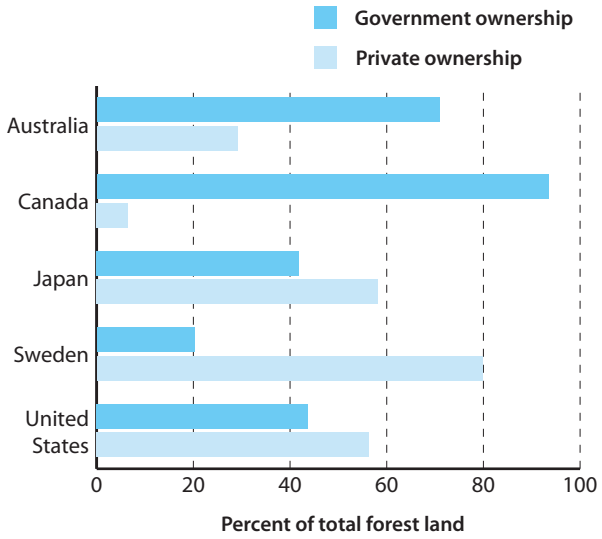
Forests: The Private Role in Public Rights

Alison Berry & Holly Lippke Fretwell

In the minds of many, Canada and forests are almost synonymous. With forests covering nearly half of its landscape, the nation is the world's largest exporter of timber-based goods (Drushka, 2003). Canadian forests also protect water quality and yield, while providing a vast number of recreational opportunities and habitats for a great diversity of wildlife, in addition to performing many other functions. Canada's forests are vital to the nation and her people.

While Canada has much in common with other developed nations such as the United States and many European countries, it is unique in terms of the amount of forested land that is privately owned. As shown in figure 1, less than 10% of forestlands in Canada are privately owned,[1] a tiny portion in comparison to private ownership in other countries such as Australia, Japan, Sweden, and the United States (White and Martin, 2002: 5). The vast majority of Canadian forests (77%) are owned by the provincial governments, and the remaining public land is federally owned (Natural Resources Canada, 2006: 6). Despite the prevalence of public ownership in Canada, much of the management responsibility is delegated to the private sector.

Figure 1: World forest ownership



Source: White and Martin (2002: 5)

Canada's unique ownership structure is a result of the manner in which Crown lands were transferred to Canada from Britain. Since the beginning of the European settlement until the early nineteenth century, the majority of Canada's forests were the domain of the British Crown. Beginning in 1837, rights to resources on Crown lands were transferred to the provinces as they formed governments. The provinces sold timber to

1 In some provinces and in some areas, the percentage of private ownership is above 10%.

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

finance government operations, while retaining ownership of forestlands. This system continues today under the timber-tenure system, which transfers responsibility for public land management to the private sector (Drushka, 2003: 30).

How forests are managed and cared for, in Canada and throughout the world, is dependent upon who owns them and the laws governing their use. The predominance of publicly owned forests in Canada magnifies the importance of public land policies, which can have huge environmental and economic impacts. The bureaucratic nature of public land management throughout much of Canada has resulted in misdirected incentives, which has led to the inefficient management of one of the country's greatest natural resources.

This chapter compares public forest management policies in Canada and the United States. It analyzes the different mechanisms used to motivate forest stewardship and provides policy implications. Canadian provincial timber tenures provide a unique set of tools for Canadian timber management. This chapter focuses on this policy application and on specific areas where it can be improved.

> The private role

Before taking a look at Canada's vast, publicly managed forests, it is important to examine how private forest owners steward their land and why. Canada is fortunate to have clearly outlined private property rights which allow these forest owners to benefit from their land when it is healthy and productive or, in some cases, to suffer the consequences of poor land stewardship. For example, a private forest owner has the right to the proceeds from timber harvesting and can reap financial benefits year after year if the forest is well managed. When poorly managed, the land may become less productive and the owner will suffer the burden of lower proceeds. It is in the best interest of the private owner to enhance the land's productive ability.

In addition to timber productivity, forest owners also benefit from other forest values. Well-maintained forestland will retain its value or even increase in value, while a poorly maintained forest will lose value. Because the value of a forest depends on what others are willing to pay for it, a wise owner will manage the land not only to ensure timber production, but also to maintain clean air, good water quality and plentiful supplies, wildlife habitats, and scenic beauty. All of these are augmented by good stewardship and will add value to the land.

One of the impediments to developing markets for non-timber forest values in Canada is government ownership of fish, wildlife, and water. This is also true in many countries throughout the world. For example, in the United States, fish and wildlife are owned by state governments. Nevertheless, these amenities can enhance the future resale value of the property and can be enjoyed in the present by the current owner. Thus, a private timberland owner who is seeking to maximize his personal benefits should be motivated to be a good steward of his land.

Private forestland owners, whether they are producing wood products or not, realize the value of alternative land uses. The United States, with its higher percentage of private forest owners, provides numerous examples of the benefits available from land uses that are not exclusively tied to timber harvest.

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

International Paper (2006), once one of the largest timberland owners in the United States, earned 25% of the revenues from its southern region during the 1990s by charging recreation and hunting fees for the use of its land. Hunters first secured permits from the state wildlife agency, and then paid International Paper for access to its lands for the purpose of hunting. As a result, the company became a wildlife manager in addition to a timber producer (Anderson and Leal, 2001: 66).[2] Rather than clear-cut large rectangular swaths, the company left corridors of standing trees to enhance wildlife populations and buffer streams to improve fisheries. Where timber was harvested, the harvest edge was feathered to provide a more natural appearance.

Similar to International Paper, smaller plantation owners protect the timber amenities they value. Chuck Leavell owns a tree plantation in the southeastern United States. His Charlane Plantation gains revenues from both harvesting timber and providing a prime bird hunting experience. Many other non-industrial timber land owners harvest little or no timber but enjoy the other amenities of their forest. Adirondack Park in the state of New York, for example, is a patchwork of public and private lands. Within the boundary of the six-million-acre park, 3.5 million acres are privately owned. Many of these private forestlands are maintained for personal recreation opportunities.

Worldwide, there are forests owned by non-governmental organizations (NGOs). The Nature Conservancy and the Audubon Society both own and manage timberland to enhance wildlife habitats and diversity. The majority of their revenues come from member donations, so they must satisfy members' desires for habitat protection in order to maintain or increase financial support. In order to meet their conservation goals, they must practice good stewardship.

Some of these NGO-owned lands are working lands, such as the Nature Conservancy's Pine Butte Ranch in Montana where cattle still graze and vacationers can enjoy learning about this habitat along the Rocky Mountain Front. On other Conservancy-owned lands, timber is harvested to enhance habitats. The Nature Conservancy's Washo Reserve in North Carolina is one of the oldest wading bird rookeries in the world. It is also home to the endangered red cockaded woodpecker. The woodpecker excavates cavities in old, large, longleaf pines. To encourage faster tree growth, managers mechanically thin the trees and use prescribed burning to inhibit undergrowth. The timber revenues help pay for the management of the reserve (Fretwell, 1999a: 24).

The vast public ownership of Canadian forests leaves little land for such private initiative. Instead, the use of the majority of forests, whether for wood products, wildlife, water quality, or recreation, is determined by government agencies and personnel. No individual receives the benefits from their own good stewardship, nor does anyone suffer the full burden of lost value due to degradation. As a result, forest management is based on government plans that are vulnerable to the demands of special interest groups—plans that do not respond to the changing values of forest uses.

Government management of Crown forestlands in Canada is implemented largely through the timber-

2 In a move to transform the company and focus on uncoated papers, as well as industrial and consumer packaging, International Paper sold nearly 80% of its US land holdings in 2006 (International Paper, 2006).

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

tenure system. Non-timber uses are either managed by the provincial governments or provided through separate tenure agreements. Forest tenure holders do not have the right to balance timber harvests with alternative forest uses to meet their goals. The timber-tenure system needs to be reformed—through either private ownership or more complete rights to forestland—so that managers can respond better to the demands of forest users. The next section describes in detail the timber-tenure system, and identifies areas for improvement.

> The timber-tenure system

Timber tenures are agreements between provincial governments and the private sector. Through tenures, private companies gain access to Crown lands for the purpose of timber harvest and, in return, must pay fees and assume management responsibilities. This system has advantages for both the provincial governments and the forest industry. The provinces retain ownership of forestland and generate revenues from the timber tenures that help finance other provincial operations. The forest industry gains access to timber, often for long periods of time, but it does not have to pay the full costs of ownership as it would if it actually owned the land.

Not all tenure agreements are the same. Some tenures carry strong incentives for stewardship, while others provide little incentive to maintain a long-term interest in the land. Each province has a unique array of timber tenures, but most harvesting rights are allocated through one of two types of tenure agreements (Haley and Luckert, 1990). One is a long-term, area-based tenure which confers significant management responsibilities. An area-based tenure restricts the holder to logging within a particular area, which can be sizeable. For example, in Ontario, the average area-based tenure covers 509,000 hectares (Ontario, Ministry of Natural Resources, 2004: 23). Area-based tenures generally last from 20 to 25 years, and are often renewable (Haley and Luckert, 1990). This encourages tenure holders to manage the land with the future in mind.

Other tenures are short-term, volume based, and confer fewer management responsibilities. Volume-based tenures allocate a specified amount of timber to the holder, but do not restrict the location of harvests within a broad area of Crown land. Under this arrangement, tenure holders might harvest from a specified site only once. Also, most volume-based tenures last for 10 years or less (Haley and Luckert, 1990). As a result, volume-based tenure holders have little incentive to manage with the long-term productivity of the land in mind.

Economic theory suggests that the stronger property rights associated with long-term, renewable, area-based tenures will result in better stewardship of forest resources (see, for example, Demsetz, 1967). Scientific research supports this theory. University of British Columbia researchers Daowei Zhang and Peter Pearse investigated the effect of tenure on reforestation practices, financial investments into silviculture, and compliance with environmental guidelines in British Columbia (Zhang and Pearse, 1997, 1996; Zhang, 1996). They found that offering more secure tenures—area-based, long-term, and renewable tenures—resulted in faster reforestation, greater financial investments, and stronger compliance with environmental guidelines. Offering secure property rights to public resources through long-term, renewable, area-based tenures improves stewardship

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

incentives (see Berry, 2006). While area-based tenures are prevalent across Canada, some provinces continue to allocate a significant portion of the allowable harvest to volume-based tenures.

However, long-term stewardship incentives can be undermined by the power of the government to breach contracts at any time. For example, since the 1970s, forest policies have increasingly regulated forest practices in some areas such as riparian zones, critical wildlife habitats, and on steep slopes. As well, provincial governments now require more public participation in the forest planning process (Drushka, 2003: 67–68). These new policies aim to enhance environmental quality and to garner public support for forest practices, but the ability of the provincial governments to regulate forest management undermines the expertise of professional forest managers and weakens the incentives for long-term management. As the risk of losing rights increases, the incentives for long-term management decline (see Alchian, 2002).

Canadian timber tenures need to be reformed in order to better encourage stewardship of forestlands. Changes in forest policy should focus on increasing property rights and private sector involvement in forest management, through either transfer of ownership or transfer of more secure and complete rights to forest resources within the timber-tenure system.

> Non-timber forest resources

Timber tenures apply strictly to the harvest of timber. They do not convey rights to non-timber forest products such as water and wildlife, or to forest uses such as recreation. These are controlled by the provinces, either through non-timber tenures or through government management. For example, in British Columbia, non-commercial recreation is managed by the Ministry of Tourism, Sport and the Arts, sometimes in partnership with local groups. Commercial recreation, such as guiding and outfitting services, is controlled through a variety of recreation tenures. Provinces also offer permits for fishing and hunting, which are generally required for these activities on all lands and waters within the province, including Crown lands in timber tenures.

Because holders of timber tenures do not control non-timber forest resources, they cannot benefit by making trade-offs between harvest and other forest values, even when it would be to their advantage. Unlike private owners who are able to choose the use that will provide the greatest return, the timber-tenure holders must rely solely on the value of the timber for revenue generation.

Usually provincial regulations do require holders of timber tenures to consider non-timber forest values in their planning and management activities. But timber is typically the only way for tenure holders to generate revenues to cover fees and the costs of management. This command-and-control management system emphasizes timber production, even though the values of other forest uses are growing over time as both incomes and the population are increasing.

A clash between timber and non-timber values came to a head in the 1990s during the "war in the woods." This "war" involved large-scale disputes between loggers, environmentalists, and First Nations in western British Columbia. The conflict centered on the temperate rainforests of Clayoquot Sound on the west coast of Vancouver Island. When logging intensified in the

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

Clayoquot area in the 1970s, First Nations and environmental groups took note of damage to fisheries and other resources that was caused by the prevailing logging practices (Iisaak Forest Resources, 2000). Logging protests were staged throughout the 1980s, escalating into a 1993 event in which more than 800 protesters were arrested for blocking access to a logging road. A resolution to the Clayoquot dispute was eventually reached in 1999 (Stefanick, 2001), but the debate continues over logging rates, in Clayoquot and across Canada. The message is clear: residents of Canada demand a wide array of values from their forests—not just timber, but also recreation, wildlife habitats, clean water, and wilderness. In order to meet these demands, Canadian forest policies need to better address non-timber forest resources.

> Geographical separation of commercial forests from conservation forests

Many observers suggest that forest management problems could be solved by designating separate commercial and conservation areas within Crown forests (Sahajananthan et al., 1998; Sedjo and Botkin, 1997). Commercial areas—the most suitable for that purpose—would be managed for timber production, while conservation areas would be managed more for environmental or amenity uses.

New Zealand recently acted on this idea by separating commercial timberlands from conservation forests. Commercial timberlands are managed mostly for timber harvest by private companies, and the conservation lands are mainly indigenous forests, reserved from logging and managed by New Zealand's Department of Conservation. This approach has been quite successful at alleviating some problems arising from conflicting forest uses, and at engendering more efficient timber management.

It is not clear, however, that government ownership of non-commercial timber lands will best protect environmental values. Not having a timber harvest to cross-subsidize the conservation lands, New Zealand's Department of Conservation is struggling to manage its lands with limited funding (Peter Berg, president, New Zealand Forest Owners Association and Fellow of the New Zealand Institute of Forestry, personal communication, March 22, 2005).

Government management of parks in both Canada and the United States has had limited success at protecting environmental quality. Canada's network of national parks, managed by Parks Canada, are plagued by a maintenance backlog, misallocated funds, invasive species, and dwindling populations of many threatened and endangered species (Struzik, 2004, Nov. 7, Nov. 28).

National parks in the United States, which have a mission to preserve and protect the land, enjoy generous public support, but they are still unable to fully care for the resources. The National Parks Conservation Association, one of the largest national parks advocacy groups in the United States, notes that invasive species and air pollution threaten many of the habitats that the parks were created to protect. Decades-old battles about appropriate recreation use continue while popular parks deal with months of congestion during the peak summer season. Many argue that a lack of funding is the problem, but political earmarks ensure that pet projects and new parks are amply funded. Meanwhile, on-going maintenance at existing parks falls behind (Fretwell, 1999b).

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

Although it is widely accepted in both Canada and the United States that public agencies can better protect the landscape than the private sector, the facts tell a different story. The public sector is not always the best steward of the land, nor does it reliably provide what citizens want from their public lands. The public sector's bureaucratic land management agencies are slow to respond to changing demands.

> Annual allowable cut

One aspect of Canadian forest policy that could be changed is the target harvest requirement, or annual allowable cut (AAC). The AAC interferes with several aspects of forest management by forcing tenure holders to focus on timber production and preventing timely reactions to market and environmental conditions.

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 economy, and generate revenue for the government. The level of the AAC is determined by the provincial governments on the premise of sustained yield: harvest rates across a broad geographical area must not exceed timber growth rates, which are based on past and current stand conditions and future growth expectations. Tenure holders are generally required to meet their assigned portion of the AAC over a five-year period; consequently, harvest rates are allowed to fluctuate annually.

In practice, target harvest requirements stymie tenure holders from reacting to changing market conditions and to ecological changes in the forest. This can result in reduced profits, economic inefficiency, and environmental degradation. For example, in some cases, forest conditions necessitate the removal of timber to prevent the spread of insects and disease, as is currently the case with the devastating mountain pine beetle outbreak in western Canada. On the other hand, tenure holders may want to reduce logging levels in environmentally sensitive areas, such as riparian zones, steep slopes, and critical wildlife habitats. Allowing tenure holders the flexibility to react to such conditions may result in more vital forest ecosystems, and more robust forest industries.

Many smaller tenure holders and community-based forests wish to manage more for amenity values than for timber harvest. But in most provinces, Canada's adherence to the sustained-yield principles of the AAC often discourages tenure holders from adopting alternative approaches to forest management. For example, one alternative approach is ecosystem-based forestry, which places less emphasis on timber production and more emphasis on ecosystem function, including the retention of old-growth trees, protection of biodiversity, and cycling of nutrients through decomposition and burning. Put simply, ecosystem-based forestry focuses on what is left behind in the forest, while sustained-yield forestry focuses on what is removed (Plotkin, 2004: 9). Not surprisingly, ecosystem-based forestry produces less timber. If target harvest requirements were relaxed, tenure holders would be better able to meet their own unique goals.

In 2003, British Columbia eliminated target harvest requirements, and other provinces could follow suit. In British Columbia, tenure holders may choose not to harvest without penalty. Any unused portion of AAC cannot

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

be carried forward to subsequent years, however. Overharvests above the level of the AAC are subject to monetary penalty and reductions in future allowable cutting rates (Dennis McPhail, senior timber-tenures forester, British Columbia Ministry of Forests and Range, personal communication, December 5, 2006).

Since the majority of tenures are held by industrial forestry companies seeking to maximize profits from timber, most tenure holders in British Columbia continue to harvest at the rate of the AAC. Data from 2004 show that the timber harvest was 105% of the AAC that year (Natural Resources Canada, 2006). But alternative tenure holders in British Columbia, such as community forests and native organizations, now have greater flexibility to practice ecosystem-based forestry.

> Recommendations for change

It is clear that Canada's forest management could be much more comprehensive and responsive to the needs of the people and the land. The current bureaucratic management encourages political decisions over scientific ones, allowing special interests to gain greater influence than the local residents who are most affected by forest management decisions. The area-based tenures that have motivated long-term stewardship in the past are becoming more susceptible to government regulations, and the changing needs of communities are not being met by the restrictive tenure system.

Our recommendations for change rely on changing the incentives for land managers. If managers receive the benefits of good stewardship directly—and bear the costs of degradation—then they will take better care of the land. By creating more incentives, we can motivate managers to look after the forest and listen to the desires of the people.

1. Transferring ownership

Private ownership can often result in better resource stewardship than public ownership. Given well-specified private property rights, individuals benefit from the use of their land as well as the increased value of their property, which results from good asset management. Forest owners have incentives to care for their land in the present and the future in order to maximize the benefits they receive, not only from timber, but also from amenity and asset values. As previously discussed, the timber-tenure system is missing, for the most part, the incentives for amenity and land values. Furthermore, many timber tenures, such as volume-based tenures, carry little incentive for stewardship even of timber resources. Private ownership is the only way to fully encourage long-term stewardship of forestland.

In addition, private ownership gives managers the opportunity to decide which forest values are most important. Timber companies may continue to manage primarily for timber production. Others, such as International Paper in the United States, may recognize the value of non-timber forest uses. Forest owners like the Nature Conservancy or Audubon Society could manage for biodiversity and wildlife habitat.

There has been an effort to transfer some of Canada's public lands to private ownership. In British Columbia, a group called British Columbians for Private Forests has proposed that 25% of the province's land be transferred

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

to private ownership—a significant percentage compared to the current level of 5% (McCarthy and Chittick, 2003). When compared with ownership patterns in other parts of the world, this is not an unreasonable option. Nevertheless, such proposals are often met with public opposition. A recent US proposal to sell off less than 1% of the acreage of publicly-owned forests faced strong opposition and was quickly withdrawn (United States Forest Service, 2006).

Educating the public is one way to gain acceptance of privatization. The signs of poor public management abound, but the private sector has yet to convince the general public that it can provide the good stewardship that is needed. In the meantime, there are additional steps that can be taken to enhance the stewardship of Canadian forestlands.

2. *More secure tenure*

Short of privatization, it would be beneficial to incorporate more elements of private management into Canada's public forest management. As mentioned above, some timber tenures encourage stewardship by incorporating more private property rights than others. A reallocation of cutting rights with a greater emphasis on long-term, renewable, area-based tenures could have positive economic and environmental outcomes. Financially, the provincial governments would be relieved of the burden of management. Instead, management would be the responsibility of the tenure holder, and the government would benefit from reduced costs. Furthermore, research suggests that area-based tenure holders tend to have better environmental practices than volume-based tenure holders (Zhang, 1996).

3. *Eliminate annual timber harvest requirements*

The timber-tenure system could also be improved by eliminating the target harvest levels of the annual allowable cut (AAC). Instead, harvest levels should adhere to the forest plan and be flexible to adapt to changing market and environmental conditions. Tenure holders should be allowed to operate at or below sustainable levels, or to be able to curb insect and disease infestations through timber harvest. This would enable timber managers to respond to changing community needs such as amenity values, water quantity and quality, and economic sustainability. This is already the case in British Columbia, and other provinces could adopt similar policies.

4. *Incorporate non-timber uses into tenures*

Incorporating non-timber forest resources and other forest uses into timber-tenure agreements would help enhance amenity values. Currently, timber tenures generally only grant access to the timber resources on Crown lands, while non-timber resources are addressed through bureaucratic regulations. Under this system, non-timber values are essentially restrictions on tenure rights, instead of potential sources of revenue. If tenure holders could generate income through non-timber forest uses such as recreation, water quality, fish, and wildlife, they would have an incentive to manage for multiple forest outputs. Given transferrable rights, non-timber users could negotiate with timber producers, creating a management system similar to that of International Paper in the United States.

The state of Montana has allowed for similar multiple-use lease options for some state grazing allotments.

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

When the leases come up for renewal, ranchers can opt to lease rights for grazing, recreation use, and logging, or they can bid on a single use, leaving the remaining rights open to the state or to alternative bidders (Fretwell, 2000: 12).

Ontario has also taken a step in this direction with Resource Stewardship Agreements. These agreements create the opportunity for timber-tenure holders to cooperate with licensed tourism establishments on forest-management issues. Together, the two parties can address issues of road use, viewsheds, and the timing of forest operations to their mutual benefit (Ontario, Ministry of Natural Resources, 2006: 13). Short of granting timber-tenure holders rights to non-timber forest resources, cooperation with other licensees could ensure that management better addresses a range of forest values.

Transferable-use rights are still subject to political manipulation, particularly in the design of parameters that define the lease rights and locations. Nevertheless, they are a feasible option that could induce recognition of the relative values of multiple uses on public lands.

> Conclusion

The public ownership of Canadian forests can sometimes lead to management practices that are guided more by politics than science. Yet, with a few changes, provincial forest policies could be restructured to encourage both economic efficiency and environmental quality. Privatization would be one logical solution, but it faces powerful opposition and is unlikely to become a political reality. The next best path to improving Canadian forest management would be to incorporate more of the incentives found in the private sector, such as a greater emphasis on more secure tenures and property rights. The elimination of annual timber harvesting requirements (AAC) would also improve management, as would the incorporation of non-timber forest resources into tenure rights. Canada, which already has innovative public forest policies, is uniquely positioned to take one step further towards better management.

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

References

Alchian, Armen A. (2002). Property Rights. *The Concise Encyclopedia of Economics*. Library of Economics and Liberty. <http://www.econlib.org/library/Enc/PropertyRights.html>, as of December 18, 2006.

Anderson, Terry L., and Donald R. Leal (2001). *Free Market Environmentalism*. Palgrave.

Berry, Alison (2006). *Lessons from British Columbia: Public Forest Management*. Property and Environment Research Center.

Demsetz, Harold (1967). Toward a Theory of Property Rights. *American Economic Review* 57, 2 (May): 347–59.

Drushka, Ken (2003). *Canada's Forests: A History*. McGill-Queen's University Press.

Fretwell, Holly Lippke (1999a). *Forests: Do We Get What We Pay For?* Property and Environment Research Center.

Fretwell, Holly Lippke (1999b). *Paying too Play: The Fee Demonstration Program*. PERC Policy Series PS-17. Property and Environment Research Center.

Fretwell, Holly Lippke (2000). *Federal Estate: Is Bigger Better?* Property and Environment Research Center.

Haley, David, and Martin K. Luckert (1990). *Forest Tenures in Canada: A Framework for Policy Analysis*. Information Report E-X-43. Forestry Canada, Economics Branch.

Iisaak Forest Resources (2000). *Our History*. <www.iisaak.com/history.html>, as of August 22, 2006.

International Paper (2006). International Paper Completes Sale of 4.2 Million Acres of Forestland to RMS for Approximately $5 Billion. News release (November 3). <http://investor.internationalpaper.com>, as of December 1, 2006.

McCarthy, Tim, and John Chittick (2003). *Why We Should Privatize BC's Forests*. British Columbians for Private Forests. <http://bcpf.org/Feature%20Essays/why_we_should_privatize_bc.htm>, as of December 27, 2006.

Natural Resources Canada (2006). *The State of Canada's Forests 2005-2006*. <www.nrcan.gc.ca/cfs-scf/national/what-quoi/sof/latest_e.html>, as of November 27, 2006.

Ontario, Ministry of Natural Resources (2004). *Annual Report of Forest Management 2001/2002*. <www.mnr.gov.on.ca/mnr/forests/forestdoc/annual_report/AR/annual_report_01_02.pdf>, as of July 17, 2006.

Ontario, Ministry of Natural Resources (2006) *Annual Report on Forest Management – 2003/2004*. <www.mnr.gov.on.ca/mnr/forests/forestdoc/annual_report/year_03_04/Pages_1_50.pdf>, as of October 10, 2006.

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

Plotkin, Rachel (2004). *Ecosystem Based Management: Reality or Rhetoric?* Sierra Club of Canada. <http://www.sierraclub.ca/national/programs/biodiversity/forests/nfs/ebm-reality-or-rhetoric.pdf>, as of July 17, 2006.

Sahajananthan, Sivaguru, David Haley, and John Nelson (1998). Planning for Sustainable Forests in British Columbia through Land Use Zoning. *Canadian Public Policy* 24, 2: S73–S81.

Sedjo, Roger A., and Daniel Botkin (1997). Using Forest Plantations to Spare Natural Forests. *Environment*, 39, 10: 14–20, 30.

Stefanick, Lorna (2001). Baby Stumpy and the War in the Woods: Competing Frames of British Columbia Forests. *BC Studies* (Summer): 41–68.

Struzik, Ed (2004, November 7). Canada's Parks: An Endangered Legacy. *Edmonton Journal*.

Struzik, Ed (2004, November 28). Saving Species at Risk: A Beastly Burden. *Edmonton Journal*.

United States Forest Service (2006). President's FY 2007 Budget Proposal for the Forest Service – Secure Rural Schools and Community Self-Determination Act Extension. News release. <http://www.fs.fed.us/news/2006/releases/02/secure-rural-schools.shtml>, as of October 13, 2006.

White, Andy, and Alejandro Martin (2002). *Who Owns the World's Forests? Forest Tenure and Public Forests in Transition*. Forest Trends.

Zhang, Daowei (1996). *The Effect of Forest Tenure on Environmental Quality in British Columbia*. School of Forest Resources and Conservation. <www.surv.ufl.edu/publications/land_conf96/zhang.pdf>, as of July 17, 2006.

Zhang, Daowei, and Peter Pearse (1996). Differences in Silvicultural Investment under Various Types of Forest Tenure in British Columbia. *Forest Science* 42, 4: 442–49.

Zhang, Daowei, and Peter Pearse (1997). The Influence of the Form of Tenure on Reforestation in British Columbia. *Forest Ecology and Management* 98, 3: 239–50.

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute

Alison Berry & Holly Lippke Fretwell

Alison Berry is a research fellow in forest economics and policy at PERC, the Property and Environment Research Center, in Bozeman, Montana. She holds a bachelor's degree in biology from the University of Vermont, and a master's degree in forestry from the University of Montana. Previously, she worked for the United States Forest Service as a supervisory botanist and forestry technician. She has also been a restoration specialist with the Trustees of Reservations in Massachusetts. Her research has been published in the *Journal of Forestry* and the *Western Journal of Applied Forestry*.

Holly Fretwell is an adjunct instructor at Montana State University. She also works with the Foundation for Teaching Economics as a presenter in their Environment and the Economy and Right Start workshops for high school teachers, helping them learn how to use economic tools.

She has presented papers promoting the use of markets in public land management and has provided congressional testimony on the state of US national parks and the future of the Forest Service. She has also published a children's book on climate change, *The Sky's Not Falling: Why It's OK to Chill About Global Warming*. Fretwell holds a bachelor's degree in political science and a master's degree in resource economics from Montana State University.

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6
Chapter 7
Chapter 8
Chapter 9
Chapter 10
Chapter 11
Chapter 12
Chapter 13
Chapter 14
Acknowledgments
Publishing Information
About the Fraser Institute