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NATIONAL VERSUS REGIONAL CONTROL OF NATURAL RESOURCE POLICY: A COMPARATIVE STUDY OF THE UNITED STATES AND CANADA

David H. Jackson* and Kathleen O. Jackson**

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I. INTRODUCTION

The control of natural resources located on public lands is an issue which has raised serious constitutional questions on both sides of the Canadian-United States border. The struggle for regional control of natural resources has been characterized as the "Sagebrush Rebellion" in the United States and has pitted the federal government against the western provinces in Canada. Development of energy resources, in particular, which will benefit national as well as regional interests, has produced controversy over political jurisdiction. In western states, federal ownership of vast areas of land within the states' geographic boundaries has brought decision pertaining to the public domain under the jurisdiction of the Bureau of Land Management and the Forest Service. The opposite is true in Canada, since the Canadian constitution¹ and subsequent court interpretations have conferred supremacy

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1. The Canadian Constitution was the product of a movement for unification of the

over public lands to the provinces rather than the national parliament.

Implications of national control versus regional control of the administration of public lands and resources are often discussed in ideological or emotional terms rather than in more objective terms of comparative resource management. This paper addresses the problem of forest resource conservation within the context of comparative implementation procedures of the forest services of the United States and of the Canadian province of Alberta. Both administrative agencies share the common goal of managing the forest resources under their jurisdiction according to the principle of "multiple-use, sustained-yield." The two agencies differ significantly in the means pursued to achieve that policy goal and this in turn reflects differences in their respective economic and political systems.

II. OWNERSHIP OF NATURAL RESOURCES

Public land ownership in the United States and Canada reflects a basic difference in the allocation of powers between central and regional governments in the two federal systems. In the shaping of the United States federal structure, the balance between central and state powers resulted in the formula whereby powers not expressly delegated to the federal government nor prohibited by it to the states were reserved to the states.² Jurisdiction over territory ceded or relinquished to the United States at the time of or subsequent to the adoption of the Constitution as well as later land acquisitions was delegated to Congress.

The Canadian federal structure, while influenced by the American model, also exhibits deliberate departures. The guiding principle behind the distribution of powers between the Dominion and the provinces at the time of the passage of the British North America Act is best summed up in the words of John Alexander Macdonald: "all matters of general interest are to be dealt with by the general legislature, while the local legislatures will deal with matters of local interest."³ Sections 91 and 92 of the Act delegated legislative authority in enumerated classes of subjects to the Parliament of Canada and to the provincial legislatures. The latter were granted exclusive control in sixteen specified areas including the management and sale of public lands belonging to the province.

provinces as a confederation. Delegates from the separate provinces as well as the British government were responsible for the draft of the constitution which was given effect by its adoption as the British North American Act, 1867, 30 & 31 Vict. 30, c. 3. Changes in the Canadian Constitution are subject to the approval of the British Parliament.

2. U.S. CONST. amend. X.

3. E. McINNIS, CANADA 359 (1969).

Beyond the constitutional delegation of authority for public lands lies the political and economic forces which shaped specific resource management policy. A brief review of the evolution of policies governing the exercise of ownership rights of the respective governments is useful.

A. *United States*

Title to nearly 80% of the total United States land area was once held by the federal government. Today, however, federal ownership constitutes only one-third of that area with the majority held in eleven western states plus Alaska.⁴ At both the federal and state levels, legislation has been drafted which would further diminish federal holdings by transferring jurisdiction over most federal lands to the western states.⁵ This revolt against federal landlords is perhaps best understood in the context of past land disposition policies.

Early in the life of the American Republic, the issue of distribution of the public domain assumed a position of paramount importance which was retained throughout most of the nineteenth century. The Continental Congress established the precedent that lands held by the federal government, "shall be disposed of for the common benefit of the United States . . ."⁶ Competing philosophical approaches to the interpretation of the "common benefit" provided the substance for political debate over the methods of land disposition for at least the first half of the nineteenth century. Land was the major political and economic resource of the new nation, and it was used to create new states, to raise revenue, to reward military service, and to promote the settlement and development of the resources of the continent. The visions of an agrarian and populist democracy advanced by presidents Thomas Jefferson and Andrew Jackson precluded the establishment of a ruling class of landed aristocrats and placed a high premium on the dispersal of land and political power to a broader social class. The availability of abundant land and the distribution of that land to individuals at minimal or no cost provided unique opportunities for the economic and political advancement of the common man. Further, a

4. C. HUSTON, PROPOSED TRANSFER OF CERTAIN FEDERAL LANDS TO THE WESTERN STATES: AN EXAMINATION OF PERTINENT HISTORY, LAWS, AGENCIES AND RELATIONS 4, 10 (1979).

5. S. 1680, 96th Cong., 1st Sess. (1979); H.R. 5436, 96th Cong., 1st Sess. (1979); H.R. 5662, 96th Cong., 1st Sess. (1979). The *Missoulian*, Jan. 7, 1981, at 24, col. 1, reports a bill has been prepared which would claim state jurisdiction over 23 million acres of federal land currently administered by the BLM and the Forest Service in Montana. Nevada earlier passed legislation claiming jurisdiction over BLM lands.

6. I S. MORISON & H. COMMAGER, THE GROWTH OF THE AMERICAN REPUBLIC 258 (1962).

political climate was created in which rugged individualism, self-government and freedom from outside interference were institutionalized as part of the western expansion.⁷

Initially, the emphasis on disposition of federal lands resulted in custodial rather than managerial administration by the General Land Office, which had been established in 1812 to handle land sales and keep records of transactions.⁸ Not only was an inventory of the physical characteristics and suitability of the land for alternative uses unavailable, but apparently little value was placed upon the resources of those lands. Minerals and, to a limited extent, timber were the exceptions. The live oak and cedar forests of the Atlantic and Gulf Coasts, which provided the basic materials for shipbuilding, were protected by early congressional legislation.⁹ Proscriptions against depredation of timber on public lands were interpreted by the Supreme Court to mean that no timber could legally be cut on public lands.¹⁰ But in general, forested land was of little commercial value, was considered as wilderness, and thus was viewed as an obstacle to the growth of cities, towns and prosperous farms.¹¹ Until the middle of the nineteenth century, the vast majority of farmland was created by clearing forested lands through cutting and burning trees. The abundance of forests and pressure to transfer federal ownership to states and individuals produced a climate wherein a large portion of forest land was converted to other uses.

Forested land in the West assumed renewed importance in the 1870's. By that time, a commercial lumber business was booming and settlements were occurring in areas adjacent to lands that were not available for sale under the provisions of the homestead legislation. The lack of provision for sale of non-agricultural timberland and the widespread failure to enforce laws prohibiting timber cutting on public lands provided the impetus for legalized private acquisition of forest resources. The Timber Cutting Act and the Timber and Stone Act of 1878¹² were ostensibly designed to open public forest lands to the use of miners and settlers. In practice, these laws paved the way for extensive depredation of the national forests and allowed corporate interests to acquire valuable timber and timber land at minimal cost. Thousands of acres of some of the best forest lands in the United States were alienated from public ownership for \$2.50 an acre in the decade following

7. R. HILL, *PUBLIC DOMAIN AND DEMOCRACY* 98-129 (1910).

8. C. HUSTON, *supra* note 4, at 6.

9. B. HIBBARD, *A HISTORY OF THE PUBLIC LAND POLICIES* 458 (1965).

10. *United States v. Ephraim Briggs*, 50 U.S. (9 How.) 351, 355 (1850).

11. R. NASH, *WILDERNESS AND THE AMERICAN MIND* 41 (rev. ed. 1967).

12. *Timber Cutting Act*, ch. 150, § 1, 20 Stat. 88 (1878) (current version at 16 U.S.C. § 604 (1976)). *Timber and Stone Act*, ch. 151, § 1, 20 Stat. 89 (1878) (repealed 1955).

the passage of the Timber and Stone Act.¹³

The 1891 General Revision Act,¹⁴ which governed land disposition policies, contained an amendment which authorized the President to create forest reserves from public lands. In effect, this withdrew forested land, located mainly in the western states, from private entry or sale. The creation of national forests is a major landmark in the history of public land policies because it marked the beginning of the end of the laissez faire approach to natural resource management and signaled a permanent, public concern for the conservation of natural resources.

The establishment of national forest reserves was refined and given legislative direction by the Organic Administration Act¹⁵ of 1897. The Act provided that:

No national forest shall be established except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of waterflows, and to furnish a continuous supply of timber for the use and necessities of the citizens of the United States¹⁶

In 1905, jurisdiction over the forest reserves was transferred from the Department of Interior to the Department of Agriculture with provision for selection of forest supervisors and rangers.¹⁷ In a memo to the Chief of the Forest Service that year, Secretary of Agriculture James Wilson specified the purposes of national forest reserves administration with particular reference to "the vital importance of forest to the great industries of the western states"¹⁸ It was made clear that policies for the protection and use of the forest reserves must strike a balance between present and future needs and that "local questions will be decided upon local grounds"¹⁹ Thus, the precedent for a forest management process that allowed for responses to localized conditions was established from the onset of the federal administration of forest reserves. As will be discussed, recent changes in forest policy may be construed as redirecting management, at least in part, away from local needs.

13. B. HIBBARD, *supra* note 9, at 457-70.

14. General Revision Act, ch. 561, § 24, 26 Stat. 1103 (1891) (repealed 1976).

15. Organic Administration Act, ch. 2, § 1, 30 Stat. 34 (1897) (current version at 16 U.S.C. §§ 473-478, 479-482, 551 (1976)).

16. 16 U.S.C. § 475 (1976).

17. The Transfer Act, ch. 288, §§ 1-5, 33 Stat. 628 (1905) (current version at 16 U.S.C. §§ 472, 524, 554 (1976)).

18. Memo from James Wilson, Secretary of Agriculture, to Gifford Pinchot, Chief of the Forest Service, (Feb. 1, 1905) *reprinted in* FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, THE PRINCIPAL LAWS RELATING TO FOREST SERVICE ACTIVITIES 138-39 (rev. ed. 1978).

19. *Id.*

B. *Canada*

In Canada, public lands were under the jurisdiction of the British Crown prior to the formation of the Dominion of Canada. Under British and earlier French rule, policies regarding the transfer of land from public to private ownership bore marked contrasts to those adopted by the United States. In Canada, both the size of holdings and the selection of private owners perpetuated a landed aristocracy. In the area formerly under French rule, referred to as Lower Canada, colonization had been promoted through a seigniorial system which was basically a feudal structure comprised of a small privileged class of land holders and a large class of tenants.²⁰ The British favored large grants of land to the clergy, British loyalists from the American Revolution and other favored by the Crown or colonial administration. Private land companies also shared in the land disposition process. The Hudson's Bay Company and the North West Company were granted exclusive rights to trade furs with the Indian population and thus competed for effective control over the territories in the North and West, while at the same time discouraging widespread settlement.

The alienation of public land into large private ownerships produced significant controversy and a variety of recommendations for land reform even prior to Confederation. Early writings by Robert Gourlay and Gibbon Wakefield and a report by the British-appointed Governor General, Lord Durham, were critical of the system of land grants which had produced local discontent and discouraged the attraction of a greater supply of immigrants.²¹ Potential Canadian settlers were frequently lost to the United States because of its more attractive land acquisition policy.

Three years following Confederation, a major change in land alienation policies transpired. The establishment of the province of Manitoba was closely followed by the transfer of land west of Lake Superior from the Hudson's Bay Company to the jurisdiction of the Dominion of Canada. Subsequent to the transfer, land disposition policies were fashioned after those in the United States except that the Dominion limited small grants for free homesteading to approximately half the western lands in the public domain. The other large block of both alienated land and land retained in public reserves "indicated survival of the belief that public lands should be a fund for the disposition of rewards."²² Thus, the fundamental issue in retaining forest reserves,

20. E. McINNIS, *supra* note 3, at 69-76.

21. See, C.D.W. GOODWIN, *CANADIAN ECONOMIC THOUGHT* (1961); Teeple, *Land, Labor and Capital in Pre-Confederation Canada*, in *CAPITALISM AND THE NATIONAL QUESTIONS IN CANADA 43 passim* (G. Teeple ed. 1971).

22. C.D.W. GOODWIN, *supra* note 21, at 5.

which occurred in Alberta at the turn of the twentieth century, was not so much a perception of scarcity but rather the retention of a political asset in the hands of the Dominion.

During the 1880's and the 1890's, judicial interpretation of the Canadian constitution began to clarify provincial powers. The trend throughout the first part of the twentieth century was to elevate powers assigned to the provinces over those of the central government. In effect, this subrogated the residual power of the Dominion to legislate for the welfare of the nation as a whole and provided the provinces with significant leverage to resist intrusions by the federal government.²³ In light of these developments, jurisdiction over Dominion forest reserve lands and natural resources was transferred to the provinces under an amendment of the British North America Act in 1930.

As a result, the Canadian federal government plays only an indirect role in forest resource management. The provincial governments have direct responsibility for policy formation and implementation. This means that the control of essential political resources to be commanded in any economic development strategy resides at the regional rather than national level. Any serious movement to alienate public lands to private control would surely mean the diminution of provincial power relative to that of the federal government. Further, there is every reason to believe that attempts by the federal government to challenge provincial ownership rights would be met with stiff resistance. Recent actions by the Trudeau government to impose new taxes, ownership rules, and prices on Alberta's oil production has been countered by the province's threat to reduce oil shipments to the east.²⁴ The growing importance of provincial resources to the nation as a whole has raised serious questions about the basic distribution of federal powers which will no doubt influence the shaping of a new Canadian constitution.

Canadian forest land management is essentially under the jurisdiction of the nine Canadian provinces. In contrast, the public forests in the United States are largely, but not completely, managed by federal agencies. Beyond the regional versus national distinction, there is a marked contrast in the importance of private forest lands between the two systems.

As indicated in Table I, 59% of the total U.S. commercial forest land is classified as (small) farm and miscellaneous private ownerships. Of this 296 million acres, 91% is located in the North and South areas which were heavily populated before the change in policy that created

23. E. McINNIS, *supra* note 3, at 420.

24. Imlach, *It's Alberta v. Trudeau in Oil War*, *Missoulian*, Nov. 2, 1980, at 37, col. 1.

public forest reserves. In fact, 88% of the total private forest land is located in the eastern United States. Only 18% of the U.S. commercial forest lands are publicly owned, and 77% of these public (national forest) lands are located in the West.

By contrast, some 87% of Canadian forest land resides in public ownership.²⁵ In Alberta, there is a total of 117.30 million acres of public land,²⁶ including national parks and other federal lands. Both productive and nonproductive (in terms of timber) lands are included in this total. One report suggests that 50.36 million acres of this public forest land is productive or potentially productive²⁷ and another indicates that 60.13 million acres is suitable for regular harvest.²⁸ The Alberta Forest Service has direct responsibility for 81.36 million acres of forest land²⁹ thus providing a land base equivalent to 89% of the total commercial forest land area in the U.S. National Forest System.

Table I. Area of Commercial Forest Land in U.S. by Ownership Type. January 1, 1970

Type of Ownership	Area+	Proportion (%)	North+	South+	Rocky Mount.+	Pacific Coast+
Federal:						
National Forest	91.92	18	10.46	10.76	39.79	30.92
Bur. of Land Mgt.	4.76	1	.08	.01	2.02	2.75
Bur. of Indian Aff. (control)	5.89	1	.82	.22	2.81	2.04
Other Federal	2.53	1	.96	3.28	.08	.21
Total Federal	107.10	21	12.30	14.27	44.70	35.82
State	21.42	4	13.08	2.32	2.20	3.83
County and Municipal	7.59	2	6.53	.68	.07	.31
Forest Industry	67.34	14	17.56	35.32	2.23	12.22
Farm and Misc. Priv.	296.24	59	128.43	139.94	12.43	15.44
All ownership	499.69	100	177.90	192.53	61.63	67.62

Source: USDA Forest Service, "The Outlook for Timber in the United States FRR-20. (Govt. Printing Office, Washington, D.C., 1973), p. 11.

+Reported in Hundred Thousand Acres

25. F.L.C. Reed & Assoc., Forest Management in Canada 8-20 (Jan. 1978) (Consultant's report, prepared for the Forest Management Institute, Ottawa, Canada).

26. F.L.C. Reed & Assoc., Canada's Reserve Timber Supply: The Location, Delivered Cost, and Product Suitability of Canada's Surplus Timber 42 (1974) (Consultant's report, prepared for The Department of Industry, Trade and Commerce, Ottawa, Canada).

27. *Id.*

28. 5 CAN. FOR. ASSOC. NEWS 3 (1972).

29. F.L.C. Reed, *supra* note 26, at 42.

C. Summary

While both the United States and Canada practiced policies of alienation of public lands in pre- and post-colonial times, the forest ownership situation that evolved is very different. Attributable in part to the major population differences and their geographic distributions at the turn of the twentieth century,³⁰ a far greater portion of forested lands in Canada are publicly owned than in the United States. The difference in the philosophy of land disposition in terms of size of holdings is also evidenced by the large portion of forest lands in the United States in the small private ownership category. Forest lands administered by the Alberta Forest Service are of a magnitude comparable to the entire U.S. National Forest holdings, thus providing a sound basis for comparative analysis of policy implementation.

III. NORTH AMERICAN FOREST MANAGEMENT PHILOSOPHY

Public forest management goals throughout North America may be traced to common European antecedents. Many of the current notions of "good forest management" originated in eighteenth century Germany, France and Britain. It appears that the transplantation of management practices from the Old to the New World was achieved primarily through the profession of forestry with notable individuals such as Bernard Fernow and Gifford Pinchot leading the way.³¹ Both of these men received their professional training in Europe and later assumed positions of leadership in forestry in the United States. Fernow's influence also extended to Canada as an educator when he became the first dean of forestry at the University of Toronto, while Pinchot's ideas are still studied by students of conservation.³²

The concept of sustained yield forestry was conceived in Germany and transplanted to the United States and Canada by Fernow. In essence, sustained yield timber management means a perpetual and more or less even flow of timber harvest volume from a forest land unit. Timber capital removed is replaced via reforestation. Even flow or equal quantity over time is accomplished by choosing ages and quantities for harvest in the light of forest growth considerations.

The Old World origins of the sustained yield concept are significant in that the concept arose in response to conditions of a growing resource scarcity and a concern for community stability. Conservation

30. The population of Canada at the turn of the twentieth century was about six million people. E. McINNIS, *supra* note 3, at 436. At the same time, the United States population was 76 million. [1965] BUREAU OF THE CENSUS STATISTICAL ABSTRACT OF THE UNITED STATES 5.

31. Behan, *Forestry and the End of Innocence*, 81 AM. FORESTS 16 (1975).

32. See generally G. PINCHOT, *THE FIGHT FOR CONSERVATION* (1910).

of forest resources in Germany was a matter of concern as early as the sixteenth century, as shown by the restriction of wasteful practices on princely estates. Timber was important both as a strategic resource and for domestic industrial purposes. Use of timber as a fuel coupled with a poor transportation infrastructure necessitated a supply system that would stabilize energy availability for isolated communities. Likewise, in seventeenth century France, regulations determining the times and conditions of sale, harvest, planting, and seeding of trees were largely prompted by depletions of timber supply for naval purposes.³³ Mercantilistic doctrines of the eighteenth century led to further restriction and regulation of the timber industry and increased police controls under the direction of the cameralists, the educated officials responsible for administering the princes' estates. Anthony Scott states that France and Germany undertook the conservation of their forests for two reasons: to provide self-sufficiency in raw materials and as part of a scheme to protect watersheds and river valleys.³⁴ Both public and private lands were affected by methods of direct control, financial assistance, and compulsory forest practices.

A carry-over of concepts developed in the Old World is evident in contemporary statements of forest policy goals in the United States. The Multiple-Use, Sustained-Yield Act of 1960 states: "It is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."³⁵ These enumerated purposes are the multiple uses to which management is to be directed. The law also provides authority for the Secretary of Agriculture to administer the renewable surface resources for "multiple use and sustained yield of the several products and services obtained therefrom."³⁶ Sustained yield "means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources. . . ."³⁷

In a recent report of the Canadian Forestry Advisory Council, there is a summary of policy for eight of the ten provinces. In each case, reference is made to land management objectives for other than timber harvesting. Frequent mention is made of the importance of continued viability of the forest resources to primary Canadian industrial activities, which have a heavy economic reliance on timber.

The basic policy of the government of Alberta is to move to-

33. A. SCOTT, NATIONAL RESOURCES (1973).

34. *Id.*

35. 16 U.S.C. § 528 (1976).

36. *Id.* at § 529.

37. *Id.* at 531b.

ward the fullest possible utilization of the forest resource that can be achieved under a forest management policy that maintains watershed and wildlife productivity of forest lands, while improving recreational opportunity and minimizing adverse effect of operations on the aesthetics of any given area.³⁸

The report states that allocated timber holdings must be managed for "continuous production" and volumes authorized for harvest are such that "sustained yield management is practiced on individual management units."³⁹

Clearly, the language enumerating resource management goals is very similar in Alberta and the United States. Having established the ownership background and common management goals, it is now possible to investigate implementation strategies.

IV. POLICY IMPLEMENTATION IN ALBERTA AND THE UNITED STATES

Given the multiple use-sustained yield framework common to the United States and Alberta, comparisons of policy implementation provide a meaningful basis for assessing the implications of different strategies. For purposes of comparative analysis, three functional components of the implementation process are differentiated: planning, distribution rules, and control. Planning decisions refer to the mixture of uses to which lands will be allocated within the multiple use framework along with resource exploitation or supply decisions in a long term context. Distributional rules determine who will gain access to what resource. Finally, control refers to those stipulations or conditions attached to resource use in order to achieve the goal of multiple-use, sustained-yield of forest resources.

A. *Timber Management Policy in Alberta*

The prevailing contractual format for disposing of Alberta timber is the timber quota.⁴⁰ Timber quotas were introduced in Alberta in the late 1950's to replace competitive sales of stumpage. According to the head of the Alberta Forest Service, the purpose of the policy change was to introduce a greater degree of raw material supply certainty and

38. CANADIAN FORESTRY ADVISORY COUNCIL, THE FORESTRY SITUATION IN CANADA—MAJOR CONCERNS AND PROPOSED REMEDIES B-9 (1975).

39. *Id.*

40. Actually there are three forms of contractual arrangements used in Alberta—quotas, forest management agreements (FMA) and timber permits. In 1972 there were three FMA's, 172 quotas, and an unreported number of small permits, mostly held by farmers. See [1975] ALBERTA LANDS AND FORESTS TWENTY-FOURTH ANNUAL REPORT 49-52.

thereby augment economic growth.⁴¹ A twenty-year supply of timber was granted to each existing mill with the amount of the quota based on a previous five-year production average. Forest Service Director F. W. McDougall rationalized the granting of free quotas by suggesting that they had been competitively earned, apparently alluding to the fact that operators had previously bid for cutting rights. On October 4, 1973, four new quotas were auctioned for a combined value of \$915,000.00. The yearly output or annual allowable cut, for the four twenty-year quotas was 19.1 million board feet.⁴² Given that the earlier free quotas contain some twenty-one times more volume than the four recent sales, there is an implication that the provincial government did not fully capitalize on its timber resource in terms of direct returns to the treasury when the quota system was established.

Quotas are characterized by two part pricing. A market price is attached to the twenty-year cutting rights when and if the quota is sold. In addition, there is a dues or unit of volume removal price attached to the actual volume of material removed. These dues are based on an assessment formula which includes factors for variation in logging costs, wood quality and transportation costs to the mill. While some real cost differences are ignored in the dues appraisal formula, it does reflect cost differentials associated with harvesting under differing conditions.

Provisions also exist regarding quota renewal. Regulations⁴³ promulgated pursuant to the Forest Act⁴⁴ require anyone desiring to bid on an existing timber quota up for renewal to make a sizeable deposit with the government to buy the right to bid. The original quota holder has the right to match the highest bid when the sealed bids are opened and thereby "buy" the next twenty-year supply of timber. A portion of the bid deposits of unsuccessful bidders is not refunded, giving current quota holders an interest in the public's timber beyond the initial expiration date. Potential public gains from competitive bidding are thwarted with these distribution rules which make quota holders members of a relatively closed or exclusive "club."

In Alberta, planning responsibilities are divided between the public landlord and corporate tenant. Initial decisions regarding which lands are to be allocated to timber production are made by the Minister of Energy and Natural Resources on the basis of recommendations of the Land Use Planning Branch in that agency. Recommendations are

41. Statement by Fred McDougall to a Forest Science Department Seminar at the University of Alberta (Sept. 1976).

42. ALBERTA LANDS AND FORESTS, *supra* note 40, at 49.

43. ALBERTA, Timber Management Regulations, Office Consolidation (1971).

44. The Forest Act, 1971, ALTA. STAT., ch. 37.

based upon physical land capabilities, such as soil types and conditions, timber growth and mineral potentials, and socioeconomic land use feasibilities.⁴⁵ The latter part of the dual criterion essentially involves resource revenue projections under different management regimes.

From a development perspective, the reorganizations of the old ministerial portfolio of Lands and Forests with the Mines and Minerals groups in the mid-1970's into the new Energy and Natural Resources portfolio provides some interesting policy dilemmas. In the reorganization, land use planning came into the purview of a department whose energy clout is felt throughout Canada and North America. Fish and wildlife management as well as provincial parks were spun off to other departments during the initial cabinet reorganization but the wildlife and fish management function has subsequently been returned to Energy and Natural Resources. Currently there is concern that renewable resources will be lost in the shadow of Alberta's immense fossil fuel wealth and that the change in control of land use planning will make the oversight easier to accomplish. Yet from a technical planning perspective, the provincial government has a true asset in the Canada Land Inventory, an advanced soil survey nearing completion for the forested lands of Alberta and all of Canada. The land inventory has proven extremely useful in determining initial land capabilities for recreation, timber production and agricultural uses.

Beyond the initial allocation of land to timber harvesting and other uses, the actual planning of particular harvests is done by the quota holders subject to Forest Service approval. In order to assist the corporations in their harvest planning, the province has been divided into four zones. Each zone has a set of operating ground rules or guidelines developed by the Forest Service to be used by the companies in developing plans.⁴⁶ These ground rules specify such things as the maximum size of clearcuts, the size of zones to be left undisturbed along riparian habitats, and bridge and culvert specifications. These ground rules act as planning constraints, rather than positive incentives designed to integrate the production of a set of associated forest resources. The ostensible purpose of the ground rules is to provide criteria to judge the acceptability of the timber harvesting and road construction plans.

Quota agreements also provide a framework regarding the time sequence of timber harvests. Since quota holders receive a twenty-year supply of timber, there is a concern consistent with the norm of sustained yield and even flow of harvests that mills might deplete their

45. ALBERTA, Foothills Resource Allocation Study. Phase 1. Livingstone Drainage District 1-10 (July 1973).

46. C. HENDERSON, TIMBER HARVEST CUT BLOCK DESIGN 3-10 (1977).

timber too quickly, and as a result, shut down operation and destabilize communities. Consequently, a set of regulations has been designed to maintain a relatively steady flow of harvests throughout the duration of the quota contract.⁴⁷ Each twenty-year quota is divided into four successive five-year periods called "quadrants." Penalties result should production during any quadrant vary by more than $\pm 10\%$ of that called for in the agreement. If production in a five-year quadrant exceeds the authorized level by more than 10%, the quota holder pays a penalty based on the over-cut volume. Similarly, smaller penalties exist for under-cutting by more than 10%, and uncut volume in one quadrant cannot be added to the agreed upon harvest in subsequent quadrants.

The Alberta Forest Service is responsible for authorizing the annual harvest level for each quota agreement. The allowable cut may be determined by a variety of rules of thumb.⁴⁸ Quota cutting levels are determined by one of the most simplistic rules called Von Mantel's Equation.⁴⁹ Recently the province has expressed an interest in using some of the newer and more complex harvest scheduling algorithms. However, at least to some observers, development of minimally adequate growth and yield data would be a more fruitful use of time and effort than employment of linear programming in harvest scheduling.⁵⁰

Despite the fact that the newer algorithms typically find considerably higher sustainable cutting levels than the old ones, industry may resist their employment. Current allowable cut is allocated to quota holders as a percentage of the harvest in forest management units—a subdivision of a provincial forest. Quota holders also are assigned "spheres" or "zones of influence" which are fairly precise operating areas within a management unit.⁵¹ Since many of the algorithms being considered for adoption by Alberta do not schedule specific stands for harvest, quota holders may be justifiably concerned that harvest scheduling may be highly variable over time within their sphere of influence.

In summary, since the provincial government is unable to manage the volatile world demand for wood products, it attempts to manipulate or manage short-term and long-term supply in two ways. First, long-term supply is managed by the determination of quota sizes in terms of

47. *Id.* at §§ 20, 27.

48. K. DAVIS, AMERICAN FOREST MANAGEMENT 118-53 (1954).

49. *Id.* at 111-15.

50. Telephone conversation with James Beck, professor of Forest Management, University of Alberta (Jan. 1981).

51. Spheres of influence are not a widely used term in Alberta in spite of the fact that the Forest Service maps the areas. Discussion of them often produces a degree of embarrassment among government officials apparently because it looks so much like private forest land.

annual allowable cut. Short-term supply is manipulated to some unknown extent by affecting the variable costs of producing at different output rates through a system of penalties.

In addition to stipulations which allocate the harvest of mature timber over time, the sustained yield philosophy calls for reforesting cut-over areas in order to perpetuate the stock of growing trees. Again, policy implementation of this portion of sustained yield forestry calls for corporate involvement in Alberta. Quota holders are given a choice of reforesting all lands they harvest or paying a reforestation levy to the government in lieu of the actual reforestation activity itself. If the timber harvester elects to reforest, stipulations must be met regarding reforestation success within a given number of years following the harvest, and the firm must reforest land with the same tree species harvested. Payments made in lieu of reforestation are based on the volume per acre of timber removed so that well stocked lands imply a higher opportunity cost of reforestation levy than do lands where timber volume removed is low. Furthermore, such species as white spruce (*Picea glauca* (Moench) Voss) are exceptionally expensive to reforest. Thus, the reforestation policy encourages the corporate reforestation of areas predominated by relatively low cost pine types with the Forest Service absorbing the expense of reforesting the more difficult and costly sites.

B. *Forest Resource Management in the United States*

The implementation of multiple use, sustained yield goals in the United States has recently undergone significant changes. Earlier legislation allowed considerable professional discretion whereas recent statutes contain strict management direction which in effect broadens the mandate of the Forest Service while more clearly prescribing management procedures. Further, the National Environmental Policy Act of 1969⁵² requires that forest management plans provide a written statement of the anticipated effects of various courses of action on the environment as well as include public participation in the decision-making process.

The Forest and Rangeland Renewable Resources Planning Act of 1974⁵³ explicitly recognized the nation's forests, both public and private, as renewable resources vital to the nation's social and economic well-being. It required the Forest Service to periodically assess the "present and anticipated uses, demands for, and supply of renewable resources from the Nation's public and private forests and range-

52. 42 U.S.C. §§ 4321, 4331-4335, 4341-4347 (1976).

53. 16 U.S.C. §§ 1600-1614 (1976).

lands”⁵⁴ and “in cooperation with other agencies,” develop and prepare “a national renewable resource program”⁵⁵ Besides extending the planning function of the Forest Service beyond the resources under its direct control, it also provides the budgetary framework for long-term resource planning.

The most specific language affecting federal forest management is found in the National Forest Management Act of 1976.⁵⁶ This law, which in part amended the Renewable Resources Planning Act, provides precise guidelines for planning. Some examples of the extreme specificity are found in Section 6⁵⁷ which contains requirements for the personnel composition of forest planning teams, designation of the planning units, minimum time spans for successful reforestation, and guidelines for the use of clear-cutting and other silvicultural systems. Standards for the determination of minimum harvest ages along with prescriptions limiting the removal of timber are found in Section 13⁵⁸ of the law.

Apart from the legislative mandates, the new multiple use planning process also introduced a new planning tool—FORPLAN. This is a linear programming algorithm designed to schedule multiple resource outputs while simultaneously allocating land to various use emphases.⁵⁹ This marks a significant departure from past planning where timber was the only resource scheduled for regular, periodic output (sustained yield).

In the United States, forest products companies are more or less continually procuring timber in the form of individual sales. The sales are relatively small in size and it normally takes many sales to supply a mill over a twenty-year period. Each sale represents a unique contract with conditions attached which are specific to the particular sales agreement. In addition, each sale is appraised in order to determine its minimum selling value before advertising for bids. Planning and control regarding the rate of harvesting are governed by both the volume offered for sale and the components of the sales contract stipulating when the sale must be completed. As a result, short-term changes in output in the light of market conditions are reflected in part by changes in the quantity of timber under contract.

Since Congress has been slow to allocate funds for the construc-

54. *Id.* at § 1600.

55. *Id.* at § 1602.

56. National Forest Management Act of 1976, ch. 588, 90 Stat. 2949 (codified in scattered sections of 16 U.S.C.).

57. 16 U.S.C. § 1604 (1976).

58. *Id.* at § 1611.

59. K. JOHNSON, D. JONES, & B. KENT, *FOREST PLANNING MODEL (FORPLAN) USER'S GUIDE AND OPERATIONS MANUAL* app. 1 (1980).

tion of forest roads, the Forest Service often makes road construction a stipulation of the sales agreement. The building costs become a credit to the account for stumpage payments, and roads must be constructed to specifications listed in the timber sale contract. Reforestation is never the obligation of the buyer. Instead, an additional sales deposit is often set aside under the Knudsen-Vandenberg Act⁶⁰ for reforestation purposes. Actual reforestation efforts on Forest Service lands are undertaken by agency direction.

The assumption of the land use planning process is that timber sales will be designed in the context of the interrelationships between timber and associated non-fibre resources. Long-term harvest planning to sustain the future availability of timber and other renewable resources is done by use of complex, mathematical programming techniques in order to forecast yields under different management options and the resulting allowable cut. Timber bidding is normally not legally restricted in terms of potential entrants to the bidding process. Payments are made as the timber is removed from the site. Other resource payments are minimal.⁶¹

While land use planning for the national forests remains the responsibility of the Forest Service, it has become increasingly subject to guidelines generated outside the agency. Forest management has been "nationalized" in the sense that decisions no longer are considered as mainly important to local industry but have national importance. Concerns for employment or community stability must be weighed against environmental consequences and even the dominant focus on timber production has been shifted to other forest uses.

C. *Implications*

From the standpoint of preliminary planning to limit land uses to a subset of total possible uses, Alberta and the United States are very similar. Forest Services in both countries investigate land capabilities and feasibilities before allocating land for particular uses. However, in the United States, the land use plan is the timber harvest schedule as well as the schedule of other resource flows. The land use plan for a forest, which is now directly coupled to the Environmental Impact Statement process, also provides the constraints and direction for on site implementation. In contrast, Alberta has divided the province into four geographic planning zones and a set of timber management constraints are designated for each. Given the size of the province, the

60. 16 U.S.C. § 576b (1976).

61. Of the monies placed in a fund for the purpose of receipt sharing in counties in 1979, 98% came from timber sales, purchaser road credits and K-V fund deposits. Fiscal Management Office, U.S. Forest Service Region I (1980) (papers on file).

constraints that form the operating ground rules are necessarily broad. Management constraints are not directly integrated with output scheduling.

Perhaps the most significant implication of these differences in planning techniques lies in their relative potential for integrated resource production. Since the U.S. approach is more oriented to site-by-site prescriptions, it is also more suited for adaptation to site specific circumstances than is the Alberta approach. Furthermore, the multiple use mandate and the Environmental Impact Statement required of the U.S. Forest Service presumably affects management decisions regarding those forest resources for which no market incentives exist, such as visual aesthetics, control of water quality and quantity, and fire and disease prevention. In Alberta, insofar as the planners are private corporations rather than public agencies, the profit motive would seem to suggest that there are limited incentives to make decisions oriented toward the joint production of timber with non-exchangeable resources such as wildlife, recreation and water. However, it is of some note that the comprehensiveness of planning decisions for the two systems is linked to the amount of timber land under public jurisdiction. Recalling that the U.S. Forest Service has direct administrative responsibility for less than one-fifth of total forest land, whereas in Alberta, provincial control extends to virtually all forest land, the latter system clearly has greater potential policing powers over land use.

Both systems express an apparent concern with maintaining long-term supplies of timber while promoting relatively even short-term levels of harvest. Alberta's strategy for implementation of that goal is through long-term supply agreements which are based on rudimentary measures of annual allowable cut. Since Alberta does not control short-term supply from the standpoint of annual sales, they have elected to implement this portion of the policy through a system of penalties for over- and under-cutting during five-year periods. The U.S. Forest Service attempts to control long-term supply by limiting the quantity of timber offered for sale. Short-term supply is purported to be manipulated by contract stipulations which alter incentives to vary harvesting rates for timber purchased under contract.

From the standpoint of economic efficiency, both systems have been developed along guidelines which will never result in efficient investment and production of timber. There has been a long and often heated dialogue concerning the optimum time to cut a tree. On one side of the issue are the economists who prescribe harvest ages based on financial maturity; in opposition are current policies which are designed to produce maximum physical yield or maximum sustained yield. At the heart of the issue is the relationship between the value of

the stock of growing timber and the value of the flow of timber harvests. The essence of the problem lies in the analogy that standing timber inventories are like the balance of a savings account. Forest growth is like accumulating interest earnings, and harvests are account withdrawals. Exceptionally long harvest ages reduce the ratio of yields to growing stock or rate of return on investment. While the theoretically correct solution (financial maturity) to the forest rotation problem has existed since 1849, it has never been widely accepted by public forest managers and has only recently gained favor among mainstream economists such as Paul Samuelson⁶² and Jack Hirschleifer,⁶³ due in part to a clear exposition by Mason Gaffney.⁶⁴

Until quite recently, both Alberta and the United States practiced constrained timber optimization. The rule has been timber production subject to multiple use restrictions. These constraints were taken into account in the land use planning process. With the advent of the new legislative mission and the development of FORPLAN, the federal forests in the United States will now be jointly optimizing the flows of fibre and non-fibre resources over time. The remaining weakness lies in the fact that the non-fibre yield information is largely derived from expert opinion instead of systematic field observation and the statistical reliability of non-fibre yields is untested.⁶⁵

Quotas are not designed with a *laissez faire* norm in mind. To some extent, they may be justified as a subsidization for development of a more diversified industrial infrastructure in a regional economy that is dependent upon energy resources and agriculture. However, the Alberta quota agreements may also be interpreted as a residual of mercantilism. The protection of vested economic interests from the vagaries of competition appears to distort the essential nature of the government landlord, corporate tenant relationship. Under current policies, firms with quota positions have been endowed with property rights that approach a sense of permanence without compensation to public owners.

In the United States, while timber sales are referred to as competitive, bidding is sometimes limited because of location economies of timber lands and mill sites.⁶⁶ Nevertheless, the relative degree of open-

62. Samuelson, *The Economics of Forestry in an Evolving Society*, 14 *ECON. INQUIRY* 466-492 (1976).

63. J. HIRSCHLEIFER, INVESTMENT, INTEREST, AND CAPITAL 82-85 (1970).

64. M. GAFNEY, CONCEPTS OF THE FINANCIAL MATURITY OF TIMBER AND OTHER ASSETS (1957).

65. Forest Service, U.S. Dep't of Agriculture, *The Proposed Lolo National Forest Plan*, app's. B-7D, B-7H, B-7P, B-7R (1980).

66. W. MEAD, COMPETITION AND OLIGOPSONY IN THE DOUGLAS-FIR LUMBER INDUSTRY (1966).

ness between the two systems is striking. Not only is there open bidding on public timber in the United States, but there are alternative sources of supply on private lands.

Long-term commitments versus small, competitive sales also suggest less flexibility in distributing forest benefits to industry as opposed to other forest users. The current United States multiple use trend is moving away from a timber production emphasis. The small timber sales make shifts in interpretation of policy goals more readily implemented than do the long-term quota agreements of Alberta.

Forest management in Alberta is essentially management by contract with private industry. Forest management on public lands in the United States is essentially management by public agency personnel with timber disposal by contract. The contractual stipulations in Alberta are far broader in terms of regulatory intent. It may be inferred that since more management responsibility is delegated to the private sector in Alberta, the issue of contract enforcement looms as a far more important issue there than in the United States. In the process of reducing the number of transactions between government and industry (which in turn reduces the number of administrative personnel) a greater requirement to police the even flow agreements for compliance is implied.

V. CONCLUSIONS

Perhaps one of the most striking conclusions to be drawn from this study is that relative resource scarcity affects natural resource policy. A recurrent theme in the history of conservation is that resource allocation is increasingly restricted in accordance with new or heightened levels of perceived scarcity. In this respect, the United States and Canada are at different points in their historical experiences. It is not coincidental that the first stirrings of the conservation movement in the United States began in the 1870's and legislation followed some twenty years later which paved the way for the creation of public forest reserves. The retention of forest land in public ownership and concrete steps to manage that land placed greater restrictions on land use than would have been the case had the land been transferred to private ownership or had public ownership simply remained custodial in nature. The legislation of the 1960's and 1970's which provided for the establishment of wilderness, required environmental impact assessments, and mandated more intense analysis and management of non-market resources in the national forests reflects policy adaptation to heightened perceptions or resource scarcity, at least as exhibited by political mobilization of support for new, more restrictive legislation.

In Alberta, the situation is quite different. With its 2.2 million

population, 117 million acres of forest land, and vast areas of uninhabited space, comparable perceptions of scarcity do not exist. As Canadian economist Anthony Scott has observed:

Conservation . . . has scarcely become a "movement" in Canada. Canadian intellectuals have been less sentimental and Canadian legislatures have taken a more commercial attitude to the conservation movement than their opposites in the United States of America. In discussing both these countries, however, it is necessary to remember that each province or state regards itself as a separate region. The exhaustion of a provincial forest is a disaster, even if there are new, profitable capital projects and greater employment opportunities in the next province.⁶⁷

The quotation suggests another important conclusion to be drawn from this study: federal versus regional control of public lands does affect forest conservation policies. Provincial control of "natural capital" is a basic foundation of provincial power in the Canadian federal structure. Therefore, it is in the interest of the province to manage its resources in such a way as to maintain or enhance its position within the confederation, and there are definitely "have" and "have-not" Canadian provinces. The quota system used in Alberta may be viewed as a paternalistic system of tenure under which trade and development are nurtured by the policies of the legislature. Relatively greater emphasis is placed upon development than upon preservation, and less attention is placed upon the value of non-market resources. Further, there is a type of state-corporation partnership in Alberta which may have the effect of blurring distinctions between public and private interests.⁶⁸ Given this situation and the absence of stringent national environmental regulations, it is likely that the provinces will continue to exploit their natural resources within regionally determined standards and to resist attempts at outside interference.

The retention of federal control over public lands in the United States means that the states lack a natural resource base as a strategic asset comparable to that of the Canadian provinces. The federal and not the state government is largely responsible for the pace of economic activity especially in states with large federal land holdings. U.S. Forest Service management has a history of concern for the effects of its policies on local industry but more recent guidelines require that local

67. A. SCOTT, *supra* note 33, at 262.

68. For example, a recent large forest management agreement reached between Alberta and Simpson Timber Company gave the province the right to purchase 40% of the company's Alberta subsidiary. Subsequently the province exercised the option and the province now has a dual objective of protecting the environment as well as seeing a good return on its investment portfolios.

concerns be viewed in the light of national needs. While the reallocation of a forest's resources may have significant effects on regional economies, the emphasis on national forest management goals may prove to be an overriding concern. Restrictions on forest resource use due to environmental legislation makes the forest less subject to commercial exploitation and this, too, may affect industries within the states. The system of timber sales used by the Forest Service also creates a greater degree of risk associated with development investments which are heavily dependent upon the availability of forest resources. In this respect, the federal administration of the United States lacks the stability associated with the twenty-year quotas used in Alberta.⁶⁹ On the other hand, the federal system is more flexible and therefore more responsive to shifts in national policy direction although it may, as a result, be less responsive to state concerns.⁷⁰

Attempts to remove federal control over public lands are based at least in part on the premise that state management would better reflect state needs. If federal jurisdiction of the forest resources was removed, one can only speculate about the future of conservation policy. Perhaps the ability of the federal government to develop a national renewable resource policy would be impeded, particularly if states were to adopt a protectionist attitude towards their resources and did not concur with federally determined goals. The power of the state to control its future would be strengthened at least to the extent that forest resources could be used to meet state development objectives. However, the current emphasis on non-market resource values may also undergo revision. In a constitutional sense, the mere transfer of jurisdiction over public land from the federal to the state level would not give the states equivalent powers to those of the Canadian provinces. The states, not the federal government, have residual powers. Unless other expressly delegated federal powers, such as the control of interstate commerce or the broad power to provide for the general welfare were also changed, states would presumably still be subject to the restraints of much of the national environmental protection and other legislation promulgated by the federal government in its sovereign role. Thus, the Sagebrush Rebellion may be chasing an illusion of regional autonomy rather than a reality.

69. Jackson, *Some Structural Components of Contracts as they Relate to Canadian Forest Tenure*, 53 FOR. CHRON. 33 (1977).

70. D. Jackson, *The National Forests and Stabilization: Fact or fiction*, (1980) (unpublished paper). The article summarizes national forest timber harvesting in Montana and Northern Idaho. The figures show a 40% reduction in cutting levels during the nine year period ending in 1979. *Id.* at 12-13.