Perspectives

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Clayoquot Sound: Lessons in ecosystem-based management implementation from an industry perspective*

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Abstract

In 1995, the Clayoquot Sound Scientific Panel submitted a report with 170 recommendations that fundamentally changed forest management as it had been traditionally practiced in the Sound. The Scientific Panel's report represents an early case study of ecosystem-based management (EBM) implementation. The recommendations were adopted by industry, government, and other participants with hopes that this would end the vociferous conflicts that had come to characterize Clayoquot Sound. British Columbia's Provincial government was committed to working with industry, First Nations, forest workers, and local communities to make the changes happen. However, the implementation was not accomplished easily or cheaply, and it was not an unmitigated success, at least from the perspective of industry. In addition to summarizing the history of the process, this article discusses outcomes of EBM implementation in Clayoquot Sound in terms of planning for environmental values before timber, using ecological rather than administrative boundaries, and engaging participants early and throughout the planning process. With emphasis on implications from an industry perspective, the authors recommend approaches that balance the strengths and challenges inherent in ecosystem-based management in British Columbia.

KEYWORDS: *ecosystem-based management, forest management, forest planning, sustainable development.*

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* **Editor's Note**
Issues and innovations relating to the topics presented in this article may have evolved since the original submission. We invite readers to contribute articles to further the dialogue.

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Introduction

British Columbia's Clayoquot Sound—a land area of 260 000 ha on the west coast of Vancouver Island—is widely known for its unparalleled wilderness, biodiversity, and recreational value. Indeed it is a beautiful place, but it is perhaps even better known for its history in the 1980s and 1990s as the nexus of protest and dissent over forest management policies and practices of the time.

In the early 1990s, forest management in Clayoquot Sound followed the industrial model which was focused on maximizing timber flow to mills, with 40-ha clearcuts, high rates of cut in watersheds, desultory recognition of reserve areas, and forest practices that were poor by today's standards. To show one measure of the legacy from logging in that period, Jakob (2000) identified about 500 landslides that had initiated from logging roads or logged areas, reflecting a rate nine times higher than that on similar unlogged terrain[1]. The numerous logging-related landslides visible in the early 1990s were a potent ingredient in the widespread anger at the status quo.

Clayoquot became the scene of protracted conflict between environmentalists, forest licensees, and the BC government. A fundamental change in this status quo took place following the 1993 Clayoquot Sound Land Use Decision (CSLUD), which increased the amount of protected and reserve areas by 48 500 ha, or 18%, from a total of 39 100 ha, or 15%, to a total of 87 600 ha, or about 34% of the Clayoquot Sound land area. The agreement to enlarge the protected portion of the land base in Clayoquot was part of a general consensus that more than timber had to be conserved. At about the same time, the Provincial government entered into an Interim Measures Agreement with the Nuu-cha-nulth, which guaranteed some measure of "co-management" with the five First Nations in the Sound. The early 1990s were a time of dramatic changes in forest policy in BC and in Clayoquot Sound in particular (e.g., Hoberg 1996).

Another far-reaching change occurred in 1995 when the Clayoquot Sound Scientific Panel submitted its five-volume report. The panel recommended sweeping changes in forest management. Among the most important were the introduction of variable retention logging (in contrast to clearcutting), more extensive riparian protection, and watershed planning. The announcement that the Province would implement these changes brought wide attention and interest. Clayoquot Sound would become a testing ground for ecologically based forest management.

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The year 2005 marked 10 years of experience implementing what amounts to the first scientifically credible ecosystem-based management (EBM) regime in a coastal forest tenure. There have been no formal analyses of the strengths and failures of the Clayoquot experiment in the decade following 1995. This paper provides an industry perspective of some of the benefits and challenges arising from the implementation of the Scientific Panel's recommendations. The authors were a contractor and an industry employee, respectively, when these changes were brought in.

In 1995, International Forest Products Ltd. (Interfor) was the most active forest licensee in Clayoquot Sound. Its Tree Farm License (TFL) 54 was located almost entirely within the Sound. The other main forest products company, MacMillan Bloedel Ltd.—at the time the holder of TFL 44—reduced operations for several years in the mid to late 1990s, then resurfaced in a partnership with First Nations in a company called Iisaak Forest Resources Ltd. The First Nations have since purchased 100% of the partnership shares and continue to operate in the Sound.

Interfor continued operations under the new regime until 2006 when it sold its license to Ma-Mook Enterprises (a consortium of five First Nations and Coulson Forest Products Ltd.). Ma-Mook, like Iisaak, continues to log in Clayoquot Sound today.

[1] Throughout coastal BC, the rate of landsliding in logged terrain is higher than on similar unlogged terrain, and a factor of nine times greater is within the range found elsewhere on Vancouver Island (e.g., Guthrie and Evans 2004).

The Clayoquot Sound Scientific Panel (CSSP) and EBM

In 1994, when the Scientific Panel was convened, EBM had not yet become a commonly used term. The panel did not explicitly define EBM, but it did note that "ecosystem management must acknowledge the physical structures, processes and biological constituents of the ecosystem" (Report 5, page xi; Clayoquot Sound Scientific Panel 1995). The Panel also stated: "sustainable forest practices must be judged by the extent to which all resources are respected and sustained." In this context, the Panel embraced ecological and cultural resources (for example, redcedar, medicinal plants, recreation, and scenic values) but did not otherwise address social or economic aspects.

The Coast Information Team (CIT), a group spawned from the Central Coast Land and Resource Management Plan (LRMP) process in 2001, defines EBM as "...an adaptive approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities" (Coast Information Team 2001). The significance of this definition is that EBM recognizes both ecological sustainability as well as the condition of human communities. The CIT identified two goals (CIT 2004):

1. maintain the ecological integrity of terrestrial, marine and freshwater ecosystems; and
2. achieve high levels of human well-being.

The phrase "high levels of human well-being" is meant to include the "health, wealth and education of aboriginal and non-aboriginal people," living in "stable, resilient, well-serviced and peaceful communities."

The Clayoquot Sound Scientific Panel's recommendations did not, therefore, exactly replicate the CIT definition of EBM[2]. Nevertheless, the Panel did consider the economic and social implications of the changes—for example, one of the five volumes was dedicated to First Nations' perspectives (Clayoquot Sound Scientific Panel 1995a).

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That these changes led to improved ecological sustainability is hard to dispute. The status quo, with its legacy of dense road networks, progressive clearcuts, landslides, and aggraded streams was widely reviled. Dramatically reduced rates of cut, smaller openings, improved management access, larger reserves, and better on-the-ground forest practices have left a much smaller footprint since 1995.

Whether the changes led to an improvement in social and economic sustainability is less obvious. In Interfor's TFL 54, the annual cut exhibited large fluctuations between 1996 and 2003—ranging from less than 5000 m^3 in 1998 to over 90 000 m^3 in 2002—despite being subject to legislated cut controls (although admittedly this wide variation was at least partly influenced by log prices). An estimated 300 forestry jobs were lost in Ucluelet after 1993 (Dai 2001); many of these were associated with the closure of MacMillan Bloedel's Kennedy Lake Camp. The population of Ucluelet declined by 6% between 1996 and 2001 (Statistics Canada 2009), partly though not entirely due to changes in forest management. Jobs in logging in the second half of the decade (2001–2006) declined by 78%, and in the last census only 15 people reported being employed in "forestry and logging."

From an industry perspective, the reduction of annual allowable cut (AAC) and the attendant loss of jobs, along with reduced stability and resiliency of communities in the region, represent a failure in the CSSP model. The reality is more complicated: the employment base in forestry-dependent communities has been declining across BC, not just in Clayoquot

[2] The Clayoquot Sound Scientific Panel's report came out seven years before the CIT's EBM Handbook was developed; the Handbook drew in part upon the knowledge gained through the Clayoquot experiment.

Sound. While there are still lessons to be learned from the Clayoquot Sound Experiment, the effect of reduced cuts on community well-being—whether perceived or real—must be taken into account.

Scientific Panel recommendations

The Scientific Panel released its report in 1995, presenting 170 recommendations (97 general and 73 specific). Of these, 44 were the sole responsibility of government, mainly associated with treaty negotiations and legislated responsibilities under the *Forest Act*. Another 30 fell under joint responsibility of government and licensees, and the remaining 96 were mainly the responsibility of licensees. Most contained guidelines or objectives that were reasonably achievable (although in some cases costly).

The recommendations spanned the full range of forest management and planning, including setting harvest levels, logging, road-building, silviculture, forest health, deactivation, monitoring and research, relationships with communities and First Nations, and inventory (Clayoquot Sound Scientific Panel 1995b). To provide an example of EBM implementation, we have picked one area of management, namely planning. We describe the nature of the changes and the outcomes, mainly from an industry perspective.

Planning

The Scientific Panel recommended the adoption of a new perspective on forest resource planning, encompassing new planning initiatives which, superimposed on the dramatic reduction in AAC, revolutionized the way forestry was practiced in Clayoquot. The Panel identified key problems in conventional forest management when reviewed in the context of ecosystem-based management. These included:

1. a focus on timber over other resources;
2. inadequate information (inventories) of environmental and cultural resources;
3. the use of administrative, rather than ecological, planning boundaries; and
4. the lack of effective participation by First Nations and local peoples.

Many of the Panel's recommendations were designed to address these shortcomings. But the new style of forest management was not universally welcomed by licensees.

Change was underway before the Scientific Panel tabled its report; Interfor, for example, had embarked on resource inventories on its own, and had taken concrete steps to involve First Nations in their planning process. Shaken by the intensity of the protests and by the publicity, industry had tried to respond by moving towards the type of forestry recommended by the Panel.

But internal change was not sufficiently fast or complete. Implementation of the Panel's recommendations created fundamental changes for the licensees in Clayoquot Sound. The general effect was to complicate the process of forest planning, increasing the time, effort, and cost of obtaining approvals.

In the following section, we describe various principles inherent in the Scientific Panel's recommendations and discuss observed outcomes related to these approaches.

Principle: A focus on environmental values before timber values

Prior to the Scientific Panel recommendations, forest planners identified harvestable areas first, and only then identified environmental values to be managed. Forest harvesting generally took priority over environmental values. The Scientific Panel reversed this priority: timber harvesting was to be regarded as a "residual" of the planning process.

Following the Scientific Panel's recommendations, further portions of Clayoquot Sound were set aside in a network of reserves to achieve various conservation objectives. These were established to protect:

1. hydro-riparian resources;
2. sensitive soils and unstable terrain;
3. red- and blue-listed plant and animal species;
4. forest interior conditions in late successional forest;
5. ecosystem representation;
6. linkages among watershed planning areas;
7. cultural values; and
8. scenic and recreation values.

Once this network was established (using new timber and non-timber inventories; see below), then the remaining area of timber could be evaluated for harvesting opportunities, subject to other constraints (such as stand-level retention, rate of cut, and restrictions on opening size).

Outcome

The major outcome of these developments was a reduction in the AAC (although there were other reasons for the reduced cut). Setting aside such areas, either as reserves or protected areas, reduced the timber harvesting land base, and commensurately, the AAC.

For Interfor, the annual cut went from 181 000 m 3 in 1992 to 75 000 m3 in 1997, a reduction of 59%. This obviously affected the economic viability of timber harvesting in TFL 54. Similar reductions were experienced in the Clayoquot portion of TFL 44 held by MacMillan Bloedel Ltd., whose Kennedy Lake operation closed in 1997. These curtailments naturally had an economic and social impact on local communities.

On another front, the implementation of reserves created practical problems. It took a great deal of time to complete inventories and then to draw up scientifically credible reserves for the eight different factors. The inventories took years to complete, but most had been finalized by 2001. Contractors working on the inventories were directed to adhere to the highest standards available—this resulted in unusually high costs. For example, terrestrial ecosystem mapping was completed in Clayoquot Sound at an average cost of over $8/ha (Madrone Consultants Ltd. 1998)—considerably more than the cost of similar mapping elsewhere in BC.

Plans for three watersheds, drawn up by the Clayoquot Sound Technical Planning Committee, were endorsed only in 2003, and a further eight were endorsed in 2006. In the meantime, interim reserves were drawn up— mostly delineated by the licensees—to allow planning to proceed. This created numerous technical problems associated with uncertainty, changing boundaries, confusion over definitions and rules, and mapping inconsistencies.

The idea of establishing reserves first, rather than as "net-downs" from the total harvestable land base, ran counter to the traditional industry perspective that saw timber as the primary forest resource. Arguably, the shift in focus was inevitable and widespread, and would have likely changed the status quo in Clayoquot even without the Panel's recommendations. However, at the time, the net outcome for the Clayoquot Sound licensee was increased costs and time delays, which on top of the reduced cut, exacerbated a deteriorating economic situation.

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The Provincial government invested some $7 million (Clayoquot Sound Technical Planning Committee 2006) to complete the resource inventories needed to fine-tune the reserve network, amounting to a cost of nearly $27 per hectare. The cost of the inventories represents only a portion of the total cost of the Clayoquot experiment. Total funding allocations in Clayoquot Sound between 1994 and 1998 amounted to some $45 million, including $38 million from Forest Renewal BC (FRBC).[3] The Clayoquot experiment did not come cheaply.

Principle: Ecological rather than administrative planning boundaries

Prior to the Scientific Panel, timber supply planning was based purely on administrative units such as TFLs, and ignored ecologically relevant boundaries such as watersheds. This led to concentrations of activity in one area or one watershed, with little regard to ecologic or hydrologic impacts. The Scientific Panel recommended that the watershed become the reference for planning. Accordingly, the "Watershed Plan" would come to serve as the cornerstone of the planning process. As a link between the broader context of regional or subregional plans and the more specific site-level plans, Watershed Plans would be the level at which reserve areas were delineated prior to harvest planning. Forest land outside this reserve network would then be available—subject to other operational and planning rules—to harvesting (i.e., the timber harvesting land base).

Outcome

Though simple in concept, in reality there were operational and mapping difficulties associated with

[3] Data from BC Ministry of Environment, Lands and Parks and Aboriginal Affairs, cited in Abrams 2000.

the transition. Delineation of watersheds took some time to complete to the satisfaction of all parties. The new boundaries forced licensees to collaborate, a new challenge for companies which before had operated in near-isolation. Nevertheless, conflict was minimal, at least in part because of the slowdown in logging operations.

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Principle: Participatory planning

The Panel recommended that members of First Nations (Nuu-chah-nulth) and local communities have meaningful participation in forest management and planning. To meet that objective, the Central Region Board (CRB) was created, with appointees from First Nations, local communities, and government, to review resource planning and management in the Sound.

Furthermore, a separate planning group, consisting of participants from local communities, government, and First Nations, was created to identify the specific planning criteria and details associated with the implementation of new planning recommendations. This committee then evolved into the Clayoquot Sound Technical Planning Committee, made up of government and First Nations representatives who have worked for many years to complete the detailed Watershed Reserve Plans (Clayoquot Sound Technical Planning Committee 2006).

These changes brought about a fundamental change in that other participants, namely First Nations and the public, were to be involved at the "front end" of the planning process. This was to be part of a sustainable forest management model, with more effective resource-sharing. Under the new process, planners were to gather information on public values at the beginning of the planning process. This input was to be considered proactive rather than reactive. Industry hoped that this would minimize potential resource use conflicts; they wanted to avoid the disruption and adverse publicity of the Clayoquot Sound protests.

Outcome

Licensees and government agencies were now required to solicit the active and effective participation of local governments and First Nations. All parties had to work more closely together. Suddenly, the long-standing practice of the licensee submitting development and logging plans to government agencies and expecting approval within set time limits was a thing of the past. All applications were now scrutinized by participants from First Nations and local governments, as well as by representatives from Provincial and Federal governments (Department of Fisheries and Oceans; DFO). Lay members of these committees faced a lengthy learning curve before they were able to effectively deal with forestry issues. At least in the first five years, the CRB was hindered by a number of obstacles, including limited organizational and technical capacity. CRB members were overwhelmed by the constant stream of forestry referrals and the need to make decisions without commensurate scientific support (e.g., Abrams 2000).
Due to this increased complexity, the approval process took more time than before, and the protracted delays were a source of frustration and expense for licensees and their logging contractors. The licensees bore the direct cost of increased planning (which for a few years had been partly offset by a stumpage additive which was phased out over time), but all parties had to pay the price for scheduling uncertainties. For licensees like Interfor, the delays in approvals made it difficult to live up to their responsibilities to its contractors, who were forced at times to lay off workers.

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Conclusions

The Clayoquot Sound Scientific Panel introduced sweeping changes in 1995 in what amounted to the first significant attempt at ecologically based forest management on the BC Coast. The wide-ranging recommendations were initially hailed as a great step forward, and many critics of BC forest policy predicted that it would herald a giant shift in the way the province's forest resources would be managed. And few could argue that the changes have resulted in a more ecologically sustainable model of forest management in Clayoquot Sound. Logging now has a much smaller footprint and, although there continues to be conflict and criticism, Clayoquot Sound is no longer the focus of conflict it was in the 1990s.

However, it has not been an unqualified success. Interfor, after weathering the AAC reduction in the mid 1990s, managed to continue operations in Clayoquot while log prices were strong. However, after 1999, it survived only because of a special stumpage reduction in recognition of the increased cost of business in Clayoquot and the reduced cut. As that dispensation gradually disappeared, Interfor found it increasingly difficult to operate profitably in TFL 54. While this was happening, government revenues also fell.

Ultimately, both major licensees in the Sound have sold their licenses, and the corporate withdrawal has caused substantial disruptions to the lives of many people. Those licensees have been replaced with two new players with much greater First Nations participation. Many see this as a move towards a more equitable sharing of the resource. And in this view there is optimism that they will continue to manage the forest in a sustainable fashion. Some have gained through this shift, but some have lost as well, and it is important that both stories are told.

Looking back from an industry perspective, the process was cumbersome, inefficient, and costly. Industry has a focus on the financial bottom line, so it is natural that the industry perspective largely reflects the effects of changes on timber revenues and costs.

The learning curve

Some problems occurred because they represented a new way of doing things, and costs were incurred due to inexperience, uncertainty, and error. Watershed-based planning should not have cost more than planning based on administrative borders, but it took time and money to make the change (both of which were underestimated at the outset). Lack of experience—on the part of both industry and government—made this shift more complicated than anticipated.

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Participatory management is an acknowledged requirement for EBM, but it meant bringing lay people into the process. The learning curve for these new participants—most of whom had no formal training in resource management—slowed the process of approving cutting permits. In retrospect, much of the cost and delay was associated with inefficient bureaucracy, redundancy, poor governance, and an uncertainty about efficient process. There are lessons to be learned from this experience, and one of them is to start the process modestly and gradually expand participation.

The cost of knowledge

The need for the resource inventories was acknowledged from the start. And in the mid 1990s, there was an appetite for large-scale forest investment—FRBC was in full operation and resource prices were strong. In the authors' experience and opinion, this led to a lack of focus on efficiency and effectiveness, particularly with respect to value for money. It is difficult to envisage a set of circumstances that would allow a similar expenditure in any one area today, even in the mid-Coast. From that perspective, the Clayoquot experiment is unlikely to be replicated in this particular aspect.

The social and economic cost

From an ecological perspective, the Clayoquot experiment was a success: logging now has a much less visible ecological footprint, and the uglier legacies, such as a high incidence of landslides and dense road networks have largely disappeared. For a

time, Clayoquot Sound was a model of ecosystem-based management that, in many ways, was a standard-bearer for new forestry.

However, that achievement has not come without cost. The AAC reduction, the closure of the Kennedy Lake Woodlands, the exodus of forest workers and their families from the communities, and the progressive squeezing of profitability in the Sound, were some of the consequences of the Clayoquot experiment. Direct costs also include those incurred by government—combined with losses in revenue—which amount to some tens of millions of dollars over the decade. Indirect costs include the expense of supporting the resulting unemployment. The Clayoquot experiment is not entirely at fault for these ills, but there is little doubt that it contributed.

The changes triggered in part by the Clayoquot Sound experiment were part of a larger shift in the balance of resource extractive industry (logging) to non-extractive activities (e.g., recreation and tourism), meaning that there were some social and economic benefits. However, there was a significant human cost. Many lost their jobs and many families relocated. One of the important lessons of the Clayoquot experiment is that the social and economic costs of upheaval must always be considered when the status quo is changed. And if government chooses to invest in future iterations of EBM, effectively subsidizing a "green economy," that cost needs to be recognized and justified.

The shift to EBM does not end with completion of the planning. The ripple effect of implementing EBM in Clayoquot Sound, and the associated social, cultural, economic, and ecological trade-offs, justifies an ongoing dialogue about how "social license" is exercised in natural resource management in British Columbia.

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Lessons learned

- Consider the social and economic costs associated with implementation; these will involve reduced cuts, delayed approvals, and increased planning costs to address more complicated practice rules. These costs may require cost-sharing or adjustment of revenues to the Crown.
- Phase in necessary resource inventories at an appropriate rate; seek efficiencies to control costs.
- Set aside sufficient funding, time, and effort for training and testing; this applies to managers, planners, (including members of participatory planning groups), lay-out technicians, loggers, silviculturists, as well as compliance and enforcement personnel. Training will be an on-going requirement.
- Allow an appropriate transition period with clear and realistic timelines so that EBM is implemented at a pace commensurate with training and competence.
- Have realistic expectations. EBM goals will not all be met immediately.
- Learn from past EBM implementation experience.

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Test Your Knowledge . . .

Clayoquot Sound: Lessons in ecosystem-based management implementation from an industry perspective

How well can you recall some of the main messages in the preceding Perspectives? Test your knowledge by answering the following questions. Answers are at the bottom of the page.

1. Name three kinds of resource inventories that were recommended by the Clayoquot Sound Scientific Panel.

2. What were some of the obstacles to implementing the Clayoquot Sound Scientific Panels recommendations?

3. What aspects of the Clayoquot process are unlikely to be replicated today?

ANSWERS

1. *Any three of the following: hydroriparian resources; sensitive soils and unstable terrain; red- and blue-listed plant and animal species; forest interior conditions in late successional forest; ecosystem representation; linkages among watershed planning areas; cultural values; and scenic and recreation values.*

2. *Delays in completing inventories; untrained members of participatory planning groups, steep learning curve with new forestry practices; lengthy delays associated with cumbersome approval processes; increased costs and decreased cuts leading to economic difficulties.*

3. *The funding levels injected to support the Clayoquot EBM model are unlikely to be replicated; future implementations will be done more slowly, carefully, and less expensively.*