

Trends in Renewable Resource Management in British Columbia

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Abstract

We examined trends in legal responsibilities, budgets, and staffing, primarily for the British Columbia government's renewable resource ministries (forests, fish, wildlife, and parks). Legal responsibilities (complexity) of forest management expanded substantially from 1912 to 2011, almost tripling in the last 25 years. Government expenditures on renewable resources increased steadily from 1975 to 1997, but decreased by approximately half since then. Budgets for the other sectors of government, however, have more than doubled since 1997. The number of professional foresters employed in both government and industry has declined in recent years, more so in industry. Although the total number of professional biologists in the province increased steadily since 1980, the Ministry of Environment has lost nearly 30% of its biologists since 2002. These decreases in funding and staffing weaken key management functions, place the province's renewable natural resources at increasing risk, and jeopardize future social and economic opportunities.

KEYWORDS: renewable resource management; increasing complexity; government expenditures; staffing; trend analysis

Introduction

British Columbia's natural resources are its greatest assets and historically have been the mainstay of its economy. The forests, fish, and wildlife of the province, in particular, are world-renowned for their productivity and diversity—the unique mix of species, ecosystems, and landscapes that symbolizes “Beautiful BC.” But these resources face increasing stresses of many kinds as development spreads farther into the hinterlands, the human population grows, and the climate changes. To sustain them for the benefit of current and future generations of citizens, the province's natural resources need to be managed carefully so they remain healthy and capable of producing their many benefits—economic, ecological, cultural, recreational, and spiritual—forever.

The responsibility for management of British Columbia's renewable natural resources falls mostly to the provincial government. Although 94% of the province's land is in public ownership, the government delegates significant elements of this responsibility to industrial licensees, especially in forestry, so private companies and the resource managers working for them are also important participants in management. The amount of care and attention that government agencies and industrial firms devote to renewable resource management and stewardship is determined mainly by the budgets and personnel they



allocate to inventories, planning, enforcement of laws and regulations, fire protection, research, reforestation, restoration, and other activities.

As pressures on natural resources have grown in recent decades, expectations placed on resource managers have grown apace. Provincial and federal laws impose more responsibilities on managers now than ever before, and non-statutory initiatives such as forest certification add to their workload. But there is growing concern (and some evidence) that government and industry are not devoting the level of funding and staffing to renewable resource management needed to meet these expectations and responsibilities. Many wonder whether the province's magnificent natural resource legacy is receiving the attention it should.

This article describes trends in legislative complexity, budgets, and staffing for renewable resource management in British Columbia. The authors, retired resource management professionals with over 120 years of experience in the province, undertook this analysis because we were concerned that the diminishing investment by government in the management of renewable resources (specifically, forests, fish, wildlife, and parks) is creating risks to environmental sustainability, and potential losses of social and economic opportunities. Our approach to addressing this concern was to track the increasing complexity of the legislative framework, and to compare this trend with changes in funding and staffing for management of forests, fish, wildlife, and parks. We hope this information will stimulate further discussion and analyses of these important issues.

Methods

Increases in the complexity of provincial renewable resource management

To produce a metric for complexity, we tracked changes to the legal framework governing forest resources over time. Our assumption is that the greater the number of responsibilities—defined as an obligation of government or of the forest and range sectors—the greater the complexity. Forest management legislation enacted since 1978 contains many provisions respecting the habitats of wildlife and fish, which we tracked in our analysis. We did not conduct separate analyses for other aspects of fisheries, wildlife, or park management, but this technique could be applied to these areas as well.

All statutes and amendments to statutes, from 1912 to 2011, under the responsibility of the Minister of Forests¹ were reviewed and major responsibilities recorded. For example:

- When the *Forest Act* was enacted in 1912, government had four major responsibilities: (1) issuing tenures, (2) setting prices for timber, (3) protecting forests from wildfires, and (4) creating forest reserves.
- In 1947, the *Forest Act* was amended to implement many of the recommendations of the Sloan Commission. Key new responsibilities included implementing an economic means test to remove land from forest production, creating Forest Management Licences, overseeing the development of Management and Working Plans by forest companies, and approving Management and Working Plans.

Investment in the management of provincial forests, fish, wildlife, and parks

We compiled figures on the budgets and staffing levels (expressed as Full Time Equivalents or FTEs) for the provincial government from the Estimates published by the Ministry of Finance for the fiscal years 1974–1975 through 2012–2013. Our analysis focussed primarily on the budgets of the ministries responsible for management of forests,² fish and wildlife, parks, and land use planning.³ We also analyzed data on the overall provincial budget and the budgets for the so-called “big three” ministries (Health, Education, and Social Services)



to document changes in renewable resource ministry budgets relative to the overall provincial budget and to these three ministries.

Because the names, composition, and responsibilities of the renewable resource ministries have changed many times since 1974, the annual budgets of the individual ministries cannot be compared directly year by year. We have therefore concentrated our analysis on the combined budgets and staffing levels (where available) for the renewable resource ministries, which reflect the total allocations for the resource management functions included in this analysis.⁴

Numbers of professional foresters and biologists in British Columbia

Although a number of professions are involved in the management of renewable resources, we focussed our attention on professional foresters and biologists, both in the provincial government and in the private sector. Notwithstanding the importance of these two professions, we had difficulty sourcing information on the number of these professionals practising in British Columbia. Therefore, additional work would be required to determine more accurately the number of, and trends in, registered professionals and technicians for both government and the private sector over the time frame of this analysis.

The number of professional biologists registered in the province from 1980 to 2010 was provided by the College of Applied Biology. The number of biologists employed in the Ministry of Environment from 2002 to 2010 was provided by the Ministry of Environment.

The total number of active Registered Professional Foresters in the province from 1997 to 2011 was extracted from annual reports of the Association of BC Forest Professionals. The number of foresters employed by government and industry for the years 1999, 2003, 2006, and 2011 was estimated from compensation reports available on the Association's website.

Results and interpretations

The complexity of renewable resource management in British Columbia

From 1912 to 2011, the complexity of provincial forest management has increased substantially (Figure 1). This increase in complexity occurred over five main periods:

1. The building years, from 1912 to 1946, initiated by the passage of the *Forest Act*.
2. Sustained yield forestry, from 1947 to 1977, initiated by implementation of the recommendations from Chief Justice Sloan's Royal Commission on forest resources.
3. Integrated resource management, from 1978 to 1994, initiated by implementation of key recommendations from Dr. Peter Pearse's Royal Commission on Forest Resources.
4. Forest Practices Code, from 1995 to 2001, initiated by implementation of the *Forest Practices Code of British Columbia Act*.
5. Results-based forestry, from 2002 to the present, initiated by the passage of the *Forest and Range Practices Act*.

As the number of statutes increased, a corresponding increase in the number of responsibilities was evident (Figure 1; for more detailed information, contact the authors). The pace of increasing responsibilities has been accelerating dramatically in the past three decades. For example, an almost three-fold increase in the total number of responsibilities occurred between 1985 and 2011.



The statutes used for this analysis do not constitute a complete list of legislation governing provincial forest resources. For example, key federal statutes (e.g., *Fisheries Act*, *Species at Risk Act*) and provincial statutes (e.g., *Water Act*) also influence forest management. We therefore believe our measure of the rising complexity of renewable resource management to be very conservative.

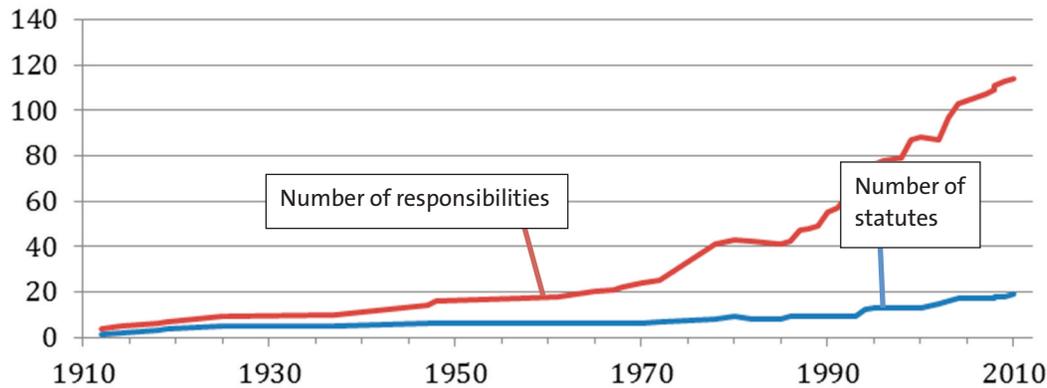


FIGURE 1. Number of statutes and responsibilities governing forest management on Crown lands in British Columbia

Investment in the management of forests, fish, wildlife, and parks in British Columbia

Unlike the progressive increases in management complexity, the historical trends in funding and staffing of the renewable resource ministries show different patterns.

Figure 2 shows that staffing has recently fallen far below the levels seen in the mid-1980s and from 1993 through 2003. In 2010, the last year government reported FTE levels by ministry in the Estimates, 21% fewer staff worked in the renewable resource ministries than in 1984, and 27% fewer than in 2002. Further reductions have occurred during the last two fiscal years, but we were not able to determine the magnitude of the reductions because the number of FTEs employed in the ministries is no longer reported by government in the Estimates.⁵

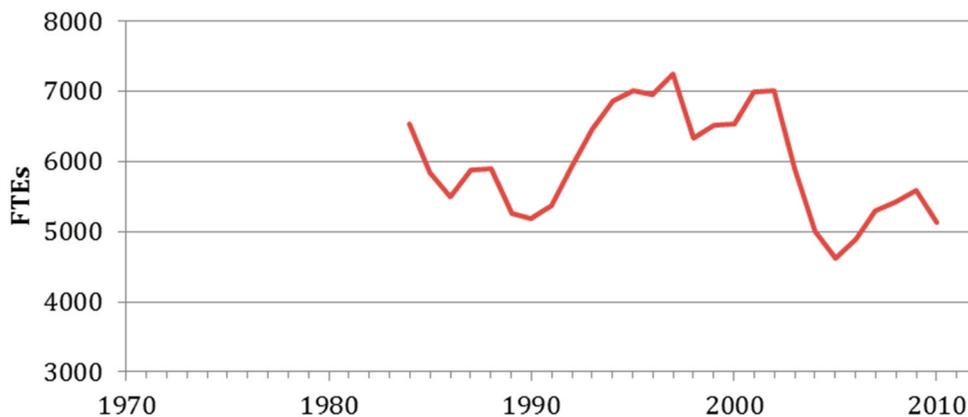


FIGURE 2. Total resource ministry FTEs (no data available before 1983-1984 or after 2009-2010)

Regarding funding, the overall inflation-adjusted expenditure for the renewable resource ministries (including Forest Renewal BC, during its tenure) trended steadily upward for 20 years beginning in 1975⁶ (Figure 3). After 1997, funding levels fluctuated, often dramatically, before declining to the current low level.



Figure 3 shows that the total budget for the renewable resource ministries (in 1975 dollars) has been lower since 2003 than it was at any time in the previous 13 years. In 2011, the total budget was less than half of what it had been in 2002 and only 8% greater than it had been in 1976. Comparing the trend in budget to the trend in responsibilities (also shown in Figure 3), one can see that the lines track in parallel until 2003 (with the exception of the severe cutbacks of the late 1990s). After 2003, the lines diverge substantially as the inflation-adjusted budget falls.

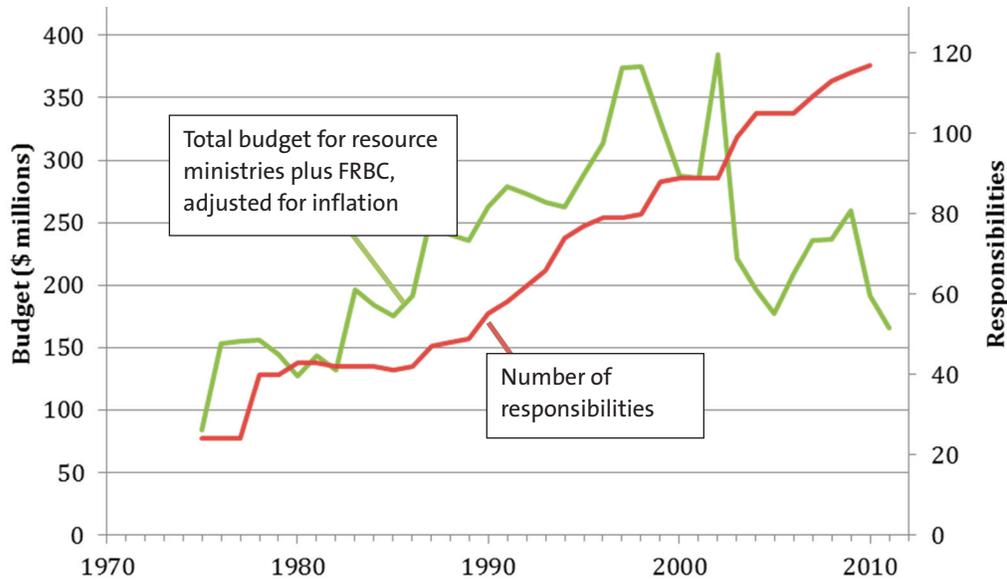


FIGURE 3. Total budget for resource ministries plus FRBC adjusted for inflation, and number of responsibilities

When the trend in inflation-adjusted funding for renewable resource ministries is compared to the trend of the overall provincial budget (Figure 4), two things become very clear:

1. the provincial budget steadily increases while the renewable resource ministry budgets decline in recent years; and
2. resource management funding is a very small part of the province's budget.

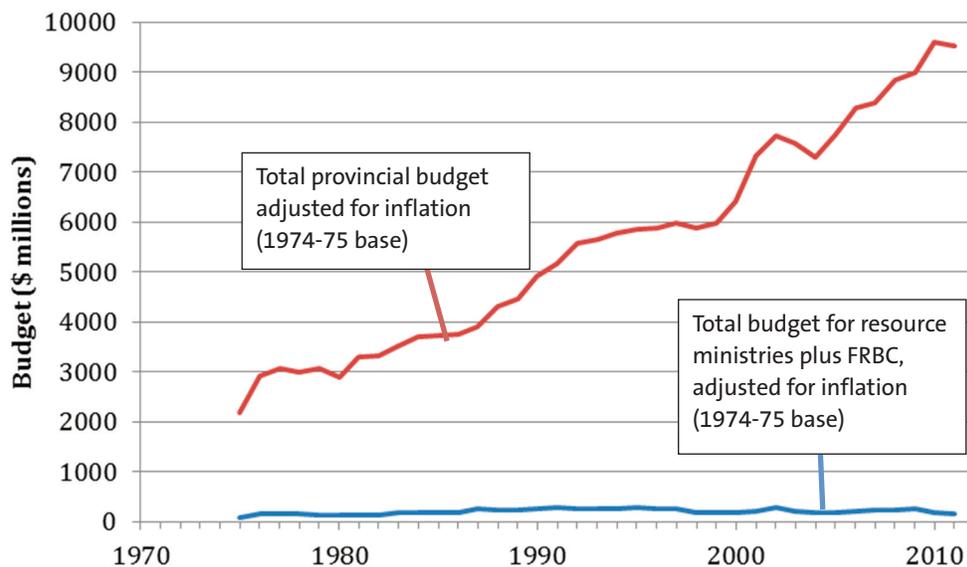


FIGURE 4. Budget for resource ministries plus FRBC compared to the total provincial budget, both adjusted for inflation



This situation partly reflects the huge growth in budgets for the health, education, and social service sectors; however, even when these “big three” sectors are removed from the provincial budget pool, the renewable resource ministry’s budgets have declined compared to other ministries (Figure 5).

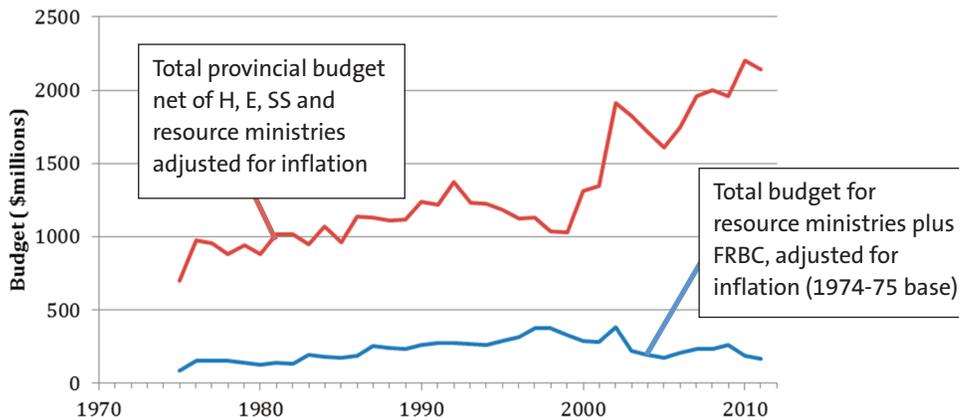


FIGURE 5. Budget for resource ministries plus FRBC compared to the provincial budget minus budgets for health, education, and social services; both adjusted for inflation

From 1998 to 2011, the inflation-adjusted funding for the remaining “non-resource” sectors of government (all functions other than Health, Education, and Social Services) more than doubled, whereas funding for the renewable resource ministries fell by almost 56%.

Numbers of professional foresters and biologists in British Columbia

Figure 6 shows the numbers of biologists in the Association of Professional Biologists and the College of Applied Biology from 1980 to 2011. Figure 6 also shows the number of biologists employed by the Ministry of Environment since 2002.

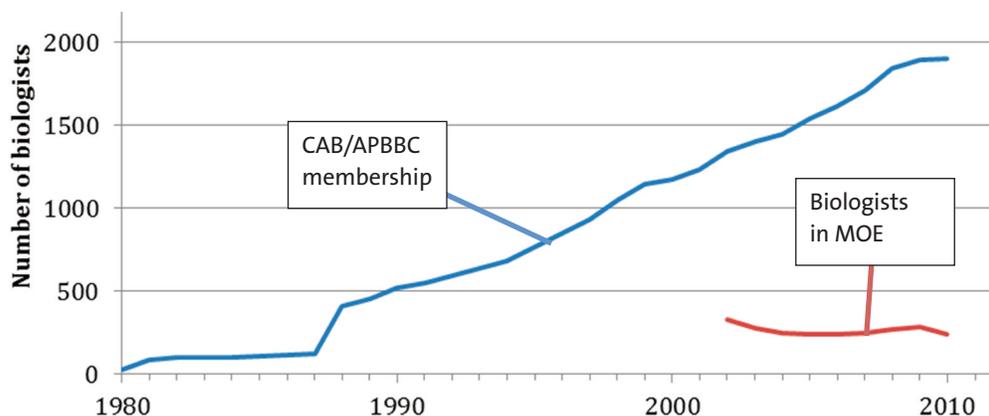


FIGURE 6. APBBC/CAB membership and number of Registered Professional Biologists in Ministry of Environment

During the period 1980 to 2011, trends in the numbers of biologists in both professional associations and in government were quite different. In the professional associations, membership grew steadily, whereas the number of biologists in the Ministry of Environment decreased. In fact, from 2002 to 2010, the number of ministry biologists declined by almost 30%.⁷

Trends in the number of active Registered Professional Foresters differ from those of professional biologists (compare Figure 6 and Figure 7). In recent years, the number of active foresters has declined, whereas the number of biologists increased. Similarly, the number of foresters employed in both government and industry has declined, although more dramatically in industry than in government.



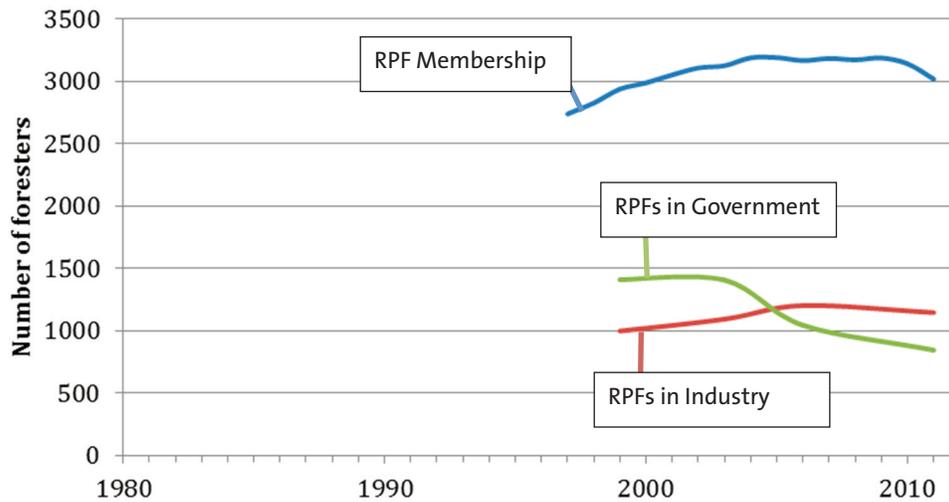


FIGURE 7. Number of RPF members in the ABCFP, government, and industry.

In summary, although the pattern of membership in the professional biologist and forester organizations differ, the number of these professionals in government is decreasing. Moreover, fewer foresters are working for forest companies, as more of this work is contracted out to consultants. The net effect of these patterns is that fewer experts in government are on hand to support resource management.

Discussion

Over the six decades since the first *Forest Act* was passed in 1912, the pace of statutory change governing forest management was slow in the province. Following the Pearse Commission in the mid-1970s, the pace of change greatly accelerated, and it has increased exponentially since the mid-1980s. It is likely this trend will continue and consequently will place increasing demands on resource managers in government and the private sector to meet their responsibilities. However, the increase in statutory responsibilities is only one simple measure of the increasing complexity facing renewable resource managers. We know that other factors not considered in our analyses, such as First Nations land claims, population increase, climate change, invasive species, the management of species at risk, and the cumulative effects of all land-based activities, will add significantly to the complexity of renewable resource management in British Columbia. To address this increasing complexity, managers need funding and trained specialists to gather and analyze information that will lead to sound, well-informed, and credible decisions.

This article documents the long-term downward trends in provincial investment in the management of forests, fish, wildlife, and parks, especially when compared to the funding of other provincial programs. Since 1998, the other ministries have more than doubled in inflation-adjusted funding, whereas funding for the renewable resource ministries has fallen by about 56%. In the last 15 years, it appears that budgets from the renewable resource agencies have been reallocated to fund the work of these other ministries and that a low priority has been assigned by government to the renewable resource agencies.

Furthermore, at a time when complexity and responsibilities are increasing, an apparent decline is evident in the number of foresters working in government and industry and in the number of biologists at the Ministry of Environment (note, however, that we were unable to determine the total number of biologists employed by the province's renewable resource sector). The Ministry of Environment predicts that the number of biologists in the ministry will continue to decline, based on current hiring policies.



Reduced funding and current hiring policies will likely result not only in fewer professionals but also in less experienced professionals assigned to manage the province's renewable resources in an increasingly complex environment. The lack of experience and corporate memory will worsen as older workers are laid off or retire and are replaced (if at all) by new recruits.

All of these trends would not be an issue if British Columbia's renewable resources were proven to be managed to the high level expected in the results-based management model, and if no problems loomed in the future; however, serious resource management problems are known to exist for fish habitat (Mount et al. 2001; Forest Practices Board 2009), parks (Auditor General of British Columbia 2010), and forestry (Parfitt 2010; Bourgeois 2011).

Also evident is the diminishment (or loss) of key sustainability functions in government. For example, the research capacity within the ministries of Forests and Environment has been severely reduced, during a time when a better understanding is clearly needed to address issues such as the mitigation or management of both climate change and cumulative development impacts on the provincial land base. These research programs were once key contributors to the credibility and public acceptance of the province's management approach to forests, fish, wildlife, and parks.

With the end of Forest Investment Account funding, and the absence of any other substantial "special account" funding (such as the former Forest Renewal BC and Forest Resource Development Agreement programs), little provincial funding is now provided for activities such as watershed and habitat restoration, wildlife and fish inventories, and research by universities and other non-government scientists. Thus, decreased funding is jeopardizing key functions both inside and outside of government.

With the current lack of up-to-date inventories for forest, wildlife, and fisheries resources, management agencies face increasing uncertainty, and appear (in some cases) to be taking a more conservative approach to resource use. This approach will likely increase over time as managers attempt to meet their legal responsibilities and minimize risks. As a result, it is likely that British Columbians are losing economic opportunities.

Furthermore, we are concerned about the viability of the results-based forest management model. With diminishing resources, increasing complexity, dated inventories, and declining numbers of foresters and biologists, this model is at risk of failure.

Also at risk is the ability of government and the province's citizens to determine whether government's sustainability objectives are being achieved. One impact of declining funding and professional staff is a reduction in the compliance and enforcement functions in the forest and environment ministries, and in resource stewardship monitoring and evaluation. If these functions are not maintained at an effective level across the province and are not credible to independent observers, it will not be possible to assess British Columbia's success in achieving sustainability.

In conclusion, the picture portrayed here is a matter of serious concern. We hope that this analysis will contribute to informed discussions about the future of renewable resource management in British Columbia among government agencies, the resource sector, professional associations, the public, and First Nations.

Notes

1. For simplicity we have used "Minister of Forests" and "Ministry of Forests" to refer to all the variations in the ministry name over the years, including the current Ministry of Forests, Lands and Natural Resource Operations. The same is true for our use of "Ministry of Environment."



2. We did not include the budget for firefighting (the “Direct Fire” portion of the Ministry of Forests budget) in our totals. This budget has fluctuated widely in some years and does not represent funds allocated to ongoing management programs.
3. In the totals for the resource ministry budgets, we included the budget of Forest Renewal BC (1995–2002) and other large programs of dedicated funding such as the Forest Resource Development Agreements. We did not include the budgets of agriculture, energy, mines, petroleum resources, and land administration, nor did we include miscellaneous, small, dedicated programs such as the Corporate Resource Inventory Initiative.
4. Because various renewable resource management programs have been transferred between ministries, sometimes repeatedly, it is impossible to track their budgets with complete accuracy. In our analysis, we have attempted to standardize, as much as possible, the set of programs whose budgets we calculated. Although a more detailed study of the Estimates might reveal minor discrepancies, we are confident that any errors in our calculations would have little effect on the overall patterns shown in our analyses.
5. We wonder why government has stopped reporting this information to the public, given its increasing promotion of “open government” and “transparency.”
6. Budgets and FTEs are reported by fiscal year. For example, “1984” for the 1983–1984 fiscal year.
7. The decrease of biologists in the Ministry of Environment is somewhat confounded by staff movements from this ministry to other ministries and then back to Environment over the time period.

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Test Your Knowledge

How well can you recall the main messages in the preceding article?
Test your knowledge by answering the following questions.

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1. How has the complexity of renewable resource management changed?
 - a. Increased
 - b. Remained the same
 - c. Decreased
2. How has the level of government support of renewable resource management changed?
 - a. Increased
 - b. Remained stable
 - c. Decreased
3. How is the effectiveness of the results-based model of renewable resource management viewed?
 - a. Very successful
 - b. Somewhat successful, but with growing concerns
 - c. Not very successful

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