Producing the Boreal: The Politics of Environmentalism, Capital and Nature in Canada's Northern Forests

By:

Victor Lorentz
University of Toronto, BA (Hons), 2007

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

MASTER OF ARTS

In

The Department of Political Science

Supervisory Committee

Producing the Boreal: The Politics of Environmentalism, Capital and Nature in Canada's Northern Forests

By:

Victor Lorentz
University of Toronto, BA (Hons), 2007

Supervisory Committee

Dr. Karena Shaw, Co-Supervisor
(Department of Environmental Studies)

Dr. Warren Magnusson, Co-Supervisor
(Department of Political Science)

Dr. James Lawson, Department Member
(Department of Political Science)

Abstract

Supervisory Committee

Dr. Karena Shaw, Co-Supervisor
(Department of Environmental Studies)

Dr. Warren Magnusson, Co-Supervisor
(Department of Political Science)

Dr. James Lawson, Department Member
(Department of Political Science)

This thesis argues that current environmentalist initiatives aimed at creating a stable regime of ecological governance in Canada's northern boreal forest are structurally complicit with the forces driving its exploitation. Through the negotiation of the Canadian Boreal Framework Agreement and the aggressive institutionalization of Forest Stewardship Council certification, environmental organizations participate in the erection of a regime of ecological production predicated on the maintenance and delivery of *ecosystem services*. Through the creation of a stable, uniform field of exchange of natural functions, these initiatives deepen the entanglement of capital with new vestiges of nature. I trace the production of this ecologized, boreal capitalism through the concepts of fixed capital and real subsumption, arguing that this organization of nature constitutes a 'fixing' of value and thus a determining factor in the trajectory of capitalist development in the region. In this, I assert that environmental organizations have become essential institutions in the functioning of processes of accumulation. They ensure an articulation between the epistemic realms of a burgeoning ecological science and capital, and secure the communication of value down the commodity chain for ecological services and certified products. Further, they take on some responsibility for the organization of consumption, and thus the modes of possible political engagement. I conclude by finding that despite this deep identity between market and environmentalist institutions the possibility for productive – rather than protective – resistance is opened up alongside the more lamentable consequences of these developments.

Table of Contents

Acknowledgements

First and foremost I would like to thank Kara Shaw for her patient supervision of this project. I have been very fortunate to benefit from her encouragement, enthusiasm and insight, and this thesis owes its shape to her ongoing advice and the engaging discussions we have had over the course of its development. I also thank Warren Magnusson for his pointed and provocative questions while I struggled to understand the material, and Jamie Lawson for his knowledgeable and alert commentary. I would also like to acknowledge SSHRC and the Department of Political Science for their support.

Lastly, I have to express gratitude to my colleagues and friends in the graduate program in Political Science at the University of Victoria. The support, collegiality and productive challenges they have offered were invaluable, both personally and professionally.

Introduction

The area called the boreal forest encompasses close to a third of Canada's landmass, and a majority of its forested land. As an ecological classification, boreal forests are characterized by predominantly jack pine and spruce conifers, interspersed with a variety of broadleaf species. Due to climatic conditions, there is generally less unfrozen topsoil in summer months than in transitional zones further to the south. Because of this, trees do not achieve much girth, and most conifer species do not live past 300-350 years. As there are large tracts of mature forest that have never been logged, much of the boreal past the jurisdictional cut-lines in the provinces is considered 'old-growth'. This classification has carried a certain political charge in other regions in Canada – many of the most recognizable forest conflicts in the past 30-40 years in Canada have been fought over the preservation of old-growth. Nevertheless, the lack of giant trees, the setting of boggy muskeg, and the difficulty of access for the public have diminished the importance of 'old growth' status for the boreal forest.

Industrial forestry in Canada has progressed steadily northward, and the northern reaches of the boreal have, until recently, been considered too difficult, expensive or unprofitable to log. However, as I trace in the first chapter of the thesis, the steady decrease in available timber has driven industry to constantly search out new land – often now in partnership with First Nations. On the side of environmentalists, the boreal is the next frontier for them as well. Groups have gotten larger and better coordinated, and successes in other regions of Canada have firmly established an institution of forest advocacy. Following initiatives in the Great Bear Rainforest and other defined locations,

the boreal is seen as a vast opportunity for conservationists to get ahead of the curve. Rather than reacting to developments already underway on the ground, or to management plans that have already been drafted, the northern, unlogged boreal is the object of efforts by environmental groups to establish a regime of governance that they hope will fundamentally shift the terrain of ecological governance. Environmental groups are more organized, have built enormous capacity, and have come to the fore as key actors in setting the terms by which the forest will be managed.

This thesis is an examination of the politics surrounding the governance and commercialization of the Canadian boreal forest, and argues for a reading of management technique and capitalist logic that situates environmental organizations as an essential institution to the smooth functioning of a reformulated 'ecological capitalism'. The first chapter looks at the emergence of management regimes as they grow out of initiatives to create and manage the 'normal' forest. This is the European legacy of 19th century attempts at a science of forest management that aimed to create large and stable tree farms out of the unruly forest at the boundaries of 'civilization'. Techniques of abstraction, classification and standardization set the stage for the creation of a regime of 'environmentality' that poses nature as an expanded field of knowledge through which to govern. Against this backdrop, I detail the evolution of boreal campaigns by national and international environmental groups. I argue that the agreements they have negotiated with industry and First Nations, and the renewed campaign strategies deployed to achieve them, constitute a regime of environmental governance predicated on a system of ecological *services.* My assertion is that such a regime constitutes an adapted mode of

rationalization of the forest similar to that which has characterized discourses of sustained yield.

The management of the forest as a homogenized field of functions – included here are social, cultural, economic and ecological functions – cannot help but constitute an altered organization of production and circulation. The second chapter builds on the first by examining this process through the lens of political economy. How is an economy in ecological services organized? I argue here that the manufacture and maintenance of a generalized field of exchange for ecosystem functions constitutes a form of fixed capital that emerges out of the deepening identity between nature and capital. As fixed capital is value imprisoned, as it were, this organization of *nature* has begun to function as a sedimentation of new circuits of exchange, amounting to a form of *ecological production.* Beyond their participation in the erection of a governance apparatus, I argue that environmental organizations perform a crucial function in maintaining an articulation between logics of capital accumulation and a destabilizing expansion of ecological knowledge. In this sense, environmentalists perform an institutional function that is indispensible to the continued development of an ecological, boreal capitalism.

The third chapter deepens this analysis of environmental organizations as economic institutions by demonstrating their role in the organization of, and relation between, individual and aggregate capital. I argue that the peculiar form of fixed capital discussed in chapter two begets a trend towards greater degrees of vertical integration for those individual capitals who have begun to embrace it. Further, I examine the role of environmentalists in the organization of consumption, and the creation and maintenance of a greened market in certified forest goods and, through this mechanism the

construction of channels of political engagement and environmental citizenship predicated on consumption. Here, their function is also one of a guarantor for the communication of value of the ecological service commodities. The final concluding section asks whether there are any new possibilities for resistance that are opened up in this reorganization of institutional environmentalism. While I find many lamentable consequences in the recent convergence of environmental organizations and capitalist production, I argue that it also demonstrates a remarkable capacity for productive resistance. That is, older models predicated on the *protection* of (usually spatialized) nature have little purchase against the processes constituting the basis of its alienation. In contrast, the production of ecological services at least points up the possibility of engaging in new social(ist) productions of nature.

All told, this work is a relatively narrow cut at an apprehension of the politics of the boreal. The thesis zeroes in on, in particular, the relationship between capitalist enterprise and logic and the ENGO sector as it emerges in the present from the very recent past. I think of it as a close look at a specific nexus of activity and conflict – one that I argue is extremely important to understand. In large part, the specificity of the examination is a consequence of my own difficulties in parsing the material; I was simply not able to wrestle adequate answers out of the few problems I had set for myself. In this sense, the rather exclusive focus on the welter of interactions between environmentalism and capital in the production of forest-nature is a gesture at the complexity of this tangle. As such, there are other cuts at the problems that would invariably enrich the analysis, but which are beyond the scope of the present work. The thesis should be taken in this

way: as an effort at zooming in on a few processes that will reveal other aspects when approached from another angle.

First Nations are largely absent in this paper. I hope the readership will not take this absence as a reproduction of the erasures that have characterized the historical advance of colonialism. It was my opinion that the discussion I might have been able to present in the context of the line of approach I have taken in the thesis would not do justice to the scholarship on Canadian indigenous territorial politics, and would serve to cloud rather than hone the analysis. Instead I have chosen to hew closely to a few key dynamics in the hopes of providing a more precise, if limited, study of their significance.

I have also largely bypassed the state in discussing the evolution of boreal politics. In part, this is due to its intentional exclusion from the negotiated arrangements I am focusing in on. I have similar motives as do the participants: the boreal is a morass of bureaucratic entanglements spanning six provinces and two territories, each with specific institutions and policy collections governing natural resources within their borders. An adequate treatment would involve not only an investigation of the Canadian federal state, but also the peculiarities of the historical management regimes of the various provinces and territories. While the southern boreal has undergone extensive commercial exploitation, the northernmost reaches of it have undergone very little, and in many cases none at all. In this sense, the agreements under study represent an attempt by the parties to establish a form of government with the state only as guarantor, not as progenitor. Nevertheless, this should not imply that the state is absent or unimportant in the equation. Rather, administrative practices have definitively determined the contours of how the

Canadian forest can be thought and politicized, albeit through a constellation of imperatives somewhat different from those that I am concerned with here.

Despite this focus on the logic of capital and it machinations in the boreal, this thesis does not address the contribution of workers' struggle and experience in shaping the organization of forest production. While there is a ample research on bushworkers in Canada and their struggles, this work is preoccupied with the crucible of conflict between environmentalist advocacy and capitalist expansion. Further, in view of the case of First Nations and the role of labour, the notion of resistance that is at play here could certainly be complicated to fruitful ends. That is, resistance is a plural concept, and clearly the forms it has taken in the boreal are variegated. Resistance in these contexts has shaped and been shaped by different forces, and at varying scales, and the manners and strategies in which people have engaged with, defended against, subverted, evaded, appropriated, and combated domination deserve attention. I have retained a rather generic notion of resistance simply for the purpose of keeping the focus on the illumination of the dynamic in the expansion of capitalism to new forms and facets of *nature* and the obstacles that it encounters in this process. As it is my argument that ENGOs in particular have begun to settle into a new role in the organization of ecological production, I have tried to restrain myself to the manners in which the ostensible resistance emanating from this 'sector' has been brought to bear on boreal governance in particular.

I could go on, of course, listing other facets that might be important to address but, suffice it to say, were I to expand this work, these would be the first directions I would head in.

My choice of the boreal as the focus or ground of this study is based on my own experience as campaigner with an Ontario-focused group. Between 2003 and 2007 I managed the forests program at Earthroots. Much of the analysis here is borne out of reflection on that experience, and my own ambivalence and struggle with questions of strategy, tactics and analysis. A good deal of the analysis here is predicated on interviews I conducted in late 2008 and early 2009. Interviews of one to two hours in length were conducted with a representative of the World Wildlife Federation (WWF), Greenpeace Canada, The Ivey Foundation, the Canadian Parks and Wilderness Society (CPAWS) and Tembec Incorporated. Questions were open-ended, and dwelt on their sense of the history of the emergence of the boreal as a political and/or campaign issue, the strategies they employed in relation to other participants, and their reflection on the position and role of their organization in the future of boreal management. The four environmental groups were chosen on the basis of their either their participation in the creation of the Canadian Boreal Framework Agreement (WWF, Ivey, CPAWS) or, in the case of Greenpeace, as a result of running a large-scale dedicated boreal campaign. Tembec was chosen for the same reason. Other organizations and companies were approached, but declined to participate. In each case, a representative was identified who participated directly in negotiations and who had decision-making authority over the activities of their group or company. Their names are not used anywhere in the thesis to ensure participants' confidentiality. Interviewees are identified by the organization they represent. In several instances I knew these individuals from my time working on forest issues in Ontario.

There is a fair amount of theoretical literature that is brought to bear on the questions I raise. In the main, I have tried to stay focused on variations of (neo)-Marxian

scholarship on the political economy of nature (Cf. Harvey 2006; Smith 1984, 2007; Lefebvre 2007; M. O'Connor 1994; J. O'Connor 1998; Prudham 2004), while trying to flex the more orthodox material to bring it into what I hope is a better alignment with methods that stress green managerialism and green governmentality (Cf. Luke 1999, 2003, Rutherford 2007; Scott 1998; Latour 2004; Baldwin 2003, 2004). In the main, the most difficult but rewarding struggles I have had with the present work have revolved around attempting to make sense of the application of political economic theory to environmental organizations. The operational approach undergirding my investigation was in the end fairly simple – to attempt to think through the processes at work in making the boreal in all of its aspects through theories dealing specifically with the intersection of ecology and capital, and to use the complexity of the boreal case to push at the boundaries of the received conceptual apparatus.

Chapter One: Campaigns and Governance

This chapter begins with a context-setting discussion of the discursive formation of forest management techniques and their implications. I begin with this to trace the development of forestry in managerial terms to the modern boreal, through the concept of the normal forest and processes of standardization, abstraction, simplification and, ultimately commodification. I assert that the Canadian boreal provides us with a unique opportunity to investigate forest politics and management, as the northern portion remains unlogged and unplanned. The development of governance arrangements for this region is therefore proceeding with more of a 'clean slate', and on a much larger scale, than has been seen in recent memory. The form and content of boreal governance is shaped in large degree by the activities of national and international environmental groups, whose campaigns have evinced a parallel scale and scope. The latter portion of the chapter is devoted to explaining the unique character of the campaigns and their impact on boreal politics and discourse. Not only have campaigns evinced a strategy differing from those of the recent past – engaging industry directly before public communications and pressure initiatives were ramped up, but they have also shifted the terms of debate to be oriented around the management of 'ecological services'. I argue that this shift indicates an important and qualitative extension of the hold of capital over nature inasmuch as it presumes to engage in the management of ecological productivity as opposed to the preservation of ecological value.

The Normal Forest and 'Regimes of Truth'

Timber management in Canada has taken on various guises across the country and through the years, although there are definite trends that can be identified in the logics deployed in this management. As Braun has aptly noted in his discussion of the Canadian Geological Survey and the making of national and colonial space, the state sought to define land and forest as an empty, physical plane (1999:47). Thus, because indigenous people did not produce value in property from the land, their activity and claims were rendered invisible and unimportant. In this sense, the work done to lay the ground for intensified resource extraction was bound up inextricably with projects of colonization and nation-building (Braun 1999: 94-97). The principal strength in Braun's work is the clarity with which it shows that the modern forest comes into being through processes that create a 'regime of truth'. For Braun, this regime sets the parameters by which the forest can come to be known; there is no pre-reflective forest that is a primary or essential entity that is merely a container of activity or object of calculation and politics. The forest is not only interpreted and shaped through the categories and sensibilities installed in this manner, but also brought into being itself as a particular sort of category. That is, regimes of truth about the forest create the forest itself, and install the epistemic contours through which the forest can be understood. The movement of the forest becoming visible within a specific regime is its legibility (Scott 1998: 11-22).

In this sense, the forest is created under both epistemological and ontological coordination; its rendering not only creates a stable object, but also produces the coordinates under which it can be known and discovered. For Braun, the 'reading' this movement engenders of the legible forest is that of a bin of resources for capitalist development. In this case, a single commodity – fibre – is the crucible for the social

production of the forest as the ‘normal’ forest. The normal forest relies on a calculus of tree age rotation, and approaches the whole land mass as an otherwise empty landscape, appraisable only in terms of its fibre yields and growth rates. Thus, the forest is managed with the intention of maintaining a constant proportion of age-classes among tree-types, with areas cycling through production. This is a form of production made possible by the process of making the forest legible as a quantitative store of material for commodity production. As the last areas are cut, those logged first should be coming ripe for harvest. In this way, the forest, and nature itself, is interpreted through the calculation of measurable qualities.

The discipline of modern forest management in Europe, ultimately adopted in North America, sought to both maximize profit from the forest and govern it more efficiently from afar (Scott 1998). This involved the gathering together of different forest regions under the rubric of a *general* notion of forest in order to create an administrative unit that could be centralized. In this sense, the forest was understood and governed through standard features and measures applicable across space and time. The forest cannot be centrally managed if its aspects are not integrated in some manner with each other. In Europe and South Asia, this involved a systematic campaign of changing existing social relations and institutions affecting the forest, such as communal property regimes and practices of wood gathering, grazing, and extremely local and opaque (to managers) tenure systems (Agrawal 2005: 107). In Canada, in the context of advancing settlement, the project employed a similar set of logics in the service of similar goals; however the obstacles and specifics took a different form. The forest itself stretched out

in front of the imperial eye as a great ungoverned expanse; a forest without any history or pre-existing production despite indigenous presence.

A key process at work in all of these projects is abstraction. The particularity of various elements of the forest must be made into manageable entities by creating categories that can catch all of them. Thus, a forest becomes first a series of spatially delineated areas and, in sustained yield, a collection of varying, progressing age classes. The forest is understood to be a regenerating store of fibre. Both a consequence and a goal of this process is the idea and reality of an ordered, 'ideal' forest. If considered through abstract, instrumental forms, it becomes possible to imagine and to attempt to create a forest that is minimally inefficient in its purpose. Tree ages themselves as calculations become reified as objects of management where their status as a techno-managerial category had not existed before and, although absent in later forms that I will discuss shortly, made these divisions spatially. That is, particular areas of the forest became defined by their location in the time of production. The harvesting of age classes according to a schedule of regrowth and sustained yield translated as a harvesting of *areas* of the forest. In this sense, the temporal requirements of management and production produced a forest spatialized according to its abstract categories. This experiment not only *considered and interpreted* the forest according to a calculus of fibre yield by area over time, it also *created* a forest whose material form reflected this calculus back. Thus, the goal and process of abstraction was not only to engage techniques at managing the forest most efficiently, but also to produce a forest that was itself most efficient.

The measurements and the data they provide to maintain this model relied on a process of standardization. That is, managers needed a framework they could apply to any or most forest regions that would yield the appropriate information in a reliable and consistent manner. Thus, not only an abstraction from the diverse elements of the forest was required, but also a standardization of the information and objects the model produced. This process of abstraction constituted a vast simplification of the forest. In the form of standardizing trees as measures of fibre volume, an enormous quantity of information about the forest is reduced to its contribution to this calculation. Thus, the process of growth was understood as linear and relatively elemental. Out of an array of species and phenomena, the forest was condensed into the management of particular tree stock. Given this it is not, in the main, surprising that the politics of the forest developed the way they did. As a forest defined as a prior spatial plane *upon which* activity occurs, contests over the forest have centred on how it is to be used within the framework implied above. That is, as a bin of already-defined resources and values, a politics concerning the where and when of management emerges that effaces debates over the social use of the forest. This is not to say that articulations of radical alternatives have been absent, but rather to say that the trajectory of negotiation has been successfully steered in directions not altogether threatening to the established order. The third chapter addresses these politics and possible alternatives directly.

This constellation of practices aimed to achieve deeper and more thorough governance of the forest through the re-constitution of knowledge about the forest. This constitution of nature as a new interface through which to govern human life has led theorists to extend Foucault's theories of biopower and governmentality to processes of

governing the environment. For Foucault (1978), the concept of biopower and biopolitics referred to the management of the health and welfare of populations. That is, biopower emerged as a technique of government aimed at politicizing and bringing life itself under calculation. However, biopower ought not to be read as limited to the discipline and normalization of bodies. The conditions and life of bodies are imbricated with their material surroundings, and the body itself cannot become a field of knowledge without a concomitant politicization of the material-biological webs it is implicated within. Thus Luke underlines Foucault's point that it is life *and its mechanisms* which are brought under calculation (1999: 133). For Luke, the category and discursive construction of "the environment" emerges as a nexus of knowledge and power formation which acts to produce technologies of government that work at the interface between the social and the natural. This interface or moment of engagement is managed, created, disciplined, enumerated and calculated within this regime of *environmentality*, which constantly produces and reproduces within everyday practice appropriate engagements with biophysical and material processes of life (1999: 146). Indeed, we might read this form of ecological 'modernization' and the management of new areas of forest life and function through this prism.

Environmentalist intervention in forest politics has proposed, ostensibly, counter-logics to those emerging out of sustained yield. Where the state-industrial nexus has produced a simplified instrumental forest, North American environmentalist campaigns have often demanded attention to the complexity of the forest and its relation to human life. Where companies and managers have focused on a narrow cut of benefits to be extracted from the forest, others, in response, have demanded the expansion of the set of

considerations emphasizing the inherent worth of nature, and the less tangible and immediate benefits it gives. Further, the effectiveness of the sustained yield strategy has been put into serious controversy through its inability to actually produce a sustained yield over the long term in the Canadian forest. Reforestation has proven more difficult than originally thought, and indeed some species have exhibited intransigence to silvicultural development and technology. The calculations could not adequately manage the forest, and growing age class 'gaps' in most regions have driven expansion into more and more remote areas of timber, and the depletion of forest classes containing the largest, most valuable trees (May 2005: 47-49).

Thus, in both technocratic and political terms there was pressure to alter the strict model of the single commodity forest that had been the goal of forest management in Canada. Out of the simplified forest of fibre yield, a process of re-complexification came to the forefront as a trend. While economic production of fibre remained the most pertinent element of management, efforts became more concerted to reconcile this with other interests seen to compete with or be disadvantaged by logging. In this, the discursive production of the forest has expanded beyond the single commodity forest into one with ever wider calculations. The forest remains a relatively ordered entity with measurable outputs, however there are further claims to consider. Despite their ostensible status as obstacles, these claims retain a logic that sees the forest as a container of measurable quantities, whose claimants must demonstrate use in order to be validated. In this sense policy revises the forest to accept new uses under delineations that do not disturb the underlying logics at play in the maintenance of a rational forest. Claims asserting the value of nature in terms other than countable statistics are quickly converted

to terms amenable to this calculus. Sometimes this occurs as a pragmatic strategy on the part of claimants to achieve tangible progress, and sometimes it occurs simply through a gradual adaptation to the process, as claimants can only be *heard* if they pose their concern appropriately. For example, environmentalists hoping to demonstrate the value of a given area will often find themselves cataloguing recreational uses and users, or producing ecological statistics citing hectares of habitat and wildlife population numbers. My point is not that these are necessarily poor strategies, but rather to point out that the rules of this game are set to facilitate fibre production.

The Boreal

The Canadian boreal is an interesting case as it provides a snapshot of the application of these various logics to forest land that has not been intensively managed for commercial purposes. In this, it presents a particularly clear picture of the trajectory of ecologically-minded managerial strategy and technique as it proposes to create a new regime from square one. However, to say that the boreal is undeveloped or unmanaged is not to say that it doesn't have its own history or that technocratic practices encounter a blank slate. Hundreds of First Nations dot the boreal, each with unique histories and activities to their territory. There are several reasons why the boreal has not been commercially developed or intensively managed until very recently. The first and most important is access costs. The costs of road-building and maintenance are high in more remote regions, and the transport costs of moving fibre from the land to the mill has made it uneconomic. The reason road blockades are occasionally effective at halting logging (apart from the creation of a media spectacle and attendant wider public pressure) is not because the trucks are physically prevented from passing by the protesters. Usually, there

are alternate routes, however even an hour or two of extra hauling distance can eliminate profit for the harvester, whose contracts with the mill usually require transport. The nutrient-poor soil in the boreal region makes for slow growth rates, which discourages long-term investment in tenure-holdings, something ministries require to grant leases, and to generate sufficient stumpage rents to justify allocation. Lastly, the boreal is rife with broadleaf species that, until recently, were not considered commercially viable (Novek and Kampen 1992).

In addition to these difficulties, there are somewhat more exogenous ones. Through economic globalization, Canada's forest industry has been pulled into disadvantageous conditions. Large scale plantation forests with extremely short rotation periods have emerged in Asia and Latin America since the 1980s (Marchak 1995: 204-206). This has been facilitated in part by the development of technologies that have made certain fast-growing tropical species viable as pulp-wood. As a staple commodity, the industry is highly susceptible to the vagaries of international supply and demand, and a glut of cheaply produced, lower quality fibre has driven down primary commodity prices. Activism has also played its role in making access to fibre in the boreal more cost-intensive. Highly organized, large environmental groups, comparably strong environmental regulation, and increasingly militant and astute First Nations legal claims present obstacles mediating and delaying capital's access to fibre in the boreal. These are the unique circumstances which contour accumulation in the boreal, and condition the organization of capital to achieve it. The second chapter of this thesis explores this in much more detail.

Canada does enjoy a somewhat privileged position in relation to low transport costs to the US, whose housing and newsprint market drives softwood and pulp/pulpwood exports. Also, the same technological developments in pulping production utilized in the south have made those previously unviable broadleaf species feasible as raw material for mills (Novek and Kampen 1992: 258). There is also a growing age class gap in the lower Canadian boreal. That is, logging has proceeded too fast, and there are now too many younger trees in proportion to accessible older ones. But, the driving demand for boreal fibre is the demand for paper, which has not diminished despite earlier predictions of the development of the 'paperless office'. Rather, paper demand within the North American market has risen steeply in this period (May 2005: 78). As a result of these developments and the increasing scarcity of high-value fibre in southern forests, the boreal has begun to emerge on the radar of forest companies and planners seeking to address both opportunities and production shortfalls. This is the context for the perspective of forestry companies entering into negotiations over the future management of the boreal. Thus, there are a variety of factors contributing to the position of industry: the costs of production stemming from historical mismanagement, changing technology and international competition and economic trends; the landscape of regulation, increasingly administered through industry/government partnerships but also increasingly constrictive; and the growing influence of environmentalists and First Nations who are no longer able to be circumvented or ignored.

As companies and governments have begun to look to the boreal with interest, North American environmental groups with a national or international focus also began

to see the boreal as a "conservation opportunity" of unprecedented scale. Buoyed by successes in previous forest campaigns, groups saw a chance to initiate a campaign *before* large-scale industrial development began. The campaign in the boreal was really a series of campaigns as a partly pre-emptive strategy to set the agenda on the boreal and frame the terms under which the debate would occur. The World Wildlife Fund (WWF) and the Canadian Parks and Wilderness Society (CPAWS) began public education campaigns that were geared towards achieving policy and/or negotiated solutions with government (WWF interview, November 5, 2008). In 2004 Greenpeace and Forest Ethics began campaigns that focused in on particular areas and/or companies and involved aggressive market/boycott initiatives aimed at pressuring major purchasers into revising their procurement policies (Greenpeace interview, November 7, 2008).

Campaign communications in these initiatives began with the "tried and true" method of attempting to pull at the heartstrings of the public by talking about the beauty of the place (CPAWS interview, November 11, 2008). As the public work of the Great Bear Rainforest campaigns was winding down, there was capacity in many groups to put towards other projects. The attempt to define the boreal as a 'special place' grew out of the momentum of the GBR initiatives in articulating the preservation value of that forest (Greenpeace interview, November 7, 2008; CPAWS interview, November 11, 2008). CPAWS initiated a 'boreal rendezvous' with famous Canadians[1] travelling the country speaking at large events. The problem was that it never caught fire in the way other campaigns had. According to CPAWS it never 'gelled' as a place. "It was too big, not as

[1] E.g. David Suzuki; Margaret Atwood; Justin Trudeau.

circumscribed as other locations you can go to, see, touch, taste, etcetera. You can't *go* there" (CPAWS interview, November 11, 2008).

In this sense, the boreal as represented in early campaign strategy was similar to that described by Braun above; namely, a space outside of production where nature functions more or less independently of human activity. The boreal was given as a new realm to be protected from human incursion, whose ecology posed absolute limits to global exploitation. What is of note in this instance is that this strategy seemed to have failed. Campaigners note that it was a 'hard slog' raising public awareness about the boreal, and that they tried to replicate their success in coastal forest initiatives to little avail (WWF interview, November 5, 2008; Greenpeace interview, November 7, 2008; CPAWS interview, November 11, 2008). The boreal is simply too large to be successfully billed as unique. The concept of ecological uniqueness is based precisely on rarity. The boreal is so large a geographic area that it gives no sense of seclusion from modernity, and cannot be announced to the public as a place *they had not known was there.* Rather, communications that aim at defining the boreal as special seek to redefine an already existing space, not introduce a new one. There is no accompanying sense of discovery, and there is no sense of the legitimacy of 'protection' by marking off a strict spatial separation between rapacious modern industry and untouched aesthetic solace. Since the boreal is too large to become such a space, it cannot be a destination. In Clayoquot in particular, a major component of environmentalist action was the ability to promote it as a place one might visit; indeed, the success of the campaign was in part both cause and consequence of the creation of Clayoquot as a tourist destination (Luke 2003: 103-107). No such possibility exists for the boreal. Some of the same reasons that

discourage industrial development contribute to this: the lack of roads, the distance and difficulty of travel, the lack of any developed infrastructure, and the absence of large, picturesque flora. The majority of eastern boreal is spindly jack pine and black spruce that typically do not live beyond 150 years and do not achieve a girth exceeding what one might see every day in cities.

These difficulties led to re-strategizing and rebranding the boreal with the caribou as a representative charismatic animal (CPAWS interview, November 11, 2008), although the function of caribou within this discourse became very different than similar representations in the past, as the focus evolved into a discourse around 'caribou country' as a 'climate shield' (Ibid). The inclusion of climate change for the discussion was crucial. Climate change was beginning to emerge as a key issue in global debate and in public concern, and linking the boreal to it became imperative in both the sense of generating public interest and in rethinking conservation goals. A CPAWS representative said: "we needed to get beyond 'innate' qualities – like in a Thoreau sense – and think of its value at the planetary scale. Think not only about biodiversity, but also how [the boreal] could shape and resist climate change" (Ibid). For them, there were two aspects to the campaign. First was achieving a comprehensive land use plan and planning process for the area. The second was the "revalorizing elements [of the boreal forest] beyond protection" (Ibid).

Protecting caribou was translated into the conservation of quantities of megatons of carbon per hectare of habitat. There are 25 billion megatons of carbon potential in unlogged portions of the southern boreal. Because of falling commodity prices, a higher dollar and general instability in the sector, much of this allocated land would not be

logged anyway. Therefore, not harvesting land that was planned to be harvested would result in money in the bank for companies (Ibid). There is, of course, an irony in all of this. Credits can only be obtained by deferring areas planned for harvest, so it would be poor planning (from the environmentalist perspective) that would afford the opportunity to do nothing for money. Barring other arrangements – particularly with First Nations communities – the land would generate income for the company while providing no jobs whatsoever for those in the area, and the land would be removed from production. That is, the fact that *too much* land was slated for harvest, under accounting models deemed inappropriate by environmentalists, is what allows the correction of these mistakes to generate profit. If planners in a given target district had done 'good planning', there would be no such opportunity for accumulation via exchange of carbon credits.

I'll point out two interesting things about this development. The boreal gained traction as a political issue within the context of a global debate. Virtually all Environmental Non-Governmental Organization (ENGO) representations of the boreal place it in the context of a global ecology. Appeals to nationalist sentiment were eclipsed by the force the forest had as an element within a global view of ecological responsibility (and catastrophe). Second, it achieved this also in the context of debates over political economy and ecology. It was not only through appealing to an international audience, but also to an international sensibility that the boreal emerged as a political ecological issue. The progenitors of the campaigns all noted the difficulty they initially had in presenting a compelling issue to the public (WWF interview, November 5, 2008; Ivey interview, November 7, 2008; CPAWS interview, November 11, 2008). Thus, the basic structure of argument changed around the boreal: from one proposing an external realm to be

territorially protected and a human relationship to the forest predicated on a bifurcation between two incommensurate realms (roughly, the natural and the social), to a boreal that is malleable and producible, whose nature circulates through social, political and economic circuits in an everyday fashion.

The Environmentalist Forest

Discussing ENGO discourse only in terms of its public framing of the boreal issue would be a mistake, however. Communicating the boreal as a political issue to the public constitutes only one facet of their political engagement in the framing of the boreal. Facing the difficulty of selling a public message geared around traditional (or at least tried and tested) discourse, environmentalists not only changed the message, but the campaign archetype that employed it as well. Since the 1960s and 1970s the public campaign has usually been the lynchpin of making change for environmental organizations; the guiding, operational reasoning was that public pressure or outcry would drive either government or industry to the table or to compromise. Significantly, in the boreal, this chronology was deliberately reversed by a coalition of ENGOs. Noting the difficulty in conjuring public interest or outrage in the boreal, environmentalists endeavoured to put the negotiations with industry at the beginning of the process (WWF interview, November 5, 2008; Ivey interview, November 7, 2008). Before the revised major public campaign was ramped up, negotiations on core governance principles were being worked out between representatives of ENGOs, forest and energy companies, and First Nations groups. It is important to look at the substance and process of these discussions as well as the public face of the campaign because it is in the agreements formulated in these negotiations that the boreal as a political-ecological matter emerges in

sharper contrast. That is, the boreal forest that is envisioned in the governance arrangements sets the stage for what it will become in both a material and semiotic sense. And indeed, this maturation into a political issue precedes its entry into public discussion.

The coalition that would undertake this emerged out of campaigns that were begun independently by the groups mentioned. In 2003 the Ivey Foundation, an Ontario-based environmental grant-maker, changed its environmental granting structure to a focus on forests (Ivey Foundation 2009). Along with this change in focus came a change in operations – rather than receiving grant applications from organizations and selecting those for funding, their model would shift to a more proactive one of seeking out organizations to fulfill internally determined campaign goals (Ivey interview, November 7, 2008). According to Ivey officials, this had a lot to do with the hiring of former executives from environmental groups who brought a campaigner's sensibility with them to the foundation. As a result, Forest Stewardship Council (FSC) certification initiatives – specifically those concerned with the Canadian boreal – received a further boost, as they became the priority of Ivey-led and funded campaigns. At the same time, US-based funders and campaign groups were turning their gaze to the Canadian boreal as well. Pew Charitable Trusts attempted to establish a new organization in Ottawa dedicated to the boreal, an effort which was shortly shut down in favour of their creation of the Canadian Boreal Initiative (CBI). The CBI was designed as a sort of clearing house for all efforts boreal and served as an umbrella organization bringing various sectors and interests together.

During the time that campaigns were starting to be established, the working groups had been developing the National Standard for FSC certification, beginning in

2000-2001, although research had begun a couple of years before that. On the ENGO and industry side, many of the participants in the development were the same, and the same groups were spearheading both initiatives. The shift in Ivey's granting focus explicitly favoured initiatives dealing with all sides of the FSC equation under the goal of fostering 'sustainable practice' (Ivey Foundation 2009) and building markets for labelled forest products. There was a growing consensus among institutional ENGOs that establishing FSC certification was where the movement would be able to make gains. In this sense, right from the beginning, the objective of environmentalists in proposing the CBFA was FSC certification as a de facto requirement for having forestry operations in the boreal.

Under the CBI, the Canadian Boreal Framework Agreement (CBFA) was conceived. The CBFA was the product of the negotiations undertaken with the goal of establishing governance principles in advance of concerted tenure allocations to forestry companies in unlogged boreal. In Ontario, for example, the 51st parallel is roughly the boundary of both forestry and the spatial limit of policy carriage – current regulations only apply to the Area of Undertaking south of the line. Thus, there was great uncertainty on all sides – environmentalists, industry, the Province – as to how planning or industrial expansion would proceed. Would they simply amend the existing government framework to move the line further north? Would planning proceed piecemeal, with areas being opened up one by one? Or would there be some new initiative? The CBI provided the impetus and space for the formation of Boreal Leadership Council (BLC), which was a collection of organizations and companies who were to negotiate framework agreement on the future of the boreal, to get out in front of developments in the boreal and to shape whatever process would emerge. Council membership was solicited through invitation by

the ENGO component of the Council. The Council is comprised of the following, by sector:

Sector	**Boreal Leadership Council Members**
Environmental Non-Governmental Organizations	• World Wildlife Fund (WWF) • Canadian Parks and Wilderness Society (CPAWS) • Ducks Unlimited Canada • Forest Ethics • Pembina Institute • The Nature Conservancy
Forestry	• Tembec Inc. • Domtar Inc. • Alberta-Pacific Forest Industries Inc.
Energy	• Nexen Inc. • Suncor Energy Inc.
Investment Institutions	• Domini Social Investments LLC • Calvert Asset Management Company • The Ethical Funds Company
First Nations constituencies	• Innu Nation • Dehcho First Nations • Kaska Nation • Poplar River First Nations • Treaty 8 First Nations of Alberta

The framework sets an agenda from the beginning, and telegraphs the goal of the campaigns and negotiation process. This is the sense in which, in view of environmentalist strategy, the boreal campaigns differ from previous efforts towards forest conservation. While the usual strategy is to agitate negatively against government or industry until they are forced to come to the table, in the boreal the goal was to reverse this process by beginning with negotiation. The point of this reversal was acceleration by eliminating the need to create ‘heat’ at the beginning of the campaign. Indeed, a

representative from CPAWS admitted that early attempts at framing the issue for the public returned disappointing results (CPAWS interview, November 11, 2008). The effort to agree on the goals with other players at the beginning of the process ostensibly reduced the necessity of public outcry. For the boreal, BLC members were defining a *solution* for the public instead of defining a *problem*.

For many groups, environmentalist strategy is characterized as "red light, green light" (WWF interview, November 5, 2008), implying groups that agitate aggressively against particular companies/activities who drive the companies into dialogue with 'softer' groups who are able to direct them into alternatives. During interviews, representatives from The Ivey Foundation and WWF characterized their approach, or the shift to this approach generally, as 'third way' environmentalism. While the allusion to the UK's Labour Party rhetoric in the 1990s was perhaps accidental, it nevertheless highlights a similar neoliberal turn. Rather than oppose current forestry practices outright, larger more conservative ENGOs seek a relationship that would see them in positions of power and partnership with industry. This stems from the conviction that practices can shift slowly and – at some point – instigate a "paradigm shift" (Ibid). In this sense, the strategy is meant to circumvent opposition. Working with companies for voluntary harvest deferrals counters government opposition to creating more protected areas as net economic losses. These groups characterize the movement as 'maturing' to a point where those companies in active partnership with ENGOs are recognized as being inappropriate targets for campaigning. One interviewee expressed it as both sides looking for cover; firms looking for 'green' cover in working with environmentalists; and ENGOs looking for 'brown' cover in the sense of having legitimacy with policy-makers by showing

successful collaboration with business – and thereby signalling their maturity in relation to their more radical cousins (Ivey interview, November 7, 2008). The calculus is in determining value for effort. As an Ivey representative put it: these committees "don't have ambitious workplans, but persist because there is mutual value for participants. Not for what they accomplish, but for public relations and government relations" (Ibid). In the third chapter, I take up these explicitly political manoeuvres in more detail.

For WWF, there is a "pyramid of performance", the pinnacle of which is eco-forestry. At the base of this pyramid are government and the regulatory floor. In terms of pursuing a vision, "starting with government takes us to the floor – takes us to competing interests, conflicts, short-term agendas and conflicts with long-term vision and need" (WWF interview, November 5, 2008). These provocative conflicts and oppositions are what stymie progress up the pyramid. Generally, they see government as providing the traditional role of authority to break such logjams; however the third way indicates that leadership can originate elsewhere, from environmental elites with the unassailable authority of ecological knowledge. In this view, without this common understanding of conservation biology as the basis for discussion, "planning would be a free-for-all" (Ibid) The focus on conservation biology is thus a strategy specifically oriented towards depoliticizing environmental conflict. The place of politics is only in the mapping of predetermined features – that is, the fight over the topographical entitlements of interests. "Mapping is a tool that depersonalizes" (Ibid), and therefore makes rational progress on ecological planning easier and less fraught. Channelling conflict into this depersonalized space removes obstacles to the sedimentation of the frames and 'regimes of truth' that ultimately determine the social composition of nature in the boreal.

The stated goal of the CBFA (2009) is “to conserve the cultural, sustainable economic and natural values of the entire Canadian Boreal Forest by employing the principles of conservation biology”. As a vision document, it mainly lays out broad, undetailed principles rather than concrete actions. It aims to accomplish this goal by setting aside 50% of the land mass of the boreal for protection and supporting “world-leading” ecosystem based management for the rest of the area (Ibid). Generally, this means FSC certification, since it is, as stated, the only program on which there is consensus within large ENGOs. Signatories to the CBFA commit to abiding by these tenets, but their practical meaning is determined elsewhere and through different political processes. As a set of principles, they are certainly wide-ranging. The key commitment the framework establishes is comprehensive land use planning for any development in the boreal. When speaking with representatives from the ENGO sector, they all indicated that this was the *sine qua non* of boreal protection (WWF interview, November 5, 2008; Ivey interview, November 7, 2008; Greenpeace interview, November 7, 2008; CPAWS interview, November 11, 2008). That is, the environmentalist discourse favours a process of ecological rationalization through which as many elements of nature become calculable as possible under a planning exercise where decision-making authority is constituted through ecological science. This is the framework within which commitments towards biodiversity conservation and enhancement, aboriginal participation/direction in planning, and the enhancement of the carbon sequestration function of the boreal can be pursued.

The acknowledgement of the ‘scientific’ necessity of setting forested land aside (and thus also the acknowledgment of the authority of ecological science in dictating

policy) led ‘naturally’ to ecological science as the basis for decision-making on where and how much. Thus, the development of more and more complex ecological models has proved to be a necessary factor for these sorts of agreements arising and being maintained. That is, the algorithms determining ecological health form the foundation on which politics can proceed. It is these determinations that allow the commensurability between environmentalist and industry interest. That is, the controversy is displaced to the realm of technical specialists.

The CBFA is the regime through which politics and its actors are framed in the boreal, and sets the governance structure under which policy will be developed. The FSC process is the mechanism of securing and implementing policy goals. The FSC is an independent, transnational organization that certifies forest products for identification by consumers. There are broad, overarching objectives at the heart of FSC; however, these get fleshed out specifically in the regional context. The FSC standards for the boreal region of Canada were developed through negotiations between ENGOs, industry, labour and First Nations – all drawing on the work and participation of ecological scientists – sorted into four chambers: environmental, economic, social and First Nations. These negotiations established the conditions under which harvesting may proceed and be certified with the FSC label. The FSC certification standards are unique in that they encompass the social as well as ecological conditions of harvesting. That is, they establish appropriate labour-relations, demand meaningful participation and agreement from aboriginal groups in forest planning, and ensure and enshrine the legitimacy and voice of environmentalist interests within the planning process. Certified forests are subject to inspection by FSC-contracted bodies, and companies must make chain-of-

custody data available, as they may have operations on lands which are uncertified, and mills, manufacturers and/or retailers may buy wood from both certified and uncertified sources. Chain-of-custody transparency assures only products proceeding from certified forests have the FSC label. FSC-oriented campaigning centres on exerting pressure on producers from both consumers and mid-level buyers, as environmentalists threaten boycotts of large retailers who then demand certification of their suppliers at pain of unrenewed purchasing contracts.

If the CBFA provides the background assumptions and consensus for what will constitute boreal politics in the present and into the future, then the FSC boreal standard provides the mechanism and authority for this management. The preamble to the FSC National Boreal Standard asks: "[i]s it practical for a single standard to embrace over three quarters of Canada's forests which are managed according to eleven different sets of laws and regulations" (2004: 23)? It immediately answers in the affirmative. In this sense the Standard is intended as a work-around for the tangle of jurisdictional bureaucracy that overlays the boreal as a whole, and seeks to create a single administrative unit for the purposes of the policy framework. FSC international sets out 10 principles of management, which the Canadian Boreal Standard deploys in creating the concrete policies pertaining to the boreal. Each of these deals with different aspects of forest management (Tenure, Indigenous Rights, Environmental Impact, etc.) and has detailed, itemized subsections laying out specific directions to certification applicants to fulfill, the verifiers that will be used to test or demonstrate compliance, long interpretations of intent for each principle and sub-clause, and definitions of contentious

terms. Adherence to these conditions and guidelines gets the applicant a label on end-use products at the retail level demonstrating ecological endorsement.

These principles and criteria constitute the basis for decision-making over the future of the region. The impetus for explicitly excluding the state (either provincial or federal) from negotiation was the plethora of provincial tenure rules which were seen as too cumbersome to permit integration. In this sense, the creation of a forest defined as a space transcending administrative boundaries was not only to frame the forest itself, but also to short-circuit the managerial and political nets in which it would otherwise be caught. Thus, a forest exceeding existing bureaucratic delineations emerges which is not only newly-defined in a material-ecological sense, but which is also 'empty' in the sense of not being overlaid with institutional jurisdiction. This boreal emerges as a definite space in conjunction with the emergence of the institutional mechanisms that are to govern it. I think this varies from other recent North American forest campaigns in a subtle, but important, respect. The politicization of the boreal exhibits a stronger two-directionality. Previous campaigns addressed institutional change by attempting to instigate a discursive shift in the framing of the boreal within the public imaginary. In the boreal, this shift in the definition of the boreal is achieved in large part by a concerted shift in the institutional terrain. Because of the reversal mentioned earlier, the boreal becomes governed before it really comes into existence as public, political issue. This is in contrast to Clayoquot, for example, in the sense that there dissent was mobilized around a contested representation of what the forest is and can be, and thus how it might be managed differently. In the boreal, the forest becomes imagined differently by first being governed differently. The re-imagination of the rules and organization of

governance takes precedence over the re-imagination of the forest. As discussed above in relation to the advent of sustained yield forestry, the governing of the forest not only changes the regime of truth within which it can become known, but also the forest itself and the human relationships with it are remade in the same process, toward the same end. The identifiable shift in the boreal I am pointing out here is therefore the extent to which environmentalist strategy, putatively a strategy of resistance, has become invested in the processes of centralized control that gave us the capitalist, modern forest in the first place.

Conservation biology is the driving logic behind their campaign initiatives (WWF interview, November 5, 2008). That is, ecological and biological sciences set the absolute, hard limits on what amount and intensity of human activity is permissible. This vision seeks to set ecology as the apolitical bedrock that frames any debate over governance. This movement of ecological rationalization is ironic in that it reveals itself to be remarkably anti-wilderness. In this sense, the boreal (still largely unindustrialized) is opened up to industrialization. In this modernization the notion of wilderness is denied in the excruciatingly detailed mapping and management approach evinced by environmentalist tactics of representation and production. That is, this is not the untouched nature preserved for its own sake. Rather, the boreal is managed according to a larger suite of ‘natural services’ which it can provide.

A key shift in the Boreal Standard in contrast to previous management regimes in the Canadian context is the discourse of *ecological productivity* that it emphasizes. While managers have always been preoccupied with the functioning of various natural processes in the forest, the subtle difference here is the management of nature as a

constellation of services (FSC 2004: 56; 60; 109). In this manner, all of the functions of the forest are to be stabilized, made objects of measurement and monitored. Other management regimes have adapted to taking natural *values* into account, but these values were generally incommensurate with one another. That is, each expressed a limit to the other. With the notion of ecological productivity, the entire field of value is expressed through the concept of *services*. The chambers of ecological and commercial (for example) have traditionally constituted limits for each other. Ecological 'values' constrain the spaces and practices available for commercial timber harvest, and are posed as conflictual. With the advent of ecosystem services, these processes provide goods whose 'circulation' is also the object of administration in the same manner as economic goods. In this way, we can say that it establishes a type of economy of natural functions that is unique in its level of integration. Why is this regime emerging specifically within the context of a framework designed to establish a label for consumer products? The communication of value that is meant to be embodied in the label not only requires stable chain of custody provisions, but also a stable set of ecological parameters that are demonstrably and unassailably secure from controversy.

For Rose, what we understand as 'the economy' is made possible through a vast statistical apparatus – inscribing, visualizing and comparing (2006: 102), and Asdal asserts that the management of nature follows similar tactics (2008: 127). In this sense, a stable arrangement of state, capital, *natural* science is the task of environmental governance. An economy of nature not only establishes a field or space of exchange between natural systems read as suites of services, but also facilitates their economic exchange. Thus the discursive production of the forest effected through its

compartmentalization into natural services is a component of the infrastructure needed for certain organizations of production. The next chapter examines this process in detail, and elaborates on the reciprocity between production and exchange and management technique evinced in the preoccupation with ecological services.

In both campaigning by large environmental groups and in the content of the formal agreements we can notice the constant push to gather the entire geographical region within a single political envelope (Baldwin 2004: 189). That is, prior to fifteen years ago the concept of the boreal existed only as an ecological forest type, but had no real, defined political or economic being. The effort, then, has been to singularize the forest, by taking the varieties of places which might each be described as boreal and include them in the synoptic entity of a single, unified boreal forest. Campaigns have achieved this in part through inserting it into the global climate change debate, thereby positioning a whole notion of the boreal within globalized efforts at ecological and climate management. This in turn posits a global environmental citizen/subject as the patron of the services the boreal delivers. There is a shift in conservation discourse that is worth noting here. The entreaty to conserve the forest for its intrinsic value, exemplified partly through appeals to protection of charismatic wildlife such as caribou, largely failed as a strategy in the boreal. Caribou only began to have force within the debate when a variety of functions were condensed within it – 'caribou country', as noted above, was a representation of carbon sequestration functions. The motivating image for the public shifted from a distinct natural *place,* to a functionally defined forest of discrete and measurable utilities. In this sense, the strategy of advocacy has moved, in the case of Canadian forest campaigning, from a politics of preservation built around motivating a

segment of a national or regional public in defence of territorial nature, to a politics of productivity by casting the boreal as an organic factory delivering consumable services to a global public.

As ‘best practices’ are the ostensible goal of boreal management (CBFA 2009), and there is little pre-existing framework of regulation or sedimented practice, what has been proposed for the boreal represents, at least in concept, an especially clear expression of creative environmentalist vision. The boreal does present us with a unique instance of a political-ecological grand vision in application that does seek to institute something different than previously seen in Canadian forestry and forest politics. As mentioned, the CBFA is more of vision document than a policy one; however what it represents is quite significant for the future of the region, and for environmental politics in Canada. First, it is negotiated without state involvement, and presents a plan negotiated between sectors beforehand that can be presented to government. The agreement sets out the parameters of a management program based on ecological integrity, with the productivity of natural functions becoming one of the primary considerations guiding decision-making. It embodies a remarkable consensus between what have come to be thought of as oppositional foes: industry and environmentalists. Even if the details are vague, that these groups could agree on the background assumptions and the epistemic apparatus of decision-making indicates a shift in the political terrain.

In all cases, I asked interview participants how the apparent consensus came about that permitted or encouraged this sort of conjunction between environmentalists and industry. None was able to give an answer other than that it had emerged independently of the boreal efforts (WWF interview, November 5, 2008), or that it was

simply the product of longer histories breeding comfort and trust between the parties (CPAWS interview, November 11, 2008). Two indicated that it was purely marketplace forces that constructed the consensus (Greenpeace interview, November 7, 2008; Ivey interview, November 7, 2008) – a thread I follow throughout this thesis. In any case, that this consensus exists indicates a general shift on both sides of the equation. For industry, it means a deeper and more explicit embrace of a sort of ecological capitalism (for those firms who participate). This is a change in the product they produce. The commodity with an FSC label is fundamentally different than the one without (I discuss this difference in detail in the next chapter). It is also a change to incorporating ecological science explicitly into their business (Tembec interview, December 19, 2008). Whereas previously ecological rationality was represented by state regulations that *limited* activity, this shift indicates an internalization of these rules to capital itself. For environmentalists it also signals an acceptance of an ecological capitalism as the unmoveable background for 'environmental progress'. Their principles are translated into the language of market exchange, and public involvement in forest planning is articulated in effective demand.

Conclusion

To sum up, the representations of the boreal come about through various forces. The materiality and history of the space of the boreal itself shape the representations that are made possible; but also, the movement and evolution of discourses of nature, control and social reproduction intersect with this material 'agency' of the boreal to create a forest that is constantly under revision and, indeed, production. The boreal is not passively produced and constituted through discourse alone. That is, we cannot think through the politics of this place merely in terms of how it appears to us in representation.

Taking seriously the materiality of nature means accepting that representations of nature are always partial (Castree 1995), against the claim that the materiality of the forest is accessible only through the regimes of representation constituted in the movement of contingent discourses (of capitalism, colonialism and nationalism). While this is a necessary insight, it is important not to overemphasize such determinations. Drawing on Castree, Baldwin asserts that the boreal can only be known and thought through the received categories which constitute it as an object of analysis (2004: 192). What this misses is the flipside of Castree's (1995) point: namely, that while nature is always mediated through the social-semiotic, the social itself is always mediated back through nature. That is, we cannot approach nature's – or in this case the boreal's – social construction as merely a causative factor in its production. In this sense, it is not merely language or epistemology that gives us a forest whose materiality we encounter within specific, contingent frames of reference. Neither is it that something of nature escapes representation – some objective, naturalist noumenal realm – but rather that we must attend to the dialectic in which the natural and the social are caught within processes and feedbacks of co-articulation and co-production.

The next section looks to the changing organization of production and the specifically 'ecological' character of capitalism that is developing in the boreal. We cannot productively demarcate structural processes determining regimes of green managerialism from so-called 'discursive politics' aimed at the production of knowledge and control of resources. Furthermore, such a division misses key elements of the development of discourses of the forest. This is not the emergence of a discourse untethered from material conditions of possibility. On the contrary, these technologies of

knowledge production and the management of life arise specifically out of the requirements of value production, and in the service of generalized accumulation. New technologies such as remote-sensing and satellite imaging for Forest Resource Information (FRI) data-acquisition have brought new realms of nature under the auspices of capitalist calculation, and have broken apart older categories and articulations of capital. The evolution of forestry as a practice has occurred through the development of an environmentality that relies on techniques bringing the logics of governmentalized ‘regimes of truth’ into articulation with the material processes of change within the human relationship to the forest itself and the accumulation of capital.

Chapter Two: Political Economy

For Castree (1995), prior Marxian attempts to come to terms with nature inadvertently maintained society and nature as silos brought into relation with one another (cf. Schmidt 1972). Against this, his interest is in preserving the 'materiality of nature'. In other words, he wants to do away with the notion of nature as a merely passive receptacle for discourse, but also to avoid a crude and naïve positivist naturalism. To this end, he elaborates a natural-social co-articulation or materialist dialectic. Capitalism produces natural conditions which enable and constrain capitalist production, are pertinent to understanding capitalism's sustainability, and which limit change. In forestry, the production of more or less monocultural tree farms was thought to enable an increase in the efficiency of fibre output of a given area. Planting a single species eliminated the amount of space of, and time spent dealing with, wastewood species. Nevertheless, this form of increasingly intensive production required stable mill infrastructure (as opposed to smaller-scale milling technology) which imposed limits on the form production could take – namely in the form of transport costs. Further, capitalistically produced nature also produces unintended consequences and crises which impede future production. As it turns out, the growth and dispersion rates associated with the cruder iterations of industrial forestry are significantly impeded by the disruption of pre-industrial natural regeneration. Age class gaps developed, as noted in the previous chapter, evidencing a decline in the *general* ability of capital to generate sufficient returns. Two things are of note in this process that are germane here. First, the silvicultural methods employed did not result in the regeneration of 'old-growth' forest archetypes, as there are significantly

more factors important to this regrowth than planting the appropriate species with an appropriate amount of time for maturation. The production of forests meant to be efficient and organized by the needs of capital produced a new forest-nature that would need to be restructured again to address the problems created by the previous management regime. Second, the specifics of the process were directed by the specific geographies implied by the production regime initiated. The farther away from a static mill a forester was to cut, the greater the amount or efficiency of fibre production would have to be. Hauling costs increase, thus either return or investment must increase or decrease in relative measure to continue the profitability of capitalist logging. Options are taking a larger fibre yield and innovation in the labour process at both the mill and the forest stand. This altered not only the human networks and flows of materials, capital, labour and energy, but also the character of the productive forest itself as this process progressed. In this, social relations and nature are always mediated through each other. In this sense, the forest is transformed according the capitalist processes and forces that produce it, but yet imposes itself on capital, which must adapt to the specific forms of forest-nature emergent. The properties of logs determine the products that are produced with them. They also determine the technological development and deployment that is enlisted in the service of the production of these commodities, and the sorts of economies of scale that are able to develop in that context. Thus, the forest itself is manifestly a force in the ongoing reorganization of social reproduction.

Real Subsumption

There is an analogy to be made between the differing emphases on the production of value in the formal and real subsumption of labour and that of nature. Under what

might be called the formal subsumption of nature, nature's use values are encountered and entered into production as inputs. Here, the emphasis is on extracting the maximum quantity of value in the form of *extensive* exploitation. That is, the transformation of nature within production turns on producing as much as possible, in absolute terms, out of nature. In the real subsumption of nature, capitalism acquires, on the one hand, a 'conservationist' tendency that slows the rate of absolute despoliation by acknowledging other capitals within nature. For James O'Connor, the advance of capitalism entails the degradation of its conditions of reproduction. This is a cost-side crisis, in that the deleterious effects of production cannot be infinitely borne by the community, and must be increasingly internalized into capitalist calculus (1998: 161). This is the moment when nature itself comes to be coded as capital. This entails the *real* subsumption of nature (as opposed to *formal*), as what was previously treated as an exploitable external domain is increasingly taken to be both the material *and* field of capitalism.

In observing the management of forests, we can detail the increasing subsumption of nature within capitalism. What does subsumption entail? On the one hand, in a material sense, the forest is increasingly produced in capitalistic ways. These include assessing growth rates and relative distribution of age classes by species. Traditionally, this has been the bedrock of calculation of the sustained yield approach to forestry. This entails maintaining a constant mean age of the forest as areas are brought under production in a cycle. Thus, as the last vestiges of first growth are being harvested, the first generation of second growth ought to be nearing maturity. Following on the calculation of growth rates, more and more aspects of forest-nature come to be taken up as capitals. This leads to an 'ecological phase' of capitalism (Martin O'Connor 1994: 56)

in which it acquires a preservationist tendency inasmuch as it ameliorates the worst excesses of capitalist predation on nature by acknowledging value in other sorts of capital.

The tendency of capital begins to shift from maximizing the processing use values external to it in nature to innovating both production and nature so as to increase or improve the availability of use values now produced from within a capitalist nature itself. Capital achieves partial control over the natural process by ensuring that desirable natural processes require capitalist production processes in order to function. In labour, machinery confronts the worker as the pre-existing conditions of material production. In a similar vein, capital can itself become the conditions of the reproduction of fully subsumed nature and/or natural functions. In the boreal, the productivity of natural functions is secured through their standardization through technical management, and their insertion into circulation through the production of FSC-monitored forest products.

The hypothesis that James O'Connor develops as his 'second contradiction of capitalism' is that the degradation of the conditions of production and reproduction constitutes a cost-side problem for capital (1998: 159). The crisis of overproduction is constituted out of the contradiction between production and realization of value (Ibid: 161); every extension of the extraction of surplus value from labour constitutes a potential demand shortfall for overproduced commodities. Short term solutions are of course market expansion and colonization, but capitalism is not just crisis prone, but crisis *dependent.* In this, crisis functions as a disciplinary mechanism by which capitalism opportunistically restructures and rationalizes itself, restoring its ability to exploit labour for its value-producing property. An ecological crisis is a crisis of *under*production of

capital. For James O'Connor, the contradiction rests in capital's tendency to degrade the physical conditions, i.e. material-ecological nature; the personal conditions, i.e. the physical, mental and social health of labour and the human's status as a biological organism; and the communal or general conditions of production, i.e. community, infrastructure and 'space' as it structures and is structured by human/environment relations. In the process of accumulation, capital is continually harming these conditions and crisis results in the emergence of a management regime, often by the state (Ibid: 166). In this way, O'Connor reads the state as a series of mediatory agencies intervening in the metabolism between the human and nature. Making these conditions the focus of planning and management brings them under politicization; therefore, capital's access to these conditions for purposes of accumulation is mediated through resistance in the form of new conflicts and social forces whose focus is around the conditions of reproduction, rather than the forces of production-proper, as in traditional Marxian theory.

I prefer, as an extension of this thesis, to read the real subsumption of nature through the lens of the refinement of capitalist production. With the introduction of machinery into generalized production in any sector, the tool of production is displaced from the worker's hand (Marx 1990a: 545). This proceeds through the further division of labour, but also through the unification of objective and subjective components of production, which are present in handicrafts or basic manufacture, into an objective whole. This is the process which provides the material conditions of possibility for the emergence of material science (or at least foundational modern mechanics) as we understand it, according to Marx. The capitalist must constantly strive to increase relative surplus value by introducing improvements to the instruments of production. The

objectiveness of the process of production enables a view of production as a sum of natural forces, giving rise to the now-familiar, detached, observational eye of science. Before, these instruments were the tool of the worker. In large scale industry, the worker is the tool of the instruments, hence its fully objective character. Here, finally, capitalism itself becomes the condition of possibility of labour. If we understand the real subsumption of nature as a similar movement, what was possessed by 'natural' provenance is now given over to capitalist institutions. That is, those elements of production which were appropriated by capital in the service of the production of commodities – all of the functions which allow the forest to be used – are made subordinate to capital.

'Community' resistance can serve as a foothold for the self-transformation of capitalism in this process (M. O'Connor 1994: 67). In capital's mediation of the struggle, nature comes to be coded as a series of capitals, and resistance is channelled into valuing and protecting one against the other. Thus, in the case of the forest, what might have been articulable to capital primarily under the rubric of a single commodity – fibre – becomes enmeshed in an expanding semiotics of valuation as new facets of the forest are brought under production. Since bringing new material under capitalist calculus opens and brings to light new obstacles, this process (at present, at least) is ever-expanding; it brings more and more within the accumulation process as further facets of life, production and reproduction become the object of capitalist analysis and calculation. Thus, the so-called ecological phase of capitalism entails the coexistence and co-articulation of both a predatory, exploitative form of capital's self-valorization along with a conservationist tendency. This tendency is evinced in the amelioration of the worst excesses of

exploitation through the acknowledgement of value of different capitals, hence the preservationist moment in ‘ecological capitalism’ (1994: 86).

Nevertheless, nature cannot be said to be the docile material of capitalist manipulation. Capital is not unimpeded in the production of nature and, as shown, encounters intransigent difficulties to which it must adapt itself. It is this apparent ‘agency’ of nature that Henderson theorizes through the lens of agriculture and the Mann-Dickenson thesis (cf. Mann and Dickenson 1978). Land and agriculture is often seen to present a problem for capital since land is neither mobile nor reproducible and usually entails a ‘high organic composition of capital’ (cf. Marx, *Capital Vol.* 3). The problem has been presented to be the large gap between the excessive time capital spends in production (without the application of labour) and its time embodied in wage-labour, high capital circulation-return cycles, and thus the minimal time capital spends producing value. The time of nature is therefore an impediment evidenced by the persistence or reintroduction of noncapitalist forms in agriculture (non-wage family labour, sharecropping, etc.). The same principle can be analogously applied to the forest. The extremely long rotation times for tree harvest (measured in decades) led Marx to conclude that forestry was less to become highly industrialized in the manner that agriculture was (1906: 274-282). However, the high organic composition of capital in the forest industry has afforded opportunities for investment in those temporal and natural gaps that tend to slow or prevent the swift circulation of capital. Silviculture, genetic breeding and means of accessing timber supplies in difficult terrain are just a few of the most obvious areas of investment that have been opened by the gradual industrialization of forestry.

Prudham (2005) provides a somewhat more concretely articulated example of this and of what Castree implies by social/nature articulation. Prudham's study of the diffuse and often contradictory processes of the real subsumption of nature in the Pacific Northwest forest industry provides a detailed account of the functioning of capitalization of biophysical nature in the form of the genetic manipulation of seed stock. In this, he provides a crucial example of the process of real subsumption and its historical contingency going back through 100 years of political economy, and, in presenting this picture, also elucidates the manner in which the ecological inscribes itself on capitalist organization. In this case, the 'obstacle' of tree improvement generated a highly *cooperative* organization of capitalist firms since the materiality of nature precluded the generation of an arena of capitalist aggressive competition or proprietary forms of research. That is, research costs, program maintenance and risk were too cumbersome for firms to adopt individually, and thus an alignment between individual capitals and the state (in the form of university research institutes) formed for the purpose of overcoming the difficulties tree genetics posed for accumulation (Prudham 2004: 122-124). Additionally, this points up time as a locus of investigation in the process of the capitalization of nature, and shows how it becomes the crucial focus of intervention into biophysical reproduction by capital, and how the temporality of nature inflects the forms of political economy which work around it and *through* it.

It might be tempting to read this as the intervention of capitalism at ever smaller scales of life, oriented towards addressing diminishing temporal 'gaps' in the realization process. That is, from the management of age classes of trees, we begin to see complexifying silvicultural techniques aimed at maximizing reforestation, and eventually

the manipulation of genetics within seedstock to manufacture a forest full of trees engineered to suit to their specific growing conditions (soil type and acidity, altitude, climate, surrounding vegetation, etc.). However, while this is the case, it is not *merely* an intensive colonization at diminishing levels of scale. Concomitant with these developments is the management of landscapes for their ecological functions and 'natural services.' Thus, management also expands extensively, taking in functions like carbon sequestration capacity, migratory bird nesting, wildlife movement, the progression of ecological systems through stages of change and imbalance, the production and reproduction of specific habitats over time, and many others. Whereas the production of nature has historically always been an incidental phenomenon (Smith 2007: 28), in the CBFA and wholesale FSC certification we see the form of nature itself become the object of planning and technique. The boreal cannot be the boreal without the management regimes securing commodification. I explore the implications of environmentalist participation in this project in the next chapter.

In forestry, for example, the production of raw logs out of minimally governed common forests moves into the management of forest stands, seedstock, and eventually cellular structure of trees. This has two impetuses: the first is reducing production costs themselves by rationalizing and ordering its materials. The second is the reparative costs of maintaining the forest as a condition of production; keeping it around as a support for the reproduction of labour and as an infrastructure for other productive activity. In this sense nature is wielded by capital to produce other natures as nature is refined to reduce friction in the production process. The material production of a capitalist forest, the maintenance of regimes of governance and knowledge about the forest and its

rationalization through itinerant processes of standardization, complexification/simplification create a forest whose character is increasingly tied to the machinations of capital, and vice versa.

To sum up, then, we might then be able to view a varied structure to the real subsumption of nature. From the point of view of production, material flows and inputs must be stabilized in the face of natural scarcities, capitalist over-exploitation and community resistance threatening accumulation. Here nature presents as an obstacle to be overcome. The intensifying entanglement between capital and nature occurs through recognition of the functions of nature for the reproduction of capital itself. From the point of view of reproduction, nature provides a new reservoir for the deployment of strategies of accumulation, and puts the means and modes of reproduction within capitalist control, further deepening the hold of capital over the supply and quality of labour power. Here nature presents as an opportunity for opening new vestiges of life to exchange value entailing the increasing penetration and involvement of capital in social and biological modes of reproduction. As accumulation threatens the conditions of reproduction of labour and the community, it must account for those use values that are degraded which, previously, were not immediately important for production. In this, it encounters new natural commons that can be enclosed and appropriated (Hardt and Negri 2004: 181). Thus, areas of life which people used to relate to directly through use value (as free gifts) become mediated through exchange. Every ‘natural’ obstacle that capital encounters to its circulation also presents an opportunity for investment in manners of overcoming it, opening new vestiges of life to capitalization and therefore to capitalist control (Henderson 1998: 114).

Fixed Capital

The rationalization and appropriation of natural production is investment in a form of fixed capital. The concept of fixed capital usually denotes the process of the circulation and exchange of capital across and through material objects and machines. As Harvey (2006) notes, objects can be used in a variety of ways but it is their *mode* of use that makes them fixed capital. The value of machinery as fixed capital, for example, is more complex than the value of the commodities it helps to produce. In the first place, there is the initial purchase price, its cost and price of production, which is determined by the amount of socially necessary labour time embodied in it. In addition to this, however, there is also the value the machinery helps to produce via its own productive consumption, which relates to the rate and degree of the transferral of its value to the products it is instrumental in producing. Lastly, devaluation occurs in relation to a variety of factors, as technological change and obsolescence contribute to determining its replacement cost. Thus, the lifetime of the instruments of production is a product of economic circumstance: when is it 'worth it' to replace it with either different instruments or more intensive labour power (Harvey 2006: 210-215)? Inasmuch as natural function has become deliberate infrastructure in both the generation of exchange value and in the reproduction of capitalist relations of production, it has become a particularly important form of fixed capital in a phase of ecological productivity.

Innovation in technology and in the deployment of fixed capital occurs in response to competition with other capitalists, and to improve the rate of surplus value extraction. However, there are myriad costs associated with technological change. First, retraining of the labour component of the productive apparatus is often necessary. Similarly, inexperience might lead to a lag time before new technology can begin to

outstrip that which it replaces. New technology often requires new infrastructure of various sorts, and possibly reorganization of the operation. And, ambivalently, it often generates resistance which can impose costs on production. But, the chief cost results from the premature retirement of other fixed capital which has been devalued in the face of emerging technology. The devaluation of fixed capital impedes further innovation by 'fixing' it in one form whose value can only be realized over an extended period of time. In this way, capital becomes captive to its fixed instantiation in a manner of speaking. This is why frequent revolutions in value threaten the value of unrealized dead labour (Harvey 2006: 220-223). The contradiction here is that capitalism is increasingly invested in the deliberate production of nature in which time is the principal obstacle, therefore 'technological change' in the organization of natural production impedes capitalistic elasticity.

With respect to nature, fixed capital is normally interpreted through the rubric of improvements to land (Harvey 2006; Mann and Dickenson 1978). In land we find not only the materials of production supplied by nature, but also instruments of production. In agriculture the land supplies the nutrients necessary for conversion into food, but also constitutes an instrument of production in that the production occurs partially *within* the soil. In this sense 'natural' functions that contribute to productive capacity imply an economic relation. Fibre yields in forestry, for example, are a relation between "natural provenance" and biological and mechanical technological development (Harvey 2006: 334-337). However, successive investments can accumulate and create more or less permanent improvements in production. In this, these improvements can create conditions which would amount to 'free' gifts of nature elsewhere and thereby *become*

free gifts. Nevertheless, nature as fixed capital in this sense can be devalued by advances in technology, changes in the spatial deployment of capital, or the degradation or rearrangement of transport relations (Harvey 2006: 228). The transport capabilities of water for raw logs were made obsolete by the emergence of different energy and transport technologies. The value and productivity of other natural functions can be affected by developments in other sectors: for example, other more plentiful sources are discovered and/or other more efficient manners of satisfaction of the use values they provide may be developed.

In the simplest sense, then, the value of any production of nature conceived as fixed capital is determined through several factors. The initial and/or ongoing price of production, including investments in both physical arrangements of second nature and investments in new or altered production processes. Next, the surplus value these functions participate in creating, in either the direct enhancement of efficiency in commodity production or in less immediate communications of value such as security, longevity, and reproduction of the labour commodity through their productive consumption (although these might become permanent gifts once they no longer communicate the value of their investment). Also, their value or rate of devaluation is determined by a variety of ‘external’ factors such as technological change or the discovery of more efficient means of producing natural functions. When is it worth it to replace one nature with another?

Improvements to land denote spatially discrete instantiations of capital. Indeed, it seems to be given in the very terminology that the fixing of capital requires it to present materially. However, it is not merely elements of nature, but life itself, that become

produced and in which value becomes “fixed” (Cf. Harvey 1998; Haraway 1997). The advent of biotechnology provides us with a particularly clear example. Here, life is “materialized as information” (Haraway 1997: 134) as the codes of biological and genetic construction are made the object of work, and wielded as instruments of production of new natures. The practices out of which nature emerges as fixed capital are in part material, but therefore also in part ‘techno-scientific’ in that the production of nature occurs not only as an investment in a material and social reorganization of nature, but also as an investment in manners of understanding nature itself.

Ecological Productivity

The discourses of ‘ecological productivity’ in boreal governance involve cataloguing all of the services provided by the forest across temporal and spatial scales. Here, the emphasis is not only on conservation of given natural qualities, but also the restoration and enhancement of natural *functions* providing services to society. Production-proper, under this regime, is to be organized around permitting and encouraging productivity in all of its guises – from the sequestration of carbon at the landscape level to the provision of site-specific reserves for biodiversity production to raw fibre output. The difference between this regime and prior ones is the switch between planning for the *conservation* of natural ‘values’ to planning that addresses itself to the *productivity* of these values. In this, industrial production is configured and conceived not through limits – either spatial or by degree of intensity – designed to *allow for* natural ‘services’, but rather as a process that operates within natural processes to *enhance and deliver* them. As Lefebvre notes, the innovation in late capitalism is that not only objects are produced, but the relationships themselves are produced. It is not only particular

elements of nature that are produced under the aegis of exchange value under ecological productivity, but the relationships among natural functions at differing temporal and spatial scales and human social organization that are produced (2007: 123). In this sense, capital takes on a truly 'ecological' character in a deep integration of industrial practice, technoscientific production and social-natural relationships. As noted, this amounts to a more deliberate and considered production of nature than previously possible.

In a certain light, it would seem at first as though it is a *disinvestment* which provides for this ecological productivity, inasmuch as this still requires keeping areas or elements *out* of commodity-production proper. However, we ought to view the investment here as an organization of nature and production which provides different benefits to capital as a whole. That is, what individual capital may encounter as a limit functions as necessary infrastructure for aggregate capital. On the one hand, this involves a reconfigured circuit of production and consumption, involving differing networks having the effect of keeping accumulation viable in the face of 'environmental' social pressure. As ecological productivity entails longer and more variable timeframes of planning and organization, this investment is in a form of production coupled with the deliberate production and reproduction of nature which circumscribes possible innovation for longer periods. That is, if capitalist organization in a given sector (or across sectors) is tied to the necessity of producing ecological productivity, this *organization* of production is limited in terms of the scope of change it can undergo without collapsing the reconfigured network on which the project of generalized accumulation depends. If we think of this through the concept of fixed capital, then the organization of nature itself

represents value imprisoned, as it were, within a very specific set of use values, which thereby confines the trajectory of capitalist development.

This both drives and is driven by the definition and compartmentalization of ecosystem services. The shift from prior models is from an accommodation of necessary ecological functions to an encounter with these services not only as costs or limits, but as components of a larger governable and productive apparatus. In this sense, all workings of the forest are to be monitored and managed in accordance with maximizing its delivery of 'natural goods'. Both negotiated framework agreements and the certification programs they encourage ensure this by installing monitoring and evaluation of natural service efficiency into the terms of reference for management. In the CBFA (2009) and the Canadian National Boreal Standard (2004), fibre harvest is meant to be integrated into (and not merely reconciled with) the provision of ecological services. The productivity of the forest in providing "a sustainable flow" of these services is the measure to assess the success of the management model. Investments in the natural "infrastructure" are an obligatory component of forestry tenure application. Indeed, management direction in the Standard poses forestry itself as an ecological force of natural change and equilibrium to be deployed in enhancing the delivery of these services.

The enormous complexity of assessing and monitoring this operation demands a similarly enormous quantity of scientific data production, which poses problems for both governance and accumulation. There is a dire commercial need for this data to produce reliable and stable objects of analysis, be they in the form of indicator species signalling overall ecosystem health or in the form of measurable carbon sequestration (Robertson 2007: 513). This planning requires entities with discrete conceptual boundaries, if not

physical ones, whose value is determined by function. In this case, the boreal can only be brought under a single map if it is composed of reconcilable units of analysis. Thus, for example, measurements of hydrological function at the site-specific level must be applicable across the entire boreal map, and indicators of health or productivity must be developed that can encompass and abstract all such processes across the entire landscape.

In order for this to occur, capital relies on an articulation between its logic and that of ecological sciences. Taking natural services into planning and commerce requires that ecology itself present this data in a manner legible to both politics and economics. Borrowing from Luhmann, Robertson asserts that these logical spheres remain structurally closed but operationally open (2007: 523). Positing not just spatial, but also processual nature in the forest as surveyable brings the forest into being as a space in need of management. The mechanisms and practices established to produce the knowledge that is necessary for, and in part constitutive of, its governability are those that work to establish the functional articulations between these logical spheres. Thus ecological sciences, in the boreal, is tasked with stabilizing the value and definition of the ecosystem services that forest management is meant to maintain, enhance and deliver.

But, as Robertson notes, “the difference between selling ecosystem services and selling loaves of bread is the legal and capital logics require information about ecosystem services that science *cannot provide* in an uncontroversial way” (2006: 378). In the boreal, negotiated agreements revolve around maintaining and measuring service productivity over the long-term. How to select, define and measure these functions requires decisions on the part of ecologists and analysts that, although they are presumed to provide expert information about the forest, require political guidance and/or

orientation. That is, ecological data can be produced in extreme quantities, but the usefulness or direction of this data is provided by the contours given by the needs of the frameworks that require it.

Planning for ecological productivity requires a reconciliation of a deeper variety of temporal and spatial practices of production and consumption. When looking at forest production, considerations ranging from microsites (a streambed within a given cutblock, for example) to landscape effects (e.g. National carbon sequestration) must be brought into relation with one another in a coherent and coordinated manner, with attention to recursive feedback effects traversing temporal and spatial scales of analysis. Thus, wildlife migration patterns, habitat creation and destruction cycles, hydrological functions and tree regeneration need to be coordinated in terms of their differing timeframes (year to year and across centuries) and from site-specific to the landscape-wide. These are coordinated precisely via capitalist production that makes the 'functionality' of nature an integrated part of the mode of production by maintaining it through the functionality of commodity production in the forest. As a means of overcoming the degeneration of the conditions of production and reproduction as discussed above, this strategy represents a strategy of integration of previously disparate and unrationalized productive practices. Harvey conceives of the built environment, in part, as a complex 'composite commodity' whose function or use-vale is the coordination of the uncountable practices and circuits collected in an urban centre (2006: 233). Perhaps I can stretch this concept to indicate the goal of the real subsumption of nature, reconciling nature itself and its space with production, and thereby producing a similar form of composite commodity.

It is of course possible that this whole process could become moot and merely collapse; that the expansion of forestry in the boreal will proceed more or less as it has elsewhere. However, there are several things militating against this conclusion. First, the scale of the reorganization and investment by Tembec, Alpac and Domtar has committed them to a process and model of production that would require accepting massive losses to change. For Tembec, the only company with whom I was able to speak, entering into this agreement has entailed deep internal restructuring. Committing to FSC certification "required [Tembec] to develop a workforce at the biologist and forester level", who had to "grow into the job" over years and years. All of their forestry plans had to be rewritten (each is thousands of pages and requires years of development) and "there was really a lot of retraining" (Tembec interview, December 19, 2008). In order for this shift to work, they required their staff to be the same through that time in order to gain credibility, knowledge and confidence not only within the organization but within new relationships that had to be built. Production processes at mills were reoriented to ensure chain of custody confidence, and clearly there was a substantial investment of energy in the policy and negotiation processes. Thus, production requires massive investment to function properly within a newly ecologized environment. However, at Tembec, sales and circulation were also radically altered: "we had to adjust to selling a different product. It looks the same, but it's a fundamentally different product" (Ibid). They had to work with sales staff as well, to ensure that the value of this product was communicated to clients. Relationships with certain clients were strengthened or altered, and they had to reorient their sales strategy. A reorientation in planning requires reorganization of many different circuits and pathways of realization. And this is not restricted to internal company

structure – rather whole clusters of commodity chains and the infrastructure supporting them are shifted at great cost. The production of ecological commodities both relies upon and creates new networks of exchange.

The Ecological Commodity

As limits are put on the absolute despoliation of nature a scarcity in "allowable destruction" emerges (Smith 2007: 24). In this case, the limitations imposed on the brute commodification of nature lead to the creation of an ecological commodity in the form of acquirable credits or rights to despoliation. While traditional industrial production regimes extracted material from nature for transformation into exchange values, a credit system allows degradation by purchasing conservation. Under a functioning credit market, this often works by paying to take valuable land out of production in exchange for continuing rights to pollute. Thus, someone generally receives a one-time windfall while the purchaser secures their operation in perpetuity. This advantage is compounded by the ability to reinvest surplus capital returned through the original investment. As Smith notes, the stock market, credit markets, and currency and exchange rates have always determined the shape and location of extraction, however with the advent of the ecological commodity this takes on a whole new dimension (2007: 35). Under a 'conservation capitalism' regime, choices over the social production of nature become more and more a function of class control rather than a social project.

The ecological service commodity is packaged, in part, with the traditional, visible commodity. Thus, especially in the case of FSC, it is purchased when the certified forest product is purchased. A part of the price of this product comprises the cost of the ecological commodity. In this guise, it merely represents an increase in the immediate

cost of production for the primary commodity, the cost of which is passed along and objectified in its price. However, it is also an instrument of production in that it reduces the cost of the production of other sorts of commodities. Thus, in the context of a carbon credits market, certain ecological functions paid for in the price of the forest product would reduce the amount of money necessary to buy credits to offset carbon emitted in production. Its value is realized when the latter is more than the former; that is, when the surplus labour put into producing the ecological commodity reduces costs more than it raises them.

As a condition of reproduction, the ecological service sustains life; natural functions do provide services to the community (however defined) that have enormous impact. Thus, consumers pay, in part, for functions that were uncosted previously. It has use-value for both production and reproduction – that is to say, for capital and for the paying consumer – however the cost of all of these is borne by the purchaser only. The consumer buys a product – a 'service' – which not only has a surplus value attached to it for the capitalist in the form of the disparity between the reduction and increase of different costs of production (where the former is larger than the latter), but also performs services for the capitalist herself for which she does not pay. In this manner, the capitalist receives a free gift from the labourer who pays for both. This will of course increase wages in the long run as the cost of workers' reproduction increases; however, value is extracted in that the use-value to the capitalist remains invisible and free.

To pick out one example, the production of habitat as a service for the maintenance of biodiversity evinces a number of functions. It reproduces certain historically determined conditions of life. Related to this, a certain status of forest

'health' has become a generalized need within society, which has been broken down into subsets of services (cultural, ideological, biological, and economic) it performs for a public. These obviously devolve into a variety of other commodities. As an instrument of production, nature is fashioned as productive force in the production of elements of other commodities. It does this in both a direct and indirect manner. Directly, it is implicated in the production of immediate consumables: a concentration of wildlife for recreational consumption, as either aesthetic objects to be appreciated through touristic practices or as objects to be obtained, as in hunting and fishing. Indirectly, biodiversity contributes to the *consumability* of traditional commodities produced in the forest. Its status as a necessary service establishes, in part, the conditions for considering other forms of value-extraction as services as well, since services from the forest are related to each other as commodities through their exchangeability. This reductive process of generalization allows commensurability between processes of industrial production and processes of 'natural' production. We then find capitalist logging practices implicated, counter-intuitively, in the *production of biodiversity*. Harvesting is now often explicitly carried out to produce *future* habitat; managers and foresters claim that enormous clearcuts are valuable secondarily (to the production of fibre) in that they create enormous areas of future biodiversity. As a condition of production, biodiversity functions maintains a continuity of conditions of traditional fibre production over time. In this it both contributes to the supply and stability of *objects* of production (trees, and their material-biological conditions of existence), and also improves the extraction of value itself. That is, an accompanying aspect of its production is the development of knowledges and technologies making other processes of production more efficient. Technologies making

biodiversity ‘knowable’ and producible are also the technologies facilitating processes of accumulation. An example would be Forest Resource Inventory (FRI) satellites which are developed to monitor the ecology of the forests for both so-called extractive and conservationist tendencies.

Conclusion

This chapter has assessed the articulations between planning for ecological productivity and the expansion of capitalism to new facets of nature. Where the first chapter emphasized the manner in which the forest comes into being through processes of management and contestation, this chapter has attempted to link those with a political economic analysis of emerging forms of the appropriation of nature by capital. The production of ecological services as commodities brings the production of nature itself under the aegis of the market. It will thus be consumption and the logic of the production and circulation of commodities that ultimately determines what kinds of forest-nature will be produced. Here, the retreat of the state gives capital a free hand to restructure nature ‘all the way down’ for purposes of accumulation (Smith 2007). The irony, of course, is that the specificity which ostensibly directs the project of ecological modernization – attention to specific and particular ecological and social conditions – is the very mechanism which reduces nature and ecology to a homogenous substance. The logic is the same as the reduction of labour forms to time. Under a regime of ecological commodities one function is exchangeable with another through the reduction to cost and price. Different use-values with the same monetary value or rate of surplus value are essentially identical for the capitalist, and natures reduced as such also become

indistinguishable from each other (Smith 2007: 25-27)[2]. Marx asserted that the generalization of exchange is what was necessary to relate specific productive practices with each other, through the reduction of labour to time. In a similar vein, the abstraction and standardization of ecological productivity can be seen as an attempt to bring the productive processes of nature into generalized relation with one another. That is, it represents a trend towards creating an abstract, universal conceptual and social plane across which different natures are homogenized.

For a market to function, the commodity needs a consistent identity across space and time, which is not subject to controversy among market participants. Thus, in part, it is the role of ecological science to provide the market in ecological services and in FSC-labelled products with this consistency and stability. In a society composed of structurally closed but operationally open logical/epistemological realms, there are multiple specialized knowledge systems, each with own standards of verity (Robertson 2007: 521). Natural science utilizes standards of falsifiable claims and reproducibility of findings, which are different from the standards utilized by the legal apparatus, which are different from those utilized by a market. Nevertheless, these realms require a 'translation' between them. A court sometimes requires scientific evidence, a market

[2] This is contingent on not only the economic commensurability of natural functions with one another, but also on the capitalist production of space. The concept of absolute space as conceived through Newtonian geometry can be thought through as historically contingent on the saturation of the social world by the commodity form. Thus, Smith (1984) argues that it has been the abstraction of commodity exchange that has produced the experience and reality of a homogenous space. This abstraction has a material basis, however, in that it is brought about through the organization of production relations. Once the commodity-form has achieved a sufficient saturation of conditions of production, it begins to restructure space itself. In this sense, space is both 'objective' and the product of social relations (Ibid). Additionally, space is a component of use-value. In order for the value of a commodity to be realized it must undergo a material change of place, according to Marx. Different concrete labour processes in different places must be brought together in the market. This is the spatial integration of capital, which links both spatially differentiated commodities and commodity production in abstract exchange. Thus, part of the commodity's use-value is constituted in its spatial properties.

requires a legal apparatus, and so on. Ecology itself materialized in the guise of conservation biology is given political form by ENGOs who provide the institutional support suturing the realms of capital and ecology. That is, this chapter has hinted at the fact that it is large environmental organizations that produce and support an infrastructure of articulation between these systems. The next chapter looks at this in more detail, taking up the question of the role of resistance in shaping the form of ecologized capitalism that is emerging in the boreal.

Chapter Three: Resistance

This chapter addresses itself directly to the question of resistance in the processes discussed thus far. Given the logic of capital accumulation in the subsumption of nature laid out in the previous chapter, what role do ENGOs and resistance more generally play in this reorganization? I begin with the tendency of capital to 'channel' resistance it encounters into forms amenable to it, and address the function of agitating for ecological values in equilibrating the cost of reproduction. I show that the organization of both 'large' and 'small' capital is affected by environmentalist market initiatives, which tend to encourage higher degrees of vertical integration and specific forms of fixed capital. I assert, here, that the form of capitalist development we can witness taking shape in the boreal is actually dependent on ENGOs as an institution. In this sense, rather than adapting, overcoming or succumbing to demands originating in the environmental sector, capital relies on this sector for a smooth circuit of realization. In particular, ENGOs evince an important role in the organization of consumption, and therefore in directing or shaping public desire. I address some of the contradictions in this relationship to the 'public' and assess consumption as a mode of political agency.

Resistance and Value

For James O'Connor, the state is a mediatory agency between human and nature (1998: 161). That is, the conditions of reproduction of labour (and thus capital) come under politicization in the guise of the state. As areas of life are opened to politicization by groups and communities, capital's access to these resources is mediated through political resistance. The degradation of the means of production for the capitalist is also

the degradation of the conditions of reproduction for the community: 'the environment' is the reservoir for use values reworked in production and for use values necessary for human biological and social survival (1998: 183). In the process of accumulation people begin to exert resistance when their means of reproducing community and social life are threatened. In campaigns such as those mounted recently with respect to the boreal, the state is largely – though not entirely – displaced from this relationship. Capital no longer has a sympathetic regulatory framework – a knowledge/power dispersion – through which resistance must often be channelled. In this way, capital meets its resistance head on.

Resistance, in this context, ought not to be understood as a separate phenomenon to a capitalist process that unfolds according to its own discrete logic. As it does in all such instances, resistance shapes the peculiar form that the organization of both capital and nature take under the regime of ecological productivity. In the case of forest product certification, environmentalist action contributes to the centralization and temporal entrenchment of individual capital by necessitating a high degree of coordination of both production and circulation. This has also shifted the logic of competition within the sector and worked to concretize new networks of exchange. What this points to is that the loci of contradiction and struggle are varied and ambivalent. For example, the future ecological 'functioning' of the forest is tied to the ability of environmentalists to effectively organize consumption, to the cost and availability of other ecological services, to the coordination of individual and aggregate capital, and to the ability of capital to circulate more or less freely through, and as, nature. Thus, nature's real subsumption,

while proceeding from logics of accumulation and realization, produces and is produced ultimately by a plethora of historically and geographically specific practices.

We might also ask whether environmental groups *are* in fact mechanisms of capitalist discipline, nevermind simply productive of *opportunities* for retrenchment. Martin O'Connor (1994), for example, argues that capitalism transforms and translates community demands into the advocacy for different capitals, thereby expanding capital's appropriation of nature. With the advent of strategies like the one being deployed through the CBF/FSC, it remains a question whether we can even speak of environmentalist demands being usurped or co-opted by capital, or whether we ought not to view ENGOs, in their current guise, as entities that communicate and mediate market demand for particular sorts of commodities.

The demand and price of these commodities bears on the price of labour-power, which is related to the cost of its own reproduction. In competition among capitalists to maximize surplus value production, there is a constant downward pressure on wages. Harvey claims there is an optimal, shifting equilibrium within capitalism between contradictory tendencies: the drive to keep the cost of labour-power as low as possible on the one hand, and on the other the need to keep labour adequately compensated (to prevent it from leaving the capitalist sector or to ensure that labour is of a high-enough quality) (2006: 244-256) For him class struggle itself can perform a function within this equilibration when it takes the form of struggle over the distribution of surplus value. If this is the case, it operates as a restructuring mechanism ensuring that labour trades at a higher cost. Thus, the struggle over real wages often represents a fight to ensure that labour trades at, or close to, its value rather than over the basis of labour's exploitation by

capital (2006: 54). In this sense, the struggle actually occurs in the labour market and represents a struggle over the price of production of labour. Of course, this is not to say that such struggles do not have profound import for people's lives or that such struggles ought to be abandoned. In this way, such market struggles merely mediate the more fundamental forces determining the value of labour power.

In an environmentalism concerned with 'greening' markets, resistance takes the form of disputing the market value of *commodities* in relation to their 'real' cost of production including all environmental effects (formerly borne by the collective). Here, they only mediate the more fundamental forces determining the value of ecological services – and their rate and intensity of degradation – instead of contesting the basis of this degradation. What is the value of maintaining or creating natural functions within current conditions of production? Forcing cost consideration of degradation performs a function in maintaining an equilibrium between the tendency to ignore the cost of reproduction to maximize accumulation for individual capitals and the necessity of accounting for this value in full to ensure reproduction. Thus, it aims less at a different relation with nature than at a more efficient industry. As a defence of reproductive exchange-values, environmentalism is necessarily tied to struggles over the shifting value of labour-power.

There are also competing tendencies towards (vertical) integration and disaggregation of production within capitalist firms. On the one hand, the value composition of a given capital *decreases* with vertical integration. Therefore, profit increases for individual firms, but there is no effect at all on the *aggregate* rate of profit across industry in general (Harvey 2006: 137-146). The centralization of capital that this

integration entails leads to technological change increasing the constant capital at the expense of variable capital. The disaggregation of production on the other hand constitutes a countervailing tendency. While centralization increases individual rate of profit in the short term, it also tends to lengthen the turnover time of capital. Disaggregation occurs in order to speed the rate of return, and also tends towards a technological mix favouring variable over constant capital. There is thus, according to Harvey, an optimal shifting equilibrium between these two poles of centralization and disaggregation (2006: 146). There are contradictory forces at play in this dialectic of fixity and mobility. On the one hand, excessive mobility disrupts established systems of support, which capital relies upon in the reproduction of labour-power. Capital that is too entrenched is, on the other hand, subject to community struggle and mediatory institutions that (potentially) emerge in specific locations over longer periods of time. At the same time, the increase in surplus value production enacted through investment in social infrastructures can outweigh the lengthened turnover time this also entails.

In discussing the deliberate production of nature as a suite of services, I have noted the contribution made to this production through processes of knowledge production. Thus, the making of the nature of the boreal through mapping and ecological science creates a discourse that works at constituting nature as a specific space of intervention and management. While I have elaborated some of the implications of a regime of ecological productivity and the ostensibly greened markets that accompany it, this regime itself (as an environmentalist initiative) bears investigation in its relation to the contradictions of capitalism. The strategy of using market pressures to achieve environmental goals has appeared to be remarkably successful in providing (at least the

opportunity for) increased profit in the short term for privileged firms who are the first to adapt to the new context. As the required centralization increases constant at the expense of variable capital, it is prone to diminishing rates of surplus value production. The long and varying time horizons in committing to ecologization of production entrench capital in the geographic region, which make it vulnerable to increasing wage costs by impairing its mobility and ability to invest in different production practices. The strategy would only seem to function in the transitional phase of shifting *to* an ecologically organized production because it relies on the differentiation between firms participating in certified production and those who are not.

Innovation in a sector supplying materials necessary for production in another sector would lower the value of those materials across all sectors. Capitalists choose technologies within the context of a market where prices are set by circumstances out of individual control, but individual decisions affecting productivity can affect production across all sectors. In this manner, we can see how particular choices can bring about generalized contradictions. In the context of ecological certification it works in a converse manner. The adoption of ecological standards by one firm entails *raising* the costs of production (for individual capitals) across the sector while still remaining vulnerable to changes in value in other sectors. The innovation to environmental performance by one firm establishes a common market and circulation infrastructure required of all competitors. If we look at the ecologization of capital as the communication of costs of reproduction to the consumer, we find that not only is the cost of the reproduction of the specific labour needed to produce the commodity transposed to the price, but generalized reproduction is also conveyed through the certified product.

When the cost of ecological services is passed on to the consumer not in the form of a purchasable commodity, but rather in the form of an addendum to another commodity, capital ties the availability of necessary services to the fortunes of specific commodities, which are only producible through a given production-nature network. Especially in the case of less immediate services not amenable (for now) to direct individual consumption such as an adequate calibration within the carbon cycle (as opposed to the provision of clean water, for example) capital faces a generalized social need which must be borne by a limited number of individuals purchasing the end commodity that this need is tied to. Given this, capital is locked into a very specific set of patterns and practices and must continue to produce the commodity to which the costs of ecological services are tied or the investment in nature as fixed capital is lost or critically devalued.

The Organization of Production and Consumption

In the boreal, ENGOs have begun to play a defining role in the organization of capital by working to 'green' the market for fibre goods by more fully and explicitly incorporating environmental concerns into the economy as described above. This attempts to both enable consumer choice between easily identifiable 'green' and contrastingly 'brown' goods, and also to ensure that access to capital by competing firms is partially determined through indicators of environmental and social performance. In resisting the depredations of capital through the (attempted) establishment of 'greened' markets, environmental resistance performs several key political economic functions. The tradeoff for environmentalists in securing protection is ensuring long-term investment and relative concentration of capital. By instituting parameters of investment that demand longer time horizons and greater spatial integration of planning, capital becomes

committed to longer term realization through the increased investments in longer term ecological productivity of the forest. Nature itself is created as a production network whose transformation would entail great expenditure and/or premature devaluation. The parameters of investment require a centralization of capital in that production processes require, in part, vertical integration in order to maintain control over varying stages of production, and to achieve a chain of custody through which the value of the of this ecological productivity is communicated. While we can observe a trend in Canadian forestry towards subcontracting and disaggregation, this trend is reversed in those companies embracing FSC certification in coordination with environmental groups. The more hands involved in production, the less direct is the means of communication of ecological value to the consumer. The end product must also be unambiguously linked with the practices of an identifiable producer. That is, the affixing of a single label to a variety of practices relies in part on these practices being highly coordinated, usually requiring a high degree of integration and centralization of production. Further, having clearly defined end products to which to affix the label limits the possibility of diversification of production, and thus the opportunity and scope of disaggregation.

A market ‘greened’ in this manner does not operate solely to transform the end-products of forest production; it also shifts the terrain of capitalist competition to include environmental performance, since this establishes conditions for access to capital and thereby for continued investment and expansion. If poor environmental performance generates the risk of disruption of the circuit of realization, then it becomes easier to raise capital through the management of this risk. The strongest point of influence is thus not at the point of realization with the end consumer, but at the point of investment at the

beginning of the production process (although leverage at one end requires leverage at the other). The ‘stick’ in this equation is constituted less out of the ability to materially interrupt the consumption of a given company’s commodities at the point of purchase (through boycotts, for example), and more in the ability to generate a climate of uncertainty problematizing the acquisition of capital from investors. Here, the competition is not to race for technological innovation permitting more efficient extraction and production; rather, the object is to blunt this competition through instituting a competitive mechanism turning on the communication of additional value in the final consumable commodity.

For corporate adherents to FSC, there is an interest in maintaining high standards, since it makes certification inaccessible for their competitors and ensures equitable and stable access to a particular market for ‘ethical’ forest products (Tembec interview, December 19, 2008). However, this is one of its ambiguities as well, as the power of the label relies on the contrast between the practices FSC endorses and those it excludes. Although environmentalists have the ostensible goal of greening the entire forest products market, it is unclear whether this is possible with the mechanism of FSC as the mechanism relies in part on the distinction between ‘green’ items and their ‘grey’ or ‘brown’ counterparts. Would a market that is entirely green then lose its ‘colour’? In this sense, FSC would function as a cost-internalizing mechanism in which it seeks to increase attention to the ecological and social costs associated with the production of traditional forest products. Creating a market for FSC-certified goods allows producers to adhere to more stringent protective measures while communicating extra costs to consumers.

Success in the boreal, according to WWF, will be measured in sales of FSC products and not in overall land conserved (WWF interview, November 5, 2008). This is because the mechanism on which the initiative is based is precisely the market in certified wood products. The boycott campaigns and more confrontational tactics have wrought a general desire in the public for something different. This desire is evidently expressed through the desire to purchase 'greener' products. This consumer desire is seen by ENGOs as the key drive for change within the existing system (WWF interview, November 5, 2008; Ivey interview, November 7, 2008). Nevertheless, packaging 'greenness' as a commodity to be sold is not a simple process. This commodification must create a product that is exchangeable and stable. As in classical economic models, consumers must have as much verifiable information as possible to make the choice of greenness a rational option. Thus, 'greenness' as an item must be guaranteed by standards, to measure it against other products. In this case, it is ecological science and conservation biology that provides the consumer with confidence in the item. The chain of value must be demonstrable; the "value must be carried down somehow to the consumer" (WWF interview, November 5, 2008).

Further, institutional NGOs must be able ensure the security of the investment against destabilizing forces. In this case, for example, they must be able to prevent or dissuade other environmentalists from targeting invested firms. If the benefit of entry for capital is the value derived from the management of risk as opposed to its evasion, becoming the target of other environmentalists both confuses the integrity of the end label on the commodity and defeats the security achieved through entry into green market institutions. In this guise, NGOs must be able to efficiently and effectively organize

consumption into appropriate patterns. In this sense, institutionalized environmental organizations are an essential component of capitalist ecological production.

Boycotts and a growing squeeze on the regulatory side forced industry to try to *manage* these factors rather than push back against them obstinately. As an Ivey representative noted, the sense of general risk and insecurity (from multiple directions[3]) was environmentalists' best tool in drawing companies into a discussion space framed through ecological modernization (Ivey interview, November 7, 2008). For both ENGOs and business, a process of planning for conservation within an already productive forest is much more difficult than such a process addressing itself to one that is not. In this sense, it is certainty and stability for both 'sides' that provides for a common arena. For industry, this means the stability to operate in and plan their allocations without the threat of having areas subtracted at a later date for conservation. For environmentalists, it means something similar: the ability to guarantee conservation objectives without the ongoing uncertainty of the campaign environment. For both the ENGOs involved and the forest companies, the potential for haphazard development in the boreal was something to be avoided. For the latter, who knew a boreal campaign was in the offing, it meant the ability to secure a stable climate in which to do business, even if it meant concessions in overall size of allocations and other alterations to production (Tembec interview, December 19, 2008). This constituted a sort of pre-emptive defence, as well as an opportunity for advantageous positioning in relation to competitors in terms of both market and political considerations; the former in the sense of capitalizing on emerging 'green markets' for forest products, and the latter in the sense of building clout and

[3] In the form of successful boycott campaigns; buyers adopting 'green' procurement policies; a growing sense of momentum in First Nations land contests in the courts; and, stronger regulations coming down the pipe.

legitimacy as actors within policy and governance processes. According to Tembec representatives, this was a lonely endeavour. The industry associations were not supportive, and governments looked askance at the initiatives, wary of outsider attempts to rewrite forestry laws (Ibid). What makes this somewhat unique, then, is the alliance struck between a few companies and non-traditional partners. Not only the success, but also the functioning of its business relied in new ways on environmentalists and First Nations organizations.

The elevation of consumption through the FSC/CBF mechanisms as the appropriate political arena for the boreal has several important, lamentable consequences. First, it establishes both legitimacy for the actors already involved in the process, and the tools for assessing this legitimacy. This makes interventions that do not line up or articulate with the set terms of reference much more difficult, and constrains politics to the appropriate management of the resources established and produced through the agreements. Thus, environmental organizations with expertise in determining ecological consequences have their authority stabilized and protected against controversy. Pressure for change from any ostensibly environmentalist direction must then be channelled through established organizations – in effect a quasi-corporatist structure, since environmental coalitions retain the ability to exclude others within their sector if they do not support the overall policy direction agreed to. This depoliticizes the grassroots of environmentalism. Here we find a foreboding contradiction: the strength of the movement has been predicated on its organizational capacity and history of citizen activism. Current structures tend toward making activists into client-volunteers, as larger groups encourage people to involve themselves in environmental advocacy only under

the general supervision and direction of existing campaigns. Thus, capacity is centralized, and independent organizing is made more difficult for the monopolization of the political field by large organizations. Clearly, this poses a problem not just for the vitality of the environmental movement. Democracy itself as an operating principle is effaced in this formulation. That is, the rules by which the boreal will be governed have been determined in advance, behind closed doors. The public only has input at the point of consumption, and cannot be present as participants at the point of determination. Thus, again, we find an established political structure whose contours have been contested by only a very limited suite of actors. In this case it is not even possible to argue that expertise and knowledge excludes members of the public, since even if they possessed these they would not have been admitted to the policy-making process. Further, there is an issue of re-establishing power at the centre at the expense of the periphery. I want to be careful not to overstate or reify this distinction; however it clearly exists in terms of the ability of communities actually in the boreal to control their own politics. In this sense the centres of consumption are positioned as the determinate factors in the governance over the lives of those who live and work in the forest itself. In this way, the solution does little to empower or engage communities (Shaw 2004). More worrying is the prospect of recognition of First Nations claims over territory and political standing being (*de facto,* if not *de jure*) contingent on the sale and purchase of commodities with a specific, affixed label. In this move, a whole history and politics of indigenous struggle is displaced onto the commodity. Solidarity is established through a link within market exchange, and in this sense indigenous subsistence and community health becomes materialized in a commodity for purchase by the far away consumer.

Publics and Consumers

There is a confusion about the role of the public at large in the discourse of environmentalists. On the one hand, ENGOs claim to represent the public within policy-making processes. On the other, the public is the audience to be convinced. Their concern must have a viable outlet in the form of a commodity that addresses this particular societal need. It is a need on several levels. On the one hand, it is materially evident that degradation due to forestry has reduced the productivity of the now-defined 'natural services' and that production must change to address this. At the level of the individual subject, the desire for change must find satisfaction in something. The solution has been to manufacture a commodity that can be purchased. Thus, the role of the public in the boreal campaigns is to generate a sense of palpable desire and to be willing to translate this desire in sufficient quantities into consumption. According to ENGO representatives, the manner of public participation in the past (open houses, public consultation windows, etc.) was not precise enough to address the problems. ENGOs provide the "precision of public voice" (Ivey interview, November 7, 2008) to accomplish these goals. In this sense, the desire must find its satisfaction in pinpointed commodities. According to them, this results in a new, desirable form of competition among companies who must distinguish themselves based on environmental performance. This shifting organization of consumption affords ENGOs the ability to offer value to industry. This market cannot exist without continued activity of ENGOs, and they are the ones who are able to ensure the communication of value down the commodity chain from the forest itself to the shelf in Home Depot. Advocating for the *full* incorporation of the environment in the capitalist economy is a manner of ensuring that there is a commodity for each environmental 'good' (Ibid). The public, then, exerts its will in the arena of the marketplace and relates

to nature only under this aegis. This is the reduction of difference to preference (Lefebvre 2007: 396; Robertson 2007: 520).

Indeed, ENGOs have begun to make a distinction between 'consumers' and the 'public'. Consumers are those who have the power to move companies, while the public is only effective (in the value for effort calculus) at influencing government, and occasionally companies with a high public profile. "There is no intersection between logging companies and the *public*" (Greenpeace interview, November 7, 2008). Because logging companies do not have the same presence with the *public* as major brand names, they reason that *consumers* are the key to moving those companies in the desired direction. In the case of the boreal, the market pressure tactics targeted Kimberley-Clarke and the Kleenex brand at the level of the individual consumer, and targeted several 'key' offenders at the level of major client-purchasers (newspapers, large retail chains, etc.) (Ibid). This is the bifurcation that enables a discourse of the public as both motivating force (environmentalists represent the 'will' of constituencies for change) and producible target (environmentalists convince consumers of the benefit of certified or endorsed labels/products). ENGOs, in this sense, are actively short-circuiting the link between a public and private enterprise. That is, instead of politicizing the economic they are economizing the political. The goal of planning is not to open space for public determination of the use of boreal nature, rather "the goal is complete incorporation of the environment into the economy" (Ivey interview, November 7, 2008).

The various approaches of ENGOs to achieving this incorporation converge in the goal of a comprehensive planning process. That is, every group cites comprehensive planning as an eventual goal of their efforts. In this sense, the reconfiguration of the

market and consumption patterns is designed to support the technical management objectives. Thus, not only does the governmentalized planning shore up the infrastructure necessary for the circulation of ecological services, but this work in reconfiguring production-consumption networks produces the political space of technoscientific ecological rationality.

When asked about obstacles to the success of the effort in the boreal, interviewees explicitly identified the incompleteness of the science (WWF interview, November 5, 2008; Ivey interview, November 7, 2008; CPAWS interview, November 11, 2008; Tembec interview, December 19, 2008). One of the largest problems is the difficulty of creating an ecological plan that encompasses the whole of the boreal and not just specific regions. That is, the operation of the management, market and governance will be smoothest when the entire forest and its functions can be calculated. Here, some identified scale as a problem. The 'raising up' of the boreal above all jurisdictional boundaries relies on the ability of ecological sciences to provide a viable and stable space for calculation. "The solution cannot be piecemeal" (Greenpeace interview, November 7, 2008), and thus a single, unified, centralized process relying on standardized and stable information must be produced. The problem is the production of stable objects and measurements for counting. The necessity of incorporating climate change, for example, implies the ability to accurately and consistently produce an arithmetic around carbon production and consumption that is quantifiably relatable to other arithmetic dealing with hydrological and biodiversity functions. How do we produce knowledge about the forest that is complete and standardized? How do we make every possible function exchangeable with every other? In short, how do we produce a fully (subsumed) capitalist

nature? The answer to this, in a more general sense, is that at the present moment it is impossible without ENGOs, or, at the very least, ENGOs are not merely incidental to the current trend towards this.

Conclusion: Possibilities and Openings

What possibilities might be latent in ENGOs participation in capitalist accumulation and comprehensive planning for ecological productivity? As Shaw has noted (2004), environmental movements have shown remarkable resiliency and creativity in the face of difficult circumstance. The campaigns in the boreal thus evince, for better or worse, a traversing of traditional political boundaries. Alliances are forged in unexpected ways and with unexpected partners and new areas of politicization are brought to bear on an intransigent tendency towards industrial exploitation. In this, environmentalist have shown the wherewithal and ability to create new institutions where old ones proved insufficient. This demonstrates the remarkable strength of highly organized NGOs. In this sense, that environmentalists are engaging in *productive* and not just *protective* campaigning signals the capacity of organizations to create different circumstances of social nature. Also for better or worse, these campaigns have been able to mimic the corporatization they aim to fight (Ibid). This has clearly led to the depoliticization of the grassroots as discussed above, and contributes essentially to the project of ecological modernization. However, it also might evince a strategic flexibility and elasticity to counter capital's expansion to new vestiges of life in an era where capital is able to move at incredible speeds and with incredible self-transformative agency. Whether such a structure is *necessarily* inimical to an anticapitalist environmental project is still a matter of debate. Further, even though we can read the anticipatory environmentalist boreal as an extension of the logic of capitalist accumulation, it does

nonetheless serve as an important highlighter of the contradictions within *existing* capitalist forest production.

Ideologically, nature has been most commonly defined by its defenders in the North American tradition as the outside of modernity, and as something to be experienced, traveled to, 'preserved,' or purchased. Nature in this gentrified form becomes less a material of production which might support human livelihood and more an object of consumption in the form of image and affect. As both Luke (2003) and Sandilands (2003) assert, the preserved aesthetic forest is as much implicated in regimes of production and consumption as the forest exploited for raw fibre. In this sense, 'nature' is conserved only to be more fully and thoroughly inserted into capitalist circulation. Thus, environmentalist interventions at preserving wilderness can be read not only as responses to the steady encroachment of capital into new territories, but also (or perhaps more preferably) as movements asserting the value of, and representing the shift towards, new sorts of commodities.

If the notion of nature in the boreal is indeed reconfigured away from the pristine and primordial as I claim, I view this obsolescence of the wilderness model as a positive development despite its replacement with strategies entailing different problems. Thus, despite being implicated, in the manners I have discussed above, in a process of capitalist expansion, boreal campaigns do bring the forest into a more direct relationship with the social. This is achieved in problematic ways yet, nevertheless, it does serve to break down or complicate the romantic ideology of nature as external and primordial. The natural services rendered by the forest make it into an object very much present and spatially integrated with wider political discussions. In this we might follow Latour

(2004) in averring the contribution of making the boreal into a tangled, political matter of concern rather than a static matter of fact. Inasmuch as the boreal has failed to obtain as a classic aesthetic object, environmentalists have been forced to begin to strategize how to bring the boreal to the city. There are of course many cautions to pay attention to in this move: the disempowering of local communities, the making of citizen-consumers and the construction of a new bourgeois nature among them. However, the move also opens new possibilities for imagining the production of a different social boreal. This is possible, but not at all necessary. In this sense, making the forest immanent to people's everyday practice at least renders the boreal more present within the social and creates at least some of the conditions of possibility for a more social(ist?) understanding and practice of consumption and production of the forest.

Critics (Cf. Wilson 1998; Soper 1996) following this line seem to be engaged in a project to re-appropriate nature in the 'now' as opposed to the 'then,' as well as in the 'here' as opposed to the 'there.' Thus, in opposition to the discursive move of making nature into the a-historic ground which humanity has despoiled through their march of progress, these theorists are concerned with removing the romantic nostalgia and refocusing us on a project of thinking through natures without this reflexive recourse to nature-as-lost or as-forgotten. However, thinking the politics of nature through the line between capitalized and uncapitalized, and the traffic between them, re-inscribes the boundary of capitalism as the limit of nature itself. This limit seems to articulate, almost always, the before and beyond of capitalism whereas the ostensible trajectory of the critical theoretical project seems to be how to think nature in the after and within.

Resistance seeking to preserve any sort of ‘first’ or ‘prior’ nature is no longer practicable, if it was ever desirable. This is the peculiarly ambivalent position of the environmentalist. On the one hand, she has become the driving force in the commodification of ecology through the insistence on, and advocacy for, the production of ‘natural services.’ On the other hand, in precisely these activities, the environmental movement has generated the possibility of conceiving of and practicing resistance as *productive*. As capitalism has moved to extend production across the entire field of nature, it has also reorganized the dispersion of relationships constituting nature. Since nature is produced precisely through human activity, we can read this production through an altered regime of labour. This presents opportunities for a more social production of nature, since nature’s production is brought into even more facets of social life. Of course, this is merely a potentiality – the arrival of certain conditions of possibility – for such a socio-natural productivity. This potential is, at present, frustrated by nature’s reduction to homogenous substance through its insertion into the market (and ostensible removal from the social-proper) under the aegis of capitalism.

In Smith’s view (1996), consumption has taken the place of production as the discourse of world-making and politics. That is, the consumption of commodities determines our relation with each other and with nature. It is capitalism which installs the possibility of the mirage of autonomy from the natural world, in which the control of nature is taken for granted. Nevertheless, Smith rejects both this discursive distancing of nature as external to sociality, and the ‘seamless union’ of the human and natural as both discursive tools of capitalist alienation. As a counterpractice, he advocates – along with Alexander Wilson (1998) – putting labour and human work at the centre of nature. He

prefers a more thoroughly political project than Wilson though, asserting the need for a real concomitant transformation of social relations and attention to the creation of something new, rather than merely bringing the 'old,' 'forgotten' or 'excluded' back in. For him, the production of nature is thus a process of both material and conceptual construction, and production is both cultural and economic.

As Smith notes, production is not the same as control – or the myth of control. Further, I do not think it's necessary to think this notion of the production of nature with an idea of nature as the *product* of this production. The second question is whether this concept of the production of nature ultimately implies a 'transparency' of production which is impossible to achieve, given that there seems to be something about 'nature' which will always escape its appropriation within human production or sociality. I understand transparency to mean a sort of alignment of nature and production – perhaps a nature that is fully immanent in the sense described above. If the first question is whether a fully immanent production of nature is something we ought to hope for, this second one is whether it is even possible. Can 'nature' – however we produce, conceive or interact with it – ever be fully 'here' and 'now?' Perhaps we can think of this incommensurability as a function of our attempts to apprehend nature through the geometrics of capitalism itself. In this sense, there is always 'something' which eludes our grasp (of instrumental reason), but rather than continue to think production as mastery, we might think it through as activity which is the condition of possibility of knowledge, but also as *nature itself.*

With this in mind, I agree with Negri (2005) that if there is hope in the subsumption of capital by nature it is precisely because nature appears to us as

humanized once again. For him this begets the possibility of relating it once again to the class struggle. In this sense, capital has restored the possibility of nature to us, and has made it into a machine – now it is up to us capture this machine and take control of it. Indeed, the fate of capitalism is more intensively tied to fate of nature, rather than less. Its impetus is two-fold: first, to subdivide and complexify in order to provide new areas for enclosure and investment or what authors have begun to call ongoing processes of primitive accumulation. The second is to generalize and universalize the modes of definition and standards of measurement by which diverse elements can be apprehended.

With the emergence of this contradiction, NGOs have repositioned themselves as a necessary component of both production and management, becoming functionally required in order for traffic in ecosystem services to proceed. They provide an organizational function in managing and pacifying information overproduction. Of course, this goal has been latent all along – the assertion that ecological values ought to be a mandatory part of any policy or political discussion of import. The administrator's forest c*an* be the naturalist forest, if only by positioning the naturalist herself an administrator. NGOs provide the framework within which the mapping exercise itself can proceed by translating conservation biology into a practicable regime of rules and procedures. Thereby they aid in defining and standardizing the services to be rendered by the productive forest. They thus convert information into a form usable and reconcilable with a spatial and temporal model of accumulation. Since the debate over how the boreal ought to be conceived and managed is largely completed in the private setting of closed door sessions between large players, politics becomes the creation of the map. Indeed, in interviews with environmentalists, some expressly wanted to depoliticize the questions of

variegated understandings of, or interests in, forest-nature. This leaves the process of mapping as the domain of debate, reducing politics to a process of ordering and technical calculation based on the delivery of forest services.

Bibliography

Adamowicz, W. and T. Veeman (1998). "Forest Policy and the Environment: Changing Paradigms". *Canadian Public Policy* 24 (Special Supplement 2), S51-S61.

Agrawal, A. (2005). *Environmentality: Technologies of Government and the Making of Subjects.* Duke University Press.

Asdal, K. (2008). "Enacting things through numbers: Taking nature into account/ing". *Geoforum* 39: 123-132.

Bakker, K. and G. Bridge (2006). "Material worlds?: resource geographies and the 'matter of nature'". *Progress in Human Geography* 30.1: 5-27.

Baldwin, A. (2003). "The Nature of the Boreal Forest: Governmentality and Forest-Nature". *Space and Culture* 6.4, 415-428.

Baldwin, A. (2004). "An ethics of connection: social nature in Canada's boreal forest". *Ethics, Place and Environment* 7.3, 185-194.

Bernstein, S. and B. Cashore (2001). "The International-Domestic Nexus: The Effects of International Trade and Environmental Politics on the Canadian Forest Sector" in *Canadian Forest Policy: Adapting to Change*, 65-93. M. Howlett (Ed.). University of Toronto Press.

Braun, B (2002). *The Intemperate Rainforest: Nature, Culture, and Power on Canada's West Coast.* University of Minnesota Press.

Canadian Boreal Initiative (CBI). "Canadian Boreal Framework Agreement". <http://www.borealcanada.ca/framework_e.php>. Last accessed August 30, 2009.

Castree, N (1995). "The Nature of Produced Nature: Materiality and Knowledge Construction in Marxism". *Antipode* 27.1, 12-48.

Eden, S. (2008). "Being fieldworthy: environmental knowledge practices and the space of the field in forest certification". *Environment and Planning D* 26.6: 1018-1035.

Forest Stewardship Council of Canada (2004). *The National Boreal Standard.* <www.fsccanada.org/nationalBoreal.htm>

Foucault, M. (1978). History *of Sexuality: An Introduction (Vol. 1).* New York: Vintage.

Haraway, D. (1997). *ModestWitness@Second_Millenium.FemaleMan_Meets_ OncoMouse: Feminism and Technoscience*. New York: Routledge.

Hardt, M. and A. Negri (2004). *Multitude: War and Democracy in the Age of Empire*. New York: Penguin.

Hardt, M. and A. Negri (2000). *Empire*. Harvard University Press.

Harvey, D. (2006). *The Limits to Capital.* New York: Verso.

Harvey D, 1998, "The body as an accumulation strategy". *Environment and Planning D: Society and Space* 16.4: 401 – 421

Harvey, D. (1996). *Justice, Nature and the Geography of Difference*. London: Wiley-Blackwell.

Henderson, D. (1998). "Nature and Fictitious Capital:The Historical Geography of an Agrarian Question". *Antipode* 30.2: 73-118.

Ivey Foundation (2009). *Conserving Canada's Forests Program: Five Year Evaluation.* <http://www.ivey.org/programs/5yearreport.pdf>

Jessop, B. (2003). "Informational capitalism and empire: the postmarxist celebration of US hegemony in a new world order". *Studies in Political Economy* 71: 39-58.

Kovel, J. (2007). *The Enemy of Nature: The End of Capitalism or the End of the World?* New York: Zed Books.

Latour, B. (2004). *The Politics of Nature: How to Bring the Sciences into Democracy*. Harvard University Press.

Lefebvre, H. (2007). *The Production of Space.* D. Nicholson-Smith (Trans.). Blackwell Publishing.

Luke, T. (2006). "The System of Sustainable Degradation". *Capitalism, Nature, Socialism* 17.1: 99-112.

Luke, T. (2003). "On the Political Economy of Clayquot Sound: The Uneasy Transition from Extractive to Attractive Models of Development" in *A Political Space: Reading the Global through Clayquot Sound,* pp. 91-112. W. Magnusson and K. Shaw (eds.). University of Minnesota Press.

Luke, T. (1999). "Environmentality as Green Governmentality" in *Discourses of the Environment*, pp. 121-151. E. Darier (Ed.). Oxford: Blackwell.

Mann, S.A. and J.M. Dickenson (1978). "Obstacles to the development of a capitalist agriculture". *Journal of Peasant Studies* 5: 466-481.

Marchak, M. (1995). *Logging the Globe.* McGill-Queens University Press.

Marx, K. (1990a). *Capital: A Critique of Political Economy (Vol. 1).* B. Fowkes (Trans.). London: Penguin.

Marx, K. (1906). *Capital: A Critique of Political Economy (Vol. II).* E. Untermann (Trans.). London: Charles H. Kerr and Company

Marx, K. (1990b). *Capital: A Critique of Political Economy (Vol. III).* B. Fowkes (Trans.). London: Penguin.

May, E. (2005). *At the Cutting Edge: The Crisis in Canada's Forests.* Toronto: Key Porter Books.

Negri, A. (2005). *The Politics of Subversion: A Manifesto for the Twenty-First Century.* Cambridge: Polity Press.

Novek, J. and K. Kampen (1992). "Sustainable or unsustainable development? An analysis of an environmental controversy". *Canadian Journal of Sociology* 17.3: 249-273.

O'Connor, J (1998). *Natural Causes: Essays in Ecological Marxism*. New York: Guildford Press.

O'Connor, M. (1994). *Is Capitalism Sustainable?: Political Economy and the Politics of Ecology*. New York: Guildford Press.

Prudham, S. (2007). "Sustaining sustained yield: class, politics and post-war forest regulation in British Columbia". *Environment and Planning D* 25.2: 258-253.

Prudham, S. (2005). *Knock on Wood: Nature as Commodity in Douglas-Fir Country*. New York: Routledge.

Robertson, Morgan (2007). "Discovering Price in all the Wrong Places: The Work of Commodity Definition and Price under Neoliberal Environmental Policy". *Antipode* 39.3: 500-526.

Robertson, M. (2006). "The nature that capital can see: science, state and market in the commodification of ecosystem services". *Environment and Planning D* 24.3: 367-387.

Rose, N. (2006). *Powers of Freedom: Reframing Political Thought.* Cambridge University Press.

Rutherford, S. (2007). "Green governmentality: insights and opportunities in the study of nature's rule". *Progress in Human Geography* 31.3: 291-307.

Schmidt, A. (1971). *The Concept of Nature in Marx.* B. Fowkes (Trans.). London: NLB Press.

Scott, J. (1998). *Seeing Like a State*. Yale University Press.

Sandilands, C. (2003). "Between the Local and the Global: Clayquot Sound and Simulacral Politics" in *A Political Space: Reading the Global through Clayquot Sound*, pp. 139-168. W. Magnusson and K. Shaw (eds.). University of Minnesota Press.

Shaw, K. (2004). "Global/Local Politics of the Great Bear Rainforest". *Environmental Politics* 13.2, 373-392.

Smith, N. (1984). *Uneven Development: Nature, Capital and the Production of Space.* Oxford: Blackwell.

Smith, N. (2007). "Nature as Accumulation Strategy". *Socialist Register* 43, 16-36.

Soper, K. (1995). *What is Nature?: Culture, Politics and the Non-Human.* Oxford: Blackwell.

Wilson, A. (1992). *The Culture of Nature: North American Landscape from Disney to the Exxon Valdez.* Cambridge: Blackwell.

Appendix

Interviews

World Wildlife Fund, Toronto, Ontario. November 5, 2008.

Greenpeace Canada, Toronto, Ontario. November 7, 2008.

The Ivey Foundation, Toronto, Ontario. November 7, 2008.

Canadian Parks and Wilderness Society, Toronto, Ontario. November 11, 2008.

Tembec Inc. Interview by telephone. December 19, 2008.