



EVOLUTION OF THE STUDY OF FOREST POLICY IN THE UNITED STATES

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ABSTRACT

The development of political science and forest policy in the United States is traced and compared. Political science began initially as comparative historical analysis and has progressively emphasized more social science methods and objective analytical approaches. Modern critics question the possibility of purely objective and neutral analysis of politics, but trends toward more vigorous standards and theoretical constructs remain. Forest policy research generally follows the comparative historical approach and modern political science methods have been applied only recently. Future applications of political science theory and methods will ironically be limited by political factors and scarce budgets.

Keywords: Forest policy, forestry, policy analysis, political science, research.



INTRODUCTION

Public policies in the United States have been crucial in determining the ownership of forests, the allocation and management of public forest benefits, and the production of private forest goods and services. Despite its largely private market economy, governments own about one-third of the forest land area in the United States. Furthermore, they provide a plethora of educational, fiscal, and regulatory incentives to encourage private forest landowners to incorporate social goals in their forest management, ranging from timber production to environmental protection. Despite the long-standing importance of public policy in forestry, the study of forest policy lacks a commensurate tradition in the profession. Biologically-based research has generally played a more significant role compared to social science research in general, and political science research in particular.

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However, new demands are being placed on forest resource professionals to incorporate more holistic and interdisciplinary approaches to forest practices and management. Many of these demands call for institutional innovations in the way the nation's forests are managed and in the ways citizens participate in making democratic choices. This, in turn, requires knowledge from many disciplines. Political science can contribute knowledge about policy tools and processes; factors affecting political behavior; institutional incentives and barriers to organizational change; and methods for monitoring and evaluating the political impacts of policy innovations.

Thus it is an appropriate time to take stock, to measure past progress, and to discern future prospects for the integration of political science into the research and instructional agendas of forest policy. Previous studies have examined the development of forest economics (Alston, 1983) and of natural resource and rural sociology (Field & Burch 1988); none have focused specifically on the applications of political science to forestry. Accordingly, this paper provides an initial effort to assess the status of, and prospects for, political science in the study of forest policy in the United States.

We approach this task by reviewing the historical development of political science as a discipline. We then trace the development of forest policy and analyze relationships between political science and the study of forest policy. Finally, we discuss the future prospects for ensuring that political science might contribute to developing better forest resource management and natural resource education.

POLITICAL SCIENCE

Political science can be examined in its two component parts, politics and science. Politics involves the civil (or acrimonious) struggle over the use of power to define, develop, and impose communal values on members of society. Politics is a means of resolving differences in individual opinions and values in order to agree upon and coerce acceptable behavior. Politics therefore involves conflict, debate, power, and authority in the determination of acceptable social values and behavior. It includes the

arbitration and imposition of normative values — principles, standards, or guidelines considered desirable or worthwhile — on members of society (Isaak, 1981).

Different values are the *raison d'etre* of politics; if everyone agreed, politics and government would be minimal. Social values form the basis for forest, and other, policies. Successful forest policies must conform reasonably well with the prevailing social values of the time. Those that do not will surely be destined for oblivion, opposition, or change.

Many other factors contribute to politics as well, of course. Securing and protecting one's economic interests influences many "political" conflicts. Culture, tradition, religion, geography, resources, race, and gender contribute to political debates. Various factors will influence political decisions in various locations, eras, or populations. Determining the relative contribution of all the potential factors to politics is difficult, but is the crux of political science. Political science tries to develop theories that explain how political debates and resource allocation occur, and empirically test these theories with existing or experimental data.

Science consists of systematic efforts to determine how biological or social events occur. Describing a political system, an aspect of it, or a general political phenomena, and explaining and accounting for such facts are scientific activities (Isaak, 1981). We could then say that political science consists of systematic efforts to explain how individual values are coalesced into communal values and imposed on members of society as a whole. It describes how events occur — the process of social interactions to determine group values — and the factors that influence how group values are determined. Research efforts seek to explain empirically the political world — to explain what has happened or predict what will happen — in the political allocation of resources or power.

Political science employs social science methods including model-building, hypothesis formulation and testing, and applying the scientific method to examine political events and processes. Political science strives mostly to describe collective human behavior, its nature, and its determinants. It attempts to evaluate the causes and ef-

facts of human behavior, and to test hypotheses to learn more about human behavior as reflected in political events — in order to increase our knowledge or to predict future responses to public actions.

A number of authors have examined the history of political science (Crick, 1959; Somit & Tanenhaus, 1967; Seidelman & Harpham, 1985; Dreijmanis, 1983). Five developmental eras in political science can be identified:

- (1) the formative stage,
- (2) realism,
- (3) scientism,
- (4) behavioralism; and
- (5) post-behavioralism.

The principal eras of United States political science are traced below and illustrated in Figure 1. Later, they are compared with the development of forest policy science.

Formative Era

The formative era of political science began after the Civil War (Somit & Tanenhaus 1967). The first school of political science was founded in 1880 at Columbia University by John W. Burgess, who patterned the program upon training he had received in Germany. The American Political Science Association (APSA) was formed in 1903, and the APSA subsequently began publication of the *American Political Science Review* in 1906.

During the formative era, two issues emerged that persist to this day (Somit & Tanenhaus, 1967): (1) is political science capable of becoming a science?; and (2) what are the most appropriate methods of inquiry? Burgess (1890), who used an historical comparative analysis, or the Teutonic Method, was the leading advocate of moving toward a science of politics. The Teutonic method posited that there were fundamental laws governing the growth and behavior of political institutions that meticulous comparative historical analysis could reveal.

Toward the end of the formative period, the tendency of Teutonic methodology to rely heavily upon formal, written records as a basis for comparative analysis came increasingly under fire. Woodrow Wilson, for example, was one political scientist (and practitioner) who argued that political science needed to deal not only with docu-

ments, but also with real life. According to Wilson (1897), scholars must “know men...to see into the heart of society and assess its notions, great and small...The needed reaction against orthodox methods should be a ... movement from formalism to life.”

Realism

The era of realism or pragmatism extended from 1903 until 1921. During this period, political science became defined as an applied science for the purpose of serving and educating the public to achieve the societal reforms of the Progressive movement. While pragmatists criticized historical comparative analysis as either having an improper focus or an improper methodology, they differed significantly in their proposals for a replacement paradigm.

On one hand, Arthur Bentley (1908) believed that there were universal principles of politics that could be found through serious and detached scientific inquiry. He applied these concepts to the study of interest groups. Bentley argued for rigorous standards of scientific objectivity and methods, and for separating values, ideas, and emotions from the analysis. On the other hand, Woodrow Wilson believed that the study of politics had to be sensitive to American culture, and that political relations were too human to be analyzed through objective science (Somit & Tanenhaus, 1967). James Bryce elucidated another feature of the pragmatists — focus on the facts and exposure of the gap between the formal institutions and realities (Crick, 1959).

The era of pragmatism introduced new perspectives into political science, including more thorough factual analyses, better statistical and scientific methods, and the separation of facts and science from values and politics. It did not, however, succeed in introducing a new science of progressive government or in creating an enlightened public.

Scientism

During the years 1921 to 1945 political science was seen less as having a role of educating the citizenry, and more in an academic role of observing and explaining the behavior of citizens (Seidelman & Harpham, 1985). In this era, so-called academic “scientism” dominated.

POLITICAL SCIENCE	YEAR	FOREST POLICY SCIENCE
	1875	Conservation Movement Emerges
Formative Era (~1875–1902)		
	1900	National Forests Established
Realism (1903–1921)		
	1925	National Timber Studies and Debates
Scientism (1921–1945)		
Behavioralism (1945–1966)		
	1950	Greeley (1951) Gulick (1951) Dana (1956) Kaufmann (1960) Schiff (1962)
Modern Era (~1967–present)		
	1975	Worrell (1970) Economic/Policy Evaluations Policy Analysis Policy Science Research
		Forest Resource Policy Texts Ellefson (1992) Cubbage <i>et al.</i> (1993)
	2000	

FIGURE 1. CHRONOLOGY OF POLITICAL SCIENCE AND FOREST POLICY STUDY ERAS

Charles Merriam (1925), who wrote that political science should emulate the scientific methods of the natural sciences, is credited with being the leading advocate of the “new science” of politics. Research emerged as a core value of the profession. Publications based on quantitative research methods grew more common. While Merriam

and his followers in the Chicago School reflected a shift in methods of inquiry from the qualitative to the quantitative, they were still reformist in nature (Seidelman & Harpham, 1985).

During this period the separate but closely aligned discipline/subdiscipline of public administration emerged. The study of administration had long been of interest, but the increased focus of political science on developing a detached academic science alienated those interested in the more practical study of public administration. While public administration valued scientific research as a means to develop principles that explained administrative processes, research was specifically tied to the practical workings of government (Waldo, 1968). Public administration was "not purely an academic activity, and it does not feel free to define its interests and set direction for its research in isolation from its outside world" (Waldo, 1968: 460). By 1940 public administration had developed its own philosophies, its own professional organization — the American Society for Public Administration — and its own journals (Table 1). The separation between political science and public administration arose not from a conflict over science, but from differences in the range of research interests and their connection to the needs and interests of their subject matter.

Behavioralism

Behavioralism was the lineal descendent of the new science of politics. There is no single definition of the era of behavioralism, but generally it spans the period from 1945 to the mid-1960s. Behavioralism arose after World War II, when the political environment became more conservative after years of New Deal activism. Behaviorists attempted to remove political science from any ideology or reformist motives found in earlier eras. Instead of embracing the earlier professional commitment to revive democratic accountability through civic education, they perceived the role of the discipline as a "pure science" (Seidelman & Harpham, 1985).

Behavioralism emphasized research techniques and empirical theory. Empirical research methods refined public opinion and survey techniques, incorporated computer and statistical analyses, and focused on measurable

political behavior, e.g., roll call analysis and voting behavior. A fragmentation of the discipline into a number of specialized fields of empirical research greatly developed the discipline's research methodology and pool of knowledge. However, no universal paradigms or theories typify the behavioral era. In fact, Easton (1953) critically observed that political science had no central organizing set of concepts, and stressed the need to concentrate on developing systematic theory.

Post-Behavioralism

The post-behavioral era, which for simplicity we call the modern era, began in the late 1960s. This movement was typified by its criticism of the failure of behavioralism, rather than by any unique theory or focused direction. Behavioralism, it was argued, was effectively insulating the discipline from the political events of the time. Some critics suggested that attempts to emulate the natural sciences were inappropriate. Others contended that behavioralists had failed to anticipate the "crisis of authority", or the social challenges to conventional democratic institutions. They advocated reform to resolve the crisis in democracy, and a revival of the realism approach.

Policy studies filled a void left by the behaviorist trend and emerged as a strong subfield. Policy studies move beyond the tendency of political scientists to specialize in particular institutions (e.g., Congress, the presidency, courts, political parties). Such studies seek to focus on substantive problems of public policy, to study decision-making across institutions and levels of government, and to transfer that knowledge to policy-makers. Development of the policy studies subfield and its applied emphasis has renewed the linkages between political science and public administration, as well as developed new linkages with economics and the other social science disciplines.

The advent of the Great Society and the planning-programming-budgeting programs of the 1960s also led to a flourishing demand by government agencies for policy analysts and program evaluation specialists (Haveman, 1987); virtually all new social legislation passed in the 1960s and 1970s required program evaluation. By 1969, nearly all federal agencies had evaluation research and policy analysis programs, and about 2500 budget analy-

TABLE 1. JOURNALS IN POLITICAL SCIENCE AND FOREST POLICY.

FORESTRY AND NATURAL RESOURCE JOURNAL	PUBLIC ADMINISTRATION JOURNAL
<i>1894 American Forests</i>	<i>1923 Public Administration</i>
<i>1912 Forest Quarterly</i>	<i>1940 Public Administration</i>
<i>Review</i>	
<i>1917 Journal of Forestry</i>	<i>1956 Administrative Science Quarterly</i>
<i>1955 Forest Science</i>	
<i>1961 Natural Resources Journal</i>	<i>1974 Administration and Society</i>
<i>1973 Journal of Environmental Management</i>	
<i>1975 Environmental Policy and Law</i>	
<i>1976 Environmental Management</i>	
POLITICAL SCIENCE JOURNAL	PUBLIC POLICY JOURNAL
<i>1886 Political Science Quarterly</i>	<i>1970 Policy Sciences</i>
<i>1906 American Political Science Review</i>	<i>1972 Policy Studies Journal</i>
<i>1939 Journal of Politics</i>	<i>1975 Policy Analysis</i>
<i>1948 Political Science</i>	<i>1977 Policy Review</i>
<i>1948 World Politics</i>	<i>1978 Evaluation and Program Planning</i>
<i>1968 Polity</i>	
<i>1970 Politics and Society</i>	<i>1981 Policy Studies Review</i>

sis staff positions existed in the federal government. Congress moved to improve its own analytical capabilities, and state agencies and non-government organizations began to employ a host of policy analysts. This need for policy analysis and evaluation capabilities spawned programs and schools of public policy, often located outside the mainstream political science departments. It also led to the establishment of a number of major public policy analysis and evaluation research journals (Table 1).

Despite the success of policy studies as a subdiscipline, and perhaps even because of it, the field of political science in the modern era remains fragmented. The influence of the behavioral movement remains strong, and its emphasis on quantitative research is well represented in the pages of the discipline's mainstream journals. However, political science has yet to agree on a unifying general theory. Nor perhaps should it.

This lack of unanimity in paradigms and approaches in political science can be viewed as a problem or an advantage. Unlike the natural world, the social world has proven too complex and unstable for universal theories or laws. Different values, deeply rooted, which prompt actions ranging from cooperation to competition and altruism to war, suggest that universal laws of political science and forest policy are absurd. People, communities, societies, governments, and politicians are all too complex to be so neatly described or predicted.

In response, political science has developed a plethora of different paradigms and methods that explain some behavior of some people. These methods have evolved through several periods. In general, they have become more positive, quantitative and rigorous — trying to scientifically link the world of experience with empirical evidence and appropriate theory. Modern developments have included a resurgence of qualitative approaches, but they too have a rigor and positivism far beyond early descriptive works. These methods help to describe and predict peoples' responses to political actions and public programs.

Application of various political science approaches has become "contextual" rather than absolute. Existing or new approaches are applied as appropriate for analyzing given situations, given policies or programs, in given cultures or locations. This does not suggest that application of theory and examination of empirical evidence are lacking in political science. Instead it suggests that many tools exist and that their utility and power depend on wise selection and application.

Forest Policy Science

Obviously, American forest policy has developed concurrently as a subset of United States policy. Key early contributors to forest policy, such as Gifford Pinchot, John

Muir, and Theodore Roosevelt, were instrumental in developing general public attitudes and policies in the United States as well as specific natural resource and forest policies. Not so obvious, however, is whether there was any explicit relation between political science and the scientific study of forest policy. In its early years, the study of forest policy consisted largely of casual observation, moderate to detailed descriptions of events, and advocacy. Not until much later did the field become more like political science. Figure 1 summarizes the trends in the development of forest policy science, which are discussed below.

Early Forest Policy Development

The beginnings of forest policy in the United States can be traced to the beginnings of the conservation movement in the late 1800s. Responding to growing concerns about perceived resource shortages and forest destruction, the federal government began to reserve lands for resource conservation and to create organizations, such as the Forest Service, for their management. These policy initiatives reflected the Progressive movement's goal of protecting the American public from monopolistic interests and ensuring an efficient accountable government staffed by a professional civil service.

These beginnings of forest policy mirrored the beginnings of the political science era of realism. The call for efficient forest management paralleled the concerns of political science for the implementation of efficient government policies and programs. The progressive conservationists emphasized scientific efficiency and forest management decisions made by scientifically trained foresters. Forestry administration thus dovetailed closely with the dominant thinking in political science concerning the relationship of administration and politics, as articulated by Wilson (1887: 210).

“...[A]dministration lies outside the proper sphere of *politics*. Administrative questions are not political questions. Although politics sets the tasks for administration, it should not be suffered to manipulate its offices...Politics is thus the special province of the statesman, administration of the technician.”

Scientific management and efficient administration were used to promote governmental control of forests. However, the analyses and studies of forestry issues and policy options more often reflected advocacy and emotional appeals than scientific analysis. Rarely did these studies utilize the research or conceptual developments of political science. The advocacy role of the Forest Service and the applied nature of forest policy studies did not correspond with political science's early move toward objective, scientific research. Studies done by the federal government, including the 1933 Copeland Report (U.S. Department of Agriculture 1933) and the 1941 Joint Committee on Forestry report (U.S. Congress 1941), as well as reports by professional societies like the Society of American Foresters (1919a and 1919b), supported federal ownership and recommended stronger planning and regulatory controls. Several articles in *Forest Quarterly* (1902–1917) argued that public rather than private ownership was justified in order to solve the “national timber problem”. Such studies were designed to gain needed political support and to justify the direction the federal government wanted to take. At times this emphasis compromised scientific research and led to oversimplification and rigidity in the analysis of problems (Schiff, 1962).

The Transition Period: 1950s–1960s

During the 1950s researchers outside the forestry community began to apply political science and public administration concepts to the study of forest policy and forestry organizations. While refraining from using empirical quantitative methods, these studies produced practical results that influenced scholars both within forestry and political science.

A good example of a study grounded in public administration is *American Forest Policy: A Study of Government Administration and Economic Control* (1951) by Luther H. Gulick. His analysis explored the administrative methods used by government to design and implement forest policy and the effects of government action on administration and the economy. The text synthesizes results from a series of studies on forestry done by the Institute of Public Administration. Analysis of administrative problems led

Gulick to conclude that reform in administrative structure would be necessary to create a more effective institutional setting for formulating and administering forest policy.

Criticizing the self-serving nature of the gloomy timber supply predictions, Gulick specifically commented on the need for a "sober and unbiased report" of future timber prospects. He contended that forestry authorities, professional foresters, conservationists, and private timber owners skewed reports on timber supply and demand in order to support their individual agendas. The inference was that even the "scientific" research needed to create forest policies had been influenced by advocacy pressures.

Herbert Kaufman's 1960 *The Forest Ranger: A Study in Administrative Behavior* also employed public administration analysis. Kaufman used detailed qualitative research methods, interviews with Forest Service rangers, and examination of agency manuals, documents, and records to examine how the behavior of field employees is influenced in an organizational setting. Kaufman dissected how such a geographically dispersed agency could overcome independent organizational and individual tendencies, avoid capture by parochial local interests, and ensure conformity with the norms set by national headquarters. The study is a classic in public administration/political science methods and literature.

Another important pair of studies are Ashley Schiff's *Fire and Water* and Charles A. Reich's *Bureaucracy and the Forests*, both completed in 1962. These studies explore the relationship between the Forest Service's institutional ideology and the responsiveness of its decision-making process to external input. Schiff examined organizational responses when agency researchers challenged well-established agency dogma about the hazards of fire and the deforestation of watersheds. Scientific studies that questioned current fire and water policies or programs were suppressed so the agency could retain professional discretion, constituent support, and funding. Reich argued that professional elitism caused the agency to formulate plans in favor of "clients" rather than the public at large. Both the Schiff and Reich studies concluded that the insularity and ideology of the Forest Service weakened ad-

ministrative accountability. Forest Service planning and research had developed as means to justify current programs and policy, strengthen the political clout and cohesiveness of the agency, and appease dominant constituents.

Through the 1960s, the development of general policy analysis presaged the development of more formal methods of policy evaluation in both forestry agencies and in forestry schools. With the rise of the policy studies subdiscipline more explicit linkages began to be made among researchers in forestry, political scientists, and public administration specialists interested in forest policy. Forestry researchers began to broaden research methods to include the whole range of political science approaches and methods, including quantitative analysis and hypotheses testing. Forest Service researchers also began to perform specific program evaluations. Based on his work in the 1960s, for example, Manthy (1970) performed a specific evaluation of the Agriculture Conservation Program (ACP) in helping landowners plant trees. This study proved to be the basis of many more forestry program evaluations in the 1970s and 1980s.

The 1970s to Present: Forest Policy Research

Environmental laws, federal policy analysis measures, and national forest management planning triggered a vast increase in the amount of forest policy research in the late 1960s, 1970s and 1980s, by the Forest Service, forestry professors, economists, independent organizations, and, occasionally political scientists. New journals with an environmental focus emerged and provided outlets for research from the social sciences as well as the biological and physical sciences (Table 1).

In 1970, Albert Worrell, a forestry professor at Yale, published *The Principles of Forest Policy*, which used a political process approach and relied on political science literature. The textbook drew heavily from public policy and public administration literature (e.g., Gulick, 1951) by focusing on the way groups determine the goals of policy, the means or institutional tools that frame policy, and the process through which policy is made effective. Furthermore, it began instruction in forest policy as a process,

not as history or case studies alone. Worrell's adoption of the process approach was quickly reinforced by the burgeoning environmental movement, passage of many federal laws directly and indirectly affecting forestry, and the infusion of economics literature and methods into political science.

Detailed forest economics and policy studies performed by researchers at Resources for the Future (RFF) also provided the bases for evaluating many public lands programs and nonindustrial private forestry issues. These studies evaluated public programs using economic efficiency as a principal criterion, and became widely used in the teaching of forest policy and economics. Based on several of his RFF studies, Marion Clawson (1975) published the succinct text *Forests for Whom and for What*, which adopted an analytical and economic approach for assessing U.S. forest policies.

In 1980 Samuel Dana's 1956 tome, *Forest and Range Policy*, was revised and updated by Sally Fairfax (Dana & Fairfax, 1980). The revision provided in-depth analyses of federal land management agencies and laws and took a more analytical approach than the original, but remained mainly descriptive and historical.

Teachers of forest policy also began a process of self-examination during the 1980s (Sendak, 1988). Because of concern that there was "no well-defined and generally accepted core of material and analytical approaches" for teaching forest policy (Muench, 1984), a national workshop on undergraduate forestry education was held. Teachers of forest policy also set up an annual workshop on teaching law and policy at the yearly meeting of the Society of American Foresters.

The environmental laws of the 1970s, and changing social values and attitudes toward resources and resource agencies, also provided many research opportunities. Policy research focused on questions of public participants and dispute resolution (e.g., Fairfax, 1981; Wondolleck, 1988; Force & Williams; 1989, Shannon, 1991); forest planning (e.g., Behan, 1981; Le Master, 1984; Cortner & Schweitzer 1983a, 1983b; USDA Forest Service, 1990); and the use of economics to analyze policy objectives and

select alternatives (e.g., Clawson, 1975; Krutilla & Haigh 1978; Boyd & Hyde, 1989; O'Toole, 1988). Other policy studies analyzed the changing power and influence of interest groups and public land management agencies (e.g., Culhane, 1981; Clarke & McCool, 1985; Twilight & Lyden, 1988; Brown & Harris, 1992a, 1992b; Yaffee, 1994).

Because the forestry-related legislation of the 1970s promoted, and indeed often required, federal forestry policy analyses, policy analysis units were established within the Forest Service and the Department of the Interior. These and other units of the agencies performed a host of policy and program evaluation studies during the 1980s. Many of these studies were initiated by astute agency leaders who recognized the political importance of credible analyses, particularly in response to continual pressure from the Reagan Administration and its Office of Management and Budget to cut budgets. A Research Evaluation Work Unit, for example, was established within the Forest Service in the early 1980s to examine research returns (Bengston, 1984; Westgate, 1986). Related studies were funded by State and Private Forestry to examine the effectiveness of the Forestry Incentives Program (Mills, 1976; Risbrudt *et al.*, 1983), and of state forestry technical assistance programs (Cubbage *et al.*, 1987; Henly *et al.*, 1990). Almost all of these studies found large positive returns to the public forestry programs. Those with less positive results took more time to be released or were not published formally — e.g., Newman (1990) for forest management research, Salazar & Barton (1988) in technical assistance.

Nonetheless, while the analysis and evaluation of forest policy became a more visible activity in the 1970s and 1980s, links to political science theories and methods often remained weak (Wallace *et al.*, 1995). If at all systematic, evaluations more often utilized economic, not political science, methodologies. Some of the lack of rigor also may be attributed to the problem of biologically-trained professionals evolving into policy experts via promotions in public agencies or administrative experience at universities. Thus much of the policy analysis, at least until the 1980s, was performed by people who were not unduly burdened by any political science training.

Prospects

In the 1990s, demands for social science increased greatly in reviews of forestry research, forestry education symposiums, and Forest Service literature (i.e., National Research Council, 1990, USDA Forest Service, 1992). The increasing importance of people, values, and culture in influencing resource use and policy has been recognized throughout most of the forestry sector (e.g., Cubbage & Brooks, 1991). In addition, a greater number of social scientists within and without the traditional forestry arena have begun to study forest communities and programs. As such, both the quantity and quality of forestry social science has increased immensely. Many new studies using political science approaches have been performed, and two new forest policy textbooks, with same main titles of *Forest Resource Policy*, were published (Ellefson, 1992; Cubbage *et al.*, 1993). These are based on a synthesis of political science approaches and forestry literature. Whether a concomitant interest in pure political science research applications in forestry will occur, however, remains moot.

Political science has much to contribute to the analysis of people's values as reflected in political institutions and implemented in public programs. It also can help explain how public debate and influence have and can be used to develop programs that work and are supported by interest groups (Ripley, 1991; Lowi, 1992). Unfortunately, however, some of the best early applications of political science to forestry found that the Forest Service carried favor of interest groups at the expense of the general public; used science selectively to favor agency programs; and enforced norms of conformity and ideology (i.e., Gulick, 1951; Kaufman, 1960; Schiff, 1962). Such findings should not seem unusual, since they are practiced by all agencies. The findings, however, did little to engender enthusiasm of the Forest Service, a major funder of forestry research, for more political science research. Nor did they do much to encourage academic forestry administrators, who depend greatly on the agency to provide research funds and employ graduates, to rush to hire their own forestry/political science critics. In addition, by 1996, social science research budgets in general were increasingly

proposed for large cuts by the new Republican majority in Congress.

Despite impediments, more positive, rigorous, and scientific applications of political science to forestry events will increase in the future. They will link theory and empiricism better, using both improved quantitative and qualitative research. Almost all observers of forestry concur that more social science research is necessary to better allocate forest resources and to create new public programs and political institutions that will reduce forestry conflicts. For many, forestry remains a fascinating arena for public policy research. The new ecosystem management paradigm also stresses public values, public input, and social science as central components of forest management. And because the theory of ecosystem management is as much about institutional change as it is about biophysical phenomena, it suggests a broad agenda of policy research (Cortner *et al.*, 1995). Debates about the public interest versus private property rights on forest lands have become legion by 1995, and go to the core of questions of governance, constitutional form, and legal and political theory.

Deterrents to further implementation of modern political science methods in forestry research will be, ironically, political. Inquiries that do little but find fault are unlikely to generate support from beleaguered agencies that fear that any additional criticism will be seized upon by critics who control budgets and ultimate agency survival. More importantly, continuing pressure to reduce budgets and personnel in all public organizations will limit expansion of social and political science regardless of perceived needs, because such forest science inherently depends on public funds. Political scientists, or even policy analysts, in forestry and natural resource agencies have always been scarce, even if agency politics have not. Funding for academic research has not been much greater. Furthermore, as public budget cuts occur, the biologically-oriented forestry profession and university faculty will tend to protect their core expertise in biology, silviculture, genetics, and vegetative manipulation. Allocation of resources and power in public and even most private forestry organizations has always favored natural sciences. Reversing this

value-orientation and biological domination will challenge social and political scientists.

If resources can be increased, political *science* in forestry does stand ready to increase its contributions. A host of new researchers well-trained in modern political science philosophy, theories, and methods — both quantitative and qualitative — already exist, and many more are currently enrolled in graduate programs. Analyzing the allocation of resources and power and the effectiveness of public programs to achieve specific social goals attracts politicians, scientists, idealists and others. Politics and science are fun, if one's livelihood is not threatened.

The stakes of political debates and decisions in the United States are getting higher, however. Public resources have become scarcer, public officials more thin-skinned, and politicians less magnanimous. This sea change in the commonweal heightens the relevance of political science skills in forestry for analyzing policies and implementing programs. It also increases the need for researchers and teachers to be politically sensitive as well as scientifically sound. As scientists, researchers must apply the best tools possible to dispassionately assess the merits of using scarcer public funds to achieve social goals. Research and policy evaluations must be theoretically sound, factual, accurate, and tactful. Neither relentless critics nor mindless sycophants of forestry programs will serve science, professions, or society well. Successfully traversing these rocky shoals can increase the practical contributions and reach of political science applications in both research and education.

REFERENCES

- Alston, R. M., 1983. *The Individual vs. the Public Interest* (Boulder, CO: Westview).
- Anderson, J. E., 1984. *Public Policy-Making* (3rd ed.) (New York: Holt, Rinehart, and Winston).
- Behan, R., 1981. RPA/NFMA—Time to Punt. *Journal of Forestry*, 79(12), 802–805.
- Bengston, D. H., 1984. Economic Impacts of Structural Particle-board Research. *Forest Science*, 30(3), 685–697.
- Bentley, A., 1908. *The Process of Government* (Bloomington, IN: Principia Press).

- Bobrow, D. B. & Dryzek, J.S., 1987. *Policy Analysis by Design* (Pittsburgh: University of Pittsburgh Press).
- Boyd, R. G. & Hyde, W. F., 1989. *Forestry Sector Intervention: The Impacts of Public Regulation on Social Welfare* (Ames: Iowa State University Press).
- Brown, G. G. & Harris, C. C., 1992a. The U.S. Forest Service: Toward the New Resource Management Paradigm. *Society and Natural Resources*, 5(3), 231-245.
- Brown, G. G. & Harris, C. C., 1992b. The U.S. Forest Service: Changing of the Guard. *Natural Resources Journal*, 32(3), 449-466.
- Burgess, J., 1890. *Political Science and Comparative Constitutional Law* (2 volumes) (Boston: Ginn & Co.).
- Cameron, J., 1928. *The Development of Governmental Forest Control in the United States* (Baltimore: Johns Hopkins Press).
- Clarke, J. N., & McCool, D., 1985. *Staking Out the Terrain: Power Differentials among Natural Resource Management Agencies* (Albany: State University of New York Press).
- Clawson, M. 1975. *Forests for Whom and for What?* (Baltimore: Johns Hopkins University Press).
- Cortner, H. J. & Schweitzer, D. L., 1983a. Institutional Limits and Legal Implications of Quantitative Models in Forest Planning. *Environmental Law*, 13, 493-516.
- Cortner, H. J. & Schweitzer, D. L., 1983b. Limits to Hierarchical Planning and Budgeting Systems: The Case of Public Forestry. *Journal of Environmental Management*, 17, 191-205.
- Cortner, H. J., Shannon, M. A., Wallace, M. G., Burke, S. & Moote, M. A., 1995. *Institutional Barriers and Incentives for Ecosystem Management: A Problem Analysis* (Portland, OR: Forest Service Pacific Northwest Research Station).
- Crick, B., 1959. *The American Science of Politics: Its Origins and Conditions* (Berkeley: University of California Press).
- Cubbage, F. W., Risbrudt, C. D. & Skinner, T. M., 1987. Evaluating Public Forestry Assistance Programs: A Case Study in Georgia. *Evaluation Review*, 11(1), 33-49.
- Cubbage, F. W. & Brooks, D. J., 1991. Forest Resource Issues and Policies: A Framework for Analysis. *Renewable Resources Journal*, 9(4), 17-25.
- Cubbage, F. W., O'Laughlin, J. & Bullock III, C. S., 1993. *Forest Resource Policy* (New York: John Wiley).
- Culhane, P. F., 1981. *Public Land Politics: Interest Group Influence in the Forest Service and Bureau of Land Management* (Baltimore: Johns Hopkins University Press).

- Dana, S. T., 1956. *Forest and Range Policy: Its Development in the United States* (New York: McGraw-Hill).
- Dana, S. T. & Fairfax, S. K., 1980. *Forest and Range Policy: Its Development in the United States* (2nd ed.) (New York: McGraw-Hill).
- Dreijmanis, J., 1983. Political Science in the United States: The Discipline and the Profession. *Government and Opposition*, 18(2), 195–217.
- Easton, D., 1953. *The Political System: An Inquiry Into the State of Political Science* (New York: Alfred Knopf).
- Ellefson, P. V., 1992. *Forest Resource Policy: Processes, Participants, and Programs* (New York: McGraw-Hill).
- Fairfax, S. K., 1981. RPA and the Forest Service. In *A Citizen's Guide to the Forest and Rangeland Renewable Resource Planning Act*, Publication FS-365., (Washington, D.C.: USDA Forest Service), pp. 181–200.
- Fairfax, S. K. & Ingram, H., 1990. No Theory, no Apology: A Brief Comment on the State of the Art in Natural Resources Policy and the Articles Herein. *Natural Resources Journal*, 30(2), 259–262.
- Field, D. R. & Burch, Jr. W. R., 1988. *Rural Sociology and the Environment* (Middleton, WI: Social Ecology Press).
- Force, J. E. & Williams, K. L., 1989. A Profile of National Forest Planning Participants. *Journal of Forestry*, 87(1), 33–38.
- Greeley, W. B., 1951. *Forests and Men* (Garden City, NY: Doubleday).
- Gulick, L. H., 1951. *American Forest Policy: A Study of Government Administration and Economic Control* (New York: Duell, Sloan, and Pearce).
- Haveman, R. H., 1987. Policy Analysis and Evaluation Research after Twenty Years. *Policy Studies Journal*, 16(2), 191–217.
- Henly, R. K., Ellefson, P. V. & Baughman, M. J., 1990. Minnesota's Private Forest Management Assistance Program: An Evaluation of Aspen Timber Sale Assistance. *Northern Journal of Applied Forestry*, 7(1), 31–34.
- Hyde, W., 1980. *Timber Supply, Land Allocation and Economic Efficiency* (Baltimore: Johns Hopkins University Press).
- Irland, L. C., 1985. Status of Research in Forest Policy: A survey of SAFE-I Working Group Members. (unpublished report) available from author, the Irland Group, Augusta, ME.
- Isaak, A. C., 1981. *Scope and Methods of Political Science* (3rd Ed.) (Homewood, IL: Dorsey Press).

- Ise, J., 1920. *The United States Forest Policy* (New Haven, CT: Yale University Press).
- Jakes, P., Gregersen, H., Lundgren, A. & Bengston, D., 1990. Emerging Issues in Forest Management and Use. *Journal of Forestry*, 88(4), 25–28, 34.
- Jones, C. O., 1984. *An Introduction to the Study of Public Policy* (3rd Ed.) (Monterey, CA: Brooks/Cole Publishing Company).
- Kaufman, H., 1960. *The Forest Ranger: A Study in Administrative Behavior* (Baltimore: Johns Hopkins University Press).
- Krutilla, J. V. & Haigh, J.A., 1978. An Integrated Approach to National Forest Management. *Environmental Law*, 8(2), 373–416.
- Le Master, D. C., 1984. *Decade of Change: The Remaking of Forest Service Statutory Authority During the 1970s* (Westport, CT: Greenwood Press).
- Lowi, T., 1992. The State of Political Science: How We Become what We Study. *American Political Science Review*, 86(1), 1–7.
- Manthy, R. S., 1970. *An Investment Guide for Cooperative Forest Management in Pennsylvania*. (Research Paper NE-156) (Upper Darby, PA: USDA Forest Service, Northeastern Forest Experiment Station).
- Merriam, C., 1925. *New Aspects of Politics*. (Chicago: University of Chicago Press).
- Mills, T., 1976. *Cost Effectiveness of the 1974 Forestry Incentives Program (FIP)*. (Research Paper RM-175) (Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station).
- Mohai, P. 1987. Rational decision-making in the planning process: some empirical evidence from RARE II. *Environmental Law*, 17(3), 507–556.
- Muench, Jr., J., 1984. Introductory Remarks. In *Proceedings of a Workshop on Forest Policy Education*, edited by R.A. Sedjo (Discussion paper D-117) (Washington, D.C.: Resources for the Future), pp. 3–4.
- National Research Council., 1990. *Forestry Research: A Mandate for Change* (Washington, D.C.: National Academy Press).
- Newman, D. H., 1990. Shifting Southern Softwood Stumpage Supply: Implications for Welfare Estimation from Technical Change. *Forest Science*, 36(3), 705–718.
- O'Toole, R., 1988. *Reforming the Forest Service* (Washington D.C.: Island Press).

- Pinchot, G., 1947. *Breaking New Ground* (New York: Harcourt, Brace).
- Reich, C. A., 1962. *Bureaucracy and the Forests* (Santa Barbara, CA: Center for the Study of Democratic Institutions).
- Ripley, R., 1991. Political Science, Policy Studies, and Practitioners: The Possibilities of Partnerships. *Policy Currents*, 1(3), 1–3.
- Risbrudt, C. D., Kaiser, H. F. & Ellefson, P. V., 1983. Cost-effectiveness of the 1979 Forestry Incentives Program. *Journal of Forestry*, 81(5), 298–301.
- Salazar, D. J. & Barton, A., 1988. Measuring the Value of Technical Forestry Assistance: The Washington Case. (Mimeo) University of Washington College of Forest Resources, Seattle, WA.
- Schiff, A. L. 1962. *Fire and Water: Scientific Heresy in the Forest Service* (Cambridge, MA: Harvard University Press).
- Seidelman, R. & Harpham, E. J., 1985. *Disenchanted Realists: Political Science and the American Crisis, 1884–1984* (Albany, NY: SUNY Press).
- Sendak, P. E., 1988. Teaching Forest Economics and Policy: Status and Literature. *Journal of Forestry*, 86(9), 23–29.
- Shannon, M. A., 1991. Is American Society Organized to Sustain its Forest Ecosystems? In *Proceedings of the 1991 SAF National Convention*, (Bethesda, MD: Society of American Foresters), pp 34–44.
- Society of American Foresters., 1919a. Forest Devastation: A National Danger and a Plan to Meet it. *Journal of Forestry*, 17(8), 911–945.
- Society of American Foresters. 1919b. An Answer to Dr. Compton's Fourteen Points. *Journal of Forestry*, 17(8), 946–964.
- Somit, A. & Tanenhaus, J., 1967. *The Development of Political Science* (Boston: Allyn and Bacon).
- Twight, B. W. & Lyden, F.J., 1988. Multiple Use vs. Organizational Commitment. *Forest Science*, 34(2), 474–486.
- U.S. Congress, Joint Committee on Forestry., 1941. *Forest Lands of the United States* (S. Doc. 32, 77th Cong., 1st session) (Washington D.C.: U.S. Government Printing Office).
- U.S. Department of Agriculture., 1933. *A National Plan for American Forestry* (Copeland Report). 2 vol., (S. Doc 12, 73rd Cong., 1st session) (Washington D.C.: U.S. Government Printing Office).
- USDA Forest Service., 1990. *Synthesis of the Critique of Land Management Planning* (Volume 1. FS-452). (Washington D.C.: USDA Forest Service Policy Analysis Staff).

- USDA Forest Service., 1992. *Assessment of Forestry Research: A Mandate for Change* (Mimeo) (Washington D.C.: USDA Forest Service Research).
- Waldo, D., 1968. Public Administration. *The Journal of Politics*, 30(2),443–479.
- Wallace, M. G., Cortner, H. J. & Burke, S., 1995. Review of policy evaluation in natural resources. *Society and Natural Resources*, 8, 35–47.
- Westgate, R. A., 1986. The Economics of Containerized Forest Tree Seedling Research in the United States. *Canadian Journal of Forest Research*, 16, 1007–1012.
- Wilson, W., 1887. *Mere Literature and Other Essays* (Boston: Houghton and Mifflin and Company).
- Wondolleck, J. M., 1988. *Public Lands Conflict and Resolution: Managing National Forest Disputes* (New York: Plenum Press).
- Worrell, A. C., 1970. *Principles of Forest Policy* (New York: McGraw-Hill).
- Yaffee, S. L., 1994. *The Wisdom of the Spotted Owl: Policy Lessons for a New Century* (Covelo, CA: Island Press).