

BRANCHING OUT:

CASE STUDIES IN CANADIAN FOREST MANAGEMENT



BY ALISON BERRY

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TO THE READER

Federally owned forests in the United States are experiencing ecological and financial problems. Concern about the state of the nation's public forests has inspired a search for different approaches to the management of logging and other forest-related activities. This search has led to Canada, where public forests are managed in ways that are strikingly different from those in the United States. In this essay, "Branching Out: Case Studies in Canadian Forest Management," Alison Berry presents four case studies from Canada that illustrate the benefits of long-term leases and licenses (often called tenures) and decentralized control.

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“Today, after centuries of forest use, Canadians have accepted their role as stewards of the forests that define this country. They have committed themselves to maintaining them, enhancing them, and passing them on to succeeding generations.”

—Ken Drushka, *Canada's Forests: A History* (2003, 87)

BY ALISON BERRY

INTRODUCTION

The forests of North America represent enormous natural bounty. Yet, in the United States at least, the benefits of this wealth of nature are not being fully realized. Taxpayers lose money on federally owned forests, and the forests face severe ecological threats. National forests are increasingly dense and at high risk of catastrophic wildfire, insect infestation, and onset of disease. Invasive species out-compete native species, and a growing list of native plant and animal species are in danger of extinction (*Congressional Digest* 2002; Fretwell 1999).

These problems appear to stem from policies that make it difficult for federal forest managers to act decisively. The goals of public forest management are not clear. Public forests produce little commercial timber, even though production of timber for sale was one of the original purposes of the public forests (Sedjo

2000). Beginning in 1992, U.S. national forests adopted a policy of ecosystem-based forestry (Stankey et al. 2003), yet that broad policy gives little guidance to managers. U.S. Forest Service Chief Dale Bosworth describes the situation as “analysis paralysis” (US HR 2001).

Among many efforts to find a way out of the paralysis (Brubaker 1984; Nelson, 2000; Sedjo 2000), one promising proposal is to move decision making away from the national government to state and local areas (O’Toole 1988; Sedjo 2001). Research in this direction leads to Canada, where public forests are primarily controlled by the provincial governments.

This essay will discuss lessons that may be learned from Canada. It will focus on one major difference between U.S. and Canadian public forest management, Canada’s long-term leases or licenses, also called tenures. Unlike its American counterpart, this tenure system transfers management from the public sector to the private sector, which can include both industrial forest companies and small community organizations. The reliance on private and local management has allowed different forests to be managed in different ways, reflecting the distinctive aims of each tenure holder.

This essay examines specific cases of forest management in Canada. It does not categorically endorse public forestry as practiced in Canada, but it does suggest that some Canadian approaches might relieve the managerial gridlock afflicting U.S. land agencies. And it includes recommendations based on the Canadian experience.

TWO DIFFERENT APPROACHES

The United States and Canada differ significantly in forest ownership (see Figure 1). The vast majority (70 percent) of Canadian forests are owned by provincial governments (Haley and Luckert 1990). In contrast, most forestland in the United States (59 percent) is privately held (USDA Forest Service 2003). The remainder is in public ownership, primarily managed by the U.S. Forest Service and the Bureau of Land Management.¹ This essay focuses on policies governing publicly owned forests—provincial, or “Crown,” forests in Canada and federally

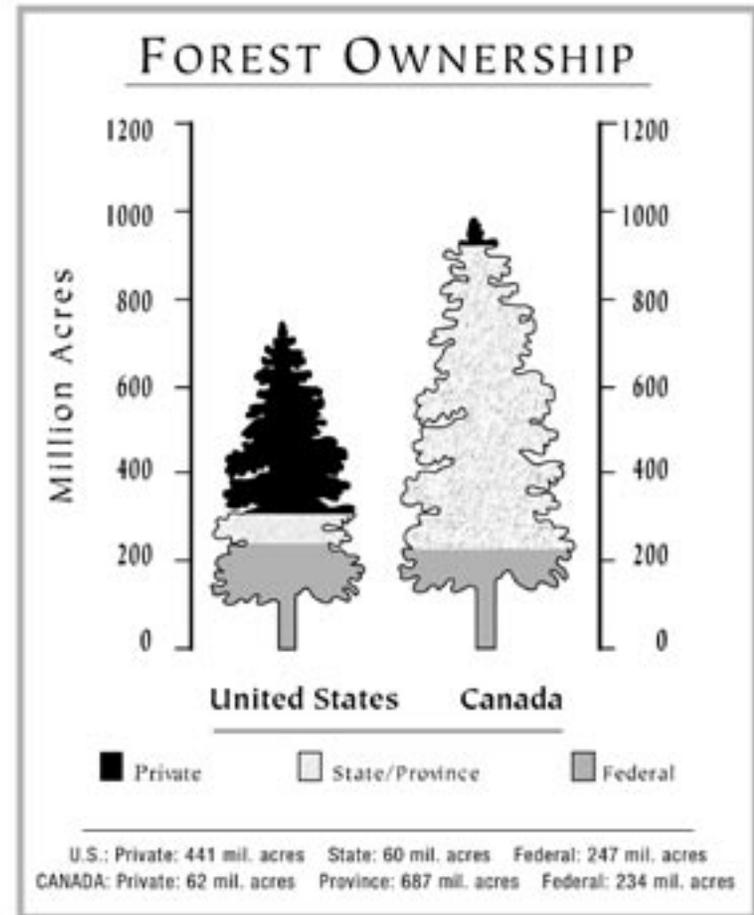


FIGURE 1; FOREST OWNERSHIP IN CANADA AND U.S.

owned forests in the United States.

Canadian Crown timber lands generate revenues for the provinces, whereas U.S. federal forests operate at a cost to taxpayers. For example, timber management in British Columbia generates \$2.35 for every dollar spent (British Columbia Ministry of Forests 2001–2002), while the Forest Service and BLM lose about \$.50 for each dollar spent on timber management.²

Forests in both countries operate under multiple-use policies,

which require managers to provide a range of opportunities for the use of forestlands. In Canada, however, holders of forest tenures must harvest a certain amount of timber annually, so timber is their first priority. In contrast, U.S. federal land managers must provide, where appropriate, recreation, grazing, wildlife habitat, protection of water quality, timber harvesting, and mineral extraction. With such a wide range of objectives and no clear priorities, U.S. managers struggle to satisfy all interested parties.

The current policy for timber harvests on U.S. federal lands is to contract out the harvest while keeping the land under government control. The government agency is responsible for all planning and restoration, and the timber goes to the highest bidder. The harvester has no responsibility for land management and little incentive to invest in forest stewardship.

In contrast, Canadian timber tenures incorporate flexibility and provide the tenure holder with greater incentives to invest in forest maintenance. A description of the Canadian forest tenure system follows.

CANADA'S SYSTEM OF FOREST MANAGEMENT

Spanning nearly 1 billion acres (400 million hectares), Canadian forests

comprise about 10 percent of the world's forests (Drushka 2003, vii). Only 6 percent of this resource is owned privately, and another 24 percent belongs to the federal government (see Figure 1). The remainder is owned by the provinces, having passed from the British Crown to the colonies as they assumed responsibility for government (Drushka 2003, 30).

Although each province has a unique system of tenures for timber management, similarities can be found nationwide. All timber tenures provide access to Crown forests for the purpose of timber harvest; none conveys rights to non-timber forest products such as recreation, wildlife, and water.³ Most timber tenures can be transferred with provincial approval (Haley and Luckert 1990).

Every province collects fees in exchange for rights to harvest. These fees include annual rents⁴ and a fee for harvested timber, also known as

a stumpage fee. Annual rents and stumpage fees are determined by the provincial governments and vary both within and between provinces, depending on the quality of the timber and the costs associated with getting it to mills.⁵ Fees generate revenue for the provinces to support forest administration and other provincial operations.⁶ They are set by the provinces, and there is some debate over whether the fees fully reflect market conditions or may instead be partially subsidized (Uhler 1991).

Most harvesting rights are allocated through one of two types of tenure agreements. One is a long-term, area-based tenure which confers significant management responsibilities. An area-based tenure restricts the holder to log in a particular location, which can be sizeable. For example, in Ontario the average area-based tenure covers 1.26 million acres (509,000 hectares) (Ontario Ministry of Natural Resources 2004, 23).

The other is a shorter-term, volume-based tenure that confers fewer management responsibilities. Volume-based tenures allocate a specified amount of timber to the holder⁷ and do not restrict the location of harvests. Some provinces also offer a second volume-based tenure for specific forest products like firewood, Christmas trees, and non-commercial timber.⁸

AREA-BASED TENURES

Area-based tenures are particularly significant because they provide incentives for responsible forest stewardship by the tenure holder. Research from British Columbia indicates that on area-based tenures companies put greater investments into silviculture and reforestation occurs more quickly after logging (Zhang and Pearse 1996, 1997).

Because an area-based tenure holder is committed to a particular site, the holder has an interest in the vitality and productivity of that site. Also, these leases tend to be long-term and renewable, providing a greater security to the lease holder and an incentive to invest in forest maintenance. And they generally confer significant management responsibilities, so that the tenure holder is active in forest planning and on-the-ground operations.

ANNUAL ALLOWABLE CUT

Most timber tenures are allocated as a portion of the Annual Allowable Cut (AAC). The AAC is designed to ensure that a steady flow of timber is produced from Crown lands in order to supply mills, sustain local communities, boost the provincial economy, and provide fees to the government. The AAC is determined by the provincial governments on the premise of sustained yield. That is, harvest rates across a broad geographical area must not exceed timber growth rates.⁹ All tenure holders are required to meet their assigned portion of the AAC over a five-year average, although harvest rates are allowed to fluctuate annually.

Canada's adherence to the sustained-yield principles of the annual allowable cut may prevent tenure holders from adopting alternative approaches to forest management such as ecosystem-based forestry. In contrast to sustained-yield forestry, ecosystem-based forestry places less emphasis on timber production and more emphasis on ecosystem function, including retention of old-growth trees, protection of biodiversity, and nutrient cycling through decomposition and burning. Sustained-yield forestry focuses on what can be removed from the forest, and ecosystem-based forestry focuses on what is left behind (Plotkin 2004, 9). Not surprisingly, ecosystem-based forestry produces less timber.

Because they must meet the AAC, holders of forest tenures in Canada generally practice sustained-yield forestry. Most logging is done through clearcutting, the most cost-effective way to harvest large amounts of timber. Some environmental groups oppose clearcutting (Brooks and Casey-Lefkowitz 2003) and argue that a lower AAC would encourage more ecosystem-based forestry, with greater reliance on alternative methods such as patch cutting and variable tree retention. If they are right, the AAC may partially counteract the positive incentives for responsible stewardship created by long-term, area-based tenures (Beckley et al. 2003).

EVERGREEN CONTRACTS

At least six Canadian provinces offer some form of evergreen contract for timber harvest (Haley and Luckert 1990). These are

tenures that can be renewed before their endpoint. For example, British Columbia's major area-based license lasts 25 years, but because it is an evergreen contract it is renewable for another full term after renegotiation at year 5.

Evergreen contracts provide the security of a long planning horizon for both the government and the tenure holder. Economic theory suggests, and experience supports, that with traditional contracts the uncertainty of renewal decreases the holder's incentives for responsible management as the lease nears its scheduled end. At that time, tenure holders are more likely to overharvest and less likely to invest in resource maintenance.¹⁰ Evergreen contracts can prevent this tendency.

A second advantage of evergreen contracts is that they allow the terms of the agreement to be gradually adjusted over time. Traditional contracts can only be renegotiated after they expire, and some Canadian timber tenures span up to 99 years. In contrast, evergreen contracts can respond to volatile markets and ecological factors such as wildfire or insect infestation through early and frequent renegotiation.

Evergreen contracts promote adjustments because they encourage successful renegotiations. Each side has bargaining power because both the government and the tenure holder have the option of turning down renewal and simply carrying the current agreement to its end. At the same time, each side has a positive incentive to renew. If the negotiation is successful, the tenure holder will get a new, long-term agreement, and the government can apply new regulations immediately instead of many years down the road.

One potential drawback to evergreen contracts is that, in a sense, they can bypass markets. Auctions through open bidding are infrequent and may be eliminated completely. When leases are rarely put up for bid there is no market information with which to determine prices. Therefore, it is possible that prices do not accurately reflect market conditions.

To address this problem, tenure fees are sometimes set through third-party arbitration (Townsend and Young 2005). Each side presents the arbitrator with relevant data, such as costs and profits,

and submits a proposal for fees. The arbitrator then selects the most reasonable offer, or some compromise between the two. In this situation, both sides have incentives to present reasonable proposals, since extreme proposals are unlikely to be selected. Although it is not a perfect science, arbitration is a common practice in forestry and other industries when market prices are not known.¹¹

RESPONSIBLE FOREST STEWARDSHIP: CASE STUDIES

Most major forest tenures are held by large industrial forest companies, but the flexibility of Canada's system permits alternative types of tenure holders as well. The following case studies include an industrial forest company in Ontario and three community-based forests, one in Ontario and two in British Columbia. They show how Canadian forest policies can achieve a variety of management goals while still providing incentives for responsible forest management.

TEMBEC, INC.: INDUSTRIAL FORESTRY

Tembec, Inc. is one of many industrial forestry companies in Canada. Like other companies, Tembec holds a variety of forest tenures in several different provinces. In 2001, Tembec made a commitment to Canada's World Wildlife Fund to certify all of its forest operations to the Forest Stewardship Council's standards.

Forest certification verifies that wood is produced and harvested in a manner that is ecologically, economically, and socially sustainable. A number of certifying organizations exist, each with unique requirements and characteristics (Fletcher et al. 2002). The Forest Stewardship Council (FSC) developed one of the earliest certification systems in 1993. Its original intent was to protect tropical rainforests, but it has since been adjusted and applied to forests worldwide. The FSC is generally regarded as the most stringent certification system.

Specific requirements of the Forest Stewardship Council are outlined in ten principles covering topics such as management planning, assessment of environmental impacts, and maintaining community relations. Forest managers must satisfy the requirements of all ten



FIGURE 2: TEMBEC, INC.

principles in order to be FSC-certified.

Potential benefits to Tembec from certification include price premiums, improved management, and market advantage (Hayward and Vertinsky 1999). So far, customers in U.S. markets have been unwilling to pay premiums for certified forest products (Cashore et al. 2004, 116; Fletcher et al. 2002; Forsyth et al. 1999), but environmental groups have pressured some of the larger retailers of wood products, such

as Lowe's and Home Depot, into adopting policies favoring certified wood. This means improved market access for certified foresters, providing an incentive for certification worldwide.

Area-based tenures are conducive to forest certification, because they allow companies to create site-specific management plans. Companies can tailor their management to environmental and community concerns that are unique to a particular area.

In 2003, Tembec announced the FSC certification of the 5 million-acre (2 million-hectare) Gordon Cosens forest in eastern Ontario (see Figure 2). Tembec manages the Gordon Cosens forest through a 20-year, area-based tenure that is renewable on an evergreen basis at year 5. This tenure transfers significant management responsibilities to Tembec, including planning, forest monitoring, and reforestation.

This example shows that industrial forest management on public lands can be carried out in a manner that meets high environmental standards. Currently, no national forests in the U.S. have been certified. One reason is that the level of timber production in any forest is too low to justify the costs of the certification process. Canada's experience suggests that long-term, area-based leases could promote a productive and environmentally sound timber industry on federal lands in the United States.

WESTWIND FOREST STEWARDSHIP: MULTIPLE-USE MANAGEMENT

In addition to industrial forest companies such as Tembec, Canada has an increasing number of organizations that practice community-based forestry. This essay will look at three examples, one in Ontario and two in British Columbia.

Westwind Forest Stewardship is a nonprofit, community-based forest management organization, the only one in Ontario (see Figure 3). Based on the east shore of the Georgian Bay in Parry Sound, Westwind is less than three hours' drive north of Toronto. The local economy is based primarily on tourism, but the timber industry has strong roots in the area (see Figure 3).

In 1996 Ontario restructured its tenure system, significantly shift-



FIGURE 3: WESTWIND FOREST STEWARDSHIP

ing management responsibilities from the provincial government to tenure holders. Westwind was created to take advantage of this new system and to allow a community concerned about protecting its surrounding environment to take control of forest management.¹² Westwind holds an area-based tenure on 890,000 acres (360,000 hectares) of the publicly owned French Severn forest.

As a nonprofit organization, Westwind does not have to meet the

demands of shareholders and can consider the values of a variety of local individuals and groups. Unlike corporate timber license holders, Westwind is directed by a local board that includes both community and industry representatives. Although Westwind's tenure only grants rights to timber on Crown land, Westwind encourages multiple uses through managing for "wildlife habitat, ecosystem function, quality forest-based recreational tourism experiences, trapping opportunities, and places for solitude and reflection" (Westwind Forest Stewardship n.d.).

Westwind has an annual operating budget of \$1.7 million, which pays for planning and silviculture. This operating budget is completely supported by timber dollars. In addition, Westwind has an annual "partnerships" budget of \$200,000, which has paid for FSC certification, forestry and safety training, and periodic conferences on forest management. The partnerships budget is funded by grants from private foundations that support responsible forest management.¹³

Although Crown forest management by a nonprofit community organization is not widespread, Westwind has proven its success. The organization carries out forestry that is ecologically, socially, and economically sustainable, as verified by FSC certification. Because it finds support from willing donors, Westwind covers additional expenses without depending on government subsidies. This model could be applied to U.S. federal forests, where forest management units could be leased to nonprofit organizations.

REVELSTOKE: A SOCIO-ECONOMIC FOCUS

There is increasing demand in British Columbia for local control of natural resources through community-based forest management. Like Westwind in Ontario, some community forests in British Columbia hold conventional forest tenures, either volume-based or area-based. Revelstoke is an example (see Figure 4).

The year 1986 was a low point for the mountain town of Revelstoke, British Columbia. After a hundred years of reliance on timber, mining, and railways, the local economy was beginning to falter. A boom caused by the nearby development of three hydroelectric dams was coming to an end, and Revelstoke's major sawmill shut down. As a result, most of

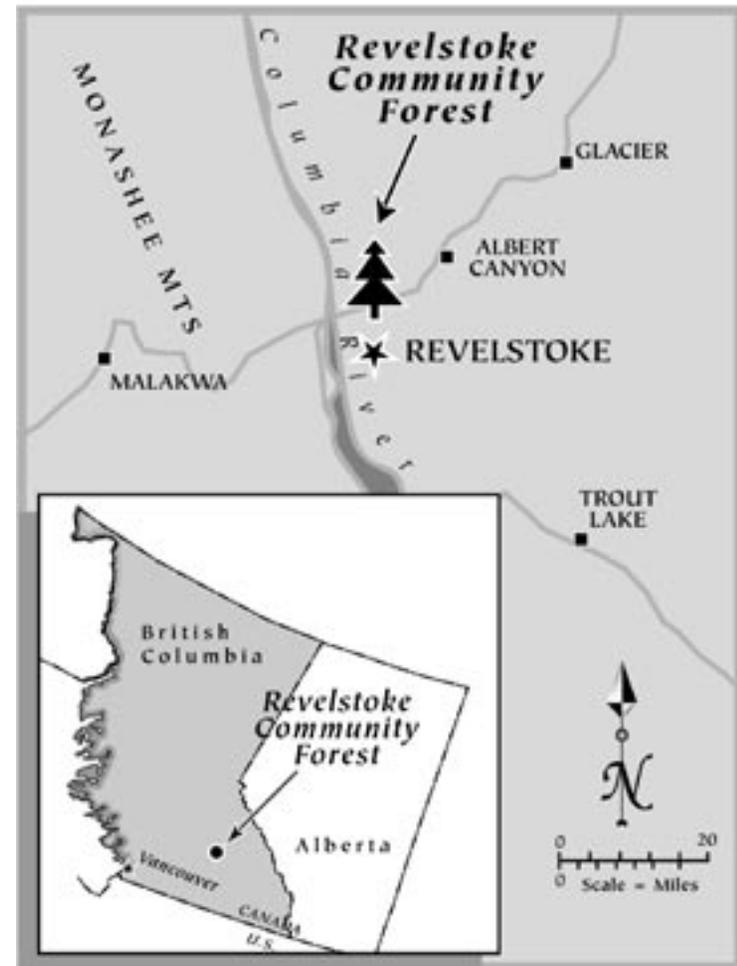


FIGURE 4: REVELSTOKE

the timber harvested from public lands in the area was sent out of town for processing, taking with it jobs and revenue (Revelstoke Community Forest Corporation 1995).

Realizing that resource dollars were flowing out of Revelstoke, community groups worked with the city government to promote more local timber processing. In the early 1990s, the province divided and reallocated the area-based tenure surrounding Revelstoke. The south-

ern portion went to a U.S. firm, Pope and Talbot, Ltd. When the northern portion became available, the City of Revelstoke formed a partnership with three industry representatives and purchased the tenure.

The city created the Revelstoke Community Forest Corporation, a municipally owned enterprise that oversees management of the forest. The major local sawmill reopened, and by 1993 most timber harvested from public forestlands in the area could be processed locally (RCFC 1995).

The Revelstoke Community Forest Corporation has met early goals of creating jobs, supplying logs for local processing, and boosting the local economy. RCFC has turned a profit ten out of the last twelve years. The losses have been attributed to the cyclical nature of the forest industry, market conditions, and environmental factors such as fires and flooding. RCFC had prepared for periods of economic downturn through a reserve fund. The corporation remains optimistic about future operations.¹⁴

In contrast to U.S. federal forests, which are bound to multiple-use mandates, Revelstoke Community Forest has clear priorities. The first priority is to address the social and economic demands of the Revelstoke community. RCFC provides a steady supply of timber to local mills for processing, employs local workers, and keeps timber dollars in the community. In addition, it maintains a high level of environmental protection and cooperates with other forest users such as heli-ski operations, guides, and trappers.¹⁵ RCFC's clear focus on social and economic issues does not preclude multiple uses of forestland.

On the environmental side, RCFC experiences challenges similar to those facing U.S. federal forests: protection of threatened species, control of invasive insects, and fire management. Specifically, it has faced declining mountain caribou populations, hemlock looper infestation, and "disastrous" wildfire (RCFC 2003–2004, 5). In contrast to U.S. federal land management agencies, however, RCFC is able to respond quickly to these issues because of the nature of its tenure agreement with the province. The corporation is formulating a recovery plan for the mountain caribou, implementing a spraying program to curb the hemlock looper infestation, and has adopted helicopter logging to salvage fire-damaged wood (RCFC 2003–2004). The ability

of RCFC managers to react to environmental conditions in a timely manner may prevent further environmental degradation.

The Revelstoke example is not without flaws. Environmental organizations contend that current timber tenures do not provide enough incentives for ecosystem-based forestry and that annual cutting rates are too high, even on community forests like Revelstoke's (Bonnell et al. 1998). In response, RCFC points out that it maintains a higher level of environmental protection than is required. RCFC is working toward FSC certification, and has been certified to the less-stringent ISO standards.¹⁶ Additionally, environmentalists acknowledge that RCFC is making efforts to implement alternative logging techniques in some areas (Bonnell et al. 1998). RCFC denies that it is harvesting above sustainable levels.¹⁷ In any case, the harvest rate is largely beyond RCFC's control, because all tenure holders must operate at or near their AAC allocation. Although RCFC does provide an innovative example of community forestry, it is still bound to the constraints of its tenure, like any other tenure holder in Canada.

If U.S. federal forests were to incorporate community forestry for timber-dependent communities, there is much to learn from the Revelstoke example. Community forest organizations could be allowed to set clear priorities and to take managerial action in response to environmental conditions. This would necessitate changes in current U.S. forest management policies. In contrast to Revelstoke, however, U.S. community forests would not be obligated to harvest an annual allowable cut. Instead, a maximum harvest level could be set and community forests could operate at or below the designated level.¹⁸ This would enable tenure holders to take various approaches to forest management, including ecosystem-based forestry. The success of community forests such as Revelstoke suggests that such a system might work for some U.S. federal forests.

HARROP-PROCTER: WATERSHED PROTECTION

In 1998 British Columbia responded to public demands for alternative tenures and for more local control over forest resources by introducing Community Forest Agreements (CFAs). Harrop and

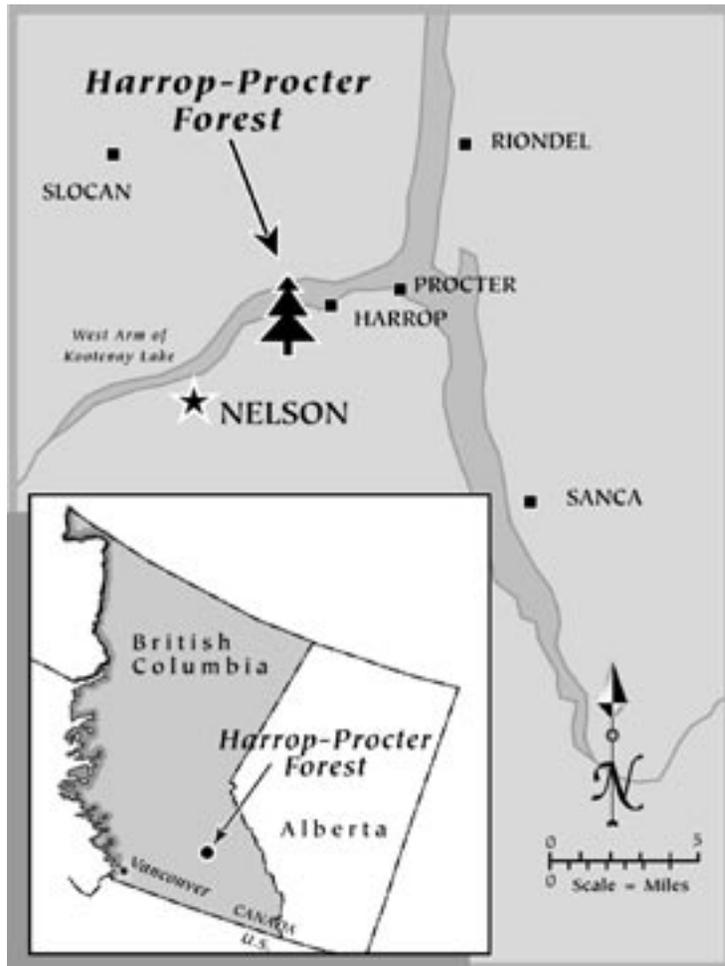


FIGURE 5: HARROP-PROCTER

Procter, two small villages on the shore of the West Arm of Kootenay Lake in southeastern British Columbia, have entered into such an agreement with the province (see Figure 5).

These agreements are area-based tenures that create an opportunity for forest management by local governments, community organizations, or indigenous groups. Each agreement is tailored to address the goals of the particular community. Agreements begin with

a five-year pilot period, during which the tenure is evaluated by the government. If the community organization meets certain economic, environmental, and management standards, terms can be lengthened into long-term evergreen contracts extending from 25 to 99 years (British Columbia Ministry of Forests 2002–2004).

Although the response to the community forest program has generally been positive, some people claim that CFAs represent a government ploy to promote logging in community watersheds (Koop 2004). In the past, communities have protested against commercial logging in their watersheds, because they feared deterioration of their water supply. (Much of Canada's drinking water comes from untreated surface water in Crown forests.) Now that most Crown forestland in British Columbia is allocated for harvest through timber tenures, more companies are eyeing these community watersheds as a source of timber. Most of these forests have not been cut previously and are relatively accessible, which means that they have the potential for high profits for timber companies. In the face of this increasing pressure to harvest community watersheds, some communities have turned to CFAs in order to maintain local control.

As of March 2005, 11 pilot agreements had been issued, and British Columbia had received 15 additional applications (British Columbia Ministry of Forests 2005b). Of the 11 pilot agreements, two have been awarded 25-year licenses, renewable at year 10.¹⁹ At least 90 communities have contacted the B.C. Ministry of Forests for information about the CFA program (British Columbia Ministry of Forests 2002–2004). This high level of demand indicates that British Columbians want more local control of Crown forests.

Harrop and Procter have 700 year-round residents, a rural economy, and a sizeable summer tourist industry. Since the mid-1970s the communities have organized in opposition to logging in the Crown forest immediately surrounding them, for many reasons. The nearby Crown forest is the main source of water for agricultural and domestic purposes. Residents rely largely on untreated surface water, and they fear that industrial logging would force the installation of costly chlorination and filtration systems. Second, the area is

home to populations of caribou and grizzly bear that the community wants to protect. Third, community members have at times opposed logging because it disturbed scenic views (Harrop-Procter Community Forest n.d.).

In 1999 Harrop-Procter received a Community Forest Pilot Agreement over 27,000 acres (11,000 hectares) of Crown forests. The Harrop-Procter Community Co-op was formed to take over forest operations and economic development. Every effort is made to use ecosystem-based forestry techniques and to process forest products locally. The co-op supports two businesses: Sunshine Bay Botanicals and Harrop-Procter Forest Products.

Sunshine Bay Botanicals sells dried herbs, teas, and tinctures created from forest-harvested and organically-farmed herbs.²⁰ Harrop-Procter Forest Products sells everything from rough-cut lumber to kitchen cabinets, all marketed as “wood with a conscience.” Future efforts are aimed at creating an ecotourism business, further developing non-timber forest products, incorporating more local processing of timber, and marketing more value-added wood products. The forest has been FSC-certified, and has been re-approved for a second five-year pilot period.

In contrast to RCFC’s social and economic focus, Harrop-Procter’s first priority is protection of the community’s drinking water. To work toward this goal, Harrop-Procter has successfully negotiated with the provincial government for a lower AAC (Anderson and Horter 2002) to reduce logging intensity and impacts on the watershed. Harrop-Procter’s management plan places a lower value on timber harvests and a higher value on ecosystem function.

Because Harrop-Procter does not intend to maximize returns from timber, it must generate revenue through alternative sources. It is the only timber tenure holder in British Columbia that is actively marketing nontimber forest products and one of the few that sell value-added wood products. The community forest has also secured development grants and funding from venture capitalists. Harrop-Procter cuts down on management costs by relying heavily on volunteers, who supply as much as 350 hours of work per month

(Anderson and Horter 2002).

Like RCFC, the Harrop-Procter community forest may offer solutions to U.S. federal forest management problems. It gives clear priority to watershed protection. It achieves economic viability through alternative forestry, donations of time from volunteers, and funding from investors and foundations. It meets sustainable management criteria, and it develops management plans efficiently and effectively.

In the United States, a community forest tenure could be created that would allow local management of federal forests. The federal government could collect annual fees and stumpage fees and determine a maximum allowable cut level. Thinning for the purpose of fuels management might be necessary in some areas. Tenure holders would be responsible for forest planning and for generating revenues to cover fees without exceeding sustainable harvest levels.

Revelstoke and Harrop-Procter illustrate two different approaches to community forestry: one for timber-dependent communities and one for communities that want to minimize commercial forestry. Their experience suggests that community forestry on U.S. federal forests could be a success. Potentially, community forestry could alleviate problems of multiple-use management, planning, economic inefficiencies, and environmental degradation on U.S. federal forests.

The Canadian experience could provide the foundation for pilot

programs of U.S. land management agencies. The programs would fall into two categories of experimentation: introducing long-term timber tenures and adopting community-based forestry.

TIMBER TENURES

U.S. federal land management agencies could manage timber through long-term, evergreen tenures similar to Tembec’s area-based tenure on the Gordon Cosens forest in Ontario. In addition to stumpage fees, the government would collect annual rents. The tenure holder would be responsible for all aspects of forest management, including

RECOMMENDATIONS

forest planning and environmental protection.

The benefits of this approach would include generating forest revenues and reducing management pressures for federal agencies. Planning and on-the-ground management would be the responsibility of the tenure holder, probably a private company. By streamlining the managerial role of the agency while generating revenue, this approach could lead to a profitable timber management program.

In the initial phase, tenures could be created for timber management that would also stipulate standards for environmental performance. This would be a variation on the industrial forestry example from Ontario, where area-based tenure holders like Tembec manage primarily for timber. Later, recreational or conservation tenures could be created to take over other aspects of forestland management. This would further reduce management pressures on federal agencies and generate additional forest revenue.

The evergreen nature of the contracts would allow frequent adjustments to tenure agreements, so management could adapt to changes in the market, technological advances, or new environmental research. Third-party arbitration could assist in assessment of annual rents and stumpage fees. If successful on a pilot basis, this type of forest tenure could be incorporated into policy.

COMMUNITY FOREST AGREEMENTS

U.S. federal forests could offer community forest agreements similar to those in British Columbia. To be successful, these agreements would have to at least partially incorporate dominant-use management. That is, communities would need to be able to determine clear management priorities so that the forest management would satisfy the specific demands of the community.

Some community forests, like Westwind in Ontario, might still decide to manage for multiple uses. Others, like Revelstoke, might manage primarily for timber, or, in the case of Harrop-Procter, for environmental protection. While multiple-use requirements might not be met on each forest, they could be achieved on a broader scale. Although each community forest could focus on a single use, multiple

uses would be provided across a large geographical area. Communities could adjust management priorities over time, but would not have to provide for every conceivable use.

Community forests would pay annual rents and stumpage fees in the case of harvest, as with traditional forest tenures. Instead of incorporating Canada's AAC, the United States could set a maximum harvest limit. Except for fuels reduction, community forests would not be required to log, so the conflicts concerning the AAC that are seen in Canada would not arise.

Community forests could supplement timber income through donations, grants, non-timber forest products, or other alternative sources. All planning and on-the-ground operations would be the responsibility of the tenure holder, although forest plans would be subject to federal approval. Community forest agreements would be renewable on an evergreen basis, so that they could be renegotiated regularly. As in British Columbia, this approach could initially be implemented on a trial basis, and expanded if successful.

ADOPTION OF CANADIAN APPROACHES

Some differences between the United States and Canada may impede the adoption of forest management styled after these Canadian examples. Forests are more prevalent in Canada than in the United States: There are 30 acres of forestland for each Canadian resident compared to 2.55 acres for each U.S. resident (and 28 acres public forestland per person in Canada vs. one acre per person in the United States). A greater perception of scarcity of forestland in the United States could lead to opposition to incorporation of the Canadian forest management system, which is based on timber harvesting. Additionally, because forestry is a major segment of the economy in Canada there is stronger cultural support for forestry in Canada which is absent in the United States.

Nor is forest management ideal in Canada. The ubiquitous annual allowable cut discourages forestry that does not include intensive logging. Ecosystem-based and community-based forests struggle to achieve their goals while also meeting the annual cut

rates required by the provincial governments.

Nevertheless, some positive aspects of forest management in Canada could be applied to U.S. public forests. A framework for introducing new forest management policies in the United States has been offered by Daniel Kemmis (2004), senior fellow in public policy at the Center for the Rocky Mountain West at the University of Montana. Kemmis suggests reconstituting the now-defunct Region 7 of the Forest Service, which was eliminated when the ten Forest Service regions were reorganized in 1965. Instead of a geographical region, the new Region 7 would be a grouping of discontinuous areas where alternative approaches to federal forest management could be applied on an experimental basis. These could include Canadian policies of the kind discussed here. After an initial pilot period, these programs could be evaluated and adjusted as necessary.

CONCLUSION

Through timber leases and community forestry, Canadians capture the wealth of nature from both extractive and non-extractive uses of their forests. This is made possible by tenures that encourage responsible stewardship as well as economic efficiency.

Whichever new policies are adopted in the United States, they should be flexible and allow for constant reevaluation. This is particularly important in light of the fact that ecosystems are poorly understood and constantly changing. Policy changes should be implemented on a trial basis or in a discrete area before being universally applied. The Region 7 approach provides a technique for initiating such projects.

Additional research should be directed toward alternative approaches to public forest management. Future research on forest management in Europe, New Zealand, Australia, and South America, for example, may produce examples of other innovative approaches to forest management. Meanwhile, the United States can learn from its northern neighbor in order to realize the bounty of its natural heritage.

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NOTES

1. Twenty percent of the total U.S. forestland is managed by the U. S. Forest Service (part of the Department of Agriculture), 13 percent by other federal agencies, and 8 percent by individual states (USDA Forest Service 2003).
2. Personal communication (January 2006) with Holly Lippke Fretwell, research associate with PERC, who compiled data from 1998-2001 for both the Forest Service and the Bureau of Land Management; financial data are adjusted to 2005 U.S. dollars throughout this essay.
3. Other forest uses are also controlled by the provinces, either through other kinds of tenures (i.e., non-timber tenures), or through government management.
4. Annual rents are based either on the area of land managed or on the volume of wood harvested, and may go toward provincial operations, reforestation, or protection from environmental threats such as fire or disease (Haley and Luckert 1990).
5. For example, stumpage fees range from \$0.20/m³ to more than \$39.00/m³ in British Columbia, and from \$0.47/m³ to \$21.53/m³ in Ontario. British Columbia charges an annual fee of \$0.20/m³. Ontario does not charge standard annual fees, but adds on charges

at the time of harvest to cover replanting and protection from fire, wind, insects, disease, and flooding. Replanting charges are \$0.38/m³ and protection charges run from \$0.08/m³ to \$9.97/m³, depending on the type of wood and the location of the harvest within the province. (Data provided by email communication with Ron Greshner, senior timber tenures forester, British Columbia Ministry of Forests, April 27, 2005; Ontario Ministry of Natural Resources 2005).

6. For example, in 2001/2002, British Columbia Ministry of Forest Revenues were \$1 billion. Forestry expenditures were \$425.3 million, and \$574.7 million went to the provincial general treasury (British Columbia Ministry of Forests 2001-2002, 4). In Ontario in 2001/2002, forestry fees generated \$146.1 million. Of this, \$69.2 million went to forestry accounts and \$76.9 million went to the provincial Consolidated Revenue Fund (Ontario Ministry of Natural Resources 2004, 24).
7. For example, in British Columbia, the average allotment of the major volume-based tenure is 213,101 m³/year (90.3 million board feet/year) (British Columbia Ministry of Forests 2005a).
8. The only province that offers more than three different kinds of timber tenure is British Columbia, which has the most diversified forest tenure system (Haley and Luckert 1990).
9. Canada's AAC is calculated in a way similar to the United States' Allowable Sale Quantity (ASQ). Growth rates are determined by yearly inventories or growth models.
10. Email communication with Ralph Townsend, professor of economics, University of Maine January 23, 2005, citing "Evergreen Operating Contracts as a Complementary Institution for Market-Based Management," by Ralph E. Townsend and Michael D. Young (unpublished manuscript, 2003).
11. Email communication with Ralph Townsend, June 21, 2005.
12. Email communication with Steve Munro, general manager, Westwind Forest Stewardship, Inc., May 30, 2005.
13. Email communication with Steve Munro, May 24 and 25, 2005.
14. Telephone communication with Bob Clarke, general manager,

Revelstoke Community Forest Corporation, March 11 and 13, 2005.

15. Telephone communication with Bob Clarke.
16. Telephone communication with Bob Clarke.
17. Telephone communication with Bob Clarke.
18. In some fire-adapted ecosystems, it might be necessary to require fuels reduction through either prescribed burning or mechanical treatments.
19. Email communication with Ron Greshner, senior timber tenures forester, British Columbia Ministry of Forests February 8, 2005.
20. Harrop-Procter's CFA is the only timber tenure in British Columbia that includes the commercial harvest of non-timber forest products, in this case forest-harvested herbs (personal communication with Ramona Faust, general manager, Harrop-Procter Community Forest Co-op, and director, Harrop-Procter Watershed Protection Society, June 17, 2005).

BRANCHING OUT:

CASE STUDIES IN CANADIAN FOREST MANAGEMENT

The forests of North America represent enormous natural bounty. Yet, in the United States at least, the benefits of this wealth of nature are not being fully realized. Taxpayers lose money on their public forests, and the forests face severe ecological threats.

Concern about the forests has inspired a search for different approaches to the management of logging and other forest-related activities. This search has led to Canada, where public forests are managed in ways that are strikingly different from those in the United States.

In this essay, "Branching Out: Case Studies in Canadian Forest Management," Alison Berry presents examples from Canada that illustrate the benefits of long-term leases and licenses (often called tenures) and decentralized control.

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