final recommendations to the Minister. With the above Cabinet-approved parameters for the Model Forest Program, the National Advisory Committee and Canadian Forest Service translated its goals into selection criteria and guidelines for applicants. A synopsis of these criteria and their weighted values follows (Forestry Canada, 1991a:5):

1. objectives and management philosophy and their support of the concepts of sustainable development and integrated resource management (40%), taking into account
   - goals and objectives of the Model Forest and their relevance to the objectives of the Model Forests Program
   - management concepts, structure and decision-making processes
   - nature of partnership and involvement of key stakeholders
   - a long-term commitment to the principle of sustainable development
2. proposed activities and results using 'best forestry practices' (25%), specifically
   - activities and outputs proposed and results expected over the five-year period
   - how they support the objectives and goals of the Model Forest and
   - how they differ from present practices

3. use of the most advanced technology and demonstration of techniques and results (25%), discussing
   - how any gaps in technology, expertise or knowledge needed to implement the proposal will be addressed
   - how the Model Forest will link into existing research programs and the collaborators involved
   - how the results will be transferred to others, at home and abroad
4. communication of the results to the public and general financial and administrative management (10%), including
   - a proposal for public communications activities
   - a realistic budget
   - any leveraging accomplished with the aid of federal funds.

These points spelled out the framework for the evaluation but other considerations mattered in the selection process. The guide to applicants (Forestry Canada, 1991a:4) mentioned a preference for easily accessed, "highly productive sites" of over 100 000 hectares in size, having regional issues of concern to both the public and forest managers; and, in general, the goal was to have a national network representing Canada's major forest regions and a mix of land tenures. Timber or fibre was to be an "essential component" in a management philosophy that comprised other values and a variety of forest uses.

Solicitation of proposals

Minister Oberle announced the program to the nation in September 1991, expressing the hope that it would contribute to all forests being managed sustainably in the future (CBC, 25 September, Thunder Bay). The Canadian Forest Service held regional briefing sessions to explain the program, resulting in the submission of nearly 90 letters of intent (Natural Resources Canada, 1993). The National Advisory Committee decided to extend the initial 20 December deadline, which was impossible to meet, to 28 February 1992 (National Advisory Committee on Model Forests, 1992). Fifty proposals were received.

The selection process

To assist in the selection, the National Advisory Committee struck a Technical Review Committee. Qualifications for its members included high expertise, thorough regional understanding and general expertise with sustainable forestry (J. Hall, pers. comm., 1997). As with the National Advisory Committee, they were drawn from academe, industry and government (but notably not First Nations or environmental groups), represented all regions of the country and even included someone from the Oxford Forestry Institute of the University of Oxford (Natural Resources Canada, 1993). The expertise of the nine-member committee (not counting its secretary) comprised forest ecology, wildlife management, information and decision support systems, and operations.

The review process began with an initial check of all proposals to discard those that did not meet the basic criteria (Technical Review Committee, 1992). The Technical

Review Committee was split into three teams of three and one third of the proposals were assigned to each team. Conference calls allowed team members and the group as a whole to come to a consensus decision. A calibration exercise followed in which everyone reviewed five sample proposals in order to calibrate their judgements; the results were discussed in meetings of the Technical Review Committee with and without the National Advisory Committee. The proposals were categorized at a final meeting and the rankings (according to category: outstanding, excellent, good, marginal and poor) reported to the National Advisory Committee. During this stage once again the group was divided into three and each team, comprising someone from within the region of origin of the proposal, one reviewer from without and one who had seen the proposal at the outset, evaluated each proposal. But no one with a declared conflict of interest participated in final deliberations for any proposal in which an actual or perceived conflict existed. The list produced by the Technical Review Committee served as a tool to help the National Advisory Committee pick those with the merit to form a representative network (J. Hall, pers. comm., 1997).

The top five proposals - Manitoba Model Forest, Western Newfoundland Model Forest, Prince Albert Model Forest, Fundy Model Forest and Foothills Model Forest - as ranked by the Technical Review Committee and recommended by the National Advisory Committee on Model Forests (1992), were approved for funding. Four others - Une Forêt Habitée, Eastern Ontario Model Forest, Clayoquot Sound Model Forest and McGregor Model Forest, this last on condition that it involve Lheit-Lit'en First Nations -

were recommended by the National Advisory Committee on the basis of geography, less so quality.[5] A tenth, Lake Abitibi, was later added by Ministry of Forests, again on the basis of geoclimatic representation (Oberle *in* Forestry Canada, 1992a).

It seems to have been important, from a political point of view, to have as the National Advisory Committee's chairman someone closely associated with the Natural Sciences and Engineering Research Council.[6] Modelling its protocol on that council's etiquette, the Technical Review Committee's deliberations ensured fair process. For instance, the precaution that Technical Review Committee members must declare any conflict of interest and were to be excluded from the review of all proposals that might be affected by the conflict (Technical Review Committee, 1992), proved fortuitous in the face of Nova Scotia Forest Minister John Leefe's suggestion following the announcement of the successful model forest sites, that the failure to locate one in his province might be due to the lack of a provincial representative on the Technical Review Committee (Proctor, 1992). But neither Jeff Patch of the Technical Review Committee nor Gordon Baskerville of the National Advisory Committee, the two members with a New Brunswick background who might have championed the Fundy submission at the expense of Nova Scotia's, had had anything to do with these proposals.[7]

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[5] Interviews with J. Stan Rowe, 26 June 1996, New Denver, BC and Jeff Patch, 2 May 1996, Fredericton, NB; John Hall, personal communication, 1997.

[6] Interview, Gordon Baskerville, 12 October 1996.

[7] Patch, 2 May 1996.

The first task of the Technical Review Committee was to derive more explicit assessment criteria from the rather vague ones in the guidelines. How to operationalize them was discussed in the Technical Review Committee but much depended on the reviewers' experience and inevitably reflected their background.[8] The following will convey a sense of the elements deemed most important by the Technical Review Committee.[9]

- Objectives and management philosophy in general terms:
  - * well articulated objectives and planning tools identified
  - * adaptive management and monitoring, both as to how well the objectives are being achieved and of one's assumptions, in recognition of the many unknowns involved in dealing with natural systems
  - * range of resource values & method of integrating them into the planning process
  - * focus on timber management
- Forest level approach, ecoregional planning, long-term management across the landscape that preserves the forest ecosystem, with modelling of the impact of logging and silvicultural activities on a range of values, and a sense of what the forest would look like well into the future

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[8] Rowe, 26 June 1996.

[9] This section based on interviews with Jeff Patch, Lois Dellert and Stan Rowe.

- A mix of jurisdictions, not just within the model forest area but across the country
- Partnerships:
    * in order to implement the model forest, key partners had to be on board, including First Nations, with a commitment on the part of all those with jurisdiction who were going to be affected by the model forest
    * industry deemed critical because of its access to timber and its role in implementing the forest management side, and would also increase a model forest's chance of success because of its technical/managerial expertise
    * decision-making process: who had the say & was industry prepared to share it
- Technology and practices:
    * research & technical tools especially emphasized
    * realism of the proposals, a realistic sense of what one can do with geographic information and decision support systems in a five-year period & technical competence in planning, forest management and geographic information/decision support systems
- Budgets must be realistic
- Innovation
- Size: an informal criterion, size was somewhat important because in a smaller area it is more difficult to meet long-term landscape planning objectives
- Presentation: not important except insofar as lack of clarity leads to poorly expressed philosophy and objectives, and poor presentation makes for difficult reading.

Finally, in weighing the proposals the Technical Review Committee was aware that their suggestions needed to be of a kind that the National Advisory Committee could recommend to the Minister and the Minister could accept. Thus, although the Technical Review Committee was free of political pressures and concentrated only on a proposal's technical merits, it was not without political acumen.[10]

The material

This section is intended as a guide to the fifty proposals submitted to Ottawa (Fig. 4.1); detailed information about them is tabulated in appendices A through D. The other objective is to discuss how I derived a classification scheme for the critical criterion 'management philosophy' advanced by each submission. Each type needed to be assessed in order to a) determine the range of philosophies present, b) determine the degree to which the successful proposals adhered to the standard set by the Model Forest Program guidelines, c) identify just what that standard was, in terms both wider and more concrete than the analysis of the National Forest Strategy was able to yield, and d) be able to compare them to one another and draw conclusions.

A taxonomy of management philosophies

If the proposals' forest management philosophy was the most important factor for the

[10] Interviews with Patch and Dellert.

Figure 4.1

Location and name of the 50 submissions to the

Model Forest Program

Figure 4.1a: Québec and Atlantic

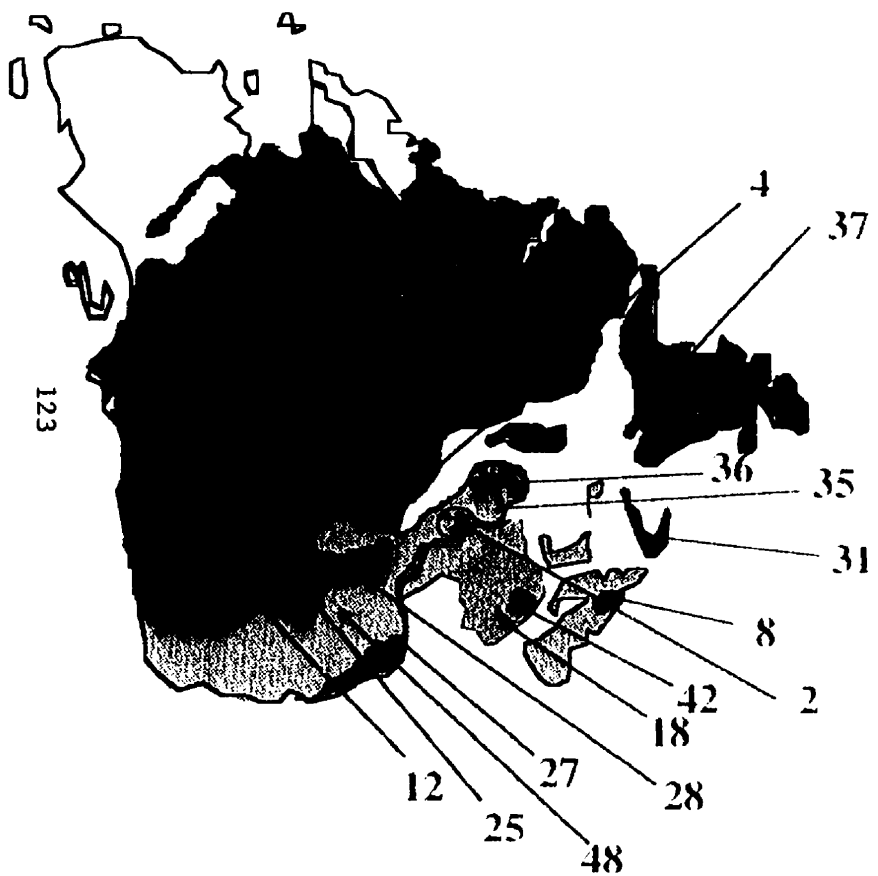
Figure 4.1b: Ontario

Figure 4.1c: Prairies and Northwest Territories

Figure 4.1d: British Columbia

Source: Forestry Canada, 1992b

QUÉBEC & ATLANTIC
QUÉBEC ET LES PROVINCES ATLANTIQUES



Forestry Canada Forêts Canada

2 Une Forêt Habitée de Dévéloppement Durable
Abitibi-Price, le Faculté de Foresterie et de Géomatique de l'Université Laval, le Groupement forestier de l'Est du Lac Témiscouata inc, le Syndicat des Producteurs de bois du Bas-Saint-Laurent

4 La Forêt Modèle Kamamukan Mamicouagan
Cégep de Baie-Comeau

8 St. Mary's-Liscombe Model Forest
Canadian Institute of Forestry (Nova Scotia Section)

12 James Bay Model Forest
Grand Council of the Crees
Cree Regional Authority (Que)

18 St. John Regional Model Forest
City of St. John

25 La Forêt Modèle de la Mastigouche
Kruger Inc.

27 L'Estrie-Une Forêt Durable Habitée
Société D'Amémagement de L'Estrie

28 Seigneurie de Beaupré
Le Séminaire de Québec

31 Cape Breton Model Forest
University College of Cape Breton

35 Gaspé Model Forest
MICMAC Restigouche Band Council

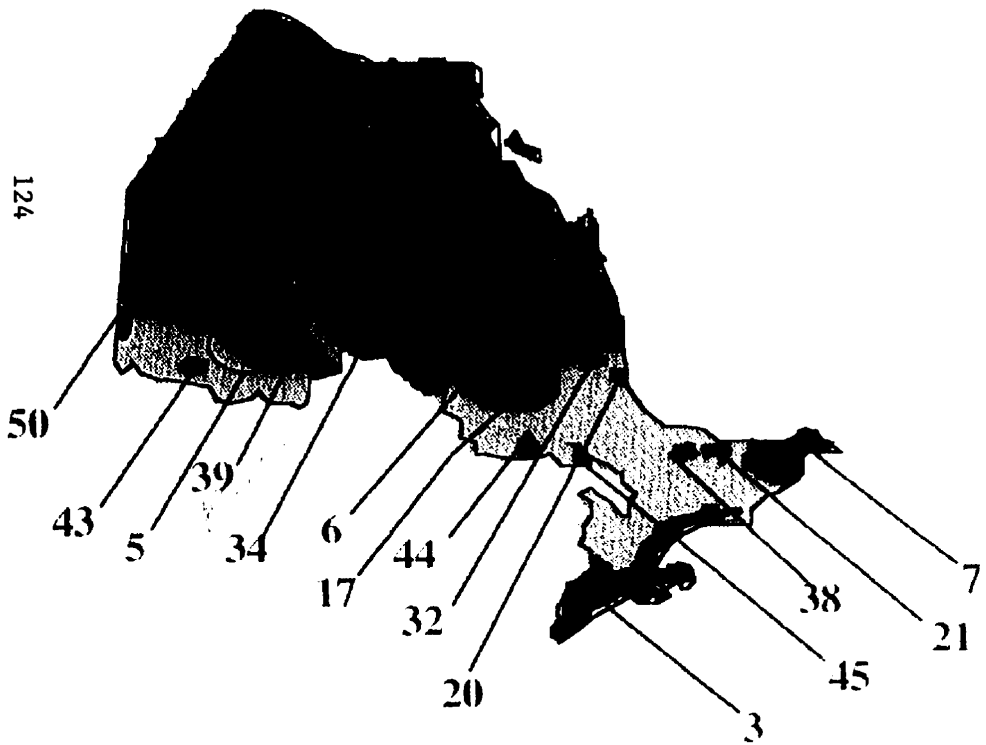
36 Gaspé Model Forest
Canadian Pacific Forest Products Ltd.

37 Western Newfoundland Model Forest
Corner Brook Pulp & Paper Ltd.

42 Fundy Model Forest
J. D. Irving Limited

48 Forêt Modèle de la Mauricie
Le Syndicat des Producteurs de Bois de la Mauricie

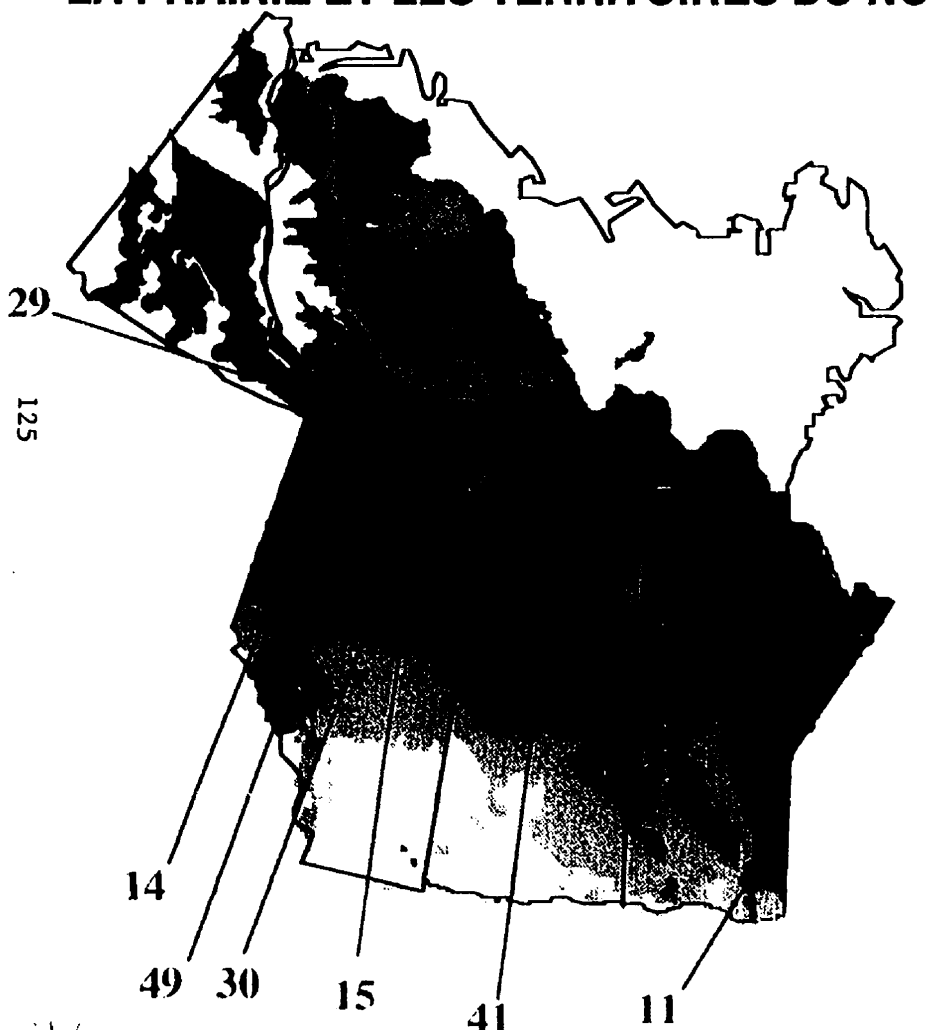
ONTARIO



3	Carolinian Model Forest Ontario Forestry Association
5	API Forest Abitibi-Price Inc. (Lakehead Woodlands Division)
6	6/70 Model Forest 6/70 Area Economic Diversification Committee
7	Eastern Ontario Eastern Ontario Model Forest Proposal Committee
17	Lake Abitibi Model Forest Abitibi-Price Inc. (Iroquois Falls)
20	N'daki Menan Teme-Augama Anishnabai
21	Algonquin Provincial Park Algonquin Forest Authority
32	Elk Lake Model Forest Elk Lake Municipality
34	Nakina Model Forest The Corporation of the Township of Nakina
38	Haliburton's Model Forest Haliburton Forest & Wildlife Reserve Inc.
39	Armstrong Model Forest Armstrong Resource Development Corp.
43	Seine River Model Forest Boise Cascade Canada Ltd.
44	Kirkwood Model Forest Ontario Ministry of Natural Resources
45	Woodlands in Keeping For Our Youth Wikwemikong Development Commission
50	Regional Community Model Forest Townships of Ear Falls, Red Lake, Golden

Forestry Canada Forêts Canada

PRAIRIES & NWT
LA PRAIRIE ET LES TERRITOIRES DU NORD OUEST



11 Manitou ABI
Abitibi-Price Inc.

14 Resource Management Through Community "I s"
Canadian Forest Products Ltd., Alberta Operations

15 Lac La Biche Model Forest
Alberta-Pacific Forest Industries Inc.

29 Lower Liard Community Forest: A Co-operative Project Between Government and Local People
Government of the Northwest Territories

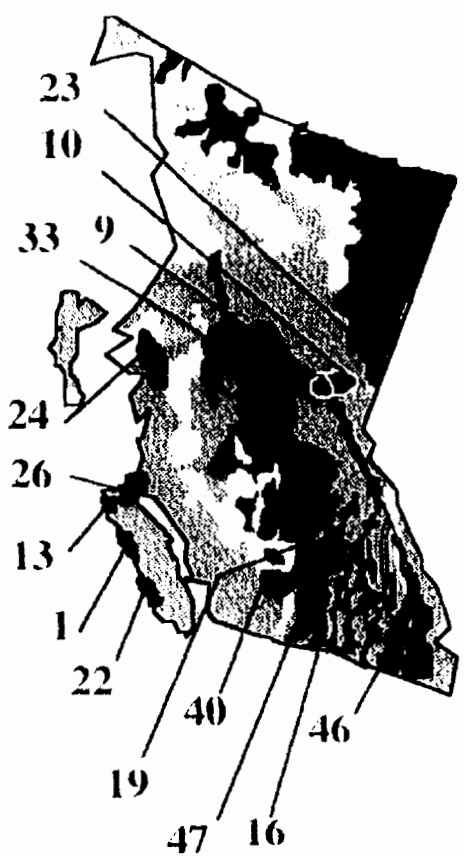
30 Caribou-Lower Peace Model Forest
Little Red River Cree Nation

41 Prince Albert Model Forest
Weyerhaeuser Canada Ltd., Saskatchewan Division

49 Foothills Forest
Weldwood of Canada Ltd.
Alberta Forest Technology School

Forestry Canada Forêts Canada

BRITISH COLUMBIA
COLOMBIE BRITANNIQUE



1 West Strathcona Model Forest
International Forest Products Inc.

9 McGregor Model Forest
Northwood Pulp and Timber Ltd.

10 Herrick Valley
Lheit-Lit'en Nation

13 Kyuquot Model Forest
Kyuquot Native Tribe

16 Boundary Model Forest
Boundary Model Forest Steering Committee

19 The Upper Adams Model Forest
Shuswap Nation Tribal Council

22 Area "C" Model Forest
Clayoquot Sound Sustainable Development Strategy Steering Committee

23 Murray River Model Forest
District of Tumbler Ridge

24 Kitamaat Model Forest
West Fraser Mills Ltd.

26 Oweetna-Kula Model Forest
Musgamagw Tribal Council

33 Nechako Model Forest
Municipalities of Vanderhoof and Fraser Lake, B.C.

40 Nicola Model Forest Partnership
Nicola Valley Tribal Council
Westwood Fibre

Technical Review Committee, my most pressing concern was to document a different type of philosophy, namely the attitude towards nature and forests exhibited by each proposal. My rationale for classifying each proposal is explained below, in the section 'presentation of the material'; here the objective, as I made clear a moment ago, is to provide the epistemological basis for goal 'c' of the above paragraph (to identify the standard of the Model Forest Program guidelines beyond what the analysis of the National Forest Strategy had yielded) and to allow me to assess the available alternatives. Accordingly, I prepared a set of profiles (Figs. 4.2-4.9), all but one Western in content. They are *simplified* snapshots drawn from a variety of sources, usually in the history of science and forestry, and synthesize in a very general way, the changes in nature philosophy evident in the West over several centuries, highlighting the direction in which forest management was developing. As with any taxonomy, these are not rigid categories but they are nevertheless a useful conceptual device. Each profile functions as an indicator of a typical though generalized nature philosophy of a particular age that may be said to become increasingly instrumentalist in outlook. The last few profiles are contemporary alternatives to the instrumentalist world view.

I begin the set with a compilation of some pre-seventeenth-century ideas (Fig. 4.2) in order to illustrate a few key changes that have occurred in the Western world view with the onset of the modern era and to place current management approaches in historical context. During that time we can discern two clusters of meanings around the word 'forest.' The first embodies the struggle between culture and nature. The experience of

NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.2: Pre-Seventeenth-Century notions & legacy

nature	▷	reflects & reveals God's benign intentions & goodness
	▷	has aim, meaning
	▷	stable, immutable universe, a perfect sphere, harmonious
	▷	closed universe, hierarchically ordered as to value
	▷	human at centre of heavy imperfect world, heavenly spheres perfect & immovable
forests	▷	abode of pagan spirits, sanctuary
	▷	external to human world of order, law
	▷	"anarchy of matter"
	▷	"a certain territory of woody grounds & fruitful pastures, priviledged for wild beasts and fowl to rest and abide in, in the safe protection of the King, for his princely delight and pleasure"
sources		Harrison (1992), Koyré (1957), Manwood (1598), Worster (1977)

culture creates a civic space delimited by (walled) enclosures. Within society one is subject to law, to human institutions; outside is the realm of the forest, nature's rule, an asylum for outlaws, for depraved human nature (Harrison, 1992). The body civic provides rules for human action, distinguishes between the clean or the proper and the unclean, dirt, the unpatterned, which is dangerous and must remain outside (Douglas, 1966). Rome's civic space was bounded by reference to the anarchy of the forests outside, a *res nullius* (no one's realm) in contrast to society's *res publica* (public realm), 'forest' probably deriving from *foris*, outside, and *nemus*, woodland, from *nemo*, nobody, since it is a *locus neminis* (Harrison, 1992). The forest is an antagonist, an obstacle and threat to human

affairs, so much so that to solve the problem of the danger at this margin by fighting it might also eradicate it. But insofar as forests are anarchic and a refuge from the domination of society, they foster cultural differences, independent holdouts representing the spirit of the local place against the tyranny of homogenization, whereas "empire erase[s]" that spirit (52).

The forest as *foris* is a judiciary term from the eighth century, by which time monarchs have become worried about the continued survival of its wildlife (Harrison, 1992). The *foresta* refer not to any and all woodlands but to the game preserves set aside (*forestare* is to make off limits, to exclude) by royal decree for the express use of the king, whose hunts re-enact mythic struggles for the ritual renewal of the entire society and even of nature; the hunts also serve to structure the hierarchy of courtly life, since part of the king's duty is to recognize and reward worthy men for their capabilities (Moore and Gillette, 1990, 1992; Schama, 1996). These preserves are thus no longer outside of the law though they remain outside of the public domain, and are administered through special acts. This is well exemplified by John Manwood's 1598 treatise of the English forest laws.[11]

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[11] "A forrest is a certen Territorie of wooddy grounds & fruitfull pastures, priviledged for wild beasts and foules of, Forrest, Chase, and Warren, to rest and abide in, in the safe proctectiō of the King, for his princely delight and pleasure, which Territorie of groūd, so priviledged, is meered and bounded with unremoveable, markes, meeres, and boundaries, either knowē by matter of record, or else by prescription: And also replenished with wilde beasts of venerie or Chase, and with great coverts of vert, for the succour of the said wild beastes, to have there abode in: for the preservation and continuance of which fair place, together with the vert and Venison, there are certen particuler Lawes, Priviledges and

NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.3: Enlightenment

nature	▷	universe infinite/interminate (*interminatum)*
	▷	confusion of nature to be fixed by application of method (subjects separate from studied objects)
	▷	power over nature is goal (God's traditional role)
	▷	nature literalized; subject to humanist ethos
forests	▷	reduction to timber/woods, resource for profit, use
	▷	care, vigilance & economy in the public (state) interest
	▷	"oracle of reason" replaces superstition & veneration, cuts waste & applies knowledge to ensure future forests
	▷	forest management reconciles all interests, including those of future generations
	▷	optimum time to cut trees, focus on young trees
	▷	preservation of soil, of some trees for future
	▷	in Germany, forestry science developed: quantification: maximum volume (not area) in perpetuity; 'normal'
sources		Harrison (1992), Koyré (1957), Lowood (1990)

The second profile jumps to the last decades of the eighteenth century when modern scientific forestry was developed in Europe. The new culture of the Enlightenment (Fig. 4.3) extended the ordered world of rational human society to untamed, chaotic nature. The idea of a forest is reduced from an 'other,' whether safe abode for beasts or nurturer of outlaw culture, to a resource that, with science (and not

Officers, belonging to the same, meete for that purpose, that are onely proper onto a Forrest, and not to any other place" (folio 1).

the exercise of kingly duty), can be tended to ensure a future supply. Timber quantity now counts for more than the excellence of the forest's other gifts; the forest has become a thing. Although in certain parts of Germany and England sustained yield was already practised during the Middle Ages (Heske, 1938; Thomas, 1984) and the practice of planting seedlings was underway in Japan by the middle of the seventeenth century (Totman, 1989), in the scientific mindset of the new age we see the unmistakable beginning of the conservationist ethic (Fig. 4.4).

Enlightenment faith in reason combined with a belief in the centrality of the human being produced a strongly utilitarian ideology in which reason must be applied to nature for the benefit of humans (Bury, 1920; Harrison, 1992). Philosophically, utilitarianism says that the right act is the one that will lead to the most pleasure or happiness for the greatest number, and in general it says that an act is right if it results in as much or more good as an alternative act (Runes, 1983). In the English Utopian tradition, science and industry are to be the instruments of the Puritan project of world reform, in which prosperity (pleasure) is increased for all and greed is eliminated (J.R. Jacob, 1994). A condition of private land ownership is that it must be improved and the benefits shared else the owner is not worthy of it. Usefulness is virtuous, uselessness vicious (Bury, 1920).

On the continent, concern over the health of the princes' wooded holdings and an infatuation with counting, with the precision of the scientific method (secular rituals), combine with the new bureaucratic art of administration (to ensure they receive their 'royalties' [Schama, 1996]) to create forestry science (Lowood, 1990). Estates must be

productive, yield revenue and apply scientific discipline to banish unruliness, including the habit of forest people to hunt wild animals (Schama, 1996). To this end, painstaking studies record the conditions for optimal tree growth (Lowood, 1990). The "economic organization" of the forest requires a utilitarian structure so that those species "most suitable for one purpose, like shipbuilding, could be efficiently harvested at the allotted time, while timber more suitable for building materials would be cultivated elsewhere"; trees grown in stands separated by age class make it easy for foresters to find samples at the right stage of growth (Schama, 1996:50).

The North American Conservation ethic (Fig. 4.4) is modelled on this Enlightenment ideal. The eighteenth-century *philosophes* had posited a view of history as one in which infinitely perfectable humans progress toward the desirable end of perfect happiness, and humans could achieve it if they applied reason and banned ignorance with knowledge. This idea of progress, rather than Auguste Comte's positive formulation of it,[12] spilled over into Canada and fuelled an optimism over the colony's potential for

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[12] Bury (1920:304-306) isolates three counts on which Comte in the *Cours de philosophie positive*, published between 1830 and 1842, differs from his predecessors. Comte puts forth the notion of a law of human development such that it will lead eventually, by continuous rather than indefinite progress, to a specific state beyond which there can be no movement; although greater world harmony in this third and final stage probably means greater happiness, to Comte its achievement is not in itself of concern since happiness is an unscientific quality; and lastly, in contrast to the quest for liberty which prevailed in much of Europe at the time of his writing, Comte's theory advances a deterministic view in which individual liberty is obviated by the fixity of sociological laws. The North American spirit of progress is of the older variety, having reached there before Comte's work gained influence in the 1850s.

economic and social development (Fallis, 1966). In the USA, under the presidency of

NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.4: Progressive (Conservation) era:
scientific forestry in North America

nature	▷	not sufficiently efficient, wasteful
	▷	knowable, controllable, for human use
	▷	free of disturbance, unaffected by human action
	▷	constant, passive, balanced
	▷	self-regulating, closed system, linear succession
forests	▷	wood factory, tree farm, crop, timber focus, renewable resource
	▷	economically motivated
	▷	judicious development, utility, silviculture
	▷	compilation of trees with linear relationship between cutting & regeneration
	▷	focus on (mixed) commercial spp, youth, natural regeneration but aims for greater uniformity
	▷	"care" means soil protection, mixed-aged, selection cutting, fire protection, water conservation
	▷	example from business (interest & capital)
sources		Meine (1995), Pinchot (1947/87), Gillis & Roach (1986), Worster (1977), Pickett & Ostfeld (1995)

Theodore Roosevelt, progressive ideology paired with Democratic aspirations, spawned the conservation movement whose most forceful and articulate proponent was Gifford Pinchot (Hays, 1959). Enlightenment and Puritan values of efficiency and utility and an indomitable faith in science are evident in this profile.

Full-scale industrial timber extraction with its dogma of maximum sustained yield, multiple use and timber-only focus is a hallmark of the modernist (M) approach (Fig. 4.5). After the Second World War there was an upsurge in the need for resources and in the use of technology, such as models for predicting and identifying a species' maximum sustained yield on which ecologists and resource managers began relying

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NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.5: Modernist era: economic sustained yield

nature	▷	as for progressive era
forests	▷	tree farm becomes industrial concept
	▷	timber focus intensified
	▷	commodity, integrate their natural features into market, capital
	▷	care aspect lost, less attention to silviculture
	▷	monocultures, even-aged, clear-cutting, cut-blocks
	▷	conversion to young stands continues, suppress competition from unwanted spp, herbicide application, genetic engineering, shift to tree planting from natural regeneration, seed selection
sources		Meine (1995), Hidy (1963), Gillis & Roach (1986)

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greatly, not just in forestry but also in fisheries and wildlife management (Bocking, 1997; Hirt, 1994; Meine, 1995). Though the modern period began with the Renaissance, the use of the term 'modernist' (or 'modernistic' [Öckerman, 1998]) points to the era of modern industrial forestry in which the modernist movement of transforming "the wilderness into

material nature" through "science, technology and liberal democracy" was heightened (Oelschlaeger, 1991:68,69; Hirt, 1994; Meine, 1995). Philosophically, the

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NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.6: Postmodern era:
sustainable development of forests

nature	▷	dynamic, in flux, non-equilibrium system
	▷	open, subject to external limits
	▷	ecosystems, integrity & resilience, adapt to disturbance
	▷	humans part of nature
	▷	nature still capable of improvement by humans
	▷	anthropocentric aims
forests	▷	as above but ecosystem management to mimic nature, disturbance
	▷	intrinsic value of forest values recognized
	▷	attention to landscapes, biodiversity but fine filter
	▷	timber focus lessened (sometimes constrained) by other values
	▷	humans compose "fibre baskets" of desirable benefits, balance of values, all stakeholder interests
	▷	best technology, adaptive management, integrated management
	▷	some preservationist notions (aesthetics, old growth)
	▷	offers spiritual rewards
sources		Canadian Council of Forest Ministers (1992), Pickett et al. (1992), Worster (1977), Boyce (1994), McQuillan (1993), Soulé and Lease (1995), Taubeneck (1992)

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modernist perspective maintains the view of nature from the previous era while industrializing forest operations. Clear cutting becomes the norm; the Progressive philosophy's protective measures against waste and its collectivist values are largely lost.

I have dubbed the next profile postmodernist (PM) (Fig. 4.6). The catalyst for the transition from modernist to postmodernist mode is the realization that flux is part of nature and that ecosystems are subject to the influence of 'external' agents. This shift in perception is remarkable: for the present it appears that Heraclitus (fl. 500 BCE) has displaced Parmenides (fl. 480 BCE), whose view that all change is illusion (the beginning of the reign of reason) had held sway almost from the moment he formulated it (Lindberg, 1992). Although postmodernism is anything but homogeneous, meaning different things to different people, the apparent rough break with the past, the focus on change or flux, the introduction of uncertainty and the ambivalence about the notion of order seem to me to justify the choice of the term 'postmodernist.' Taubeneck (1992), for example, referred to "the ambivalence, instability, and uncertainty of 'the postmodernist condition'" (11,12). Hughes (1996) highlights postmodernity's "repressed memory" (183) which makes the break with the past (flux vs. stability) seem more real than it is, as well as the synthetic, designed character of the postmodernist landscape — a feature that will be discussed in depth below. Designing landscapes also entails technological aids, a further feature associated with postmodernity (Hughes, 1996). The postmodernist supposition that nature can be and has been invented by humans according to a choice of desirable conditions and values, is the theme running through Soulé and Lease's (1995) book *Reinventing Nature?* McQuillan (1993) also mentions this, but identifies other characteristics of the new direction as postmodernist, such as its sometimes contradictory concerns and a preoccupation with diversity and complexity. That the break with the past

is not as profound as it may appear is born out by a comparison between Figures 4.4 and 4.6, for both display the Enlightenment value of utility and that era's faith in science (a similarity not lost on one of the Model Forest Program's reviewers).[13] On this point McQuillan (1993) and I differ, for he believes that the postmodernist approach has done away with utilitarianism.

The defining document for this category is the National Forest Strategy which, augmented by other sources, provides the standard for this analytical exercise since, first, the guidelines and criteria of the Model Forest Program were composed or applied by some of the same people and came out of the same office at about the same time, and second, the National Forest Strategy foresaw the creation of a Model Forest network that would attempt to implement it.[14] As the proposals had to follow Model Forest Program guidelines, naturally most fall into this category. Interestingly, one proposal (# 18, Saint John Regional Model Forest) combined the (bio-) technological focus of PM with a modernist philosophy keen on management objectives of an earlier time, such as road building and herbicide use. I labelled it M-PM.

Borrowing from conservation biology, the preservationist tradition and deep ecology, a second postmodernist profile is eco- or biocentric (Fig. 4.7). Ecocentrism differs from PM mostly in being less timber-focussed, less technocratic and less

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[13] Jeff Patch, 2 May 1996.

[14] For example, both Patch and Dellert had been delegates to the National Forest Strategy regional workshops.

anthropocentric, but maintains the focus on changeability in nature. Eco- or natural selection forestry principles apply.

NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.7: Ecocentrism: sustainable forests and landscapes

nature	▷	as above
	▷	biocentric view, focus on contemporary nature, web
	▷	evolutionary-ecological land ethic
forests	▷	conversion to plantations questioned
	▷	emphasis on context and process
	▷	sustainability of landscapes, process and evolution, including disturbance regimes
	▷	long timelines, human impacts limited by ecological limits
	▷	biodiversity, conservation biology
	▷	coarse filter approach
	▷	zonation (*sensu* Hammond) over balance of values, human use not ubiquitous or dominant, corridors
	▷	mixed-aged, selection cuts, small to medium & aggregated clearings, coarse woody debris, structural legacies, old growth, natural selection forestry
	▷	community forestry
sources		Hammond (1990), Swanson & Franklin (1992), Grumbine (1993), Rowe (1992), Meine (1995), Leopold (1966), Camp (1990)

The geocentric model is based on Beyers (no date) (Fig. 4.8). It builds on the ecocentric outlook but its point of departure is the geologic record. Thus it includes abiotic and non-contemporary nature and recognizes that stability and flux co-exist. It

holds that, since nature predates humans, human intervention must respect this relationship which, in operational terms, means the scale (spatial and temporal) of our actions must approach natural background levels; forestry practices are those of ecocentrism except that wilderness and the overarching totality of nature are stressed.

NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.8: Geocentrism: a geo-ecological perspective

nature	▷	autonomous, larger than human, 'alive'
	▷	inclusion of non-contemporary and abiotic nature, planetary history, 'deep time'
	▷	nature pre-exists, invents humans
forests	▷	as above
	▷	wilderness celebrated
	▷	management reflects reality of nature's pre-existence
	▷	sacred inherent, not value or reward
	▷	evolution & long timelines emphasized
	▷	natural flux but on geologic time scales
	▷	scale of human operations examined
	▷	need a forest to perpetuate the forest; need all the pieces
	▷	unknowable, management always poor imitation, not heroic
	▷	alternatives to wood sought
	▷	technology serves, does not lead
sources		Beyers (no date), Grange (1967), Leopold (1966), Rowe (1994), Soulé (1996), Livingston (1981), Worster (1993)

The geocentric model constitutes the critical angle from which I have approached the analysis of this chapter.

Finally, in order to classify the many native proposals, I have added a 'native' profile, keeping in mind that there is no one native outlook on nature or on what to do with the forests (Fig. 4.9). Compiled from several sources, including interviews I

NATURE PROFILES & IMPLICATIONS FOR FORESTS/FORESTRY

Figure 4.9: Cosmocentrism: a 'native' perspective

nature	▷	always changing
	▷	includes abiotic nature
	▷	humans small part of a dynamic, balanced world
	▷	humans dependent on pre-existent natural world
	▷	all life a manifestation of spiritual reality
	▷	unity of all living things
	▷	land is gift, stewardship the human task
forests	▷	renewed through spiritual reciprocity
	▷	home, First Nations part of ecosystem, interconnected with forest
	▷	emphasis on natural cycles, balance & protection of life
	▷	coarse filter tendency
	▷	seven-generation planning
	▷	seasons & areas of no use; management varies with time & place
	▷	use of appropriate technology, care
	▷	common property regime (≠ open access)
	▷	emphasis on community welfare & group decision making
sources		Royal Commission on Aboriginal Peoples (1996), Nathan (1993), National Aboriginal Forestry Association (1993), Berkes et al. (1991); 1996 interviews with Gene Kimbley, Jean-Guy Whiteduck, Ed Henderson (Appendix E)

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conducted with First Nations people, I have borrowed the term 'cosmocentric' for this profile from the Report of the Royal Commission on Aboriginal Peoples (1996).

Presentation of the material

The material contained in the 50 model forest submissions has been compiled in tables collected in appendices A through D. The first of these (Appendix A) is a list of the proposals, organized by identification number (they were numbered in order of receipt) and showing province of origin (see also Fig. 4.1). Appendix B is a compilation of descriptive elements for each model forest proposal showing its geoclimatic location, physiography, proponents, and some details of tenure and the critical matter of partner representation. The Canadian Forest Service ably solicited nation-wide interest in the Model Forest Program, to judge by the variety of ecoregions, tenures and sponsors among the submissions. Represented ecoregions were, east to west, varieties of the boreal, Acadian, Great Lakes and St. Lawrence, Carolinian, montane, subalpine, Columbian, and coastal. Property regimes included a range of Crown tenures, small and large private lands, native reserve and agreement lands, and parks. First Nations, forestry companies, woodlot owners, community economic development groups, schools, forestry associations, environmental groups, municipalities, governments and ad hoc groups composed the diverse list of sponsors. Likewise, size of properties ranged from the small (7000 ha) to the very large (over 2 million ha) and soil productivity from poor to high.

Appendix C details the Evaluative Criteria. The category 'broad partnership' is

self-explanatory but the others require comment. In assigning an evaluation on the point of philosophy (Figs. 4.2-4.9) I drew on the sections in each proposal dealing with research, proposed activities and vision/objectives statements. Thus, the information in the categories 'management focus,' 'technology and science,' 'noteworthy' and 'comments,' will indicate to the reader my grounds for a particular decision.

The 'noteworthy' category is neutral - it may contain positive or negative remarks (as judged from the geocentric perspective). An example of a positive feature is Western Strathcona's (# 1) partnership with fisheries workers; the Saint John Regional Model Forest (# 18) drew a negative comment because of its focus on, for example, herbicide use.

'Non-timber' values (Table 4.1) are generally those the proponent(s) paid attention to (rather than just mentioned). For the most part, the submissions show little variation on this point. Of the 14 classes of values, wildlife and recreation/tourism are recorded by nearly everyone (48 times each or 96% of proponents), closely followed by fish (46, 92%). These high values probably reflect the important place angling and hunting have historically had in the Canadian lifestyle. A gap separates these from conservation values (36, 72%). Next most frequent are water, heritage and biodiversity (34, 32, 31 times respectively or 68%, 64% and 62% of proponents). Trapping is next with 29 counts (58%), followed by products (26, 52%). These might be wild rice, berries and the like. The remaining five classes were included by fewer than half of the proponents: 'other' values such as grazing or mining, and soil (20 and 15 times respectively or 40% and 30%);

medicinal plants appear eight times (16%), and last are the carbon pool and air quality values at two times or 4 percent each.

non-timber values	# mentions	% proponents
wildlife (animals)	48	96
recreation & tourism	48	96
fish	46	92
conservation	36	72
water	34	68
heritage	32	64
biodiversity	31	62
trapping	29	58
products, various	26	52
grazing, oil & gas, coal	20	40
soil	15	30
medicinal plants	8	16
carbon pool	2	4
air quality	2	4

Table 4.1: Frequency of non-timber values in the model forest proposals (n=50). Source: proposals submitted to the Model Forest Program.

In 'technology and science,' the items before the semi-colon refer to technologies, the second set of items to the suggested scientific program. Among the first, Geographic Information Systems, Decision Support Systems and other variations on the 'most sophisticated technology' theme were nearly universal. Proposed scientific programs

ranged widely, from riparian management to historical disturbance and climate studies; silvicultural activities and cutting style trials were common items. Because of the nature of integrated resource management, everyone committed to undertaking inventories of some sort and most included monitoring; by the same token, most proponents proposed to carry out some form of land classification. For these reasons I have not normally mentioned them. Likewise, demonstration forests featured in nearly every proposal because of the requirement for technology transfer, and I have not made note of it. Further, because technology transfer in general and public education and participation were not the focus of the study, I have pointed them out infrequently and inconsistently and only if they contained some special feature or the proponent felt strongly about the issue.

Management structure of the model forest was another section in the proposal not central to this study but I have noted whenever the sponsoring company was set to play a dominant role. The category 'timber industry' specifies who the partnered companies are; names in square brackets are those not included in the partnership. Such oversight (and others) rated a 'no' in the 'landholder inclusivity' box. At times exactly who held tenure was unclear; this is noted in the 'comments' section.

Analysis

To make comparison between the successful and unsuccessful proposals easier, I have grouped together the successful ones in Appendix D. Some general comments about

these are warranted. Obviously, although it was not critical, all the successful sites conformed to the size criterion. On another small point, presentation, there was some variation; since content was more important, a lower performance here did not preclude success. In terms of philosophy, predictably all fall within PM; Long Beach (# 22) pushed the edge a little and was typed PM-ECOC.

As an aside, Table 4.2 and Figure 4.10 record the geographical distribution of the various philosophical assignments of all the submissions. On the whole, the standard PM occurs in all the provinces but the least conformable submissions are concentrated in British Columbia and Ontario. One reason for this is that most of the First Nation proponents live in those two provinces and their submissions for the most part were built on a different philosophy. Several others presumably came from what may be thought of as postmaterialist communities (Bakvis and Nevitte, 1992), e.g. in the Kootenay region of British Columbia. The two most conservative proposals came from New Brunswick and Ontario.

Returning now to the successful submissions, in accordance with program objectives there was variation of tenure and the model forests are located across the country and represent the major ecoregions. It should be borne in mind that to achieve this distribution the National Advisory Committee chose only five of those ranked highest by the Technical Review Committee; the others came from lower down its list. Let us now turn to detailed discussion of the content of the submissions and how they fared.

Partnerships

The nature of a model forest's partnership was key to its selection. Three levels can be distinguished in this regard, the most critical being landholder inclusivity. Many

philosophy	# submissions	province of origin
Postmodernist	32	all
Ecocentric	11	ON 4, BC 6, AB 1
Modernist	2	ON 1, NB 1
Geocentric	2	BC 2
Cosmocentric	9	BC 4, ON 1, PQ 1, NS 1, AB 1, NWT 1
indeterminate	3	ON 2, PQ 1

Table 4.2: Nature philosophies of the 50 Model Forest Program submissions with distribution by province and territory. Numbers do not add up to 50 because those identified as spanning two types were counted once in each category.

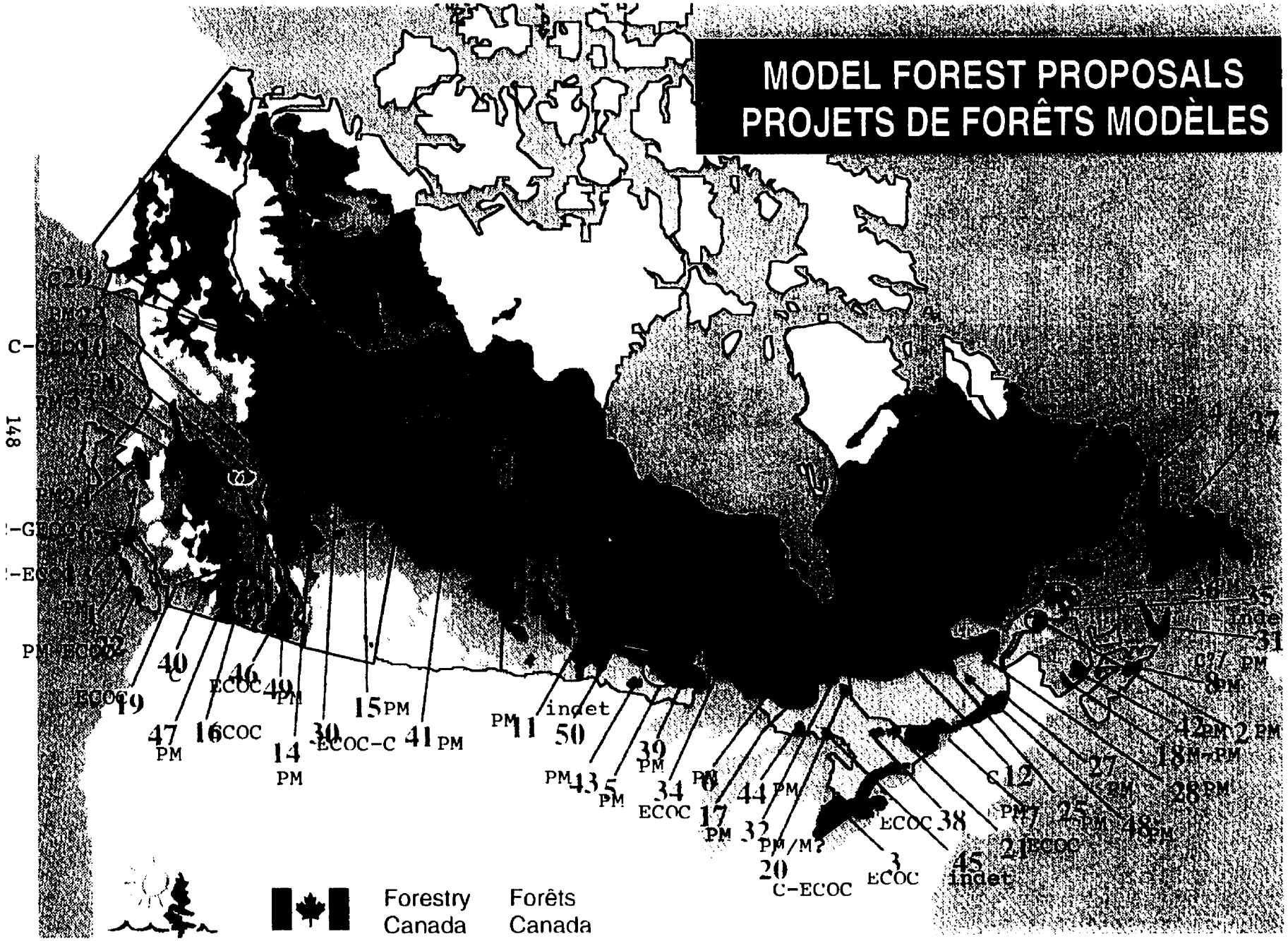
proposals fell out in the first round on this account. This point will be taken up again below. At the moment I will point out only that an exception was made for Long Beach Model Forest.

In terms of broadness of partnerships, this was desired but, as suggested by the Western Newfoundland (# 37) and Prince Albert (# 41) model forests, apparently not decisive, as long as some mechanism was in place to accommodate other voices. In many proposals the mechanism for accommodation was multi-tiered participation. But as Foothills Model Forest (# 49) demonstrates, even when a broad partnership had been assembled, not necessarily everyone was to have equal say or responsibility. At Foothills,

Figure 4.10

Regional distribution of the nature philosophies of the 50 submissions to the Model Forest Program

(Next page)


MODEL FOREST PROPOSALS
PROJETS DE FORÊTS MODÈLES
Forestry Canada
Forêts Canada

only government and industry representatives would be given management, i.e. highest, involvement, yet that did not disqualify it. Nevertheless, Technical Review Committee participants believed that if there were environmental groups or a First Nation in an area that had not been included, a proposal would not have been successful.[15] We need to qualify this, not only because of the Foothills example, but also because Prince Albert Model Forest is one of those without an environmental group in its partnership, and say that such groups needed to be tied into the management structure of the model forest through, at the least, an advisory function.

The ability to consult other voices is related to the Technical Review Committee's concern (above) that the sponsoring company be prepared to share decision making. This criterion too was not applied across the board. At Lake Abitibi (# 17), in spite of a broad partnership, Abitibi-Price meant to put only its own staff on the management team and even the model forest co-ordinator was to be one of its own. Limited decision sharing was planned as well for Eastern Ontario (# 7) through a system of weighted voting.

Lastly, a mix of administrations was appreciated. Thus proposals including parkland in their area were viewed favourably, as were those, such as Eastern Ontario, that could contribute some variety of tenure to the cross-country network.[16]

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[15] Dellert, 9 August 1996; Patch, 2 May 1996.

[16] Dellert, 9 August 1996.

Landholder representation

The landholder category comprised the provincial government and tenure- and freehold-holding companies; depending on the situation, the federal government (in the case of national parks), First Nations and small woodlot owners might be included. Their role in the partnership is to provide clear jurisdictional lines to ensure that forest management plans can be implemented.[17]

Governments

Some proposals with a national park within their boundaries, such as # 48 (Forêt Modèle de la Mauricie) failed to get the federal government on board. Another, fairly common, mistake, especially in Québec and with First Nations, was to assume that because all the land in the model forest area was private, provincial representation was not necessary. A variation on this was to have some ministries on board, such as tourism or wildlife, but not the ministry responsible for forests. However, even if the land is private, companies and organizations involved in forestry still need to reckon with provincial regulations. Most importantly, since this was a federal program and the provinces have jurisdiction over forests, provincial approval was required in order for the federal government to be able to carry it out.

Provincial responses to the proposals need further comment. Minister Oberle's

[17] Patch, 2 May 1996; Dellert, 9 August 1996.

generous words notwithstanding,[18] the provinces were not on the whole enthusiastic or co-operative. British Columbia, for example, imposed the condition before granting Ottawa approval that its Forest Service would not be obliged to divert resources to helping groups, nor could it be expected to change its policy focus or plans as a result of the Model Forest Program.[19] It is tempting to extend this finding across the board since even successful model forests have had trouble attracting the interest of their provincial governments (chapters 5 and 6; Gardner Pinfold, 1996). On a few occasions, a province avoided lending its crucial support (in the form of a signature confirming its partnership intention) with the ruse that provincial departments were not signing proposals. This happened to Western Strathcona (# 1), an otherwise competent submission. In other cases a province might say that it would join once a site had been chosen, but fall short of

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[18] "I was just utterly amazed ... how co-operative the provinces were particularly. They actively supported several of the model forests and helped promote them." Interview, 1 May 1997.

[19] Dellert, 9 August 1996. The National Advisory Committee appears to have hoped that provinces would adjust their policies in response to Model Forest Program results (Whiteduck, 15 October 1996). Reading between the lines, this hope may have been written into the background information for applicants since that document identifies institutional change (including the creation of new organizations) as a necessary ingredient of the transition to sustainable forestry and says that the Model Forest Program was designed "to set [this] process in motion" (Forestry Canada, 1991a:15). Institutional change was recognized as important to sustainable forestry long ago in the Great Lakes basin (Regier, 1992) but the trouble here is that forests are a provincial responsibility; any structural changes of this type are strictly in the domain of the provinces. Gardner Pinfold's (1996) evaluation of the Canadian Model Forest Program found that the model forests have not yet had much influence on provincial policies. Conversely, British Columbia and Ontario have introduced legislation that overtakes and affects model forest activities there (Gardner Pinfold, 1996), a possible demonstration of federal-provincial competition.

signing. It is possible that at times their refusal was due to genuine lack of support; at any rate, given that provinces did sign some proposals and refused to sign others, they sent conflicting messages to sponsoring groups, favouring some and dooming others.

First Nations

Noteworthy is the lack of a First Nation's proposal among the successful sites (none made it past the first round),[20] though nearly all have First Nations participation. The lack of First Nations' involvement became an issue for McGregor (# 9) because the Lheit-Lit'en Nation had filed a proposal (# 10) based on their traditional territories which include Northwood's Tree Farm License. On National Advisory Committee member Chief Whiteduck's urging, McGregor was accepted on condition it make this First Nation a partner.[21] In general, First Nations proposals were judged strong on decision making and native aspects – socio-economics and traditional use of resources – but poor in their inclusion of other elements of sustainability, and in technical and research areas. The latter counted for more than even partnership did.[22] Several First Nations proposals, however, such as the James Bay Cree Model Forest (# 12),[23] Oweetna-Kula (# 26) and one of the

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[20] Dellert, 9 August 1996.

[21] Interview, 15 October 1996, Ottawa.

[22] Interviews with Whiteduck and Dellert.

[23] With phase II of the program, this group has now joined the network as the 11th model forest, known as the Waswanipi Cree Model Forest (Anonymous, 1997a).

Gaspé model forests (# 35) also had a narrow partnership base; Wikwemikong (# 45) had none (Appendix C). These 'flaws' counted heavily against them.

Many First Nations proposals also exemplified the imbalance in resources available to the 50 proponents. There was no seed money to help groups employ consulting foresters and professional writers.[24] The importance of wordsmiths and forestry professionals is twofold: they know how to make a good presentation and they know the right forestry language.[25] Projects such as Prince Albert's could afford to hire a writer (paid by Weyerhaeuser)[26] and McGregor's is said by one unsuccessful BC proponent to have been well supported by Northwood (written comm., 1995). In contrast, some community proposals, native and non-native alike, seemed put together on the run, were incomplete and failed to grapple with 'the issues.' And, in the words of Stan Rowe, often there was "a spirit of defeat written right into the submission."[27]

Industry

If the timber industry was the key partner as Technical Review Committee and National

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[24] Interviews with Dellert and Patch. Also John Hall, personal communication, 1997.

[25] Of course, putting things well on paper is no guarantee that the performance will be equally good. Interviews with Dellert, Patch and Whiteduck.

[26] Interview with Tony Richmond, Prince Albert, SK, 12 June 1996.

[27] This and previous sentence based on interview, 26 June 1996.

Advisory Committee members repeatedly stated,[28] then Long Beach, which did not have all industry interests on board (two out of four), is an oddity (Appendix C). Its inclusion may reflect instead the judgement of the National Advisory Committee. According to the same proponent, the choice of Long Beach was entirely expected because it would be "politically correct and geographically logical." On the other hand, Chief Whiteduck recalled much discussion about this proposal because of the area's controversial history.[29]

Several industry-led projects planned to draw on the extraordinary resources at their disposal (beyond those already mentioned and the powerful fact of land control) to further their management stake in the model forest. I refer to the proposed use of company office space and existing management hierarchy, even the seconding of personnel to the model forest. The selection of Lake Abitibi, Fundy, Weldwood and McGregor, all of which have some form(s) of direct company involvement, demonstrates that this clear conflict of interest was not judged problematic. It is of course possible to argue that such companies were showing commitment to the partnership. The experience of Fundy (Chapter 6), however, amply shows the detrimental effects that can flow from these kinds of arrangements while Prince Albert (Chapter 5) offers a fine contrast.

Timber focus

A prime point of tension in the selection procedure turns on the role timber was to play in

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[28] Dellert, 9 August 1996; Whiteduck, 15 October 1996.

[29] Interview, 15 October 1996.

the proposals. Obviously, non-timber values had to be included - the more the better, according to Chief Whiteduck and Stan Rowe. We note then that McGregor featured very few of these values and others, such as Eastern Ontario, did not display a range outside the ordinary. Timber, however, was essential. Technical Review Committee member Jeff Patch explained that because this was a forestry program, a proposal that did not include managing for the flow of timber would not have been a proposal in forest management but in some other area; some form of "exploitation and the harvesting associated with it" was a given.[30] Thus, proposals that advocated lowering the cut or otherwise de-emphasized timber management stood little chance.

Patch's statement perfectly captures the ambiguity inherent in a program that, like the National Forest Strategy, seeks to accommodate old and new attitudes. The ambiguity operated on at least two levels: the choice of National Advisory Committee and Technical Review Committee participants and the guidelines' directives. As noted, the majority of National Advisory Committee and Technical Review Committee members were old hands at industrial forestry. Chief Whiteduck, in no way a stranger to forestry, found himself surrounded by expertise that made him believe his role was rather to provide the token native representation.[31] And although according to one reviewer the Technical Review Committee and National Advisory Committee were far ahead of those working on the

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[30] Interview, 2 May 1996.

[31] Interview, 15 October 1996.

ground, neither was yet a "new paradigm" committee.[32] Too many of their members were "strongly strongly on timber" for this to be possible.[33] This is the crux of the dilemma. As well, if in the Model Forest Program the hope was to set objectives that would treat the forest's gifts equally, the guidelines could not get past the fact that timber was the essential element.

Science and technology

Given the focus on timber and high-tech integrated management, it cannot be perplexing that the Technical Review Committee looked in vain for innovation. This committee on the whole thought that the submissions were unimaginative and was consequently disappointed.[34] Yet innovation could be found in several proposals (for example, # 12, the James Bay Cree Model Forest, planned for traplines to be the unit of management), except not in those considered for selection.

Applicants were advised of the several scientific research projects of potential interest to a model forest in the Partners in Sustainable Development of Forests Program pamphlet (Forestry Canada, no date). These included Integrated Pest Management, ecological land classification, climate change, cutting techniques, waste and pollution reduction, fire management and impacts of forest practices. Consequently, most proposals

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[32] Stan Rowe, 26 June 1996.

[33] Chief Whiteduck, 15 October 1996.

[34] Dellert, 9 August 1996.

suggested research in a combination of these fields. Unfortunately, being tied to a timber production paradigm, the scientific guidelines also fell short of innovation and so proposal writers were hamstrung. This point is shown by the narrowly defined scope for research areas such as fire management which aimed for the increased use of decision support systems to reduce losses due to fire. It is as though there had been no studies carried out into the nature of wild fire and its effects compared to cutting style, or into the use of fire as a management tool on which the Model Forest Program could build.

'Forestry practices' likewise was concerned with minimizing damage from logging, but nothing in the program, for example, encouraged people to stay out of sensitive areas. In fact, Lake Abitibi (# 17) with its proposal to drain peatlands (so as to get at the black spruce better) was chosen. How, one has to ask, does destroying ecosystems further their sustainability? Research guidelines into environmentally acceptable ways to cut timber also did not proceed to a high level; as noted, the timber imperative was not questioned, nor were proponents asked to explore alternative fibres. Just one of the 50 submissions (Manitoba, # 11) mentioned alternative fibres but only in order to increase the wood supply, not to reduce the pressure on existing forests.

Discussion: the forest unbundled

The nature/forests profiles highlight and summarize different understandings of sustainability. As Dellert said, the Model Forest Program guidelines spelled out a mainstream notion of sustainability that differed from, say, the aboriginal notion and, one

may add, from that held by one or two on either selection committee.[35] What is the understanding of sustainability exemplified by the guidelines and here labelled PM (or 'postmodernist')?

A good place to start to answer this question is the concept of the ecosystem and the distinction between the fine and coarse filter approaches to forest management that flow from it. I mentioned that it was Arthur Tansley (1935) who coined the term 'ecosystem.' He remarked: "Though the organisms may claim our primary interest, when we are trying to think fundamentally we cannot separate them from their special environments, with which they form one physical system" (299). These systems are, for an ecologist, "the basic units of nature on the face of the earth." Although Tansley's thinking is on the whole problematic,[36] his definition of the ecosystem draws attention first of all to the fact that we easily lose sight of the system in which organisms live and without which they could not survive, favouring the organisms instead, and secondly to the ecosystem as a geographically real segment of the earth. Thus, a forest landscape "consists of an atmospheric layer overlying a soil/water layer with myriad organisms the

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[35] Interview, 9 August 1996.

[36] Mention was made of the effects his thinking had on energy studies. He himself wrote of the "new entity" that is the product of "the actual relations and interactions observed between the components of an integrated system," "who will be so bold as to say that this new entity, for example the molecule of water and its qualities, would be unpredictable, if we really understood *all* the properties of hydrogen and oxygen atoms and the forces brought into play by their union? Unpredictable by us with our present knowledge, yes; but *theoretically* unpredictable, surely not" (297,298) - revealing a faith in the idea of progress and the Cartesian assumption that natural phenomena are entities whose complexities can be understood fully with the appropriate knowledge or tools.

bacon bits in the two-layered sandwich"; it is a "volumetric" "chunk of life-giving space" (Rowe, 1992:223). This insight then leads to a principal concern with the persistence of land- and waterscapes. If we ensure the maintenance of the forest as a *system* and the various mosaics of which it is comprised, then the animals and plants that inhabit it and move through it will also be maintained. This is the basis of Hammond's (1990) work with corridors (connectors between mosaics) and is known as the coarse filter approach.[37] Coarse filter planning takes the top down strategy: by looking after the ecosystem, its patterns and processes, the organisms that belong to it are automatically looked after too (Hebert, 1994).[38]

Throughout this discussion the terms 'fine' and 'coarse filter' are used only as a shorthand notation, not as a cut-and-dried key to sustainable forest management. This cautionary note is in order since Alberta-Pacific's operations in boreal mixedwood Alberta have been described as coarse filter (Hebert, 1994). The question here is how the forest mosaic can be retained given that provincial rules stipulate that cutblocks are not to exceed 40 ha and are to be cut during a two- to three-pass clear cut cycle with a rotation

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[37] A recent study by Burkey (1997) adds to the literature that casts doubt on the ability of corridors to fix the fragmentation problem. Burkey studied persistent simple communities consisting of three trophic levels of bacteria and protozoans (bacteria, a ciliated bacterivore and a protozoan top preditor) under different conditions of habitat fragmentation, keeping the sum of the subareas equal to the original unfragmented area. In the experiments the top predators went extinct sooner in environments subjected to fragmentation. Unfragmented systems retained their biota longer regardless of whether they were linked to other systems, but linked fragmented populations became extinct "significantly sooner" than isolated subpopulations.

[38] Rowe, interview, 26 June 1996.

of between 40 and 70 years (Schmiegelow and Hannon, 1993). Retention of stands over 70 years of age is not expected and no area is to be left greater than 10 ha except along river banks and on reserve lands. Since natural dynamics in the mixedwood boreal ecozone do not match these regulations, predicted outcomes are severe fragmentation, loss and isolation of older forests and truncation of the natural age distribution. For example, riparian old-growth white spruce and balsam poplar stands in Wood Buffalo National Park, located just north of the northern boundary of Al-Pac's Forest Management Area, may persist for more than 300 years; their succession is driven by flooding, lengthening the mean fire return interval for the area which is otherwise about 100 years (Timoney and Robinson, 1996), in excess of the scheduled 70-year rotation and far greater than the 10 year interval between cuts required by Alberta (Schmiegelow and Hannon, 1993). Patch size of 40 ha is consistent with fire-created openings about one-third of the time, at least in the wetter eastern boreal (Payette et al., 1989); many boreal fires are in the middle range (50-1000 ha; Payette et al., 1989) but not uncommonly exceed 10 000 ha (Heinselman, 1981). Lest this be interpreted as support for large cutblocks, it is incorrect to equate the action of fire with that of logging. They differ on many counts, especially in terms of plant responses to fire *versus* cutting, and the variability of fire behaviour. For example, fires create patchiness in distribution, range and magnitude of openings, leaving much interior forest intact, while (clear) cutting (even if spread over several passes) imposes regularity and eliminates the interior forest (Anonymous, 1996c).

With few exceptions, Rowe's understanding of ecosystems ("geo-ecosystems,"

Rowe and Barnes, 1994) and its implications for forest management were quite different from those of his colleagues on the Technical Review Committee and National Advisory Committee (an instance of science politics). The Model Forest Program was skewed towards a fine filter management approach; it is bottom up, relying on individual species and stand management (Hebert, 1994). Fine filter departs from the view that 'environment' or 'habitat' is what surrounds an organism. Since organisms move, an ecosystem concept based on the organism ("bio-ecosystem," Rowe and Barnes, 1994) rather than on a chunk of the earth's surface will be rather vague, "relatively elastic in its space/time dimensions" (40) and, depending on the species, more or less extensive. In other words, there are as many ecosystems as there are organisms, each defined by habitat.[39] Management then becomes concerned with the supply of habitat required by each organism. Consequently, research and effort are expended on identifying which organisms are worthy of our beneficence (often, as at Fundy, fish and ungulates that have been licensed for sport) and then at finding out what sort of habitat requirements they have and how to make sure that we leave enough. Part of this exercise of course involves setting desired population targets.

This type of planning depends on habitat supply and decision support systems, models that key a species to timber type, tree development stage and their geographic distribution pattern.[40] In effect, the timber focus is maintained and animals are fitted to the

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[39] Rowe, 26 June 1996.

[40] Gordon Baskerville, 12 October 1996.

timber characteristics.[41] As a stand matures, so do its characteristics change, but the model keeps track of how much habitat there is and where it has shifted to. Thus the object is to ensure that each habitat type, defined by reference to the three variables, will exist somewhere in the forest at any given time, not in one place all the time. This is a crucial point, illustrating the concept of 'ecosystem' as something that attaches to the organism rather than being the stationary chunk of geography that organisms inhabit. One implication is that forestry takes place *across* ecosystems rather than within, that is, it does not retain the mosaics that result from specific on-the-ground differences.

Why should one pursue the fine filter over the coarse filter method? Gordon Baskerville explains that fine filter is more amenable to measuring management effects, because if one had predicted a certain number of trees ('stems') to be at a certain spot, or a certain population of marten among them, then one can go and count and adjust one's practices accordingly (adaptive management).[42] It is also eminently suitable for the design of forests along human tastes and desires. Forest management is above all a design process – we can speak of "designer habitats." Thinking 'habitat' and 'design' means making provision for "the habitat for a population of pulp mills, a population of sawmills, a population of warblers, a population of marten" and so on. Unlike the geocentric and cosmocentric views in which 'sustainability' means the maintenance of multi-million-year-old natural processes, here it is "the persistent presence of some desired predefined level

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[41] Rowe, 26 June 1996.

[42] This and next paragraph based on interview, 12 October 1996.

of a population." Each value will be accessible and sustainable as long as we do not want everything at the same time and in the same place. That is to say, since fulfilling all demands (from riparian zones and wildlife to timber) in one place and one segment of time would be to overtax the system, planning for the sustainable supply of values must take place across the landscape. This involves what I call the unbundling of the forest ecosystem into the various values which are then recombined by design such that access to them somewhere in the region is assured long into the future. It is not a constraint approach if constraint means "stopping" activity, e.g. cutting in a particular way or not cutting in the riparian zone, rather than "starting" it, as in designing for long-term supply of desired values.

If nature has been providing riparian zones, wildlife and trees as an integrated system ever since the Late Devonian, how can retaining them be overtaxing the system? The answer is that a multi-purpose forest in which all human stakeholders must be accommodated concentrates demands. In a forest in which timber is one value among equals, mills, having been elevated to the status of organism, must be able to demand their supply of fodder on a basis as legitimate as that of elk, bear or moose. Thus, if we are to satisfy the demands on the forest and supply all the values, we must engage in a rational planning exercise in which each value's (habitat's) requirements are studied and pegged to the three variables (stage of development, geographic pattern and stand or timber type) so that they can be spread across the landscape.

We can now understand the emphasis the guidelines placed on technology and the

implied link between sustainability and technology. Departing from the premise of a roving ecosystem and a concomitant unbundled forest, the fine filter's design philosophy must be carried out with the backup of a considerable amount of hardware. Further, only advanced technology can keep track of the dynamics of a forest subject to intense exploitation (of timber and other extractable values). If in ancient North America detailed traditional knowledge of the land and periodic migration mitigated overuse, in today's climate of exploitation such knowledge is inadequate (and at any rate alien to the Western way) to predict future effects and migration is not an option. We are therefore stuck with the technological route.[43]

The unbundled, designer, fine filter and postmodernist approach undoubtedly is set to be the high-ball, sophisticated version of the future forestry. Unfortunately, it is atomistic and as such in the Enlightenment tradition. If for Manwood a forest was not a forest if it did not have trees, vert and animals in it all the time and everywhere; and if for more than 350 million years trees have grown in forest communities with shade-adapted plants, animals (a limited array for some of that time) and insects, encompassing a variety of environments from drier to wetter, from lowland, river-side communities to those of the highlands, in which broad-scale, landscape level processes – fire, wind, evolution, insect invasions and disease – operated such that forests persisted, providing their 'values' all the time everywhere in a rich, enduring yet evolving, infinitely varied mosaic, why should

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[43] Interviews with Jeff Patch and Stan Rowe.

sustainability now no longer be defined in terms consistent with forests' own history, but according to whether some 'values' occur somewhere at any one time'? It is moreover reductionist to speak of values when the values in question are either the forest processes themselves working together as a system (trees cannot be isolated from the inorganic and organic elements with which they interact) or the results of their working together (as in purity of water and air or a spiritual connection). Paradoxically, while unbundling breaks a forest down into constituent values (such as streambank or individual species) defined in part at the stand level, the design process rebundles them at the forest/landscape level, legitimating the claim that this thoroughly humanist type of forestry is in fact ecocentric and sustainable. But anthropocentrism is not sustainable. It is an anachronistic interpretation of planetary history, pretending that humans (and therefore human action) evolved right alongside with the rest of nature instead of arising at the very end (from today's perspective) when patterns of natural activity had long been established.

A perspective that dislodges ecosystem processes from the earth underneath and treats "populations of mills" on a par with real organisms has performed an intellectual sleight of hand that we can term 'the fallacy of equivalent scales,' an adaptation of Soulé's (1996) "fallacy of equivalent rates."[44] In its anthropocentric, reductionist conflation of human with natural activity (as we do when we speak of mills in the same manner as

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[44] Soulé (1996) defined that fallacy using the following syllogism: "(1) extinction is a natural process; (2) nearly all species that have ever lived are now extinct; therefore (3) the extinction of most contemporary species is normal" (24).

moose), fine filter philosophy warps temporal and horizontal scales and blurs the crucial aspects of rates and intensity. In a temporal sense, the implication that mills have 'evolved' as though they are bears is absurd. Spatially, the scope of human action often exceeds the natural range. Nor can we claim that it is always of the same type or frequency. Background (geological) extinction rates, for example, are estimated at two to three, even four orders of magnitude less than current anthropogenic ones (Leaky and Lewin, 1995; Soulé, 1996) and biotechnology is crossing specific boundaries; in forestry, natural and anthropogenic disturbances will have different effects in part because of timing and frequency differences (Attiwill, 1994; Mallik, 1995; Lynham, n.d; Knight, 1987; Brumelis and Carleton, 1989; Carleton and MacLellan, 1994). It would be a mistake to make cut-and-dried distinctions, but in general we can say that we are simplifying and regularizing natural processes, increasing the range and intensity of disturbances and collapsing the time scale. These qualitative and quantitative changes and the anthropocentric inversion of planetary history are the reason why authors such as Shrader-Frechette and McCoy (1995) are courting red herrings when they argue that to distinguish between 'natural' and 'human' is unsound. It is of course true that humans are natural beings; but they override nature by interfering in long-standing patterns cumulatively on exceedingly short time scales. The argument here is not that sustainability entails the absence of humans but that it requires our actions to be fairly consistent with the geological pattern. Fine filter thinking may be well suited to the current regime of exploitation (fitting animals and forests to the mill) but that does not make it sustainable. Further, its faith in technology

betrays an antique optimism that our models, which quantify a very few variables, can describe nature enough to enable us to comfortably predict the results of intervention. Since we are not nature we cannot hope to comprehend it fully nor, if we did, expect computers to handle its complexity with certainty. It seems reasonable then to err on the side of caution rather than take up the big gamble. But the fine filter attitude, stuck as it is at the species level within an abstracted, unbundled and remixed forest, cannot but choose the gamble.

To sum up, the Model Forest Program guidelines, quite like the substance of the National Forest Strategy, advocated an interpretation of sustainability embedded in an anthropocentric, atomistic philosophy, loyal to continued exploitation and dependent on advanced technology. "Best forestry practices" are unquestionably an improvement over the past and the creation of partnerships is likewise a radical idea with potentially far-reaching effects, but the real question is, would a proposal that satisfied the guidelines result in a sustainable, a *model* forest?[45] I have argued here that the long-run answer is 'no.' Would such a proposal accomplish the goal of the Model Forest Program, to propel the forest industry onto the path of sustainability? If one interprets sustainability to mean the establishment of designer forests in the human image, the answer is yes.

If "the die was cast" by the guidelines and criteria, yet individuals within the

[45] Dellert, 9 August 1996.

Technical Review Committee still possessed some freedom of interpretation,[46] National Advisory Committee members could have advanced other proposals and the Canadian Forest Service could have chosen a different tenth model forest. There were alternatives. Why, one must ask, was Fundy (# 42; Chapter 6) successful and not St. Mary's-Liscomb (# 8)? Like Fundy, all landholders and industrial partners were on board, it aimed to increase timber production, and its scientific program was well connected to regional institutions; unlike Fundy, it was not dominated by its industrial partners, it questioned traditional forestry practices and planned to build on an existing co-operative project. One point may have worked in Fundy's favour: the presence of a forestry department at the University of New Brunswick. Equally problematic is the choice of Western Newfoundland (# 37) with its strong timber ethic in a sensitive region of slow growth and with its limited partnership. It is understandable in that it completes boreal representation geographically, but the wisdom of the choice is otherwise debatable. This proposal gives the reader the impression that the model forest is to be little more than an attempt to protect the industry's holdings from "indiscriminate" fuel wood consumption by the public and to remove the credibility problem the timber industry has acquired there. The continued liquidation of the old growth that is home to the threatened Newfoundland pine marten (Mitchell and Brady, 1997) ensures that it is not going to disappear soon.

Another questionmark attaches to the latecomer choice of Lake Abitibi.

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[46] Dellert, 9 August 1996.

Ostensibly picked to fill the gap in boreal cover between Manitoba Model Forest and Eastern Ontario, it lies in fact a little to the northwest of the latter (Fig. 4.1b). A more convincing choice, it seems to me, would have been Armstrong (# 39), located just north of Lake Nipigon. For Lake Abitibi, public participation and research agendas seemed tools to promote the company, and the proposed partnership committee, at the time of submission, heavily favoured it and the provincial government (the model forest's Strategic Plan shows this has changed since with each of these two parties having just one seat); Armstrong, on the other hand, proposed that its sponsors be co-chairs. If Lake Abitibi's forest management audit was a point in its favour, Armstrong meant to initiate a project to return stumpage fees to the area (provincial government was on board), and their scientific programs were similar, though Armstrong did not propose to drain peatland.

The Cariboo-Lower Peace Model Forest (# 30) of Alberta was, I believe, a superior (and First Nation) submission. This is a case where the provincial government declined to sign although it said it intended to. Another stroke against this proposal is its narrow partnership base. Given that the Technical Review Committee and National Advisory Committee made exceptions when it suited them – in terms of partnership base, decision-sharing and non-inclusivity of landholders – and that negotiations prior to signing have been possible elsewhere (Long Beach, # 22, and McGregor, # 9), these points should not have prevented this group from being successful. The absence of both environmentalists and First Nations people on the Technical Review Committee may have played a part in this decision. Unlike Foothills (# 49) which is completely sold on habitat

models (it rated very high), this group's philosophy is not the dominant industry-driven PM; the incorporation of First Nations knowledge would also have guaranteed innovation. In contrast to Foothills, it is located in the boreal forest which in terms of ecoregional representation was perhaps a disadvantage; other provinces, however, have been assigned two model forests. Conceivably it might have taken the place of McGregor, an industry dominated, hi-tech favourite chosen on account of its sophisticated adaptive management approach.

The exploitative ethic of the Canadian Forest Service's idea of sustainability resulted in a choice of safe proposals over those of equivalent merit. One cannot expect change while directing the enterprise in the old direction. The next two chapters will underscore that the lasting gains of the Model Forest Program are the creation of new relationships and the production of new research. Unfortunately, the promise of the program was undermined by the fact that guidelines and selection process alike, although prepared and administered by forward looking people, suffered from an industrially conformant mentality. Provincial authorities aggravated it by supporting some submissions and not others. While the gains are to be appreciated, we must still be concerned that the push towards PM, having legitimated the existing exploitative attitude, does not constitute in the long run a more harmful path.

Gillis and Roach argued in 1986 that the history of Canadian forestry is marked by a series of promising initiatives that failed because of a policy regime restricted by such factors as the close industry-government relations discussed in Chapter 2. The present

chapter demonstrates the degree to which professional forestry is shaped by industrial objectives, a symbiosis, as the historical profiles illustrate, begun during the Enlightenment and crystallized during the Conservation era, with a strength such that it is now impossible to think of a forestry program without a strong timber component. The adoption of an ecosystem, and specifically a landscape, outlook could not correct the traditional perception whereby forests are accumulations of trees. Indeed, it is entirely to be expected from the view, discussed in Chapter 3, that sustainable development or forestry is expanded sustained yield, since that doctrine presupposes the liquidation of original forests. That we must "start" activity rather than "stop" it also seems a throwback to Puritan intolerance for the unimproved. The choice of the PM philosophy for the National Forest Strategy and the Model Forest Program curbed their potential sufficiently that they too may have to be counted among the "lost" forestry initiatives.

CONCLUDING REMARKS: INTEGRATING ECOLOGY INTO POLICY

Gordon Baskerville (1995) wrote of the gap between the academic policy literature, forestry science and policy implementation by government, that the policy and science literatures are isolated from one another and that the policy literature in particular "has been essentially irrelevant to the unfolding of the [forestry] problem" (38). Science cannot inform policy or only slowly, and "scientists and academics might as well write in Sanskrit

on the far side of the moon."[47]

The need to create feedback channels between policy and science and to make academic work relevant to policy makers, points to the utility of the interdisciplinary method. Evidence presented here and analysed with that method suggests a somewhat different argument. The historical references show first of all that forestry science was invented with the express purpose of solving a financial problem for estate administrators (in the end a problem of supply), so that we would be justified in thinking of it as subservient to policy. It is in that tradition that Pinchot established forestry in North America as "tree farming" – science in the progressive platform was to be the handmaiden of a program of societal reform, just as it was for their Puritan, Utopian forebears. Constrained by the colonial complex of factors, the development and implementation of the conservation agenda in Canada confirmed and entrenched the eighteenth-century precedent of forestry's close alliance with economic interests. Foresters implemented only those scientific elements (land classification, fire control) that supported the higher objectives of a benignly paternalistic, industrially patterned society. Weir's (1992) assertion that the "creation of policy networks narrows the range of ideas likely to receive a hearing" is applicable here (210). One might speak of the enlisting of certain strands of scientific knowledge over others in the program of reform and of the constraining of science by elites as the politics of science (Sandberg, in prep.).

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[47] Interview, 12 October 1996.

On the other hand, the selectivity of management efforts that has been the topic of much of this chapter is typical of a politics within science; yet the outcome was not a chance event nor due to the superiority of the chosen options. Rather, external forces weighted the choices towards and not away from the prevailing paradigm, demonstrating the two-way dynamic of science and politics and the difficulty of separating science politics from the politics of science. This has been so historically. For instance, in the seventeenth century, during the initial stage of the development of modern science, apian society provided the Puritans with their metaphor for a desirable human society, down to the idea that private property is allowable if one improves it, and sinful if one does not, punishment for which is expropriation, just as drones are kicked out of apian society for their uselessness (J.R. Jacob, 1994). Simultaneously, nature is believed to be a poor economist whose wasteful (and amoral, as in animals that kill for their living [Thomas, 1984]) habits must be corrected. Thus forests must be made to grow so as to be most convenient to the human user. As a result only those scientific findings win the day (science politics) that support the human agenda or world view and in particular the dominant world view (politics of science).

Extending this to the present context, when in the mid-nineteen eighties the government began to rely on outsiders to direct its policies, the integration of scientific content into policy, the 'how' and 'what' were mediated through the lenses of professionals (in the bureaucracy, industry and academe) and the industry-government culture. Other views were solicited, but they were made to fit the dominant frame during the process of

'operationalization,' translating what is heard into the right language. This theme, the distinctive places that the network and wider policy community occupy, will become clearer in the next two chapters.

The thorough change in outlook between 1987 and 1991 was forced upon the Canadian forestry community by the "shocking" (Jenkins-Smith and Sabatier, 1993) circumstances that led to the blacklisting of Canadian lumber and to a shake-up in the industry because of serious competition and globalization of the economy. Peter Hall (1990) associates this sort of upheaval with a change in the ruling paradigm: during this time politicians go to outsiders to help them with the transition. From the smug statement that Canadians are no longer so worried about clear cutting (Pickering, 1997), we may conclude that the old paradigm has successfully integrated the threat of the new arrival. We are therefore still some ways from a paradigmatic transformation. It is plausible, but not yet probable, that this and concomitant shifts in the power network may come about as a result of the recent First Nations court decisions (Chapter 2).

Oberle said that the bureaucracy is never the source of new ideas;[48] they came from him and those outside whom he consulted extensively. But the outsiders in question, although ahead of the rest of the community, were themselves not a "new paradigm" group; they were steeped in the tradition of industrial forestry. The few who were not found themselves outnumbered. It would be inaccurate to say that they were not listened

[48] Interview, 1 May 1997.

to or even that they had no influence. They were and they did. Both the Model Forest Program and the National Forest Strategy were nudged toward ecocentrism by their efforts but neither could escape the gravitational pull of the timber imperative. We may note that in fact there are two types of professional involved: ecologists (listened to along with native representatives, ecoforesters and environmentalists but without much clout) and industrial foresters (deriving influence from taking an industry line). Or, less sweepingly, those whose methods and philosophy resisted politico-economic interests and were consequently marginalized and those that did not and were considered credible (Sandberg, in prep.). In my meaning the second group has turned to nature only to find it devoid of stability and ruled solely by disturbance. A new ecology conformable with exploitation, "lenient," as Worster (1993) said, "toward human activity," an ecology in which "human wants and desires [are] the primary test of what should be done with the earth" describes this nature (138,140).

The outcome is the curiously mixed, schizoid philosophy, here labelled postmodern, of the National Forest Strategy and Model Forest Program, in which sustainability amounts to the construction and deployment of baskets of bundled benefits that have little to do with forest system persistence because the scale, the benchmark used is human utility, as though forests and humans had evolved in parallel. The timber imperative with its exploitative Little Red Riding Hood ethic demands the application of advanced technology and imposes a timber bias; ecosystem care and economic expediency demand best forestry practices and involvement of all parties. Consequently, the solution

is an uneasy, technocratic and anthropocentric compromise known as sustainable development. It selectively integrates scientific information into policy, a process aided by the uncertainty and difficulty in operationalizing ecological concepts (Peters, 1991). Although it causes some uncomfortable adjustments, it is really quite safe because no transformation of attitude is necessary. Industry continues on its path constrained by minor obstacles and forests continue to be cut and forced into the managed state without let-up. The exploitative, humanistic ethic is beyond questioning. And so are the larger problems of growth (population and economic), wealth and capital.

CHAPTER 5

PRINCE ALBERT MODEL FOREST

Until now our attention has been with the process of public policy making, first by examining the historical and politico-economic container in which Canadian forest policy is made, then by turning to the role of experts in helping produce the specific scientific content of such policy. The Model Forest Program in particular was instructive on this question of the experts, who stand somewhere in the middle of the dynamic between knowledge and material interest in the policy arena, and on the manner in which environmental science is taken up in resource policy.

In this chapter and the next I continue the examination of that program, but now by visiting two of the 10 original Canadian model forest sites, Prince Albert and Fundy, for, after taking apart the federal initiatives from a geo-ecological angle and placing them in their cultural context, what remains to be done is to see how these stakeholder groups were able to forge policy communities of their own and negotiate the delicate issues of material interest and knowledge among parties who traditionally have had either very much or very little of the first, with the tools they were given. These tools were few: money, the freedom that comes with the experimental quality surrounding a pilot project, and the experience of having written a lengthy, demanding proposal together. The partners were also burdened for, despite the novelty, the model forests operate in real life, and real life in Canadian forestry means the by now familiar constraints. The proposal

itself, however, constituted a burden too since it had to conform to the program rules which, as demonstrated in the previous chapter, imposed a conservative, industrially conformant interpretation of sustainable forest management upon its participants. The second goal of this and the next chapter therefore is to probe how the partnerships applied themselves to the task of putting sustainable forestry into operation. In both chapters I approach these goals by telling the story, quite descriptively, of the partners' relationships and the issues they face, gathered from model forest documents and from interviews I conducted in the spring of 1996 (Appendix E). To set the stage, each chapter begins with a summary of the model forest's location and the characteristics of the region's forests.

But why these two model forests and not others, and why not more? Originally, I planned to visit three sites that would give me nearly one-third coverage and therefore some indication, compared to the other model forests, of how peculiar or ordinary my sample sites were. These were to be Fundy, Prince Albert and Long Beach, chosen for their geographic, ecological and socio-economic differences. Thus, at Fundy, located in the Maritimes in the Acadian forest, woodlot owners were to be partners in a region where small timber producers had long struggled to be a part of the forest sector network; at Prince Albert, in the boreal region of the central prairies, First Nations were prominent; and at Long Beach, on the Pacific coast in strongly contested rainforest, the role and strength of the environmental voice could be determined. But shortages of time and money made three sites infeasible and in addition Long Beach Model Forest was experiencing problems getting started. I therefore decided on the first two, knowing that a

planned evaluation of the program could augment my observations at these sites. In any event, when it came to the credibility of the study, in the case study method the objective is not to generalize (incorrectly) from one or more cases to statistical populations, but analytically to theory (Yin, 1988). And as the expectation was that their widely varying conditions would nevertheless not produce substantially different results, a choice of two model forests was still acceptable (Yin, 1988). Furthermore, the threefold structure of the study (Chapter 1) was designed to maximize its validity. Let us now look at the first of these, Prince Albert Model Forest. It must be understood that the text that follows refers to the first phase of the Model Forest Program, which came to a close in 1997.

LOCATION AND ECOLOGY

Prince Albert Model Forest (PAMF) is located in central Saskatchewan, 70 km north of the city of Prince Albert (Fig. 4.1c). Ecologically, it is part of the southern boreal forest, northern mixedwoods zone, transitional between the grasslands and parklands of the prairie, dominated by trembling aspen [*Populus tremuloides*], and the northern coniferous forest. Unlike the mixed forests of the Great Lakes-St. Lawrence and Acadia, here the southward change from coniferous forest to mixedwoods is due to moisture stress and not better growing-season conditions (Scott, 1995). The drier climate also favours increased fire activity which in turn favours the growth of *Populus tremuloides*.

PAMF comprises 314 649 ha[1] on gently undulating to steeply rolling terrain; about 160 000 are forested, mostly in softwood and mixedwood (49% and 37% respectively), on luvisols with some brunisols and chernozemic soils of variable glacial origin (PAMF Planning Committee, 1992). Brunisols and luvisols are associated with boreal well-drained, carbonate-rich, glacial deposits, brunisols occurring in the cooler portions, luvisols under the mixed forests; chernozems are derived from prairie vegetation (Scott, 1995). Organic (peaty) soils also occur but are confined to poorly drained areas.

Over 250 species of wildlife and 16 fish species are found within PAMF. Mammals include ungulates such as plains bison, moose, elk and woodland cariboo; the three canine species wolf, red fox and coyote; lynx, cougar, black bear and several mustelid species like marten, river otter and wolverine. Among fish species are sturgeon, northern pike and pickerel; white pelicans, bald eagles and osprey are just three of an estimated 150 bird species (PAMF Planning Committee, 1992).

The important tree species of PAMF are *Populus tremuloides*, *P. balsamifera* [balsam poplar], *Betula papyrifera* [white birch], *Pinus banksiana* [jack pine], *Picea mariana* and *P. glauca* [black and white spruce respectively], *Abies balsamea* [balsam fir]

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[1] This figure is taken from Kulshreshtha and Walker's *Strategic Planning for the Prince Albert Model Forest* (1994) and differs from the original one of 367 034 ha cited in government brochures and listed in Appendix B. The discrepancy is due to the fact that originally Candle Lake Resort Village (together with Candle Lake Provincial Park) and Lac La Ronge Indian Reserve lands were included in the model forest proposal but failed to become part of PAMF; as well, Weyerhaeuser has fewer hectares in PAMF than originally envisioned. (Candle Lake Resort Village and the Lac La Ronge's Bittern reserve have been included in phase 2).

and *Larix laricina* [tamarack], making up the majority of pure and mixedwood stands, with *Picea mariana* and *Larix laricina* occupying wet and wet-mesic sites (PAMF Planning Committee, 1992).

Zoltai (1975) proposed the distribution of the typical boreal coniferous species *Pinus banksiana*, *Picea mariana*, *P. glauca* and *Larix laricina* as a convenient defining criterion for the northern boundary of the transition zone. If from one to three of the four occur, the area is in the transition zone, and if all four, the northern coniferous zone. Thus, the occurrence of all four species in the PAMF area should place it in the northern coniferous boreal forest. Rowe (1972), however, bases the northern limit on the presence of large stands of the two *Populus* species, which moves this margin farther to the north. One can therefore argue that the PAMF lands belong to either the northern transition or the southern band of the northern coniferous zone, although the presence of *Abies balsamea*, a typical component of the closed spruce forest of the northern coniferous forest, would seem to give more weight to the latter interpretation (Scott, 1995). As noted, however, the primary soil type is luvisolic with some brunisols. Both are characteristic of the boreal in central Canada but luvisols occur in its mixedwoods and the minor chernozems show the influence of the prairie. Consequently, taken together, the tree species distribution and the presence of all three soil types support a location near or on the boundary with the northern coniferous forest.

PAMF GOALS AND OBJECTIVES

PAMF's goals are twofold: "Ensure a sustainable and predictable supply of forest based ecological, social and economic benefits through the management of forest ecosystems and people" and "Raise awareness of and commitment to the concepts of sustainability, integrated resource management, and ecosystem management among forest users, researchers, and managers at the local, regional, national, and international levels" (PAMF Planning Committee, 1992:19).

The first strategic goal has been addressed through the mechanism of adaptive and integrated resource management planning.[2] In the best rational tradition, it is meant to provide "good planning tools for decision making" (PAMF Planning Committee, 1992:20) based on "solid knowledge and information of present and future needs and capability, and the ability to predict and control management actions in achieving desired outcomes" (20,21). The focus of PAMF's activities during its first phase has therefore been on scientific and socio-economic research. Objectives related to the goal of implementing an ecosystemic management regime include maintaining the PAMF ecosystem in such a way that it remains healthy and can provide, for example, "an economic long term wood supply to Weyerhaeuser mills" (22), and developing inventories to support integrated resource

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[2] Integrated resource management is an ecosystem approach in which natural resources are regarded as part of interconnected ecosystems (Mitchell, 1995). In adaptive management computer modelling is used to predict the outcomes of planned interventions, to evaluate the results and to determine whether further action is needed, for example by collecting more information (Peters, 1991).

management.

An education program and activities geared to the transfer of technology and skills both to the public and among the partners and their associates, are part of reaching the second goal. PAMF has also hosted an international conference entitled "Sustainable Forests – Global Challenges and Local Solutions." Educational objectives included bringing together "resource managers, forest users and public to develop ecosystem management strategies and build consensus on common land ethics" (PAMF Planning Committee, 1992:23), to develop educational activities that will "inspire all stakeholders, and the public to understand and appreciate forest ecosystems" (23) and to "demonstrate the resource stewardship philosophy of the partners that positive public opinion is the mechanism for continued access to public resources" (23).

From these excerpts we may further isolate one phrase to help indicate why PAMF's philosophy is in the PM category (Chapter 4; Appendix C), with this philosophy's technological focus: "solid knowledge" is needed "to predict and control management actions in achieving desired outcomes." In the absence of a coarse filter approach, "desired outcomes" suggests a designer forest achieved *via* permissive ecology, even if the goals statement expresses the desire for a healthy forest – at the very least we know that it will have to be one that can also accommodate Weyerhaeuser's substantial and long-term timber supply. This potential clash of interests has been the cause of tension in forestry communities across the country, its resolution a prime motivator for why the Model Forest Program was built on the notion of partnerships. The remainder of the present

chapter will explore how the PAMF partnership has tackled the problem. To this end I first introduce the partners and the management structure at PAMF.

PAMF PARTNERSHIP AND MANAGEMENT STRUCTURE

The partners

A striking feature of PAMF's management structure is its rather limited partnership which yet extends beyond the traditional province-industry relationship. Membership is confined to seven partners. Of these, the four landowners are Weyerhaeuser Canada, the Montreal Lake Indian Band, the Canadian Parks Service and the province (Saskatchewan Environment and Resource Management). Besides the Montreal Lake Cree, two additional levels of aboriginal government are represented by the Prince Albert Tribal Council and the Federation of Saskatchewan Indian Nations. The seventh partner is the Canadian Institute of Forestry. The Canadian Forest Service appears *ex officio* (but has been made a full partner in phase 2 as per instruction [Natural Resources Canada, 1996b; Anonymous, 1997b]). All have a representative on the Partnership Management Committee or Board of Directors.

Canadian Institute of Forestry

When Frank Oberle spoke of consulting outsiders because they had fresh ideas (Chapter

4), the Canadian Institute of Forestry was one of these.[3] Originally known as the Canadian Society of Forest Engineers, the Canadian Institute of Forestry was formed in 1908. As an organization for professional foresters, the Canadian Institute of Forestry assists in the professional development of its members and aims to foster the practice of responsible forestry and better communication among foresters (Johnstone, 1991). To these ends, it publishes *The Forestry Chronicle*.

After Forestry Canada announced the Model Forest Program, the Canadian Institute of Forestry became the moving force behind the effort to bring the Model Forest Program to Saskatchewan. Since the Model Forest Program was to promote forest stewardship and this is also part of the Canadian Institute of Forestry's mandate, it got interested parties together and worked with them to submit the proposal.[4] In the words of consulting Professional Forester Tony Richmond, these "Saskatchewan forestry-ites, a group of refugees from a bunch of goulags" (referring to the influx of foresters from other provinces during the 1970s), were a bit reserved at first, but soon a smaller coalition decided to proceed. Leadership then shifted to Weyerhaeuser.[5]

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[3] Interview, 1 May 1997.

[4] Interviews with Gene Kimbley and Michael Newman, Prince Albert, 11 and 13 June 1996. Another party at Meadow Lake had expressed interest in the Model Forest Program but did not submit a proposal. The Canadian Institute of Forestry was involved only with the PAMF effort.

[5] Interview, Prince Albert, 12 June 1996.

Weyerhaeuser Canada Ltd.

Weyerhaeuser's interest in joining on to the Model Forest Program proposal was the opportunity it offered to develop channels of communication to the Montreal Lake Band, the park and other forest interests and to conduct needed research into the ecological and socio-economic aspects of forest management (Spencer, 1995). Good relations are critical since roadblocks and other forms of unrest put access to timber in jeopardy; besides, Millar Western, an Alberta-based pulp and paper company operating a lease in the Meadow Lake area of northwestern Saskatchewan, is known for its strong social program favourable to natives, which may be putting pressure on the company to better its own performance.[6] Its neighbour to the east is SaskFor-McMillan in the Hudson Bay region near the boundary with Manitoba where a Forest Management Licence Agreement was developed to supply a new oriented strand board facility (May, 1998).

Weyerhaeuser Canada Ltd. is based in Kamloops, British Columbia. Its parent company, headquartered in Tacoma, Washington, has been called the "aristocrat of the American timber industry" (Herndon, 1991:170). With total assets of more than $13 billion dollars, net sales and revenues totalling $11.8 billion and net earnings of $800 million (Weyerhaeuser Company, 1996), it is the largest producer of market pulp and softwood lumber in the world (Gozon, 1995). The company owns and/or manages over 9 million hectares of land in the United States and Canada, but the Canadian branch alone,

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[6] Anonymous interview, June 1996.

with leases in BC, Saskatchewan and Alberta, has access to 7.1 million hectares of forest land; it also has a string of sales centres across the country. The company came to Canada in 1965, when it built a pulp mill in Kamloops, BC. Its operations there, which now include several sawmills, are sustained by a lease of 1.4 million ha; in Alberta it manages 2.3 million ha and the remaining 3.4 million are in Saskatchewan in the boreal forest north of Prince Albert (Weyerhaeuser Canada, n.d.), with 152 200 ha included in PAMF.

Holding 3.4 million ha out of a total of 6.5 million ha of available productive forest in the Commercial Forest Zone of Saskatchewan makes the Weyerhaeuser Forest Management Licence Agreement the largest in the province. Its allowable annual cut stood at 2.4 million m^3 in 1991 (PAMF Planning Committee, 1992), at the time almost one third of the province's total of 6.645 million m^3 (Canadian Council of Forest Ministers, 1993).[7]

Weyerhaeuser has been in Saskatchewan since 1986 when it bought a pulp and saw mill from the government-owned Saskatchewan Forest Products. Today, in addition to a chemical processing plant in Saskatoon and a seed orchard, it owns and operates Prince Albert Pulp & Paper which produces 325 000 tonnes/year of Bleached Kraft pulp and 210 000 tons/year fine paper, and a 90 million board feet (225 000 m^3) saw mill in Big River, northwest of Prince Albert (PAMF Planning Committee, 1992). In addition to requiring about 400 contractors, the combined projects keep around 1210 people

[7] By 1995 Saskatchewan's Commercial Forest Zone's allowable annual cut had climbed to 7.108 million m^3 (Canadian Council of Forest Ministers, 1996).

employed full-time (W. Rosnowski, pers. comm., 1997). The Prince Albert pulp and paper mill alone accounts for 889 of the full-time positions, making it and the woodland operations that supply it by far the most important regional employer.

Over its more than 100 years of existence, Weyerhaeuser has developed a tradition that embraces full utilization, sustained yield, community involvement, public relations and co-operation (Hidy et al., 1963). It established positive labour relations, offering attractive benefits and setting up a scholarship fund. Multiple use, in the sense of managing for more than the timber value, and sustainable forestry have recently become additional targets as they have for the entire industry, and the company is aiming for a minimum-impact manufacturing process (Creighton, 1994). Evidently, the company pursues these policies also in Saskatchewan[8] (the 50 millionth seedling was planted in that province in 1993 [Weyerhaeuser Canada, n.d.]) and its influence as the largest employer in the region is marked. Yet with increased public scrutiny of industrial forestry practices and widening user claims on the resource, together with pressures arising from the

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[8] Company president John W. Creighton, Jr. (1994) has said that young forests grown by companies can be managed sustainably for their timber value while paying attention to such values as the soil, species diversity, wildlife habitat and the protection of culturally or biologically special areas. Public lands, on the other hand, should be earmarked for protection of wilderness, old growth and for recreation. In Canada, where public lands are leased to the forest industry, the situation may ask for a different response. Indeed, Weyerhaeuser Canada (n.d.) states that "the vision of stewardship encompasses the full range of resource values" including the "preservation of special areas" and recreation. In practice, the company has displayed reluctance to support setting aside representative areas in the belief that unleased public lands already protect unique features through the provincial park and related systems (Anonymous interview, June 1996).

colonial legacy in race relations, this tradition, and Weyerhaeuser's reputation with it, has not been robust enough to avoid unrest and resistance to its operations. Thus the company is faced with issues not only of vital concern to itself but with considerable impact on PAMF. These will be discussed below.

Parks Canada

Prince Albert National Park contributes nearly 157 000 hectares or 40 percent of its territory to PAMF. It was established in March of 1927, apparently as political payment to Prince Albert for having helped, with that city's Liberal riding association, win Prime Minister Mackenzie King a seat there in a by-election after he lost his own in the 1925 general election (Waiser, 1998). Although, as part of the national parks system whose mandate is the protection of Canada's natural heritage, the new park was to "preserve in perpetuity a portion of the primitive forest and lake country of Northern Saskatchewan" (Canada, 1990:38), the feeling in the Parks Branch in Ottawa at the time was that the region had very little in the way of scenic appeal (Waiser, 1998). But political pressure overrode this concern and the park would be developed for its recreational potential. Liberals in the area hoped that tourism dollars would help offset a large debt accumulated during the war and at least some of the local promoters with summer cottage lots in the area counted on the park bringing needed services such as a road (Waiser, 1998). They were successful in this and the park became known as an "automobile park" (Goode et al., 1996).

Although the Canadian Parks Service expressed concern over the wisdom of setting this land aside given the meagre scenic appeal of its natural features, the fact is that the new park's recreational character fitted the thinking of the time. The National Parks Act of 1930 (Canada, 1930a), Section 4, says that the parks are "dedicated to the people of Canada for their benefit, education and enjoyment ... and such Parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations." But at this early stage of policy development, believing that "the best and highest resource use for these areas lies in recreation," Parks personnel often placed greater emphasis on the provision of "artificial" recreational opportunities than on conservation goals (Canada, 1969).

The emphasis on artificial recreation, which as late as 1974 permitted a dam to be constructed on Kingsmere Lake in Prince Albert National Park in order to facilitate boating and lake access (Prince Albert National Park, 1993), has in recent years largely been abandoned in favour of protection and restoration of the resource. Thus the 1983 policy states that "no new golf courses and downhill ski areas will be developed in national parks" (Canada, 1983:33:4.1.6); Parks Canada will provide those outdoor recreation opportunities that "are dependent upon a park's natural resources and require a minimum of man-made facilities" (33:4.1.2). The move away from the amenities approach has come with the adoption of the ecosystem method of land (and water) management. Recent policy, for example, uses the terms "ecological integrity," "stewardship," "citizen awareness" and "diversity." The fulfilling of international obligations is also a prominent

feature and there is a clear sense that the ecological integrity of national parks is affected by activities taking place outside of it (Canada, 1994), a marked departure from an earlier time when such concerns did not exist.

This insight has led to the statement that "Parks Canada will take the lead role in establishing integrated and collaborative management agreements and programs with adjacent land owners and land management agencies. Parks Canada will seek mutually satisfactory solutions to trans-boundary concerns associated with the management of shared ecosystem components, the effects of adjacent land use practices on park ecosystems, or the effects of park management practices on the use of adjacent lands" (Canada, 1994:35:3.2.9). Hence, from the park's perspective, participation in PAMF is an extension of its mandate.[9] Like other national parks where ecological integrity is threatened, it is becoming an island within an agricultural and industrial forestry landscape. Thus, the park's aspiration in its involvement with PAMF is to contribute to the region's (and the world's) ecological health by broadening the discussion to include, for example, biodiversity, or by raising the possibility of connecting existing protected areas "either philosophically or geographically."[10]

Apart from this educational goal, and also in accord with Parks policy, park personnel have made Prince Albert National Park available for use in scientific studies, in

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[9] Interview with Paul Tarleton, Waskesiu, 10 June 1996.

[10] Paul Tarleton, 10 June 1996.

partnership with PAMF and with others. An example of the latter is BOREAS (Boreal Ecosystem Atmospheric Study), which investigates the relationship between global climate change and boreal forests and involves the Atmospheric Environment Service, the Centre for Remote Sensing and the National Aeronautics and Space Administration. Within PAMF, the park has supported hydrological and biodiversity studies of several taxa, among them fungi, birds and forest plants, and has benefited from some socio-economic investigations into recreational activity and visitor spending patterns in the park (Bouman, 1995). While there is bad feeling towards the park among a few of PAMF's partners, the value of the park as a contributor to scientific research is readily acknowledged. In fact, to some that function is critical because "the more evidence the park has about conditions outside the park, the more ammunition they have to protect it."[11]

Prince Albert National Park's shift in focus away from development has caused concern and opposition in the community of Waskesiu Lake, a tourist centre in the park and site of its headquarters, even though the park remains committed to accommodating its 200 000 annual visitors (Prince Albert National Park, 1993). The conflict regarding economic development and its threat to the park's ecological integrity, evident among park users, can be seen also within PAMF where it is expressed as doubt over the park's usefulness. For example, to some forestry observers the park seems like a "silvicultural slum" because the one natural control, fire, has determinedly been kept out (a policy now

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[11] Anonymous interview, June 1996.

being eased [Prince Albert National Park, 1993]) and human controls in the form of logging have been illegal.[12]

The province

Saskatchewan's Department of Environment and Resource Management is the province's representative on PAMF. As the jurisdictional authority and principal landowner, the province is a *de facto* partner. It has not been an enthusiastic one. Reportedly, its then Minister, Berny Wiens, was reluctant to sign the enacting agreement of January 1993. One reason for this may be the federal nature of the model forest project and its potential threat to provincial authority but a provincial observer disputed it, saying that any reluctance would have occurred beforehand because more than one group intended to submit a proposal but that once a group was successful, the province would automatically become a partner.[13] Nevertheless, Wiens is said to have hesitated prior to signing. A member of PAMF's Planning Committee believes that the worry was about internal meddling, that is, by members of the Saskatchewan forestry community, this "motley collection of little has-beens interfering with their God-given right to manage the provincial landscape,"[14] and not by the federal government. A more cynical view has it

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[12] Richmond, 12 June 1996. Note that until the mid-1960s some slight "harvesting" was permissible in Prince Albert National Park. Goode et al. (1996) report that it was "very controlled" and "restricted to the removal of cordwood" (49).

[13] Anonymous interview, June 1996.

[14] Tony Richmond, 12 June 1996.

that, since "trees don't vote,"[15] the "government does not care about trees, forests, anything; they are just concerned about their pensions."[16]

Certainly, forestry may not be all that important in the eyes of the provincial government. By the summer of 1996, only 13 practising foresters were employed by the province; four were in management but a mere two in the Operations Division handled the entire province.[17] Saskatchewan's allowable annual cut of 7.6 million m^3 (up from 7.1 in 1994-95) is not much compared, for example, to Québec's with 57.8 million m^3 or British Columbia's with 71.6 million m^3; only Nova Scotia, Prince Edward Island and Newfoundland/Labrador rank below it (Natural Resources Canada, 1997). Historically, Saskatchewan's entire manufacturing sector, including forest products, has represented about 5 percent of a provincial economy dominated by agriculture and mining (Steele, Boylen and Baumgartner, 1988). True, within the manufacturing sector the forest industry ranks second behind food processing in total value added, but given that sector's smallness, the forest industry still occupies a modest place in the economy, reflecting the province's limited forest base (Howlett, 1989b).[18] Yet the industry is not insignificant.

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[15] Tony Richmond, 12 June 1996.

[16] Interview with Tom Ballantyne, Prince Albert, 14 June 1996.

[17] Anonymous interview, June 1996.

[18] Saskatchewan's forest land comprises the Reconnaissance Zone in the far north and the Commercial Forest Zone in the north-central region which includes Lac La Ronge and Peter Pond and Churchill lakes. The former zone's isolation and poor quality timber make timber extraction not commercially viable, leaving only the latter to support the forest industry. Here, of a total of 12.9 million ha, 7.7 are considered productive and of these

Direct and indirect employment for 1995 in the sector totalled 9000 jobs or 1 in 51 (compare this to 1 job in 9 in British Columbia and 1 in 17 in Québec), with wages and salaries (in 1993) amounting to $123 million (Natural Resources Canada, 1996a). Although 46 percent of the land base is forested (including provincial parks), almost all of this land is located in the north-central portion of the province. Consequently only a small percentage of the population is affected, mostly Indian communities experiencing, according to one reporter, poverty comparable to that in the Third World, but apparently outside the circle of interest of Premier Romanow who is said to visit the region less often than he does the Ukraine (Urbanoski, 1996).

Whatever the reason, the province's performance at PAMF has been "disappointing." The prevailing opinion at PAMF is that the province has not been as supportive as it might have been.[19] The representative to the Board of Directors, seeing Saskatchewan Environment and Resource Management as a "silent partner," would often leave halfway through a meeting or send a proxy unfamiliar with PAMF. At a general meeting shortly before my interviews took place, the concern was raised about the degree of the ministry's involvement and its seeming lack of interest. The complaints resulted in its Director of Sustainable Land Management Planning, Doug Mazur, becoming the representative and subsequently (1996-97) PAMF's president. It should be noted that the

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1.2 are not available. This means that only 10 percent of Saskatchewan is productive available forest (Steele, Boylen and Baumgartner, 1988).

[19] Interviews with Tony Richmond, Ian Monteith, Michael Newman and others.

complaint was aimed only at the Board of Directors level; provincial personnel on the technical committees have been highly involved, doing more than their share of work. In contrast to the Board of Directors, the Department's people on the committees have tended to come from the operational rather than the bureaucratic ranks.

Montreal Lake Indian Band

The Montreal Lake Indian Band was the only band in the region to become a PAMF partner. The original proposal had been signed by another Woodland Cree group, the Lac La Ronge Band (210 km north of Prince Albert), but worries about the involvement of the Village of Candle Lake, with which it has clashed over some 12 000 ha of land in this area (Burlinguette, 1996), prompted it to withdraw.[20] PAMF took Candle Lake out of the model forest area and inserted into the enacting agreement a no-prejudice clause to existing land claims or future actions in order to get La Ronge to stay, but to no avail.[21] The band felt too uncomfortable, though they have joined the phase 2 PAMF as has Candle Lake Village, with the result that the boundaries originally proposed for PAMF will be largely in effect (footnote 1 above; Anonymous, 1997b).

Montreal Lake Reserve is 6000 ha large, located against the northern boundary of PAMF along the southwestern and southern margins of Montreal Lake. It was established

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[20] Gene Kimbley, 11 June 1996.

[21] Michael Newman, 13 June 1996; Richmond, 12 June 1996.

at a site selected by plebiscite when the Montreal Lake Indians signed the adhesion to Treaty 6 in 1889 and surveyed the following year (Goode et al., 1996). As colonial rule has effectively removed the means and powers associated with independence, joining PAMF was a matter of strategy on the part of the Montreal Lake Cree in their quest for control over resource management and ultimately self-government. Such action would seem to be fully in line with Montreal Lake's tradition of active involvement with the world around them in order to influence their fortunes as much as possible; in this view even the signing of the adhesion to Treaty 6 exemplified this attitude (Goode et al., 1996). Through the PAMF partnership they could discover who is who in forestry in the region and how it operates.[22] PAMF offered an opportunity they could not refuse, because the provincial and national governments, the national park and industry are seldom gathered at the same table.[23] Building the relationships that will help the Cree move towards meaningful participation in land management and decrease the burden of social ills such as unemployment is thus the motivating force behind Montreal Lake's involvement. While Montreal Lake is visibly a strong beneficiary of the Model Forest Program, given the demands of the Model Forest Program selection process it seems likely that without them PAMF's proposal would not have been successful. In general, improved relations between

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[22] Interview with Ed Henderson, Prince Albert, 13 June 1996.

[23] Kimbley, 11 June 1996.

the band and other forest users go a long way toward stabilizing access to the forest resource.

Prince Albert Tribal Council and Federation of Saskatchewan Indian Nations

Both the Prince Albert Tribal Council and the Federation of Saskatchewan Indian Nations serve a supportive function to the Montreal Lake Nation at PAMF, although in recent months they have increased their own involvement.[24] Montreal Lake is a member of both organizations and the Prince Albert Tribal Council is a member of the Federation. Membership in the regional bodies does not affect band autonomy. An individual Indian nation is always free to decide on its own actions; the umbrella groups can either support it or stay away.

The Montreal Lake Band takes credit for having taken a leadership role in the development of many native positions provincially and nationally.[25] This flair for organization and leadership is felt regionally as well, so that the band has gained a reputation for aggressiveness. With some 2140 members, it is the smallest of the three Woodland Cree groups, after Lac La Ronge which, numbering about 5790, is the largest Indian Nation in Saskatchewan, and Peter Ballantyne Nation with almost 5300 members (Saskatchewan Health, 1996). Together, however, these three Woodland Cree groups are

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[24] Kimbley, 11 June 1996.

[25] Henderson, 13 June 1996.

known as the "Big Three" because they make up approximately 55 percent of the Prince Albert Tribal Council and correspondingly wield much political power which can spill over into national, even non-Indian national politics.[26] Although Montreal Lake hopes it has earned a position of respect because of the experience its members have gained in the forestry business and the Big Three believe they do not exploit their majority power for the joy of wielding power, other First Nations have sometimes referred to them as the "Woodland-Cree-get-a-heart."

The Federation of Saskatchewan Indian Nations is the principal political instrument for the articulation of the goal of self-government available to the province's native communities. It grew out of the Union of Saskatchewan Indians, established in 1946 with the assistance of Tommy Douglas and the Co-operative Commonwealth Federation or CCF (elected in 1944), and was itself the result of a merger of two regional groups and the Saskatchewan chapter of the North American Indian Brotherhood (Pitsula, 1994). Interestingly, already at that time Treaty 6 area natives were the most active in their national organization, the League of Indians of Canada, founded in 1919.

It is not easy to sort out Douglas' motives in encouraging and assisting the growth of a united voice for Saskatchewan's natives through their Union. Pitsula (1994) suggested that two concurrent forces had led to its creation. Firstly, Indians who had participated as equals in the war returned home to be confronted by the patriarchal

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[26] This and next statement, interview with Henderson, 13 June 1996.

attitude that permeated the federal approach to natives and native affairs, and by their status as second class citizens. The clash between this and their own sense of worth spurred them to action. Secondly, an awareness of the treatment of natives was emerging among non-native Canadians, evidently also much induced by the war. The *Globe and Mail*, for instance, saw a parallel between the Indian reserve and a concentration camp (Pitsula, 1994). While from a non-native point of view assimilation was an implicit or explicit goal, natives themselves resisted assimilation, many not even having an interest in obtaining the franchise - a situation due at least in part to the fact that the term "enfranchisement" appeared in the Indian Act where it stood for the ceding of Indian status (Pitsula, 1994; Royal Commission on Aboriginal Peoples, 1996). Yet the CCF, and especially Douglas with his high regard for humanity, could not condone the grim conditions in which Indians lived and sought to empower them by aiding them in building the political infrastructure through which they might more forcefully speak and act (Pitsula, 1994).

In his drive to establish the Union, Douglas incurred the hostility of the Liberal government of Mackenzie King and in particular of the Indian Affairs Branch which feared interference in its jurisdictional rights (Pitsula, 1994). The Metis, who did have the franchise, voted strongly Liberal; thus, by courting status Indians, the CCF may have tried to undo the Liberal hold. The Catholic Church, however, was also distrustful of a socialist government and discouraged natives from associating with it. Since the Metis and many Indians were Catholic, and since Indians could not vote, there was little political mileage

to be gained from supporting the creation of an Indian Union. Humanitarian ideals, then, may well have been Douglas' chief motivation.

I believe, however, that we can look at this issue through one more lens, but here too the argument is inconclusive. The CCF's 1944 election plan looked to the province's northern resources as a source of wealth which would fund its social welfare programs (Goode et al., 1996).[27] As a result, the north would have to be opened up and this would require the assent and co-operation of its population, mostly native. If they could speak with one voice and unite behind the government, it would expedite development. The downside to such a strategy, if indeed it existed, is that it might be easier to keep the various bands weak than to risk a united voice if such a voice were to be one of disagreement.

Be that as it may, the Union eventually matured into the Federation of Saskatchewan Indian Nations, like its predecessor an organization devoted to the protection of native rights and the fostering of self-determination.

PAMF management

Charged with overseeing the commitments of the association, the Board of Directors elects a chairperson annually. Although the aim is to try for consensus (successfully

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[27] Incidentally, opening up the north for its resources by means of a road was also on the mind of Prince Albert Liberals when they approached King about a national park in 1926 (Waiser, 1998).

apparently),[28] a process described as "imperative" in PAMF's proposal (PAMF Planning Committee, 1992:20), committee decisions are arrived at by vote.[29] The Program Administrator or General Manager (at the time Thomas Bouman) answers to the Board of Directors and in turn two committees report to him: the technical committee (sometimes referred to as the partners committee) which he chairs, and the communications committee, chaired by the Communications Officer (Ian Monteith, no longer with PAMF). Prior to 1996 when it became defunct, a research committee made recommendations to the Board of Directors. The consultative committee, a so-called external body whose existence is necessitated by the limited partnership base, also answers to the Board of Directors. In 1996 it was chaired by Ian Monteith. A peer evaluation group and liaisons to funding and other agencies round out PAMF's (first phase) operational set-up.

The prominence given to research and the desire to maintain a climate of scientific objectivity with arms-length relations to researchers have helped structure PAMF management. For example, the research committee was formed by solicitation of volunteer members - four from diverse disciplines, including landscape ecology and aboriginal affairs, at universities in western Canada and the United States, and the remaining member from the Forest Engineering Research Institute of Canada's western division. From its inception in 1994 to its final meeting in December 1995, its role was to

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[28] Michael Newman, Prince Albert, 13 June 1996.

[29] Anonymous interview, Prince Albert, June 1996.

advise PAMF's Board of Directors on how to best integrate research results into "a single decision-making framework for sustainable use of forest resources" (Bouman, 1994:90), that is to say, PAMF's management plan. Apart from this principal role, the committee also worked with the administrator on the management and planning of PAMF's research program. The committee's disbanding may have signalled a decreasing interest in research on the part of the Board of Directors, with the possible result that, in a second-phase PAMF, research will, if anything, be negligible (T. Bouman, pers. comm., 1997). The fact that the intended "deliverable," the management plan, has not been delivered, suggests that it might still have had a role.

In a similar way, the technical committee published an invitation to researchers with expertise in boreal forest ecology and management in order to establish a pool from which to draw scientific project staff. This arm's length strategy caused some rancour in at least one PAMF contractor who complained that the terms of reference for contracts are poorly written and the group lacks "hands-on expertise" with forestry, being composed of biologists and ecologists.[30] In fact, foresters and forest technicians do have a place on the technical committee and, as I noted, compared to the Board of Directors, representation on the technical committee by provincial staff tends to be at an operational and less a bureaucratic level.

All partners have a representative on the technical committee which, among other

[30] Interview, June 1996.

tasks, conducts reviews of proposals for funding. If consensus is reached, the technical committee makes a recommendation to the Board of Directors; if not, a decision is referred to this board. Technical committee recommendations have not been denied and if the decision is left to the Board of Directors, the technical committee is also listened to.[31] As budgets will be sharply reduced, the future of the technical committee in second-phase PAMF is uncertain.

The communications committee has been preoccupied with liaison duties with public relations personnel in other organizations and the media, and with education efforts such as curriculum development. During the summer of 1996, the committee was developing a CD ROM aimed at bringing PAMF and its version of ecosystem management to the schools. PAMF co-ordinates guided tours that combine a visit to Weyerhaeuser's Clarine Lake Demonstration Forest, located outside of PAMF boundaries and established and maintained by Weyerhaeuser (Bouman, 1994), and to the Prince Albert National Park, and further participates by making available its Communications Officer and by subsidizing the costs of bus transportation for grade seven students at whom the tour is aimed (Anonymous, 1994a). An education kit on sustainable and multiple forest use also targets this age-group while a video entitled *Rhythms of Nature*, promoting global ecosystem management, was produced for local highschools (Anonymous, 1996a,1996b). In addition, PAMF plays host to researchers from around the world. The communications

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[31] Anonymous interview, June 1996

committee also produces the monthly pamphlet *Forestimes*.

The consultative committee was created in the fall of 1993 in order to draw upon interests and views excluded from the partnership circle. This "grassroots" external body helps fulfil PAMF's commitment to public consultation but, as its name suggests, its mandate is strictly advisory in nature. The committee is "to act as a sounding board for sharing concerns and providing recommendations to ensure that the objectives of the Prince Albert Model Forest are being achieved" and its foremost concern is educational, "to heighten awareness of the forest and of forest activities" in the spirit of the 1987 World Commission on Environment and Development 'Brundtland' report (Consultative Committee, 1996:2).

In 1996, representatives of thirteen non-governmental "forest stakeholder" (Consultative Committee, 1996:1) organizations [NGOs] comprised the consultative committee; these NGOs ranged from municipalities to recreational societies to environmental groups such as the Saskatchewan Wildlife Federation, and included an association for professional foresters, the Saskatchewan Forestry Association. Since there are no farm woodlots within PAMF's boundaries, one group not on the consultative committee was the Farm Woodlot Association. Its views, however, may not have been completely excluded because one of its members, Tom Ballantyne, represented the Saskatchewan Agro-Forestry Advisory Committee on the consultative committee. Some shadow boxing seemed to be taking place between the two organizations over a dispute concerning a federally funded farm woodlot extension project for which the Farm

Woodlot Association had written a proposal but which the Agro-Forestry Committee with its "bureaucratic intelligence" refused to endorse because, as Ballantyne put it, "they are afraid of losing horses in their stable."[32]

The independent voice of woodlot owners in the region was shut out of the PAMF process early on. The Farm Woodlot Association had wanted to submit a proposal to the Model Forest Program but, when Weyerhaeuser's gathered steam, the group requested to be a partner and was refused. Ballantyne speculates that Weyerhaueser was not interested because it feels the Farm Woodlot Association's "sole interest is to increase the cost of our wood."[33] The company does buy from local woodlot owners but is not actively seeking their wood. This may be because the uses of poplar, a species very easily grown on a renewable basis, are limited. Poplar's low desirability may change in the near future when Weyerhaeuser runs out of wood closer by and higher costs, incurred by greater hauling distances, make a deal with local woodlot owners attractive. But the Farm Woodlot Association is not mandated by statute and consequently its position is weak, although the factor just mentioned may give the group some leverage; in fact, negotiations were taking place during 1996.

An advisory role for auxiliary committees at PAMF is the norm. The communications

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[32] Interview, 14 June 1996.

[33] Interview, 14 June 1996.

committee, for instance, does not participate in decision-making although members have input into its products. Thus the CD ROM project has been passed back and forth between Ian Monteith, who was the key actor behind it, and the committee. But in the case of the consultative committee, composed, as I have noted, of all NGOs with an interest, and often an economic interest, in forest affairs, their confinement to advisory status appears to be a weakness. The new open board structure which PAMF adopted late in 1996[34] was not expected to substantially change that because, although consultative committee members would attend all but *in camera* sessions, they would not have voting rights (I. Monteith, pers. comm., 1997). The point appears to be moot now anyway since there have been no committee meetings since the fall of 1997 and the new General Manager[35] has been very slow in returning messages, sometimes waiting up to a year (A. Brady, written comm., 1998). A related development is that Monteith's position was dissolved in anticipation of some other way to look after communications, though the phase 2 proposal had budgeted for it. In light of the lack of non-landowner representation on PAMF's Board of Directors, I regard the evolution toward greater isolation of the board as disquieting.

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[34] A committee established to write up the second-phase proposal which included the Board of Directors, the Village of Candle Lake and consultative committee members (SK Environmental Society, Nature SK, SK Wildlife Federation, SK Agro-Forestry Committee, SK Institute of Applied Science and Technology) precipitated the change (I. Monteith, pers. comm., 1997).

[35] Keith Chaytor, a Newfoundland forester with experience both in the private sector and with Forestry Canada (Anonymous, 1997b).

Speaking of the time that the consultative committee was active, one board member believed that the Board of Directors implemented most of the committee's recommendations, those, that is, that did not interfere with the board's "legal obligation to get things done."[36] Monteith, its chairman, reportedly worked hard to make the consultative committee more than token, but there is no ignoring the fact that the consultative committee, like the other committees, was an add-on created after the formation of the partnership in order to fulfil its promise of consultation with all forest users. This function now seems crippled. Allyson Brady (written comm., 1998), Co-ordinator of the Saskatchewan Eco-Network, thought that future consultative committee meetings will now proceed without the voice of environmental NGOs.

Already at the time, the consultative committee was easy-going and preferred to avoid controversy.[37] One reason for this was the lay qualifications of most people on the committee who must read quantities of material and attend many meetings and, although they were refunded travel expenses, were not remunerated for their time. This is typical of NGOs, operating with volunteer labour except for a few who are on staff and whose involvement is part of their employment. Often also one person must wear more than one hat; for example, Brady was also the full-time staff person for the Saskatchewan Environmental Society and a member of the Saskatchewan Forest Conservation Network

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[36] Newman, 13 June 1996.

[37] Interview with Allyson Brady, Saskatoon, 11 June 1996.

and represented the latter two groups on PAMF's Consultative Committee.

Consequently, that observer found that the consultative committee was a bit "lost" at first and its review of the PAMF program vague, agreeing with the process rather than examining it with a critical eye, or asking how the results of scientific research will be incorporated by Weyerhaeuser in its Forest Management Licence Agreement or by industry throughout the province on other Crown land leases. Weyerhaeuser's erstwhile representative and the first president of PAMF, Jack Spencer, had similar thoughts, saying that the consultative committee lacked direction because it was unclear about its role which he had envisioned as being larger, with some of the groups attaining partnership.[38] At one point, more confrontational questions were asked and referred to the technical committee, generating a written reply. Questions by the consultative committee afterwards were less concerned with the validity of the projects than with how the projects were administered.[39] On the whole, the consultative committee was supportive of PAMF and said so in its report (Consultative Committee, 1996).

Spencer's remarks are the more interesting because Weyerhaeuser displays a strong preference for advisory boards elsewhere in its Forest Management Licence Agreement area. Although there may be "a natural evolution from advisory group to partnership," Weyerhaeuser at this time does not want to enter into such an arrangement with all

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[38] Telephone interview, 19 June 1996.

[39] Anonymous interview, June 1996.

members of the outside community.[40] Spearheading PAMF was a risk but, as Spencer points out, the area is small and the partners had ample opportunity at the start to set out clearly the conditions: "Weyerhaeuser would continue to harvest wood, First Nations would continue to have their treaty rights, the park would continue in its policy of no logging." A taste of the risk to Weyerhaeuser was described vividly by consulting forester Richmond, who attended the first meetings and helped write PAMF's proposal, when he related asking Spencer at those first meetings, "are you prepared to wake up in the morning and open your eyes to find people in your bed that you had never even thought you knew?"[41] This risk and Weyerhaeuser's response to it can be appreciated better when we examine the issues facing PAMF as it prepared for a second phase (see below). Weyerhaeuser has never ceased feeling the risk, which is really about security of wood supply; in fact, former Montreal Lake Chief Ed Henderson, signatory to the 1992 proposal, thought that the company, now that it was in the middle of Forest Management Licence Agreement renewal negotiations, had become overly cautious, even paranoid, viewing everyone as the enemy.[42]

A lesser problem endemic in PAMF's committee structure was a lack of communication between the committees and the Board of Directors and among committees. As mentioned, this situation has worsened in the past year. One

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[40] Jack Spencer, 19 June 1996.

[41] Interview, 12 June 1996.

[42] Henderson, 13 June 1996.

representative on the communications committee noted that the Board of Directors seldom informed committee members of decisions it made and that minutes of Board of Directors meetings were not circulated.[43] Committee members were not informed either about the activities of the other committees. A member from the technical committee at times attended consultative committee meetings, but this type of involvement seemed to be rare.[44] Likewise, Saskatchewan Environmental Society's Allyson Brady had for most of her involvement not met anyone outside of the consultative committee.[45] There was no rapport with the Board of Directors. If opportunities for it existed, at fieldtrips, for example, or at meetings, the former might be difficult to attend because of the extra time commitment, and joint discussion was not deliberately made part of meetings. One positive change in 1996 was that Prince Albert Tribal Council's representative, who until then was a white person said to rubber-stamp Board of Directors decisions,[46] was replaced.

ACCOMPLISHMENTS AND ISSUES FACING PAMF

The above sketches a picture of who the partners are and gives an indication of the kind of pressures that may be expected. Countering an increasing contestation over the forest

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[43] Anonymous interview, June 1996.

[44] Anonymous interview, June 1996.

[45] Brady, 11 June 1996.

[46] Anonymous interview, June 1996.

resource, at home and overseas, by applying principles of sustainable development to real forested landscapes, was an important element in the creation of the Model Forest network. As it brings together a great variety of people, it is reasonable that different views on ecosystem management should underlie some tensions at PAMF, tensions that this particular model forest has tried to lessen by limiting the partners to landholders. But historical factors also contribute and in general, we can recognize two broad categories of accomplishments and issues facing PAMF: those to do with 1) the partnership, by far the most numerous, and 2) the management plan. In the following pages I will present these, beginning with those to do with the partnership.

The partnership

As elsewhere in the Model Forest network, PAMF's greatest accomplishment may be that it has brought diverging interests to the table to talk and work together on pressing land use issues. Many of those interviewed ranked highly the opportunity to get to know one's neighbours, the improved communications, trust and co-operation. This judgement is compatible with the Model Forest Program's formal evaluation (Gardner Pinfold, 1996) which termed the formation of partnerships a major accomplishment. Two interrelated partnership matters stand out at PAMF: native relations and the notion of co-management.

First Nations relations

Some of the partnership's most visible successes in co-operation are in the area of native relations. In the case of the Woodland Cree, for example, there are long-standing grievances against the park, and the park has made significant progress towards setting them right. One of these goes back to the park's creation in 1927. Goode et al. (1996) state that native persons living in the area were not forcibly moved out but, forcibly or not, residents were relocated in the 1930s, some "under the cover of night,"[47] in accordance with the National Parks Act of the time (Canada, 1930a) which stated that "Lands within the Parks shall not be ... settled upon, and no person shall use or occupy any part of such lands ..." (Section 6.1) and "The Governor in Council may authorize the Minister to purchase, expropriate or otherwise acquire any lands or interests therein, including the lands of Indians ... for the purposes of a Park" (Section 6.3). Hunting, fishing and trapping were no longer permitted in these traditional territories, except by special arrangement (Goode et al., 1996). Today, a "pet" joke in some native quarters has it that they want to be able to go and see the animals, that is, to hunt deer.[48] Also, as Ed Henderson said, they are "very contemptible" of the $40 fee to be paid if they want to visit their gravesides.[49] Paul Tarleton, Prince Albert National Park's Head of Ecosystem

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[47] Gene Kimbley, 11 June 1996; also Michael Newman, 13 June and Paul Tarleton, 10 June 1996.

[48] Newman, 13 June 1996.

[49] Interview, 13 June 1996.

Management and acting manager since the loss of his superintendent in a Parks Canada reorganization, disputes that, saying no one has approached him directly about unrestricted access.[50] Nevertheless, he recognizes that to the local natives, Prince Albert National Park appears as a "big black hole."

A related grievance dates back to 1930 when the Liberal government of Mackenzie King, in its final days, transferred ownership of and jurisdiction over natural resources to each of the three prairie provinces. Although the Saskatchewan Natural Resources Act states that the "Indians shall have the right, which the Province hereby assures to them, of hunting, trapping and fishing game and fish for food at all seasons of the year on all unoccupied Crown lands and on any other lands to which the said Indians may have a right to access" (Canada, 1930b:Article 12), Canada also "agreed that the laws respecting game in force in the Province from time to time shall apply to the Indians within the boundaries thereof." Article 20 further provided that the province would set aside as necessary bird sanctuaries and shooting grounds. The combined effect of the National Parks Act and these provisions of the Natural Resources Act was to shrink very considerably the discretionary land base to which the Indians had had access. It did not take long for the food situation at Montreal Lake to become so serious that Bishop George Exton Loyd of Prince Albert felt obliged to seek some solution from the Department of Indian Affairs in July 1927 (Goode et al., 1996). This was exactly what

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[50] Interview, 10 June 1996.

National Parks Commissioner Harkin had feared when he had argued, unsuccessfully, for a smaller park since, the larger the park, the greater the impact from exclusion (Waiser, 1998).

The Natural Resources Act is also believed to have had the effect of limiting Treaty rights[51] because its words gave a permanence and fixity to an agreement that hitherto had held some vague and even unspoken elements;[52] it may also have begun the current trend towards a devolution of responsibility for native people to the provinces, a breach of the terms of the treaties that were signed between Indian nations and England on behalf of Ottawa. Even before 1930 regulations aimed at conservation had restricted the number of species natives could hunt (Goode et al., 1996), but with the transfer of resources to the province, Saskatchewan came to have powers that penetrated into almost every area of native life; water, forests, fish, wildlife and minerals were all subject to provincial legislation. At the stroke of a pen, thought former chief Henderson, the 1930 act had "robbed the inhabitants of that land base ... and told them they no longer existed."[53] The province was requested "from time to time" to set aside reserve lands as needed (Article 10) but these remain as outstanding land debts, and the difficulty in settling them, together with the issue of treaty rights, is the cause of some heat and

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[51] Though they did not sign an adhesion to Treaty 6 until 1889, 13 years after the Sturgeon Lake band had signed, Montreal Lake and Lac La Ronge Woodland Cree lands had been included in the ceded territory of 1876 (Goode et al., 1996).

[52] Richmond, 12 June 1996.

[53] Interview, June 13 1996.

negotiations between the province and the Federation of Saskatchewan Indian Nations (Sampson, 1995a).[54] Outstanding land debts are still being brought before the courts; not long ago the Lac La Ronge Band lost a fight for more land under Treaty 6 (Burlinguette, 1996).

From the native point of view, Prince Albert National Park has added fuel to the fire over the years by glamourizing Grey Owl, a British conservationist who adopted native ways and lived in the park from 1931 to 1938 (Canada, 1990). The native anger is easily understood – a white person masquerading as an Indian, extolling Indian values, is revered while the people who held the values were "booted out" of Prince Albert National Park.[55] Some similar inversion had happened in August 1928 on the occasion of the opening ceremonies of the park, Prime Minister King in attendance. On the shore of Waskesiu Lake a tall spruce was clipped to make a lobstick, an aboriginal marker in which only the crown branches are left, signifying "that the chief was on his home ground" (Waiser, 1998:18). Evidently, the "chief" was King, and the organizers had appropriated this symbol to honour him, but in the meantime the provisions of the Parks Act required the imminent displacement of the real chief. In later years, Grey Owl became something of a figurehead for the park; photos of him hung in the reception area of the park's headquarters at Waskesiu and a local group, Friends of the Park, wanted to build a Grey

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[54] Also Richmond, 12 June 1996.

[55] Paul Tarleton, 10 June; Gene Kimbley, 11 June; Michael Newman, 13 June 1996.

Owl Museum. The Cree protested and the idea was dropped; all of the pictures but one have disappeared. Instead of focussing on Grey Owl, park management is now preparing interpretative sessions with local Cree who will talk, not about a make-belief Indian, but about real ones and their history with the park.

PAMF has been directly credited for this, but in fact the initiative was begun before the association became fully operational and involves two bands that are not partners (Anonymous, 1995a). PAMF's spirit of co-operation is, however, evident and there can be little doubt that the build-up of trust fostered by PAMF has helped this project. The park has always employed the local Cree to help with fire protection, but the new training and job opportunities being worked out under the agreement are designed to open career paths in park conservation and interpretation and generally prepare the Cree for employment within the federal civil service. In a similar development unrelated to PAMF, the Ministry of Environment and Resource Management and the Federation of Saskatchewan Indian Nations recently signed an agreement jointly funded by the federal and provincial governments whereby native conservation officers will be trained in a program run by the federation (Burlinguette, 1995).

Another small victory for Montreal Lake is an increased share of the contracts let by Weyerhaeuser which has considerably brought down unemployment on the reserve.[56]

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[56] Gene Kimbley, 11 June 1996. Contracts with Weyerhaeuser, Prince Albert National Park and Saskatchewan Environment and Resource Management together add up to more than 32 person-years of work for the Montreal Lake Band or 1.5 percent of the entire membership (Anonymous, 1994b).

For the band the jobs are less important than the long term dividend it aims for in the form of education and a chance at positions of responsibility, which, at the time of my visit, had as yet not come about. In fact, one Montreal Lake member commented that Weyerhaeuser is regarded as a "selfish" company precisely because the work available to natives tends to be through silvicultural and "harvesting" contracts rather than through jobs that could reward native aspirations. As it is, the pulp and paper plant at Prince Albert has a disproportionately low level of natives on the payroll. In 1991, natives made up more than 20 percent of the Prince Albert population (Kulshreshtha et al., 1994) while natives working full-time at the pulp and paper plant numbered 8 percent of the workforce there (W. Rosnowski, pers. comm., 1997) or 1.6 percent of the town's population. Certainly the feeling is that the company is not keen to jointly develop resource management policy. This view is substantiated by the debate on co-management discussed below. On the other hand, others within PAMF believe some factions within the native community have a vested interest in the current state of affairs.[57] In this view, for example, Montreal Lake has not taken full advantage of PAMF's innovative training opportunities. Cultural sensibilities that value family rank over experience or merit are thought to further restrict native ability to compete. Also, like many native communities, Montreal Lake suffers from the usual divisiveness that pits traditionalists against those in

[57] Anonymous interview, June 1996.

support of Western economic ways[58] - "corporate natives," as someone called them.

The air of co-operation at PAMF with which it began and which has only improved since, is considerable contrast with the historical lack of it. Richmond, who had been the liaison between the Montreal Lake Band and the PAMF planning committee, noted that the writing of the proposal had been an exciting experience because natives "had never ever in their lives before been asked for their opinion on anything."[59] The penchant for action without informing those affected, the elevation of Grey Owl, the exclusion from decision-making in areas of vital interest, belong to the colonial context that permeates natural resource affairs in general and PAMF's situation in particular (Bouman et al., 1996). One important item of discussion – or rather, of avoidance – in this category is co-jurisdiction.

Co-management

Pinkerton (1992) writes that co-management in general may be defined "as power-sharing in the exercise of resource management between a government agency and a community" (277). The concept of co-management, however, comprises a range of meanings along a continuum of co-operative management arrangements. At one end is self- or sole management, akin to self-government and conveying the sense that First Nations are

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[58] Ed Henderson, Prince Albert, 13 June, 1996; anonymous interview, June 1996.

[59] Interview, 12 June 1996.

autonomous entities, not a third level of government like municipalities as so often believed, but on a par with Ottawa because they are nations; at the other end is a softer variety that simply aims for a greater say in the affairs that affect the First Nations so that resources extracted return some of their value in benefits to the community on whose traditional territory the resources occur. Co-management is a critical issue because the goal of self-government is dependent on access to resources and a land base sufficient to sustain an economy.[60] Self-management (or sole jurisdiction) "is at the core of the social and economic health of many native communities, and is tied to larger questions of self-government" (Berkes et al., 1991:12). The soft version of co-management, from this perspective, is a provisional arrangement on the way to self-government and supporting it.[61] Ideally, co-management is based on "institutional arrangements whereby governments and Aboriginal entities ... enter into formal agreements specifying their respective rights, powers and obligations" in the management of natural resources of a particular region (Royal Commission on Aboriginal Peoples, 1996:666). Clearly, this view of co-management is a native view; in the eyes of the province and Weyerhaeuser, co-management means rather an advisory function to improve the way resources are managed (Urbanoski, 1995b). Importantly, in this interpretation co-management requires the participation of all stakeholders, relativizing natives' special claim with all the others, a

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[60] Gene Kimbley, 11 June, 1996.

[61] Henderson, 13 June 1996.

position the province has inclined to even though in 1994 it and the Federation of Saskatchewan Indian Nations signed a protocol in which a partnership was established to explore avenues for First Nations' involvement in natural resources management (Gosse, 1995). Nevertheless, for the province, intent on keeping its jurisdictional powers unimpaired, influence over decision-making in resource matters must remain separated from the jurisdictional aspects, related though they may be (Gosse, 1995; Urbanoski, 1995c).

For Weyerhaeuser, the principal resource extraction company in the region, the concern is quite similar. As the holder of a Forest Management Licence Agreement, it is the only party with the delegated legal right to access and management of the forests. This type of situation caused Ovide Mercredi (1997), former Chief of the Assembly of First Nations, to remark that multinational companies now hold more rights to natural resources than do people holding treaty rights. The company's position on the issue therefore is that co-management boards not have the last word on forestry decisions, saying that these ultimately rest with Saskatchewan Environment and Resource Management (Oleksyn, 1996b).

Weyerhaeuser has experimented with the weakened or advisory variety of co-management in the region in order to defuse threats to its wood supply. Thus in the late spring of 1996, as part of a lengthy dispute between Weyerhaeuser and the Dore-Smoothstone Lakes Wilderness Protection Association over how certain forests which the association has earmarked for protection should be cut, a co-management board was

established, consisting of representatives of all interested parties, including Weyerhaeuser (Oleksyn, 1996b). This area contains one-third of its Forest Management Licence Agreement and therefore features strongly in its supply plan. But residents, cottage owners in the main, are dead set against clear cutting while Weyerhaeuser, predictably, argues that there is nothing wrong with that method.

A much more warmly received proposal took place at PAMF regarding the Bull Moose harvesting area. Weyerhaeuser invited trappers, First Nations, cottage owners, recreational users, biologists, the province and Prince Albert National Park personnel to design the cut blocks, beginning with a blank map. The exercise lasted three days; the final plans included an area left intact for woodland cariboo, provisions for fish, old growth and the location of roads.[62] Another example of Weyerhaeuser's flexibility and willingness to accommodate others - at least within PAMF - was the decision not to cut Thunder Hills, an area just north of Prince Albert National Park and sacred to Indian people, although it had been slated for cutting.[63] Both instances have engendered trust in the company.

Weyerhaeuser has set up six co-management boards within its Forest Management Licence Agreement and leads them; the province, which supports the idea, has an observer on each one who acts as a technical resource on forest policy and regulations.[64] Because

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[62] Kimbley, 11 June; Newman, 13 June 1996.

[63] Kimbley, 11 June 1996.

[64] Anonymous interview, June 1996.

they are "guidance groups" whose decisions, even when reached through consensus, carry no legal weight, they have been called "a sham," not just by some within PAMF but, for example, by others participating in the process in northwestern Saskatchewan where Mistik Management[65] has tried to avert repetition of a recent year-long logging road blockade at Meadow Lake (Canadian Press, 1995a). Some boards think of themselves as co-jurisdiction boards but the province has informed them frankly that they have no such authority, being strictly advisory in nature.[66]

While some of these boards may be successful, it is also clear that non-native interests can be as unhappy with the process as native ones. In the case of Mistik, for instance, Brian Ratt, the chairman of one such board in the tiny community of Ile à la Crosse, predicted there might be a confrontation if the firm were to go ahead and cut the timber (Canadian Press, 1995a). Indeed, despite the experiment with a co-management board, in the spring of 1996 there were plenty of rumours that the RCMP and the Canadian Security Intelligence Service had begun surveillance of area residents, including Ratt, in anticipation of "some form of uprising," sparked perhaps by forestry disputes or outstanding Metis issues (Urbanoski, 1996). Closer to Prince Albert, members of the Dore Lake group differed with Weyerhaeuser as to how much decision-making power it

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[65] Mistik is in charge of woodlands management for its owners Millar Western and NorSask Forest Products. The latter company holds the Forest Management Licence Agreement in the area.

[66] Anonymous interview, June 1996.

should have (Oleksyn, 1996b). Jack Spencer, first PAMF president and Weyerhaeuser's Saskatchewan Timberlands Operations Co-ordinator, said the company did not want to enter into a partnership with the group because of a perceived lack of co-operation.[67] He reiterated Weyerhaeuser's position that the existing contractual relationship with "the landlord" (Saskatchewan Environment and Resource Management) is the key to its security of wood supply, although having the Forest Management Licence Agreement is not enough; one needs also stakeholder consultation.

PAMF and co-management

The story of co-management is illustrative of the dynamics that shaped and were at work within PAMF during 1996 and it is therefore useful to dwell on it a little longer. For instance, for Weyerhaeuser, its dominant partner, the question has always been and continues to be, does PAMF have anything to offer that an ordinary co-management board cannot?

In view of Weyerhaeuser's chief worry - security of wood supply - its interest in joining on to the Model Forest Program proposal was the opportunity it offered to develop channels of communication to the Montreal Lake Band, the park and other interests and to conduct needed research into the ecological and socio-economic aspects

[67] Interview, 19 June 1996.

of forest management (Spencer, 1995),[68] or, in the words of an anonymous contributor to Weyerhaeuser's (Saskatchewan Division) *Saskspirit*, "to learn how to be a better integrated resource manager" (Anonymous, 1995b).

These two aspects of Weyerhaeuser's interests, getting information that will help improve their management record and building positive relationships with other forest interests, are vital to their long-term survival. In both respects, PAMF is superior to any advisory board since, first, it is well funded and second, the partners have had to hammer out a *modus vivendi* sufficient to allow them to submit a successful proposal and carry out their contractual obligations to each other and the Canadian Forest Service, thereby forging stronger relations. Doug Mazur, PAMF's 1996-97 chairman and the province's representative, said that, because at PAMF the partners are equal, they are far more than just advisors.[69] But this is the rub. A partnership on terms of equality means a more serious commitment than an advisory group. Weyerhaeuser therefore has been showing a divided attitude towards PAMF, trying to reconcile its misgivings with its desire to retain the benefits that come from such an association.

The divided mentality is notably expressed in the fact that the level of Weyerhaeuser's representation at PAMF has been lowered from Jack Spencer, one of its senior managers, to a more junior employee who, by all accounts, lacks a talent for co-

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[68] Also interview with Spencer, 19 June 1996.

[69] Telephone interview, 12 June 1996.

operation and consensus-building.[70] Although Spencer's removal from PAMF affairs (he is now Saskatchewan Timberlands Operations Co-ordinator) was due to a structural reorganization exercise the company is undertaking in a bid to promote team problem solving and production, an experiment being conducted at its operations everywhere (Weyerhaeuser Company, 1996), the junior position of the person assigned to PAMF means he has little decision-making authority and his personal deficiencies threaten the trust and goodwill so far built up. Remarked Richmond, "the elephant has rolled over and we are all getting squished."[71] In general, PAMF observers understood the change to signal Weyerhaeuser's diminished interest in the institution.

The key to Weyerhaeuser's strategies seems to be whether the vehicle in question will confer legal rights or obligations to others than themselves, that is to say, whether the existing Forest Management Licence Agreement arrangement will be jeopardized. Because the 'how'of getting a secure supply is not as important as having it, the company does not rule out a day when a Forest Management Licence Agreement is no longer needed.[72] Until then, they are all for better relationships as long as their contractual situation with the province remain intact. PAMF does not actually threaten it because whatever agreements the partnership reaches, even by consensus, they are not legally binding. This voluntary aspect is one of the major limitations of the Model Forest

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[70] He twice refused an interview with JMB.

[71] Interview, 12 June 1996.

[72] Interview, 19 June 1996.

Program, and it shows that this is a national program very mindful of provincial sensibilities. But the belief at Weyerhaeuser is that they have achieved most of their objectives with PAMF already.[73] It always comes back to access to timber, the security of which is aided by good relationships. As Spencer said, now that these relationships have been built, all that needs to be done is to maintain them. PAMF may not be the sole vehicle for achieving the kind of relationships that protects the wood supply, nor the most convenient if guidance groups can accomplish the same thing. In other words, partnership in PAMF has become less than critical. Minutes of a 1995 board meeting show the company's position that if the province were to legislate public advisory boards, it would make PAMF "redundant" (PAMF, 1995).

The company's cautious and conditional approach to co-management is well illustrated by an event that took place during the proposal planning days. Reportedly, on hearing mention of the "C-word," Weyerhaeuser threatened to pull out. Consequently, the Cree chose not to pursue the topic but, if possible, to bring it up at a later date in a more roundabout, neutral way.

As it happened, Ron Irwin, then Minister of Indian Affairs and Northern Development, himself dropped the bomb when his department presented a draft document, dated 14 March 1994, for discussion on co-management to the provincial government. The document came about in keeping with the department's view that First Nations should

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[73] Interview, 19 June 1996.

enter into co-management agreements across the country, which may be entirely advisory or, with the approval of the government holding jurisdiction, have the power to pass and enforce laws and regulations (Gosse, 1995). It was this kind of model that had been proposed for the area, said to encompass Prince Albert National Park and much of the Lakeland Rural Municipality including Candle Lake, and under it a joint council was to be established, composed of 50 percent native representation, 25 percent federal and 25 percent provincial (Oleksyn, 1995).

The proposal did not become public until the following March, probably because the province had reacted negatively and decided to ignore the federal proposal. Then it caused a furor in the region that convinced Ottawa eventually to withdraw it. "If you've ever seen the rednecks and the whitenecks come out of the woodwork, they came out of the woodwork this time last year," said Tony Richmond of the events of the summer of 1995.[74] Lakeland residents, "stridently opposed" to such an arrangement, were angry at not having been consulted and very anxious that the Montreal Lake Band would turn them out of their property, this in spite of the fact that Chief Bird had already assured them this would not happen (Urbanoski, 1995a), that apparently the agreement would apply only to traditional Cree lands, not the Rural Municipality,[75] and that non-native rights would be preserved (Gosse, 1995). Another point of grief concerned a grant made to the band to

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[74] Interview, 12 June 1996.

[75] Richmond, 12 June 1996.

map its traditional lands while Lakeland residents did not receive any money (Sampson, 1995b).

The provincial government foresaw a challenge to its jurisdictional base if the result would be that the joint council could make bylaws overriding provincial laws; the council's call for federal representation was understood as a power grab or else a scheme to "off-load" federal responsibility in native affairs onto the province (Urbanoski, 1995b). Responding to Lakeland concerns, its position was unambiguous: Saskatchewan Environment and Resource Management Minister Berny Wiens stated that the "provincial government will not turn over its mandated jurisdictional control of provincial lands and resources to the federal government" (Oleksyn, 1995), that its understanding of co-management differs from Ottawa's which envisions real decision-making power (Urbanoski, 1995b), and that any co-management plan must involve all stakeholders. It is interesting that Irwin has said that it was Saskatchewan that had requested Ottawa's involvement in the first place (Urbanoski, 1995d). Indeed, given that Saskatchewan Environment and Resource Management had been actively exploring consultative co-management arrangements throughout the province, Irwin's department had expected the province to welcome its ideas and had already begun to fund co-management projects in the province under the Co-Management Innovation Initiative (Gosse, 1995).

Natives also had some scepticism about the plan because it seems to have been patterned on British Columbia, Ontario and the Wisconsin Menominee (Urbanoski, 1995b) with little applicability to the Prince Albert region where Treaty 6 is in effect. "We don't

need agreements for a lot of what's being said here or what we do," commented Tony Richmond who examined the document for the Montreal Lake Band.[76] Another point of distrust follows from the fact that despite Indian Affairs and Northern Development's promotion of far-going shared-management agreements, Ottawa's native affairs policy still envisions narrow powers akin to those of municipalities for First Nations; all others, including those to do with resource management, would remain under the purview of federal or provincial authority, as is currently the case (Urbanoski, 1995d). In the meantime, Irwin withdrew the controversial proposal and by the end of August 1995 an early version of a new proposal was circulating in provincial ministries, based on a report he had commissioned from former Saskatchewan deputy minister and attorney-general Richard Gosse. Compared to the original document, it proposed no format for co-management and asserted the need to consult all parties (Gosse, 1995; Urbanoski, 1995d).

Because the issue of co-management is sufficiently potent to galvanize everyone with a stake in forestry and because its implications touch on those delicate matters of land use and jurisdiction that the Model Forest Program was to help resolve, I suggest that it may be taken as paradigmatic of the difficulties facing PAMF. The underlying condition for its formation was acceptance of existing power relations, that is, that the province retain its authoritative position, Weyerhaeuser's special relationship with the province not be challenged, Prince Albert National Park's management philosophy be respected and the

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[76] Interview, 12 June 1996.

Cree's treaty rights be upheld. The co-management hullabaloo threatened this diplomatic arrangement, with some standing to gain and others, at least in their perception, to lose. Weyerhaeuser's vice-president in charge of Timberlands, Steve Smith, said their "biggest fear" was that it would damage their good relations with the Montreal Lake people (Gustavson, 1995). To those who believe that PAMF can be a vehicle for change as good as any co-management plan, Irwin almost upset the apple cart, displaying, they thought, a serious ignorance of the Model Forest Program and what it can do.[77]

Meanwhile, the Montreal Lake Band is pursuing a more practical approach to gaining decision-making power. Faced with a decline in the numbers and size of the pickerel population of Montreal Lake, the Cree have begun to challenge provincial management methodology and are proposing to start up a pickerel enhancement project, perhaps with the support of PAMF.[78] In addition, they have restricted the band's take of the pickerel spring run, the elders have begun to educate those who fish not to take more than they need and the river has been cleaned up.[79] In the area of game hunting, too, the Cree are taking initiatives that Saskatchewan Environment and Resource Management may be interested in supporting because, as Gene Kimbley explained, if the Cree themselves were to impose restrictions on their own hunters who, by treaty, have the right to hunt year-round, it would accomplish something the province has long wanted to.

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[77] Richmond, June 12 1996.

[78] Henderson, 13 June 1996.

[79] Kimbley, 11 June 1996.

They have also instituted taxation measures on reserve employment earnings to fund band projects.[80] The attitude displayed by the Montreal Lake Cree that they must take matters in their own hands and by dint of application effect a *de facto* co-jurisdiction is typical of the new Indian mood that says, "We'll do it with you or without you" (Mercredi, 1997).

The management plan

Since, for natives, the agenda is about control over resource management in the capacity of "stewards and co-owners" (Burlinguette, 1995); for the province, the question is unrivalled jurisdictional authority; for the attentive public the goal is access to meaningful participation; and for Weyerhaeuser the prime concern is security of wood supply, the potential for conflict at PAMF is readily apparent. The attempt to produce the integrated resource management plan promised in the original proposal for the final year of PAMF's first phase (PAMF Planning Committee, 1992) has brought to the fore other tensions. These have to do with the integration of the scientific findings of the first three or four years, differences among the partners about the meaning of sustainable forest management and the process whereby the plan will come to be.

The integrated resource management plan was to be the result of the integration of the partners' "individual objectives" and would "manage all ecosystem resources" (PAMF Planning Committee, 1992:29). As noted, it was to close off PAMF's first phase. Its

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[80] Henderson, 13 June 1996.

development is now deferred to phase two. Significantly, it is no longer referred to as a plan, but rather a strategy (I. Monteith, pers. comm., 1997). Whether this change in terminology suggests a watering down of the partners' commitment to it, is uncertain. PAMF's phase 2 agreement includes the intention to "outlin[e] how it intends to fulfill its mandate of advancing forest sustainability" (Anonymous, 1997b), which presumably means developing and implementing the management plan. But the integrated resource management plan never was intended to require more than voluntary adherence, a condition unlikely to have been changed. It is probably also significant that earlier attempts to produce the integrated resource management plan almost ran aground on Weyerhaeuser's resistance due to the coincident timing of the Environmental Impact Assessment (EIA) that the company was performing on its management plan and PAMF's integrated resource management plan. The apparent concern was that the public, whose commentary is required for the EIA, might become confused as to which plan was under discussion if first Weyerhaeuser and then PAMF were to ask for its co-operation, thus jeopardizing a considerable monetary investment.[81] In contrast to the size of Weyerhaeuser's expenditure, running into a few million dollars, PAMF's would be much smaller, perhaps $80 000. PAMF decided to go ahead with its integrated resource management plan but settled on a compromise in which there would be no interference with Weyerhaeuser's public consultations. Instead, PAMF would rely on internal

[81] Newman, 13 June 1996.

information from its advisory committees, its partners and its research and, when they became available, results from Weyerhaeuser's studies.

The fact that these were not going to be available until 1997 contributed to PAMF having to rely primarily on internal data and displays once more the company's image as selfish, the general feeling at PAMF being that Weyerhaeuser is unwilling to share its database. Yet apart from the studies the company has launched on its own, much public money has been invested in its store of information. It is only now, pressed by financial strain, that the province has been seeking to renegotiate existing Forest Management Licence Agreements with a view to diminishing its fiscal burden and bringing forest companies into compliance with the new Forest Resources Management Act. Up until now, for example, Saskatchewan has carried the entire cost of inventory (PAMF Planning Committee, 1992) and provided other services such as free seedlings.[82] "Inventory" means the calculation of the allowable annual cut, mapping and classification, the establishment of a large number of volume sampling plots and the maintenance of Permanent Sampling Plots (PAMF Planning Committee, 1992). The 1996 act, which would introduce regulations to support ecosystem management and dispute resolution (The Exchange, 1996), also proposed to double stumpage fees, and was vigorously opposed by forest

[82] Anonymous interview, June 1996. Weyerhaeuser has provided over a quarter of the seedlings planted in its reforestation program from its own 'improved' stock (PAMF Planning Committee, 1992).

companies, including Weyerhaeuser (Bernhardt, 1996; May, 1998).[83] Another example of the influx of public moneys into what becomes private information is a recent project known as Saskatchewan Forest Habitat Project to which Saskatchewan Environment and Resource Management, Prince Albert National Park, First Nations, Forestry Canada, the Canadian Wildlife Federation and other entities contributed in addition to Weyerhaeuser itself. Lastly, PAMF research has substantially enriched Weyerhaeuser's knowledge of boreal forest ecology both inside and outside the PAMF area.

Since both PAMF and Weyerhaeuser needed to gather information for their respective plans, it stands to reason that the latter might have worked with its partner organization. Why did it not? One factor is that PAMF's share is just 4.5 percent of the Forest Management Licence Agreement, making it necessary to conduct additional studies that cover the total area, especially on socio-economics.[84] It is possible too that co-operation was hampered by the friction between personalities already mentioned. It is also likely that PAMF is just not important enough to Weyerhaeuser.

But of greater importance may have been disagreements about the inclusion of

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[83] The new fees imposed on industry were to apply also to costs incurred in firefighting, silviculture and insecticide spraying (May, 1998). Doubling stumpage would have brought Saskatchewan fees closer to those of other provinces but in the end, with industry threatening to revise its production plans, stumpage was not raised and cost recovery of forest protection services was shelved. Further, making changes to the terms of a Forest Management Licence Agreement has become more difficult because the legislature will have to approve them (May, 1998), whereas before any clause could be changed at any time if both parties agreed (Anonymous interview, June 1996).

[84] Spencer, 19 June 1996.

research findings into the revised 20-year management plan. I already noted the early demise of the research committee. There is always the chance with research that the results will not be appreciated because ecological information is bound to place limits on what can be sustainably used. In such a case it might be better not to be too closely associated with the integrated resource management plan. Take, for example, Weyerhaeuser's cut on the PAMF portion of its Forest Management Licence Agreement. Until 1986, when Weyerhaeuser bought the pulp and saw mills from Saskatchewan Forest Products and renegotiated the Forest Management Licence Agreement, the annual cut averaged 489 ha/a and 133 m^3/ha or 65 070 m^3/a[85]; since then, the annual cut has increased to 1000 ha/a and 182 000 m^3/a or 182 m^3/ha (PAMF Planning Committee, 1992:15). Projections for the PAMF era stood at a conservative 122 500 m^3/a on 700 ha or 175 m^3/ha, to be reviewed during the land use planning stage. To put this in perspective, timber on 60 000 ha can supply Weyerhaeuser's mills for about one year (Sampson, 1995c). Significantly, a Geographic Information System simplified simulation at PAMF using the software product Harvest Schedule Generator and locally calibrated yield tables found that long-term cutting of all species could be maintained if the rate stood at 51 000 m^3/a, and this only if logging activity were spread out over the entire commercial model forest; if instead the activity is designed to minimize fragmentation by aggregating the cutting area and is confined to 40-year periods as a check against too-frequent

[85] 8800 ha were cut in the 18 year period between 1969 and 1986 which yielded approximately 1 171 000 m^3 of wood (PAMF Planning Committee, 1992:15).

intervention, then the rate must be reduced to 12 000 m^3/a (Dendron Resources Survey and Langen, 1995). Thus, the current cutting level means not only that lands cannot be set aside for protection or other uses, but the timber value itself is being seriously depleted.

Notwithstanding these results, Weyerhaeuser's Saskatchewan vice-president Bill Gaynor is optimistic that, based on company studies, "the forest resource included in the company's forest management licence area could accommodate expanded harvesting without any threat to the forest's ecosystem" (Oleksyn, 1996a). The EIA currently underway and a feasibility study Weyerhaeuser conducted in 1995-96 into the possibility of expanding its Prince Albert pulp mill, would reveal whether there is enough wood to supply a larger mill. An article reporting on the issue noted that the company was "beating the bushes for wood" (Canadian Press, 1995b). A similar tone comes from Weyerhaeuser's annual report for 1995 that repeatedly mentioned the decline in harvest from western forests and announced the creation of the World Timberfund which is to finance purchases of forest lands in order to keep its operations running (Weyerhaeuser Company, 1996).[86] Yet when Weyerhaeuser announced in the summer of 1996 that the expansion would be postponed indefinitely (see footnote 83), the sole reason was said to be the too-large outlay of capital required, with poor pulp prices playing a secondary role (Oleksyn, 1996a; Bernhardt, 1996). Furnish was apparently not a factor in the decision.

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[86] Pressures on the wood supply in northern forests and a decline in the quality of their timber are noted by Hirt (1994), Marchak (1995) and May (1998).

Perhaps we can note in passing that already companies like Weyerhaeuser have indirect access to a few non-tenure provincial forests outside of their Forest Management Licence Agreements, logged by small operators (at an estimated rate of 50 000 m^3/a) who sell to the puip mills as well as to two reserve supply areas of 10 000 km^2 or 1 million ha each which the company is harvesting now, although small operators can have access to them too.[87] Through the efforts of Saskatchewan Environment and Resource Management personnel, much of this wood comes from diseased areas, but there is no management plan for these forests. Weyerhaeuser also sets much stock upon its silvicultural and tree improvement programs in its quest for improved timber yields. Intensive forest management, including stand tending, is being practised on Weyerhaeuser lands in the United States and in Canada (Weyerhaeuser Canada, 1995); for the US lands this has led to a forecast of a 25 percent increase in yields in the west and 70 percent in the south by 2020 (Weyerhaeuser Company, 1996).

Finally, the delay in reaching agreement on a management plan can also be ascribed to the fact that PAMF's partners do not see eye to eye on the important matter of forest management. Weyerhaeuser is pursuing what may be referred to as the fine filter approach to management (Chapter 4), which is geared to the production of timber alongside the maintenance of other values. The focus on timber means a focus on young forests, unavoidably accompanied by pesticides, fertilizers, cut-block logging, regeneration

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[87] Anonymous interview, June 1996.

by means of seedling planting (together with natural regeneration), loss of genetic and species diversity, genetically altered trees, soil impoverishment and impairment, damage to waterways and loss of habitat. "Managing for other values" in this case is seen to be a problem additional to the first task of producing timber, to be approached incrementally (Creighton, 1994). Undoubtedly this is significant progress compared to not worrying about them at all, but all the efforts are bound to be secondary to the imperative of growing timber. The province and Weyerhaeuser, like jurisdictions and companies everywhere, are implementing steps that will help them obtain healthier forests, but, as discussed in the previous chapter, it is a stretch to claim that young, artificial forests are healthy. Further, weakening of the genetic pool and alteration of genetic material to produce "superior" trees are seldom considered a danger to sustainability.

When quizzed as to how native forestry would differ from industrial forestry, the Cree believe that its framework would be the maintenance of harmonious relations with nature. They would not engage in cut-block operations and leave certain areas untouched because the forest, which is home to them, comprises patches of communities - trees but also blueberry bushes or medicinal plants and gardens - such that forestry would also have to take a patchwork approach.[88]

The national park, as we have seen, has ideas different from either the industrial or the native ones but, insofar as the park takes a coarse filter approach, comes most close to

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[88] Henderson, 13 June; anonymous interview, June 1996.

the latter. Environmental groups favour coarse filter management as well as protective measures but, not being partners, their views are not central to the discussion over the integrated resource management plan.

"We will never agree on common objectives," said one PAMF partner about it (T. Bouman, pers. comm., 1997). But the truth is that it does not really matter whether the partners will ever agree. There are in fact only two players - Weyerhaeuser and the province - because no one else engages in forest management on the same scale. It will therefore not be unexpected if, as one observer believed, the integrated resource management plan turns out not to be substantially different from Weyerhaeuser's new 20-year plan.[89] PAMF might then serve as a vehicle for making the company plan credible, partly by association, partly by showing the world that the company's actions are sound. This is suggested as well by an expression of heightened interest in PAMF on the part of Weyerhaeuser were PAMF to affect the certification process the company is currently pursuing (PAMF, 1995; Weyerhaeuser Canada, 1996). Thus a handmaiden role for PAMF does not seem unlikely, indeed befits the Canadian tradition of supporting the timber industry through government programs.

DISCUSSION AND CONCLUSIONS

To review, PAMF's (phase 1) partnership is limited to the landowners (Prince Albert

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[89] Interview with Tom Ballantyne, Prince Albert, 14 June 1996.

National Park, Montreal Lake Indian Band, Weyerhaeuser and Saskatchewan Environment and Resource Management), a professional foresters' association (Canadian Institute of Forestry) and two political native umbrella organizations (Prince Albert Grand Council and Federation of Saskatchewan Indian Nations). All other interest groups have a voice through an array of advisory committees. The inclusion of a native band is not unique to the Model Forest Program but what is unique is the participation of umbrella political groups. Native participation has forced into the open issues that are rooted in Canada's colonial history. The most important bear on the transfer of natural resources to Saskatchewan in 1930 and the creation of Prince Albert National Park in 1927.

The public turmoil over co-management is *sensu stricto* a reaction against the native quest for self-determination[90] but exemplifies the broader situation of unrest in matters of natural resources management: the position of control exercised by industry and government, the search by citizen groups of all kinds for influence in policy making, the debate over what makes healthy forests, the acrimony over land use and the hostility towards native claims for jurisdictional authority. As such it captures the difficulties PAMF faces nicely. These types of difficulties, however, as experience with co-management elsewhere suggests, are not insurmountable, but an open process is critically

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[90] A poll conducted for the federal Department of Indian Affairs in 1996 found that only 40 percent of Canadians sampled thought that self-government would improve conditions on reserves and 20 percent thought they would worsen (Platiel, 1996). Most of those in the first group live in Ontario, British Columbia and the Maritimes while most in the latter lived in Québec and the Prairies.

important. The negotiations for the Yukon land claims in the late 1980s found that painstaking, diligent work and sincere commitment to the process were the means by which distrust in all the parties could be overcome (Stuart, 1992). Making the process open and ensuring meaningful, not token, public input tempered the racism and led to public support for the settlement. The Model Forest Program, therefore, designed on the principle of partnership, is an excellent forum for achieving meaningful links between the various opposing parties. That PAMF succeeded in forging links and increasing trust among its partners is shown by positive results in the form of increased employment for aboriginal people, action to address some long-standing grievances and experimentation and flexibility on the part of industry. But the partnership has not included other vital community voices except peripherally. Although, late in the first phase, steps were taken to address this shortcoming by inviting the consultative committee to attend Board of Directors' meetings, changes in management at PAMF since Bouman left in 1997 appear to be closing this avenue again. Against this is the positive development that has brought Candle Lake village and the Lac La Ronge Band to the partnership. As I mentioned above, Candle Lake is part of the Rural Municipality of Lakeland whose non-native residents protested "stridently" to joint management in the region (Oleksyn, 1995); their experience in PAMF may increase support for genuine First Nations participation in regional resource management.

But more than good relations are necessary to solve resource management problems. As we saw, PAMF's main action program has been to initiate a range of

research activity, from scientific and silvicultural to socio-economic. The arm's length relations set up in the first year by then-president Jack Spencer have gone far towards making that research credible. Nevertheless, the research program cannot be evaluated on its own; to be truly successful its findings must be incorporated into the document that is to guide partner action in the future, namely the integrated resource management plan, yet to be produced. The failure to come up with the integrated resource management plan at the end of phase one is a direct consequence of marked differences of opinion among the partners about forest management. It also shows that the relatively low-key profile of its industrial partner is an illusion. PAMF is really a well-endowed co-management board within the confines of the dominant Weyerhaeuser-Ministry of Environment and Resource Management relationship. The initial attempt at formulating the integrated resource management plan highlights that the plan that counts is Weyerhaeuser's, not PAMF's, precisely because it has the force of law. Doug Mazur said that his ministry (Saskatchewan Environment and Resource Management) can "experiment with alternate decision-making processes" as part of a trend by government towards greater public participation, but should not set a precedent.[91] No amount of public consultation, however, even if legally mandated, can undo the fact of the licensee-landlord contractual relationship.

Further discussion of this topic leads to the question of the capacity of the Model

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[91] Doug Mazur, 12 June 1996.

Forest Program to induce public policy change and, in general, the change in industrial forest management that was its mandate. But I will leave treatment of that question till the end of the next chapter since the story of Fundy Model Forest, which I tell there, will enlarge the basis for discussion. Because I wish to proceed once more from the (theoretical) image of the policy community interacting and colliding in the arena formed by knowledge and material interests, the organization of that chapter follows the one I have used here.

CHAPTER 6

FUNDY MODEL FOREST

Fundy Model Forest offers a contrast to Prince Albert Model Forest on several counts. Not only is the forest landscape different, but it lies in a much older part of the country, both in terms of European settlement and of New Brunswick's entry into Confederation. New Brunswick's forest industry is likewise far older and more important to the province's economy than it is in Saskatchewan. The two model forests differ most significantly in how the two operations are run, as will become clear in the following pages, yet they face difficulties that are at bottom not dissimilar. The experiences at both model forests therefore contribute to the discussion of the forest policy community and policy learning. In its layout, this chapter largely follows the previous chapter, beginning with an introduction to the forest region and of the model forest partners, and proceeding to a presentation of the issues the partnership struggles with. As before, it is important to remember that the story I tell here relates only to the first phase of Fundy Model Forest's existence.

LOCATION AND ECOLOGY

Fundy Model Forest occupies about 420 000 ha of land in the Acadian forest region of southern New Brunswick (Fig. 4.1a). The Acadian mixed conifer and deciduous forests of the Maritime provinces are a part of the boreal-broadleaf ecotone along with those of the

Great Lakes-St Lawrence region (Scott, 1995). Unlike the mixed wood transition zone of the prairies where the appearance of broadleaf deciduous species was due primarily to moisture stress, here it is caused by better growing conditions. Most of New Brunswick is dominated nevertheless by conifers because the maritime influence, while shortening the winter and its severity, also depresses summer temperatures and increases humidity. Hardwoods become more noticeable in the west and south. The Fundy Model Forest area is 29 percent coniferous, 27 percent broadleaf and 23 percent mixedwood with the remainder in agricultural, non-productive forest and non-forest land (Fundy Model Forest, 1992). Soils are dominantly podzolic (base-rich), although in some parts (the central to south-central area) of New Brunswick luvisols occur also, promoting agriculture and better hardwood growth (Scott, 1995).

Common conifer species in the Acadian forest are *Abies balsamea* [balsam fir], *Picea glauca* [white spruce], *P. rubens* [red spruce] and *P. mariana* [black spruce] alone or mixed with pines and broadleaf species such as *Betula lutea* (or *alleghaniensis* [yellow birch]) and *Acer saccharum* [sugar maple] (Scott, 1995). The red spruce is characteristic of this region. Selective logging and fire have encouraged pine and spruces and diminished *Thuja occidentalis* [eastern cedar]. Historical accounts also cite oaks [*Quercus* spp.], butternut [*Juglans cinerea*], several species of birch [*Betula*] and maple [*Acer*] and much hemlock [*Tsuga canadensis*] for the New Brunswick forest (May, 1998). Hemlock has been reduced to one percent of total softwoods; in Fundy Model Forest nine small stands have been identified (Greater Fundy Ecosystem Research Group, 1997). The

Fundy National Park on the rocky shore of New Brunswick with its cool, moist climate and poor soils was rich in spruce with lesser amounts of fir, birch, maple and beech (Cooper and Clay, 1994). Cedar was never frequent; white pine occurs on the drier river valley ridges and hemlock was more typical farther inland.

FUNDY MODEL FOREST GOALS AND OBJECTIVES

Fundy Model Forest's vision was "to demonstrate the ability to derive full economic potential from the forest resource while ensuring that its use and development is environmentally sustainable" (Fundy Model Forest, 1992:15).[1] The proposal explains that sustainable development does not mean protectionism or rules that constrain management activity, but "the ability to quantify measures of various resource values and how they respond to management intervention over time" (Fundy Model Forest, 1992:15). In other words, adaptive management in which timber will be the focus while other 'values' will be monitored for responses to the timber-first regime. Linked to New Brunswick's forest habitat planning objectives, this is timber management to meet constraints imposed by habitat values. In the language of New Brunswick's Department of Natural Resources and Energy, the unconstrained forest is open to industrial use, the constrained forest indicates

[1] In the 1994-95 Annual Report, reiterated for phase 2, the phrasing was reversed so that the vision reads "to ensure environmental sustainability and ecological integrity of the forest, while deriving sustainable social and economic benefits" (Fundy Model Forest, 1995; Anonymous, 1997).

reserved or restricted areas.[2] In the unconstrained forest, standard operating procedures apply, but in the constrained forest, all timber operations must meet habitat objectives, with the aim of improving, for example, deer wintering habitat. On the surface, New Brunswick employs a kind of mixed filter method in which marten is the indicator species for all other species requiring mature to old forest, but as with timber the focus is on habitat provision and supply across the landscape (connected by corridor) rather than on ecosystem preservation (Sullivan, 1994). The province's strategy is to obtain its protected areas not through the designation of parks, but from a hodgepodge of winter deer yards, riparian buffers and mature conifer habitat supply (May, 1998). In the words of the then Minister of the Department of Natural Resources and Energy, the protected spaces will come from "moving mature conifer forest" (May, 1998:106). Thus New Brunswick's forest management remains of the fine filter type (Chapter 4). This is very true of Fundy Model Forest's strategy, a PM proposal (Chapter 4; Appendix C).

Three goals follow from Fundy's vision: the implementation of an environmentally sustainable management plan in order to attain the forest's full economic potential; practise full multiple use; and increase the knowledge base of the forest ecosystem (Fundy Model Forest, 1992). They are understood as a departure from traditional timber-only management. Major issues identified in the proposal include timber supply and ecosystem related concerns (e.g. water), recreation, public participation and education, and a

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[2] Interview with Tom Pettigrew, Hampton NB, 30 April 1996.

scientific program using Fundy National Park as a control (Appendices B, C).

FUNDY MODEL FOREST STRUCTURE

Like Prince Albert Model Forest, Fundy Model Forest had only one sponsor – JD Irving, Limited – but its partnership is much bigger, 28 in 1996, up from 20 (counting JD Irving) in 1992.[3] Because of the great number of partners, I shall discuss only the most important ones and treat as a group the various environmental organizations.

The partners

Ownership of forest land in Fundy Model Forest is 63 percent small woodlots, 17 percent JD Irving freehold and 15 percent lease by JD Irving from the provincial government; the remainder belongs to Fundy National Park. This pattern is the reverse from that in New Brunswick generally where 70 percent is held by large pulp and paper companies and the other 30 percent by small woodlot owners.

Greater Fundy Ecosystem Research Group

The core of the Fundy Model Forest existed before the Model Forest Program. Formed in 1991, the Greater Fundy Ecosystem Research Group grew out of doctoral work by Fundy

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[3] Phase 2 partners number 27. Additions are the City of Moncton and the Saint John campus of the University of New Brunswick, while the Village of Petitcodiac, Fundy Region Development Commission Inc. and the New Brunswick Executive Forest Research Advisory Committee have left (Fundy Model Forest, undated information sheet).

National Park ecologist Stephen Woodley, who is the group's chair. Consistent with other recent work that demonstrated the permeability of ecosystems to outside influences such as wind-borne pollutants that make even isolated regions vulnerable,[4] Woodley's work found that the park's ability to manage biodiversity was undermined by its isolation in a region fragmented by roads and subjected to intense industrial forestry practices (Woodley, 1993).[5] He formed the Greater Fundy Ecosystem Research Group to address this problem of outside effects on Fundy National Park's ecological integrity with the aim of reducing the park's ecological isolation. The group would develop and pursue a scientific research agenda in support of the ecological management of the entire Fundy landscape. It aims to be inclusive and non-threatening so that everyone who wants to can join, yet intends the results to influence forestry management; to these ends its membership is varied, including the province, the park, researchers at the University of New Brunswick, Dalhousie and elsewhere, the federal Department of the Environment, and JD Irving. The first meetings with JD Irving proved difficult because of resistance to the idea that its management causes adverse environmental effects. In a response typical even of today, the company said, just tell us what we are doing wrong and we will fix it, as though what is causing the effects are individual practices within a sound system, rather

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[4] There is a vast literature on the subject of why an ecosystem approach to resource management is necessary. Two pertinent references are Daisey et al., 1981 and Colborn et al., 1990.

[5] This section also based on Stephen Woodley, telephone interview, 1 August 1997.

than industrial forestry itself.

The Model Forest Program announcement created an opportunity to back up the research partnership with money and commitment. The Greater Fundy Ecosystem Research Group initiated the Fundy Model Forest proposal but, as that needed the sponsorship of a company, JD Irving took over. The research group became one group among the others but evolved into the independent scientific arm of Fundy Model Forest, its research agenda serving as Fundy's biodiversity agenda. The writing of Fundy Model Forest's proposal fell to JD Irving's Chief Forester Blake Brunsdon who, with a group of Irving employees, invited some 20 groups to comment on successive drafts and then join the company in partnership.[6] Brunsdon described the proposal as being without question but not strictly a JD Irving proposal, and the original vision statement that Fundy Model Forest existed to extract the most possible wood without harming the region's environmental quality is telling. Interestingly, the revised vision statement (footnote 1 above), putting ecological integrity and environmental sustainability before economic benefit, is as it appeared in the original Greater Fundy Ecosystem Research Group draft, a "breakthrough" achievement for the Fundy Model Forest, as Woodley characterized it.[7] Another aspect that changed under JD Irving's direction was the proposed Fundy Model Forest area. Originally it was centred more on the park; JD Irving moved it northward,

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[6] Brunsdon, Sussex NB, 3 May 1996.

[7] Interview, 1 August 1997.

taking in the hauling area for the Sussex mill. They also brought in the small woodlots owners' association, the Southern New Brunswick Wood Co-operative or SNB, a move that must have increased Fundy Model Forest's chances of selection.

Fundy National Park

Fundy National Park, located in the traditional sawmilling district of Albert County, was created in 1948 as an alternative strategy for a region subject to chronic economic uncertainty. Sawmillers there had struggled for more than two decades of economic depression to stay solvent in a system of political patronage and provincial policies beholden to the large pulp and paper companies (in the case of Albert County, the absentee Maine-based Hollingsworth and Whitney) who held the licenses to the public woodlands while access by sawmillers was arranged on a yearly sub-licensee basis and was dependent on the licensee's goodwill, most likely to be in evidence when the sawmiller was politically well connected (Colpitts, 1992).[8] By restricting access to the wood supply, the favourable regard shown to pulp and paper manufacturers also helped restrict access to capital for the sawmilling industry because it made sawmilling more risky. Most of these enterprises were too small and rural to overcome the banks' aversion to lend them money,

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[8] Poor access to timber for sawmillers continues today. The Fawcett Lumber Company of Petitcodiac, a partner in Fundy Model Forest that processes between 40 and 42 million board feet a year, must scrounge to find enough wood. Three license holders, among them Irving, supply 27 percent of its needs and the rest comes from private woodlot owners, an increasing number of them (in 1996 nearly 20% of its total supply) in Prince Edward Island (Robert Fawcett, interview, Petitcodiac, 1 May 1996).

especially after the 1921 collapse of the biggest mill in Albert County (CT White & Sons, whose lands were bought by Hollingsworth and Whitney). When the idle Hollingsworth and Whitney lands were expropriated for Fundy National Park, the company was well compensated; sawmillers, on the other hand, did not own land, lost the little bit of access they had had and were not compensated. The creation of the park, therefore, contributed to the difficulties of the local sawmilling industry, while the new tourism economy has not yielded the kind of returns hoped for (Colpitts, 1992). In 1991, the park had a yearly budget for 70 person-years in employment, $3 million for capital expenditures, and $550 000 for environmental research, and spent another $600 000 annually on goods and services (Fundy Model Forest, 1992). The value of park tourism to the local economy was estimated at $2 million per year.

Fundy National Park's participation in the model forest is due in large degree to its status as landholder, but its purpose is to have some means of influence over what happens outside its borders, precisely the concern that motivated Woodley to found the Greater Fundy Ecosystem Research Group.[9] This ability is the national park's greatest preoccupation and the criterion for its participation: is the Fundy Model Forest the best route to secure the integrity of the park or must it find some other way?[10] Without a

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[9] Indeed, Parks Canada is the group's co-ordinating agency and funds its co-ordinator, Graham Forbes.

[10] Interview with then Fundy National Park Superintendent Dan Mullaly, 3 May 1996, Alma NB.

solution to the security of the park's ecological integrity, its ability to manage for biodiversity and protect its resources as mandated by Parks Canada, the sanity of trying to preserve the area as a national park while activities outside its boundaries undermine it, is open to question. As we saw in Chapter 5, the isolation of national parks as islands in industrially developed landscapes is currently being addressed by park managers everywhere. At Fundy, however, the concern is exceedingly pertinent because industrial forestry in and around the park, which was never Parks Canada's first choice for the region anyway (Colpitts, 1992), has made it difficult to restore it to something of its previous character. It is "a permeable forest patch" (Cooper and Clay, 1994:2), a fact that puts the survival of reintroduced pine marten in doubt.[11]

JD Irving

JD Irving, Limited is the timber and lumber segment of the Irving family's holdings, under the direction of its president, JK Irving. Including the Fundy license of which the Fundy Model Forest's Crown lease is a part, JD Irving controls through ownership and lease some 1.8 million ha of timberland in Québec, Maine and the Maritime provinces (DeMont, 1991; How and Costello, 1993). The company's involvement with Fundy Model Forest is due to the realization that if they are to survive in the business, they can no longer pretend the forest can be managed just for timber but must use a softer footprint. As the firm's

[11] Interview with Stephen Flemming, Alma NB, 3 May 1996.

chief forester explained, "in the long run if we're not ecologically sustainable we're done for. Better we learn and adapt than go on and hit the wall. If we run with blinders on we may be doing such an irresponsible job with respect to maintaining habitat levels or biodiversity that we may lose our right to do forest management the way we know how to do it."[12]

The softer footprint is explained in company pamphlets and brochures, highlighting its educational activities with groups such as the Brownies, its "Discovery Network" World Wide Web site aimed at highschool students, its community projects in salmon enhancement, and a variety of short features on forest management. One such undated publication, entitled *Woodlands ... Responsible Forest Management*, describes the care devoted to forest road building (400 miles a year), the firm's extensive tree planting projects, wildlife management projects such as installing bird nesting boxes and towers, and the establishment of a "unique areas" program (JD Irving, no date). Special sites to be protected range from graves to rare plants and very large trees. In terms of management practices, "The Irving Way" corresponds to PM "best forestry practices." It means wildlife corridors, or that a minimum of 10 percent of woodlands, whether mixedwood, hardwood or softwood, is to have a rotation of more than 70 years (7), or that 30 percent of the cut is not to be clear cut (3), or a general rule of a 60 m watercourse buffer strip along each shore (4), generally far in excess of the legislated 30 m (in designated protected

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[12] Interview with Brunsdon, 3 May 1996.

watersheds the requirement is for 75 m). Needless to say, these are measures that can only improve the state of the forests and rivers, but at the same time the materials also make it clear that they are improvements, not a rethinking of the system within which industrial forestry takes place nor, more importantly, of the nature philosophy it embodies. There is, for example, the usual message that many "trees in a natural forest are no longer healthy and vigorous. Left uncut, these trees would die and blow down. When the trees in a forest become over-mature, clearcutting is the preferred method" (3). There are other familiar phrases: seedlings must be freed, pesticides used are rigorously regulated and safe, forests need protection from pests, disease and fire (JD Irving, 1995) and, as mentioned in Chapter 3, all of Irving's seedlings come from "improved" seed (JD Irving, no date:1).

Another brochure, entitled *Forest Management Plan Highlights - Crown License 6* is instructive here (Anonymous, no date; this may or may not be a government publication). Crown License 6 consists of two blocks in two separate counties, together comprising 570 400 ha leased by JD Irving, and is the company's most important wood supply. It has a projected sustainable cut of 517 000 m^3 per year for five years from the so-called regular forest, one of four management units created on the license to match provincial management goals of retaining about 10 percent of coniferous forests in a mature state, maintaining winter deer yards (often within the same mature stands [May, 1998]) and a minimum of 30- metre-riparian buffers (on each side), and producing timber - in the words of the brochure, "maximizing the sustainable supply of marketable wood"

(2) within the above constraints.

It is recognized, however, that sustaining the projected 517 000 m^3 softwood cut depends entirely on an ongoing program of protection and silviculture. Add to this that Irving foresters have found the 1986 provincial inventory, on which this figure is based, to be an overestimation (May, 1998), and we may agree with May that "[t]here is no margin for error" in the New Brunswick forests (107). Yet the faith in silviculture and forest protection (May calls it "voodoo forestry") is so profound that this amount is anticipated to increase by at least 20 percent after 30 years to more than 650 000 m^3, as a histogram of 'harvest' methods on the license shows (Anonymous, no date:4). Also interesting is that, in addition to the regular forest and its current softwood production of 517 000 m^3, the other management units, far from being no-cut zones, are expected to yield another 17 000 m^3 or about 3 percent of the compounded annual softwoods total of 534 000 m^3. Thus, over the foreseeable future (25 years), deer winter habitat would supply approximately 59 percent of this supplement, riparian buffers close to 24 percent, and the mature coniferous habitat the remainder. Hardwoods may increase the total yield by another 150 000 m^3 a year.

In connection with the mature coniferous habitat which, according to provincial law, must average 10 percent in the province, I already mentioned that May (1998) found that it may include the winter deer yards since they also occur in mature forest. Unfortunately, the highlights on Crown License 6 do not give enough information to sort this out unequivocally for the license's two blocks, so that three scenarios are possible, but

in each case the mature coniferous stands add up to less than 10 percent. At the time the license was granted, in 1992, the brochure tells us there were 118 deer yards comprising 39 000 ha; the *habitat* portion (what is to be counted towards the Deer Winter Habitat Management Unit area), however, is only 22 000 ha large and will, the brochure says, diminish after 10 years to an eventual low point of about 11 000 ha, rising at 80 years to about 16 000 ha (3). Simultaneously, the Mature Coniferous Forest Habitat (in stands of 500 ha) on the license, in 1992 at just over 120 000 ha, is scheduled to decline sharply in the first 20 years, levelling out at 30 years to just below 27 000 ha. Therefore, if we assume that the winter deer yards and the mature stands are to be considered separately, and if we take the high figure of 22 000 ha in deer habitat, the total percentage of mature coniferous forest is 8.6; if we take the 80-year point of 16 000 ha, then the figure is 7.5 percent. If, on the other hand, we assume complete overlap, then the total in mature forest comes to a mere 4.7 percent. What this suggests is that, regardless of how we count it, if all 10 New Brunswick forest licenses present a similar picture, the province will have difficulty meeting its target of retaining 10 percent as older forest.

A final note on this general topic is in order. I drew attention earlier to Irving's claim that 30 percent of its cuts are accomplished through methods other than clear cutting. Referring once more to the information on License 6, assumed to be a typical instance of how the company operationalizes sustainable development, of its current 517 000 m^3 softwood cut, less than 38 percent is obtained by clear cutting, about half by something called 'partial' cutting and the rest through variations such as strip cutting and

even some (uneven-aged) selection cuts. Kimmins (1992) regards partial cutting as selective (not selection) cutting, highgrading in other words, in which only the biggest trees are removed. For Hammond (1990) the term means a grab-bag of cutting options, including making two or more (depending on the system used) passes and highgrading. The *Forest Management Plan Highlights* glossary defines partial cutting as the removal of "selected species and/or products ... with no planned immediate silviculture follow-up" that may be meant to achieve "silvicultural, environmental or wildlife objectives" (5). Though at first glance perhaps unlikely, partial cutting might yet potentially refer to highgrading because, at year 30, when the annual cut from the license is expected to climb sharply (see above), the small alternative cutting category will be eliminated altogether while partial cutting and commercial thinning will take its place. Clear cutting at that time is slated to be used more than 90 percent of the time, dropping again to about 77 percent in the last 20 years of the 80-year planning period. At the moment, the province has instated a maximum clear-cut size of 100 ha, and Irving on License 6 is limiting itself to cuts that average 35 ha. In all, then, the improvements that the company has undertaken are modest, though it is possible that the experience of the model forest will prompt more. That experience, as I illustrate below in the section "projects and budgets," has already led the company to alter some of its practices. Also, as in Saskatchewan, the foregoing suggests that the provincial grip on the forestry industry is weak. Colpitts (1992) remarked that New Brunswick's Crown forests have gradually been transferred to the large pulp and paper companies such that the government became little more than a "client

spectator" (96), and Parenteau (1992) spoke of the "limited power of the state to control forest capital" (138). In the case of the Irving family, this situation becomes more understandable by looking at their status in the province.

The wealth of the Irving family, estimated at $3.5 billion, ranks it 84th on Forbes' 1996 list of the world's top 100 billionaires (Associated Press, 1997). Built by KC Irving, son of James Dergavel, its reach includes the country's largest shipyard, largest oil refinery, first deep water port facility, the province's English-language newspapers, a television station, pulp and paper plants, bus and truck lines, a frozen foods company, service stations, tugboats and dredgers, hardware stores, home heating companies, and a restaurant chain; Irving companies also sell tires, life insurance, heavy equipment and computers (DeMont, 1991).[13] About one in every 12 New Brunswickers is on the Irving payroll, 25 000 in total around 1990, and one in five New Brunswick private-sector jobs is related to an Irving enterprise. A New Brunswicker can hardly turn without being reminded of the Irving empire (which also reaches into Japan, Maine and South America).

The Irving companies are privately held; no annual reports nor information about their wood products operations were made available to me. The following account is therefore extracted from other, older sources. KC Irving entered the wood products

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[13] The Irving companies, a list three pages long in the 1978 Royal Commission on Corporate Concentration, are complexly and obscurely connected (How and Costello, 1993). When the Seafarers' International Union attempted to organize the crews of six Irving cargo ships, the project had to be abandoned because the vessels' ownership could not be determined (DeMont, 1991; Hunt and Campbell, 1973).

business when his father JD died in 1933. Starting with JD's timber holdings (a sawmill and Kent County woodlands), he gained control over Canada Veneers in 1938 (the company became the world's largest supplier of plywood for the Second-World-War Mosquito bomber); during the 1940s and 1950s he bought the Dexter Sulphite Pulp and Paper Company of upper New York State, the Port Royal Pulp and Paper Company of Québec as well as Saint John's two daily newspapers, going on to build a new sawmill near Saint John, soon followed by a kraft pulp mill in the vicinity (DeMont, 1991; How and Costello, 1993). To finance the pulp mill, he sold a 35 percent interest to Kimberly-Clark (recently bought back), which in turn agreed to build a tissue mill, supplying mostly Irving's needs. This mill had a daily capacity of about 900 tons of semi-bleached and bleached kraft pulp and employed 500 people (DeMont, 1991). The pulp and paper operations were expanded in 1981 with the purchase of Rothesay Paper (becoming Irving Paper Limited), also in Saint John, from MacMillan-Bloedel. At the beginning of this decade, that mill's capacity was 950 tons of newsprint and fine paper daily, employing 700. Forest products at that time brought in $900 million in sales. The family owns 10 sawmills, seven of them located in New Brunswick, together producing 1.25 million m^3 of finished lumber per year (JD Irving, www.ifdn.com, 9 June 1998).

The mills needed trees, so KC went looking for land. Veneer (used also by his bus lines) was made from yellow birch which he found by buying out the Québec D'Auteuil Lumber Company (DeMont, 1991). It owned timberlands in Québec, Maine and New Brunswick, but he needed additional supplies. These he found in the old New Brunswick

and Canada Railway and Land Company lands which he bought in two steps in 1943 and 1945 for one dollar per acre (Hunt and Campbell, 1973; How and Costello, 1993). Still faced with the prospect of running out of wood, soon afterwards KC embarked upon a reforestation project. Met with ridicule and later hailed as a pioneering move, at present the family spends $10 million on supplying its lands with seedlings (mostly black spruce) at a rate of 15 million a year; it planted the 200 millionth in 1986 (DeMont, 1991; How and Costello, 1993; Fundy Model Forest, 1992). The Parkindale seed orchard provides the 'improved' seed for the Sussex and Juniper seedling nurseries. KC's eldest son, James Kenneth, took over the forest products division; his son James is now responsible for forestry operations. It was JK, as president of JD Irving, who signed the Fundy Model Forest proposal together with his Chief Forester Brunsdon.

Southern New Brunswick Woodlot Owner Organizations

The Southern New Brunswick Woodlot Owner Organizations (SNB) consist of a Wood Co-operative and Forest Products Marketing Board. Only the first is a partner in Fundy Model Forest. Woodlot owners in New Brunswick number about 41 000 and own more than 1.8 million ha of land, supplying 25 percent of the province's annual forest products sector requirements and contributing $90 million to the economy (New Brunswick Federation of Woodlot Owners, no date). SNB, agent for nearly 7000 woodlot owners, was created by plebiscite in 1979 and operates under provincial statute (New Brunswick Federation of Woodlot Owners, no date). There are seven regional marketing boards in

New Brunswick, organized into the New Brunswick Federation of Woodlot Owners, formed in 1965, which in turn is a member of the Canadian Federation of Woodlot Owners.

The SNB concerns itself with finding markets for its members, negotiates price, and engages in extension education on growing and cutting wood. While supporting silviculture, SNB's management approach nevertheless differs from the industrial variety in its protection of forest succession and a preference for selection cuts. Plantations, said a spokesperson for SNB, are a sign of management failure.[14] Motivated by its involvement with Fundy Model Forest, SNB is now a key actor in the bid for certification launched by the national woodlot organization through the Canadian Standards Organization (Belyea, 1996; Canadian Federation of Woodlot Owners, 1996; Gardner Pinfold, 1996). In the Fundy Model Forest, SNB has promoted the development of model woodlots to "witness the practice of environmentally sound, multiple use woodlot management" (SNB, no date) and participates in forest inventory projects, a survey of deer habitat on woodlots, an economic study of alternative cutting techniques, technology transfer and like projects.

The key issue for woodlot owners has been and continues to be fair pricing of their products (Anonymous, 1996d; New Brunswick Federation of Woodlot Owners, no date). Before woodlot owners associations existed, they sold a cord for between $12 and $15, at times a little more (Parenteau, 1992; Simkins, 1996), now they get considerably more.

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[14] Anonymous interview, May 1996.

The Winter 1996 issue of the Atlantic Forestry Review (page 23) published pulpwood prices paid by Irving to SNB ranging from $99 to $105 per delivered cord of four-foot logs, slightly less for eight-foot lengths.

But to achieve a good price took more than producers banding together into marketing boards because a landowning company like JD Irving can regulate its rate of cutting, thus setting the price for smaller suppliers (Parenteau, 1992). Moreover, the pulp and paper industry was not above price-fixing as it did from 1948 to 1954. After much resistance, the provincial government finally gave its support in 1982 in the form of legislation (reforming the Crown Lands and Forests Act) that designated woodlots as the primary source of wood fibre and Crown leases as the residual source (Parenteau, 1992; May, 1998). At the same time most Crown lands were consolidated into 10 licenses to be held by mill owners. But amendments to the Act passed in 1992 during a price slump, just as the Model Forest Program got underway, revoked "Primary Source of Supply" status, together with the marketing boards' power to set production and prices (May, 1998). DeMont (1991) and local woodlot owners[15] implicate then Premier Frank McKenna, said to be "impressed and intimidated by the Irvings," in the regulations overhaul (200). Lease holders were encouraged to continue buying from private lots but could do as they wished; a woodlot owner in the area believed that JD Irving tried to break SNB after 1992

[15] Interviews, May 1996.

by refusing to buy from SNB but inviting woodlot owners to sell independently.[16] No wonder SNB felt the organization had "crept into bed with the enemy"[17] when it joined Fundy Model Forest. Another woodlot owner recalled that SNB agreed to sign if JD Irving would buy their wood. But, he added, "Irving still screws us worse than any other mill in the province. Most woodlot owners would gladly give up Fundy Model Forest in return for primary status" - understandably so since the change has translated into a loss of about $14 a cord.[18] In addition, the availability of such cheap wood has attracted out-of-province buyers and encouraged overcutting. The change in status has precipitated a political fall-out too. The York-Sunbury-Charlotte Forest Products Marketing Board, dissatisfied with its representative associations, has withdrawn from the provincial parent body, convinced it can do a better job of lobbying the government given the federation's failure to prevent the change in supply status (Fullerton, 1996). Strong demand for roundwood has shielded woodlot owners from the worst effects of the loss of primary status but their new vulnerability is clear. After two strong years, demand fell again in 1996; lumber prices declined in 1995 although newsprint prices were expected to remain high (Cameron, 1996).

In its dealings with Fundy Model Forest, SNB used its position early on to threaten walking away over the allocation of project funds, which led to many late-night meetings

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[16] Interview, May 1996.

[17] Anonymous interview, May 1996.

[18] Interview, May 1996.

trying to convince it to stay.[19]

The province

New Brunswick's Department of Natural Resources and Energy represents the province on the Fundy Model Forest. As is the case at other model forests, it has been a reluctant partner, its participation largely handed over to the regional office in Hampton.[20] Unfortunately, this has meant that representation by the policy making level of government has been all but absent, a problem recognized by the model forest.[21] Thus the provincial people active on committees are resource specialists, managers and scientists; the same is true of the few Fredericton staff who do attend. It may be that the lack of higher level participation is not a sign of disinterest on the part of the government; nevertheless, the act of delegating provincial responsibility in Fundy Model Forest to a non-policy making level separated the policy makers from their field staff and regional managers, ensuring that whatever results the Fundy Model Forest achieved, policy feedback would be unlikely to be among them. It is reasonable to blame the federal nature of the model forest

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[19] Woodley, telephone interview, 1 August 1997.

[20] Pettigrew, Hampton NB, 30 April 1996; Brunsdon, 3 May 1996; Mullaly, 3 May 1996.

[21] Interview with Doug Clay, Fundy National Park, Alma, 3 May 1996. Recently there has been some movement in this position. The Department of Natural Resources and Energy's Director of Sustainable Development, Policy and Planning Branch has accepted a position on the national Model Forest Network's Board of Directors, signalling a new attitude towards Fundy Model Forest (P. Etheridge, written comm., 1997).

initiative for this. The province had its own set course to integrated management, its own wildlife habitat management project; the model forest then was a competitor in the eyes of Department of Natural Resources and Energy administrators.[22] Two other factors may contribute to the apparent distancing by Fredericton.[23] One is lack of time in an age when organizations are cutting down on staff; the other the very technical nature of the committees' work.

But the example of Saskatchewan shows that if a senior member of government is interested and responsive to requests for committed involvement, time and commitment can be found, and technical know-how is at any rate not indispensable at the Model Forest's planning level. Moreover, unlike Saskatchewan, forestry in New Brunswick is a sizeable component of the provincial economy[24] – a good reason to become involved. As Tom Pettigrew, head of Natural Resources and Energy at the Hampton Regional Office and chair of Fundy's wildlife committee, said, if one can advance one's forest resource management interests through a project, it is a positive thing.[25] The province *has*

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[22] Peter Etheridge, Fundy Model Forest General Manager, Sussex, 29 April 1996; Pettigrew, Hampton, 30 April 1996.

[23] Clay, 3 May 1996.

[24] New Brunswick's Annual Allowable Cut was 11.2 million m^3 in 1995, greater than that in previous years (Natural Resources Canada, 1997). Provincial exports of forest products were valued at more than 2 billion dollars in 1996, three quarters coming from the wood pulp and paper products sector, with a trade balance of $1.9 billion. Forest industries provided 26 000 direct and indirect jobs, or 1 in 12.

[25] Interview, 30 April 1996.

benefited from its involvement in Fundy Model Forest, for example through the expansion of knowledge. If it so wished, it could regard the Model Forest Program as a valuable partner in advancing the cause of sustainable forest management and hence the well-being of the province's forest industry.[26] This is the hope, perhaps now realizable, of many Fundy Model Forest participants.

Environmental groups

Five environmental groups are represented on the partnership, including the Conservation Council of New Brunswick, Fundy Environmental Action Group, New Brunswick Federation of Naturalists and Washademoak Environmental Group; only the Federation of Naturalists and the Conservation Council are original partners.

The Conservation Council of New Brunswick is one of New Brunswick's oldest and most comprehensive of these groups. Strongly ecocentric in outlook, its activities range widely, from the protection of the Christmas Mountains farther north to community forestry and ecological fisheries. The group has also produced a video for schools on agricultural sustainability and works with communities in the United States for the protection of the Gulf of Maine ecosystem, of which the Bay of Fundy is a part.

Washademoak Environmental Group is the self-styled watchdog of the health of the Washademoak Lake region, located on Fundy Model Forest's northwest border and

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[26] Etheridge, 29 April 1996.

subject to the effects of forestry and agriculture, prompting the group to join Fundy Model Forest (Anonymous, 1995c). Their efforts are geared at raising awareness and the protection of the lake region.

Fundy Environmental Action Group, like the Washademoak group, dates from around 1990. Its formation filled the need for an environmental group in the Albert County area of Fundy, allowing its members to become informed by being plugged into the provincial and national environmental networks, and active on an issue if they so desired knowing they had the support of a group behind them.[27] They bring a conserver society point of view that places the question of forestry in the context of human consumption, "encourag[ing] people to leave as much forest as possible untouched," and they challenge industry to prove that industrial forestry with its plantations works (Fundy Environmental Action Group, 1996:1).

The New Brunswick Federation of Naturalists's primary goal for involvement with Fundy Model Forest is to ensure the conservation of nature in forest management planning, for example by directing attention beyond the focus on consumptive species that has occupied both provincial planning and Fundy's wildlife committee, and by seeking the protection of critical areas.[28] For the Federation, the test of whether Fundy Model Forest achieves change on the ground would be the preservation of such areas. In a province

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[27] Interview with Anna Holdaway, Alma, 3 May 1996.

[28] Interview with Peter Pearce, Fredericton NB, 2 May 1996.

that, at the time of my interviews, had just received a failing grade from the World Wildlife Foundation for its policy of not setting aside representative ecosystems, where "every tree is numbered" and the last remaining bit of 'virgin' forest in the Christmas Mountains was being logged (Cox, 1996), success in this matter is an unlikely prospect.[29]

Environmentalists at Fundy Model Forest then bring a decidedly different view to the enterprise than that of the working forest of the principal landholders. Talk about the love of trees, as has been attempted by some Fundy Environmental Action Group members, has been met with derision.[30] How, after all, can such a thing be quantified? The technocratic fixation on quantification is associated for these partners with "male super-rational language" (Townsend, 1996). The divergent philosophies have made environmental groups question their role in Fundy Model Forest. Several

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[29] Quote from interview with Peter Pearce, 2 May 1996. The idea of preserving the Christmas Mountains was apparently supported by then Premier McKenna and other members of the Legislature, though opposed by his Department of Natural Resources and Energy Minister Alan Graham (Coon, 1995). Cox (1996) reports that the government was "adamant" the area be cut "so that a new forest can emerge." New Brunswick's policy of trusting to the fine filter, unbundled methodology means that setting aside permanently protected areas makes no sense. The 10 to 12 percent of reserved habitat that is to take their place will be made up of small blocks of mature coniferous forest, deer yards and riparian strips wherever they happen to occur; they remain open to selection cutting (see above). The province's plan to obtain its protected areas from moving mature conifer forest prompted May to remark that "[n]ot since Birnham wood removed to Dunsinane in *Macbeth* has so much depended on a mobile forest" (1998:106).

[30] Telephone interview with Lara Inglis, former Fundy Model Forest Communications Officer, 7 May 1996.

environmentalists saw their role as speaking up for the ecological integrity of the forest,[31] but the Conservation Council of New Brunswick has held ambivalent feelings about its involvement, deciding that staying was better than leaving;[32] likewise Fundy Environmental Action Group members struggle with whether they are helping to green-stamp industrial practices by participating (Townsend, 1996).

Just as at Prince Albert Model Forest, environmentalists wishing to participate in Fundy Model Forest also face material barriers. If time is a problem for a landholder such as the province, it is a formidable one for environmentalists who in addition must cope with limited financial means and technical expertise, the latter frequently due to the multitude of issues on which they have to be knowledgeable.[33] Institution of a stipend to cover their travel expenses and a portion of their time has helped[34] but, even so, the paperwork generated by Fundy Model Forest and the very large number of meetings severely tax the resources of these organizations.[35] Lack of a land base (though several are small woodlot owners) is a further handicap that assigns them to the sidelines because land ownership is an indirect factor in the allotment of Fundy Model Forest project funds.

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[31] Interviews with David Coon, Fredericton, 3 May 1996 and Karen Townsend, Alma, 3 May 1996.

[32] Powell, Cambridge Narrows NB, 3 May 1996; Coon, 3 May 1996.

[33] Interview with Marilyn Powell, 3 May 1996.

[34] Pearce, 2 May 1996.

[35] Pearce, 2 May 1996; Mullaly, 3 May 1996; Coon, 3 May 1996.

Partners without a monetary stake feel they have less credibility.[36]

Yet environmentalists have been vocal. They may lay claim, together with scientists (especially those of the Greater Fundy Ecosystem Research Group), to the achievement of the reversal in the new vision statement quoted above, putting biodiversity and integrity before economic benefit. They are the ones to point out conflicts of interest, press the importance of discussing controversial issues, instil the notion of forests being something more than trees, advance the cause of conservation and in general raise questions that make pursuing the industrial course a little less comfortable.[37] There is a price to be paid. Fighting industry by sitting down with them to play a game where everyone is manoeuvering is, one activist thought, "a terrible ordeal."

Management and organization

Fundy Model Forest's first phase organizational structure was, compared to Prince Albert's, simple. A management committee chaired by Louis LaPierre, a professor in the Department of Biology at the Université de Moncton and member of the New Brunswick Premier's Round Table on the Environment and Economy, consisted of the four land tenure groups (permanent seats), a representative of the education, research and environment sectors (annually elected seats), and three *ex officio* members (Canadian

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[36] Holdaway, 3 May 1996.

[37] Interviews with Powell and Townsend, May 3 1996, and Pearce, 2 May 1996.

Forest Service, Fundy Model Forest's General Manager and a lawyer). It met monthly to approve work plans and to administer funds and schedules (Fundy Model Forest, 1995). The 28 partners on the partnership committee met less frequently to review the strategies and recommendations of the management committee and the various technical committees. The General Manager and the rest of the staff (public relations/ communications and public participation officers, secretary and data base manager) answered to the management committee.

Project proposals were examined and ranked by the technical committees according to their priorities. They might be initiated or solicited by a technical committee or be submitted unsolicited to a technical committee. Peter Etheridge, Fundy Model Forest's General Manager, normally formed a special group of technical committee chairpersons to prioritize further because typically all projects together exceeded the budget. The list then went to the management committee for approval.[38]

ACCOMPLISHMENTS AND ISSUES FACING FUNDY MODEL FOREST

Projects and budgets

At the outset expenditures were assigned according to a formula that allocates 75 percent to operations (administration, inventory/planning, communications/education, industrial

[38] Paragraph based on interviews with Etheridge and Powell.

projects) and 25 percent to research (Fundy Model Forest, 1992).[39] Thus, technical committees have access to 25 percent funding. Of these, the biodiversity committee receives the bulk or 52 percent, wood supply research almost 20 percent, wildlife 11 percent, socio-economics 4 percent, soils 7 and recreation 5.5 percent (1994-1995 figures; Fundy Model Forest, 1995). Operations, in 1994-95, spent 7 percent of the total budget (or total expenses of $1 023 860) on administration, 9 percent on communication & education, 22 percent on inventory & planning and 36 percent on operational projects.

At this point a comparison with Prince Albert Model Forest is instructive. It is not straightforward, but at Prince Albert the allocational division between operations and research is roughly 50-50. In 1994-95, communications, education & technology transfer consumed 22.5 percent of the (near-equal) total budget, administration 15 percent, and decision-making tools (approximately equivalent to Fundy Model Forest's inventory & planning) over 13 percent (Bouman, 1995). Socio-economics and ecology-related research plus support for these activities account for the remaining 50 percent of the total budget. Three differences are immediately evident for the same period (keeping in mind that their accounting practices vary so that exact comparisons are not possible): communications & education at Prince Albert Model Forest are more than double that at Fundy Model Forest; administration costs at Prince Albert are again roughly twice that spent at Fundy Model Forest, a discrepancy due to the fact that at Fundy office space, the

[39] The formula has been much debated at Fundy Model Forest with researchers arguing against and landowners for. It was, by all accounts, defended most vigorously by SNB.

general manager's salary and a portion of secretarial support are donated by JD Irving; and Prince Albert still has 50 percent or close to $600 000 available for research, compared to the almost $270 000 spent on this at Fundy Model Forest.[40]

But the most striking feature about Fundy Model Forest's budget is that the remaining 36 percent or nearly $368 000 (having added up research [26%], administration [7%], communications/education [9%] and inventory/planning [22%]) is devoted to so-called operational projects. Most of this money, a little under 90 percent, has been appropriated by SNB (46.5%) and JD Irving (42%) for activities that are of immediate relevance only to those organizations, many of which would have been covered in the past by the old federal-provincial agreements (Chapter 2). Thus, about one-third of Fundy Model Forest funds is directed at the operational and technical needs of the two forest management organizations in the model forest (without counting the $52 000 used by the wood supply committee on timber management research). In effect, this money constitutes a separate pot available to SNB and JD Irving in support of projects properly a part of their normal managerial responsibilities.

Of course, if forest managers apply the results to their operations, these technical activities benefit the region and the Model Forest Program's goals and consequently they can be interpreted as legitimate model building.[41] For example, Irving has adopted a

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[40] These figures are strictly moneys available through Canadian Forest Service program funding and do not include levered funds contributed by outside sources.

[41] Woodley, interview, 1 August 1997.

method for protecting natural regeneration obtained from cutting trials the company conducted with Fundy operational funds, constructs fewer roads in favour of trails, and has decreased by 20 percent its clear-cut areas; SNB's model woodlots, likewise, educate the thousands of visitors they apparently attract (P. Etheridge, written comm., 1997). By testing and applying 'best management practices,' Fundy Model Forest is contributing to regional forest health; however, a considerable amount of public funds have been dedicated to work that leaves the actualization of ecosystem management within the industrial paradigm, in fact continuing in the vein of the former federal-provincial agreements, and benefits the accumulation of private capital. I noted something similar about Weyerhaeuser at the Prince Albert Model Forest (Chapter 5) and showed that helping the industry by publicly funding research has long been the way of the federal government (Chapter 2). In all then, and given that Fundy's wood supply committee, with its strong contingent of timber-minded individuals, is where the operational project funds are decided upon, anything else would be remarkable. The fact that Irving's chief forester Brunsdon has acted as informal chairman of that committee, a situation he himself recognizes as problematic[42] (though he is said to have been a good one and has successfully pared down the wood supply committee's wish list), adds to that perception. Had someone from SNB been chairperson, it would also be incriminating. The problem,

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[42] Though others do call him that, Brunsdon says he is not and has not been chairman or interim chairman of the wood supply committee since he wants to retain the right to speak on behalf of JD Irving; he has only offered to represent the committee at meetings. Interview, Sussex, 3 May 1996.

therefore, is greater than who chairs the wood supply committee – a committee whose privilege it is to spend hundreds of thousands of dollars on a philosophy of 'timber first' is limited in what it can contribute to a new direction in dealing with the forest.[43]

How can such a compromised situation have been permitted to happen? Two particular factors throw light. In the first place, Fundy Model Forest suffers from a system of accepting projects that is not at arms-length from the partnership; in the second place, Fundy Model Forest supports (and was meant to support) the concept of an industrial working forest. By this reasoning a large sum should go to forestry practices to promote, as Graham Forbes of the Greater Fundy Ecosystem Research Group put it, a willingness to invest now for future gain.[44] Since the former point has bearing on the creation of the management plan, I want to elaborate on it a little.

Accepting projects at Fundy Model Forest

The problem of moneys being used to serve special (and often powerful) interests of Fundy Model Forest is in fact symptomatic of the way research funds too are assigned, though there are fewer involved. Fundy failed, by choice or lack of foresight, to form an independent committee given the task to determine what the research needs of the model forest are in relation to its goals and objectives, solicit proposals by publishing the research

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[43] Interviews with Pettigrew, Powell and Brunsdon.

[44] Interview, Fredericton, 3 May 1996.

questions and approve them according to criteria developed by this committee, as was done at Prince Albert. It is not as though the problem of objectives-based criteria was never brought before the partnership and at least two committees (biodiversity and water) did identify research needs and solicited proposals on that basis, but the discussion was more to work out a means for prioritizing than finding a mechanism for arms' length solicitation; it contributed little to creating a sense of how the findings might fit into an overarching strategic plan.[45] Technical committee members were simply told to bring a proposal. This carelessness, by no means restricted to the Fundy Model Forest (Gardner Pinfold, 1996), encouraged "disjointed initiatives" "parochially" reflecting individuals' interests that to a degree became Fundy's focus.[46] That is to say, researchers (many of them partners) rather than any management plan have been allowed to direct research.

An instance of this - it is also a demonstration of the fine filter approach in ecosystem planning - is the selection of four consumptive species (white-tailed deer, ruffed grouse, Atlantic salmon and brook trout) by the wildlife committee as the focus for their efforts. Though their interests range beyond these species and there is a limit on how much a committee can do, yet the choice is consistent with partners' observation that selection of projects suits the researchers more than a (non-existent) management strategy. To the province (and other landowners) the choice was convenient because for many years

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[45] Interviews with Clay and Pearce.

[46] Interviews with Clay and Mullaly.

now it has worked on securing deer wintering habitat; trout was picked as an indicator species of stream water quality and because it fit a stream restoration project with good potential to interest the public; and the others reflect the wishes of anglers and hunters on the committee.[47] Fur-bearers were not selected because there is little market for them in the Fundy Model Forest region.

Perhaps the most serious consequence is that many projects have not been well fitted to Fundy's goals. This was judged true even of solicited projects since it is a relatively easy matter for researchers to adapt their own agendas to appeal to the model forest.[48] While some research has made a significant contribution to the development of a management plan (e.g. that of the biodiversity committee), towards the end of its first phase, Fundy Model Forest found that there were no answers to some specific management questions.[49] General Manager Etheridge explained that only then, as results were coming in, were the partners discussing how all this information might fit into their management planning scenarios; only recently had they begun to identify and address the contentious issues, another indication that research could not have been directed specifically to provide information on them.[50]

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[47] Interviews with Clay, Pettigrew and Powell.

[48] Interviews with Pearce and Mullaly.

[49] Interviews with Etheridge, Clay and Pearce.

[50] Interviews with Townsend and Etheridge. The tendency to avoid controversial topics exists also at other model forests (Gardner Pinfold, 1996).

The impact of the lack of a guiding research strategy was compounded by the tendency to let those who had submitted proposals stay to decide on their fate.[51] In a region where everyone knows everybody else, not many would want to object to the project of a colleague, especially, as has happened, junior personnel who must decide on a project submitted by their superiors while these superiors are seated at the same table. It is no wonder that some participants likened it to a trough to which researchers, academics and the forestry partners "nosy on up."[52] If corruption means the payment and acceptance of bribes, Fundy Model Forest does not qualify for that epithet; yet there is a degree of conflict of interest worrisome in a program such as this.

The JD Irving factor

Another challenge facing the partnership is the perception of conflict of interest stemming from the role of Fundy's sponsor. While the woodlot owners' organization has been described by one Fundy Model Forest observer as "not any different than the Irvings, maybe even a little more aggressive,"[53] it is the Irvings who mostly are the target of the partners' externalizations or projections, a term I use to indicate that it is, as Woodley thought, a matter of biassed perception as well as reality.[54] The prominence of the Irving

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[51] Interviews with Clay, Pearce, Holdaway and Forbes.

[52] Interviews with Mullaly and Woodley.

[53] Interview, May 1996.

[54] Interview, 1 August 1997.

family in New Brunswick has created something reminiscent of chaos theory's 'strange attractor.'

JD Irving, Limited has gained a dominant position in the Fundy Model Forest obviously by virtue of its economic position and its importance as the model forest's sponsor. Apart from this given, it donates the time (guesstimated by an insider at about 80 percent) of Fundy's manager Peter Etheridge, its office space and variable portions of the salaries of some support staff. Although the partnership has collectively decided that they would accept these contributions, the arrangements generate ill-will and tension. Etheridge's personal integrity has been spoken for; he himself believes he is impartial, does not bring his own or JD Irving's point of view, and views his role as providing administration and management but not direction.[55] He is said to bend over backwards to be fair but has been viewed by some as manipulative. His position, in the employ of JD Irving while also working, by that company's good graces, on behalf of the Fundy Model Forest, is very delicate.

The use of JD Irving's Sussex premises by the Fundy Forest for anything but the large membership meetings creates further tension. It is here especially that we see the effects of the Irving myth. While hardly a pervasive feeling, some partners fear telephones in the office are tapped and that microphones are hidden on the parking lot. Some refuse to even enter the premises. The mere mention of the Irving name has the power to arouse

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[55] Interview, 29 April 1996.

hostility, but the bias is said to be strongest among those who in the past have worked for the Irvings. KC Irving was known for his unpretentiousness, his helpfulness and generosity, but he also overworked and underpaid his people; his sons like to subject employees to random spot-checks and do their best to stir up competition among them to test their limits (DeMont, 1991). JK Irving, in charge of the forestry division, has a reputation for "running roughshod" over his workers (145). There is a story of him flying over a field during a logging operation and spotting someone who was not working. He leaned out of the Beaver and with a loudspeaker yelled at him – in fact the man was a farmer standing in his own field (DeMont, 1991; Hunt and Campbell, 1973). All this begets an atmosphere of fear and paranoia, and a high employee turnover. At the same time the family also receives much loyalty from its employees, perhaps in part in reaction to the obvious biases that circulate with the New Brunswick air; certainly because of KC's personal generosity which his sons have continued, for example by flying ailing employees down to the family's clinic in Boston or by providing scholarships for children of employees, and because remuneration has been increased to match that in the rest of the private sector (DeMont, 1991).

Thus fact and fiction mix to create a potent tangle of animosity and loyalty, and this naturally suffuses partners' experiences at Fundy Model Forest. Whether by design or simply as the inevitable result of being an industrial giant, intimidation becomes part of everyday operations. KC was not afraid to apply the tactic to New Brunswick premiers (as when he persuaded Richard Hatfield that the Supreme Court of Canada was wrong in

its decision to rule oil a movable property on which taxes had to be paid [How and Costello, 1993]); DeMont (1991) found few people willing to talk openly of their experiences with the Irvings just as members of a Saint John yachtclub were unwilling to lodge a complaint when Irving logs interfered with their sailing (How and Costello, 1993) - it cannot be surprising then that in the Fundy Model Forest the partners too are affected. There have been in fact instances when pressure has been brought to bear.[56] Inevitably, the JD Irving factor ensures that as soon as someone is critical of the Irvings another will jump to defend them, fostering internal dissent and fracturing the partnership's sense of purpose. An instance of the crippling effect the Irving presence can have (whether or not one thinks of it as too much) regards the information and education committee.

The information and education committee

At least until 1997, the communications position has not stayed filled for more than one year at a time. At issue was who should be giving the staff member direction. There had been a tussle about this between Etheridge and Clark Phillips, an SNB member who had been chairman of the information and education committee since 1994-95. So long as the communications officer's salary came out of that committee's budget, direction from the

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[56] On one occasion senior JD Irving representatives came to a meeting to state that a certain decision of the management committee, made with the approval of the partnership, was not acceptable. There was also a communications video that had to be completely redone because in it someone had said that JD Irving "handpicks" its advisory board representatives, a comment JD Irving labelled "a vicious attack" (based on interviews).

committee was more than justified. But things became awkward when Inglis, the communications officer during much of 1995 and 1996, and Phillips sought to emphasize public participation and partnership input and response,[57] goals that would augment the more basic ones such as signage, publishing a newsletter, brochures and in general putting a positive spin on industry, that both the management committee and Etheridge pursued.[58]

With Etheridge unhappy about the information and education committee, soon the arrangement became that the communications officer's salary would be paid out of the administrative budget, making her (all have been women) answerable to the management committee, thereby reducing the information and education committee's influence. At the same time the committee naturally still had to have some say in any communications agenda. There were thus two conflicting sources of direction for the communications officer. In addition, the officer has had to work out of Fundy's offices on JD Irving premises and consequently suffers the pressure that goes with that: first, she is not fully accessible to the partnership since not all partners want to set foot in the building; second,

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[57] Phillips made it clear that an important school outreach project of the information and education committee to enhance textbooks contrasts with a previous Irving package.

[58] Interviews with Mullaly, Powell and Inglis. One form this struggle has taken is what someone referred to as "the battle of disclaimers" - articles in *Horizons*, Fundy Model Forest's quarterly publication, critical of the group's philosophy have sometimes closed with a note abdicating responsibility for the opinions expressed. For instance, in the spring 1996 edition Judy Loo, a Canadian Forest Service scientist, took exception to the pro-timber consumption message of an earlier, anonymous, article and said it did not, though it appeared to, speak for all partners. Her article ran with a disclaimer; the one she responded to did not. Likewise, in the same issue, Brunsdon's in praise of plantations did not receive one.

she must answer to Etheridge on a daily basis, someone who is widely perceived as being really JD Irving, pushing her in a direction other than what the partnership might want. In short, the situation for Fundy Model Forest staff is confusing and difficult.[59]

The problem has been summed up thus: "There are certain members of the partnership who cannot be comfortable having communications and public participation run through a manager who represents an industrial partner."[60] In fact, if the information and education committee has gone to battle over public and partner participation, it is in part because of the widespread feeling that such input is stifled and distorted by Etheridge[61] or, if you will, a manager who despite sincere good will is perceived as not being neutral (it does not help him that Brunsdon, his boss, represents JD Irving on the management committee). It is not, however, all due to his 17-year long association with JD Irving; rather, the professional forester, and industrial forestry generally, well represented on the management committee, is at odds with the sensibilities of the larger policy community.

Interestingly, the discussion about these matters at technical committee meetings proceeds in what someone has called "code," talking "around the issue somewhere," not about the ostensible question but to achieve some other agenda, leaving newcomers confused about what is actually under discussion. So on the surface the talk may be about

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[59] Interviews with Powell and Townsend.

[60] Interview with Powell.

[61] Interviews, May 1996.

the competence of the communications officer when in actuality it is about having Fundy Model Forest staff in the Irving office.

The management and partnership committees

The discomfort exhibited over the source of direction in communications is present also with respect to management: is it the management committee or really the partnership committee that guides the Fundy Model Forest and which should it be? This is one more area seemingly underlain by the polarization induced by the JD Irving factor. Fundy's proposal explicitly charges the management committee with the coordination of activities to meet Fundy's goals and objectives, and with the direction of activities, setting priorities and supervising finances (Fundy Model Forest, 1992). The management committee has indeed taken the lead role in steering the Fundy Model Forest, which does not seem to be a problem when it concerns finances and the like, but it is seen by some partners to be setting policy far more than is right, sometimes changing priorities on its own. At the same time some have viewed the partnership committee as the ultimate decision maker and also as the source of the important management concepts the model forest discusses. The partnership committee then could be seen as a board of directors, except that it meets less often as the management committee and is hampered by its unwieldy number, irregular attendance and incomplete information base (which remains with the management committee since technical committees and staff are accountable to it). In this view, the partnership committee's decisions ideally would instruct the management

committee which, as executive, would implement the partnerships' wishes. Most of the partners, however, have not seen themselves as providing strategic direction or as the decision makers. It has therefore been a conceptual change for the partnership committee to have become, together with the public at large, the principal advisor on the strategic issues that the management plan must address.[62]

The proof of a model forest's partnership lies in its endeavour to create the management plan. It is there that the different philosophies of nature clash the most, but also there that the accomplishments of the partnership display themselves best. This is the subject of the next section.

The management plan

Although at Fundy Model Forest all participating groups are partners and there is no such thing as an advisory tier, its history of operating without a guiding plan all the same left controversial issues undiscussed until late. Eventually the turmoil about the information and education committee, that committee's anxiety about its continued relevance and, alongside it, the need to review any headway made toward achieving Fundy Model Forest goals, forced a workshop, a little spiced up by competition between Etheridge and Phillips, at which partners would "discuss, quantify and refine the issues" and find expressions for them such that comparative scenarios could be developed "in sufficient specificity and

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[62] Interviews with Mullaly, Pearce, Forbes and Coon.

detail to act as a clear set of planning instructions" (Fundy Model Forest, 1996:2).

The strategic issues[63] in question were derived from the information and education committee's public consultation function. During this process Fundy's public participation staff member, under the direction of the information and education committee, had gathered from groups in the region information as to what forestry issues, deemed most important by them, the Fundy Model Forest might address. Management planning committee, unhappy with the general and qualitative form the responses took, asked that a questionnaire be developed and presented to the same groups. The information and education committee, however, decided instead to take the public concerns to the partnership to allow it (in its new-found capacity as Fundy Model Forest's Board of Directors) to formulate a response by defining a management approach to each of the issues. Thus the task of developing Fundy Model Forest's integrated resource management plan became framed as an exercise in public accountability.

To guide the partnership at the May 1996 workshop, the Greater Fundy Ecosystem Research Group (in part through the biodiversity committee) developed a set of biodiversity guidelines, combining both coarse and fine filter approaches such that landscape-wide and site-specific aspects would be incorporated. Scenarios based on them were developed at the workshop; they were to be processed by computer, results

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[63] There are nine: buffer strips in riparian zones, road construction and management, spraying, biodiversity, clear cutting, plantations, increased use of selection cutting, wildlife and the natural range of tree species.

presented to the partners who would decide on the best candidates, and these then applied to a test area located in the eastern part of the Fundy Model Forest and about one-third its size.

Success, here judged as the degree to which the Greater Fundy Ecosystem Research Group's recommendations will be followed, seems mixed. That the guidelines were developed in the first place (with the explicit acceptance of the importance of industrial forestry to the province) and have been accepted as point of departure for discussion is in itself noteworthy and sets Fundy apart from other Model Forests.[64] I have already noted that JD Irving has reduced clear cutting by 20 percent since Fundy Model Forest began (though the existing plan for Crown License 6 may still roll this number back) and is implementing research results. Planning for biodiversity is in fact good business practice and Fundy Model Forest is a means to accomplish it, as the Model Forest Program was meant to. At the same time the membership risks getting caught in a game of numbers because industrial operations and the computer programs that direct their planning require quantification. Not necessarily hard numbers, as Brunsdon said, but "an understanding that this species needs areas of at least 200 ha and in this watershed you haven't got any. ... Tell me what flying squirrels dislike about plantations and maybe we can address it."[65] And the way to address this and similar problems in a management plan

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[64] Woodley, interview, 1 August 1997.

[65] Interview with Blake Brunsdon, Sussex, 3 May 1996.

is, for lack of choice, by putting a number to it. Here we see once more why coarse filter-fine filter characterization is only shorthand (Chapter 4): landscape level planning for gap size and buffer zones can be reduced to numbers just as well as site-specific planning. My quarrel is not with numbers *per se*, but with the idea that forests and water courses can be adequately dealt with by quantification. A forest is more than a quantified forest. Fundy Model Forest's faith in quantification led one partner to think that the technocrats had taken over, but in fact they were there right at the beginning when the proposal was being written: the integrated resource management strategy "must be based on the quantification of resource values and ecosystem dynamics" (Fundy Model Forest, 1992:22). For that matter, the mood at the birth of modern forestry during the Enlightenment was all for quantification (Lowood, 1990; Chapter 4); at least historically then it is difficult to conceive of forestry without quantification.

Quantification is about seeking the minimum one can get away with (or a compromise) and so is the handmaiden of exploitation. Indeed, the use of scenarios comes into play only because of economic concerns. If, as Mullaly pointed out, the Greater Fundy Ecosystem Research Group's guidelines had been accepted, only one scenario would have been necessary (instead of three for each of the nine issues); economic impacts would have been discussed building on the ecological bottom lines.[66] Etheridge gave a revealing account of how economic logic proceeds: after the available

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[66] Telephone follow-up, 24 May 1996.

commercial species are depleted, smaller diameter trees are utilized followed by the branches, then non-commercial species and fast-growing ones such as poplar.[67] Sawmillers in the area have been retooling in order to process thinner logs (May, 1998) and the move to pulp "underutilized" or non-traditional species is evident across the country and the globe (Pratt and Urquhart 1994; Marchak, 1995). Totman (1989) recorded a similar progression in pre-modern Japan, and recently it has been noted in the world's fisheries (Pauly et al., 1998).

JD Irving and SNB are not opposed to the Greater Fundy Ecosystem Group suggestions, but what drives the use of scenarios in the first place is the economic logic with its quantifying methodology. Scenarios then, much as partners may dislike them, are the only route. Ironically, and this points to the inadequacy of rational planning, choosing the scenarios may in the end well be based more on the agendas of particular partners than on specific information. If environmentalists put a clear-cut ban on the table, the company will respond that they cannot manage forests without making some.[68] In the case of buffer strips, the scenarios proposed 30 m (small woodlots) and 60 m (Crown and freehold) strips with 30 percent cutting subject to some restrictions (a situation similar to current provincial regulations); a 60 m no cutting zone; and an intermediate provision suggested by Greater Fundy Ecosystem Research Group of 60 m with slope protection and some

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[67] Interview, 29 April 1996.

[68] Interview with Etheridge, 29 April 1996.

selection cutting (Fundy Model Forest, 1996). But the park's strongly felt position that adjacent landowners (JD Irving in this case) have a responsibility towards the ecological integrity of Fundy National Park and ought to curtail their activities along its border, fell on deaf company ears at the May 1996 workshop.

In terms of phase 2, the quest to produce quantifiable scenarios with the aid of decision-support systems will not be diminished since the Forest Service's objectives put a heavy emphasis on the development of local indicators of sustainable forest management and their application to management activities (Natural Resources Canada, 1996b). This is adaptive management, and the idea is to monitor and forecast how the various indicators change as activities proceed, then adjust those activities using the new information. While commendable in theory, adaptive management is meaningless unless good baseline information exists against which to compare the industrial activities, something the provinces are often not capable of providing,[69] and, as I explained in Chapter 4, it is intimately associated with designer, unbundled forests, a permissive methodology legitimating continued intensive forest use. Incidentally, Fundy Model Forest, which has been working on the problem of indicators for a few years already[70] and recently produced a handbook on it for the other model forests, has replaced its technical committee format

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[69] This claim can be backed up by reference to the many publications that point to the paucity of, for example, taxonomic (e.g. Harding and McCullum, 1994) or inventory information (e.g. May, 1998).

[70] Etheridge, interview, 29 April 1996.

with six working groups, each assigned to develop the guidelines for one criterion (Sullivan, 1997).[71] By having working groups concentrate on the needs of one specific area, the new format is also expected to correct the above-noted shortcoming, that research at Fundy in the past was poorly directed. It is to be hoped that the work to develop local indicators, with its focus on identifying and addressing knowledge gaps, will help ground the adaptive management strategy in detailed information.

As a final note in this section on Fundy's management plan, it should be said that implementation of eco-integrity measures *via* quantification and high technology, involving trade-offs on a landscape level as a substitute for fixed protected areas on public land, adds complications when many small owners are involved. Woodlots are too small to count as ecological units, so larger parcels of land can be obtained only if landowners co-operate. Geographic Information Systems and related technologies can be of help by integrating ecological information and assisting diverse landowners across the landscape in decision making (as is being tried by the United States Department of Agriculture's Forest Service; Comanor, 1994). But sound decision making depends on sound inventory information; extracting it from the thousands of small woodlot owners in the province

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[71] The criteria that Fundy Model Forest will use are those put forward earlier by the Canadian Council of Forest Ministers (1995) in response to the Canadian commitment to sustainable forestry made at Rio and to the guidelines developed for boreal and temperate forests through the Montreal Process: 1. conservation of biological diversity; 2. maintenance and enhancement of forest ecosystem condition and productivity; 3. conservation of soil and water resources; 4. forest ecosystem contributions to global ecological cycles; 5. multiple benefits to society; and 6. accepting society's responsibility for sustainable development.

appears to pose an overwhelming challenge to high-technology-based planning. Moreover, who will pay the price for roving habitat provisions randomly located by computer? In a situation such as New Brunswick's where small woodlots comprise 30 percent of the forest landbase, there is a fair chance it will be their owners.[72] At present, the questions of compensation for those who delay 'harvesting' during a period of good prices for ecological reasons and the equitable distribution of the habitat selections have not been discussed at the Fundy Model Forest.

CONCLUDING REMARKS & DISCUSSION

Fundy Model Forest, during the period studied, fits the evaluative portrait for the first phase of the Model Forest Program well. The authors of that report (Gardner Pinfold, 1996) noted that at many sites research had proceeded, at least in the early stages, in a hurried, unfocussed way, sometimes in a bid to keep partners from leaving; they found that the industrial partners had made few of their Model Forest findings a part of their regular operations; and that issues were often ignored. Fundy is one of the Model Forests where conflict of interest, in the eyes of Gardner Pinfold, flowed from a consensus style of decision making that permitted those who submitted projects to participate in their adjudication. With respect to funding, Fundy Model Forest was apparently not unusual in that some of its partners appear to have regarded Model Forest Program funds as a timely

[72] Interviews with Pettigrew and Pearce.

substitute for traditional sources. It is also typical of the model forests in its inability to come to a consensus about the meaning of sustainability except that partnership building is a crucial element. This it has done well; in contrast to those model forests such as Prince Albert where a limited partnership created inner and outer circles of influence, at Fundy the large partner group makes it easier for those who are normally outside the policy network to have influence. Thus researchers and environmentalists have been able to set the biodiversity research agenda and, most importantly, serve the critical function of catalyst in getting management planning under way. Yet the political and economic might of the largest player, JD Irving, can easily overshadow that alternative influence. Coupled to this is the technocratic philosophy that dominates the spirit of Fundy Model Forest and of the program as a whole. Environmentalists and others of similar persuasion have had to work doubly hard to counteract it and were only tentatively successful.

All partners have shown greater understanding and consideration of each others' needs or perceptions although any change, as at most other model forests, has been mainly in detail rather than outlook (Gardner Pinfold, 1996), significant though it may be. It is telling in this respect that industrial partners had faith in the Model Forest Program to remove the threat of environmental boycotts, in particular European ones, whereas environmentalists expected the threat to lift only if changes occurred on the ground. At Fundy, environmentalists dubbed the Model Forest Program a scam to pacify the European threat, did not expect true on-the-ground change to occur because of the reductionist planning methodology and feared that they would inadvertantly contribute to

an approval stamp for JD Irving and, to a lesser extent, the woodlot owners' co-operative. Lastly, as elsewhere, not only has provincial participation been less than enthusiastic, but Fundy Model Forest has so far not been able to influence provincial legislation except indirectly.

Gardner Pinfold (1996) remark that distrust among partners for historical reasons at times has taken up to two years to abate. At Fundy Model Forest these factors are twofold: the economically marginalized, politically vulnerable position of the woodlot owner and the keystone position occupied by the Irving family. Of course, the woodlot owner and the industrialist are linked together in the enterprise, the one as dispensable supplier, the other as price-setting buyer. Both have contributed to making New Brunswick's forests little more than a fibre farm. While change on the ground does seem possible, it will be incremental, firmly circumscribed by the needs of the industry and marked by the requisite scenarios and haggling over numbers. So, practices will be ameliorated, but the overarching philosophy will remain: how does one extract the maximum out of an ecosystem without condemning it to grow just shrubs and without triggering a chaos of boycotts? It is a reminder that the word 'model,' here as at Prince Albert, is far from monotypic. For example, does a model mean replicability or can it be peculiar to itself? For some the concept implies setting an example of responsible forestry others may emulate, for others it is the development of computer modelling tools that will facilitate the judicious application of multi-value resource management and any acceptable

means by which to increase fibre yield. This issue too revolves around the meaning(s) of sustainability.

Change was the mandate for the Model Forest Program. It was to lift the forestry industry in Canada from its foundation in sustained yield and set it down on the new ground of sustainable forestry. The fine points of what that might mean in practice were discussed in this chapter and in Chapter 5; now I want to conclude with some thoughts on what the experience at the two model forests examined in this study can teach us about policy change.

How good Fundy and Prince Albert (and the other) model forests can be, in the long run depends on whether they can gain regional and perhaps provincial relevance, becoming a 'model' other areas can take up; a more poignant question is whether they have the potential to influence existing policies and to stir the pot by creating an atmosphere for change. Gardner Pinfold (1996) remarked on the low level of enthusiasm shown by most provincial governments for the model forests, something which both Fundy and Prince Albert suffered from for several years, and concluded that so far the program has had little effect upon provincial forest policies. One test of this would be the application of research results to provincial regulations and management plans, but I believe that a more significant indicator of change at the provincial level is whether the provinces in fact will delegate authority to parties other than industry. If they are any indication, the new co-management boards used by the Saskatchewan government are guidance groups only,

devoid of any true co-managerial authority. The feeling at the model forests was that the provinces are not yet willing to restructure the institutions of resource management in any way that would jeopardize the existing landlord-tenant relations. If they try, the industry is sure to object strenuously. Weyerhaeuser for one has always asserted that the province has the final word since this leaves their privileged relationship with the province intact. Thus the indication is that the answer is no, at least for now. Brenneis and M'Gonigle (1992) thought that, to be effective, the public participation process must rest upon legal mandate. Saskatchewan's experience with co-management suggests that something more is needed.

Will the experience of the model forests entrench the sophisticated model of forests as unbundled landscape elements or will it on the contrary encourage a more profound 'social' learning? Lertzman et al. (1996) believe that it is possible to arrive at a paradigm shift *via* incremental adaptations without being pushed there by external events, but are forced to concede that at this stage such a conclusion is premature. If the present situation is symptomatic of a transition period between two policy paradigms, industrial and ecosystemic, then, following Hall (1990), we may expect to see a protracted struggle from which it is far from certain that the latter paradigm (in my sense) will emerge victoriously.

The emphasis on research at Prince Albert and Fundy's quantifying approach to its integrated resource management plan reflect a strong belief in the rational nature of decision making. That is to say, knowledge is seen as being capable of convincing policy

makers and resource managers to do things differently; the decisions so attained will then defuse conflict. Evidence from the US Forest Service's planning for the national forests indicates that information is a double-edged sword that can be used by all parties concerned and undermine, rather than strengthen, the alternative cause (Healy and Ascher, 1995). As interested organizations scramble to react and adjust their strategies, the incremental changes observed in the case studies take place. They do not, by any means, denote a fundamental shift in approach. In fact, it would seem that all the manoeuvering entrenches the technocratic, industrial side in part because it has so many more resources available than do environmentalists and academics. Therefore, at present, the answer seems to be that, in accord with the program's guidelines and the spirit of the National Forest Strategy, progress will be made incrementally within the 'postmodernist' paradigm, without upsetting it.

To sum up, the experiences of the two model forests point to the obstacles in the way of a true paradigm shift. The difficulties surrounding the formulation of a management plan at both sites show that even under the unusually favourable circumstances created by the program, the capability of the policy community to influence the proceedings is limited. Where institutions "unite networks of expertise and orient the policy concerns of private actors ... it is difficult to redirect the course of policy," writes Weir (1992:210) of a different policy field. In the cases here described, vested interests were preserved, demonstrating at once the weakness of the federal position in Canadian forestry affairs and the vigour of the clientelist or captured policy network, a result of the

legal relationship between the industrial licensee and the landlord or province, and the political strength of the industry. These obstacles suggest the shape of the colonial legacy at work in Canadian forest policy, including the pressure brought to bear by the demands of a staples-based economy, as well as the shape of the debate as it emerges from the encounters between forest scientists, environmentalists and industry. In the next and final chapter these points will be contextualized a little further.

CHAPTER 7

CONCLUSIONS

> Can it perhaps be that life's security is in the production of life; that if all species are to live, each must produce its own kind abundantly for all others?
>
> *Wallace B. Grange, 1967:121*
> *Those of the Forest*

Forests are communities of many organisms, characterized and structurally supported by trees, whether gymnosperms (e.g. conifers) or angiosperms (flowering plants). Canadian forests, depending on location (climate, soil), may be of either kind or mixed. Forests have existed in one form or another at least since the Late Devonian (374-360 million years ago [Ma]); gymnosperms date from the Late Carboniferous (320-286 Ma), angiosperms from the Early Cretaceous (144-98 Ma). Conifers dominated over spore plants and seed ferns by the Jurassic (208 Ma), but gained the advantage much earlier during the Permian (286-245 Ma) as the climate became drier and colder. Angiosperms have been the predominant land plants since soon after they arose. Conifers and many flowering trees (in temperate regions) rely on the wind for pollination and dispersal of seeds, and consequently forests, in which numerous individuals of a species occur closely together, are the ideal community form to ensure reproductive success. They are thus a reproductive strategem for individual trees. Moreover, even for insect-dependent

angiosperms (pollination phase) and bird- and small mammal-dependent angio- and gymnosperms (seed dispersal), the forest form maximizes their reproductive chances by harbouring, during at least some life-cycle stages, the insects, birds and mammals employed for the task (Cowen, 1990).

Below ground, we find innumerable species of several groups and trophic levels, such as fungi, which feed on plant materials as well as on each other. They contribute to the accumulation and the disintegration of organic matter, to the circulation of nutrients, and to the maintenance of the productivity of the forest soil. Mycorrhizae, or fungus-root associations, are vitally important to forest trees and shrubs, both for normal functioning and for reproduction. Old forests, and old stands within younger forests, as well as the reverse - younger trees within old forests - are a typical occurrence in Canadian forest ecoregions. As trees die, the snags are visited by various insects and birds; on the ground, the logs stabilize soil, trap water, encourage tree seedlings by inhibiting competition from shrubs, and provide multi-layered habitat for insects and small vertebrates. Their decay products feed the entire community. The additional light let in through the opened canopy favours shade-intolerants and adds to the forest's vertical structural variety. Consequently, temperate natural forests are species-rich; trees in such forests additionally exhibit great genetic diversity. Forests, although composed of randomly reproduced trees (and of random assemblages of species established following retreat of the ice 10 000 years ago), are yet not atomistic collections of trees haphazardly thrown together in the form of a forest; rather forests are the logical community structure taken on by trees and associated

species ever since they evolved. Trees need each other to reproduce, and they and the forest itself are further dependent upon arthropods, worms, birds, mammals, fungi and bacteria for their general well-being. In other words, they depend upon the forest ecosystem. The latter includes fire, wind, insects, death and disease - natural phenomena essential to life and its processes. Life evolves because of and in concert with these forces, not in opposition to them as if against an enemy. Already in the Lower Devonian (408-387 Ma) Rhynie Formation of Scotland (and elsewhere in Devonian rocks) there are mites and other small arthropods that punctured and ate plants (Cowen, 1990).

Thinking of ecosystems in a geological context forces a correction to the current popular assertion that nature is dominated by flux. Natural processes are in fact stable, most having been in operation since earth's origin or since life (or its principal developments, such as sexual reproduction or the arrival of eukaryotic cells) arose, that is to say, most are several billion years old. Examples are the mechanisms of evolution and respiration, and redox reactions. It is the products of the mechanisms that change (themselves affecting over the long term the conditions of their development) and outside factors such as climate and earth's rotational angle (itself an influence upon climate). Even then there are consistencies through time and across place. So, for example, Phanerozoic (i.e. Cambrian to present) assemblages of rocky shore communities will be recognizably different from sandy shore communities. The species will differ with time, but the *type* of organism that makes its living in the sand will not suddenly become a type that can survive on the rocks. We may say that the foreground changes but the background remains

remarkably stable (or consistent) for very long periods of time.

This geo-ecological or geocentric picture is a contemporary scientific one. Certainly it is also compatible with non-Western understandings and with Western pre-seventeenth-century views insofar as the latter envision forests as a unity. But the picture we encounter in industrial forestry is very different. Industrial forestry regards the trees (timber) as the sole characters around which the plot revolves. There are desirables and undesirables: whole regions may be converted into the former while the latter are eradicated. In the tradition of the ideals of progress, which portrays nature as wasteful, only young, growing trees are valued since they add the most bulk to their stems. By contrast, old specimens die, succumbing to disease, rot, and insects, and gradually lose volume. Foresters regard this process as problematic and speak of decadence and overmaturity. Likewise, at the generation pole of the life cycle, the process must be controlled against competition from unwanted herbs and shrubs. Throughout the growth period, disease, insects, plus other agents of forest renewal such as fire must be protected against.

In its truncation of the forest's life cycle, in its atomistic treatment of forests as simple collections of their most visible component (trees), in its insistence on simplification through homogenization of species, of genetic content, of structure, in its warped anthropocentric designation of life processes as enemy and the attendant use of the language of war (fight, eliminate, threat, attack), modern (modernist and postmodernist) forestry amply shows that it operates from what is fundamentally a position *contra*

naturam. Even under the ideal sustained yield regime, when the objective is to cut annually only as much as the forest grows in one year, we assume that this growth is not essential to the forest's health. But perhaps, as Wallace Grange said in the quote that appears at the top of this chapter, the forest needs the surplus to propagate itself far into the future and conversely, the trees may need the extra forest biomass (either in the form of living trees or biomass on the ground) in order to flourish. Natural systems then might be said to cultivate excess whereas those of humans cultivate parsimony. Further, the widespread acceptance of genetic manipulation and seed selection for desired traits reveals the hubristic illusion that humans can predict what traits will be necessary to ensure fitness in the future as well as determine and assess the full repercussions of their actions upon nature.

The anthropocentric, technocratic orientation optimistically assumed to favour timber growth is completely in accord with forestry's Enlightenment and Progressive antecedents. In the current climate of thought, industrial forestry recognizes that many natural processes are not stable and that humans must be included in the idea of nature. Extended into the socio-political realm, this has led to the notion of sustainable development, where a balance of ecological and economic processes is attempted. Typical of its socio-political dimension are measures to extend talks to all those with an interest in the forest and especially to First Nations. In terms of the physical environment, it is an improvement to think of human actions as taking place within it; however, both the notion of unstable nature and that of humans as part of nature may have a negative side too.

The danger in declaring that nature at all levels is in flux occurs when this already-lopsided idea is coupled with the further notion that humans are an integral part of nature, for that may be understood to mean that human actions are natural events, the same as a thunderstorm or fertilization; consequently, nothing unnatural could ensue. Thus the emphasis on a nature-in-flux may imply that any and all interventions are fine, regardless of their scale (temporal, spatial). Interestingly, the failure to realize the evolutionary relationship between humans and nature, namely that humans arose out of pre-existent nature and are therefore limited by older natural patterns, suggests that the human being has in fact still not quite been assimilated to nature. These and other limitations create what Worster (1993) evocatively called a permissive ecology, the use of ecological knowledge and sophisticated technology to justify an accelerated and more thorough exploitation of earth's resources.

The goal of both the National Forest Strategy and the Model Forest Program is expressly to move the Canadian forest industry in an ecosystem direction. Did they do this? I have probed this question by exploring the meaning of ecosystem management in these policies, both theoretically and on the ground, whether it inclines towards the industrial or the geo-ecological interpretation, and what if anything the Canadian context has contributed to the situation. The answers to these questions have been derived by integrating several intellectual traditions.

As the story is told from a policy angle, in Chapter 2 I introduced the tools of relevance to policy analysis, namely policy community theory and political economy; I

included a look at policy change as well as a treatment of the federal role in forest policy and of the position of experts in forest policy decision-making. This chapter showed the constraints of relevance to the Canadian context (the colonial legacy of staple economy, federalism and close government-industry relations, plus the association of experts with the dominant paradigm) that must be considered together. As the investigations related in chapters 3 to 6 offer the best commentary on the material presented in Chapter 2, let us go to those chapters and recapitulate their findings.

Chapter 3 opened with an assessment of the National Forest Strategy's ecological content. The Strategy, I argued, is built upon the view of nature-in-flux, an element that, if treated right, can support a more ecological forestry, but has not shaken itself loose of the timber imperative, to large degree because it remains openly committed to the sustained yield principle. In its modern form this principle is a key tenet of scientific forestry, and entails the interest-capital (annual growth of trees-forest) formulation of the ideal cutting formula which, as mentioned, is a parsimonious interpretation of natural relationships in a forest. This is accompanied by a commitment to intensive management, an approach that seeks to increase the available cut through biotechnological and other techniques and the control of fires, weeds and insects. Lacking also is a place for old growth, barring exceptional circumstances. The summarizing image for this policy comes from Little Red Riding Hood (where the wolf answers the girl's queries about her "grandmother's" strange features with the phrase "the better to eat you up") because the Strategy gives the impression that it supports, with the exception of a few selected stands,

the commercial consumption and transformation of all of Canada's forests. In terms of its understanding of ecosystem management, then, the Strategy is an expression of permissive ecology.

The bulk of Chapter 4 was an analysis of the selection process for the Model Forest Program sites. Its principal tool was a taxonomy of Western (and one First Nations) nature philosophies, a set of profiles I prepared from the history of science and other sources, ranging from pre-seventeenth-century times to today. Their purpose was to categorize according to nature philosophy the many proposals that had been submitted to the program and to have a way of comparing contemporary models with earlier ones. To offer a contrast with pre-modern times, this early profile highlights a meaningful unchanging nature expressive of the divine will, and the forest as a place outside human society in which pagan spirits dwell. During the Enlightenment the expectation arises that nature's confusions can be sorted out through the application of method or reason; forests become things to be rationally administered for the benefit of society now and in the future. The profile for the Progressive or Conservation era continues in that tradition, but the scientific side is more developed; importantly, the idea that forests are a renewable crop is introduced. After the Second World War, the modernist view of nature entrenched the scientific approach, industrializing it; such practices as selection cutting and soil protection were lost in the adoption of the clear cutting method on nearly all forested lands. Next is the standard profile for this study, which I called the postmodernist model, furnished to large degree by the Strategy and its notion of sustainable development and

ecosystem management. It applied equally well to the Model Forest Program because this program had been designed on the same philosophical basis. As one may expect, it views nature as dynamic and in flux, adaptable to disturbance and inclusive of humans. Management correspondingly justifies its actions on the basis that it mimics nature by building in disturbances; its technological outlook leads to a role for experts that is to design fibre baskets of desirable forest values. The ecocentric model similarly departs from a flux-based view of nature but holds to an evolutionary-ecological land ethic. The geocentric profile describes nature as possessing elements of flux and stability and stresses the long timelines of natural (biotic and abiotic) processes. Finally, a compilation of First Nations sources constitutes the cosmocentric view with its emphasis on stewardship to preserve and protect the unity of all life.

The Model Forest Program is an attempt to translate the more abstract directions for sustainable development contained in the Strategy into reality, providing us with a sharper picture of how a permissive ecology may be blueprinted. In spite of a clear intent to achieve multi-value forest management (itself problematic), the program also maintains the timber focus. This constraint proved decisive because it imposed a stand perspective on all the other values, primarily wildlife habitat. In other words, habitat supply, targeted wildlife species and their number became tied to timber availability, stand age and tree species distribution. This is the so-called fine filter or bottom-up approach to ecosystem management. Sustainability in the new Canadian forestry initiatives turns out to be a concept with little meaning unless keyed to timber stands, while the demands of such an

approach, given that forest stands change with time, require the deployment of the "most advanced" technology, particularly decision support systems. On a more fundamental level, the pre-eminence given to the timber value of forests does not challenge but continues in the atomistic tradition with its far-ranging simplifications and culture of intervention, its anthropocentric attitude hostile to life. The permissive mode of the program is further strengthened by the insight that humans are a part of nature. Human actions are then anachronistically relativized to natural events, such that the lumber mill and its timber needs become equivalent to the needs of 'other' animals of the bush. From this ageological position permissive ecology designs forests to suit human wishes while its ecosystemic sensitivity inquires into the carrying capacity of the forest and spreads its now unbundled values over the landscape.

As expected, submissions to the program for the most part complied with this postmodernist philosophy. The successful sites were chosen entirely from among them. This was unfortunate, since a few submissions of different philosophy were as worthy as and sometimes, I concluded, worthier than some of the successful ones. However, the chosen standard, with its vision of the ideal forest as the unbundled forest, could not permit any other outcome.

Let us now briefly summarize the dynamics of the Canadian forest policy community as seen in Prince Albert and Fundy model forests, keeping in mind that they are in a somewhat special class as a result of the nature of the program. The composition of the two communities is quite similar though not identical in detail. At both sites, all

landholders are represented - industry, private landholders, provincial government, Parks Canada - but at Fundy there are woodlot owners and at Prince Albert First Nations. As landowners, these parties have material interest as well as knowledge and so belong to the particular network that, in terms of the model forests, may be translated as the management or partnership committee. Although at Fundy all partners are represented on it, there was a feeling that those with an industrial or management interest had more credibility. In that sense, environmentalists at Fundy fell outside the network. This was literally true at Prince Albert where they were present only on the various advisory committees. Frequency of contact, as I argued in Chapter 2, is not a sufficient determinant of whether a party belongs to the nexus, otherwise the marginality of environmentalists would have been erased in the model forests, or at least at Fundy where they are partners. But their effectiveness even there depends on the circumstances, on others' goodwill, and their accomplishments, though important, are still limited to broadening the breadth of the discussion, to challenging the norm. At both model forest sites, the environmentalist position was a critique of the postmodernist profile, falling into the biocentric category. As in the outer world, however, environmentalists found it difficult to forge their critique and have it heard, for similar reasons to do with their non-material interests: compared to their companions in the partnership, they disposed over less time, money and 'expertise.' Still, due to the experimental nature and the infusion of funds into the model forests, the circle of those with an interest was broadened to include many more parties not ordinarily part of the network (government, industry and

sometimes labour). As a result, in terms of both widening the basis of knowledge and challenging the norm - educating - Parks Canada people were able to play an important role. Unlike the environmentalists they were scientific experts, were paid to participate and, by virtue of their expertise, enjoyed the credibility necessary to direct the discussions over the management plans toward ecologically higher ground. Needless to say, they were also landholders.

The First Nations, another group normally marginal to the network but, as landowners in the Prince Albert Model Forest, more powerful than the environmentalists there, concentrated efforts on redressing historical inequalities and grievances to improve conditions for the Montreal Lake Band. This long overdue work was and remains important and Prince Albert's achievements in this area are laudable, but the parochial nature of their concerns induced by the very fact of their material interest inhibits them from putting together a critique of the type sought by many of the model forests' environmentalists. Hessing and Howlett (1997) speculated that more open Canadian forestry networks and, consequently, a new direction in forest management, might follow the redrawing of the map of material interests, such as will occur when First Nations, as a result of the courts and a society-wide tendency toward inclusivity, take their place among the other landholders. The experience at Prince Albert indicates that dealing with the effects of the colonial era, including its post-colonial institutions, may take up the greatest share of available energy and money, as Bouman et al. (1996) understood, and raises the question of whether the acquisition of material interest forfeits the ability to exercise the

critical function on behalf of the greater good of communities outside one's own. This point applies equally to the small woodlot owners in the Fundy Model Forest who, by joining the ranks of the network, gave up their usual outsiders' perspective and with it the ability to comment critically on the larger issues. Traditionally the enemy of the large forestry companies, they joined the Fundy team with one of them in order to squeeze benefits for their members out of the publicly funded program.

The historically strong position of the forest companies remained strong. The program was, after all, not binding, a fact that appears to have been a decisive element in the decision of many partners to join up. The voluntary nature of the partnership, however, has had one major effect, namely to leave the legal arrangements between the provincial governments and the lease-holding industries standing. So long as they were intact, the companies really did not have anything to lose but the relationships they had forged with their model forest partners. As Weyerhaeuser made clear, though, there are other ways to achieve good relations with neighbours that may be cheaper in concessions than a model forest. Unlike the community advisory boards now becoming a regular feature of forest management, at the model forests companies did in actuality owe their partners something. They have made many gestures of good faith, such as hiring First Nations people, not logging sensitive sites and engaging in debates in a way they would not have considered ten years ago. Yet Weyerhaeuser, for example, seeing its goals for Prince Albert essentially achieved, considered leaving, and Irving has refused to budge on Fundy National Park's request that the company restrain its logging operations in the

vicinity of the park. In terms of the raising of ecological consciousness, the struggles over the management plans at both sites and the changes the companies are willing to commit to, make evident that this thinking is occurring in the kind of fragmentary manner the postmodernist or sustainable development model entails, that is to say, it does not proceed from a comprehensive, geo-ecological position. Given the timber imperative of the program, this is of course expected. From the provincial government point of view, this approach is ideal too, because it does not challenge the departmental divisions and biases (for example, the management of only those species that have a commercial value) upon which resource management is based. Bouman et al. (1996) marked this as one of the obstacles to sustainability at Prince Albert but it must be emphasized that the provinces' overall reluctant participation has to do with jurisdictional concerns.

From an analytical point of view, then, the value of the Model Forest Program and the National Forest Strategy lies in part in showing how current and old ideas about nature, forests and the human place in nature coalesce into a new postmodernist management approach whose metaphor is the unbundled forest. It also lies in clarifying and amending points of theory brought up in Chapter 2. To illustrate it, I shall now revisit the main dissertation question. I have argued that the newness of the postmodernist philosophy is deceptive since the outcome of the process of operationalizing sustainability is anchored in the same limited, anthropocentric world view that prompted the search for a sounder forestry in the first place - then why should this supposedly new but limited approach have become the choice of policy makers?

The transformation of the concept of sustainability into the postmodernist package and its incorporation into the two policy initiatives points to other forces beyond simple expediency, even beyond the claim that policy making is the compromise outcome of various stakeholder interests. Let us take the timber bias. It is not an accident. As the most important contributor to Canada's trade surplus, as the sole sustainer of dozens of Canadian communities, Canada is critically dependent upon forestry and in general remains a dependent staples economy, not all that different in its policy concerns from the colonial era despite its broadened industrial base - a vulnerable situation not, as we saw, particularly discouraged during generations of elite decision making.

The choice of the postmodernist perspective also rested upon the professional judgement of another elite group, the forest scientists and managers. The pessimistic opinion may have it that scientists are not listened to much by policy makers, yet the importance of experts is demonstrated by the fact that the Model Forest Program and the National Forest Strategy endorsed the stand-based, fine filter version of ecosystemic resource management (permissive and industrial) rather than the alternative umbrella-like coarse filter method (ecocentric, geocentric), letting the timber bias stand. It was the strength of the expert voice, whether in Ottawa or the provinces, in academe or in industry, that resulted in the retention of this bias and the principle of sustained yield in both programs, and the continued belief in the ability of silviculture to rescue falling yields and the human capacity to successfully substitute cultured stands for forests. It is the epistemic community of experts that took important ecological insights into natural

variability and the common occurrence of disturbance as a rejuvenator of ecosystems, and turned the new thinking into a sophisticated forestry in which sustainability is keyed to timber stands, human actions are equivalent to natural events and human constructions to animals, and the stands themselves are turned into designer creations. The ideal forest in this interpretation of the human-nature relationship has been atomistically unbundled into its constituent 'values,' then repackaged into fibre baskets. The unbundled forest management approach allows industrial forestry to continue much as before, hastening the transformation of Canadian forests into very different landscapes, as Kellhammer (1992) and Schindler (1998) foresee.[1]

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The prospect that they will be proved right is not greatly reduced by the 1998 National Forest Strategy. The document expresses the fact of increased global competition and expands the section on aboriginal forestry to take account of recent events. In general, it de-emphasizes the traditional prominence of timber production in favour of social and environmental concerns. As a whole, therefore, the document comes across as more ecologically sensitive than the 1992 version on which it is based. For example, it is recognized that timber activities cannot keep on expanding "into undeveloped forest areas." Another example is the section on clear cutting. The new version takes account of new knowledge to mitigate its effects through "emulat[ion of] natural disturbance patterns and frequencies and reflect[ion of] post-disturbance characteristics of stands and landscapes"; alternative systems such as shelterwood, rather than clear, cutting are now said to be appropriate cutting methods. Also, the role of fire in forested landscapes has been recognized. Further, the statement that sustainable development of forests is an expansion of sustained yield has been dropped; the equivalent section now reads, "Adopting sustainable development in forestry has meant broadening our overarching goal, from sustained yields to healthy forest ecosystems." But this does not necessarily mean that sustained yield is not still the basic principle to which multiple values are added (suggested also by the title of this section, "Forest Ecosystems: Multiple Values"). The most significant factor here is that the strategy continues with the unbundled approach, in spite of the increased emphasis on best forestry practices. This is made clear when the role of values held by Canadians with respect to the forest is elaborated. Thus, the framework of criteria and indicators, which is to "define and measure progress towards

The expert, unbundled forestry vision prevailed in the choices of the Model Forest Program's selection committees. Of the two model forests studied here, Fundy is most instructive as to what that vision means in terms of forest management. For example, the discussions about the management plan were issue- and value-based; the mixed coarse and fine filter ecocentric guidelines of the Greater Fundy Ecosystem Research Group (1997) were set against fine filtered alternatives that haggled about the number of metres to be included in riparian zones and how much of that zone should be closed to cutting. Other illustrations of the new approach are provided by the narrow focus of Fundy's wildlife committee and the remark by Irving's chief forester, related in the previous chapter, to let him know what it is about plantations that flying squirrels find disagreeable, in order to better design the company's plantations. Doing away with plantations is unthinkable.

That new knowledge may become mainstream only so long as it does not undo the dominant extractive paradigm suggests for experts, at least in the Canadian context, a privileged position in the policy network. By contrast, those who prefer alternative

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sustainable forest management," is to be a reflection of those values and will "identif[y] the forest features and uses they want to sustain or enhance." One of these values is old growth, and the new version of the strategy retains the previous statement that it is mainly Canadians' "attachment" to it that warrants its inclusion in forest management planning. Additional values are habitat, gene pools, water and carbon sequestration. Other sections on forest management that remain largely the same have to do with the use of biotechnology and the incidence of weeds, disease and insects. Mention of criteria and indicators is new to the 1998 edition; this reflects the work that has been done globally and by Canada in defining concrete measurements of sustainable forestry practices. Of course, the quantification (and its implied reductionism) that is entailed may, as it did at Fundy, increase unease about the procedures.

approaches cannot prevail upon policy makers in the bureaucracy who, often professional foresters themselves, are committed to or are persuaded to support the industrial view; they remain instead in the far more influence-limited sphere of the attentive public. I note too in this regard the explicit connections that have traditionally existed between the forestry community and the economic and political elites, and the fact that foresters must work with the demands of a staple economy, as documented by Leman (1981), Gillis and Roach (1986), Wilson (1990), Sandberg and Clancy (1997), and others. The Model Forest Program process further lends support to Haas's (1992) finding that the epistemic or professional community's authority sets the tone for the policy debate. In this case the epistemic community of foresters was able to exert enough influence that even a program actively searching for innovation was limited by the traditional preoccupations that shaped it. It is remarkable that only the experimental nature of this program and the fact of their landownership got a First Nation, and therefore a non-standard world view, at the network table. First Nations' cosmocentric understanding had otherwise been excluded from this program (though not in its second phase). For the same reason Parks Canada's ecologists have been able to bring to the discussions the strand of science that I referred to above as having been neglected in favour of the industrially-acceptable variety. Their views can be regarded as departing from a non-permissive ecology, in the biocentric to geocentric range of the attitudinal spectrum.

It would therefore seem an underestimation of the political power of the experts to say that they are not listened to. They are but it is necessary to distinguish between, let us

say, 'environmental' and 'industrial' scientists. Those who by virtue of background and inclination produce interpretations that do not seriously challenge the prevailing industrial model or its humanist ethic enjoy good access to the network; they were, for instance, well represented on the bodies that directed and oversaw the creation of the guidelines and the selection of the successful candidates in the Model Forest Program. With the weight of power and tradition behind them, they overshadowed the others. For this reason, the influential epistemic community must be positioned within the policy network, as Hessing and Howlett (1997) argued. As shapers and makers of important decisions for society, they are part of what Porter (1965) considered the elite. Another way of saying this is that the struggles (and their outcome) within the scientific or expert communities over interpretation - science politics - are subject to considerable societal pressures - the politics of science.

This aspect of the study allows us to comment on the process of policy change. Many people routinely liken the introduction in resource management of the ecosystemic point of view to a paradigm shift. As we saw, this is too simplistic a conclusion since the ecosystemic perspective may be so operationalized as to leave in place the basic premise(s) of what Grumbine (1993) called a pre-ecological attitude. The outcome of a new mode of thinking, despite its potential, is not invariably subversive. Porter (1965), Hall (1990) and Howlett (various) have all pointed to the ability of elites to assimilate new and threatening information, without overturning the privileged position. The National Forest Strategy and the Model Forest Program give the impression that we have met the conditions for

paradigm shift because the process of change that culminated in these programs has apparently traversed Hall's (1990) six stages of policy paradigm replacement - paradigm stability, accumulation of anomalies, experimentation, fragmentation of authority, contestation and institutionalization of the new paradigm. It should be remembered of course that the Model Forest Program is an experiment and that the National Forest Strategy is not binding, yet in developing them the Canadian Forest Service gave evidence of being able to make new administrative procedures such as stakeholder consultation work; moreover, the new way of thinking has certainly taken hold of this organization and of foresters across the country. But in the end, as we run up against the fact that the new attitude perpetuates the traditional theme of exploitation, the conclusion must be that no paradigm shift has taken place. In the language of policy change, the learning that took place was lesson-drawing. Thus we must augment Hall's scale of change with an analysis of the impact and the quality (or content) of the change in thinking. Had the programs paved the way for a geocentric or cosmocentric overhaul of our world view, had they prepared and supported Canadians to change their relationship to the forest from one that exploits to one that seeks to work within the evolutionary context, then indeed we could speak of a paradigm shift. The programs made overtures in this direction, but my assessment is that the overall approach in fact will work against this possibility. The historical continuity between it (postmodernist or sustainable development model) and the Enlightenment and Conservation models is too strong. This fact of historical continuity (ideological but also politico-economic) supports the theoretical position of the policy

community approach to policy analysis, which holds that institutions through their cultural and ideological biases help shape the outcomes of the public policy process.

Historical continuity in the Canadian case also means the facts of federalism and the closeness of government to resource industries, a consequence of Crown ownership of the public forest lands, as Nelles (1974) argued. The two case studies, the Fundy Model Forest and the Prince Albert Model Forest, demonstrate the effects of these two constraints. For example, the strength of the provinces' jurisdictional position is evident from their reluctance to come on board both federal initiatives, from the vagueness of the National Forest Strategy content and the voluntary nature of the Model Forest Program. Both initiatives also show that the federal presence remains, for the moment, most marked in the fields of research and international trade, its traditional ways of supporting the Canadian forest industry. Generalizing to the forest policy community at large, its configuration appears to be the outcome of the four constraining factors (staple economy, federalism, close government-industry relations, and role of experts) this study has isolated.

On the question of whether the Model Forest Program achieved its goals, the answer is 'partially, but not in substance.' As Gardner Pinfold (1996) concluded, the most important gain is that parties who had never before come to the table on a (quasi) equal basis, did so as *partners* to work out solutions to regional forestry issues and, as partners, they had obligations towards each other. But we saw that, in spite of the widening of the traditional network to include those previously belonging only to the attentive public,

those who were in and those who were out still depended on whether there was material interest, and that the ghost of the old closed network showed through because in the end the process could not alter the legal reality. This is very much a reflection of the traditionally privileged position of industry, but also of the curbed role of the federal government and the protectiveness of the provinces.

The intention of the Model Forest Program was to lift industry out of its sustained yield straightjacket into sustainability mode. This goal was sabotaged from the outset, first, by the widespread interpretation of sustainable development as an extension of sustained yield and, second, by the related (but perhaps unavoidable) decision to require a timber-oriented attitude on the part of applicants. As a result, while there can be no doubt that the program has encouraged greater responsibility in forestry, its potential to experiment with a non-sustained-yield approach was left largely fallow. As for the objective to mitigate Canada's poor environmental reputation overseas, here too the results seem equivocal: on the one hand, several model forests have received visits from foresters around the world and the Canadian example has been exported under Ottawa's auspices to various countries; on the other hand, in recent months the newspapers have again reported that new international boycotts of Canadian timber have begun. Undoubtedly, regardless of what the merits of the Model Forest Program (and the National Forest Strategy) may be, here is another sign of the low potential of a federal program to penetrate into and change provincial policies.

In closing, I would like to take up some points of policy analysis with which this

work began. For instance, the kind of behaviour public choice theorists point to in support of the rational egoist model of policy making held true. The Southern New Brunswick Woodlot Owner Co-operative, for example, quite successfully laid its hands on nearly half of the funds earmarked for timber operations at the Fundy Model Forest. Researchers (in government departments, at universities and independents) were another group to benefit from the availability of funds. This aspect was much better handled at Prince Albert than at Fundy, where projects frequently were not tailored to the research needs of the model forest. Likewise, the Montreal Lake Cree Nation saw the advantage in joining the Prince Albert group in terms of an expected improvement in relations with its neighbours and material benefits for its members. Just so too did the forestry companies hope to benefit from their association, even losing interest when objectives had been substantially reached, as was the case at Weyerhaeuser. Personnel of the two national parks hoped that sharing a forum with industry where each was involved as a landowner would ameliorate the impacts of development on the parks. Of the institutional partners, only the provincial governments, at the upper levels, remained distant in their involvement, seeing in the program a threat to their jurisdiction. On the other hand, the advantage for the federal government was twofold: the Model Forest Program (and the National Forest Strategy to a lesser degree) gave Ottawa a soft means of influence over the provinces; and internally, the Canadian Forest Service found a way amidst budget cuts to defend an existence always shaky because of the historical uncertainty around its role in a field of undisputed provincial jurisdiction. This point, however, once more shows that policy

community theory, by assigning to institutions a broader and historically informed role, is better able than public choice to account for the fact that the program was designed with the Service's jurisdictional handicaps very much in mind. That the whole exercise was meant to counter environmentalist threats to the security of Canada's international lumber markets (an interest-based response), underscores rather the importance of linking sectoral studies to the macro or system level of analysis.

These last remarks touch on some of the criticisms to the policy community method of analysis raised in Chapter 2 and we may now treat these criticisms *in toto*. Following up on the last point, with respect to the dearth of policy community work on international influences on domestic policies, this study has not helped beyond its finding that international environmental pressures did galvanize the federal government to counter them by means of, among other things, the Model Forest Program. Several participants in that program regarded it as the manufacture of a green stamp for the Canadian lumber export industry. Next, the method's powers to explain policy change or its lack have been demonstrated through this study, but their vigour was seen to be directly related to the extent to which one takes into account the institutional containers within which policy is made. The programs under discussion moved the discourse of forest management from modernist to postmodernist mode, but the constraints imposed by Canada's historical, cultural, socio-economic and political reality limited the amount of what could be achieved and indeed the direction of change. The result of these constraints was, I argued, the adoption of a self-contradictory interpretation of sustainability as a permissive ecology for

sustainable development. Lastly, and I combine the two final objections here (Chapter 2), the content of the relationships among the various parties must be assessed for the location of the power nexus if we are to gain a meaningful idea about them. The fact that, even in an experimental situation, policy change in the real world still depends on the one legally valid relationship between industry and government, and that the camps of influence divide the policy community grossly among those with material interest and those without (this is true also at Fundy Model Forest where participation nevertheless includes everyone), amplifies the need for a clear association in the policy community literature of the policy network with what I have here called the power nexus.

The Canadian forestry situation, observed through the magnifier of the National Forest Strategy and the Model Forest Program, is the outcome of a complex interplay between several factors. They derive ultimately from the country's colonial past and, as resource management is an applied science, also from the culture of that science. They are powerful constraints, as the two policy initiatives have demonstrated, and should be considered together in resource policy analysis because they are the container policy makers must work with. Given that forestry science was from its origin a marriage of economics and the search for control over nature through the application of science, the dominant modernist policy paradigm that evolved quite naturally developed along the same lines. For several decades now, beginning in the 1950s and stepping up with the environmental movement in the 1970s, opposition to it has been frequent, articulate and, recently, activist, with challenges coming from First Nations, from ecologists and

foresters, from environmentalists and recreationists (Hirt, 1994). These challenges have pushed aside the staid boundaries of the forestry debate and exerted pressures that governments and industry have had to respond to. The National Forest Strategy and the Model Forest Program, though far from satisfying the expectations of many in the opposition, have yet legitimated and thereby strengthened their critique and advanced the cause for a diversified policy community.

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APPENDIX A

The 50 proposals by province & identification number

* selected Model Forest. Source: Forestry Canada 1992b.

BC 1	Western Strathcona MF
PQ 2*	Une Forêt Habitée, Modèle de Développement Durable
ON 3	The Carolinian MF
PQ 4	Forêt Modèle Kamamukan Mamicouagan
ON 5	API MF
ON 6	6/70 Communities Area MF
ON 7*	Eastern Ontario MF
NS 8	St. Mary's-Liscomb MF
BC 9*	McGregor MF
BC 10	Herrick Valley MF
MA 11*	Manitoba (Manitou Abi) MF
PQ 12	James Bay Cree MF
BC 13	Kyuquot MF
AB 14	Resource Management through Community "I's"
AB 15	Lac La Biche MF
BC 16	Boundary MF
ON 17*	Lake Abitibi MF
NB 18	Saint John Regional MF
BC 19	The Upper Adams MF
ON 20	n'Daki Menan MF
ON 21	Algonquin Provincial Park MF

BC 22*	Long Beach (Area "C") MF
BC 23	Murray River MF
BC 24	Kitamaat MF
PQ 25	Forêt Modèle de la Mastigouche
BC 26	Oweetna-Kula MF
PQ 27	L'Estrie-Une Forêt Durable Habitée
PQ 28	Seigneurie de Beaupré
NT 29	Lower Liard Community Forest
BC 30	Cariboo-Lower Peace MF
NS 31	Cape Breton MF
ON 32	Elk Lake MF
BC 33	Nechako MF
ON 34	Nakina MF
PQ 35	Gaspé MF
PQ 36	Gaspé MF
NF 37*	Western Newfoundland MF
ON 38	Haliburton's MF
ON 39	Armstrong MF
BC 40	Nicola MF
SK 41*	Prince Albert MF
NB 42*	Fundy MF

ON 43	Seine River MF
ON 44	Kirkwood MF
ON 45	Wikwemikong MF
BC 46	Kootenay Lake MF
BC 47	Shuswap-Okanagan MF
PQ 48	Forêt Modèle de la Mauricie
AB 49*	Foothills MF (Foothills Forest Proposal)
ON 50	Regional Community MF

APPENDIX B

Abbreviations used in descriptive tables & descriptive criteria

Abbreviations

general

CAAF contrat d'approvisionnements et d'aménagement forestier

CIF Canadian Institute of Forestry

cl soil capability class, according to the *Canadian Land Inventory* (Environment Canada, 1970)

DCL District Cutting Licence

FMA Forest Management Agreement

FML Forest Management Licence

FMU Forest Management Unit

FN First Nation(s)

MF Model Forest

MU Management Unit

mxwd mixedwood or mixed forest

N.S. not specified

OIC Order In Council Licence

OMNR Ontario Ministry of Natural Resources

Pre€ Precambrian (Canadian Shield)

TFL Tree Farm Licence

TL Timber Licence

TSA Timber Supply Area

tree species and associations

AT alpine tundra

bl black

BS black spruce

BWBS boreal white and black spruce

CWH coastal western hemlock

ESSF Engelmann spruce subalpine fir

ICH Interior cedar-hemlock

IDH Interior Douglas fir

JP jack pine

LP lodgepole pine

MH mountain hemlock

P pine

PP ponderosa pine

S spruce

SBS sub-boreal spruce

wh white

WH western hemlock

Descriptive criteria

CRITERION	1	2*	3	4
SIZE (ha)	451 113	112 634	2 500 000	300 488†
ECOREGION	Coast (WH)	Great Lakes (L6, mxwd)	Carolinian	Boreal
PHYSIOGR	rugged	hilly to rugged	low to rugged, glacial	low to hilly, rocky
PRODUCTIV	high; 1° hemlock	good (cl 3,4)	v high; 1° deciduous	varies; 1° coniferous
ACCESS	good	good	good	good
TENURE-major	Crown (TFL + TSA)	private (large & small)	private	Crown (CAAF)
SPONSORS	Intl Forest Products	Ab-Pr, Groupem forestier de l'Est du Lac Tém, Syndicat Product.s de bois Bas-St Laur & U Laval	Ontario Forestry Association	Cégep de Baie-Comeau
PROV REP	invited	yes	yes	invited
NATIVE PAR	yes (w clause of no prejudice to land claims)	no	yes	yes

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	5	6	7*	8
SIZE (ha)	146 900	299 000	1 534 115	198 500
ECOREGION	Boreal (mxwd)	Boreal (N Clay)	Great Lakes (mixedwood)	Acadian
PHYSIOGR	low, glacial	flat w uplands	lowlands; rough on Shield	lowlands & rugged uplands
PRODUCTIV	above average; 1° bl spruce	varies; 1° spruce	varies; 1° hardwood	varies (av 4.14 m^3/ha/yr); 1° softwood
ACCESS	good	good	good	good
TENURE-major	Crown (CAAF)	Crown (OIC, DCL)	private (small)	freehold (small + large), Crown
SPONSORS	Cégep de Baie-Comeau	6/70 Area Econ Diversifcn Cmtt	Eastern Ontario MF Proposal Committee	CIF, NSDepNR, Scott Worldwide & Stora For Ind
PROV REP	invited	yes	yes	yes
NATIVE PAR	yes	no	yes	no

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	9*	10	11*	12
SIZE (ha)	180 867	200 000	1 047 069	200 000
ECOREGION	Montane (SBS, ESSF)	Subalpine	Boreal	Boreal
PHYSIOGR	low, glacial	mountainous	riperian, low ridges, swamps, PreC uplands	Shield (hills & plateau)
PRODUCTIV	coniferous	limited; spruce & balsam ?fir	varies; 1° softwood	varies; 1° bl spruce
ACCESS	good	good	"exceptional"	limited & isolated
TENURE-major	Crown (TFL)	Crown (TFL to Northwood P&T)	Crown (FML)	James Bay & N Québec Agreement Lands
SPONSORS	Northwood Pulp & Timber	Lheit-Lit'en FN, Nechako Env'l Coalition	Abitibi-Price	Cree Regl Auth, Mistissini & Waswanipi FN
PROV REP	yes	yes	yes	no
NATIVE PAR	yes (not originally)	yes	yes	yes

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	13	14	15	16
SIZE (ha)	145 495	655 484†	779 351†	281 000
ECOREGION	Coast (temperate rain: CWH)	Boreal (mxwd)	Boreal (mxwd)	Columbian (ICH, ESSF, IDF, PP)
PHYSIOGR	mountainous & steep	flatlands; plateaus; rolling lands	diverse	diverse, semi-arid to alpine
PRODUCTIV	v high; conif (1° hemlock)	high (varies); 1° softwood	high; 1° deciduous	1° lodgepole
ACCESS	good	good	good	good
TENURE-major	Crown (varies)	Crown (FMA)	Crown (FMA)	Crown (TSA)
SPONSORS	Kyuquot Native Tribe	Canadian Forest Products	Alberta-Pacific Forest Ind	Boundary Woodlot Assoc, Christina Lk Watershed All, Pope & Talbot
PROV REP	no	yes	yes	yes
NATIVE PAR	yes	yes	no	no

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	17*	18	19	20
SIZE (ha)	1 094 690	95 200	138 171	150 000
ECOREGION	Boreal (Central Transition, N Clay, mxwd)	Acadian	Columbian (ICH)	Great Lakes (& S Boreal†)
PHYSIOGR	"level, rolling to broken" or steep	rolling to rugged	mountainous	"undulating & rocky"
PRODUCTIV	1° spruce	low-moderate; 1° coniferous	1° spruce	varies; mixed, 1° wh birch & jack pine
ACCESS	good	"excellent"	good	good
TENURE-major	Crown (FMA)	Crown (TL)	Crown (TSA)	Crown (FMU)
SPONSORS	Abitibi-Price	City of St John	Shuswap Nation Tribal Council/ Oregon State U	Teme-Augama Anishnabai
PROV REP	yes	yes	yes	no
NATIVE PAR	yes	no	yes (w clause of no prejudice to land claims)	yes (w/out prejudice to treaty negotiations)

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	21	22*	23	24
SIZE (ha)	768 451	400 000†	253 000	1 200 000†
ECOREGION	Great Lakes (mxwd)	Coast (temperate rain: CWH), also MH & AT	Boreal & Subalpine (AT, SBS, BWBS, ES-SF)	Coast (temperate) & Subalpine (CWH, MH & AT)
PHYSIOGR	PreЄ uplands & Ottawa lowlands	marine - alpine	low to alpine	alpine tundra to deep fjords
PRODUCTIV	1° hardwd + red & wh pine in lowlands	very high; coniferous	1° coniferous	coniferous, 1° Western Hemlock
ACCESS	good	good; some restricted	N.S.	good, some areas difficult
TENURE-major	Crown	Crown (TFL)	Crown (TSA)	Crown (TFL)
SPONSORS	Algonquin For Auth, OMNR	Reg District of Alberni-Clayoqu & Clayoquot Snd Sust Dev Commtt	District of Tumbler Ridge	Eurocan Pulp & Paper
PROV REP	yes	yes	invited	yes
NATIVE PAR	no	yes	consulted	yes (in principle)

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	25	26	27	28
SIZE (ha)	273 000	981 250†	127 000	158 500
ECOREGION	GrLk St-Lawr Lowlands	Coast (CWH)	GrLk St-Lawr Lowlands	Great Lakes
PHYSIOGR	Laurentian plateau	rugged	plain to plateau	hilly
PRODUCTIV	1° mxwd (yellow birch, fir & red spruce)	poor to medium; 1° coniferous	high but varies; 1° hardwd (maple)	varies; 1° balsam fir, BS & wh birch
ACCESS	good	good	good	good
TENURE-major	Crown (CAAF)	Crown (TSA & TFL)	private (mostly small)	private (large)
SPONSORS	Kruger	Musqamagw-Tsaw-ataineuk Tribal Council	Soc d'Aménagement de l'Estrie	Séminaire de Québec
PROV REP	no	no	no	no
NATIVE PAR	no	yes	no	no

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	29	30	31	32
SIZE (ha)	380 000	330 000†	1 072 352	470 044
ECOREGION	Boreal	Boreal (mxwd, Northlands & Subarctic)	Acadian	Boreal (Missinaibi-Cabonga)
PHYSIOGR	valley bottom & rugged uplands	level to gently undulating	hilly dissected	N.S.
PRODUCTIV	varies; 1° wh S & poplar	varies; 1° aspen-spruce	provincial avg; deciduous low-lands, whS & fir in highlands	1° softwood
ACCESS	good	good	good	good
TENURE-major	Crown	Crown	private (small), Crown	Crown (MU, OIC)
SPONSORS	Gov Northwest Territories (Renewable Res)	Little Red River Cree FN	University College of Cape Breton	Township of James
PROV REP	yes (NWT)	yes (conditionally)	no (support confirmed)	yes
NATIVE PAR	yes	yes	yes	no (invited)

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	33	34	35	36
SIZE (ha)	315 000	24 800†	7 000	59 369
ECOREGION	Montane (SBS, ESSF)	Boreal (mxwd)	GrLks St-Lawr/ Boreal†	Boreal (B2)
PHYSIOGR	N.S.	low; hummocky, kettled, ridged	rough	plateau w valleys
PRODUCTIV	medium; 1° lodgepole pine	poor (cl 4) to high (cl x)	1° fir and WS	mod to v severe (cl 3-6); 1° balsam fir
ACCESS	good	good	good	"excellent"
TENURE-major	Crown (FL)	Crown + private	Crown (CAAF)	freehold (large)
SPONSORS	Fraser Lk & Vanderhoof	Township of Nakina	Restigouche Band Council	Cdn Pacific Forest Products (Avenor)
PROV REP	no (support indicated)	partners N.S.	no	yes
NATIVE PAR	yes (w clause of no prejudice to land claims)	partners N.S.	yes	no

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	37*	38	39	40
SIZE (ha)	707 060†	20 000	250 000	775 000
ECOREGION	Boreal (B28b)	GrLks St-Lawr Lowlands	Boreal	Montane
PHYSIOGR	steep w bogs & barrens	low, glacial	N.S.	rolling inter.r plateau, deep valleys, glacial
PRODUCTIV	varies; 1° balsam fir	high; 1° hdwd (maple)	moderate-high; 1° JP & BS	varies; 1° LP
ACCESS	good	good	good but limited	good
TENURE-major	Crown & freehold (large)	freehold	Crown (MU)	varied Crown, private (ranches, FN reserves)
SPONSORS	Corner Brook Pulp & Paper	Haliburton Forest & Wild Life Reserve	Armstrong Resources Dev Corporation, Whitesand FN	Nicola Valley Tribal Council, Westwood Fibre
PROV REP	yes	yes	yes	yes
NATIVE PAR	no	no	yes (unconfirmed; w clause of no prejudice to land claims)	yes

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	41*	42*	43	44
SIZE (ha)	367 000	419 266†	280 493	147 123†
ECOREGION	S Boreal (mxwd)	Acadian	Great Lakes (Quetico)	Great Lakes
PHYSIOGR	glacial; gently-steeply rolling	cliffs, hills, undulating	rolling	flat, rolling-steep on Shield
PRODUCTIV	1° luvisols; brunisols & chernozems; 1° softwood & mxwd	varies; conif, decid & mixed	cl x to 4; 1° jack pine	high; 1° hardwood
ACCESS	good	good	good	good; limited in N
TENURE-major	Crown (FMA & parks)	freehold (small woodlots)	Crown (FMA)	Crown (DCL, OIC)
SPONSORS	Weyerhaeuser Canada Ltd.	J.D. Irving	Boise Cascade (Stone-Consol.)	OMNR, Blind River Area
PROV REP	yes	yes	yes	yes
NATIVE PAR	yes	no	yes	yes

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	45	46	47	48
SIZE (ha)	47 000	220 000	1 750 227 + 456 665	238 949
ECOREGION	Great Lakes	Columbian Subalpine (ICH, ESSF)	Columbian Subalpine	GrLk St-Lawr Lowlands (mxwd)
PHYSIOGR	glacial; high plateau w steep cliffs	hilly to rugged & mountainous	hills, plateaus & mountains	plains & plateau
PRODUCTIV	shallow-fertile soils; 1° maple, birch, poplar, S & P	high	varies, good to poor; 1° Douglas fir	moderate (4.2-5.6 m^3/ha/yr); 1° deciduous
ACCESS	poor, esp. in S section	good	good	good
TENURE-major	Unceded Indian Reserve	Crown	Crown (TSA, TFL)	freehold (small woodlots)
SPONSORS	Wikwemikong Devel. Commiss.	Kootenay Lk MF Steering Cmtt	Shuswap-Okanagan Forestry Assoc	Syndicat des Producteurs de Bois/Mauricie
PROV REP	no	no (support indicated)	no (support indicated)	yes
NATIVE PAR	yes	no	yes	no

* selected Model Forest

† altered from Forestry Canada (1992b) on basis of proposal text

CRITERION	49*	50		
SIZE (ha)	1 218 014	N.S.		
ECOREGION	Boreal, Subalp & Montane (B19, SA, M5)	Boreal		
PHYSIOGR	Cordillera & Interior Plains	N.S.		
PRODUCTIV	1° coniferous (LP)	N.S.		
ACCESS	good	N.S. for MF		
TENURE-major	Crown (FMA)	Crown (FMA)		
SPONSORS	Weldwood, AB Forest Techn School & AB Dept For, Lands & Wildl	Townships of Ear Falls, Red Lake & Golden		
PROV REP	yes	no partnerships		
NATIVE PAR	yes	no partnerships		

* selected Model Forest
† altered from Forestry Canada (1992b) on basis of proposal text

APPENDIX C

Abbreviations used in evaluative tables & evaluative criteria

Abbreviations

general

AFMP advanced/best forest management practices

AM adaptive management

BS black spruce

CC carrying capacity

cwd coarse woody debris

DCL District Cutting Licence

DR dispute resolution

DSS Decision Support System

ec economy, economics

ES ecosystem(s)

est established

FN First Nation(s)

f for

for forest/ry

GIS Geographic Information System (may include Forest Ecosystem Classification mapping)

GPS Global Positioning System

hdwd hardwood or hardwood forest

IA impact studies, assessment

irm integrated resource management

MAT most advanced technologies

MoE Ministry of Environment

MoF Ministry of Forests

mxwd mixedwood or mixed forest

OIC Order in Council Licence

OMNR Ontario Ministry of Natural Resources

PP ponderosa pine

res resource(s)

RS remote sensing

SBW spruce budworm

sd sustainable development

SF sustainable forests or forestry

SRD sustainable resource development

SRM sustainable resource management

SV silviculture (may include biological/structural legacies, coarse woody debris, regeneration, old growth)

TMP Timber Management Plan

nature/forest profiles

M modernist

PM postmodernist

ECOC ecocentric

C cosmocentric/'native'

GEOC geocentric

non-timber values

a air quality

b biodiversity (may include habitat diversity)

c carbon pool

co wilderness, conservation, protected areas (may include spiritual values)

cu heritage (usually FN; may include spiritual values)

fi fish

m medicinal plants

p products (berries, maple syrup, mushrooms, wild rice)

r/t recreation, tourism (may include aesthetics)

tr trapping

so soils

w water, watersheds

wl wildlife (animals)

o grazing or range, oil, coal, gas, agriculture

score card

i	incomplete
++	very good
+	good
+(+)	good-very good
(+)	good, grudging
-	poor
--	very poor

Evaluative criteria

CRITERION	1	2*	3
MANAGEMENT FOCUS	workable irm thr balance of env.l & comm.y needs at optimum sust level; ↑ timber prod w ES mgmt	socio-ec; irm; ↑ use & prod.y of for; diversification	SF to balance for values using demonstration projects; irm
NON-TIMBER VALUES	wl,r/t,fi,co,b,cu,w,o	p,wl,fi,r/t,cu,w	co,cu,b,c,tr,r/t,w,p,wl,fi,so
TECHNOLOGY & SC FOCUS	GIS, DSS; for mgmt, SV, cutting styles & activities, fisheries	"cutting edge" of S&T, IPM, AM, GIS, DSS; private for.s data mgmt, fire & disease protect.n, env.l stress	GIS, GPS, DSS, RS, IPM; for mgmt, ES dev & protection
LANDHOLDER INCLUSIVITY	no	yes	no
BROAD PARTNERSHIP	yes	yes	yes (see comments)
TIMBER INDUSTRY	IntlForProd, Canfor, MacMillBloedel, CanPac-ForProd, Hecate Logging [Fletcher Challenge, DomanInd, small operators]	Abitibi-Price, woodlot owners, small operators	Townsend Lumber, woodlot owners
NOTEWORTHY	partn.p w fisheries workers; fish/forestry interaction; FN concerns; museum preservation	collective approach to woodlot mgmt; "forest farmers" lease from A-P	organized around land use nodes w associated activities; focus on protect.n & rehab Carolinian spp
COMMENTS		will reallocate land to increase woodlot sizes	partn.p excludes Parks Cda; env.l & recr.n gps; wood prod.n minor in regional ec; for remnants basis of non-timber ec; sci programme tentative
PHILOSOPHY	PM	PM	ECOC
PRESENTATION	++	+(+)	++

CRITERION	4	5	6
MANAGEMENT FOCUS	irm to solve regener.n; cutting for windfall & pests; ↑ for prod.y	"free-market driven" res dev w pl.g/auditing for env.l prot.n; integr div interests & needs; sustn for integrity; ↑ vol & value of wood prod.n	SF mgmt & res dev thr coop.e effort; irm; apply existing knowl & techniques; ES mgmt
NON-TIMBER VALUES	fi,cu,w,wl,r/t,tr,so	b,wl,fi,w,p,cu,tr,r/t,co	r/t,wl,tr,fi,b
TECHNOLOGY & SC FOCUS	GIS, DSS, RM; SV, post-fire for evol.n, fert.n & protect.n, cutting styles	AM, GIS, DSS, GPS, RS, IPM; for mgmt IA on boreal ecos, operation.n	MAT, GIS, DSS, RS; hdwd ID, fast-growing aspen, clonal for.y, cutting styles
LANDHOLDER INCLUSIVITY	no (see comments)	yes	no (see comments)
BROAD PARTNERSHIP	no	yes	yes
TIMBER INDUSTRY	Québec & Ontario Paper [small operators]	Abitibi-Price	[small operators]
NOTEWORTHY	alternatives to permanent road system	reduce res pressure on remote locations; diversify for ec; env.l audit team; zoning/ "featured use"; user pay=mgmt tool	socio-ec; diversific.n
COMMENTS	prov gov to join when site selected; fed landowner missing	MF means of ↑ A-P revenues to cover land costs; A-P to appoint MF coordinator	tenure structure unclear
PHILOSOPHY	PM	PM	PM
PRESENTATION	+(+)	+	+

CRITERION	7*	8	9*
MANAGEMENT FOCUS	sd thr community partn.p; irm	prototype of sust landscape-based irm f multiple benefits; foster public supp; ↑ timber prod.n	for dynamics thr DSS f socio-econ; ecol sust.y
NON-TIMBER VALUES	fi,wl,p,cu,o	fi,cu,co,wl,r/t,w	b,r/t
TECHNOLOGY & SC FOCUS	MAT, AFMP, GIS, DSS, IPM; implement ES mgmt, SV, for mgmt	GIS, DSS, MAT, AM, cutting styles, pest mgmt, wl & habitat, hydrol.y, for mgmt IA	AM, DSS, GIS; DSS, SV/biod integr.n, ecolog. processes, for practices
LANDHOLDER INCLUSIVITY	yes (majors)	yes	yes
BROAD PARTNERSHIP	yes	yes	yes
TIMBER INDUSTRY	Domtar [small operators]	Scott Worldwide, Stora Forest Ind.s, woodlot owners	Northwood P&T (Noranda)
NOTEWORTHY	Mohawk Heritage Food Forest; p&p sludge to be used as fertilizer	focus on landscape plg; attention to road construction	labour is partner; DSS focus directs scientific effort tow quantif.n of narrow range of variab.s
COMMENTS	strong on prop activit.s but weak on vision dev; weighted voting; MF=string of projects	MF wld build on existing coop.e project; not dominated by industry	MF area coincides w TFL; MF office in Northwood building
PHILOSOPHY	PM	PM	PM
PRESENTATION	++	++	origl prop not available

CRITERION	10	11*	12
MANAGEMENT FOCUS	optim fibre yld; enhance other values w mgmt f long-term benefits; irm; stewardship; sust selection & patch cuts; Plenter for system	operat.l viabil.y; env.l protect.n; balance of values; irm; soc-ec dev	irm w trad.l Cree values & land use patterns; ES mgmt; integr.n of cutting & SV
NON-TIMBER VALUES	fi,wl,co,r/t,w,b,cu,p,m,tr,so	co,fi,p,cu,r/t,tr,wl,m,o	co,tr,r/t,fi,wl,cu,p
TECHNOLOGY & SC FOCUS	MAT, GIS, state-of-art SV w IPM; select.n cuts & alternative equipm IA, contaminants surveys	GIS, DSS, AFMP; irm, for /wl interface, for ES, cutting styles, for protection	GIS, RS, DSS; fire, succession, for ES, archaeolg.l mgmt methodology
LANDHOLDER INCLUSIVITY	no	yes	no (see comments)
BROAD PARTNERSHIP	yes	yes	no
TIMBER INDUSTRY	small operators [Northwood P&T]	Abitibi-Price, smaller operators	Mishtuk, Apit-See-Win, Eenatuk Forestry
NOTEWORTHY	focus on ec diversif.n; self-determ.n; community stability; horse & heli-logging; process-based critique of ind.l for	integr.n of policy w irm; 2dy wood process.g	traplines basis of mgmt units; integrate native land knowl; focus on conflict resol.n & socio-economics
COMMENTS	this FN became part of #9	alternative fibres emphasized but as means of increasing wood supply; sci & activities sections not developed	lands are Category 1 f exclusive use & benefit of James Bay FN but still under fed jurisd.n yet fed gov not a partner; tentative mgmt & sci sections
PHILOSOPHY	C-GEOC	PM	C
PRESENTATION	+	++	++

CRITERION	13	14	15
MANAGEMENT FOCUS	SF thr partnership & irm prot.g all values; env.l & ec sust of communities	SRD thr Innovation, Involvement, Industry, Integration & Interaction; site-specific irm	optimum ec dev w prot.n of soil, wl & plant div, social values; maintain mxwd structure; irm
NON-TIMBER VALUES	w,co,cu,wl,fi,r/t,p,b	co,w,wl,r/t,fi,so,tr,o	wl,tr,r/t,fi,so,b
TECHNOLOGY & SC FOCUS	GIS, GPS, MAT; timber yld analysis, cutting styles (Plenter, Femel), SV, for mgmt IA, fisheries, altern.ve pest mgmt	AFMP, GIS, DSS; cutting styles	GIS, DSS; SV of mxwd & BS, wl habitat use & road plg, cutting styles, regen.n, succession, fragmen-t.n, disease, insects, soil hydrology
LANDHOLDER INCLUSIVITY	no (see comments)	yes	no (see comments)
BROAD PARTNERSHIP	yes	yes	no
TIMBER INDUSTRY	Doman Ind.s, IntForProd, [CanFor, Fletcher Challenge, CanPacForProd, MacMBloedel, Hecate Logging, small operators]	CanFor, small operators	AlPac, Weyerhaeuser Cda, small operators [4 tenure holders]
NOTEWORTHY	focus on socio-ec; timber/fish interface; good control areas; sheep as herbicide alternative; 2dy process.g; comm.y tenures	workers are partners; employment focus; site-specific mgmt integr.d w socio-ec	study cutting regime effects on plant competition; fine filter
COMMENTS	no info on tenure holdings	total FMA in FM area; MF secretariat by CanFor; Sturgeon Lake FN did not sign, Metis Nation did	tenures unclear; attention to woodlot owners who may not even be w/in MF area; also to native knowl but FN not partners; weak mgmt structure
PHILOSOPHY	C-ECOC	PM	PM
PRESENTATION	(+)	++	+(+)

CRITERION	16	17*	18
MANAGEMENT FOCUS	sd thr land & water use strategy & amicable DR; irm w ecol stewardship; ec fairn.s & soc equity	irm; timber use w constr; sd thr communic.n, database, res, partner.s & plg; balance values	irm f multiple use; ↑ fibre prod; AFMP f ecol & econ benef.l for mgmt
NON-TIMBER VALUES	w,r/t,wl,co,fi,cu,tr,o	fi,cu,wl,r/t,p,b,c,co,o	co,w,r/t,wl,fi,a
TECHNOLOGY & SC FOCUS	AFMP, GIS, DSS, RS; cutting styles, land & water use mapping	MAT, AFMP, GPS, DSS, GIS, for mgmt audit; for mgmt, cutting styles, SV, mxwd mgmt, fire, sheep, peatland drainage	GIS, DSS, AM, radio collars; air & H2O qual, SV & cutting IA, riparian mgmt
LANDHOLDER INCLUSIVITY	yes	yes	no
BROAD PARTNERSHIP	yes	yes	yes
TIMBER INDUSTRY	Boundary Woodlot Assoc.n, Pope & Talbot, small operators	Abitibi-Price	Southern NB Wood Co-op [JD Irving]
NOTEWORTHY	liaison w Am gps & gov.s; feedback loop to legisl.n; inherent value of non-timber; plg res basis f zoning; focus on process	includes worker gp; for mgmt audit procedure dev	focus on experiment.n, fire prot.n, road building, herbicides; investigate pollut.n-proof spp
COMMENTS	difficult project mgmt procedure; science section not developed	MF coord.r=A-P employee; in orig.l prop, mgmt team to have only A-P staff	implementation not possible due to absence of JD Irving; animals = "specimens"
PHILOSOPHY	ECOC	PM	M-PM
PRESENTATION	+ (no budget details)	++	+(+)

CRITERION	19	20	21
MANAGEMENT FOCUS	holistic res mgmt to permit res extract.n & maintain ecol integrity; natural wealth thr partn.p, irm, landsc mgmt, soft systems methodology	holistic sust-life mgmt f all users; for steward.p f max long-term benefits; enhance res; irm	irm; prot.n of park features, enhance its regional benefits
NON-TIMBER VALUES	fi,wl,co,r/t,cu,w,a,m,p,b,o	wl,r/t,fi,tr,co,w,cu,m,p,b,o	w,r/t,b,wl,fi,co,cu,so
TECHNOLOGY & SC FOCUS	GIS, RS, DSS, GPS, AM; ES processes, SV, cutting styles, insects & disease, ethnobotany, carbon flux, fisheries	GIS, RS, DSS, AM; ecol for mgmt, SV, cutting styles, ecol proc.s, env.l qual	RS, GIS, DSS; mgmt techn, SV, fire mgmt & ecol, for/recreation interface, for health, acid rain, fisheries
LANDHOLDER INCLUSIVITY	no	no	yes
BROAD PARTNERSHIP	yes	yes	yes
TIMBER INDUSTRY	Weyerhaeuser, Interfor, SlocanForProd & Gilbert-SmithForProd (invited) [small operators, Bell Pole, Tolko]	Goulard Lumber, Fryer ForProd, small operators	Algonquin Forest Authority, Forest Industry Survival Association
NOTEWORTHY	focus on structural legacies, riparian & zone-based, even & mx-aged mgmt; for prod res, 2ndy mfg	wetlands strategy; cultural heritage prot.n; 7-gener.n plg; coarse filter; land use maps; partic.y action res; integrate FN knowledge; focus on ec diversif.n & commun stability	extensive use of zoning; polarized approach to insects; valuation of non-timber res
COMMENTS	admin staff thr SNTC; project staff-heavy; partnership very big	no info on tenure holdings	park's master plan fulfils MF objectives already
PHILOSOPHY	ECOC	C-ECOC	ECOC
PRESENTATION	++	-	++

CRITERION	22*	23	24
MANAGEMENT FOCUS	irm; timber & human use planning	irm thr partn.p f present & future benefits	irm thr issue resolut.n & DSS; enhance benefits & maintain employment, FN culture, ecos & wl
NON-TIMBER VALUES	co,fi,r/t,w,cu,wl,b	wl,r/t,fi,tr,b,cu,so,o	wl,fi,b,w,tr,r/t,p,cu, co
TECHNOLOGY & SC FOCUS	MAT, AFMP; for ES, cutting styles, biodiv, SV, hydrology	GIS, IPM, DSS, GPS, RS; SV, mgmt IA, cutting & road constr.n & reclam.n trials, sheep browsing, ES proc.s & health, wl & habitat, grazing/for interface	IPM, AM, MAT, GIS, DSS, RS; for ES, SV, biodiv, riparian zones, cutting styles, pests & disease, transport.n, hydrol.y, geomorphol.y
LANDHOLDER INCLUSIVITY	no	no (see comments)	yes
BROAD PARTNERSHIP	yes	yes	yes
TIMBER INDUSTRY	MacMBloedel, Interfor, Ahousaht FN, small operators [CdnPacFor Prod, CoulsonForProd]	woodlot owners, CanFor, Louisiana Pacific [small operators, West Fraser Mills]	Eurocan P&P [small operators]
NOTEWORTHY	ES (natural-built)integr.d into plg thr use of scale is foundation for zonation; univ students incl.d; 2dy wood process.g; focus on landscape aesthetics	horse & other alternative logging methods	partn.p w workers & Cdn Women in Timber; DR plg; current logging uses cable systems; fine filter; cwd tracking study
COMMENTS	human use not ubiquitous	FN consulted but not signatory	
PHILOSOPHY	PM-ECOC	PM	PM
PRESENTATION	+	++	+(+)

CRITERION	25	26	27
MANAGEMENT FOCUS	sd thr balance of ec & env.l values; irm	sd thr multi-cultl & multi- discipl.y appr; protect est evolut.y relations; improve regional ec; multiple values	irm; for=biophysical whole; multiple values env.l mgmt; ! timber prod & sustain env.t
NON-TIMBER VALUES	wl,r/t,cu,co,b	w,cu,r/t,b,m,p,fi,wl	p,wl,r/t,fi,co,w,so,o
TECHNOLOGY & SC FOCUS	DSS, GIS, IPM, RS; ES fnctns & CC, for mgmt practices, SV, pests/disease/fire, cutting styles, seedbanks	AM, RS, GIS, DSS; SV, cutting styles, transport.n, reclamat.n, hydrol.y, biodiv as IA tool, ethnobotany	GIS, AM, IPM; SV, wl & riparian habitats, for IA on H2O, cutting styles, hdwd restor.n, soil enhancement, nat.l regeneration
LANDHOLDER INCLUSIVITY	no	no	yes
BROAD PARTNERSHIP	yes	no	yes
TIMBER INDUSTRY	Kruger, small operators	Interfor, CanFor, MacM-Bloedel [Fletcher Challenge]	woodlot owners, Domtar, Soc. d'aménagement de l'Estrie
NOTEWORTHY	ec valuation studies, wood product dev	integr.n of strenghts of FN & Cdn cultures; focus on socio-ec; watershed= mgmt unit; for prod certific.n; niche mrktg; ec & ev.l indicators	integr.n of indiv.l owners activities w regional socio-ec needs; influence municipal for policies
COMMENTS		repetitive; poor budget present.n; vague overall	
PHILOSOPHY	PM	C-GEOC	PM
PRESENTATION	++ (no budget details)	+	++

CRITERION	28	29	30
MANAGEMENT FOCUS	long-term irm; AFMP; harmonious use of all for resources	irm w trad.l FN uses & knowl; sust diver.d dev thr co-mgmt; balance of trad.l & modern culture; prot for integ.y; equit access; benefit north	enjoyment of treaty rights; participate in region.l ec & its res mgmt; ↑ ec/empl benefit; long-term SF of ES
NON-TIMBER VALUES	wl,r/t,fi,b,w	wl,tr,r/t,cu,co,p,o	tr,wl,fi,r/t,co,w,cu,b,o
TECHNOLOGY & SC FOCUS	GIS, DSS, AM; ↑ knowl of for dynamics & wl, disturb hist, for mgmt IA, habitat enhancem.t, cutting styles, for health, riparian mgmt	GIS, RS, radio collars; boreal ES, fire, cutting styles, for prod.y, SV, landscape analysis (f zoning), trad.l uses, wl habitat	GIS, DSS, RS, IPM; mgmt of wl habitat change, yld/growth, SV, cutting styles, for mgmt IA & restor.n, biodiv IA, H2O, FN knowl, SBW, fire
LANDHOLDER INCLUSIVITY	yes (see comments)	yes	no (see comments)
BROAD PARTNERSHIP	yes	no	no
TIMBER INDUSTRY	Séminaire de Québec, Abitibi-Price, woodlot owners	none	Higl Level ForProd, Little Red River Cree FN, small operators
NOTEWORTHY	for health doesn't include "over-mature"/ mature stands; favour clear-cutting (but have pin cherry & hdwd ↑); policy feedback loop	co-mgmt of community for; focus on healthy commun; ed for locals; zonation	sound descr of region's wl, habitats & mgmt problems; socio-ec focus; incorpor.n of FN knowl; policy feedback loop
COMMENTS	mgmt under ultimate Séminaire control	forest almost untouched by modern dev	prov did not sign but said it fully intended to; a superior proposal
PHILOSOPHY	PM	C	ECOC-C
PRESENTATION	+	+(+)	++

CRITERION	31	32	33
MANAGEMENT FOCUS	co-ordin.n of for agencies; holistic for mgmt; restore for & ↑ prod.y, ec; irm; build sust model of non-comm spp	irm f sust.d ec viability of region; clarify & integrate ES mgmt	holistic irm thr knowl, public particip.n; for mgmt w/in CC; ↓ env.l impacts; ↑ diverse timber use, supply & prod.y
NON-TIMBER VALUES	r/t,wl,fi,cu,m,p,b,w,co	r/t,fi,wl,tr,b	wl,fi,r/t,tr,cu,b,co,w,so,o
TECHNOLOGY & SC FOCUS	DSS, IPM, GIS; SV, for succession, cutting styles, for mgmt IA, acid rain, fisheries, small mammal mgmt, ethnobotany for pharmaceut.s	DSS, AM, MAT, GIS, RS; growth & yld, cutting styles	GIS, RS, GPS, DSS; SV, roads, for mgmt IA, soil prod.y, seed mgmt, for ES, cutting styles, pests, fire, mxwd mgmt
LANDHOLDER INCLUSIVITY	no (see comments)	yes (majors)	no
BROAD PARTNERSHIP	yes	no	yes
TIMBER INDUSTRY	woodlot owners, small operators [Stora]	Liskeard Lumber, Grant ForProd, Grant Lumber, Normick Perron [small operators]	Westar Timber, West Fraser Mills, Vanderhoof Specialty Wd Prod, woodlots, small operators [CanFor, L&M Lumber]
NOTEWORTHY	socio-ec focus; history from Mfkmaq perspective; market analysis; include FN knowl; fire protec.n; biosphere mgmt unit	Eco-Resource Centre feasibility study; IA of SF on timber supply & costs; seek community tenure	alternative logging methods on sensitive sites; ↑ fibre yld on woodlots; commun stabil.y; drain "idle" land; some zoning
COMMENTS	NS Nat'l Res attached letter confirming support; some sections not well developed	tenure holdings unclear; wilderness parks cause f concern	
PHILOSOPHY	PM-C?	PM (M?)	PM
PRESENTATION	(+)	(+)	+(+)

CRITERION	34	35	36
MANAGEMENT FOCUS	community mgmt; ecol integrity; re-est remote conditions f long-term viability, close roads; wl important for humans	multiple res mgmt f long-term benefit to all residents	irm f biodiv & long-term ES health; res mgmt f full for prod.y; landscape-level plg; env.l enhancement
NON-TIMBER VALUES	wl,r/t,fi,tr,co,w	p,r/t,wl,fi,w	wl,fi,tr,r/t,b,w,co
TECHNOLOGY & SC FOCUS	MAT; road access, SV, cutting styles, endangered spp		IPM, DSS, GIS; fire & SBW, stand vulnerab.y classif.n, SV, featured wl spp, disturbance, cutting styles, growth & yld, for mgmt IA
LANDHOLDER INCLUSIVITY	no	no	yes
BROAD PARTNERSHIP	no	no	yes
TIMBER INDUSTRY	none	Restigouche Band Council (now Listuguj Mi'gmaq FN Council)	CanPacForProd
NOTEWORTHY	socio-ec, diversific.n & value-added; road access contentious; human/nature contact f solitude; "micro" for appr; export market dev plan		fine filter; constraint & site-specific mgmt; DR thr zonation; socio-ec focus
COMMENTS			env.l gps involved as collaborators; CanFor to provide chairman &? MF director; partnership gp advisory
PHILOSOPHY	ECOC	insufficient info	PM
PRESENTATION	--	i	++

CRITERION	37*	38	39
MANAGEMENT FOCUS	irm & plan.g; irm as conflict resol.n tool; long-term timber use thr constraints	balance of values; irm; selection cuts; max ec & social benefit from wd prod.n; protect env.t	achieve biodiv, healthy ES f future benefit; I & maintain for values, ecol proc.s; intensive for mgmt as part of irm
NON-TIMBER VALUES	wl,fi,r/t,w,b,co,o	r/t,wl,fi,w,tr,p,co,cu,b,so	r/t,wl,fi,tr,p,cu,so,co,m
TECHNOLOGY & SC FOCUS	GIS, DSS, digital image analysis, GPS; for mgmt IA, H2O qual, cutting styles, SV	GIS; wl habits, cutting styles, fisheries, acid rain, SV, for mgmt IA, tree genetics, wetlands, soils, stress, insects	MAT, GIS, DSS; pest/disease/fire, cutting styles, SV, cariboo, road access
LANDHOLDER INCLUSIVITY	yes	yes	yes
BROAD PARTNERSHIP	no	yes	yes
TIMBER INDUSTRY	Corner Brook P&P, Abitibi-Price	Tembec Forest Products	CanPacForProd, Armstrong Resources Dev Corp [small operators]
NOTEWORTHY	conflict resolution emphasis	aims f socio-ec w high for mgmt stds	focus on ed; "living laboratory"; pilot project to return stumpage fees to MF area
COMMENTS	strong timber focus, fine filter	Haliburton appears to be model already	sponsors to be cochairs; ARDC may provide office
PHILOSOPHY	PM	ECOC	PM
PRESENTATION	+(+)	(+)	++

CRITERION	40	41*	42*
MANAGEMENT FOCUS	profits & knowl from sust use of all res to foster stable rural commun.s, healthy & diverse env.t	permanent supply of for benefits; education on sust.y; irm; ES mgmt	derive full economic potential from for thr sust mgmt plan w multple use obj.s; irm
NON-TIMBER VALUES	r/t,tr,wl,w,p,cu,co,fi,b,so,o	wl,fi,r/t,cu,p,b,w,tr	r/t,p,wl,b,w,co,fi
TECHNOLOGY & SC FOCUS	MAT, ADMP, GIS, DSS; SV, re-est fast-growing PP f pest control, habitats, disease, fire, growth & yld, hydrol.y	GIS, DSS, AM, GPS; for ES, mgmt IA, cutting trials, SV, roads	DSS, GIS, IPM, RS; pop.n studies, for mgmt, SV, cutting styles, aesth.s
LANDHOLDER INCLUSIVITY	no	yes	yes
BROAD PARTNERSHIP	yes	no	yes
TIMBER INDUSTRY	Westwood Fibre, Weyerhaeuser, Ardew WdProd, Apen Planers, Tolko Ind.s, Sanders [wdlots]	Weyerhaeuser Canada	JD Irving, woodlot owners, small operators
NOTEWORTHY	ec diversif.n; 2dy mfg; aspen plantations; coarse filter	socio-ec focus, native pt/view integrated, hands-off sc programme	
COMMENTS	tenure holdings N.S.; MoE (Parks) not partner (MoF is)		office & admin support by JD Irving
PHILOSOPHY	C	PM	PM
PRESENTATION	+	++	(+)

CRITERION	43	44	45
MANAGEMENT FOCUS	irm thr local mgmt to balance & integrate all interests, values & maintain ES integrity	irm; working for; ↑ for ES, health; ↑ human/nature harmony, socio-ec & cult.l benefit	env.l mgmt f optimum band benefit; sust restricted timber prod.n, diversify nat.l res use
NON-TIMBER VALUES	cu,wl,fi,r/t,w,tr,p,b,co,so	tr,wl,fi,r/t,co,p,b,so	m,fi,wl
TECHNOLOGY & SC FOCUS	GIS, DSS, RS, IPM; SV, cutting styles & IA, growth & yld, ES/wl, ES structures & fnctns, riparian/wetlands, soils, disturbance	GIS, DSS, IPM; biodiv indicators, restore ES, growth & yld, genetic co, root/soil, SV, for mgmt IA, climate, crop plg, pests, env.l prot, cutting styles, fish.s	SV
LANDHOLDER INCLUSIVITY	yes	yes (see comments)	yes
BROAD PARTNERSHIP	yes (see comments)	yes	none
TIMBER INDUSTRY	Boise Cascade Cda	Midway Lumber Mills [small operators]	Wikwemikong Development Commission
NOTEWORTHY	focus on FN socio-ec benefits; ES & habitat divers.y mgmt; fine fltr	biodiv indices=measures ecol integr.y; explore co-mgmt; design ES to cope w climate change	focus on socio-ec & self-determination; market analysis
COMMENTS	no env.l or recr.l gps; Boise's TMP is core of prop; mgmt committees add.s to co's strcture	tenure holdings N.S.; most important decisions to remain w OMNR	restrictions in Indian Act affect band's for mgmt experience
PHILOSOPHY	PM	PM	insufficient info (C?)
PRESENTATION	+(+)	++	i

CRITERION	46	47	48
MANAGEMENT FOCUS	irm; biodiv; responsible for mgmt maintaining landscape corridors	incorporate sust.y idea into for mgmt & plg; engender biolog.l & ec resilience	irm; integr.n of for values thr partn.p & ed; diversify for use; ecol to optimize for potential
NON-TIMBER VALUES	r/t,wl,fi,tr,cu,w,co,so,o	wl,fi,w,r/t,co,o	r/t,wl,fi,tr,p,co,o
TECHNOLOGY & SC FOCUS	electronic monitoring; landsc restor.n, roads, cutting styles, env.l prot.n, SV, hydrol.y, nutrient loss	GIS, DSS, MAT; growth & yld, hydrol.y, wl, SV, biodiv, for/range mgmt IA	GIS; disease/pest/fire
LANDHOLDER INCLUSIVITY	no	yes (see comments)	no (see comments)
BROAD PARTNERSHIP	yes	yes	yes
TIMBER INDUSTRY	Kalesnikoff Lmbr, Slocan ForProd, Wynndel Box & Lumber, Hushcroft, Atco Lumber, Kootenay Valley Sawmill, wdlot owners [1 licensee N.S.]	Bell Pole, Federated Co-operatives, Fletcher Challenge Cda, Gormon Bros Lmbr, Riverside For Prod, Tolko Ind, Weyerhaeuser [woodlot owners]	diverse producers, woodlot owners
NOTEWORTHY	focus on wilderness value & socio-ec/value-added mfg; harmonious relation to nature, not dominant; climate; comparison tree spp planting	labour is partner; feedback loop to policy; fine filter	focus on tourism; ind.l mgmt practices=lack of respect f env.t; obj.s organized around long- & short-term goals
COMMENTS	science section compilation of ideas	tenure holdings N.S.; partnership very large	Parks Cda not partner; sc/tech section not dev
PHILOSOPHY	ECOC	PM	PM
PRESENTATION	--	+(+)	++

CRITERION	49*	50	
MANAGEMENT FOCUS	irm thr conserv.n & cooper.n; wise use stewardship; mgmt by objectives	env.ly friendly for mgmt; ↑ ec benefits; max sawlog prod.n	
NON-TIMBER VALUES	co,b,wl,fi,w,cu,tr,r/t,o	r/t,tr,p,o	
TECHNOLOGY & SC FOCUS	AM, GIS, DSS; terr.l & aquatic ES, for mgmt, wl, cutting styles, SV	SV, cutting styles	
LANDHOLDER INCLUSIVITY	yes	none	
BROAD PARTNERSHIP	yes (see comments)	none	
TIMBER INDUSTRY	Weldwood of Canada	[CanPacForProd, Boise Cascade, small operat.s]	
NOTEWORTHY	for fnctns to be consvd; commun for; for mgmt integr.d w oil/gas/coal; worker rep; horse log.g; ed outr.ch to Metis, FN, energy ind; fine filter	MF prop contextualized in global economy; community for & stability; 2.y mfg	
COMMENTS	only gov & ind partners hold mgmt respons.y; office & admin supp by Weldwood		
PHILOSOPHY	PM	insufficient info	
PRESENTATION	++	i	

APPENDIX D

Successful model forests: a synthesis

CRITERION	UNE FORET HABITEE	EASTERN ONTARIO	MCGREGOR	MANITOBA
SIZE (ha)	112 634	1 534 115	180 867	1 047 069
TENURE-major	private (large & small)	private (small)	Crown (TFL)	Crown (FML)
SPONSORS	Ab-Pr, Groupement forestier de l'Est du Lac Tém, Syndicat Producteurs de bois Bas-St Laur & U Laval	Eastern Ontario MF Proposal Committee	Northwood Pulp & Timber	Abitibi-Price
NATIVE PAR	no	yes	yes (not originally)	yes

CRITERION	LAKE ABITIBI	LONG BEACH	WESTERN NEWFOUNDLAND	PRINCE ALBERT
SIZE (ha)	1 094 690	400 000	707 060	367 000
TENURE-major	Crown (FMA)	Crown (TFL)	Crown & freehold (large)	Crown (FMA & parks)
SPONSORS	Abitibi-Price	Reg.l District of Alberni-Clayoquot & Clayoquot Snd Sust Dev Committee	Corner Brook Pulp & Paper	Weyerhaeuser Canada Ltd.
NATIVE PAR	yes	yes	no	yes

CRITERION	FUNDY	FOOTHILLS		
SIZE (ha)	419 266	1 218 014		
TENURE-major	freehold (small woodlots)	Crown (FMA)		
SPONSORS	J.D. Irving	Weldwood, AB Forest Techn School & AB Dept For, Lands & Wildlife		
NATIVE PAR	no	yes		

CRITERION	UNE FORET HABITEE	EASTERN ONTARIO	MCGREGOR
MANAGEMENT FOCUS	socio-ec; irm; ↑ use & prod.y of for; diversification	sd thr community partn.p; irm	for dynamics thr DSS f socio-econ; ecol sust.y
NON-TIMBER VALUES	p,wl,fi,r/t,cu,w	fi,wl,p,cu,o	b,r/t
TECHNOLOGY & SC FOCUS	"cutting edge" of S&T, IPM, AM, GIS, DSS; private for.s data mgmt, fire & disease protect.n, env.l stress	MAT, AFMP, GIS, DSS, IPM; implement ES mgmt, SV, for mgmt	AM, DSS, GIS; DSS, SV/ biod integr.n, ecolog. processes, for practices
LANDHOLDER INCLUSIVITY	yes	yes (majors)	yes
BROAD PARTNERSHIP	yes	yes	yes
NOTEWORTHY	collective approach to woodlot mgmt; "forest farmers" lease from A-P	Mohawk Heritage Food Forest; p&p sludge to be used as fertilizer	labour is partner; DSS focus directs scientific effort tow quantif.n of narrow range of variab.s
COMMENTS	will reallocate land to increase woodlot sizes	strong on prop activit.s but weak on vision dev; weighted voting; MF=string of projects	MF area coincides w TFL; MF office in Northwood building
PHILOSOPHY	PM	PM	PM

CRITERION	MANITOBA	LAKE ABITIBI	LONG BEACH
MANAGEMENT FOCUS	operat.l viabil.y; env.l protect.n; balance of values; irm; soc-ec dev	irm; timber use w constr; sd thr communic.n, database, res, partner.s & plg; balance values	irm; timber & human use planning
NON-TIMBER VALUES	co,fi,p,cu,r/t,tr,wl,m,o	fi,cu,wl,r/t,p,b,c,co,o	co,fi,r/t,w,cu,wl,b
TECHNOLOGY & SC FOCUS	GIS, DSS, AFMP; irm, for /wl interface, for ES, cutting styles, for protection	MAT, AFMP, GPS, DSS, GIS, for mgmt audit; for mgmt, cutting styles, SV, mxwd mgmt, fire, sheep, peatland drainage	MAT, AFMP; for ES, cutting styles, biodiv, SV, hydrology
LANDHOLDER INCLUSIVITY	yes	yes	no
BROAD PARTNERSHIP	yes	yes	yes
NOTEWORTHY	integr.n of policy w irm; 2dy wood process.g	includes worker gp; for mgmt audit procedure dev	ES (natural-built) integr.d into plg thr use of scale is foundation for zonation; univ students incl.d; 2dy wood processing; focus on landscape aesthetics
COMMENTS	alternative fibres emphasized but as means of increasing wood supply; sci & activities sections not developed	MF coord.r=A-P employee; in orig.l prop, mgmt team to have only A-P staff	human use not ubiquitous
PHILOSOPHY	PM	PM	PM-ECOC

CRITERION	WESTERN NEWFOUNDLAND	PRINCE ALBERT	FUNDY
MANAGEMENT FOCUS	irm & plan.g; irm as conflict resol.n tool; long-term timber use thr constraints	permanent supply of for benefits; education on sust.y; irm; ES mgmt	derive full economic potential from for thr sust mgmt plan w multple use obj.s; irm
NON-TIMBER VALUES	wl,fi,r/t,w,mining,b,co	wl,fi,r/t,cu,p,b,w,tr	r/t,p,wl,b,w,co,fi
TECHNOLOGY & SC FOCUS	GIS, DSS, digital image analysis, GPS; for mgmt IA, H2O qual, cutting styles, SV	GIS, DSS, AM, GPS; for ES, mgmt IA, cutting trials, SV, roads	DSS, GIS, IPM, RS; pop.n studies, for mgmt, SV, cutting styles, aesth.s
LANDHOLDER INCLUSIVITY	yes	yes	yes
BROAD PARTNERSHIP	no	no	yes
NOTEWORTHY	conflict resolution emphasis	socio-ec focus, native pt/view integrated, hands-off sc programme	
COMMENTS	strong timber focus, fine filter		office & admin support by JD Irving
PHILOSOPHY	PM	PM	PM

CRITERION	FOOTHILLS		
MANAGEMENT FOCUS	irm thr conserv.n & cooper.n; wise use stewardship; mgmt by objectives		
NON-TIMBER VALUES	co,b,wl,fi,w,cu,tr,r/t,o		
TECHNOLOGY & SC FOCUS	AM, GIS, DSS; terr.l & aquatic ES, for mgmt, wl, cutting styles, SV		
LANDHOLDER INCLUSIVITY	yes		
BROAD PARTNERSHIP	yes (see comments)		
NOTEWORTHY	for fnctns to be consvd; commun for; for mgmt integr.d w oil/gas/coal; worker rep; horse log.g; ed outr.ch to Metis, FN, energy ind; fine filter		
COMMENTS	only gov & ind partners hold mgmt respons.y; office & admin supp by Weldwood		
PHILOSOPHY	PM		

APPENDIX E

INTERVIEW PROTOCOL and LIST OF INTERVIEWEES

INTERVIEW PROTOCOL

Interviews were conducted to obtain information regarding the Model Forest Program's selection process and the Prince Albert and Fundy model forests. The basis for selection of sources was as follows. For the selection process, members from both the Technical Review Committee and the National Advisory Committee were deemed essential. For the Technical Review Committee, I looked for cross-country representation, choosing one from each of the provinces where I planned to investigate a model forest, so that I spoke to three of its nine full members. One of these, the forest ecologist Stan Rowe, would also be able to provide an independent scientific viewpoint. Of the eight full members of the National Advisory Committee, I spoke to two. Jean-Guy Whiteduck was chosen to provide a minority, particularly a First Nations, view. Two others whom I had intended to interview, one from industry and the environmental representative, could not be located. Gordon Baskerville was selected because of his undisputed status as one of this country's foremost forestry experts.

With respect to the model forests themselves, representatives were chosen from each of the partners or their constituencies, and from those who were then or had been most involved in day-to-day activities, including staff and committee representatives. Representative coverage of all viewpoints was the broad aim, but sometimes people could not be reached or they declined to participate. As the study proceeded, additional information about the program and the two sites was obtained on the basis of need

through follow-up interviews and by contacting the program's co-ordinator in Ottawa, John Hall. Two additional interviews, with the Honourable Frank Oberle and with Parks Canada ecologist Steven Woodley, were arranged later when the need for them became clear.

LIST OF INTERVIEWEES

Gordon Baskerville

Tom Ballantyne

Rose Burkun-McNeilly

Allyson Brady

Blake Brunsdon

Doug Clay

Gerald Coburn

Stephanie Coburn

David Coon

Mark Connell

Lois Dellert

Peter De Marsh

Peter Etheridge

Robert Fawcett

Stephen Flemming

Graham Forbes

Noland Ed Henderson

Anna Holdaway

Lara Inglis

Gene Kimbley

Kent McNeilly

Doug Mazur

Ian Monteith

Dan Mullaly

Michael Newman

Frank Oberle

Jeff Patch

Peter Pearce

Tom Pettigrew

Clark Phillips

Marilyn Powell

Tony Richmond

J. Stan Rowe

Graham Savage

Jack Spencer

Jane Tims

Paul Tarleton

Karen Townsend

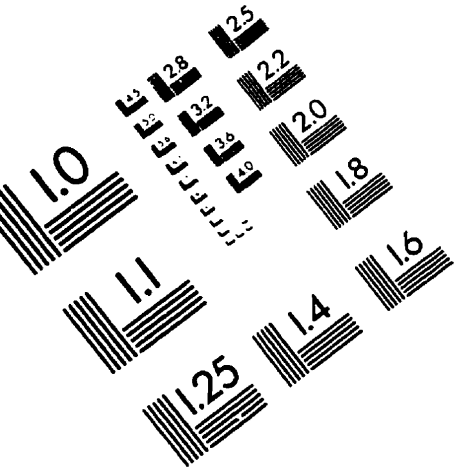
Hugh Walker

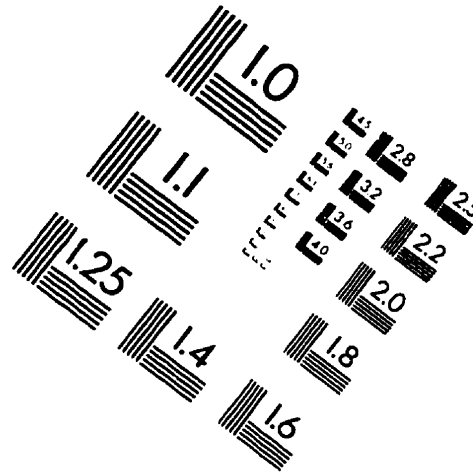
Jean-Guy Whiteduck

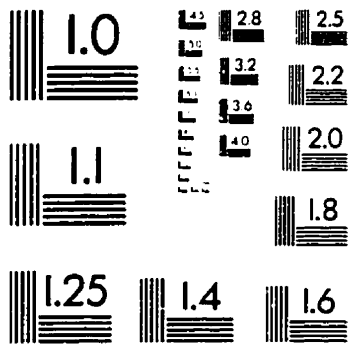
Stephen Woodley

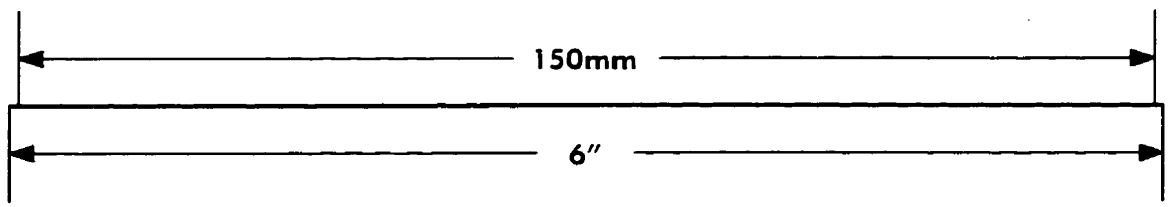
plus five Anonymous

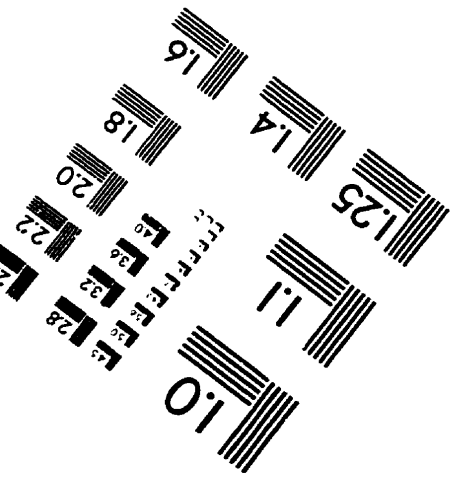
IMAGE EVALUATION
TEST TARGET (QA-3)

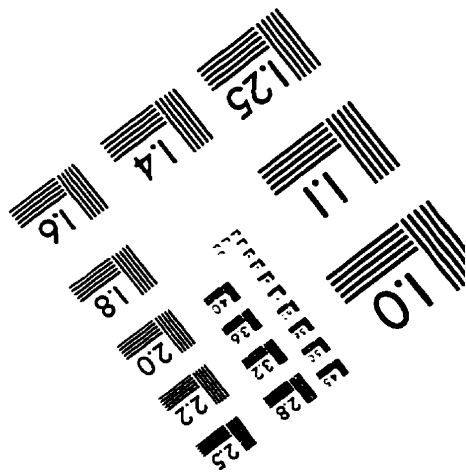












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