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**FEDERALISM AND NATURAL RESOURCE POLICY: COMPARING STATE AND  
NATIONAL MANAGEMENT OF PUBLIC FORESTS**

**Tomas M. Koontz**

Submitted to the faculty of the University Graduate School  
in partial fulfillment of the requirements  
for the degree  
Doctor of Philosophy  
in the Department of Political Science  
and the School of Public and Environmental Affairs  
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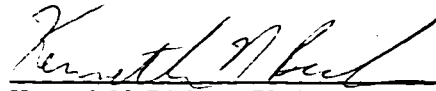
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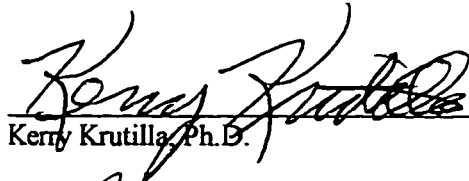


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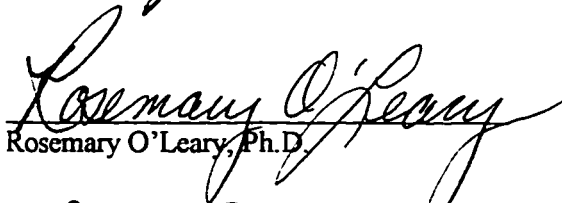


Kenneth N. Bickers, Ph.D.

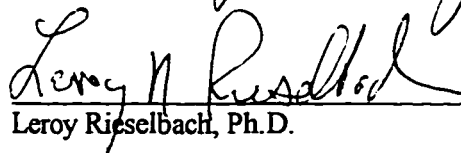
Doctoral Committee



Kerry Krutilla, Ph.D.



Rosemary O'Leary, Ph.D.



Leroy Rieselbach, Ph.D.

Dated: 4/10/97

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for Amelia

## Preface

Indiana University at Bloomington is blessed with an enviable location. With abundant forested hills nearby, the campus is well-situated within a state otherwise known for its flat farmland. Coming from the Pacific Northwest, I was happy to enjoy these forests. Indiana University also is blessed with the Workshop in Political Theory and Policy Analysis, a home for interdisciplinary work among political scientists, economists, ecologists, sociologists, anthropologists, and others scholars from around the world.

It is through a combination of these two assets that I first became interested in forest policy. I learned that Indiana's forests were owned and managed by a variety of private and public parties, including individuals, corporations, non-profit organizations, and state and national government agencies. At the same time, Elinor Ostrom and others at the Workshop were developing the International Forestry Resources and Institutions (IFRI) research program, examining physical and social factors affecting community organization and forest management around the world. Through my association with IFRI, I became interested in questions about forest policy in our own "back yard," especially in differences between types of public jurisdiction. Thus began my work leading to this manuscript.

There are many people who provided essential help with this dissertation. Elinor Ostrom has provided valuable guidance throughout my graduate work, playing a crucial role in my doctoral journey and intellectual growth at Indiana University. It has been a privilege working closely with her over the past few years. Rosemary O'Leary provided important feedback, particularly at the design stage of this research. In turning my analysis into finished writing, Leroy Rieselbach was a careful and attentive reader whose comments greatly improved the clarity of the final manuscript. I also appreciate help from Ken Bickers and Kerry Krutilla. Useful comments on portions of this work were provided by Yu-che Chen, Charlie Schweik,

and Paul Turner, as well as colleagues at meetings of the Western Political Science Association and the Midwest Political Science Association.

In the course of gathering data, I called on the generosity of family and friends while conducting field work across four states. In Ohio, I am especially thankful to Steve Davis; in Washington I enjoyed the generosity of Gael Koontz, Nathan and Andrea Harrison, and Eric and Kirsten Barkman; in Oregon I enjoyed an extended stay with Linda and Tom Davis and the hospitality of Chuck and Florida Lund. I also benefited from the generosity of Fred Thompson at Willamette University's Atkinson Graduate School of Management.

I would not have gained such extensive information for this study without the cooperation of the nearly one hundred forest agency officials who took the time to answer many questions and provide numerous documents. These public servants were always helpful and accommodating in discussing a wide range of topics. I also gained important insights from conversations with over five dozen non-agency participants, who spoke openly about their experiences and views.

I appreciate the financial assistance provided by the Workshop in Political Theory and Policy Analysis at Indiana University, National Science Foundation Grant SBR 9521918, Indiana University Graduate School, and the Center for the Study of Institutions, Population, and Environmental Change at Indiana University.

As important as our academic pursuits are, we students of public policy also know that there are things even more important. As I neared completion, after two years, of this dissertation, I was easily upstaged by the birth of our first child, Amelia, on March 31 (less than two weeks before my dissertation defense). This personal milestone is an appropriate reminder of the importance of those who enrich our lives outside of academia. I am thankful for the love and support my wife Kristin has given me, which has made completing doctoral work all the more meaningful.

**Federalism and Natural Resource Policy:  
Comparing State and National Management of Public Forests**

Tomas M. Koontz

Abstract

In the U.S. federal system, public policy responsibilities are placed in multiple government jurisdictions. The question of differences in jurisdictions for various government activities is a fundamental issue. Unfortunately, despite the importance of this question about how to best sort out Federal and state responsibilities, little systematic research has been undertaken to describe and compare policy making across these two levels.

To more fully understand differences between U.S. state and Federal policy, this study compares state and national policy in the context of one policy area, management of public forests. Policy processes and outcomes are examined. A substantial literature presently exists on several related subjects, including higher versus lower levels of government responsibility, factors influencing policy processes, and outcomes. But little systematic work has examined the question, To what extent do state and national public forest policy processes differ, and what effect do these differences have on policy outcomes? Addressing this question provides valuable insights into the importance of governance arrangements to forest policy. It also contributes to federalism and natural resource policy theory more generally.

Data for this study come from four cases across two different regions of the United States. Each case consists of two public forests with similar physical characteristics but different governmental jurisdictions (state versus national), to emphasize the effects of human actions on policy processes and outcomes. For each of the eight forests, data gathering and

analysis involves several techniques, including interviews, observations, and analyses of written documents. A number of precautions are taken to enhance the validity, dependability, and objectivity of the findings.

Policy analysis is undertaken within the Institutional Analysis and Development (IAD) framework. This framework focuses the researcher's attention on the interaction of actors in action situations pertaining to forest management decisions and activities. To understand policy processes, data are collected regarding policy participants' values, attributes of the organizational community in which they work, rules that shape their incentives and constraints, and interactions with those outside of the organization. To understand outcomes, data are collected regarding both fiscal outcomes and forest uses; the former include timber sale profitability, use fee collection, and transfer payments to local governments, while the latter focus on investigation of commodity provision, recreational facilities, and environmental protection.

Analysis suggests important differences between national and state policy processes and outcomes. While national and state officials share similar values and beliefs, the former face greater statutory, regulatory, and planning constraints affecting their activities than do state policy makers. These constraints require more public input and higher levels of environmental protection. Patterns of interaction also differ; those favoring forest preservation for ecological and amenity values communicate more with national than state officials, while those favoring the use of forests for commodity production communicate more with state than national officials. Outcomes reflect these differences. State officials provide more timber, at higher net profit, than do national officials, and they transfer more revenue to local governments. But national officials devote a higher level of resources to provide recreational benefits, and they undertake greater efforts to provide non-timber environmental benefits than do state officials.

## Contents

### CHAPTER 1 INTRODUCTION

- Analytical Framework and Research Questions
- Contributions of the Study
- Existing Knowledge Relevant to the Research Questions
  - Levels of Government Responsibility
    - Normative Debates about Levels of Government
    - Positive Descriptions of Differences between Levels of Government
      - Public Lands and Environmental Policies
  - Factors Influencing Forest Policy Processes
    - Forest Agency Officials' Values and Preferences
    - Forest Agency Officials' Incentives and Constraints
    - Interactions with Non-agency Participants
      - Commodity Interests
      - Preservation Interests
      - Recreation Interests
    - Combining Values, Incentives and Constraints, and Interactions
  - Policy Outcomes
    - Fiscal
    - Forest Uses and Environmental Protection
- Conclusion

### CHAPTER 2 RESEARCH DESIGN

- Hypotheses
  - Policy Processes
    - Agency Officials' Values and Communities
    - Agency Officials' Incentives
    - Agency Officials' Constraints
    - Interactions with Non-agency Participants
  - Policy Outcomes
    - Fiscal
    - Forest Uses
- Instrumentation and Operationalization of Data Elements
  - Policy Processes
    - Agency Officials' Values and Preferences (Hypothesis 1)
    - Attributes of the Community (Hypothesis 2)
    - Agency Officials' Incentives and Constraints (Hypotheses 3-6)
    - Interactions with Non-agency Participants (Hypotheses 7 and 8)
  - Policy Outcomes
    - Fiscal (Hypotheses 9-11)
    - Forest Uses (Hypothesis 12)
    - Environmental Protection (Hypothesis 13)



Addressing Threats to Validity

Data Sources

Sampling Plan

Variation among Pairs

Control for Physical Variables within Pairs

Case 1: Ohio State Forests and Wayne National Forest

Case 2: Indiana State Forests and Hoosier National Forest

Case 3: Washington State Forests and Gifford Pinchot National Forest

Case 4: Oregon State Forests and Siuslaw National Forest

Conclusion

### CHAPTER 3 AGENCY OFFICIALS AND THEIR COMMUNITIES

Agency Officials

Educational Background and Work Experience

Affiliations with Other Organizations

Stated Values and Preferences

Summary of Officials' Values and Preferences

Agency Communities

Mission and Goals Statements

Range of Job Positions Included in the Agencies

Conclusion

### CHAPTER 4 BUDGETARY AND PERFORMANCE EVALUATION INCENTIVES

Budgetary Incentives

Perceived Importance of Budgetary Resources

Acquiring Budgetary Resources

Appropriations

User Payments

Non-timber Use Fees

Timber Sales

Summary of Revenue Incentives

Officials' Performance Evaluations

Conclusion

### CHAPTER 5 STATUTORY AND PLANNING DOCUMENT CONSTRAINTS

Statutory and Regulatory Constraints

Planning Process Requirements

Constraints on Forest Activities on the Ground

Mandates

Specific Management Activities

Anticipated Statutes

Summary of Statutory and Regulatory Constraints

Planning Document Contents

- Timber Stand Improvement
- Leave Trees
- Riparian Areas
- Regeneration Harvesting
- Land Use Zones
- Summary of Planning Document Constraints
- Conclusion

## CHAPTER 6 INTERACTIONS WITH NON-AGENCY PARTICIPANTS

- Extent and Diversity of Public Input
  - Officials' Efforts to Encourage Public Participation
    - Mailings
    - Public Meetings
    - Working Groups
    - Other Efforts
  - Officials' Stated Reasons for Engaging in Public Communications
  - Actual Communication Levels
    - Officials' Perceptions
    - Non-agency Participants' Perceptions
- Influence of Non-agency Participants
  - Officials' Perceptions of Influence through Communications with Non-agency Participants
  - Officials' Perceptions of Influence through Multiple Channels
  - Non-agency Participants' Perceptions of Influence
- Explaining Differences in Participation and Influence
- Conclusion

## CHAPTER 7 LINKING POLICY PROCESSES TO OUTCOMES

- Influential Policy Factors
- Fiscal Outcomes
  - Profitability of Timber Sales
  - Use Fee Collection
  - Transfer Payments to Local Governments
- Conclusion

## CHAPTER 8 FOREST USES

- Commodities
  - Oil, Gas and Minerals
  - Timber
- Recreational Uses
  - Officials' Perceptions of Agency Policies
  - Recreation Expenditures
  - Physical Outputs
    - Hunting

Developed Camping  
Hiking  
Horse Riding  
Off-Road Vehicle Riding  
Summary of Recreational Uses  
Conclusion

## CHAPTER 9 ENVIRONMENTAL PROTECTION

Ecosystem Management  
Large, Connected Patches  
Rare Species Identification and Protection  
Ecosystem Research and Monitoring  
Soil and Watershed Protection and Improvement  
Conclusion

## CHAPTER 10 CONCLUSION

Summary of Findings  
Policy Implications for Natural Resource Management  
Broader Implications for Federalism

## Chapter 1: Introduction

On March 15, 1996, Charles Oliver, a U.S. Forest Service (USFS) employee, was literally beaten and thrown out of a ranchers' meeting in eastern Arizona. After refusing to leave the meeting, held in a public school, Oliver was "attacked, hit on the back of the head and neck, kicked, pulled by the ear, wrenched by the shoulder, and finally, picked up and thrown into the schoolyard" (Yozwiak 1996). Oliver subsequently named three ranchers in a federal lawsuit. One of the alleged attackers, 65-year-old rancher John Joy, said that Federal government restrictions were forcing ranchers and loggers out of the public forests in the region.

Joy was not alone in his displeasure with Federal land management. County officials in nearby Nye County, Nevada, passed a resolution declaring that Federal lands in the county belong to the state of Nevada (US Newswire 1996). In attempting to assert this resolution, County Commissioner Dick Carver drove a county bulldozer past an armed USFS agent and onto the Toiyabe National Forest, as a crowd of 200 people – many of them armed – cheered him on (Larson 1995). Carver's action led to litigation as well as a spot on the cover of *Time* magazine, as a symbol for increasing hostility over Federal land ownership in the West. Such hostility is evident in the pipe bombs found in New Mexico's Gila Wilderness, gunshots fired at a Forest Service biologist in California, and a bomb that destroyed a USFS ranger's van parked in his Nevada driveway (Larson 1995).

In the legal arena, activists recently circulated petitions to urge Idaho Governor Phil Batt to declare state ownership of the over thirty-three million acres of Federal land in the state (Rauber 1995). In Oregon, Representative Jim Bunn proposed a bill in Congress calling for the transfer of two and a half million acres of timber-rich Federal land to the state, a move supported by counties in which the land is located (Register-Guard 1996). Similarly, Utah Representative Jim Hansen called for a bill to transfer control of certain Federal land to the state (Rauber 1995). More recently, Senator Larry Craig of Idaho, who chairs the Senate

Republican Policy Committee, vowed to introduce a new National Forest Management Act that would allow the USFS to contract out forest management to state governments (Margolis 1997).

Of course, conflict over the role of the Federal government is not a new phenomenon. The question of appropriate jurisdictions for various government activities is a fundamental issue in American politics. Periodically, much debate centers on initiatives to transfer a variety of social programs from the national to the local or state level. For example, Richard Nixon's "New Federalism" aimed to provide local government with more freedom to carry out programs. In his first term, Ronald Reagan pursued consolidations of block grants to transfer authority (and less funding) to the states. He also proposed turning over two welfare programs, Aid to Families with Dependent Children (AFDC) and food stamps, to the states. More recently, the 104th Congress generated proposals to devolve a number of national social programs to the state level, and the welfare reform bill that President Clinton signed into law in 1996 granted increased responsibility and authority to state governments. During these debates over the appropriate levels of government responsibility, proponents of state primacy claim that states would provide more effective and efficient administration, while opponents counter that this would thwart achievement of certain policy goals.

In the realm of natural resource policy, debates often focus on questions of private versus public control. For example, the "Sagebrush Rebellion" in the late 1970s and early 1980s spawned calls for the wholesale privatization of national lands in the West. In 1982 Secretary of the Interior James Watt fueled controversy with a plan to sell thirty-five million acres of national land to private owners. Scholars have joined the privatization debate, examining positive and normative questions about public versus private control of natural resources. John Baden and Richard Stroup (1981), for example, have long championed the "new resource economics" school of thought, suggesting that privatization is economically and environmentally superior to public control. On the other hand, Kai Lee (1993) and others

emphasize the importance of public management to provide better stewardship for natural resources.

A neglected area within natural resource policy inquiry, however, is intergovernmental differences. In addition to comparing private to public management, we must delve more deeply within public management to build knowledge about policy across different government jurisdictions. That is, for those natural resource decisions made in the public arena, what processes and outcomes are likely to occur at different levels of government?

Amid proposals to centralize or devolve authority for various programs to higher or lower levels of government, it is important to develop a systematic, thorough understanding of differences that may exist between levels. Though the focus of this study is on one type of natural resource policy, the results should provide useful insights into intergovernmental differences in other policy areas, as well as into natural resource policy theory more generally. Wherever valuable resource use is determined in the public arena, questions about how different jurisdictions create and implement policy, and the resulting outcomes, will continue to be important. We can learn much about policy in a federal system through careful examination of a policy area in which both higher and lower level jurisdictions have responsibility.

The natural resource examined in this study is forests. Specifically, this research focuses on management of state and national forests in two different regions of the United States, the Midwest and the Northwest. Within each of these regions, comparisons between pairs of public forests located near each other, sharing similar physical characteristics but with differences in governmental jurisdiction (one state, the other national), allow empirical investigation of important policy questions.

This study focuses on the role of agency decision makers in forest management policy. Although the role of elected representatives is not trivial, to understand how policy is made, and its impacts, it is crucial to investigate policy on the ground, including the impacts of legislation on policy. This emphasis reflects the recognition that forest policy, indeed any kind of public policy, is more than the enactment of laws by legislatures; agency officials are

important policy makers as they implement, interpret, and "fill in the details" of broader legislative directives. Furthermore, this emphasis recognizes that agency policies change more frequently than do laws. For example, some of the key Federal laws that continue to guide forest management are the Multiple-Use Sustained Yield Act of 1960 and the National Forest Management Act of 1976, whereas the U.S. Forest Service (USFS) develops forest plans every ten years, prepares budgets annually, and establishes regulations even more frequently. Similarly, some state forest mandates have remained virtually unchanged for decades, while state agency policies change more often. Thus a focus on agency policy illuminates causes and effects of policy changes in finer resolution than would a focus on legislation.

The analytical framework for this study comes from a natural resource model that includes two key components: (1) physical characteristics of the resource or ecosystem and (2) patterns of human use and management (Blaikie and Brookfield 1991; Ostrom et al., 1994: 37).<sup>1</sup> The first component is controlled through careful case selection of forests located in the same geographic region. This study investigates the second component through examination of policy processes, which involve patterns of human use and management of resources.

### Analytical Framework and Research Questions

The goal of this research is to provide a thorough, systematic comparison of national and state level public forest policies. The Institutional Analysis and Development (IAD) framework guides analysis of the central research question:

*To what extent do state and national public forest policy processes differ, and what effect do these differences have on policy outcomes ?*

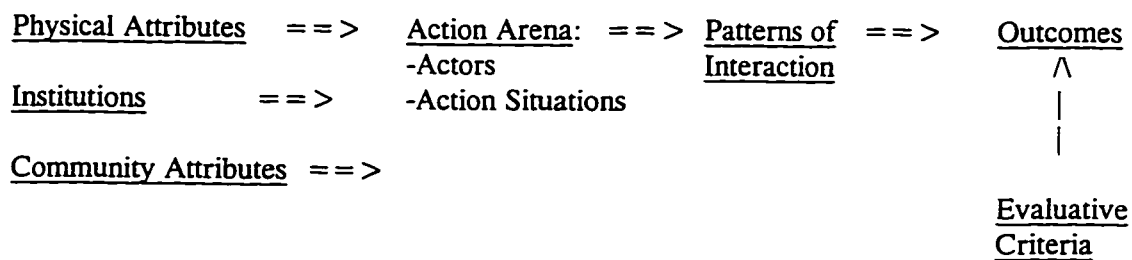
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<sup>1</sup> Ostrom et al. (1993) further distinguish between attributes of the community and rules-in-use.

The IAD framework, developed by Ostrom and colleagues (Ostrom et al. 1994), directs the analyst's attention to attributes of the physical world, institutions (rules), and attributes of the community within which individuals act, which affect actors in action situations. Patterns of interaction among actors in action situations lead to outcomes. Figure 1 illustrates these components.

Figure 1

The IAD Framework (from Ostrom et al. 1994)



Attributes of the physical world include such elements as subtractability of resource flows (i.e., whether one person's use makes the resource unit unavailable for another person) and ease of exclusion from benefits. The nature of forest ecosystems is such that a diverse array of potential benefits exist, ranging from soil protection and wildlife habitat to climate stabilization and timber. Important physical characteristics affecting the potential for these benefits include topography, soil, and climate. Controlling for these physical characteristics highlights the effects of institutions and community attributes on decision makers and policies.

Institutions and community attributes are human artifacts. Institutions define which actions are required, prohibited, or permitted and the sanctions prescribed for transgressions (Ostrom et al. 1994, p. 38). Institutions for forest management differ between the national and state level; procedures for decision making and activities are not the same in national forests as they are in state forests. Community attributes include common understanding, norms of behavior, homogeneity of preferences, and distributions of resources among members (ibid, p.



45). While nearby national and state forests share the community of a particular region of the United States, each forest agency has its own organizational culture. Thus it is important to examine community attributes, to gain a better understanding of the organization within which forest management occurs in each jurisdiction.

Actors in the IAD framework are characterized by their preferences, resources, information processing capabilities, and selection criteria for decision making (ibid, p. 33). In comparing state and national forest management, assumptions about the latter two characteristics do not differ. However, this study includes examination of differences in actors' preferences and resources. It is important to note that this study does not assume strict rational choice, as described by theorists such as Von Neumann and Morgenstern ([1944] 1964). Actors are not assumed to possess complete or perfect information leading them to maximize expected utility through their actions. But it is expected that actors take actions based, in part, on perceptions of external factors, such as community attributes and institutional arrangements. For example, budgetary resources are important for public servants because they enable bureaucrats to increase perquisites, reputation, power, and ease of managing their responsibilities (Niskanen 1971) as well as to provide personnel, equipment, and services necessary to accomplish what they perceive to be their mission (Arnold 1979). Also, employees who remain in an organization for any length of time are expected to value their membership and thus will attempt to act according to organizational norms. In addition to such external factors, it is assumed that actors take actions based, in part, on internal factors such as their own preferences and values.

Action situations are comprised of sets of participants who decide, based on information available to them, among alternative actions that are linked to outcomes (Ostrom et al. 1994, p. 29). This study focuses on action situations involving forest officials' decisions and activities about how to manage the forest. In comparing national to state forest management, important differences include who the participants are, what positions they take,

and what information is available to them. Of particular interest is the level of outside involvement by various interested parties attempting to influence bureaucratic decision making.

Action situations in policy processes apply to both formation and implementation. Policy formation involves decision makers who set goals, create plans and enforceable rules to reach those goals, and select means to implement these plans and rules (Rosenbaum 1991, p. 69; Ostrom and Kiser 1982, p. 208). Forest policy formation includes agency officials' activities that lead to regulations, forest management plans, budget priorities, target levels of forest uses, and policy statements.

Implementation involves the translation of formulated laws, rules, and plans into day-to-day decisions and activities. At this operational level, an action in the physical world flows directly from a decision (Ostrom and Kiser 1982, p. 209). For forest policy, this component involves activities such as harvesting products, monitoring users, enforcing rules, planting trees, conducting research, building trails, maintaining campsites, and protecting species. The following questions guide investigation of action arenas in policy processes:

*Which individuals are influential in forming and implementing forest policies? What are their preferences, the attributes of the community in which they work, the rules shaping the incentives and constraints they face, and their interactions with others?*

Actions taken in policy formation and implementation are linked to policy outcomes. These outcomes include fiscal items such as profitability of operations, use fees collected, and monetary transfers to local communities. Outcomes also include forest uses promoted, such as commodity, recreation, and environmental protection. The guiding questions for describing outcomes are as follows:

*What are the agencies' revenues and expenses for various activities, and how much funding do they transfer to local communities? What forest uses are promoted or discouraged?*

### Contributions of the Study

A number of scholars have suggested the need for greater understanding of human-environment interactions. For example, Lee (1993, p. 8) states that, to achieve a sustainable future, "we need to understand far better the relationship between humans and nature." With regard to forest policy in particular, Salwasser et al. (1993, p. 61) state, "The subject of human-forest relationships is ripe for further research and education." They also suggest a need for "accurate and timely information on conditions of forest ecosystems and the estimated consequences of policy choices." In discussing sustainability of natural resource management, Souder and Fairfax (1996, p. 297) write, "The institutional aspects of sustainability [on public lands] are as important as the definitional ones. . . This area is ripe for further analysis."

Policies regarding forests, natural resources more generally, or any other area may be made at higher or lower levels. In the context of federalism in the United States, which features significant interconnections among levels, scholarship has emphasized the success (or lack thereof) of higher levels of government in encouraging lower levels to carry out certain policies. Implementation literature often addresses the failure of national policies as they are translated to state and local levels (see, for example, Pressman and Wildavsky 1984, Derthick 1971). With this focus on lower level implementation of higher level policies, relatively little work has compared public policy formation and implementation across levels of government.

Given the lack of rigorous research on the subject of differences between state and national public forest policy, this study makes a significant contribution to our knowledge. Through systematic comparison across several cases, this research provides empirical findings that will foster greater understanding of natural resource policy processes and outcomes in the United States. Moreover, through careful examination of one policy area within a specified theoretical framework, this research aims to provide insight into the broader question about differences inherent in different levels of governance in a federal system. This broader

question is applicable not only to forest or natural resource policy, but to other policy areas as well.

### Existing Knowledge Relevant to the Research Questions

Questions about differences in forest policy processes and outcomes between the state and national level are related to a number of research traditions. Areas of particular relevance for this study include scholarship relating to (1) higher versus lower levels of government responsibility, (2) factors influencing forest policy processes, and (3) forest policy outcomes. While much is known about these important areas, scant rigorous, empirical research has been performed to compare state with national natural resource policy. This study addresses this important area of scholarship.

### Levels of Government Responsibility

#### *Normative Debates about Levels of Government*

The question of whether different governmental levels are associated with fundamentally different natural resource policy processes and outcomes has been largely neglected. Of course, scholars have devoted ample ink to the study of higher versus lower levels of government activity, but such studies have not generally included a close examination of natural resource policy. Instead, they have focused on other governmental functions, such as taxation, wealth redistribution, economic stabilization, and public service provision. Normative arguments have been made about the proper role of national versus lower-level government.

Some scholars stress the benefits of policy making by lower-level governments in a federal system. For example, Vincent Ostrom (1987) argues that the existence of a diverse

array of local governments promotes citizen involvement in self-governance, where individuals are less likely to fall into the "central government trap" of waiting for distant officials to solve problems for them. Ostrom, Otrosen (1992), and others have argued that lower levels of government are expected to be more responsive to local citizens and better suited to know local needs and preferences. These arguments reflect Tiebout's classic (1956) model, which suggests that lower levels of government should provide most public services, because citizens can "vote with their feet" by moving to the jurisdiction that provides their preferred mix of services and taxes. Ostrom, Tiebout, and Warren (1961) argue that an important benefit of local control over service provision in a federal system is that citizens are better able to compare costs with neighboring jurisdictions and demand more efficient government. Nelson (1995, p. 241) claims that devolution of responsibility to lower levels leads to better alignment of policy benefits with costs, a step closer to economic efficiency than is possible with higher-level policies.

Other scholars have supported a broader role for national government. For example, Sundquist (1969) calls for greater authority at the national level, with Federal bureaucrats providing guidance to manage intergovernmental relations and make federalism work. Anton (1989) argues that the Federal government should take responsibility for activities such as stabilizing the economy, accounting for externalities, and enhancing equity. Oates (1991), Derthick (1971), and others suggest that the national level is the most appropriate arena for the pursuit of equity through redistribution, because at lower levels wealthier individuals might easily emigrate to protect their wealth from being redistributed.

Normative implications of the level-of-government debate for natural resource policy are not clear. If we are to base our notions of what constitutes the proper government level on issues of equity, economies of scale, or externalities, as some suggest, then where do natural resources fit? Should a goal of natural resource management be the redistribution of wealth? (Krutilla and Haigh (1978) argue that it should not.) Do economies of scale exist for certain natural resource activities? Are externalities of natural resources sufficient to warrant control

by a higher level of government? To address such questions, we must closely examine natural resource policy at different levels of government. Thorough descriptive and explanatory work is needed before normative arguments can be persuasive.

### *Positive Descriptions of Differences between Levels of Government*

In addition to normative arguments, a number of scholars have pursued positive research, seeking to describe the functions that different government levels perform in practice. Peterson (1995) suggests two distinct policy types, developmental and redistributive. In Peterson's functional model, lower levels of government favor developmental policies over redistributive ones, because these jurisdictions focus on economic goals. Developmental policies, by definition, enhance the economic position of the government by generating net benefits, in the form of business and employee taxes. Redistributive policies, on the other hand, encourage wealthier individuals and firms, who seek to avoid having their wealth redistributed, to move away, which hurts the local tax base. Therefore there is little support for redistributive policies at lower levels of government, and elected officials unduly pursuing such policies are defeated at the polls.<sup>2</sup> Peterson et al. (1986) support this argument with empirical evidence, concluding that, in cases of national programs implemented at the local level, cities are more willing to pursue policies that help them fiscally. Similarly, in a study of local housing expenditures from city and national funds, Goetz (1995) finds that national funds are targeted to tenant assistance for low income households, while city funds are targeted to middle-income households seeking home buying assistance.

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<sup>2</sup> While Peterson originally (1981) focused on cities, his arguments can be applied to states, to the extent that migration is a viable option between states. For example, Greer (1979) and Orren (1974) argue that firms may use the threat of relocation to avoid state policies that would cost the firms significant amounts of money. Peterson subsequently (1995) argues that states occupy an intermediate position between the national and local governments with respect to the propensity to pursue developmental policies.

Peterson's scheme suggests that lower levels of government focus more intently on economic development than do higher levels of government. If this proposition holds, then we may expect that, compared with national forest policy, state forest policy more strongly favors forest management for economic development. This includes attempting to attract development-oriented industry, especially timber, through less restrictive regulation.

While lower levels of government are depicted as focusing on economic development, they also are expected to emphasize fiscal equivalence rather than redistribution. Fiscal equivalence refers to fee collection so that individuals pay according to their direct benefits from a service rather than according to their ability to pay. Peterson (1981) argues that the Federal government promotes redistribution through a progressive income tax, while local governments prefer to pursue policies that charge users based on their benefits received, for example sales tax and use fees. Likewise, Stein (1990) describes lower levels of government (cities) as choosing service modes that minimize fiscal nonequivalence. Based on these arguments, it is expected that, compared to national forest policy, state forest policy is more likely to favor revenue from direct beneficiaries of the forest, e.g., through use fees and other specific revenue tools, rather than funding from general government coffers.

### **Public Lands and Environmental Policies**

A number of scholars have argued that environmental and public lands policies differ substantively between state and national levels. Most argue that lower levels of government are more likely to encourage industrial activities that favor economic development over environmental protection. For example, Moe (1989) argues that, in the face of interjurisdictional competition for industry, lower-level governments set less stringent environmental standards than does the Federal government. Rowland and Marz (1982) also have argued that states have little incentive to create stricter environmental protection standards because these would put them at a disadvantage in attracting industry. Similarly, Lowry

(1992), in examining environmental policy across states, finds that states competing with each other for mobile capital are not likely to increase stationary source pollution control standards. Following this logic, compared with national forest policy, we would expect to find state policy exhibiting fewer restrictions on economic development of forests. In fact, the U.S. General Accounting Office reported that, in two states examined, state forest agencies face fewer process constraints affecting timber sales and, as a consequence, they sell more timber volume per acre, at higher net profit, than does the national forest agency (1996).

The Sagebrush Rebellion in the late 1970s and early 1980s provides an instructive example of perceived differences in state- and national-level public lands policy. Western ranchers, timber producers, and others favoring commodity uses from public lands called for privatization and devolution of Federal lands to the states. Proponents of devolution believed that state control would result in policies that provided fewer environmental regulations and greater commodity development (Short 1989). Many opponents of the Rebellion shared a similar belief. For example, the Public Lands Institute argued that state land policy emphasized commodity production while ignoring wildlife and conservation concerns (*ibid*, p. 29).

Comparison of state with Federal public lands management is complicated by the fact that the state land management agency in over a dozen states is legally mandated to act as trustee, managing lands for the monetary benefit of designated trustees (usually schools) rather than the citizens at large. In Souder and Fairfax's seminal work on state trust lands, the authors describe an overriding focus on economic development to generate income in the eleven states where state forest lands are managed in trust by the state forest agency (1996, p. 151). However, many more states do not have such a trust mandate, and little empirical evidence exists regarding the degree to which these non-trust states focus on economic development.

Despite a perceived state emphasis on development for economic returns, some researchers argue that state agencies protect natural resources and environmental quality better than do national agencies. Leal (1993) cites an environmental study showing that, in Montana,



the state agency more effectively protected land from adverse impacts of timber harvesting than did the national agency. Souder and Fairfax (1996) argue that states with a trust mandate successfully protect forest resources in order to meet their requirement to manage the productive capacity of the land in perpetuity. Van Horn (1989) claims that, in the 1980s, states initiated more policy experiments in a number of areas, including environmental protection, than did the Federal government. Similarly, Kritz (1989) argues that, as President Reagan led the charge to cut Federal environmental regulation, states exceeded the Federal government in many policies aimed at environmental protection.

In considering policies to transfer land between jurisdictions, Hyde (1983) argues that a wholesale devolution of Federal land to state or private owners would not be in the economic best interests of any party. He suggests that many Federal lands are commercially unproductive, because historically the best lands have been privatized. Furthermore, economic development interests currently enjoy subsidized resource costs on Federal lands, and states benefit from transfer payments (PILT, or Payments in Lieu of Taxes) based on Federal ownership of land within their borders. In a subsequent article, Hyde and Chamberlain (1995) estimate that the net outflow from the USFS to states was over \$1 million in fiscal year 1994.

Hyde and Chamberlain's analysis is based on expenditures and revenues of Federal lands, with no attention given to management of existing state lands. Nevertheless, they assume that "there is no a priori reason to believe that state management would be more efficient than federal" (1995, p. 23). Instead of assuming the same efficiency, it is important to compare costs involved in national and state forest management in a rigorous manner. This study provides such a comparison.

Other scholars have argued that states, not the national government, should manage recreational benefits on public lands. For example, Nelson (1995, p. 217) claims that the perceived state emphasis on commodity interests rather than recreation reflects physical attributes -- state lands are more scattered and fragmented than national lands. He believes that if lands were to be transferred from Federal to state agencies, then new political pressures

would be created to favor recreation. Nelson's argument can be evaluated only after careful examination of state and national forest policies.

### Factors Influencing Forest Policy Processes

In addition to work addressing higher versus lower levels of government policy, a second major strand of research relevant to this study is the literature focusing on bureaucratic decision making in forest agencies, particularly the USFS. Attempts to explain public forest policy processes in the United States have emphasized three primary factors as shaping bureaucratic decisions: (1) agency officials' values and preferences, (2) incentives and constraints they face, and (3) interactions with non-agency participants seeking influence. This study examines the importance of these three factors in influencing policy processes at both the national and state level.

#### *Forest Agency Officials' Values and Preferences*

"Values are central to understanding people and their relationships to their environments and equally important to understanding organizations such as the U.S. Forest Service" (Cramer et al. 1993, p. 479). Past studies of the values of forest agency officials have focused on Federal personnel, frequently portraying USFS officials as holding narrowly timber-oriented beliefs. Scholars commonly attributed this set of values to organizational culture as well as to individuals' educational background and identification with local communities. For example, Kaufman (1960) described employee recruitment, training, and relocation that encouraged adherence to the agency's dominant paradigm of forest management for commodity production, principally timber. Similarly, Twight and Lyden (1988) and O'Toole (1988) described USFS officials as timber-oriented. More recently, however, studies of USFS employees' values and behavior indicate that they are becoming less narrowly timber-oriented,

siding more often with environmental and recreational interests (Tipple and Wellman 1991, Boyle 1994, Brown and Harris 1992, Cramer et al. 1993).

Analysts have undertaken much less research to understand employees in various state forest agencies, to test the long-standing view that better-educated, more capable individuals interested in public service are attracted to national rather than state government, because of better pay and civil service protection (White 1953, p. 63). More recently, state employees have exhibited increased professionalization and capacity to meet policy challenges (Cigler 1993, Bowman and Kearney 1986, Eisinger 1988). A common disciplinary background (forestry) and professional organizations such as the Society of American Foresters may serve to link individuals across forest agencies at different governmental levels (see Thompson and Scicchitano 1985). Thus state forest officials may model their behavior on that of USFS officials (Souder and Fairfax 1996, p. 245). This study compares state with Federal officials' values and preferences, to test the hypothesis that there is no significant difference between officials at these two levels of governance.

### *Forest Agency Officials' Incentives and Constraints*

In addition to the importance of officials' values, scholars have described the significance of incentives and constraints in shaping behavior. Individuals are assumed to respond to external rewards and sanctions, adjusting their behavior in ways believed to increase the probability of receiving the former and to reduce the likelihood of being subjected to the latter. Incentives and constraints include revenues, employee performance evaluations, statutes and regulations, and planning documents.

The first category of incentives and constraint facing forest agency officials is revenue rules and allocations. A common assumption in administrative behavior literature is that bureaucrats with budgetary discretion seek to maximize their revenues (Niskanen 1971, Johnson 1983). At the national level, the existing USFS funding structure is such that

employees seeking to maximize earned revenues may emphasize timber production over other forest benefits. The Knutsen-Vandenberg Act of 1930 allows local officials to keep most of the gross receipts from timber sales to fund local projects directed toward roads, wildlife, recreation, and watersheds (Budiansky 1991, p. 57). In contrast, most camping fees are remitted to the U.S. Treasury, and wildlife hunting fees accrue to the states, not the USFS. Most other recreational uses are not accompanied by user fees, and, of course, the USFS does not receive revenue for its contribution to species protection or global climate stabilization. Thus agency officials seeking budget augmentation may have an incentive to promote timber production. In addition to the possibility of gaining and retaining revenue through local timber sales, USFS officials receive annual congressional appropriations that may favor timber sales over management for recreation, watershed protection, and other resources (O'Toole 1993, p. 27).

At the state level, less is known about budget incentives that officials face. But functional theories indicating that lower levels of government promote economic development suggest the hypothesis that state budget incentives encourage timber production even more than do Federal budget incentives.

The second type of incentives and constraints facing forest agency officials involves individual performance evaluations. Different organizations encourage different types of employee activity, manifested in relations between supervisors and supervisees. Feedback from one's hierarchical superior can be in the form of informal interactions as well as formal performance reviews. This study includes examination of employees' perceptions of the criteria on which they are evaluated.

The third category of incentives and constraints facing forest agency officials comes from legislation and agency regulations. At the national level, public forest management is subject to National Environmental Policy Act (NEPA) environmental assessment requirements, National Forest Management Act (NFMA) planning mandates, and public participation procedures, among other requirements. Several states have legislation that constrains forest

management, such as requirements to manage forests for the primary purpose of earning financial returns that are earmarked to fund schools. In fact, Peterson (1981) suggests that legal mandates encouraging agencies to emphasize economic development over other goals such as environmental protection are expected at lower levels of government. This study provides a means to investigate more closely the existence and impact of such constraints on forest policy across different jurisdictions. It is expected that Federal agency officials face more constraints than do state agency officials, and that Federal constraints are aimed at promoting activities without substantial, direct economic benefits to a greater degree than are state constraints.

In addition to statutes and regulations, officials in forest agencies that engage in formal planning face another type of constraint: planning documents. The NFMA-required "land and resource management plans" for national forests are subject to formal public participation requirements, involving a wide range of interests. At the state level, in contrast, it is expected that planning is more closed, with less public involvement and fewer resulting constraints on forest officials' activities. It also is expected that planning document requirements promote activities without substantial, direct economic benefits at the national more than the state level.

### *Interactions with Non-agency Participants*

In addition to the importance of agency officials' values and preferences, and the incentives and constraints they face, a third set of variables expected to impact forest policy processes involves non-agency participants who seek to influence policy. Policy making involves the interaction of participants ("actors," in the IAD framework) in a particular context ("action situation"). A rich history of scholarship suggests that an important policy determinant is who is involved. Hecló (1978) argues that a wider variety of issue specialists are involved in policy making at the national than at lower levels of governance.

Another possible difference in the array of participants at each level can be examined through the concept of participation costs. As Downs (1957) suggests, lowering costs (effort required) to participate may encourage a greater number of participants. Thus the use of "notice and comment" periods, public meetings, mailing lists, and other tools to solicit public input might lead to greater participation in policy making. While these tools frequently have been used at the national level, they may be less prevalent at the state level; Peterson (1981) argues that local government decision-making procedures are less open, which hinders participation by non-business interests. To the extent that national agency officials use such tools more frequently, there should be greater public participation levels in national forest policy processes than at the state level.

A number of scholars have described the link between who participates and the resulting national forest policy statements and outputs. For example, Sabatier et al. (1995) argue that local political pressure is one of the most important determinants of USFS forest plan decisions. Shepherd (1975) claims that, because USFS officials receive input primarily from influential timber, grazing, and mining interests, they favor forest management for commodity uses. Culhane (1981) suggests that the involvement of participants with diverse preferences, including timber production, recreation, and environmental protection, leads the USFS to craft policies that balance development and preservation uses. But Culhane's data are over two decades old, and little information has been collected regarding policy making on state forests. Thus there is a need for close investigation of patterns of forest policy participation that affect policy at both the national and state levels.

A fuller understanding of public participation in forest policy processes can be gained by distinguishing among types of citizens involved. One type of citizen identified as important in forest policy is the "user," whom Ostrom et al. (1994b, p. III.A.5-1) define as "anyone who makes consumptive or non consumptive use of the forest" by physically visiting it. Consumptive users harvest products such as timber, fodder, and firewood, that, when harvested, are unavailable to others (subtractable goods). Nonconsumptive users, on the other

hand, make use of the forest without harvesting, for example bird watching, worshipping, and hiking. The distinction between consumptive and nonconsumptive use is important for understanding whether forest benefits are subtracted when used. The notion of subtractability allows a distinction among classes of goods, for example common-pool resources (non-trivial exclusion of subtractable goods) versus pure public goods (non-trivial exclusion of non-subtractable goods), or private (trivial exclusion of subtractable goods) versus toll goods (trivial exclusion of non-subtractable goods).

However, preferences about forest management do not necessarily fall along consumptive versus nonconsumptive lines. For example, timber harvesting and mushroom gathering are both consumptive uses, but individuals favoring the former prefer cutting trees, while those favoring the latter prefer leaving trees to provide conditions favorable for mushroom growth. Furthermore, forest policy making is affected not only by those who visit the forest, but also by those who do not directly use the forest. For example, many Audubon Society members across the United States who have never visited national forests in the Pacific Northwest have nevertheless effectively pursued their preferences for timber cutting restrictions in this region to protect the northern spotted owl. Thus, in explaining participant efforts to influence forest policy, rather than focusing on consumptive or nonconsumptive users who visit the forest, it is more helpful to focus on which types of forest benefits involve participants with similar preferences. In this study, participants are differentiated according to three types of preferred forest uses: commodity, preservation, and recreation.

### **Commodity Interests**

Commodity users are those who favor active management of forests for the direct economic benefits they can provide. While oil, gas, and minerals may be extracted from under forest land, the most prominent commodity use from a forest is timber. Commodity forest uses

tend to be among the higher impact activities, with a substantial potential to alter forest conditions.

A number of researchers argue that those favoring higher-impact forest uses are more active and influential at lower levels of government. Sabatier (1974), using Schattschneider's "scope of conflict" model<sup>3</sup>, suggests that such interests advocate lower-level government authority, where they will find regulators more attuned to promoting economic development. This preference can be seen in western commodity users' support for the Sagebrush Rebellion in the late 1970s and early 1980s. In addition, Davis (1993, p. 44) argues that higher-impact interests, especially those with large economic incentives to shape policy, exert greater influence at lower levels of government. Ziegler and Dahlen (1976) also describe interest groups representing dominant economic interests as most influential at the state level.

But there also is evidence that commodity interests may be very influential at the national level. According to the "cozy triangle" model of public policy (Parker 1989), executive agencies, congressional committees, and groups seeking economic payoffs tend to adopt mutual noninterference strategies of interaction. The resulting policies favor the groups' preferences over other interests. In the case of national forest policy, the expectation is that timber industry preferences prevail (see, for example, Barney 1974, Shepherd 1975). According to Souder and Fairfax (1996, p. 294), timber purchasers, historically, have dominated national forest management. Moreover, in a dissenting opinion in *Sierra Club v. Morton* (405 U.S. 727 (1972)), Justice Douglas claimed that the USFS was dominated by the timber industry. Thus the question remains as to whether groups favoring timber harvesting on public lands are more influential at the national or the state level.

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<sup>3</sup> Schattschneider (1960) argues that a central political strategy is adjusting the "scope of conflict" to include more or fewer players until the majority of the players favor a powerful player's position. Thus an issue can be interpreted by interested players as national or local, to be decided at a higher or lower level of government.



O'Toole (1993) and others argue that county government participants have a preference for timber production in national forests. This is based on a key financial incentive: counties generally receive Federal payments equal to 25 % of gross timber sales, as partial compensation for the tax-exempt status of these Federal lands (Rice 1989). While counties also receive 25 % of non-timber gross revenues, timber comprises the biggest portion of gross revenues. Therefore local government officials may be motivated to press the USFS for higher timber production.

If such revenue-sharing arrangements do not exist at the state level, then one would expect less active local government pressure for timber production on state forests. However, the portion of the economic base provided by forest development may be an intervening factor in this relationship. For example, a community that doesn't receive revenue-sharing funds from timber production on a state forest may nevertheless press for timber production that can provide many jobs. To address these questions about revenue-sharing, this study includes data regarding incentives for local communities to participate in forest policy making to press for certain forest uses.

### **Preservation Interests**

While the term "preservationist" has been used by opponents as a negative label for those favoring minimization of management activities on forests, the term "preservation interests" is an appropriate descriptor for the preferences of one set of forest interests. Preservation as a forest "use" refers to activities (or lack thereof) directed at protecting the forest community from human activities that have potential to damage the forest. Compared to commodity uses, preservation uses tend to be among the lowest impact activities, with significantly lower potential to alter forest conditions.

A key set of individuals favoring preservation is environmental advocacy groups. The growth in membership and resources of these groups over the past two decades has increased

the potential influence of preservation interests. Such growth has been especially important at the national level. Several studies describe a shift in interest groups to Washington, DC, where they increasingly focus on national policies (see, for example, Walker 1983; Schlozman and Tierney 1983). Membership in the five largest national environmental organizations – National Wildlife Federation, National Audubon Society, Sierra Club, The Nature Conservancy, and The Wilderness Society – more than doubled during the 1980s (Hendee and Pitstick 1994, p. 26).

Besides noting the growing presence of a variety of interest groups at the national level, a number of scholars have suggested that environmental groups are likely to be more active and influential at higher levels of government. Nash (1982) argues that support for natural resource protection is stronger among those living far from the resource than those living near it. Several survey research efforts have supported this attitudinal difference (see Tremblay and Dunlap 1978, Lowe and Pinhey 1982). Similarly, Robinson (1975) indicates that preservation-oriented groups tend to be more successful at higher levels of government. A recent example is the northern spotted owl controversy in the Northwest; it was largely through the work of national environmental interest groups, such as the Audubon Society, that the USFS was forced to halt timber sales in Federal old-growth forest that provided habitat for northern spotted owls.

Peterson (1981) also argues that non-business interest groups are more likely to act at the national level. He argues that this occurs because the more important policy decisions are made at the national level, and because these interest groups realize they are unlikely to succeed at pressuring local governments to adopt policies that may hurt economic development. Hence it is expected that environmental groups more actively participate, and are more influential, in forest policy at the national than state level. Research in this study includes analysis of the efforts of preservation-oriented groups across levels of governance.

## **Recreation Interests**

Recreation users are those people who visit a forest for aesthetic, spiritual, communal, health, or other recreation-related benefits. Their primary interest lies in using the forest for non-economic benefits. They represent a broad array of forest enthusiasts, who may pursue diverse activities such as hiking, camping, hunting, fishing, horse riding, off-road-vehicle riding, berry picking, rock climbing, spelunking, fossil collecting, skiing, snowmobile riding, or swimming. The potential impact of recreation activities on forest conditions varies tremendously, from solitary hikers who "leave no trace and take only pictures," to off-road-vehicle riders who may contribute to noise pollution, soil compaction, and erosion.

As a group, recreation interests are not easily categorized as pro-commodity or pro-preservation. Many forms of recreation require management activities that may disturb the forest community. At the same time, most recreationists prefer that large amounts of commodities are not provided in areas where they like to recreate. Thus this group of interests lies between commodities and preservation. Arguments focusing on forest uses with economic benefits do not fit this group, as economic benefits are not the primary motivator. On the other hand, arguments focusing on minimizing forest disturbance do not necessarily hold with this group either, as some recreational activities require altering forest conditions. To provide a better understanding of recreationist participation in forest policy, this research includes data regarding several types of recreational activities.

### *Combining Values, Incentives and Constraints, and Interactions*

Policy process literature, as described above, includes emphases on officials' values and preferences, the incentives and constraints they face, and interactions with non-agency participants. A number of policy scholars have posited models that stress the importance of these variables for policy analysis. For example, Kingdon (1984) describes policy formulation

as based on three "streams" (policy, problem, and political) that are coupled by an entrepreneur to create policy. Kingdon's work has been applied to the study of state environmental policy by Rabe (1986), who examines environmental permitting innovations in three states. Rabe accounts for innovation success by describing the "policy stream" of ideas about how to improve permitting, the "problem stream" of public opinion about drawbacks with existing permit systems, and the "political stream" of agency officials pushing for change. He describes the importance of agency personnel values favoring fragmented approaches to pollution control (values and preferences), limits to innovation inherent in budgeting processes and political power (incentives and constraints), and public opinion and level of support from other policy actors (interactions). While Rabe's analysis is an insightful application of Kingdon's model to state policy, his analysis does not help us to understand differences across levels of governance.

Clarke and McCool (1985) describe a similar set of variables in examining power differentials among Federal natural resource agencies. The authors explain each of seven agencies' power in terms of variables such as members' profession, leadership, esprit de corps (values and preferences); agency mandate and recruitment (incentives and constraints); and constituency and intragovernmental support (interactions). The analysis provides ample evidence regarding agency power, as defined by budget size and growth, number of employees, and ability to expand into new areas of responsibility. However, the authors do not explain whether the agencies differ in terms of substantive policy outcomes, nor do they compare agencies across levels of governance.

Ringquist (1990) argues for a comprehensive set of variables important for understanding environmental policy. He combines state economic and ideological factors with indicators describing organized interest groups and what he calls "political systems" (operationalized as interparty competition and legislative professionalism) into a composite model for analyzing the stringency of state air and water pollution requirements. In his analysis of implementation of these requirements, he refers to the importance of variables

including organizational norms, actor's preferences, statutory and budgetary constraints, and interactions among policy actors, as described previously by Nakamura and Smallwood (1980).

Thus several sets of variables have been examined together by scholars pursuing policy analysis related to the environment and natural resources. However, little research has emphasized differences in these variables across levels of governance. An important purpose of this study is to do so.

### Policy Outcomes

In addition to understanding policy processes, the practical application of knowledge to solve problems requires an understanding of policy outcomes. That is, if policy processes differ, then we need to learn whether such differences yield different outcomes. Two important types of policy outcomes are fiscal and forest use.

#### *Fiscal*

An important forest policy outcome involves the agency's revenues and expenditures (Souder and Fairfax 1996, p. 99). Some scholars have argued that economic efficiency should be the primary goal of public forest management (see Krutilla and Haigh 1978). Comparing revenues and expenditures allows evaluation of an agency's net profit from operations, a topic for which many relevant empirical analyses have been completed and theoretical arguments have been developed to suggest differences between the state and national level. There is no consensus, however, regarding which level exhibits more fiscally profitable use of its resources.

Peterson (1981) argues that economic interests dominate local policies because local officials hope to attract mobile firms. Therefore, local officials are likely to provide industries with financial incentives, such as tax abatement and subsidized resources. The Federal

government, on the other hand, is susceptible to a wider variety of groups pressing for economic as well as non-economic benefits. National forests also are subject to the National Forest Management Act of 1976, which requires economic considerations in forest planning. Thus, based on such arguments, it is expected that states are more likely than the Federal government to provide subsidized benefits to attract firms.

However, laws require some state forest management agencies, such as those following a trust mandate, to produce substantial revenue and generate profits, while the USFS multiple-use mandate directs the agency not to manage strictly for maximum dollar returns. In analyzing one state, Leal (1993) argues that national forests lost money on timber sales while nearby state forests earned profits. He attributes this result to environmental restrictions that caused higher labor hours per board foot of Federal timber sold and lower harvest quantities on Federal forests. Furthermore, numerous studies cite cases where Federal timber sales generate less revenue than the cost of sale preparation, making them "below cost" (see Rice 1989). Moreover, the USFS mission, traditionally, has included the provision of forest commodities to promote rural jobs. Thus, based on these arguments, it is expected that the Federal government is more, not less, likely than states to provide subsidized benefits such as below-cost timber, resulting in higher profits on state forests.

A possible answer to these conflicting claims about profitability lies in regulation. If state officials focus more intently than do national officials on economic development, perhaps they do so not through providing low-cost timber, but instead through less stringent environmental regulations. In fact, if national officials face stricter environmental regulations, it is likely that their cost to provide timber will be higher, which will decrease their net profit from timber sales. To explore this explanation, this study includes analysis of both timber profitability and environmental regulations.

The below-cost timber sale issue is the most frequently highlighted element of agency net profitability research (see, for example, Rice 1989; USDA Forest Service 1995). While scholars continue to describe examples of expenses exceeding revenues on USFS timber

operations, the broader question is the degree to which expenses exceed revenues across different public forest jurisdictions (i.e., both national and state). This study examines this question and tests the hypothesis that state forest management generates higher net profits than does Federal management.

Use fees, arguably, can improve fiscal outcomes by more closely matching who benefits and who pays for a good or service. Krutilla et al. (1983, pp. 555-6) state that individuals who make political demands for benefits without paying for them directly will demand a higher level of benefits than is socially optimal. Robinson (1975) argues that charging use fees for recreation would generate revenue that provides a more efficient level of recreation benefits.

Robinson (1975) goes on to criticize the lack of USFS autonomy (because of congressional restrictions) in collecting use fees. Thus it appears that national forests are unlikely to collect use fees. States, on the other hand, are expected to charge use fees, as lower levels of government may focus more on fiscal equivalency than on promoting access to low-income individuals (Peterson 1981; Stein 1990; Nelson 1995, p. 216). This study provides an empirical test of the expected greater prevalence of use fees at the state than the national level.

Related to revenues and expenses, an important consideration is the amount of funds transferred from the forest agency to local government coffers. A common criticism by local communities is that public forests decrease their tax base. To make up for this shortfall, the USFS and forest agencies in a number of states are required to transfer a portion of their revenues collected to local governments. While no systematic study has compared state to Federal forest agency revenue transfer, arguments can be made either way regarding which level of government is expected to transfer more revenue to local governments. On the one hand, USFS policies, traditionally, have included a concern for the economic health of local communities; thus, the national level might transfer more money to local governments. On the other hand, to the degree that state forests collect more revenue than do national forests, they

might share more funds with local governments than do national forests. This study provides empirical evidence to compare revenue sharing by agencies across different levels of governance

### *Forest Uses and Environmental Protection*

Forest management involves the promotion and discouragement of certain forest uses. As noted above, forests are capable of providing a wide range of benefits, from commodity uses like timber harvest and mining, to high impact recreational activities such as off-road vehicle riding, to lower impact recreational uses such as hiking, to environmental services and existence value (utility from the knowledge that a resource exists) emphasized by those favoring preservation. Those benefits that are linked directly to individual utility can be measured fairly readily. While no systematic study has compared state to national forest uses promoted and discouraged, such a comparison is possible with data collected in this study. Analysis examines those forest benefits with a market price in monetary terms and those benefits without easily identifiable market prices in physical units such as trail miles.

For forest benefits not linked directly to individual utility, however, measurement is more problematic. In particular, the set of environmental services that a forest provides is hard to evaluate. For example, healthy forest ecosystems can provide absorption of carbon to reduce global warming, protection of soil from erosion and associated water pollution, and habitat for maintaining the viability of many species. Evaluation and definition of ecosystem sustainability is highly controversial. While disagreements remain over this concept, several useful ecological components of forest sustainability have been suggested, including ecosystem-level management; large, connected habitat patches; identification and protection of rare species; ecosystem research and monitoring; and soil and watershed protection (see Aplet et al. 1993). These items serve as indicators of environmental protection efforts for this study.



While scholarly work on sustainability has not focused on differences between state and national levels, a number of researchers have examined factors thought to influence sustainability of resource management. One such factor is the power of local people to make decisions about the resource. Some argue that decentralized management that allows important decisions to be made locally is more likely to lead to sustainable outcomes (Ostrom 1990, Blomquist 1987, Anderson and Hill 1996). This argument suggests that, to the extent that state forest management involves participants closer to the resource than does national forest management, state forests will provide greater ecosystem sustainability.

However, a competing hypothesis suggests that the involvement of participants further from the resource may favor greater sustainability (see Tremblay and Dunlap 1978, Lowe and Pinhey 1982). Based on the argument that environmental groups are more powerful at the national level, and that they have more leverage over distant national than distant state forests<sup>4</sup>, this hypothesis suggests that national forest policies will exhibit greater environmental protection than will state forest policies. For example, Gibbons (1994) argues that those favoring strong environmental protection often press for restrictions to be determined at the national level, rather than tolerating local variation in standards. This study provides evidence to test competing hypotheses about sustainability at higher and lower levels of governance.

### Conclusion

While the merits of responsibility at different levels of governance in a federal system have long been debated, surprisingly little empirical work has compared policy across levels. This study addresses this important area, focusing on the following question: To what extent do state and national public forest policy processes differ, and what effect do these differences

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<sup>4</sup> For example, Vermont residents can exert more pressure on their national representatives regarding a national forest in Colorado than on representatives in state government regarding a state forest in Colorado.

have on policy outcomes? Analysis, conducted within the IAD framework, examines four cases of public forest management.

Existing scholarship focuses on three areas of relevance for this study. First, studies in levels of government responsibility in a federal system provide a general view that lower levels focus on economic development more than do higher levels, while the latter focus more on non-economic policies such as redistribution or environmental protection. While no consensus exists with regard to natural resource policy, the lion's share of scholarship suggests that state agencies emphasize economic development of natural resources more than do national agencies.

Second, research in forest policy processes emphasizes the importance of several sets of factors shaping bureaucratic decisions, including agency officials' values and preferences, incentives and constraints they face, and interactions with non-agency participants seeking influence. Scholarship suggests similarities across levels in forest agency officials' values and preferences. Research focusing on incentives and constraints indicates that national officials face considerable constraints to involve the public in decision making and to pursue environmental protection. Scholarship regarding interactions suggests differences in the types of interests who are most involved at different levels; commodity interests are expected to be more active and influential at lower levels of governance, while preservation interests are expected to be more active and influential at higher levels of governance, and recreation interest activities and influence is rather uncharted territory.

Third, work in forest policy outcomes includes fiscal as well as use elements. Important fiscal measures include net profit from commodity production, which may be greater at either higher or lower levels of governance (there is much disagreement in the literature); use fee collection, which is argued to be greater among state officials; and revenue transferred to local governments, which may be greater at either level (there is much disagreement in the literature). In forest use promotion, given the pro-development bent of lower levels of governance, it is expected that state officials provide higher levels of commodities than do

national officials. Environmental protection, on the other hand, is expected to be provided more by national officials.

Together, these strands of existing scholarship suggest a number of specific hypotheses to be tested. Chapter 2 describes these hypotheses in detail, as well the research design and other methodological issues. Chapters 3 to 6 focus on factors influencing policy processes, including agency officials and communities (Chapter 3), officials' budgetary and performance evaluation incentives (Chapter 4), officials' statutory and planning document constraints (Chapter 5), and interactions with non-agency participants (Chapter 6). Chapter 7 links policy process factors to outcomes, starting with fiscal outcomes. Analysis of commodity and recreational uses is presented in Chapter 8, followed by environmental protection in Chapter 9. Concluding comments are the subject of Chapter 10.

The concepts explored in these chapters suggest important differences in policy process and outcomes across levels of governance in the United States. Although analysis focuses on one particular type of natural resource policy, forest management, the theoretical framework within which this study is cast supports broader conclusions about policy making in a federal system.

## Chapter 2: Research Design

To address questions about policy at different levels of governance, a research design must be constructed carefully. The wide variety of scholarship relevant to federalism and natural resource policy, discussed in the previous chapter, suggests specific, testable hypotheses. These hypotheses, which generate particular data elements, guide data collection and analysis. Throughout the research, measures are taken to address threats to validity. Since the time requirements for thorough research preclude examination of the entire universe of public forests, analysis proceeds from a careful sampling plan that informs selection of four cases.

### Hypotheses

Existing research described in the previous chapter suggests several underlying theories regarding higher- versus lower-level government responsibility, factors influencing policy processes, and policy outcomes. Compared to the national level, states provide limited access by the public in agency decision making, so policies are largely determined by agency officials and legislators. State agency officials act according to their beliefs about how to manage the resource, shaped by incentives and constraints. State legislators impact agency officials through statutes, budgets, and oversight. Legislative influences reflect the pursuit of economic development, which leaves little room for redistribution, environmental protection, or other policies that do not produce direct economic benefits. Thus state agency outcomes should exhibit higher levels of economic development, indicated by net profit, collection of use fees, and uses that provide direct economic benefits.

At the national level, existing scholarship suggests that a wider range of policy making participants leads to policies that include more activities that do not provide direct economic benefits, such as environmental protection. Agency officials have less discretion in pursuing

their preferences about how to manage the resource, and the incentives and constraints that they face discourage emphasis on activities that promote economic development. Thus national forest agencies should provide higher levels of environmental protection than do state forest agencies.

These theories suggest a number of hypotheses for forest policy processes and outcomes, which are tested through analysis of data described in the next section. Specific hypotheses are as follows:

### Policy Processes

#### *Agency Officials' Values and Communities*

1. State and national forest officials hold similar values and preferences about forest management and use.
2. National agency mission and goals statements emphasize public participation and activities without substantial, direct economic benefits more than do state agency mission and goals statements.

#### *Agency Officials' Incentives*

3. Budgetary incentives encourage state more than national officials to promote uses with direct economic benefits.
4. Officials' performance evaluations favor activities with direct economic benefits more at the state than the national level.

#### *Agency Officials' Constraints*

5. National forest officials face more legal and planning constraints than do state forest officials.
6. Legal and planning constraints foster greater efforts for environmental protection at the national level, while constraints foster greater efforts for activities with substantial, direct economic benefits at the state level.

### *Interactions with Non-agency Participants*

7. Compared to state forest officials, national forest officials devote more effort to seeking public input, and they receive a higher proportion of public input from those favoring uses without substantial, direct economic benefits.
8. Non-agency participants favoring forest uses without substantial, direct economic benefits are more influential in national than state forest policy, while those favoring uses with substantial, direct economic benefits are more influential in state than national forest policy.

### Policy Outcomes

#### *Fiscal*

9. State forest policies generate a higher net profit from commodity sales than do national forest policies.
10. State forest policies emphasize revenue from targeted beneficiaries (use fees) more than do national forest policies.
11. State forest policies favor transferring funds to local governments more than do national forest policies.

#### *Forest Uses*

12. State forest policies promote uses with substantial, direct economic benefits more than do national policies, while national forest policies promote uses without substantial, direct economic benefits more than do state forest policies.
13. National agency policies promote environmental protection more than do state agency policies.

### Instrumentation and Operationalization of Data Elements

To test these hypotheses, a number of techniques, including interview, observation, and document analysis, yield information about policy processes and outcomes. A large portion of the data comes from semi-structured interviews, based on interview guides (see Appendix 2). Semi-structured interviews are useful for obtaining large amounts of data, tapping into

information from a wide variety of individuals, and discovering complex interconnections in social relationships (Marshall and Rossman 1989, p. 102). However, interview data are subject to distortion from miscommunication or even untruthful interviewees. Furthermore, such information is based on individual perceptions rather than on actual behavior. To overcome these limitations, interviews were conducted with a number of people regarding the same events or phenomena, to check for consistency of explanations. In addition, other data gathering methods supplement interviews.

To complement interviews, observation and documents provide additional data. Systematic observation provides useful insights beyond individual perceptions. Observations focus on forest user activities, public meetings, and office environments. Additional data were generated through analysis of written documents, including public reports, government documents, opinions, legislation, media accounts, memos, and questionnaires (see Appendix 1). Analysis of written documents provides objective data classification, useful documentation of major events, and the opportunity to generalize (Marshall and Rossman 1989, pp. 95 & 102).

These data gathering techniques are applied to address each hypothesis described above. Information is gathered to learn about forest policy processes as well as outcomes.

### Policy Processes

Policy processes, as described in the previous chapter, are analyzed in terms of action situations. This research involves examination of three primary factors expected to influence policy processes: agency officials' values and communities, incentives and constraints, and interactions with non-agency participants. Table 2-1 summarizes specific elements and techniques used to gather data about them.

Table 2-1

Data Elements and Techniques Relating to Policy Processes

**Agency Officials' Values and Preferences (Hypothesis 1)**

- a. educational background and work experience (interviews)
  - educational attainment
  - major field of study
  - length of agency employment
  - mobility within the agency
- b. affiliations with other organizations (interviews)
  - number and types of memberships
- c. stated preferences (standard questionnaire)

**Attributes of the Community (Hypothesis 2)**

- a. elements included in agency mission and goals statements (documents)
- b. range of specialists employed in the agency (interviews, documents)
- c. homogeneity of preferences (standard questionnaire)

**Agency Officials' Incentives (Hypotheses 3-4)**

- a. revenue acquisition (interviews, questionnaires, documents)
  - perceived importance
  - appropriations
  - use payments
- b. officials' performance evaluations (interviews, documents)

**Agency Officials' Constraints (Hypotheses 5-6)**

- a. statutory and regulatory constraints (interviews, documents)
  - planning requirements
  - constraints on specific forest activities
  - anticipated statutes
- b. planning document constraints (documents)

**Interactions with Non-agency Participants (Hypotheses 7-8)**

- a. officials' efforts to encourage public participation (interviews, documents)
- b. realized participation levels (interviews, observation)
- c. perceived influence (interviews, questionnaires)

*Agency Officials' Values and Preferences (Hypothesis 1)*

Agency officials' values and preferences relating to forest management activities and uses are examined through their educational background and work experience, organizational affiliations, and stated beliefs and preferences. Individuals who make decisions in any



organization are affected by life experiences. When selected into the organization, public forest agency employees bring with them knowledge, values, and beliefs that are based, in part, on their education and work experiences. In addition to descriptions of agency officials' educational background and work experience, information about their values is gleaned from their affiliations with other organizations. Knowing with whom these individuals choose to associate can provide an additional indicator of their preferences and beliefs. Interviews provide information about educational background and work experience, as well as organizational affiliations. A more direct means to examine officials' values and preferences is to ask them to indicate their views about certain issues. Officials completed a standard questionnaire that elicits their views on various forest management issues (see Appendix 1).

#### *Attributes of the Community (Hypothesis 2)*

In this study, a "community" is the collection of individuals working in a particular agency. A comparison of agency goals and mission statements provides insight into the vision and goals articulated by each agency to guide its members' activities. In each case the state agency's goals and mission statement is compared with the national agency's goals and mission statement. In addition, it is important to examine the range of positions that exist within an organization, including the number of specialists with different areas of expertise within the agency. Job positions described by interviewees and in organizational charts provide the basis for comparing state with national agencies. Finally, homogeneity of preferences within an organization is examined through examination of individual responses within each agency to the standard questionnaire (see Appendix 1). In each case, the similarity of members' responses within the state agency is compared to the similarity of members' responses within the national agency.

### *Agency Officials' Incentives and Constraints (Hypotheses 3-6)*

In addition to preferences, a crucial factor affecting behavior is an individual's perception of benefits and costs associated with certain actions. Benefits and costs are linked to rules that create incentives and constraints. Analysis focuses on rules in four areas: revenue acquisition, employee performance evaluations, statutes and regulations, and planning documents. Information is gathered from interviews, budget reports, legal documents, agency planning guidelines, and standard questionnaires. These sources provide a means for comparing state and national institutional arrangements in each case.

Two key types of institutional arrangements that provide incentives for certain bureaucratic behavior are budgetary rules and officials' performance evaluation criteria. Budgetary rules are indicated by how officials' receive revenues enabling them to perform forest management responsibilities. Officials' descriptions of their preferred strategies for increasing or protecting budgets provide insight into budgetary incentives. Performance evaluation criteria are measured by officials' descriptions of the most important elements in their supervisors' evaluation of them.

Officials are constrained by institutional arrangements relating to statutes and regulations and to planning documents. Statutes and regulations are compared in each case by examining the agency's statutory mandates as well as other statutes, and their implementing regulations, that require officials to act in certain ways while performing forest management activities. Planning documents are compared by examining requirements in the agency plans that constrain officials' activities.

### *Interactions with Non-agency Participants (Hypotheses 7 and 8)*

While most forest agency officials are not elected, and few are appointed, they are nevertheless accountable to the citizenry of their political jurisdictions. Through day-to-day,

informal contacts as well as more structured interactions, agency officials communicate with non-agency participants ("the public" or "publics"). It is hypothesized that these participants affect agency officials' decisions about how to manage the forest.

Analysis focuses on key individuals affecting policy formation and implementation. Identifying "key" individuals presents a methodological challenge, as determining influence is difficult in practice (it requires knowing whether a certain person or group caused something to happen). A useful approach is to ask interviewees whom they believe to be influential (see Culhane 1981, p. 209; also Clarke and McCool 1985). Interviews with both agency officials and non-agency participants provide useful insights into interactions, as does attendance at public meetings, observations, legal documents, agency publications, and standard questionnaires (see Appendix 1).

Specifically, indicators of communication efforts include the number of activities that officials undertake to solicit public input, such as mailings, public meetings, and working groups. An important indicator of the degree to which officials incorporate public input into decision making is officials' explanations of their reasons for communicating with external parties. Indicators of the frequency and influence of communications with various user groups (i.e., commodity, preservation, and recreation) include officials' and non-agency participants' perceptions.

### Policy Outcomes

Interactions of actors in action situations are linked to outcomes. This study includes examination of fiscal and forest use outcomes. Table 2-2 summarizes specific elements and techniques used to gather data about them.

Table 2-2

Data Elements for Understanding Policy Outcomes

Hypotheses 9-11: Fiscal Outcomes

- a. profitability of timber sales (documents, interviews)
- b. use fees collected (documents, interviews)
- c. transfer payments to local governments (documents, interviews)

Hypothesis 12: Forest Uses

- a. timber (documents, interviews)
  - quantity sold
  - budget expenditures
- b. recreation (documents, interviews, standard questionnaires)
  - officials' perceptions
  - budget expenditures
  - physical outputs
    - hunting
      - level of vegetative management to promote game species
      - quantity of hunters' facilities (campsites, shooting ranges)
    - developed camping
      - quantity of campsites
    - hiking
      - quantity of trails
    - horse riding
      - quantity of trails and facilities
    - off-road vehicle (ORV) riding
      - quantity of trails and facilities

Hypothesis 13: Environmental Protection (interviews, documents, standard questionnaires)

- a. efforts to promote ecosystem management
- b. provision of large, connected forest patches
- c. identification and protection of rare species
- d. ecosystem research and monitoring
- e. soil and watershed protection and restoration

*Fiscal (Hypotheses 9-11)*

Fiscal data are derived from interviews, agency reports, and budget figures. These sources provide important evidence regarding net profit from commodity production, use fee revenues, and transfer payments to local governments. These data provide a solid basis for numerical comparisons of state and national agency fiscal outcomes.

### *Forest Uses (Hypothesis 12)*

Forest use outcomes include commodities provided as well recreational benefits promoted. Timber provision is measured in terms of quantity sold and percentage of agency operating expenditures devoted to timber, derived primarily from agency documents. Recreational use provision is measured in terms of officials' perceptions, percentage of agency operating expenditures devoted to recreational benefits, and physical quantities of facilities for hunting, developed camping, hiking, horse riding, and off-road vehicle riding, derived from a combination of interviews and agency documents. Data gathering techniques include interviews, documents, and standard questionnaires.

### *Environmental Protection (Hypothesis 13)*

Environmental protection is difficult to measure. Ecologists, biologists, botanists, and others continue to struggle over operationalization of the concept of ecosystem health. For the purposes of this study, environmental protection outcomes are measured, through interviews, documents, and standard questionnaires, according to five ecological principles associated with forest ecosystem sustainability in temperate climates of North America: (1) management focus at the ecosystem level; (2) provision of large, connected forest patches; (3) identification and protection of rare species; (4) ecosystem research and monitoring; and (5) soil and watershed protection (see Aplet et al., 1993).

Management focus at the ecosystem level, rather than on a species or tree stand basis, is one indicator of an output designed to protect forest ecosystem health. Franklin (1993, p. 130) argues that holistic thinking is required to overcome the high expense and lack of knowledge that hinder humans' ability to manage on a species-by-species basis. Since we have not yet discovered many of the species, and our understanding of complex interactions among

species is limited, it is important to focus on the ecosystem level. The primary indicators of ecosystem management for this study are officials' perceptions about agency promotion of ecosystem management and the comprehensiveness of analysis prior to vegetative manipulation. Comprehensiveness is measured in terms of the range of forest resources analyzed and the size of the area examined; inclusion of a wider range of forest resources and larger area indicate more management focus at the ecosystem level.

Large, connected forest patches, which reduce habitat fragmentation, are associated with healthier forest ecosystems. While wildlife managers traditionally have favored fragmentation for its support of "edge" species such as deer and other preferred game animals, many scientists argue that fragmentation hinders sustainability. Noss (1993) states that larger, connected habitat patches provide greater forest sustainability. Parker (1993, p. 210) argues that fragmentation is one of the greatest threats to sustainability. Indicators of fragmentation for this study include timber harvest opening sizes and efforts to acquire land that will increase forest continuity. Smaller timber harvest opening sizes and acquisition of land that will increase forest continuity indicate larger, more connected forest patches.

Environmental protection includes concern for all of the species that interact in a forest ecosystem. Many organisms contribute to the complex web of life in ways that we do not understand; the loss of one or a few key species potentially may cause a chain reaction that significantly impacts the health of the entire forest community (Roush 1989). Noss argues that the abundance of sensitive species is an important indicator of ecosystem health (1993, p. 34). In this study, agency efforts to identify and protect rare species are measured by the number and extent of rare species projects completed, including monitoring rare species populations, inventorying habitat for rare species, and enhancing rare species habitat through vegetative manipulation, timber harvest cessation, or exclosure creation.

In addition to identification of rare and threatened species, research and monitoring can be devoted to learning about the broader forest ecosystem. It is through more complete understanding of forest ecosystem components that humans are better equipped to mitigate

potentially harmful impacts of forest activities. Scholars such as Lee (1993) advocate close monitoring in order to learn about effects of human actions on the environment. Thus the extent of agency efforts devoted to ecosystem research and monitoring, measured by expenditures and projects completed, serves as a useful indicator of environmental protection. Specifically, comparisons focus on activities outside the scope of particular timber sales that enhance understanding of the forest ecosystem, including aquatic and terrestrial ecosystem inventories, ecological classification research, and watershed analyses.

The final indicator of environmental protection is the extent of efforts to protect and restore soils and watersheds. Such efforts may occur through minimization of harm during timber harvesting, as well as through reclamation of degraded land. Timber harvest contracts, interviews, budget expenditures, and project completion reports indicate soil and watershed protection and restoration activities across the agencies. Protection activities are indicated by timber contract requirements as well as by officials' monitoring and enforcement of these requirements. Restoration activities are indicated by the quantity of stream banks stabilized, trail and road erosion control devices constructed, and acres seeded for vegetation that reduces erosion.

#### Addressing Threats to Validity

The power of a research study to test hypotheses and inform theory is linked to success in overcoming threats to validity. This study addresses threats to four key characteristics: internal validity, external validity, dependability, and objectivity.

Internal validity refers to a study's truthfulness, the degree to which data support the conclusions. This criterion is a particular strength of qualitative inquiry, which requires grounding findings in the data. A useful means to enhance internal validity is to carefully describe the context, so that the setting, population, and theoretical framework are clear to the reader (Marshall and Rossman 1989, p. 145). These elements are carefully described in this

study. In addition, triangulating methods and sources bolsters internal validity, as multiple methods and data sources that converge on similar results enhance the credibility of findings (Miles and Huberman 1994, p. 279).

External validity refers to the generalizability of the findings. That is, given the embedded nature of the study and close ties with context, can findings be transferred to other settings? It is important to note that such generalizability is not to a population, in the sense that statistical methods provide, but to a theory. By tying the data analysis to a theoretical framework (in this case, the IAD), readers can decide whether a theory speaks to other contexts, in which case the findings from a study are useful for generalizing to other contexts (Marshall and Rossman 1989, p. 146). Cross-case analysis, the replication of investigation across different settings, also enhances transferability (Yin 1989). In this research, sampling to increase variation (four different cases in two dissimilar regions) provides very different settings in which to gather data. Finally, triangulation of data sources, as emphasized in this study, increases generalizability (Marshall and Rossman 1989, p. 146).

Dependability indicates the degree to which "the process of the study is consistent, reasonably stable over time and across researchers and methods" (Miles and Huberman 1994, p. 278). Dependability is enhanced through careful specification, and adherence to, the research design. Also, clearly specified analytic constructs such as the IAD framework make the findings more dependable.

Objectivity exists where a study could be repeated by different researchers and yield the same findings. This requires minimization of researcher bias, through such techniques as following data collection protocols carefully and avoiding jumping prematurely to conclusions. Objectivity also involves thorough documentation of data and analytical procedures, so that others may perform re-analyses (ibid, p. 278). Careful attention to data collection protocols and documentation of procedures in this study increase its objectivity.



## Data Sources

Interview data come from a wide range of individuals most closely involved in making decisions about how the forests are managed. These individuals include agency officials in line as well as staff positions, from field workers up to the state forestry department chiefs and national forest supervisors. While not all of these individuals supervise employees and allocate budgets, each has responsibilities for making management decisions and providing input into forest decision making. The interviewees included in this research constitute a representative sample of similar areas of responsibility within each agency, including timber sales planning and administration, wildlife, recreation, environmental protection, legislative relations, public education and communication, budget management, and overall program / agency management.

To facilitate open and honest communications, interviewees were assured that no comments would be associated with particular individuals in any written reports. Therefore, this study does not mention any interviewees by name, nor does it attribute quotations to named individuals. Instead, it identifies interviewees by a four-character alphanumeric label. The first character indicates governance level (national or state), while the second character indicates case number. For example, the national agency in Case 3 is "N3." The third character lists a particular individual in that agency as a letter, and the final character indicates the interview number with that particular individual (many officials participated in repeated interviews). For example, the first interview with individual B is denoted "B1." Thus, a comment made by Case 3 national official B, during his or her first interview, would be cited as "N3B1." Similarly, a quotation from Case 2 state forest official A, in the third interview, would be cited as "S2A3."

All of the interviewees were open and accommodating in their communications. They were encouraged to talk freely and assured that none of their comments would be attributed to them by name. While a few interviews took place over the phone, most interviewees

participated in multiple, in-person interview sessions, each lasting at least one hour. Repeated contacts and in-person visits provided the opportunity to build trust, witness non-verbal cues, and observe work environments.

The interviews were semi-structured. Interviewees responded to a set of specific questions, but the questions were not asked in the same precise words or order (see Appendix 2). Rather, interviewees answered questions during the course of a continuing discussion, with attempts to link one topic logically to another. This allowed flexibility to follow up responses, seek clarification, and probe more deeply into interesting statements. Conversations were not recorded on tape, but notes were carefully taken and, for several sessions, the notes were subsequently checked by the interviewees, who endorsed their accuracy.

In Case 1, Ohio State Forests and Wayne National Forest, eleven state and ten national officials participated in in-depth interviews, for a total of over thirty hours of interviewing at the state level and about twenty-four hours at the national level. In Case 2, Indiana State Forests and Hoosier National Forest, twelve state and eleven national officials participated in such interviews, totaling twenty hours and seventeen hours, respectively. In Case 3, Washington State Forests and Gifford Pinchot National Forest, twelve national and thirteen state officials participated in interviews, totaling sixteen and fifteen hours, respectively. In Case 4, Oregon State Forests and Siuslaw National Forest, a dozen national and eleven state officials participated in interviews, for a total of eleven and fourteen hours, respectively. Thus the research for this manuscript included in-depth interviews with 94 officials, for a total of over 150 hours of conversation.

In addition to interview data, participants completed a standard three-part questionnaire (see Appendix 1). In the first part, respondents indicated, on an five-point Likert scale, their values and preferences about specific management issues. They also indicated their perceptions about their agency's activities with regard to these issues. In the second part, respondents shared their perspectives on the amount of influence various factors have in determining agency activities. Finally, the third part of the questionnaire provided space for respondents to

describe who they considered to be their key contacts, and the nature of their communication with these contacts. To encourage honest and accurate responses, respondents were assured that no responses would be attributed to particular individuals. In Case 1, six (of seven) national and seven (of eight) state officials returned questionnaires. In Case 2, eight (of nine) national and nine (of eleven) state officials returned questionnaires. In Case 3, eight (of eleven) national and eight (of ten) state officials returned questionnaires. In Case 4, ten (of twelve) national and all twelve state officials returned questionnaires. Overall, officials returned a total of seventy-five of eighty-seven questionnaires, for a response rate of 86%. Not every respondent completed all parts of the questionnaire. Overall, seventy-five of eighty-seven (86%) respondents provided a usable first part, forty of sixty-eight (59%) respondents provided a usable second part, and sixty-eight of eighty (85%) respondents provided a usable third part.

In addition to questionnaires, existing documents provided written data. Participants shared numerous documents, including official reports, plans, budget proposals, accounting spreadsheets, internal memos, and maps. All documents are referenced using a coding system that includes the agency (national or state), case, and a document number. For example, a document from the national agency in Case 2 might be identified as "N2-1" or "N2-17."

Finally, to gain further insights and perspectives, the study included phone interviews with non-agency participants involved in forest policy, some of whom represented organized interests. The interviewees were purposefully selected, based on agency personnel listing them as "key contacts" or by other interviewees suggesting them as important people to contact. Interviewees were encouraged to speak freely and honestly, with the assurance that no statements would be attributed to them. Most interviews lasted from ten to fifteen minutes, with discussion focusing on communication levels, perceived influence, and perceived agency support for the individual or group's particular goals. The number of non-agency participants who participated in such interviews is as follows: twenty-one in Case 1, twenty in Case 2, fourteen in Case 3, and thirteen in Case 4. Non-agency participants are identified by the letter "U" for user, followed by the case number, letter representing type of use (Horse rider, Off-

road vehicle rider, Timber proponent, Environmental preservation proponent), and a participant number. For example, the Case 2 horse rider interviewed first is identified as "U2H1," where "U" stands for "user," "2" signifies Case 2, "H" indicates horse rider, and "1" stands for the first horse rider.

### Sampling Plan

Case selection is based on two logical design requirements: variation among pairs and physical controls within pairs. First, to make generalizable statements about national versus state forest policy processes, examination focuses on cases in four different states. To increase variation, these states are selected from two very different regions of the United States, the Midwest and the Northwest, which have different types of forest ecosystems, with different quantities of forested land. Forests in these regions also differ in their contiguousness, especially for national forests. Finally, these regions vary significantly in the relative importance of the timber industry to state economies.

Second, to understand differences in outcomes attributable to forest management policy, rather than to physical characteristics of the resource, examination focuses on forest pairs located in close proximity to one another, sharing similar physical characteristics. While it is true that no two forests are identical, they can share key physical site characteristics that affect the forest ecosystem, including climate, topography, and soil type (Spurr and Barnes 1980, p. 108). These three factors are the basis for ensuring that each pair of sites exhibits similar physical characteristics. Data regarding these factors come from existing research documents as well as from interviews with forest officials.

The quality of site selection decisions is measured by four criteria suggested by Marshall and Rossman (1989, p. 54): (1) entry is possible, (2) a rich mix of processes, programs, and people relevant to the research question is present, (3) the researcher can

maintain a presence for a sufficient period of time for thorough data collection, and (4) data quality and credibility are assured.

Ease of entry was high in both the Midwest and the Northwest forest sites. Across the cases, research involved establishing contacts, conducting numerous interviews, and attending public meetings. Phoning individuals at least a week in advance of interviews and sending letters of confirmation provided sufficient time to arrange meetings. During the interviews, the establishment of ongoing relationships facilitated future contacts for follow-up questions. Interviewees proved helpful in providing pertinent documents and suggesting important participants willing to provide further insights.

A rich mix of processes, programs, and people relevant to the research question is present in both the Midwest and the Northwest. In the Midwest, although forests do not dominate the region's economy, a number of environmental interests and non-timber users compete with timber users that covet the region's valuable oak, maple, and other hardwood species. In the Northwest, the importance of forest use to the region, and the saliency of forest issues evident in the northern spotted owl and "salvage rider" debates, indicate that a rich mix of processes and people is present. State and Federal government personnel are designing new programs and approaches to forest management in this region.

A continued presence in each area allowed sufficient time to conduct the study. A Midwest residence in close proximity to forests managed by various governmental jurisdictions facilitated testing and adapting specific data collection techniques early in the research. Subsequently, in the Northwest, past residence and an extended research visit in the region provided ample opportunity to collect valuable data.

Data quality and credibility are assured in all sites. In each site, many individuals have invested significant time and effort in affecting forest policy, thus there is no shortage of interview material. Moreover, much research and writing has been spurred by forest debates, especially in the Northwest, so multiple sources are easily tapped. Clearly forest issues are salient to many individuals within and outside forest agencies.

### Variation among Pairs

Several important differences are evident among the forest pairs selected for this study. Primary differences can be seen in comparing forests in Ohio (Case 1) and Indiana (Case 2), in the Midwest, with forests in Washington (Case 3) and Oregon (Case 4), in the Northwest. Specifically, these regions vary with regard to forest type, quantity of forested land, forest contiguousness, timber industry size, and state forest mandate.

Forest type, identified by dominant tree species present, differs across the two regions. In the Midwest, the most common forest type is deciduous hardwoods. Specifically, the largest percent of the timberland across Ohio (Case 1) is in the oak-hickory group, followed by the northern hardwoods group, which includes maple and beech species. Together these groups comprise about 84% of the state's timberland (USDA Forest Service 1993a, pp. 12-13). In Indiana (Case 2) the dominant species group is maple-beech, followed by oak-hickory, which together total 71% percent of timberland in the state (USDA Forest Service 1990, pp. 1-8). However, in the Northwest region, conifers dominate. The most common forest type in both states is Douglas fir and associated conifers (N4-2).

Quantity of forested land also differs between these regions. In Ohio, eight million acres of land are forested, which represents about 30% of the total state land area. In Indiana, four million acres, about 20% of the state land area, are forested. There is a significantly higher quantity of forest land in the Northwest. In Washington, about twenty million acres, or nearly 50% of the state, is forested, while in Oregon, about twenty-eight million acres, again nearly half of the state's land base, are in forest cover (S4-2, USDA 1993c).

Not only do the states in the Northwest have a higher quantity of forest land, but they also have more contiguous forest land. Large blocks of forested area are located throughout the mountainous regions in both states. This is primarily a result of ownership history, as several U.S. presidents designated national forests on land that had not yet left the public

domain. In the Midwest, the national forests were pieced together several decades later, from abandoned private holdings, on land that had long been disposed by the Federal government.

Differences in forest resources are reflected in the timber industries in these states. States in the Midwest have a substantially lower lumber and wood product value. In Ohio, lumber and wood production accounted for approximately \$917 million in 1992, which was 0.4 % of the gross state product. Similarly, in Indiana, lumber and wood production in the same year were valued at \$1,021 million, or 0.8 % of the gross state product. In contrast, in Washington, lumber and wood production in 1992 totaled \$3,078 million, or 4.9 % of the gross state product, and in Oregon, these same industries accounted for \$2,297 million, or 1.8 % of the gross state product (U.S. Department of Commerce 1995a). The higher timber production values in the Northwest also are reflected in work force size. Personnel employed in logging and lumber mills, in 1992, totaled 24,600 in Washington and 20,300 in Oregon, compared to just 2,800 in Ohio and 5,100 in Indiana (U.S. Department of Commerce 1995b).

Moreover, the state forest agencies in the two Northwest states operate under a trust mandate (discussed below), while those in the Midwest states do not. With such differences in forest type, forest quantity, forest contiguousness, timber industry, and existence of trust mandate, any similarities discovered across the cases will provide strong evidence of systematic patterns based on levels of governance.

#### Control for Physical Variables within Pairs

The logic of this study design requires control for physical variables within each pair of forests. Thus forests were carefully selected to ensure comparability in physical factors including forest acreage, tree growth capacity, and tree species present. A comparison of these physical factors between forests in each case is presented below, preceded by a brief description of historical land use and ownership.

*Case 1: Ohio State Forests and Wayne National Forest*

Historical land use patterns are important in shaping present forest conditions. In Ohio, in the mid-nineteenth century, people cleared large amounts of forest for building material, fuel and fields. Harvesting targeted high quality trees such as black walnut, cherry, and white oak, followed by other species, and many areas were burned repeatedly, leaving only small or undesirable species. By the turn of the century few uncut areas remained in the state (N1-12). However, this trend has reversed in the past several decades; in 1940 about 10% of the state was forested, but that figure has climbed to over 30% today. The increase is largely due to pasture land reverting, or being converted, to forest. A total of over seven million acres is considered timberland,<sup>5</sup> over 90% of which is in private ownership, with the remaining portion in public (state or national government agencies) ownership (USDA Forest Service 1993a, pp. 9-10).

In Ohio, land acquisition for management by government officials began in the early part of the twentieth century. Government officials purchased formerly private land, much of it deforested and abused, and put it into public ownership. State officials first acquired land as state forest in 1916. Originally designed to create testing grounds for reforestation efforts, state land acquisition broadened to include land acquisition for scenic and recreational values. State officials acquired abandoned and abused lands to enlarge the state forest system, which has continued to grow over the years (S1-8). Meanwhile, the national government experienced a similar land acquisition pattern. In 1934 the state legislature authorized the Federal government to purchase damaged land to create the Wayne National Forest (N1-12). In less than two decades, national officials acquired over 96,000 acres and designated the land as a national forest (N1-12). Through the years, national officials have continued to acquire land for the national forest.

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<sup>5</sup> Timberland refers to a forested area capable of producing at least twenty cubic feet of timber per acre per year and not withdrawn from timber production.



In fiscal year 1995, the state forest system included over a dozen forests, totaling over 175,000 acres, most of which were located within a region of approximately 10,000 square miles. The national forest, which was close to 225,000 acres in size, contained a number of management units located primarily within the same region.

The state forest agency, which has responsibility for managing state forests, is a department headed by an appointed chief. The agency has a central office in Columbus, the state capital, as well as numerous field offices close to state forests. While agency responsibilities include programs related to private forest land, this study focuses on the agency's responsibilities over state-owned forests. The national forest agency, as defined in this study, includes USFS officials in the national forest's headquarters, in Athens, and in field offices who have responsibilities over the national forest.

To compare the effects of forest management on timber sales, recreation opportunities, and other forest benefits produced, it is necessary to control for physical elements of the forest sites. For example, comparing the timber volume of a forest characterized by rich soil and a favorable climate with one of a forest with poor soil in a harsh environment would not provide a useful comparison of the effects of management activities on timber production, since physical factors significantly differ.

A helpful physical measure that combines soil type, climate, topography, and elevation characteristics is site productivity, or the quantity of tree growth per acre per year. According to several state officials, state forest land grows approximately 150 board feet<sup>6</sup> per acre per year (S1C1). Similarly, biological growth of timber on the national forest is estimated to be about 144 board feet per acre per year (N1-1, p. 2-5). Another important similarity across the forests is dominant species. The most common forest types in this region are oak-hickory and northern hardwoods. Both the state and national forests are predominantly of these types (USDA Forest Service 1993a).

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<sup>6</sup> A board foot is a standard measure of timber volume, measuring one foot by one foot by one inch.

In addition to information from the central office, data were gathered at the field level. To increase comparability within agency pairs, extensive interviews were held with field officials at a single state forest unit located near a single national forest unit ("district"). These two forest units are similar in distance from large population centers; both areas are characterized as rural but are less than two hours, by car, from Columbus, a city with population of about 600,000.

Located in adjacent counties, these two units share the same regional climate, topography, and forest type. The counties in which these units are located are heavily forested, with forest land covering about three-fourths of the county of the state forest and two-thirds of the counties of the national forest unit (*ibid.*, p. 110). The county in which the state forest unit is situated has oak-hickory species over about three quarters of its timberland, whereas the counties in which the national forest unit is located has oak-hickory species over about two-thirds of its timberland (*ibid.*). The second most prevalent forest type in both forest units is northern hardwoods, which comprise nearly 10% in the state forest unit county and nearly 20% in the national forest unit counties. Together, the oak-hickory and northern hardwood groups comprise the same proportion, within one percent, of the forest type at both forest units.

In addition to similar species composition across these forest units, timber growth is similar as well. For this measure, comparisons come from the USFS Forest Statistics report (*ibid.*), which lists four classes: very good (120 or more cubic feet per acre per year), good (85 to 119 cubic feet per acre per year), fair (50 to 84 cubic feet per acre per year), and poor (20 to 49 cubic feet per acre per year). In the forest units, average site productivity classes are similar. For the timberland in both the counties of the state forest unit and the national forest unit, just over 80% of the timberland is classified as either fair or poor. The remaining timberland, less than 20%, is classified as very good or good (*ibid.*).

## *Case 2: Indiana State Forests and Hoosier National Forest*

In Indiana, land use history and ownership have followed a similar pattern as in Ohio. Today about 20% of the land area in the state is forested, most of which is considered timberland. Forested area has increased by approximately 10% since the mid-1960s. The increase is attributable to a reduced quantity of pastureland, along with restocking of lands that were cleared in the late 1800s and took a long time to recover because of highly erodible soils. Nearly 90% of the timberland is in private ownership, while the remaining amount is in public ownership (national, state, county, and municipal). The dominant forest type in Indiana is maple-beech, which comprises about 38% of the total, followed by oak-hickory, which accounts for 33% of the total (USDA Forest Service 1990, pp. 1-8).

Land acquisition in Indiana by the state and Federal governments began in the early part of the twentieth century. State officials purchased land for the first state forest in 1903, but the majority of present-day state forests were purchased in the 1930s and 1940s (S2-5, p. A-3). Much of this land had been cleared for farming, and the state began preventing erosion and restocking the forest to encourage afforestation (S2-5, p. A-2). National officials first acquired land for the Hoosier National Forest in the midst of the Depression. As farmers abandoned deforested, marginally productive lands, local officials became concerned about rising property tax delinquency. The USFS began purchasing land in the state in the mid-1930s and continued to do so over the following several decades.

In fiscal year 1995, the state forest system included over a dozen state forests, with a total of nearly 150,000 acres. Nearly all of these forests are located within a 6,000 square-mile area of the state. The national forest, divided into several districts, totaled over 180,000 acres. The national forest is located in the same region of the state as the state forests, in an area of approximately 2,000 square miles.

The state forest agency responsible for managing state-owned forest lands is a division within the state's natural resources department with headquarters in Indianapolis. The forest

agency is a distinct unit, with a central office in the state capital and numerous field offices near state forests. The focus of this study is on the forest agency rather than the entire natural resources department. Moreover, while the agency has responsibilities relating to private forest land, this study focuses on the agency's responsibilities relating to state-owned forests. The national forest agency, as defined in this study, includes USFS personnel at the national forest's headquarters, in Bedford, and field offices who have management responsibilities over the national forest.

With locations in the same region of the state, sharing a similar climate, timber growth potential on the national forest and state forests is similar. Merchantable timber growth was estimated to be about 108 board feet per acre per year on the national forest, compared to 117 board feet per acre per year on state forests (N2-1, pp. 4-1 and B-20; S2G1). Moreover, similar forest types have developed on state and national forest lands. The most common tree species groups in both places are oak-hickory and maple-beech (USDA Forest Service 1990).

Data from officials at the field level were gathered from a single state forest unit which was located near a single national forest unit ("district"), sharing similar physical characteristics. The state forest unit is located in one county, while the national forest unit is located primarily in the same county, but also in a small portion of three adjacent counties. Topography and climate are similar for these forest areas. Both forest units are located in rural areas, within one and a half hours, by car, from Indianapolis, a city with a population of approximately 700,000.

The counties in which these forest units are located are heavily forested, with forest covering about three-fourths of the county where the entire state forest unit, and most of the national forest unit, are located (*ibid.*, p. 48). The three remaining counties where the national forest unit exists are also significantly forested, averaging about forty-five percent of the land area (*ibid.*).

Tree species composition is similar in these forest units. The dominant forest type in the primary county is oak-hickory (41%), followed by maple-beech associations (23%) and

other hardwoods (ibid., p. 52). In the three other counties with national forest land, dominant forest types are the same (ibid.). Physical conditions to support tree growth are similar at both forest units. In the primary county, average site productivity is classified as "very good" or "good" on 50% of the timber land and "fair" or "poor" on the other 50% (ibid., p. 56). In the three other counties with national forest land, about 48% of the timberland is classified as "very good" or "good," with the remaining 52% considered to be "fair" or "poor" (ibid.).

### *Case 3: Washington State Forests and Gifford Pinchot National Forest*

In Washington, the state became a forest land owner when the Federal government deeded land at statehood. The state expanded its ownership acreage in the 1930s by acquiring, from counties, land that had been logged and abandoned by private owners (S3-1). Meanwhile, the Gifford Pinchot National Forest was created as one of many "forest reserves" established by President Theodore Roosevelt at the turn of the century (N3A1). First managed by the Department of Interior, the forest was transferred to the Department of Agriculture before 1910. Land purchases and exchanges since then have adjusted the national forest's boundaries.

In fiscal year 1995, the state forest system included over a dozen state forests and numerous smaller patches of forested land, for a total of over two million acres of forest land. These state forest lands are spread throughout the state, though the majority are located in an area of approximately 25,000 square miles in the western half of the state. The national forest, which is divided into four ranger districts, totalled over one million acres of land designated as national forest. This forest is located within an area about 3,000 square miles in size, also located in the western half of the state.

The agency responsible for managing state-owned forest lands is a division within the state's natural resources department, with headquarters in Olympia. The focus of this study is on the forest agency rather than the entire natural resources department. While the state forest

agency has responsibilities relating to private forest land, this study focuses on the agency's responsibilities over state-owned forests. The national forest agency, as defined in this study, includes USFS officials in the national forest's headquarters, in Vancouver, and field offices who have responsibilities over the national forest.

Tree species composition is similar across the state and national forests. The most common forest type on the national as well as the state forests is Douglas fir, which is found in association with western hemlock and western redcedar (N3-1, p. I-6). Site quality is similar across state and national lands, although an important physical difference is the existence of significant patches of old-growth forest on the national lands that are absent from the state lands. Unfortunately, neither the state nor national agency has information about the site productivity of its lands; no research studies exist that measure average annual growth quantities. However, reflecting similarities in geographical location and climate, it is expected that the productive capacity across these forests does not differ dramatically.

Data from officials at the field level were gathered from a single state forest unit which was located near a single national forest unit ("district"), sharing similar physical characteristics. The state forest unit is equally divided between two counties, while about one-third of the national forest unit is located in one of these counties and two-thirds in an adjacent county. Topography and climate are similar for these forest areas. Both forest units are located in rural areas and within two hours, by car, from Tacoma, a city with a population of nearly 200,000.

Tree species composition is similar in the national and state forest units. The dominant forest type on the national forest unit is Douglas fir and its associated western hemlock, followed by other fir species. On the state forest unit, Douglas fir also predominates, comprising about 90% of the trees, with other common species including hemlock and other firs (S3D3).

#### *Case 4: Oregon State Forests and Siuslaw National Forest*

The first state-owned forest lands in Oregon were deeded by the Federal government at statehood. The state gained additional forest lands from private owners who lost title due to tax foreclosure in the 1930s, and then through purchase from counties following devastating forest fires in the 1930s, 1940s, and 1950s (S4-1). Meanwhile, the Siuslaw National Forest was created when President Theodore Roosevelt declared a large portion to be part of a forest reserve at the turn of the century. Officials acquired additional forest land as homesteaders abandoned scattered tracts in the 1930s (N4-1).

In fiscal year 1995, the state forest system included five state forests and numerous smaller patches of forested land, for a total of nearly 800,000 acres of forest land (S4-1). These state forest lands are spread throughout the state, but over two-thirds are concentrated in an area approximately 1,600 square miles in the western half of the state (S4-1). Similarly, the national forest, which is divided into four ranger districts, totaled about 600,000 acres of land designated as national forest. This forest is located within an area about 2,900 square miles in size, also located in the western half of the state.

The state forest agency, which has responsibility for managing state forests, is a department headed by an appointed chief. The agency has a central office in the state capital, Salem, as well as numerous field offices close to state forests. While the agency has responsibilities relating to private forest land, this study focuses on the agency's responsibilities over state-owned forests. The national forest agency examined in this study includes USFS officials located in the national forest's headquarters, in Corvallis, and in field offices who have responsibilities over the national forest.

Tree species composition is similar across the state and national forests. The most common forest type in the national forest is Douglas fir, which also dominates the state forest lands (N4-3, p. IV-14; S4E2). Site productivity is similar, with both forests estimated to grow

about 1,000 board feet per acre per year, and no substantial volume of old growth trees at either forest (N4C1, S4E1).

Data from officials at the field level were gathered from a single state forest unit located near a single national forest unit ("district"), sharing similar physical characteristics. Both the state and national forest units lie predominantly within the same county. Topography and climate are similar for these forest areas. Both forest units are located in rural areas, within two hours, by car, from Portland, a city with population over 400,000.

Tree species composition is similar in these forest units. In the state forest unit, the dominant forest type is Douglas fir (95%), followed by red alder, red cedar, and noble fir (S4A1). In the national forest unit, Douglas fir also dominates, along with western hemlock and spruce and some red alder (N4H1). Physical conditions to support tree growth are similar at both units. Neither unit includes substantial amounts of old growth stands, and site productivity is estimated to be 1,000 board feet per acre per year across the two forest units.

### Conclusion

As described above, the foundation for this empirical study is a careful research design. Four cases are selected from two dissimilar regions, to enhance generalizability of the findings. Within each case, both forests in the pair share similar physical characteristics, so analysis highlights differences attributable to patterns of human use and management across different levels of governance. Data are collected via interviews, observation, document analysis, and questionnaires. These data are linked to specific hypotheses generated from existing literature about federalism and public policy. Discussion of these hypotheses, in the chapters that follow, is grouped according to seven categories of variables: agency officials and their communities (Chapter 3), incentives (Chapter 4), constraints (Chapter 5), interactions with non-agency participants (Chapter 6), fiscal outcomes (Chapter 7), use outcomes (Chapter 8), and



environmental protection (Chapter 9). Thus analysis begins with the first of these categories, agency officials and their communities, in Chapter 3.

### **Chapter 3: Agency Officials and Their Communities**

As described in Chapter 1, individuals make decisions and carry out actions based, in part, on their preferences and the community in which they work. Thus a comparison of state and national policy making requires close examination of agency officials and their communities. If systematic differences exist across levels of governance, then policy processes and outcomes should reflect these differences. If systematic differences do not exist, then other variables become more important in the search for policy differences across levels of governance. This information will contribute to greater understanding of policy making at different levels in a federal system. The focus of this chapter is agency officials and their communities.

In a federal system, job positions attracting candidates with similar characteristics can exist at multiple levels of government. For example, the position of forest silviculturist exists in both the U.S. Forest Service (USFS) and various state forest agencies. Thus individuals trained in particular specialties may choose to work in agencies at higher or lower levels of government. An important question in the study of public policy in a federal system is whether different levels of government attract individuals whose characteristics differ systematically. Traditionally, scholars described state officials as qualitatively different from national officials, claiming that state job positions attracted individuals with lower qualifications (White 1963). But more recently, researchers have argued that there is little qualitative difference between characteristics of individuals working in state and national government organizations (Cigler 1993; Bowman and Kearney 1986, Eisinger 1988).

In the policy area of forest management, scholars have described the importance of educational background and professional organizations in connecting individuals within and across organizations (Thompson and Scicchitano 1985). Shared disciplinary backgrounds and professional memberships can lead to similarities in individuals' views and preferences about

their work. Unfortunately, no study has compared the preferences of state with national forest officials. Thus it is important to seek empirical data to test Hypothesis 1: State and national forest officials hold similar values and preferences about forest management and use. This research includes such data. Comparison of state and national officials' preferences centers on educational background and work experience, affiliations with other organizations, and, more directly, stated preferences. Analysis reveals strong support for Hypothesis 1.

In addition to examining officials' preferences, it is important to examine the community in which these officials work. As Ostrom et al. (1994, p. 45) suggest, an important component affecting behavior is the "culture" of a community in which the actors are situated. In comparing policy in a federal system, one must determine whether agency cultures differ systematically across levels of governance. Key community attributes include norms of behavior and homogeneity of preferences among individuals (ibid.). Systematic differences in these attributes would likely lead to different policy processes and outcomes at different levels of governance in a federal system.

Examination of officials' communities focuses on mission and goals statements, range of job positions included in the agencies, and heterogeneity of preferences within the agencies. Comparing these indicators allows testing of Hypothesis 2: National agency mission and goals statements emphasize public participation and activities without substantial, direct economic benefits more than do state agency mission and goals statements. Analysis provides strong support for this hypothesis.

### Agency Officials

A number of research studies have focused on the attitudes, educational backgrounds, and work experiences of USFS officials. These studies typically aim to explain officials' values and preferences across regions (Boyle et al. 1994), hierarchical positions (Cramer et al. 1993), or time (Brown and Harris 1992). While such work sheds considerable light on members of

the USFS, the values and preferences of state level forest officials have not been illuminated. A meaningful comparison between state and national forest officials must include examination of their preferences. Testing Hypothesis 1 relies on several indicators, including educational background and work experience, organizational affiliations, and stated preferences.

### Educational Background and Work Experience

Individuals who make decisions in any organization are affected by their life experiences. When selected into the organization, public forest agency employees bring with them knowledge, beliefs, values, and preferences that are based, in part, on their education and work experiences. Interview data suggest that, in terms of educational background, the forest agency employees studied in this case exhibit similarities in field of study, yet some differences in level of educational attainment.

The majority of interviewees in each agency share forestry as a common disciplinary background. In Case 1, eight of ten (80%) Ohio State Forest and eight of ten (80%) Wayne National Forest officials indicated a post-secondary focus on forestry or forest resources (see Table 3-1). In Case 2, eight of nine (89%) Indiana State Forest and six of ten (60%) Hoosier National Forest officials focused on forestry or forest resources at the undergraduate or graduate level. In Case 3, seven of eleven (64%) Washington State Forest and seven of eleven (64%) Gifford Pinchot National Forest officials shared forestry as a disciplinary emphasis. In Case 4, Oregon State Forests and Siuslaw National Forest, ten of fourteen (71%) Oregon State Forest and six of eleven (55%) Siuslaw National Forest officials shared forestry as a disciplinary emphasis.

At the time many of these officials were engaged in forestry course work (1970s and 1980s), forestry schools emphasized, through curricula and professors' research interests, the growth, extraction, and use of forest products, primarily timber (Raphael 1981, p. 205; Fisher

1996). Thus to the extent that educational backgrounds are the same, officials' values and preferences regarding their role as forest professionals should be similar across agencies.

Table 3-1

Officials' Major Fields of Study

<u>Agency</u>	Number and proportion of interviewees with the following major field:		<u>Number of Interviewees</u>
	<u>Forestry</u>	<u>Other</u>	
Case 1:			
National	8 (80%)	2 (20%)	10
State	8 (80%)	2 (20%)	10
Case 2:			
National	6 (60%)	4 (40%)	10
State	8 (89%)	1 (11%)	9
Case 3:			
National	7 (64%)	4 (36%)	11
State	7 (64%)	4 (36%)	11
Case 4:			
National	6 (55%)	5 (45%)	11
State	10 (71%)	4 (29%)	14
Total, National	27 (64%)	15 (36%)	42
Total, State	33 (75%)	11 (25%)	44

Educational backgrounds do differ, however, in terms of highest degree attained. In the Midwest cases, national employees tend to have received more formal schooling than state employees (see Table 3-2). In Case 1, three of the ten Wayne National Forest officials interviewed have completed post-graduate degrees, including one doctoral, with the remaining seven holding bachelor degrees. At the state level, three of the ten Ohio State Forest officials interviewed have completed post-graduate degrees (all Masters level), while only four have received bachelor's degrees and three have obtained associate's degrees. Moreover, two state

officials downplayed the importance of academic achievement. For example, one official commented that "book learning" is no substitute for field experience, stating that some of the best foresters he knows do not have higher than an associate's degree (S1F2). Another official, in discussing hiring, said that it is more important for an individual to possess good communication skills to work with the public than to excel in technical skills taught in college, as the latter could be learned on the job (S1K1).

In Case 2, the contrast in educational achievement between agencies is less pronounced, yet apparent. None of the interviewees in either agency holds less than a bachelor's degree. In fact, the highest degree, a doctorate, is held by one of the Indiana State Forest officials. But for the majority of interviewees, higher degree attainment is evident in the national agency. Five of ten Wayne National Forest officials have completed a master's degree, with the other five attaining a bachelor's degree. Only two of nine state officials have finished graduate degrees (one master's, one doctorate), while the remaining seven of nine have reached the bachelor's level.

In the Northwest cases, however, educational attainment does not follow this pattern. In Case 3, all eleven of the Gifford Pinchot National Forest officials interviewed have earned a bachelor's or master's degree. Ten of the eleven Washington State Forest officials interviewed have achieved this level of education. Thus educational attainment is similar across agencies. In Case 4, Oregon State Forest officials have achieved somewhat higher levels of education than Siuslaw National Forest officials. Master's degrees or higher are held by five of fourteen state officials but just two of eleven national officials. Most officials in both agencies hold bachelor's degrees, though two national, compared with no state, officials have attained only an associate's degree.

Table 3-2

Officials' Educational Attainment

<u>Agency</u>	Number of interviewees attaining the following highest degree:				<u>Number of Interviewees</u>
	<u>Ph.D.</u>	<u>M.S.</u>	<u>BS/BA</u>	<u>Associate's</u>	
Case 1:					
National	1	2	7	0	10
State	0	3	4	3	10
Case 2:					
National	0	5	5	0	10
State	1	1	7	0	9
Case 3:					
National	0	4	7	0	11
State	0	5	5	1	11
Case 4:					
National	0	2	7	2	11
State	1	4	9	0	14
Total, National	1	13	26	2	42
Total, State	2	13	25	4	44

In terms of past work experience, national officials tend to have longer employment with their agency than do state officials with theirs. In Case 1, of ten national agency employees asked about their length of employment with the agency, the longest was twenty-nine years, the shortest was five, and the mean was just over seventeen years (see Table 3-3a). Of ten state agency employees, the longest was twenty-two years, the shortest was six years, and the mean was under sixteen years.

In Case 2, of ten national agency employees asked about their length of employment with the agency, the longest was twenty, the shortest was five, and the mean was over fifteen years. Among nine state agency officials asked, the longest employment with the agency was twenty-four, the shortest was six, and the mean was just over sixteen years with the agency.

In Case 3, national agency officials reported substantially longer tenures than did state officials. The average length of service in the national agency was nearly twenty-one years, compared to under fourteen years in the state agency. In fact, all national agency interviewees reported at least ten years of service, compared to just seven of the eleven state agency interviewees reporting at least ten years of service.

Interviews from Case 4 indicate a difference like that in Case 3. National agency officials reported an average of nearly twenty-one years in the agency, compared to just over twelve years among state agency officials. The number of officials with at least ten years of service is ten of eleven in the national agency and just eight of fourteen in the state agency.

Table 3-3a

Officials' Length of Employment with their Agency

<u>Agency</u>	<u>Number of Respondents</u>	<u>Number of Years with their Agency:</u>		
		<u>Longest</u>	<u>Shortest</u>	<u>Mean</u>
Case 1:				
National	10	29	5	17.1
State	10	22	6	15.6
Case 2:				
National	10	20	5	15.4
State	9	24	6	16.1
Case 3:				
National	11	32	10	20.9
State	11	26	3	13.8
Case 4:				
National	11	28	7	20.7
State	14	24	1	12.2
Total, National	42	32	5	18.6
Total, State	44	26	1	13.8



Comparing across all four cases, statistical testing indicates a difference that is significant, at the 0.01 level, between state and national officials' length of employment with their agency (see Table 3-3b).<sup>7</sup>

Table 3-3b

Statistical Test of Differences Between State and National Officials' Length of Employment

<u>Agency</u>	<u>N</u>	<u>Mean Length of Employment (years)</u>	<u>Standard Deviation</u>	<u>Pooled t-test:</u>	
				<u>t-value</u>	<u>p-value</u>
National	42	18.6	7.47		
State	44	13.8	6.87		
Combined				-3.08	0.0028***

\*\*\*Significant at the 0.01 level

In addition to examining lengths of service in the agencies, it is important to investigate officials' job mobility within each organization. Across the cases, national agency officials indicated greater mobility, as measured by the number of years working for the agency divided by the number of locations served, than did state agency officials. In Case 1, the most mobile Wayne National Forest interviewee had been in nine locations in twenty-two years with the USFS, for an average of over two years per location, while the least mobile Wayne National Forest interviewee had been in one location for six years (see Table 3-4a). The average for all ten national officials in Case 1 is under four years per location. At the state level, the most mobile Ohio State Forest official interviewed had been in four locations in twenty years, for an average of five years per location, while the least mobile state official had been in one location for sixteen years, for an average of sixteen years per location. The average for all ten state officials in Case 1 is under eight years per location, more than double that of national officials.

In Case 2, the Hoosier National Forest official with the least amount of time spent per location had been in two locations in five years, for an average of two-and-a-half years per

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<sup>7</sup>See Appendix 3 for a more thorough description of the statistical tests.

location, while the national official with the most average time per location had been in two locations in eighteen years, for a mean of nine-and-a-half years per location. The mean number of years per location among national officials interviewed in Case 1 is five-and-a-half. Among nine Indiana State Forest officials interviewed, the most mobile official had been in four locations in seventeen years, for a mean over four years per location. The least mobile state official had been in the same location for thirteen years, for an average of thirteen. The mean number of years per location among state officials interviewed is over eight, substantially higher than the five-and-a-half mean among national officials.

In Case 3, the Gifford Pinchot National Forest official with the least amount of time spent per location had served in three locations in ten years, averaging over three years per location, while the national official with the longest average time per location had been in two locations in twenty-three years, averaging eleven-and-a-half years per location. The mean number of years per location among national officials interviewed is under six. In the state agency, the most mobile Washington State Forest official interviewed had been in the same location for three years, while the least mobile state official had worked in the same location for fourteen years. The mean number of years per location among state interviewees is over seven, higher than that of national officials.

In Case 4, Siuslaw National Forest officials indicated only slightly higher levels of mobility than did state officials. The national official with the least time served per location had worked in eight locations in twenty years, averaging two-and-a-half years per location, while the national official with the longest average time per location had worked in the same location for eighteen years. The average number of years per location among national agency officials is under six. Among Oregon State Forest officials, the longest average time served per location is ten years and the person with the shortest time served per location reported an average of under one year. The mean number of years per location among state officials is over six, slightly higher than the mean among national officials.

Table 3-4a

Officials' Geographic Mobility Within their Organization

<u>Agency</u>	<u>Number of Respondents</u>	<u>Average number of years per location for an employee:</u>		
		<u>Longest</u>	<u>Shortest</u>	<u>Mean</u>
Case 1:				
National	10	6.0	2.4	3.7
State	10	16.0	5.0	7.6
Case 2:				
National	10	9.5	2.5	5.5
State	9	13.0	4.3	8.2
Case 3:				
National	11	11.5	3.3	5.6
State	11	14.0	3.0	7.2
Case 4:				
National	11	18.0	2.5	5.6
State	14	10.0	0.7	6.2
Total, National	42	18.0	2.4	5.1
Total, State	44	16.0	0.7	7.2

Comparing across all four cases, statistical testing indicates a difference that is significant, at the 0.01 level, between state and national officials' average lengths of employment with their agency (see Table 3-4b).<sup>8</sup>

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<sup>8</sup>Ibid.

Table 3-4b

Statistical Test of Differences Between State and National Officials' Mobility

<u>Agency</u>	<u>N</u>	<u>Mean Number of Years per Location</u>	<u>Standard Deviation</u>	<u>Pooled t-test:</u>	
				<u>t-value</u>	<u>p-value</u>
National	42	5.1	3.02		
State	44	7.3	3.52		
Combined	86			2.99	0.0037***

\*\*\*Significant at the 0.01 level

Indeed, geographic mobility is critical for career success in the national forest agency. As one USFS official in Case 1 explained, "I wouldn't have been able to advance my career without having traveled to gain diverse work experiences" (N1E1). Another said, "It's rare for someone to be promoted in place" (N1I1). A national official in Case 2 said, "For promotions, being mobile is important, since you have to go where the jobs are. A lot of people don't want to do that these days" (N2G3). Another explained, "As I've moved up the ladder I've had to transfer locations -- to move up you've got to move on" (N2C1). Similarly, a national official in Case 4 said that without mobility, she would not have been able to advance as rapidly as she has (N4B1).

While such mobility can be useful in providing employees with a wealth of experience, and, as Kaufman (1960) argues, increasing loyalty to the organization, it can hinder the organization's ability to get work done when an employee leaves. For example, in Case 1, in one instance a vacant position in the national agency could not be filled until the start of the next fiscal year, because the current budget had no money available for the moving expense required to put a new hire into position (N1E1). Furthermore, one national official stated, "Turnover can cause problems in terms of knowing the local community and the forest; some local people complain that just when you get to know a Forest Service employee, he leaves" (N1I1).

At the state level, there are fewer incentives for mobility. One state official in Case 1 was content to continue in his current (mid-level) position, which he had held for over five years, because any career advancement would require the hassle of relocating to a different city without a significant increase in pay (S1J2). While less mobility can promote personnel stability, it carries an organizational drawback in that people may develop "tunnel vision" rather than a broader range of experience that would be helpful in managing forest resources for multiple uses and users (S1H1).

In addition to less time spent at each location, USFS official geographic mobility often includes relocation across thousands of miles within the national forest system. For example, one Wayne National Forest official (Case 1) had worked for the USFS in Oregon, West Virginia, and North Carolina, while another previously had been assigned to forests in Colorado and California. In Case 2, Hoosier National Forest officials' past work locations included Alabama, Utah, South Carolina, and Oregon. One Gifford Pinchot National Forest official (Case 3) reported prior positions located in Texas, Puerto Rico, Alaska, and North Carolina. In contrast, state employees who change locations within the organization do so within a much smaller geographic range, limited to one state.

Overall, national officials exhibit greater length of service within their organization than do state officials. They also indicate higher mobility within the organization. These work experiences are important for understanding officials' values and preferences, as an organization whose members remain in the organization for a long period and relocate often are more likely to share common views about their profession and goals (Kaufman 1960).

#### Affiliations with Other Organizations

In addition to descriptions of agency officials' educational background and work experience, information about their values and preferences can be gleaned from their

affiliations with other organizations. Knowing with whom these individuals choose to associate may provide a useful means to compare their values and preferences.

Overall, there is no consistent pattern of differences in the number of organizational affiliations reported. In Case 1, Ohio State Forest officials reported more memberships than did Wayne National Forest officials; the mean number of memberships per state official is 3.0, compared to 1.7 per national official. In Case 2, however, the mean number of memberships per official is 2.1 among both Indiana State Forest and Hoosier National Forest officials. In Cases 3 and 4, reported membership is low in both the national and state agencies.

Moving from quantity to types of memberships provides additional evidence of similarities across the agencies. As shown in Table 3-5, membership in one professional organization, the Society of American Foresters (SAF)<sup>9</sup>, is common at both agencies in the Midwest cases (four of nine national, five of ten state officials in Case 1; five of nine national and six of eight state in Case 2). In Case 1, a few officials also belong to another forestry organization, American Forests; one of nine national and three of ten state officials indicated membership. In the Northwest cases, membership in forestry associations is substantially lower across agencies, with only three of ten national and two of ten state interviewees in Case 3 reporting such affiliations. Similarly, just one of ten national and four of thirteen state interviewees in Case 4 reported membership in a professional forestry association.

In addition to forestry associations, officials are involved in a wide range of organizations including churches, civic groups, local economic development associations, and forest-related interest groups. For example, several officials are affiliated with economic development organizations. In Case 1, one national agency official is a member of a rural action network designed to increase economic opportunity, while two state agency employees are affiliated with a local chamber of commerce. In Case 2, one national official is affiliated

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<sup>9</sup>SAF is the nation's largest professional forestry organization, with members in forest agencies, private corporations, and academia. Its activities include publishing *Journal of Forestry*, holding professional conventions, and accrediting forestry school programs.

with a tree farming organization, while one state official is a member of a local tourism association. In Case 3, one national official reported membership in a community assistance and economic development organization, while one state official in Case 4 belongs to a local chamber of commerce.

Several officials reported membership in environmental organizations. In Case 1, two Wayne National Forest officials and one Ohio State Forest official are involved in environmental organizations. In Case 2, two Hoosier National Forest and three Indiana State Forest officials are affiliated with environmental groups. In Case 3, two Gifford Pinchot National Forest officials reported affiliations with The Nature Conservancy, while one Washington State Forest official reported membership in Sierra Club. In Case 4, one Siuslaw National Forest official and four Oregon State Forest officials reported affiliations with environmental groups.

While there is no consistent pattern of types of affiliations across agencies, a notable difference occurs in Case 1 with respect to membership in a state organization that represents wood products industries: one of nine Wayne National Forest officials is a member, while four of ten Ohio State Forest officials belong to the organization. In Case 2, no Hoosier National Forest officials reported membership in any timber industry group, while one Indiana State Forest official reported such membership. This difference is not found in the Northwest cases, however; no such memberships were reported by any official in Cases 3 or 4.

Another difference is evident in hunting organizations, where three state but no national officials are members in Case 1. However, this difference does not appear in Cases 2 - 4, where no officials reported membership in hunting organizations.

Overall, there is no clear pattern of differences between national and state officials in membership types.

Table 3-5

Officials' Organizational Affiliations

Number of interviewees affiliated with the following organization types:

<u>Agency</u>	<u>Number of Respondents</u>	<u>Forestry:</u>		<u>Economic development</u>	<u>Environ-ment</u>		<u>Forest products industry</u>
		<u>SAF<sup>a</sup></u>	<u>other</u>		<u>Hunt</u>		
National 1	9	4	3	1	2	0	1
State 1	10	5	1	2	1	3	4
National 2	9	5	0	1	2	0	0
State 2	8	6	0	1	3	0	1
National 3	10	3	0	1	1	0	0
State 3	10	2	0	0	1	0	0
National 4	10	1	0	0	1	0	0
State 4	13	4	0	1	4	0	0

<sup>a</sup>Society of American Foresters

Stated Values and Preferences

A more direct means to examine officials' values and preferences is to ask them. Interviewees completed a standard questionnaire (see Appendix 1). To encourage honest revelation of perceptions, interviewees were assured that no names would be attached to any of the questionnaire responses. In Case 1, Ohio State Forests and Wayne National Forest, eleven state and seven national officials returned questionnaires. In Case 2, Indiana State Forests and Hoosier National Forest, eleven state and eight national officials returned questionnaires. In Case 3, Washington State Forests and Gifford Pinchot National Forest, eight state and eleven national officials returned questionnaires, while in Case 4, Oregon State Forests and Siuslaw National Forest, twelve state and nine national officials returned questionnaires. Total response rate was seventy-five of eighty-seven, or 86%.



The questionnaire asked respondents to circle the response that most closely matched their preferences and beliefs about a number of forest management statements. Responses for each statement were arrayed on a five-point Likert scale, labeled "strongly favor," "favor," "neither favor not disfavor," "disfavor," and "strongly disfavor." Each completed response is coded as either 2 (strongly favor), 1 (favor), 0 (neither), -1 (disfavor), or -2 (strongly disfavor).

Table 3-6 displays questionnaire results. First, note that mean scores vary across questionnaire items. For example, officials at state and national agencies tend to disfavor increasing oil/gas/mineral extraction and off-road vehicle (ORV) trails, while they strongly favor charging recreational use fees and increasing efforts to seek public input. Second, comparing across agencies, it is apparent that national response means are higher in a majority of the cases. However, for most items, the response value difference is trivial; of the fourteen response categories, national and state official mean values differ by less than 0.50 for eleven items.

Statistical tests provide a more thorough comparison of state and national officials' responses. Response values for the first seven items exhibit a normal distribution; that is, more responses from both state and national officials fall towards the center of the -2 to 2 range, and fewer responses are towards the outside of the range. A pooled t-test is appropriate for these normally distributed responses. For the remaining seven questionnaire items, response values do not exhibit a normal distribution. For example, officials across each agency disfavor increasing ORV trails; the most frequent response values are -2 and -1. A non-parametric test (Kolmogorov-Smirnov) provides statistical evidence for the items with responses that are not normally distributed.<sup>10</sup>

As indicated in Table 3-6, state and national officials' response values are significantly different, at the 0.05 level of significance, for only two questionnaire items, increasing hiking trails and allowing clearcutting. Only the latter is significantly different at the 0.01 level of

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<sup>10</sup>See Appendix 3 for a more thorough description of the statistical tests.

significance. While differences in these two items indicate more favorable attitudes among national officials towards one non-economic benefit and among state officials for one activity that promotes economic development, it is important to note that the combination of all fourteen response items does not indicate any systematic differences based on economic development. In fact, in none of the remaining twelve questionnaire items do response values indicate statistically significant differences, at the 0.05 level of significance, between state and national officials.

These results suggest that officials' preferences do not exhibit systematic differences across levels of governance. Instead, they support Hypothesis 1: State and national officials hold similar values and preferences about appropriate management and use. This is an important finding, as it suggests that, should subsequent analysis in this study indicate differences in policy processes or outcomes across levels of governance, such differences can not be attributed to officials' preferences.

This finding also calls into question the need for certain organizational approaches to fostering specific values among employees. Traditionally, the USFS encouraged its employees to relocate frequently, in part as a means to encourage them to embrace pro-commodity preferences (Kaufman 1960). The agency also emphasized promotion from within, which lengthened average length of employment with the organization and ensured that agency leaders held similar pro-commodity preferences (ibid.). Data in this study indicate that state officials relocate with significantly lower frequency and serve significantly shorter average tenures with their agency. Yet state officials' preferences are remarkably similar to those of national officials. Thus relocation and employee tenure may be less important than previously thought in fostering specific preferences regarding forest management and use.

A competing hypothesis regarding job mobility, agency tenure, and officials' preferences is that the first two variables are indeed important in shaping the third variable. Given the wider range of job positions in national than state forest agencies (discussed below), perhaps the higher job mobility and longer agency tenure among national officials is critical in

keeping their officials' preferences similar. In other words, without frequent transfers and a high level of promotion from within, perhaps national agencies would see increasing disagreement over appropriate forest management among their officials. Evaluation of these competing hypotheses is beyond the scope of this study, but valuable information about organizational members' preferences may be gained by pursuing this question in depth.

Table 3-6

Mean Response Values from Officials' Questionnaires

<u>Questionnaire Item</u>	State Officials:			National Officials:			Dif. in <u>Mean<sup>a</sup></u>
	<u>Mean</u>	<u>Dev.</u>	<u>N</u>	<u>Mean</u>	<u>Dev.</u>	<u>N</u>	
Managing with an ecosystem focus	0.62	0.99	39	0.78	0.90	36	-.16
Increasing horse trails	0.13	1.01	39	0.26	1.01	35	-.13
Increasing hiking trails	0.56	0.85	39	0.97	0.75	35	-.41**
Increasing oil/gas/minerals extraction	-.51	0.89	39	-.43	0.82	35	-.08
Increasing timber	0.44	1.02	39	0.17	0.85	36	0.27
Increasing hunting/fishing	0.58	0.78	40	0.60	0.70	35	-.02
Favoring local econ. development	0.53	0.79	40	0.50	0.70	36	0.03
Charging recreational use fees	0.60	0.90	40	1.20	0.72	35	-.12
Increasing public input	0.90	0.93	40	1.11	0.85	36	-.21
Increasing developed camping	-.21	0.95	39	0.31	1.05	35	-.52
Increasing ORV trails	-.77	1.09	39	-.56	1.11	36	-.21
Active conversion to native species	0.71	0.90	38	0.94	0.89	36	-.23
Increasing wilderness/preservation	0.03	1.27	39	0.36	0.99	36	-.33
Allowing clearcutting	1.48	0.60	40	0.42	1.30	36	1.06***

<sup>a</sup>Positive values indicate a higher state mean; negative values indicate a higher national mean.

\*\*Significant at the 0.05 level

\*\*\*Significant at the 0.01 level

Summary of Officials' Values and Preferences

In general, state and national agencies do not attract significantly different populations of employees with regard to educational attainment, disciplinary background, or organizational affiliations. But length of time in the agency and job mobility do differ systematically across

levels of governance. In fact, the USFS traditionally has emphasized job mobility and long tenure among its employees as a means to inculcate certain values and preferences about forest management and use. However, statistical analysis of questionnaire data indicates that values and preferences about forest management and use do not differ between national and state officials. For twelve of the fourteen survey items, state and national officials share similar values and preferences. Thus evidence supports Hypothesis 1: State and national forest officials hold similar values and preferences about forest management and use. In searching for differences across levels of governance, it is important, therefore, to examine factors other than officials' preferences. One such factor is agency communities.

### Agency Communities

An important determinant of officials' behavior involves attributes of the community in which they work. Examination of organizational norms and culture focuses on agency mission and goals statements, which are developed by agency officials to set direction for agency activities. Hypothesis 2 suggests that national agency mission and goals statements emphasize public participation and activities without direct economic benefit more than do state agency mission and goals statements. Evidence supports this hypothesis. Another important element of agency community is the diversity of its members. Analysis suggests that national agencies include a broader range of specialists focusing on non-timber aspects of the forest. However, national officials do not exhibit lower levels of intra-agency homogeneity of preferences than state officials.

### Mission and Goals Statements

Evidence from all four cases supports Hypothesis 2. In each case, national mission and goals statements emphasize public participation and activities without substantial, direct

economic benefit more than do state agency mission and goal statements. Table 3-7 highlights analysis of these statements.

In Case 1, Ohio State Forests and Wayne National Forest, the state and national forest agency mission and goals statements share several elements. Both include the following items: manage public forests for multiple uses to benefit people, encourage private forest owners to practice good stewardship, provide assistance to urban forestry efforts, promote rural economic development, and advocate a conservation ethic (N1; S1-1). Stated missions and goals of both agencies address economic benefits, though in a somewhat different manner; the state agency mission statement includes the growing and selling of tree seedlings, which generates revenue, while the national agency goals statement includes the charging of use fees for products and services (S1-1; N1-1, p. 4-4).

Despite such similarities, differences in Case 1 support Hypothesis 2. Regarding activities without substantial, direct economic benefits, the national agency's mission statement includes two elements not found in state mission or goals statements: developing scientific knowledge and providing employment and training for the disadvantaged. Another important difference involves public participation. The state mission statement emphasizes "informing the public" (one-way communication), while the national statement stresses "listening to people and responding."

In Case 2, Indiana State Forests and Hoosier National Forest, certain elements of the agencies' mission and goals statements are similar. Both the state and national agency mission and goals statements include a focus on multiple-use management. For example, state goals include the following directive:

State forests are managed for all forest resources in an integrated and sustainable fashion that allows for both the long term integrity of the ecosystem and provides for timber production and watershed protection as well as consumptive and nonconsumptive use by the public (S2-5, p. 5).

Multiple-use resources listed in the state forest mission statement include recreation, timber, watershed, and wildlife, as well as resources deemed archaeologically, historically, or ecologically significant (S2-5, pp. 5 and A-1). Similarly, multiple-use resources included in the national forest mission and goals statement are recreation, timber, watershed, wildlife, cultural (archaeological or historical), and ecosystems (N2-1, p. 2-2).

Delving deeper into statements regarding ecological protection, however, reveals support for Hypothesis 2. The national agency's goals statement provides greater detail than does that of the state agency regarding ecological resources. National forest goals specify several ecosystem components, including species variety, genetic make-up, and ecological processes, and they describe protection and management of rare species, communities, and habitats (N2-1, p. 2-2). State goals, on the other hand, describe only a more vague "integrity of the ecosystem" (S2-5, p. 5).

Further support for Hypothesis 2 in Case 2 lies in treatment of two other activities without substantial, direct economic benefits. As in Case 1, the national statement directs officials in Case 2 to promote the development of scientific knowledge and to provide employment and training for the disadvantaged. The state mission and goals statement does not include these elements.

Finally, public input goals in Case 2 also support Hypothesis 2. The national mission statement includes "Listening to people and responding to their diverse needs in making decisions," while the state vision of public interaction is for officials to "market properties and division services to a diversified public who are shown forest resources management . . ." (N1; S5-2, p. 1). As in Case 1, the national statement directs agency officials to engage in two-way communication (listening and responding), while the state statement requires officials to "show" the public.

In Case 3, Washington State Forests and Gifford Pinchot National Forest, national and state mission and goals statements reveal certain similarities. Both address multiple forest uses and call for timber harvesting to be performed in a sustainable manner. Both call for public

involvement in agency planning, protection of riparian areas and of cultural sites, maintenance of roads to minimize adverse environmental impacts, and research to increase understanding of forest resources (S3-2, N3-1, N1).

However, certain differences support Hypothesis 2; the national agency mission and goals statement emphasizes activities without substantial, direct economic benefits more than does the state agency mission and goals statement. As in Cases 1 and 2, the national statement directs officials in Case 3 to provide employment and training for the disadvantaged, while the state statement does not. Moreover, the state statement directs officials to encourage and promote the sale of special forest products, to make investment decisions based on expected returns, and to treat tree stands that will produce acceptable rates of return on investment (S3-2). These statements do not appear in the national agency mission and goals statement, which addresses economic goals only in terms of a directive to generate a "positive economic return" from timber operations (N3-1). It should be noted that one counter-example is the national agency's goal of encouraging "orderly development" of mineral and energy resources, while the state agency goals statement is silent on this issue.

Several statements in Case 3 illustrate that the state agency places higher priority on revenue generation, as opposed to other forest benefits, than does the national agency. For example, one national agency goal is to provide habitat to sustain native wildlife populations and communities (N3-1, p. IV-1). The comparable state agency goal, on the other hand, is to provide such habitat to the extent that it doesn't conflict with trust management objectives, which focus on revenue generation (S3-2). Similarly, while the national agency goals statement includes a directive to maintain and enhance habitat for threatened and endangered species, the state agency goals statement directs officials to meet legal requirements for the needs of such species, going beyond minimum requirements only where such participation is consistent with trust management objectives. In addition, while the national agency aims to promote a diverse range of recreational opportunities, facility development level, and trail experiences, the state recreation goal is to "allow" recreation on state forest lands when it is compatible with trust

objectives. A final example involves identification and protection of lands with special ecological features: the national agency statement emphasizes managing such areas for protection, while the state agency statement emphasizes removing these areas from trust ownership.

In Case 4, Oregon State Forests and Siuslaw National Forest, the mission and goals statements of both the state and national forest agencies include providing timber in an environmentally sound and efficient manner, developing scientific knowledge to improve forest management, and enhancing local community economies through forest outputs (N4-3, N4-4, S4-3). However, several differences support Hypothesis 2. While the national mission and goals statement provides equal emphasis for a variety of uses, the state mission and goals statement directs the agency to pursue timber production and revenue generation as primary goals:

[The] basic goal . . . [is] to provide a sustained contribution to the people of [the state] by managing the growth and harvest of the forests in a cost-effective and environmentally-sound manner. Timber production is the primary goal of management of these lands to fulfill the trust responsibility to provide revenue. Timber production is tempered by the need to protect soils, streams, wildlife habitat, recreational opportunities, and other environmental values (S4-4).

Further support for Hypothesis 2 in Case 4 is found in statements about public involvement. The national agency mission and goals statement describes the importance of "listening to people and responding to their diverse needs in making decisions" (N4-4). In contrast, the state agency mission and goals statement directs officials to focus on informing and educating the public in order to support "increasing the overall awareness of forestry issues and forestry information" so that state residents will understand, accept, and support agency decisions (S4-3, p. 64). This statement suggests an emphasis on forest agency experts teaching citizens about forest management issues rather than seeking greater public input in shaping policy.



Finally, as in Cases 1-3, two additional differences in Case 4 support Hypothesis 2. First, the national agency statement includes a goal of providing resources for technical and scientific exchanges that will improve forest management beyond the United States (N4-4). The state agency research goal, in contrast, is directed toward improving forest management within the state only. Second, the national agency's goal to provide assistance for unemployed, elderly, youth, and disadvantaged citizens is not shared by the state agency.

Table 3-7 summarizes data from the cases. Evidence from mission and goals statements across the four cases clearly supports Hypothesis 2: National agency mission and goals statements emphasize public participation and activities without substantial, direct economic benefits more than do state agency mission and goals statements.

Table 3-7

Agencies' Mission and Goals Statements

<u>Item</u>	Included in which mission and goals statements:			
	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
Public participation:				
Seek substantial public input	<i>National</i>	<i>National</i>	Both	<i>National</i>
Activities with substantial, direct economic benefits:				
Grow and sell seedlings	<i>State</i>	-- <sup>a</sup>	--	--
Sell special forest products	--	--	<i>State</i>	--
Activities without substantial direct economic benefits:				
Ecosystem protect specifics	--	<i>National</i>	Both	Both
Develop scientific knowledge	<i>National</i>	<i>National</i>	Both	Both
Share knowledge widely	<i>National</i>	<i>National</i>	<i>National</i>	<i>National</i>
Employ / train disadvantaged	<i>National</i>	<i>National</i>	<i>National</i>	<i>National</i>

<sup>a</sup>Item absent from both national and state mission and goals statements.  
*Italics* indicates support for Hypothesis 2

### Range of Job Positions Included in the Agencies

Another important element of an agency community is the variety of job positions included. A greater diversity of views is more likely to come from an agency with a wider range of specialists. Compared to the state agency, the national agency in each case includes more positions focusing on non-timber aspects of forest management. In Case 1, the national agency includes two public and legislative affairs specialists, three planning and information management specialists, five engineers, eight lands/minerals/special uses specialists, six ecosystem specialists, two wildlife biologists, one botanist, one fisheries biologist, one (part time) soil scientist, eight recreation specialists, one archaeologist, and one realty specialist (N1-1). In contrast, the public forest management section of the forest agency includes few officials dedicated to such specialized functions: one legislative affairs and two information and education specialists are shared with other sections, and there are no agency engineers, wildlife biologist, botanists, fisheries biologists, soil scientists, recreation specialists, or archaeologists (S1-1).

The range of job positions in the state and national forest agencies also differs in Case 2. As in Case 1, the national agency includes a wide variety of specialists, including positions in planning and information, land management planning, and public and legislative affairs, as well as soil science, civil engineering, botany, landscape architecture, archaeology, wildlife biology, and silviculture (N2-1). In contrast, the state agency does not include such specialists. As one state official explained,

We don't have any biologists, botanists, or ecologists on staff. We're more generalists, with resource positions responsible for several different resources. If we need expertise in certain areas, we have access to people in other divisions of the [natural resources] department, such as fish and wildlife or nature preserves (S2I1).

In Case 3, the national forest agency has a broader range of positions than does the state forest agency. The Gifford Pinchot National Forest staff includes a number of professionals in wildlife biology, botany, ecology, soil science, hydrology, silviculture, fisheries, geology, archaeology, landscape architecture, engineering, public affairs, timber sale administration, and recreation, among other specialties (N3B1, N3C1). Positions among Washington State Forest staff are primarily in silviculture and timber sale administration, with a handful of others in planning/inventory and landscape architecture, plus a public information officer (S3-3). While the staff includes several scientists, most are in "natural resource" science rather than more specialized fields. In fact the agency includes just one full-time wildlife biologist, and there are no archaeologists, botanists, or ecologists on staff.

Case 4 exhibits a similar difference in the range of agency positions. As in other national forest agencies, Siuslaw National Forest staff include specialists in public affairs, rural development, special events, National Environmental Policy Act (NEPA), economics, Geographical Information Systems (GIS), recreation, archaeology, timber, minerals, soil science, ecology, biology, and botany (N4A). Oregon State Forest staff include fewer specialists, instead depending on other state agencies to provide expertise in a variety of fields. One state employee who had worked previously in the USFS explained the difference as follows:

The Forest Service has expertise such as soil scientists, biologists, and hydrologists on staff, while our agency has fewer specialists. Yes, we can work with staff from the state fish and wildlife agency, but it takes more time to get ahold of them and it's harder to get their time for our projects. For example, on two occasions I've tried to get soil scientists from the state agency to help, but instead I had to go outside to the national Natural Resource Conservation Service, which slowed my work (S4B1).

However, another state agency member viewed the lack of specialists more positively:

Since we have fewer specialists on staff compared to the Forest Service, we work with other state agencies. This is good because it gives us a broader perspective. We factor in any extra time required for getting outside help, so it's not a problem. When I was at the Forest Service, there were a lot of specialists on staff but this caused problems with turf battles, and when the agency specialists were stationed on a different district, it wasn't always easy to get help quickly (S4C1).

Clearly, the national agency community includes greater job position diversity than does the state agency community in each case. But does this higher job position diversity lead to a community of members with vastly different values and preferences about how to manage forests?

Questionnaire results provide evidence to determine whether greater position diversity decreases homogeneity of values and preferences among agency officials. Levels of homogeneity among officials of each agency are indicated by the distribution of officials' responses to questionnaire items (see Appendix 1). Standard deviation values computed for each of the fourteen statements allow statistical testing for differences in standard deviation between state and national officials. Analysis of standard deviations suggests that significant differences between state and national officials for only one of the fourteen items, allowing clearcutting (see Table 3-8).<sup>11</sup>

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<sup>11</sup>ibid

Table 3-8

Intra-Agency Variance Among Officials' Responses

	State Officials:		National Officials:		p-value
	Standard Dev.	N	Standard Dev.	N	
Managing with ecosystem focus	0.99	39	0.90	36	0.5716
Increasing horse riding	1.01	39	1.01	35	0.9950
Increasing hiking	0.85	39	0.75	35	0.4619
Increasing oil/gas/minerals	0.89	39	0.82	35	0.6311
Increasing timber	1.02	39	0.85	36	0.2789
Increasing hunting/fishing	0.78	40	0.70	35	0.5235
Favoring local econ. develop.	0.79	40	0.70	36	0.4707
Charging recreation use fees	0.90	40	0.72	35	0.1881
Increasing public input	0.93	40	0.85	36	0.5923
Increasing developed camping	0.95	39	1.05	35	0.5470
Increasing ORV riding	1.09	39	1.11	36	0.9096
Active conversion to native sp.	0.90	38	0.89	36	0.9494
Increasing wilderness	1.27	39	0.99	36	0.1399
Allowing clearcutting	0.60	40	1.30	36	0.0000***

\*\*\*Significant at the 0.01 level

These data do not suggest that homogeneity of values and preferences differs systematically between state and national agencies. Despite the wider variety of job positions present in national agencies, national officials do not exhibit greater heterogeneity. Conversely, national officials' higher levels of job mobility and greater length of tenure do not lead to greater levels of homogeneity among officials' preferences.

One plausible explanation for this similarity between state and national agency homogeneity is disciplinary background. As discussed above, the vast majority of officials across agencies share a major field of forestry. If educational background is indeed crucial, then public agencies across levels of governance may be successful in creating a work force with homogeneous preferences would do well to select individuals from a common major field of study. Another plausible explanation, described above, is that it is precisely the national officials' job mobility and length of tenure that counteract tendencies for heterogeneity of

values and preferences among officials. Further analysis, beyond the scope of this study, is needed to sort out causes of shared values and preferences among agencies.

### Conclusion

Examination of agency officials and their communities supports Hypotheses 1 and 2. Hypothesis 1 suggests that state and national forest officials hold similar values and preferences about forest management and use. While it is true that there are differences in length of employment with their agency and mobility within their organization, such differences do not lead to different values and preferences between state and national officials. Based on questionnaire responses describing values and preferences over fourteen items, officials across the agencies exhibit substantial similarities. An important basis for these similar values and preferences may be educational influences; a vast majority of officials share a common disciplinary background in forestry. It may also be, as Kaufman (1960) suggested, that national officials' job mobility and employment tenure help to instill common values and preferences across the organization.

Hypothesis 2 suggests that national agency mission and goals statements emphasize public participation and activities without substantial, direct economic benefits more than do state agency mission and goals statements. Close examination of these statements supports this hypothesis. In each case, national mission and goals statements include more elements that may hinder providing substantial, direct economic benefits than do state mission and goals statements. National statements also include greater emphasis on public participation. Moreover, national agencies include a wider diversity of job positions, including those focusing on non-timber activities, than do state agencies.

These findings have important implications for public policy in a federal system. Evidence does not suggest that state and national agencies attract employees from different

populations. Values and preferences regarding their work and the resources they manage do not differ substantially between levels of governance.

However, the job positions and agency goals and mission statements differ. The emphasis at the state level is on encouraging activities with substantial, direct economic benefits, while the emphasis at the national level is on encouraging meaningful public input and activities without substantial, direct economic benefits. Such differences support Peterson's (1995) functional theory of policy in a federal system. This theory applies not only to forest policy, but also to a wide variety of substantive policy areas. The question of whether these differences lead to different public interactions and outcomes is addressed in Chapters 6-9.

Analysis in this chapter casts doubt on the traditional notion that frequent relocation and promotion from within that increases average agency tenure are critical for fostering homogeneity among individuals' preferences and shared specific beliefs about how to go about one's work. Kaufman (1960) emphasized the importance of these factors in explaining U.S. Forest Service officials' adherence to pro-commodity forest management and shared agency norms. But, as described in these four cases, state officials' exhibit no less adherence to specific preferences or homogeneity of preferences than do national officials, even though state officials have significantly fewer relocations and shorter length of tenure. Of course, a competing explanation is that these factors are important; national agencies include a wider diversity of job positions, so perhaps without relatively high job mobility and long tenure they might be less likely to have specific preferences in common with other national officials. To test these competing explanations is beyond the scope of the data collected for this study; however, an interesting research design could be designed to further investigate this topic.

The findings about agency officials and their communities have important implications for this study. In examining a variety of factors impacting public policy processes and outcomes, evidence suggests that any differences discovered should not be attributed to officials' preferences. In other words, policy differences in a federal system are not determined solely by bureaucrats' values and beliefs.

Instead, other factors are more important. One such factor is agency community; state and national agency mission and goals statements, as well as job position diversity, differ substantially. The greater emphasis at the national level on producing benefits without substantial, direct economic benefits, and on encouraging public participation foster substantially different policy processes, affects bureaucratic behavior, as will be discussed in later chapters. Moreover, the wider job position diversity in national agencies leads to greater efforts towards management for benefits other than timber.

But officials' preferences and agency community are not the only important elements affecting public policy. Another factor suggested by the IAD framework and public policy literature is the incentives and constraints that officials face. Thus analysis proceeds next to Chapter 4, which describes officials' incentives.



## **Chapter 4: Budgetary and Performance Evaluation Incentives**

To understand the behavior of officials involved in managing public forests, or any other area of public policy, it is important to examine not only their values and preferences, and the communities within which they work, but also the incentives and constraints that they face. A crucial factor affecting behavior is an individual's perception of benefits and costs associated with certain actions. These benefits and costs depend, in part, on institutional arrangements that reward or penalize different types of behavior.

While the next chapter focuses on constraints, the emphasis in this chapter is incentives. If state and national officials' incentives differ systematically, then policy processes and outcomes across levels of governance should exhibit systematic differences. Such differences would provide valuable information about what happens when policies are assigned to different levels in a federal system. Such differences also would provide insights into the relevance of changing incentives as a means to alter policy processes and outcomes. If, however, state and national officials' incentives do not differ systematically, then other variables become more important in the search for policy differences across levels of governance.

The two types of incentives examined in this study involve budget processes and officials' performance criteria. Budget processes depend on institutional arrangements that affect how officials acquire revenue needed to perform forest management activities. These arrangements provide incentives for officials interested in budget maximization or preservation to behave in certain ways in order to acquire desired levels of revenue. Given the differences between state and national agency goals and mission statements, as discussed in Chapter 3, state agencies emphasizing the provision of direct economic benefits should structure incentives that encourage state officials to focus on certain activities such as timber provision. Hypothesis 3 suggests that budgetary incentives encourage state more than national officials to promote uses with direct economic benefits. However, as described below, public agencies in a democratic

system cannot insulate budgetary incentives from outside factors, particularly legislative appropriations processes and use fee retention rules, that decrease the incentive for officials to pursue certain activities. Analysis of two types of budgetary incentives, appropriations and user payments, does not support Hypothesis 3.

Officials' performance criteria determine how their supervisors evaluate them. These criteria provide incentives for officials interested in remaining, and succeeding, in the organization to behave in certain ways to earn positive performance appraisals. Hypothesis 4 suggests that officials' performance evaluations favor activities with direct economic benefits more at the state level than the national level. Analysis does not support Hypothesis 4. Even for state agencies whose goals and mission statements emphasize activities that generate direct economic benefits, provision of such benefits is not a primary evaluative criterion for agency officials. This result reflects the reality that public organizations are not the same as private firms; performance cannot be reduced to revenue or profit as the ultimate measure of performance. Instead, officials view measures such as constituent communication and public safety as crucial. Debates over appropriate responsibilities in different levels of a federal system often emphasize economic efficiency or cost-effectiveness. But it is important to remember that, while economic efficiency in government provision may be an important goal, it is not the only goal.

### Budgetary Incentives

No agency can undertake activities without resources. The most fundamental agency resource is its budget, which provides for personnel, equipment, and other expenses that allow the organization to function. For budgetary rules to provide officials with incentives to act in certain ways, officials must perceive budgets to be important. This section examines, first, the importance of budgets to officials. Subsequently, budget processes are explored, to test Hypothesis 3.

### Perceived Importance of Budgetary Resources

Numerous scholars of bureaucracy have presumed that receiving increasing, or at least non-declining, agency budget resources is an important goal for bureaucrats (see Niskanen 1971). While Niskanen's model based on this assumption focuses on an appointed agency head, the logic can be extended to any bureaucrat facing limited budgets. As he argues, budgetary resources allow bureaucrats to increase their salary, perquisites, reputation, power, patronage, and the ease of managing their responsibilities. Even for "selfless" bureaucrats, funding allows the provision of personnel, equipment, and services to carry out their perceived mission (Arnold 1979). To test these theoretical assumptions about the importance of agency budgets to bureaucrats, interviews with agency officials included discussion of the value they place on agency budgetary resources.

Not surprisingly, officials in both the state and national forest agencies indicated that funding is very important to them. At the state level, officials in each case suggested that funding is crucial for several reasons, including employment security as well as staffing and equipment that allow them to perform their job responsibilities. For example, a few years ago, budget cutbacks led to the closing of several Ohio State Forest offices; one official recalled his painful participation in the process of claiming equipment from an office that had to be closed, taking items from employees who would no longer need them because they were about to be laid off. In Indiana, funding reductions several years ago required the state agency to reduce staffing and contract out certain activities (S2B1). In Washington, a state official explained,

The budget is a major concern now, with the cutbacks we've had in the last couple of years. We've had vacancies go unfilled, and staff-months for this region have dropped to less than half of their previous level. This is particularly difficult as the complexity of timber sales has increased and harvest targets remain stable (S3D1).

An Oregon State Forest official described budget cutbacks in the past that led to layoffs, reducing the agency's productivity (S4K1). Besides staffing levels, agency budgets have important affects on other aspects of agency performance. For example, an Ohio State Forest official pointed to limited funding that prevented his work group from acquiring necessary equipment and manpower to carry out certain activities he believed would be beneficial to forest management (S1F1). Another Ohio State Forest official lamented his office's lack of modern equipment, such as copiers, computers, and fax machines, due to low budget allocations (S1J4).

At the national level, officials also stressed the importance of revenues, for similar reasons. Budget cuts bring the possibility of personnel layoffs, which can be traumatic for all employees; one national official in Case 1 recalled the unpleasant downsizing process at another national forest that resulted in identifying ten individuals as "surplus" employees (N1C2). Interviewees indicated frustration at being criticized for not fulfilling plans, even when the shortfalls are caused by revenue cutbacks. As one Wayne National Forest official (Case 1) stated, "Funding is critical to our ability to carry out commitments we made in the Plan, but we traditionally have received less than half of the amount we need to implement the Plan" (N1C2). Another national official said, "Revenues determine staffing levels, which puts a cap on what we can accomplish" (N1K3). In Case 2, a Hoosier National Forest official cited numerous projects in need of completion that were delayed for lack of funding (N2G3). Another national official explained,

The budget is very important. We are a small forest but we still have to keep areas of specialty available (archaeologist, biologists, botanists, etc), so a large proportion of our budget goes to fixed costs for employees. Therefore budget cuts hit us hard, because they mean we leave vacancies open when people leave (N2C1).

Falling budget levels have significantly impacted national officials in Cases 3 and 4. For example, the budget for the Gifford Pinchot National Forest (Case 3) declined from \$63.2 million in 1991 to \$27.7 million in 1995 (N3-12, p. 6). In Case 4, a Siuslaw National Forest official called the budget a "major concern," especially for recreation, because the falling recreation budget has limited what can be done in terms of staffing, keeping sites open, and providing services like garbage collection and security (N4B1).

In addition to interview comments, data collected from the questionnaire (see Appendix 1) provide further evidence that budgets are important. Each respondent rated, on a scale of 1 (low) to 5 (high), the importance of budgets in influencing agency activities. Average ratings, ranging from 3.4 to 5.0 (see Table 4-1), indicate similarly high importance in state and national agencies across the cases.

Table 4-1

Average Official Ratings of the Importance of Budgets in Shaping Agency Policies

<u>Agency</u>	<u>Number of Respondents</u>	<u>Average Rating</u>
Case 1		
State	7	4.8
National	6	5.0
Case 2		
State	9	3.4
National	8	4.6
Case 3		
State	8	4.4
National	8	4.6
Case 4		
State	12	4.2
National	8	4.3
Total state	36	4.2
Total national	30	4.6

### Acquiring Budgetary Resources

Clearly, evidence strongly suggests that state and national officials place a high value on agency budgetary resources. Thus analysis proceeds to the investigation of rules that structure how officials can affect their budgetary resources. Comparison of budgetary incentives focuses on how and whether officials believe they can increase their funding, through both appropriations and revenue collected from forest users. Analysis does not support Hypothesis 3 with regard to either of these sources.

### *Appropriations*

Since state and national forest agency officials value budgetary resources highly, budget appropriations rules provide a potentially strong incentive for them to act in certain ways. That is, officials are expected to behave in ways that they perceive will increase their chances of receiving high levels of appropriations. Hypothesis 3 suggests that state officials face revenue incentives that encourage commodity production and other activities with substantial, direct economic benefits more than do national revenue incentives. Thus one would expect that state officials, to a greater degree than national officials, can increase their budget appropriations through activities to enhance substantial, direct economic benefits.

To determine the importance of appropriations incentives in shaping officials' behavior, it is necessary to understand both the appropriations process and the degree to which officials perceive that their actions can affect their appropriations. Analysis of these items, as detailed below, does not support the hypothesis that budget incentives systematically encourage state more than national officials to emphasize activities that generate substantial, direct economic benefits.

In Case 1, the operating appropriations process for Ohio State Forests begins with the state forest agency submitting a budget request to the state natural resources department, which

subsequently submits a budget to the governor's budget office. For general operating funds, the forest agency competes with other agencies in the natural resource department for its share of budgetary resources, and it also supports requests for the overall department budget allocation once that budget has been prepared. The governor's budget office formulates the governor's budget to be presented to the state legislature, which makes alterations and eventually passes, with the governor's signature, a two-year lump sum allocation that includes funding for forest agency operations.

Some state forest officials in Case 1 indicated that they might improve their chances of appropriations success with a number of strategies. One forest official closely involved with the budget process indicated that factors important for success include (1) providing "solid" forestry programs, (2) maintaining good relationships with agency constituents who can lobby legislators for higher funding, (3) developing a strong identity for the forest agency to set it apart from other natural resource agencies, and (4) to a lesser extent, showing profit from forest operations (S1H1). Another state official with agency budget responsibilities noted the importance of constituent pressure on legislators to increase the natural resources department's appropriations (S1K2). While the legislature does not allocate specific line item amounts within an agency, forest officials let legislators know which items would be cut in cases of funding shortfalls.

Officials at lower levels of the state forest agency compete with other parts of the agency for funds. They indicated several potentially useful strategies to increase their revenues, including saving money in one area to transfer to another (S1J4), showing that the additional revenue will generate more revenue or save money (S1C1), and demonstrating that the additional revenue will improve work quality or accuracy (S1C1). Among these various strategies cited by higher and lower state officials, only one individual mentioned showing profit from forest operations, and he said that this was not a primary strategy (S1H1).

While some state officials in Case 1 perceive their activities to be linked to appropriations levels, several others stated that there is little they can do to increase their

funding appropriations, as allocations are largely incremental. They remarked that, no matter what activities they were to undertake, their budget sum would be based primarily on past allocation levels (S1E3, S1J4, S1I3). In fact, regional and local officials pointed to budgets that had not increased in several years. Moreover, budget changes are more likely to result from uncontrollable physical variables like fires, weather, or pest infestations, than from officials' behavior (S1C1).

For the national forest agency in Case 1, the appropriations process for the operating budget begins with program managers developing project work plans and estimating budget needs for about forty "expanded budget line items" (N1K3). Members of the forest "leadership team," comprised of a dozen individuals, including program managers, district rangers, budgeting support staff, and the forest supervisor, meet to compile the forest budget request. This request is submitted to the appropriate USFS regional office (in this case, in Milwaukee) and, subsequently, combined into a regional budget that is sent to the Washington, D.C. headquarters of the USFS, to be submitted to the Office of Management and Budget (OMB) for integration into the President's budget request to Congress. Eventually Congress passes an appropriations bill for the President's signature, which lists amounts allocated to each of the USFS expanded budget line items.

Once the USFS headquarters in Washington, DC, receives its appropriations line items, it divides the funds among its nine regions. At the regional level, a leadership team including forest supervisors in the region divides the regional line item appropriations among different forests. One official in Case 1 indicated that these meetings can include heated debate over amounts allocated to different forests. Decisions are based primarily on past program levels at each forest and recognized needs (N1C2). For example, the Wayne National Forest includes a large amount of land that was degraded in the past, so it receives a large proportion of the region's soil and water restoration funds. Furthermore, forest budget requests come into play; if a forest requests only a small amount for a certain expanded budget line item, it is not likely to receive a large appropriation for that item.



On the national forest in Case 1, within-forest priorities must be determined among various programs. One member of the leadership team said that the sum of the forest's expanded budget line item requests to the region could not exceed a set figure, thus individuals had to, in a sense, compete with other team members on the forest (N1D2). The official remarked that useful justifications include linking desired activities to the forest Plan and to user demands and showing how certain expenditures would save money in the long run (e.g., preventative maintenance of facilities to avoid more costly future repairs).

While national forest program managers in Case 1 may feel some ability to affect their budget appropriations within the forest's appropriations, they also recognize the larger constraint from the forest's total appropriation. One official indicated that, in submitting the forest budget to the USFS regional office, there was little he could do to increase the forest-level budget, since the primary factors for determining allocations are past appropriations and Congressional and executive priorities (N1C2). The official also mentioned the importance of emphasizing special conditions on the forest. Of course, forest conditions such as past land degradation obviously cannot readily be changed by officials desiring higher appropriations.

National officials' sense of inability to influence appropriations levels in Case 1 is compounded by the lengthy budgeting process that clashes with constantly changing executive and legislative political priorities. National officials typically work on budget requests for three years in the future; in the fall of 1995, management team members were preparing the fiscal year 1998 budget request (N1I3). This long lead time makes it difficult to predict which line items Congress will prioritize. For example, if Congress were to increase wildlife funding and the management team had not requested a large wildlife allocation, then the forest would miss out on extra funds (N1I3).

In Case 2, officials on Indiana State Forests at the forest level prepare a budget request that includes estimated amounts for annual operating expenses on the forest, plus funding requests for a number of specific projects. The request is passed up to agency officials who compile requests from each forest, prioritize needs, and create an agency budget request that is

submitted to the natural resources department. The natural resources department, in turn, submits a budget request to the governor's office for consideration in the governor's request to the state legislature. Eventually the legislature passes a budget, which, when signed by the governor, allocates funds that are sub-allocated to the department and the forest agency in a number of broad "budget points": personnel, utilities, services, operating, equipment, workman's compensation, and travel. Funds for specific projects also may be allocated.

State officials in Case 2 listed several potential strategies to increase budget success. One local official said that public contacting of legislators or higher state agency officials, in support of specific projects, might lead to higher allocations (S2F3). He believes that the forest officials most successful in securing funding are those who can show that they are using funds efficiently and that they have public support. Another state official indicated that the best chance for increasing his budget would be to have constituent groups ask the legislature for higher funding (S2D1). Unfortunately, he added, such groups do not often follow this strategy.

A budgetary strategy that was not mentioned was increasing commodity production. Contrary to Hypothesis 3, state officials do not perceive a strong link between forest commodity production and appropriations levels. This finding is surprising in light of the fact that the forest agency has a dedicated fund with forest revenues accruing for future use by the agency. However, the appropriations process ensures that this dedicated fund does not provide budgetary rewards for increased commodity revenue. After revenues accrue to the dedicated fund, legislative authorizations tend to prevent higher agency earnings from yielding a larger agency budget. One state official explained,

The dedicated fund comprised about 82% of our total operating budget last year [1995]. The legislature has to allocate funds before we can spend them. They nearly always allocate the whole dedicated fund amount, and they add additional general revenue funds needed to provide an overall stable operating budget year to year. There's no budget incentive for us to earn more money from forest activities, since our bottom line won't change – if our revenues go up, the legislature will just reduce the portion of our funding that comes from state general revenues (S2I1).

Moreover, actions designed to increase forest revenue would require additional labor, which several officials feel that the agency could not spare (S2D1, S2F3).

Realistically, then, state officials see little opportunity to affect their appropriations levels. As one Indiana State Forest official said, "We have little influence over our appropriations -- by the time our request goes up to the department, the governor, and finally the legislature, there's not much we can do" (S2D1). Another said, "Regardless of our efforts, the operating budget is not likely to change from year to year" (S2I1).

National officials in Case 2 face a budgeting process similar to that described by national officials in Case 1. Budget team members on the forest negotiate among each other to produce a "constrained" line item budget that doesn't exceed a pre-determined maximum amount for the forest. This request is sent up to the regional office, where it is consolidated with other forests' requests and passed on to the USFS in Washington, DC, which consolidates it with other regions. The USFS budget request eventually passes through the OMB and into the President's budget request, then to Congress, which allocates funds in expanded budget line items.

Possible strategies for program managers to secure a larger share of the national forest total in Case 2 include showing that the funds will be used to reach Plan objectives (N2B1), addressing user health and safety issues (N2G2), and meeting output quantity targets previously approved by the regional office (N2G2). Such output targets include a variety of forest uses, including timber, wildlife habitat, trails, and recreational sites.

In general, however, national officials in Case 2 see little opportunity to influence their budget. One Hoosier National Forest official described the most important factor for increasing his budget as physical conditions clearly beyond his control: storm or insect damage that creates a need for treatment (N2J1). Another national official explained that, within the forest budget ceiling, it is important not to push too hard to take money from other programs, because being a team player in managing the national forest is critical (N2G2). From a total forest standpoint, one national official said, "There's not much we can do to improve the

budget; in fact, we're in a serious reduction mode now" (S1C1). Moreover, budgets are unpredictable, with the three-year budgeting occurring in an unstable political climate where it isn't known which line items will be favored by Congress in the future (S1C1). One Hoosier National Forest official put it succinctly, "It's all politics, not based on our arguments" (N2H1).

Therefore, as in Case 1, data from Case 2 do not support Hypothesis 3. State officials do not face greater appropriations incentives than national officials to focus on activities that create substantial, direct economic benefits. In fact, neither state nor national officials face strong appropriations incentives to undertake any specific management activities as a means to gain a higher appropriation levels. Rather, many perceive that appropriation amounts are largely beyond their ability to influence. For additional evidence regarding Hypothesis 3, Cases 3 and 4 are instructive.

In Case 3, officials on Washington State Forests receive funding from the state general fund as well as from revenue earned through the sale of forest commodities. For either source, the budget allocation must be authorized by the state legislature (S3D1). When asked to describe strategies helpful for increasing or preserving budget allocations, several officials suggested the importance of quantifying costs and linking the budget to specific outputs, especially those that generate revenue (S3D1, S3B1, S3K1). For example, one official noted the success of showing that funding to examine cellular phone tower leasing on state forests would more than pay its own way in future revenue (S3D2). Other state officials indicated that officials whose work is directly tied to timber sales have greater influence than those whose work isn't (S3K1, S3J1). While such strategies indicate incentives to generate revenue in order to receive higher budget allocations, the ability of an official to influence his or her budget should not be overstated. As one official said, "In the budget process, the budget goes through so many people that by the time it gets back to me, I have little influence" (S3B1).

National officials in Case 3 face a similar budget process as national officials in the other cases. In fact, suggested strategies for increasing or protecting their budget mirror those

indicated by national officials in Cases 1 and 2. For example, one official on the Gifford Pinchot National Forest said it is important to link funding in specific line items to specific outputs, especially those that improve forest user service or safety (N3J1, N3D1). It also is important to request higher amounts for line items that Congress funds more in a particular year (N3J1, N3I2). In addition, physical conditions beyond the control of the agency are critical, as damage caused by weather can provide an effective justification for additional funds to make repairs (N3F1, N3A1). Several officials said that proposed timber activities are likely to have greater funding success (N3L1, N3B1, N3K1). But other resources may also have funding success, including fisheries, watershed restoration, and recreation (N3B2, N3L1). In addition, cost savings may be important, if funding can be shown to reduce future costs by preventing facility deterioration (N3J1).

Despite these possible strategies, a number of national officials believe that they have little ability to influence budget amounts. As one official explained, "The budget is more a reflection of last year's budget, with little chance to shape appropriations" (N3E1). Another suggested that, for the timber program, the sale target level determined by the Plan dictated the maximum that would be funded for timber activities, so little influence was possible (N3F1).

Thus in Case 3 national officials described a mix of strategies for obtaining funds, including emphasizing timber activities but also a number of other strategies. These descriptions differ from state officials in Case 3, who suggested primarily that revenue-generating activities were more likely to lead to success in budget levels received. This difference provides supports for Hypothesis 3. But at both agencies, there were those who doubted their ability to impact budgets meaningfully.

In Case 4, officials on Oregon State Forests seek authorization from the state legislature for their budget. The operational budget is granted in two broad categories, Board of Forestry (county) and School Trust lands, rather than in multiple, narrowly-defined line items. Field-level officials request funds from area offices, which request money from the forest agency headquarters in the state capital. In making successful requests, one state official cited the

importance of encouraging constituent groups to contact legislators in support of budget requests (S4O1). Recall that state officials in Cases 1 and 2 also described this strategy.

Other budget request strategies perceived to be successful by state officials include focusing on activities that will generate revenue. For example, as one official explained, a successful argument could be made for hiring another forester to increase sale preparation for commercial thinnings, which generate revenue from the thinnings sold as well as from future increased timber value in thinned stands (S4I1). Another official stated that the agency usually has "no problem" in receiving requested authorizations, especially if the argument is made that funds will be used to increase intensive management for timber (S4E1). Certain non-timber activities related to long-range planning, such as developing geographical information systems or inventorying birds, water, and soil, may be similarly likely to receive funding (S4K1). But other non-timber activities are less likely to receive full funding requests. For example, recreation funds were not provided at requested levels during the most recent budget cycle, reflecting a general desire to reduce government spending (S4J1).

National officials in Case 4 expressed less faith in their ability to influence budget request success through any strategy. One Siuslaw National Forest official said, "There's not much we can do to increase our budgets, so we focus on stretching our dollars further" (N4B1). Another said, "I'm pretty cynical about the budget process, which starts from the ground up but by the time it gets to OMB and Congress and trickles back down in a mystical process, we get amounts decided by people who don't know our situations" (N4J1). Moreover, with the large number of line items for which officials receive funds, there is less flexibility by forest officials in applying funding than state officials have.

Nevertheless, several officials did cite strategies that may increase appropriations success. For example, proposing additional timber activities may be more successful than other strategies because "Congress likes timber production to create jobs and income for local economies and to supply timber for the nation" (N4J1). Even so, the agency's timber budget request is constrained by the fact that timber sales are limited to target levels set in the Plan

(N4J1). Other activities with better funding opportunities include activities for which planning already has been completed, such as stream restoration and road obliteration (N4G1).

Thus in Case 4, national officials expressed somewhat less optimistic views of their ability to influence budgets than did state officials. State officials described a primary strategy as emphasizing how funding would be used to generate revenue, while fewer national officials described revenue generation as a key to successful budget requests.

Overall, then, the evidence for budget request strategies is not convincing (see Table 4-2). In Cases 3 and 4, state officials indicated a stronger link between timber and revenue-generating activities and budget request success than did national officials. Even so, several state officials in Case 3 described an inability to influence their budget allocations meaningfully. In Cases 1 and 2, state officials did not describe revenue-generating activities as being significantly linked to budget request success. In fact, neither state nor national officials in Case 1 or 2 indicated substantial efficacy in influencing their budget allocations, regardless of strategies pursued. Considering all four cases, evidence does not indicate systematic differences between state and national officials' appropriations incentives. Rather, there appear to be some regional differences, with state officials in the Pacific Northwest indicating the strongest appropriations incentives to increase agency revenue and timber provision.<sup>12</sup>

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<sup>12</sup>This finding illustrates the importance of case selection that increases variance among forest pairs, as with this study, to avoid spurious claims about systematic differences between levels of governance.

Table 4-2

Summary of Officials' Appropriations Incentives

Strategy:	Agency Officials Indicating this is a Key			
	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
Increase timber provision	-- <sup>a</sup>	--	Both	<i>State</i>
Increase other revenue-generating activities	--	--	<i>State</i>	--

<sup>a</sup> Not indicated by either national or state agency officials  
*Italics* indicates support for Hypothesis 3

*User Payments*

While data regarding budget appropriations do not support Hypothesis 3, it is important to examine all sources of agency revenue. If state and national officials feel relatively powerless to affect their budget appropriations, perhaps they try to increase revenues from other sources. For example, with many individuals visiting the forests to undertake activities such as horse trail riding, off-road vehicle riding, camping, and special forest product collection, use fees might generate additional revenue. Furthermore, commodity production such as timber can generate substantial receipts. Based on Hypothesis 3, one would expect to find incentives encouraging state forest officials to generate revenue from user payments to a greater degree than incentives encouraging national officials to do so. While this hypothesis appears, at first, to be supported with regard to non-timber uses, in practice it is not. Nor is this hypothesis supported for the most significant non-appropriations revenue source, timber sales.



## **Non-timber Use Fees**

With regard to non-timber user payments, in Case 1, Ohio State Forest officials are allowed to collect and retain certain fees. The state agency chief may set prices and retain revenue for uses such as firewood collection, hiking, camping, and trail riding. Revenues generated from these payments accrue to the forest agency headquarters in the state capital. Since local and regional state forest officials do not retain such revenues, there is no direct revenue incentive for them to encourage fee-generating activities. Nevertheless, officials at agency headquarters potentially are motivated by the incentive structure that allows agency retention of such user payments.

This potential motivation is not realized in practice, however; officials do not view the arrangement as providing an incentive to collect use fees. Despite the rule allowing state forest officials to retain non-timber use fees for agency purposes, these officials realize that such revenues comprise only a small portion of the agency's revenues. Several officials cited this small contribution of use fees to revenues, as well as the high cost of collecting the fees, as discouraging efforts to collect more revenue from forest users (S1K2, S1F5). No state officials suggested that increasing efforts to collect use fees would be a worthwhile endeavor for agency revenue enhancement.

In fact, prior to 1995, the forest agency chief waived all recreational use fees, for financial reasons of another type: liability. In case of injury, a forest user who has paid a use fee for a trail or campsite on a state forest has a potential liability claim against the forest agency. If no fees are collected, then the state is less likely to be liable for costs associated with injuries. Therefore state forest officials can reduce the potential for large economic losses by waiving use fees (S1H4). Thus, while the hypothesis that state forest officials are more likely to encourage use fees is not supported, the underlying theory that state level officials are highly focused on economic concerns is supported.

Like state forest officials, national forest officials in Case 1 collect revenue from non-timber forest activities, though rules specifying what fees may be collected are more stringent than state officials face. Federal law (16 USCA 460 l) specifies that national forest officials may not collect use fees for entrance into a general area for recreational use (although they may circumvent this rule, to some extent, by charging fees for parking in a recreational area that is not readily accessible without a motorized vehicle). The same law prohibits the collection of use fees for camping unless the facilities meet certain minimum standards, including tent or trailer spaces, drinking water, road access, garbage containers, toilets, picnic tables, reasonable visitor protection, and campfire containment devices.

Whereas the state agency in Case 1 retains 100% of the non-timber use fees it collects, the national forest agency retains just 15% of its non-timber use fees. Furthermore, this revenue is not available for general forest expenditure; rather, it must be invested back into the resource that generated it, for example a specific campground (N1C2). Thus, one national official indicated that, considering the expense involved in collecting fees and maintaining facilities, increasing use fees would not be an effective way to raise revenue for managing the forest, as the net effect would be to lose money (N1C2). Therefore, like state agency officials, national officials in Case 1 do not face significant incentives to undertake activities to generate revenue from users.

Analysis of non-timber use fees in Case 2 indicates findings similar to those in Case 1. At the state level, non-timber use fees collected from Indiana State Forest users are deposited in a dedicated fund for the state forest agency as a whole. Thus local officials do not gain direct economic benefits from increasing use fee collection. Higher-level agency officials, on the other hand, might be expected to increase use fees if that would translate into higher levels of agency funding. But, as described in the appropriations section above, in Case 2 the state forestry dedicated fund is not available for agency use until legislators allocate it through the legislative appropriations process. Since legislators tend to appropriate the same total level of funding from year to year, an increase in dedicated fund money would be offset by a decrease

in general revenue money. Thus, from agency officials' perspective, there is little budgetary advantage in collecting higher levels of use fees.<sup>13</sup>

Even if state agency officials in Case 2 did seek to increase use fee revenues, they would be constrained in their ability to do so, for two reasons. First, all use fees on state lands are determined for the entire natural resources department. One forest official explained, "The parks division takes the lead in establishing visitor fees such as camping on all state properties" (S2D1). Second, Governor Evan Bayh recently undertook an initiative to reduce use fees statewide, cutting many by as much as 50% (S2G2). Thus, without budgetary benefits associated with increased use fees, and with limits on their ability to set use fee rates, state officials do not have incentives to increase use fee collection.

Nor do national officials in Case 2 face incentives to increase non-timber use fees. As described above, national officials may charge such fees only if facilities meet legally defined standards. Moreover, Hoosier National Forest officials retain only 15% of use fee revenue collected, and that money must be spent on the facilities that generated it.

An interesting rule that does affect use fee collection on national forests relates to concessionaires. Concessionaires are private contractors who agree to provide services on national land to earn revenue, in exchange for which they pay a portion of their revenues to the USFS. They may pay their due in one of two forms: (1) a monetary sum to the U.S. Treasury, or (2) in-kind goods or services of equivalent value to the local forest. National officials in Case 2 prefer that the payments be made in-kind to their forest, rather than remitted to the "black hole" in the Treasury. Moreover, the concessionaires may believe that investing locally can increase their business. Thus both parties have a strong incentive to see that the revenue sharing is through local improvements rather than a check to the Treasury. National officials on the forest work out agreements with concessionaires, as one official described:

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<sup>13</sup> It is the state legislators who may face incentives to raise fees, since increased user payments could be used to offset reduced spending from the state general fund. However, Indiana legislators have not pursued this action.

For example, we'll say, 'If you provide X picnic tables, we'll consider it to be worth \$ Y.' Perhaps the concessionaire can do it himself or get a favorable contract to complete the project for less than \$ Y. That way, he can benefit and the forest gets the additional picnic tables (N2G2).

In fact, concessionaires operate all but one national forest campground in Case 2. Officials would like to concession this one exception as well, but the area has relatively low use and income potential, so no concessionaires have been willing to bid for the contract (N2G3). Thus, in Case 2, national officials have strong incentives to shift recreational service provision and fee collection to private contractors. Officials also view such a shift as a viable strategy for keeping camping facilities open in the face of declining recreational line item allocations from Congress. But national officials, like state officials, do not face incentives to collect additional non-timber use fees.

In Case 3, the potential exists for Washington State Forest officials to increase budgetary resources through use fee collection. A share (25% for school trust lands and some county trust lands, 50% for other county trust lands) of all use fees collected goes into the fund from which the legislature allocates the agency's budget (S3B2, S3D1). But the incentive to increase use fee collection is diminished by liability concerns. As in Cases 1 and 2, state officials in Case 3 fear greater risk of liability lawsuits for paying injured recreationists, which could substantially impact agency resources (S3D1). State officials also question whether the share retained by the agency would cover costs of collection. Hence, as in Cases 1 and 2, financial considerations limit the incentive for state officials in Case 3 to increase use fee collection.

National officials in Case 3 face similar restrictions on use fee collection as do their counterparts on other national forests. Since only 15% of fees collected stay on Gifford Pinchot National Forest, there is little incentive to increase use fees. As on other national forests, concessionaire payment arrangements and limited agency recreation budget allocations

provide an incentive to shift fee campground management to private concessionaires. Thus officials have contracted out management of most campgrounds (N3E1).

In Case 4, Oregon State Forest officials potentially face an incentive to charge use fees as a way to increase budgetary resources. Fees collected accrue to the state agency headquarters, where the trust beneficiary share is paid (63.75% to counties, 100% less management expenses to schools) and the rest is available for the agency to use, following authorization by the state legislature (S4-7, p. 2; S4H1). However, financial considerations temper the incentive for state officials to increase use fee collection. Officials fear that, if fees are set too high, then more users might avoid payment, necessitating expending greater agency resources for monitoring (S4H1).

National officials in Case 4 see a growing potential for generating revenue from use fees, especially for permits to collect commercially valuable special forest products such as floral greenery, mushrooms, and cedar boughs. But they are frustrated by the incentive structure that transfers 85% of such fees to the Treasury, rather than allowing them to stay on Siuslaw National Forest for developing the special forest product program (N4J1). With a steadily declining recreation budget, staff are constrained in their ability to increase recreational use fee collection, which generally requires more resources than are generated from the 15% of use fees that stays on the forest (N4B1).

An interesting development regarding use fee collection on the Siuslaw National Forest involves an experimental program to alter the use fee revenue structure. In April 1996, Congress authorized a three-year pilot program allowing participating Federal agencies to develop new use fees and retain most of these new revenues for use at the site where they are collected (PL 104-34). Thus officials have greater opportunities to gain and retain use fees to increase their budgets. As this program is in its infancy, results are not yet available to examine the significance of this incentive in altering use fee collection on national forests. But several national officials described the new program as a helpful opportunity to fund popular recreation sites at higher levels. As one official said, "This is a good program -- I think it

represents the future of forest management here, where we are able to gain economic benefits from many non-timber resources" (N4J1).

Raising substantial amounts of non-timber use fees through such a pilot program on national forests is by no means assured. As state forest agency officials have discovered already, allowing an agency to retain use fees for its own expenditures may not lead to significant use fee collection. Liability and collection cost concerns create important obstacles to the success of forest use fee program.

Considering Cases 1 through 4, non-timber use fee revenue structures in place in fiscal year 1995 provided only limited incentives for increasing use fee collection by state and national officials. This finding does not support Hypothesis 3. While state agencies accrued a substantial portion of use fees collected to the agency headquarters, state officials were hesitant to increase non-timber use fee collection because of liability concerns and financial concerns relating to costs of monitoring and collection. Similarly, national officials did not perceive raising non-timber use fees to be an effective means to increase revenue, because of the revenue sharing formula that retained only 15% of revenues on the forest where use fees were collected and also because of the costs of monitoring and collection.

### **Timber Sales**

Non-timber use fees related to recreation and special forest products, described above, comprise a relatively small portion of revenue for the forest agencies. A more important potential revenue source is the sale of standing trees for timber to private contractors. Data indicate that, contrary to Hypothesis 3, rules do not provide stronger revenue incentives for state than national officials to sell more timber.

In Case 1, Ohio State Forest officials do not retain any revenues from timber sales. Instead, all stumpage<sup>14</sup> payments accrue to the state general fund. Interestingly, this rule for timber revenue accrual used to be different – several years ago the rule prescribed that the state forest agency would retain timber revenue to fund its own programs. But agency officials requested the change, negotiating a new rule whereby they would give up timber revenue in exchange for a higher biennial appropriation level (S1A1).

Agency officials who pushed for this change preferred the uncertainty of legislative appropriations to the uncertainty of fluctuating timber prices and harvests, since loggers do not make stumpage payments until after they complete a harvest. A typical contract provides a two-year period in which the contractor must harvest and pay for the timber (S1E2). When timber prices are low, many contractors choose to defer harvesting in hopes of higher prices later, which causes a downturn in state forest stumpage revenue in the current time period.

Unlike state forest officials, national officials in Case 1 are entitled to retain a share of timber revenue for use on Wayne National Forest, through the Knutsen-Vandenberg Act (1930). Thus national officials face a possible direct incentive to increase timber production. Moreover, the share of timber revenue retained is based on gross receipts rather than on net profit, leading a number of scholars to argue that USFS officials have an incentive to over-harvest forests, selling timber at "below cost" prices to increase revenues for their budgets (see, for example, Budiansky 1991, O'Toole 1988, Rice 1989).

For the national forest in Case 1, however, such criticism is misplaced. Although the rules appear to provide a strong incentive to over-harvest, in reality national officials do not view the Knutsen-Vandenberg (K-V) Act as an important factor in timber sale decisions. Use of timber revenues on a particular national forest is constrained by USFS regional limits. As one official explained,

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<sup>14</sup>Stumpage refers to the right to harvest a given set of standing trees.

K-V funding is not a reason to have a sale. We do timber sales for forest health and ecosystem reasons, with K-V funding as a possible benefit, so long as the regional ceiling has not been reached. But if other forests are ahead of us in line for funding from the region, then we may not receive any such K-V funds (N1C2).

Another national official in Case 1 noted that, since the use of K-V funds is limited to projects within the timber sale area, sometimes part of the funds to which the forest is otherwise entitled are unneeded and thus revert to the Treasury (N1H2). For example, in one recent timber sale, officials budgeted only half of the allocated K-V funds for work in the timber sale area, returning the rest to the Treasury. Therefore, in Case 1, timber sales do not provide the K-V windfall that some scholars have suggested.

Analysis in Case 2 suggests similar results; neither state nor national officials face significant incentives to increase timber sales in order to enhance their budgets. On Indiana State Forests, timber sales revenues accrue to a dedicated fund, but the agency must seek authority from the state legislature to spend these revenues. Neither local nor headquarters forest officials see a direct link between timber revenue and agency revenues. For example, one state official noted,

The dedicated fund is not a revolving fund; we don't use in one year what was earned the previous year. Instead, dedicated fund money goes through the appropriations process, which I believe is good as a safeguard against short-term thinking, and it reduces our incentive to focus on maximizing revenue (S2D1).

Similarly, national officials in Case 2 lack financial incentives to increase timber sales. On the one hand, K-V funds may be made available as a result of timber sales. One official suggested that such revenue can be very useful for performing work in the sale area, such as wildlife openings, trail maintenance, and stocking surveys (N2J1). However, the K-V revenue requested for the most recent sale amounted to just \$4,000, a trivial proportion (0.1 %) of the



agency's operating expenditures for managing public forest lands (S2-4). A national official explained,

On this forest, K-V funds are not a significant enough amount of money to provide a reason to harvest more. The money is to be used for specific projects, like reforestation, TSI [timber stand improvement], or wildlife habitat in the sale area. You have to balance the extra funds with the need to provide the extra work. I've heard some critics say the foresters are doing sales to get K-V money, but I don't know anybody who's drumming up sales in order to increase K-V funds (N2F1).

In Case 3, state officials do not gain revenue directly from timber sales. Rather, as described in the appropriations discussion above, a portion of timber sale revenue accrues to a dedicated fund, which agency officials may spend only after legislative authorization (S3D1). Thus the budget is only indirectly tied to timber sales. While timber sales provide an important argument when the agency makes its budget request, the connection between increasing timber sales and receiving higher budget allocations is weak. One state official explained that, no matter what the argument, the agency expects that the legislature will not often allocate the budget amount requested by the agency (S3D3).

National officials in Case 3 are entitled to keep certain revenues earned through timber sales. K-V funds are a useful by-product of timber sales for the national agency; in fiscal year 1995, Gifford Pinchot National Forest received \$0.9 million in K-V funding, which represented 5% of its total operating expenses for public forest land management (N2, N3-2). Moreover, national officials use a revolving salvage sale fund, comprised of revenue from salvage sales (trees that are diseased or dying, or in imminent danger of becoming diseased or dying), to prepare additional salvage sales on the forest. In fiscal year 1995, officials on Gifford Pinchot National Forest collected \$1.3 million in salvage sale revenues, which represented 7% of the agency's total operating expenses for public forest land management (N2, N3-2). Thus timber sale revenues are directly tied to about 12% of the agency's operating expenditures. But their

significance as an incentive is tempered by other constraints that limit the amount of timber that officials prepare for sale. One Gifford Pinchot National Forest official explained, "We haven't increased sales to get more K-V funding. We do what's best for the land, working toward our seventy-three million board feet target, which we haven't reached yet" (N3F1).

In Case 4, as in Case 3, state officials do not directly gain revenue from timber sales. Rather, budget allocations are made by the state legislature from timber sales and other agency revenues. Thus the budget incentive to increase timber sales is indirect. However, state officials report that authorizations are not a significant limiting factor, because the agency usually is authorized to spend whatever it requests, so long as the resources are present in the forest management fund. One state official commented, "We have no problem getting legislative authorization. We've even gone back to ask for supplemental authorization and, as far as I can recall, we've never been turned down" (S4E1). Another state official concurred: "I usually get what I ask for in authorizations" (S4O1). Therefore, the incentive to increase timber sales is strong, since officials expect to be able to use these earnings to fund agency expenditures.

National officials in Case 4 face an incentive to sell more timber to increase the agency's budget. In fiscal year 1995 Siuslaw National Forest officials received \$2.9 million in K-V funds and \$0.3 million in salvage sale funds, which together totalled 23% of the agency's operating expenses for public forest land management (N2, N4-7). But K-V and salvage revenues are not key determinants of timber sales, since the use of these earnings is limited to specific project work or additional salvage sales. One official explained, "K-V earnings are not a reason to put up more sales, because we're limited by Plan targets and small number of staff" (N4C1).

### *Summary of Revenue Incentives*

With respect to revenue incentives, comparing state with national agency rules does yield some support for Hypothesis 3. For the largest share of forest agency revenues, budget appropriations, state officials in Cases 3 and 4, as well as national officials in Case 3, perceive a useful budget strategy to be increasing activities that generate timber. However, this is not true of state officials in Cases 1 or 2. Thus there appears to be somewhat of a regional difference, with timber revenues being stronger in the region where timber is in higher quantities and more important to the regional economy. However, throughout all of the cases, officials indicate a generally low level of efficacy regarding their ability to influence budget allocations, no matter what their strategies.

Nor do non-timber user payments provide significant revenue incentives. For state officials, the low proportion of agency revenue coming from non-timber use fees, combined with the drawbacks of use fee liabilities and collection costs, or inability to affect use fee rates, militate against revenue incentives that might otherwise promote activities with substantial, direct economic benefits. Similarly, non-timber use fees do not provide revenue incentives for national officials, who are allowed to collect fees only under certain conditions, and who face collection costs that easily exceed the 15% fee share that is retained.

With regard to timber revenue, at the state level, the accrual of stumpage receipts to the state treasury (Case 1) or to a dedicated fund subject to conservative legislative appropriations (Cases 2 and 3) means that officials lack revenue incentives for boosting timber sales. However, state officials in Case 4 do have incentive to increase timber sales, since sale earnings that accrue to a forest management fund generally are made available by the legislature for forest officials to spend. National officials, meanwhile, may earn revenue for the forest through timber sales through K-V funding or salvage sales. However, across the national forests, officials described spending restrictions that limit the motivating power of this

incentive in practice. Thus, contrary to Hypothesis 3, budgetary incentives do not encourage state more than national officials systematically to promote uses with direct economic benefits.

### Officials' Performance Evaluations

In addition to agency budgetary resources, a second important type of incentive is officials' performance evaluations. Every agency official reports to a supervisor, who provides some level of feedback and evaluation of the supervisee's work. Officials, especially those who choose to remain with the agency for many years, are expected to value their membership and career success in the agency, which depend on supervisors' approval of their job performance.

For this study, officials described the criteria on which their supervisors judge them, to test Hypothesis 4: officials' performance evaluations favor activities with direct economic benefits more at the state level than the national level. Data do not support Hypothesis 4, as state criteria do not strongly feature either economic output or environmental protection, while national criteria include both. Moreover, across the agencies, other criteria are viewed as more important than specific outputs.

In Case 1, officials on Ohio State Forests described a range of criteria on which they are evaluated. One state official described three equally important areas: (1) managing the resource properly (especially timber and recreational use), (2) managing personnel, and (3) working with local officials and the public (S1J4). Another state official said the most important evaluative criteria involve working with constituent groups and performing administrative duties such as personnel management and equipment maintenance (S1E3). A higher-level state official also cited the importance of working with constituents, especially local communities (S1K2).

In addition to public contacts and administrative functions, officials mentioned other criteria. One state official in Case 1 observed that employees are rewarded for finding ways to

save money. Another Ohio State Forest official complained that too much evaluative emphasis is placed on work quantities, such as timber sales prepared, equipment maintained, and forest acres inventoried, rather than on comparing accomplishments to goals (S1C1). But two other state officials in Case 1 said that output quantities are not an important evaluative criterion for their performance (S1K2, S1H2). Ohio State Forest officials also pointed to a list of expectations that apply to employees statewide. The list is prioritized, with officials expected to accomplish the top items before focusing on the bottom part of the list:

1. timely administrative functions
2. health, safety and welfare of people and resources
3. training and quarterly contact of volunteer fire departments
4. contacts with township trustees and county commissioners
5. vigorous fire law enforcement
6. state legislative and constituent contacts
7. timber sale administration and reclamation
8. forest fire suppression and assistance to volunteer fire departments
9. effective wildfire prevention
10. roadway maintenance and co-op agreements
11. timber stand examinations per plans and management objectives
12. recreation facilities and trails maintenance
13. compatible timber sale offerings per cruises and zoning
14. structure and facility maintenance
15. grounds maintenance and mowing
16. support to other activities and programs

Note that the top priority involves performing administrative functions. In fact, one state official lamented that the list places too much emphasis on administrative functions over caring for forest resources (S1F5). The second highest priority involves health, safety, and welfare, an item that is further emphasized by fire control priorities (#3, 5, 8, and 9). Another high priority item is contacting local officials and others outside the agency (#3, 4, 6). While timber-related activities (#7, 11) are further down the list, they rank just ahead of recreation activities.

National agency officials in Case 1 described a wide range of evaluative criteria. The forest supervisor and program managers on Wayne National Forest share the same criteria,

including communications, external relations, teamwork, output targets (visible accomplishments such as miles of stream surveyed or board feet of timber sold), and workplace conditions. The latter, identified by one official as the most important criterion, includes attention to health, safety, training, and a supportive, nondiscriminatory work environment (N1C2). Another official identified external relations and teamwork as the most important evaluative criterion (N1A1).

Output targets described by several national officials in Case 1 are quite extensive. One official said he is accountable for over twenty-five targets, including wildlife coordination activities, wildlife structures built, wildlife acres improved, threatened and endangered species activities, timber stand improvement treatments, and timber sales prepared (N1I2). While all targets are important, he said that top priority goes to mandated activities such as threatened and endangered species work. Another official said that priorities among his many targets are determined based on current projects and line item budgets (N1H2).

In Case 2, no officials on Indiana State Forests described outputs with substantial, direct economic benefits as more important than other evaluative criteria. One state official indicated that his supervisor expects him to attain several resource management objectives, including boundary lines checked, timber stand improvement (TSI) completed, tree stands inventoried, and timber sales completed (S2I2). Another state official said that his most important performance criteria emphasize planning, facilities and recreation management, resource management, and personnel responsibilities (S2F5). Although he does work toward timber sale targets, he can easily reduce these targets by requesting a change from his supervisor, when resources are needed for other efforts.

A higher-level state official in Case 2 said that his evaluative criteria focus on affirmative action, personnel management, and liaison work with constituent groups and other agencies (S2D1). He also cited "budget control," which refers not to generating economic benefits, but to keeping expenditures within budget targets. Moreover, he said, "I have never

been asked how much revenue I generated." Nor does he face output targets for timber, wildlife, camping, or any other management activities.

When asked about what activities are most likely to result in promotions, state officials in Case 2 did not emphasize the production of direct economic benefits. One official said that promotions are based on "doing your job well, doing more than it requires, showing leadership on programs or task forces, avoiding complaints, and working well with the community" (S2F5). Another stressed the importance of achieving job goals (which typically do not focus on promoting economic benefits) and of finding ways to perform work easier or better (S2G2). Clearly these state officials do not face strong evaluative criteria promoting production of economic benefits. Moreover, few tangible rewards are linked to any of the evaluative criteria. Annual reviews are not tied to salary increases, bonuses, or other recognition (S2D1, S2G2, S2F5).

National officials in Case 2 indicated that performance appraisals feature a number of important criteria, including environmental protection as well as outputs with substantial, direct economic benefits. One Hoosier National Forest official noted that he is accountable for targets in timber, wildlife structures, recreation, mineral cases, land exchange, older American program work hours, reforestation, TSI, habitat enhancements, and many other areas (S1C2). A national official who has responsibility for silvicultural activities indicated that, while timber targets are important, other key targets include environmental assessments, silvicultural prescriptions, and TSI work (N2J1).

In addition to output targets, national officials in Case 2 cited evaluative criteria including "advice and counsel," teamwork, public health and safety, and affirmative action. One official listed communication effectiveness, customer satisfaction, team participation, and program implementation as critical (N2B1). Another said that work quality and quantity, team participation, external relations, and civil rights all are important criteria (N2E2). One national official stressed the importance of interacting with the public and agency personnel, promoting

safety, and supporting agency work through technical reports and computer applications (N2J1).

Unlike state officials in Case 2, national officials may receive tangible rewards tied to performance appraisals. For example, good performance review scores can lead to cash awards or to increases in step level within a pay grade (N2C1, N2G3). However, such rewards are viewed by some as only weakly correlated with job performance:

Awards and recognition depend a lot on who your supervisor happens to be. In one office I worked my butt off, 90-100 hours per week, but the supervisor didn't give any awards. Then a new supervisor came in, and, even though I had reduced my hours, I started getting awards (N2C1).

Another national official expressed a similar view:

Awards, certificates, and recognition make you feel good and appreciated, and they look good on a resume. But they depend a lot on your supervisor. You could be working very hard and not get recognized, while another person with a supervisor who likes to give out rewards gets them without working as hard (N2G3).

Thus the link between actions and rewards is weakened, which decreases the power of performance appraisals to shape behavior.

In Case 3, officials on Washington State Forests did not emphasize economic production as a key evaluative criterion. Instead, important criteria include supervisory skills, communication, accepting responsibility, and completing work in a cost-efficient manner (S3J1). One state official mentioned the importance of using appropriate chains of command and not "making waves" in the organization (S3K1). Another did say that timber harvest levels and successfully arguing for his budget were the most important criteria (S3D2). But even so, performance evaluations are not linked to salary. Instead, salary is tied to length of service and



position within the organization (S3J1). Of course, an employee can gain a higher position through promotion, but promotions are linked less to specific outputs or technical skills than to communication, interpersonal skills, and diverse experience (S3C2, S3J1, S3D2).

National officials in Case 3 are evaluated on a wide variety of criteria. Depending on position responsibilities, performance evaluations may include a number of output targets ranging from timber to stream surveys to wildlife projects to recreation facilities. Two officials with responsibilities across several Gifford Pinchot National Forest programs indicated that timber is especially important in light of the dramatic timber sale reduction in the past few years and the importance of timber to the local economy (N3B2, N3A1). Across positions, officials listed several common criteria, including communication, supervision, external relations, teamwork, civil rights, plan implementation, and budget management (N3E1, N3I1, N3D1, N3J2, N3B2, N3L1). High marks on officials' performance evaluation may be rewarded with monetary bonuses, salary increases, and certificates. Another possible reward for good work is promotion. In describing criteria for promotions, one official said that timber program employees tend to be more successful than others (N3I1). But most officials indicated that, in promotion decisions, output accomplishments are less important than are networking and geographic mobility (N3E1, N3I1, N3J2).

In Case 4, performance criteria for state officials on Oregon State Forests include a variety of items. The most important criteria include working relationships with constituents, timeliness of project completion, problem solving, and employee supervision (S4K1, S4I1, S4E1, S4O1). While output quantities including timber are important for some employees, they are not a dominant criterion for evaluation (S4K1, S4I1). Moreover, there are few direct rewards tied to performance. One state official explained,

Raises can come by increasing to another step within a pay classification, but if you're at the top step, then to get a raise you must be promoted to a different position with a higher pay classification. I haven't had a raise in six years, not even a cost of living increase (S4K1).

Important criteria for evaluating national officials in Case 4 include supervision, human resource management, leadership, program direction, external relations, and budget management (N4K1, N4G1, N4J1, N4B1). Some Siuslaw National Forest officials do have output targets, which, depending on the position, may include timber sold, habitat work completed, fisheries projects undertaken, or others (N4G1). In fact, with the substantial decrease in timber sales over the past several years, timber goals are viewed as particularly important (N4J1). As in other national forests, rewards for high performance include cash awards, step increases within a pay scale, and promotion.

When asked who tends to be promoted most easily, one national official in Case 4 said that employees working in timber used to be favored for higher grade jobs, but that now there is no particular area that is favored (N4K1). The traditional domination of foresters at upper levels of management seems to be changing, as the older generation of officials retires (N4L1). Thus timber production may be less important in performance evaluations than it once was, as a wide variety of performance criteria are important. Nevertheless, timber outputs remain one important criterion, in part, because of the substantial decrease in allowable timber sales on Siuslaw National Forest over the past several years.

Considering all four cases, comparison of state to national forest agency performance evaluation criteria does not support Hypothesis 4. Both national and state agencies emphasize administrative and workplace environment performance, as well as contacts with individuals outside the agency, as key criteria. Economic output levels are not a high priority criterion for state officials, nor is environmental or species protection. Environmental protection items do appear on national officials' evaluative criteria, in the form of output targets for activities such as endangered species work and reclamation activities, but economic output levels also are part of some national officials' criteria. Thus analysis does not support the systematic difference between state and national incentives that Hypothesis 4 suggests.

## Conclusion

Analysis of budgetary and performance evaluation incentives that officials face allows empirical testing of Hypotheses 3 and 4. Comparison of state and national rules about these incentives does not provide support for these hypotheses.

Hypothesis 3 suggests that state officials face greater budgetary incentives than do national officials to pursue activities with substantial, direct economic benefits. But analysis indicates that in only two cases (3 and 4) do state officials face budgetary incentives to pursue such activities. Even in these cases, such incentives are weakened by officials' perceptions that they have little ability to influence revenues available to them. In Cases 1 and 2, budget incentives do not significantly encourage either state or national officials to emphasize commodity production or other uses with substantial, direct economic benefits. Increasing forest economic benefits is not expected to lead to higher agency funding levels. In fact, funding mechanisms prevent state agencies in these cases from directly using their revenues to fund their activities. Moreover, most state and national officials in these cases perceive little ability to influence funding amounts, no matter which activities they promote.

Chapter 3 described differences between state and national agency goals and mission statements. State agency statements emphasized the provision of activities with substantial, direct economic benefits more than did national agency statements. However, budgetary incentives do not foster such activities more among state than national officials. This incongruence illustrates the importance of factors external to the agency. In a democratic governance system, checks and balances impede officials' ability to pursue agency goals independently. Institutional arrangements such as legislative budget allocation and authorization procedures affect an agency's budget resources. Even the use of funds that agency officials generate from commodity sales or use fees may be constrained by rules requiring legislative authorization or accrual to a general treasury. Such rules affect state and

national officials, reducing incentives to engage in certain behavior to augment budgetary resources.

An important conclusion about budgetary incentives is that scholars who claim officials at lower levels of governance are more likely to collect use fees to pay for services, thus enhancing economic efficiency, must recognize that impediments to such revenue generation are inherent in a governance system with checks and balances. Devolving policy responsibility to lower levels of governance will not lead to high levels of fiscal equivalence unless policy makers overcome disincentives for agencies to collect use fees. This lesson, clearly illustrated by institutional arrangements that reduce state forest officials' incentives to collect use fees, is applicable to policy in any area where agency decision makers have the potential to generate revenue from service recipients. Simply devolving authority to lower levels of governance without addressing budget allocation rules will not encourage greater use fee collection.

Hypothesis 4 suggests that officials' performance evaluations favor activities with substantial, direct economic benefits more at the state level than the national level. However, data do not support this hypothesis. State officials discussing their evaluative criteria did not indicate that supervisors weigh heavily economic outputs. In addition, state officials reported a distinct lack of tangible rewards associated with high performance ratings. Meanwhile, national officials' evaluative criteria include a number of items, including economic outputs such as timber sold and numerous non-economic elements. These diverse criteria reflect a recognition that, despite the value often placed on cost-effective and economically efficient administration of government policy, performance measures in a public agency cannot be reduced to revenue or profit as a bottom line. In federalism debates centering on economic efficiency at different levels, it is important to recognize the wide range of goals that citizens demand of public organizations. To encourage public employees to pursue specific outputs, existing incentive structures would need to be altered to emphasize these outputs above the many other evaluative criteria currently in use.

Without evidence that budgetary and performance evaluation incentives differ in ways that Hypotheses 3 and 4 suggest, it may seem that rules do not create significant differences between state and national agencies. However, to complete analysis of incentives and constraints, we must examine the constraints that officials at these two levels face. As will become evident in Chapter 5, it is here that significant differences are apparent.

## Chapter 5: Statutory and Planning Document Constraints

While rules creating incentives, described in Chapter 4, do not differ systematically across levels of governance, it is important also to examine rules that constrain forest officials. The study of rules, or institutional arrangements, provides valuable insights into individuals' actions. In any area of public policy, rules provide a means to affect bureaucratic behavior. An important category of rules is legal constraints, codified in statutes and their implementing regulations. In a democratic polity such as the United States, statutory and regulatory constraints aim to foster bureaucratic responsiveness to elected officials and the public.

A rich body of literature describes relationships between elected officials and non-elected bureaucrats, much of it emphasizing how elected officials influence bureaucratic behavior through various methods, including statutes. As Moe (1989) argues, legislators often create rules to constrain bureaucratic discretion and prevent changes in the future from legislators with opposing views.

In understanding public policy within a federal system, such legal constraints provide a means to extend Peterson's (1995) functional theory to bureaucrats. Peterson addresses the behavior of elected officials, who, he argues, are encouraged through electoral mechanisms to pursue economic development policies more at lower levels of government. Any lower-level elected officials who fail to encourage economic development face defeat in elections. Of course, non-elected bureaucrats are not subject to such "corrective" mechanisms. However, they are subject to rules created by elected officials. Thus elected officials at different levels of governance may create different rules to constrain bureaucrats. Specifically, statutory and regulatory constraints are expected to foster greater economic development at lower levels of governance. Empirical testing of this expectation permits evaluation of this extension of the functional theory to bureaucratic policy makers in a federal system. It reveals the degree to which constraints on bureaucratic behavior vary systematically across levels of governance.

In addition to statutes and regulations, a second category of constraints facing agency officials is agency-created planning documents. Agency officials can influence behavior of their subordinates through creation of standard operating procedures and plans that guide officials' activities (Kaufman 1960). Planning documents reflect the preferences of the individuals who create them. Planning documents created and enforced solely by agency officials may be very different than planning documents created and enforced by agency officials in conjunction with external parties. In fact, strategic legislators with preferences different from agency bureaucrats may enact legal requirements to involve external parties in creating and enforcing agency planning documents.

Peterson (1995) argues that planning is less open at lower levels of government, where economic interests dominate. Thus, compared to lower levels of governance, planning documents at higher levels of governance should reflect more input from parties outside the agency and thus more constraints on bureaucratic behavior. Furthermore, planning document constraints at higher levels of governance should include more restrictions on activities that generate substantial, direct economic benefits. Comparison of agency planning documents provides important empirical evidence to examine policy processes in a federal system.

This chapter describes analysis of constraints relating to planning documents as well as to statutes and regulations, in order to evaluate two hypotheses. First, Hypothesis 5 addresses the overall level of constraints, suggesting that national officials face more constraints than do state officials. Second, Hypothesis 6 addresses the substantive nature of constraints, suggesting that constraints foster greater efforts for environmental protection at the national level while constraints foster greater efforts for activities with substantial, direct economic benefits at the state level. Analysis supports both of these hypotheses.

### Statutory and Regulatory Constraints

Statutes and regulations are rules that constrain agency officials. Legislatures, with input from chief executives (president or governor) and perhaps administrative officials, create statutes, while chief agency officials issue regulations to comply with specific statutes. Both statutes and regulations constrain agency officials, through either planning process requirements or constraints on forest activities on the ground.<sup>15</sup> Moreover, agency officials may act in ways calculated to preempt anticipated statutes.

#### Planning Process Requirements

One important category of rules that constrain officials' behavior involves planning processes. Data regarding planning process requirements support Hypothesis 5; national forest officials face more constraints than do state forest officials on how they go about planning forest management activities.<sup>16</sup> The most important planning process constraints affecting national forest officials come from the National Forest Management Act (NFMA) of 1976 and the National Environmental Policy Act (NEPA) of 1969, which require comprehensive planning and extensive public involvement.

NFMA and its implementing regulations require the creation of a "Land and Resource Management Plan" ("the Plan") for each national forest every ten years. The statute directs

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<sup>15</sup>Planning processes occur at the collective choice level of action, where actors make decisions about items such as forest management direction, budget priorities, and agency rules or standard operating procedures. Activities on the ground constitute the operational level of action, including such activities as marking trees for harvest, inventorying stands, conducting surveys, building habitat structures. See Chapter 1 for further discussion of levels of action.

<sup>16</sup> It is important to note the distinction between planning process requirements, which constrain how officials go about creating their planning documents, from the resulting constraints included in the completed planning documents (the latter are discussed extensively later in this chapter). For example, a planning process requirement may demand that agency officials specify zones on the forest in which timber harvesting will occur. A completed planning document that is in compliance with such a process requirement would include maps showing where such zones have been designated on the forest.



planners to "provide opportunity for public involvement" and to "consult with other interested governmental departments and agencies" in creating the Plan (16 USCA 1601 c). It provides significant detail regarding public input standards:

[The agency must encourage] public participation in the development, review, and revision of land management plans including, but not limited to, making the plans or revisions available to the public at least three months before final adoption, during which period the Secretary shall publicize and hold public meetings or comparable processes at locations that foster public participation in the review of such plans or revisions (16 USCA 1604d).

Moreover, NFMA requires the creation of implementing regulations that "establish procedures, including public hearings where appropriate, to give the Federal, State, and local governments and the public adequate notice and an opportunity to comment on the formulation of standards, criteria, and guidelines applicable to Forest Service Programs" (16 USCA 1612a). In fact, national officials send a copy of the Plan, free of charge, to anyone requesting it.

In addition to procedural requirements for public involvement, NFMA and its implementing regulations also specify criteria to be included in Plan formulation. For example, planning must include consideration of a broad range of alternative levels of forest outputs. Officials must calculate the financial impacts, including net present value estimates, of suggested alternatives. Furthermore, they must designate land use zones, called "management areas," within the forest to focus on different management activities.

This latter requirement often leads to conflicts in national forest planning. For example, one official on the Wayne National Forest (Case 1) commented that NFMA public input and management area requirements move the fight over zoning into the public arena, where more participants can, and do, become involved (S1K1). In addition, several participants involved in the original planning process for the Wayne National Forest recalled substantial zoning conflicts that arose at that time and had yet to be resolved (N1-9).

Unlike national forest agency officials, those at the state level are not required to adhere to specified planning requirements. In Case 1, an official advisory committee<sup>17</sup> does comment on Ohio State Forest policy generally, but it is not intimately involved with planning at the forest level. Rather, agency officials guide the planning process, relying on their expertise to do "what's right for the land" and accommodate existing forest uses (S1E3, S1F1, S1J5). Similarly, in Case 2, Indiana State Forest officials do not face any legal requirements regarding state forest management planning, which has developed internally as administrators seek to formalize existing state management practices (S2G1). While state officials on Washington State Forests (Case 3) are required to provide a public comment period after developing proposed plans, they do not face other legal requirements in creating forest management plans (S3A1). Finally, for Oregon State Forest officials (Case 4), the lack of specified state forest planning requirements has opened the door to legal challenges under the state administrative procedures law, which prohibits arbitrary decision-making in agencies. To prevent future lawsuits, the state forestry board recently began developing administrative rules to codify, in the future, the planning process that state agency personnel use (S4C1, S4D1).

But state forest planning is not wholly without constraints. In all four cases, state officials refer to forest planning documents that, much like national forest Plans, guide the types of activities to be undertaken on state forests. In Cases 1 and 2, these planning documents include zoning area designations describing what types of activities are appropriate at different places in the state forests. The Ohio State Forests planning manual was prepared and reviewed by a number of state agency officials, but it was not circulated for general public comment. In fact, to obtain a copy of the document, requesters generally must pay \$0.25 per page (S1F1). On Indiana State Forests, one official remarked, "I've never received outside

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<sup>17</sup> The committee is comprised of eight members, representing forest-based research activities, small private forest owners, large private forest owners, the pulp and paper industry, other forest industries, soil science, forest recreation, and the public.

input in making updates [to the planning document], because no interest has been shown" (S2G1).

State forest planning in Cases 3 and 4 includes more public input than in Cases 1 and 2. In both Washington and Oregon, a state forestry board creates a broad plan giving general direction to state forest land management. Subsequently, officials create more detailed plans for specific state forests. Washington State Forest officials held public meetings to discuss the broad plan as it was being developed, and the plan is currently available to requesters free of charge (S3B1). The more detailed plans for specific forests are in the early stages of development, but the process will likely involve advisory committees including citizens (S3B2). Meanwhile, creation of the broad plan for the Oregon State Forests included public involvement, and officials creating lower-level forest plans subsequently have solicited public input through meetings and focus groups. Still, it is important to note that such efforts to gain public input are voluntary, not required by law, and state officials across all cases face fewer planning process constraints than do national officials.

Clearly national forest officials face greater planning constraints than do state forest officials. In addition to NFMA planning constraints discussed above, national officials also face a second important legal constraint: National Environmental Policy Act (NEPA) requirements. NEPA mandates that any Federal agency undertaking "major Federal actions significantly affecting the quality of the human environment" must formally examine alternatives and environmental impacts (42 USCA 4332c). The statute also requires officials to perform "scoping" activities, which include analyzing public communications needs regarding the proposed action, informing the public, and soliciting feedback. Furthermore, NEPA and its implementing regulations prescribe processes for citizens to appeal proposed activities at multiple levels within the national agency.

The impact of NEPA procedural requirements is significant. In Case 1, a state forest official who had previously worked for the USFS said that NEPA represents one of the biggest differences between state and national forest policy making, because the law leads to battles

over procedures, where interested parties can stop proposed forest management activities. In fact, one official on the Wayne National Forest believes that unless every minute detail of the letter of the law is followed in planning any given timber sale, an environmental group will successfully appeal the sale under NEPA (N1H1). In Case 2, all three timber sales proposed on Hoosier National Forest between 1991 and 1995 were appealed, significantly delaying tree harvest. Appeals substantially affect forest management activities, as described by one national official:

The biggest impact of the appeals process is not the time it takes to prepare a response, but rather the delay it causes in our activities and the fact that we spend a lot of time and money – hundreds of thousands of dollars – on the front end, trying to design appeal-proof projects. The actual benefits to all of this front end work are minimal. It's a paper exercise that doesn't affect quality of work on the ground. We don't get a lot of return for our investment in the paperwork (N2H1).

Similarly, national officials in Cases 3 and 4 cited NEPA as one of the most important laws affecting their work. One official on Gifford Pinchot National Forest explained that NEPA requirements affect every project, and that they are the primary reason for the district's thirty-member planning team (N3B1). Another explained that over twenty-five appeals were filed in fiscal year 1995: "We were upheld in every case but, nevertheless, the appeals impact our work. We have to collect information to send to the regional office to defend each appeal (N3D1)." Appeals also are influential for non-timber activities, as one national official described:

I gained millions of dollars in grant funding for a motorized trail reconstruction project to widen trails to increase motorized use, but an anti-motorized use group appealed and we lost on minor points in the process. We'll lose most of the grant money and have to start over – it's frustrating because the lawyers were running the show (N3E1).

State officials in three of the four cases, in contrast, are not bound by law to inform the public about proposed forest management actions. There is no "state NEPA" law in Cases 1, 2, or 4, so neither environmental impact statements nor environmental assessments are required to be made available to the public. Moreover, in these cases there is no procedure in place for granting concerned individuals the opportunity to appeal administratively forest officials' decisions. This difference in planning requirements provides state officials with fewer prescribed procedures. As one state official who once worked for the USFS noted,

One of the biggest differences between the state Department of Forestry and the U.S. Forest Service is the lower amount of planning work here. Each project and decision on a national forest requires NEPA documentation. Here there is no state NEPA, so much less documentation is required and we can move a project through to completion quicker (S4B1).

In the one case where state officials do face a "state NEPA" statute, it is less constraining than NEPA requirements that national officials face. A key difference is the threshold for determination of when an environmental assessment must be completed. On the Washington State Forests, only timber sales over \$100,000 in value require the preparation of an assessment (S3-2, p. 33). This contrasts with USFS application of NEPA on the Gifford Pinchot National Forest, which requires at least an environmental assessment for any timber sale (N3D2). Moreover, the state law is not viewed as an effective tool for those opposing projects to cause officials to halt or modify them. One Washington State Forest official indicated that grounds for appeal are limited to certain resource impacts, and the process isn't well-known by the public, thus appeals filed under the law are rare -- none were filed in fiscal year 1995 (S3C2). A state citizen with environmental concerns concurred: "The state NEPA law is more watered down than the Federal NEPA" (U3E7).

Overall, state officials face fewer requirements than do national officials to involve the public in forest planning. Thus state officials have more discretion in determining forest

management activities. But this is not to say that state officials are isolated from public opinion. Rather, the influence is likely to come through channels other than the planning process. For example, it may be felt through interested publics contacting their state legislators to restrict certain forest agency activities (see "Anticipated Statutes" section below). Moreover, even without legal constraints forcing them to do so, state officials may choose voluntarily to seek public input and participation (see Chapter 6). With regard to legal constraints, however, the important distinction is that, unlike national officials, state officials generally are not required to inform the public in planning processes.

The finding that state officials have fewer requirements than national officials to involve the public in forest planning supports Hypothesis 5. But do these requirements significantly impact actual processes as they occur? Scholars such as Peterson (1981) and Heclo (1978), argue that, compared to national decision making, state decision making involves a narrower range of participants and tends to be more closed. Chapter 6 addresses this question about differences in participation.

#### Constraints on Forest Activities on the Ground

As discussed above, requirements that constrain national more than state officials in planning processes support Hypothesis 5. Examination of requirements relating to forest activities on the ground provides further support for this hypothesis. Analysis of such requirements also reveals evidence in favor of Hypothesis 6; constraints foster greater efforts for environmental protection at the national level and for activities with substantial, direct economic benefits at the state level. Substantive requirements compared in this study include statutes mandating the purposes for which forests shall be managed, as well as other statutes and regulations that describe what management tools and techniques must, may, or must not be used in the forests.

## *Mandates*

The Multiple-Use, Sustained-Yield Act (MUSYA) of 1960 directs the USFS to manage national forests for multiple uses, including outdoor recreation, range, timber, watershed, and wildlife and fish, and it declares that wilderness areas are consistent with these uses. It directs management to produce the combination of uses that will best meet the needs of the American people "without impairment of the productivity of the land," which is "not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output." (16 USCA Sec. 528 - 31). In fact, the maximization of economic returns was rejected by a federal court ruling that upheld the legality of USFS officials selling timber at a net economic loss (*Thomas v. Peterson*, 753 F.2d 754 (9th Cir. 1985)).

In three of the four cases, the state forest agency also is required, by state law, to manage its forests for multiple uses (see Table 5-1). However, unlike the national mandate, these multiple use mandates do not indicate that timber uses are to be weighted equally with other uses. Rather, these mandates give timber and the revenue it generates greater emphasis than does the national mandate.

In Case 1, statutory language addressing Ohio State Forests lists the following purposes for which the state agency must manage trees: watershed and soil protection, timber production and use, recreation, esthetics, and wildlife habitat (1994 Ohio Code 1503.011). In fact, one official contrasted the agency's multiple-use mandate with that of private timber companies, which he described as having a single goal of timber production (S1J3). But the same state statute directs the agency to take measures to promote "profitable growth of timber" (1994 Ohio Code 1503.03-5). Thus while the state statute shares a multiple-use mandate with the national statute, it also mandates timber production to generate a profit – unlike the national directive.

In Case 2, statutory language addressing Indiana State Forests mandates the state agency to protect and conserve timber, water resources, wildlife, and soil for use by current

and future generations. However, it also mandates the agency to produce timber to improve the commercial value of the forest, provide revenue to the state and local governments, and supply local timber markets (Indiana Code 14-5-4-1, Sec.1; PL1-1995 16-23-4-1, p. 306). Clearly this emphasis on timber production to provide revenue differs from the national mandate.

In Case 3, statutory language addressing Washington State Forests includes a multiple-use mandate for the state agency, but this mandate is tempered by the primary obligation to manage state forest lands for designated trust beneficiaries. The trust mandate, not present in Cases 1 or 2, is common in western states gaining statehood within the past 150 years.<sup>18</sup> The state multiple-use law in Case 3 lists numerous uses for which the forest agency shall manage state forests, so long as such uses don't interfere with the financial obligations of trust management to produce revenue. In addition to timber, multiple uses include recreation, education, scientific studies, special events, hunting and fishing, scenic values, historical sites, watershed protection, and greenbelt areas (Washington Code 79.68.050). However, as one official explained, "Our mandate is quite different than that of the Forest Service. Public use and non-timber resources are secondary to timber production, due to our fiduciary obligation to generate revenue for the trusts" (S3I1).

In Case 4, no multiple use mandate exists for Oregon State Forests. Rather, the mandate is to manage for the predominant use of timber production, to generate revenue for the trusts (S4-3, 22).<sup>19</sup>

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<sup>18</sup> For a thorough treatment of state trust lands, see Souder and Fairfax (1996).

<sup>19</sup> Oregon Revised Statute 530.500 lists a variety of uses for state forest lands, but it does not provide a multiple use mandate. Rather, the statute declares, "The State Forester may permit use of lands for other [non-timber] purposes" including fish and wildlife, landscape, protection against flood and erosion, recreation, and water supply protection. Of course, *permission* ("may") to manage for multiple uses does not constitute a mandate ("must" or "shall").



Table 5-1

Elements of Agency's Statutory Mandate Related to Management Purposes

<u>Explicitly Stated Elements</u>	<u>National Cases 1-4</u>	<u>Ohio State</u>	<u>Indiana State</u>	<u>Wash. State</u>	<u>Oregon State</u>
Multiple uses	X	X	X	X	
-Timber	X	X	X	X	
-Watershed/soil	X	X	X	X	
-Wildlife/fish	X	X	X	X	
-Wilderness	X				
-Range	X				
-Recreation	X	X		X	
-Scenic		X		X	
Profitable timber		X			
Produce revenue			X	X	X

*Specific Management Activities*

Beyond statutory mandates relating to management purposes, legislation also may constrain specific agency management activities. In all four cases, data suggest that national forest officials face greater legal substantive restrictions than do state officials, primarily through NFMA.

NFMA and its implementing regulations place many constraints on national forest management activities, including silvicultural techniques, calculation of maximum harvest levels, and species protection. For example, even-aged silvicultural techniques<sup>20</sup> are allowed only where they are (1) appropriate to meet Plan objectives, (2) reviewed by an interdisciplinary team that considers the potential environmental, economic, esthetic, engineering, and economic impacts, (3) performed in such a manner as to blend with the

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<sup>20</sup>Even-aged management is defined as "the application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together" (N4-3, Glos-8).

natural terrain, (4) set within maximum acreage limits, and (5) carried out to be consistent with other multiple uses (16 USCA 1604g3f).

Furthermore, NFMA stipulates that harvest levels normally must be limited to "sustained yield" amounts, averaged over a ten-year period, although exceptions are allowed so long as they are consistent with multiple-use management and Plan objectives (16 USCA 1611a). USFS regulations have interpreted "sustained yield" to mean non-declining even flow, a conservative level that assures no more timber will be harvested in a single year (rather than in a ten-year period) than in the next year (rather than in the next ten-year period), even if higher levels would generate greater economic returns in the short as well as long term.<sup>21</sup>

Another important NFMA harvest level requirement is determination of lands suitable for timber harvesting. The statute requires USFS regulations to declare lands suitable for harvesting only where (1) watersheds will not be irreversibly damaged, (2) land can be restocked within five years, and (3) bodies of water are protected from serious adverse affects like water temperature changes, blockage of water courses, and sediment deposits (16 USCA 1604g3E).

In addition to timber concerns, NFMA requires national officials to protect species diversity:

[The Plan must] provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and . . . provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan (16 USCA 1604g3b).

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<sup>21</sup>There are two primary reasons why even-flow requirements limit economic returns. First, harvesting a higher level of timber in the present can open space in the forest necessary for growing new trees that require sunlight, which may have a faster growth rate than older trees. Second, harvesting a higher level of timber at a period when market prices are high can increase economic returns.

This constraint is more than a planning process requirement. Not only does it require officials to address species diversity in the Plan, but it also requires officials to preserve species diversity. Thus officials are not permitted to sell timber in such a way that destroys species diversity.

Unlike national officials, state officials in Ohio and Indiana face few legal requirements regarding silvicultural techniques, harvest levels, or species protection. As one state official in Case 1 explained, "We have created most of our silviculture parameters, not the legislature. We question each other, so there isn't a need for the legislature to question us so much " (S1F2). Another official indicated that most vegetation management constraints are agency policy, not legislative requirements (S1H2). An important legal requirement affecting national but not state officials in Case 1 is harvest amounts. Ohio State Forest officials are not required to limit quantities to sustained yield, even-flow amounts. Instead, they may harvest greater quantities in one year than the next in order to increase economic returns.

In Case 1, there does exist a state law relating to non-point-source pollution<sup>22</sup> that pertains to forest practices such as timber harvesting and trail construction, but this law establishes a voluntary reporting system. The state forest agency has agreed to submit an operations and management plan to the appropriate county soil and water conservation district before each timber sale or trail construction. However, this is a voluntary submission (S1H2).

In Case 2, Indiana State Forest officials do not face state laws prescribing or prohibiting specific activities. As one state official commented, "Other than for wetlands activities or earth moving work, there are no significant statutory constraints affecting management activities on state forests" (S2B1). An important difference between state and national constraints in Case 2 relates to harvest quantities. Unlike state officials, national officials are not required by law to limit harvest quantities to sustained yield, even-flow amounts.

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<sup>22</sup> Pollution emanating from dispersed activities rather than a single source such as a pipe or smokestack.

There is a notable exception in Cases 1 and 2 to state officials' generally high level of discretion regarding management tools and techniques: clearcutting<sup>23</sup> restrictions. The state forest agency chief in Case 1 has required that he review all proposed clearcuts. The primary reason for this rule is to ensure that clearcuts "don't cause problems that can be identified with the harvesting" (S1K2). In Case 2, the state agency has created a policy that no timber shall be harvested by clearcutting. While foresters recognize that clearcutting may be more appropriate than "group selection"<sup>24</sup> cutting for some purposes, they are constrained by this policy, which was created in response to forest visitor aversion to clearcuts (S2D1). It is important, however, to note that such restrictions on clearcutting come from within the agency, not from statutory requirements.

In Cases 3 and 4, state officials face more legal constraints than do their counterparts in Cases 1 and 2, but they still face fewer legal constraints than do national officials. In Case 3, a forest practices act (FPA) constrains Washington State Forest officials. FPA statutory requirements and implementing regulations apply to state as well as private forest lands. Provisions address activities related to wetlands, roads, riparian areas, chemical applications, and timber operations. For example, officials must complete a mitigation plan before filling more than one-half acre of wetland, and roads must be of specified length and slope. Of particular importance to forest management is the section describing timber harvest methods. This section limits even-aged harvest methods to 240 acres or less and describes the volume and number of trees per acre to retain, size and number of trees per acre to leave for wildlife enhancement, and reforestation methods (Washington Administrative Code 222-30).

As in Cases 1 and 2, an important difference between state and national constraints in Case 3 lies in timber harvest quantities. Unlike the national statute, Washington state statutes

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<sup>23</sup> Clearcutting is defined as "the harvesting at one time of all trees on an area for the purpose of creating a new, even-aged stand" (N4-3, p. Glos-4).

<sup>24</sup> Group selection involves harvesting all trees within a selected group, usually over a smaller area than clearcutting.

do not require officials to limit harvest amounts to sustained yield, even-flow amounts. Instead, state officials may harvest quantities that are greater in one time period than a subsequent one, in order to increase economic returns.

In Case 4, Oregon State Forest officials also face a forest practices act. Statutory and regulatory restrictions address a number of activities on state and private forests, including timber operations, chemical applications, sensitive species monitoring, and protection of ecologically significant sites. For example, with regard to timber operations, even-aged harvest methods are normally limited to 120 acres or less, openings greater than twenty-five acres require leaving at least four trees per acre, and officials must leave, temporarily, at least fifty trees per acre in designated "sensitive corridors" (Oregon Code 44.527.740, .675, .755). However, as in Case 3, state legal requirements in Case 4 do not require harvest amounts to be limited to sustained yield, even-flow amounts, which can limit economic returns.

Thus, compared to state agency officials, legal requirements place greater constraints on national agency officials, limiting their ability to manage forests profitably for higher levels of activities that provide substantial, direct economic benefits, and requiring greater environmental protection in terms of species protection. This finding supports Hypothesis 5 and the argument that, in a federal system, actors in lower levels of governance emphasize economic development more than do actors in higher levels of governance. The pressure for bureaucrats to pursue certain activities does not come directly from the electorate, as civil servants are not subject to electoral defeat. Rather, elected legislators and executives craft legal constraints that affect agency decision makers. Thus, compared to higher levels of governance, bureaucrats at lower levels of governance face fewer constraints on their ability to promote economic development. In Chapter 7, analysis addresses the degree to which these constraints lead to financial outcomes that are more favorable at the state than national level.

## Anticipated Statutes

While data suggest that national officials face greater legal constraints than do state officials, there is one area in which the reverse appears to be true: anticipated statutes. In Case 1, several Ohio State Forest officials recounted that environmentalists had been successful in encouraging state legislators to ban all commercial timber cutting on a particular state forest (S1H2, S1J2, S1C1, S1E1). One state official shared his concern that the controversy over commercial cutting on this forest might lead to legislative mandates requiring more formal, open decision-making processes (S1H1). In response to the threat of such legislative constraints, agency officials took actions to reduce the potential for such restrictions. While the proposed commercial harvesting ban was being considered by state legislators, agency officials placed a temporary moratorium on commercial timber cutting in that forest, and they undertook increased efforts to inform the public about planned forest activities (S1I1, S1H2). Clearly the anticipated statute provided an important constraint on state officials.

This is not to say that national officials are unaffected by anticipated statutes. For example, a few years ago, pro-development individuals who opposed the purchase of private land for addition to the Wayne National Forest (Case 1) successfully lobbied their U.S. senators to intervene in a Senate appropriations subcommittee, which restricted the national forest from carrying out a planned purchase (N1A1). Subsequently, when opposition arose to another land purchase, national officials chose to withdraw the purchase to avoid the possibility of a similar legislative block (N1A1).

Interestingly, neither state nor national officials in Case 2, Indiana State Forests and Hoosier National Forest, indicated a significant likelihood of legislative intervention that would directly affect forest management activities.

In Case 3, anticipated legislation relating to Washington State Forests has come from those advocating greater timber production. A bill to give county control over some of the state forest lands was introduced into the state legislature prior to 1995, and although it was not

passed, the issue has not completely disappeared (S3D3). State officials indicated that, if they fail to provide revenue satisfactory to trust beneficiaries, then they may face legislation placing more requirements on management practices.

In Case 4, as discussed above, the impetus for Oregon State Forest officials to develop new forest planning requirements came from a lawsuit challenging decision-making processes. To head off future legal challenges and statutory restrictions, the forestry board recently began to create rules codifying existing planning processes.

Overall, there is some evidence of greater constraints on state than national officials from anticipated statutes, especially in Cases 3 and 4. Such preemptive behavior reflects not existing statutory and regulatory constraints, but expectations about the possibility of such constraints being enacted in the future. These expectations reflect an important aspect of federalism: citizens who belong to multiple jurisdictions can compare the performance and procedures of various jurisdictions and press for change in those jurisdictions they view as not "measuring up."

#### Summary of Statutory and Regulatory Constraints

Data analysis for statutory and regulatory constraints supports Hypotheses 5 and 6: National officials face a greater number of constraints than do state officials, and constraints foster greater efforts for environmental protection at the national level while constraints foster greater efforts for direct economic benefits at the state level. Support is evident in planning process requirements as well as in constraints on forest management activities on the ground (see Table 5-2).

As suggested by Hypothesis 5, national officials face greater constraints on planning processes. On national forests, NFMA and NEPA establish formal opportunities for citizen involvement, through public notification and comment provisions as well as avenues for citizen

appeals. State agencies, on the other hand, face fewer requirements constraining officials' planning processes.

Across all cases, agency mandates support Hypothesis 6. While the national agency's multiple-use statutory mandate requires that forests shall not be managed for the uses that generate the highest dollar return, the state agency's statutory mandate in Case 1 includes a directive to manage state forests for the "profitable growth of timber," and the state agency's mandate in Case 2 directs the agency to produce timber to generate revenue for the state and local governments. In Cases 3 and 4, mandates requires the state agency to manage forests in a manner that will generate revenue for trust beneficiaries.

Beyond mandates describing management purposes, national agency officials also face more stringent legal requirements than do state officials to protect the environment, through NFMA requirements that specify harvest methods, timber base criteria, and species protection.

Thus there is evidence of systematic differences between higher and lower levels of governance. It is largely through statutory and regulatory constraints that elected officials influence bureaucratic behavior, fostering or limiting agency officials' pursuit of activities with substantial, direct economic benefits. In a federal system, statutes and regulations encourage economic development more at lower than higher levels of governance. Therefore, where economic development is an important goal, lower levels of governance may be the more appropriate locus of responsibility. Statutory and regulatory constraints also have an important indirect effect on policy processes; as will be discussed below, these constraints affect planning document contents by defining the scope of participants who participate in creating them.



Table 5-2

Key Statutes and their Implementing Regulations Affecting Officials

<u>Item</u>	<u>National Cases 1-4</u>	<u>Ohio State</u>	<u>Indiana State</u>	<u>Wash. State</u>	<u>Oregon State</u>
Planning process	NFMA <sup>a</sup> , NEPA <sup>b</sup>	— <sup>c</sup>	--	--	--
Plan contents	NFMA	--	--	--	--
Proposed activities	NEPA	--	--	SEPA <sup>d</sup>	--
Harvest methods	NFMA	--	--	FPA <sup>e</sup>	FPA
Harvest quantity	NFMA	--	--	--	--
Species protection	NFMA	--	--	--	FPA

<sup>a</sup>NFMA = National Forest Management Act

<sup>b</sup>NEPA = National Environmental Policy Act

<sup>c</sup>no key statute or regulations indicated by officials

<sup>d</sup>SEPA = state version of NEPA

<sup>e</sup>FPA = Forest Practices Act

Planning Document Contents

Determining forest management activities involves more than compliance with statutes and regulations. State and national agency officials also must develop plans to chart management direction. Officials develop such planning documents (called "the Plan" for national forests) for a particular forest or set of forests, taking into consideration conditions on the ground. Planning process requirements were described above. Discussion now turns to contents of the completed planning documents, which include criteria for determining which activities are appropriate in which places.

Planning documents contain rules for certain practices, including timber stand improvement, "leave trees," riparian area protection, and regeneration harvesting, and they prescribe land management zones. As is the case with statutes and regulations, national forest officials face greater constraints, especially those promoting non-timber benefits, from their

planning documents than do state officials. This finding, described below, supports Hypotheses 5 and 6.

### Timber Stand Improvement

Timber stand improvement (TSI) activities, which ordinarily involve fertilizing and removal of certain vegetation to increase growth in preferred trees, are subject to guidelines in the agencies' planning documents. In two of the four cases, the national agency faces more requirements to seek non-timber benefits in TSI activities.

In Case 1, Ohio State Forests and Wayne National Forest, there is a significant difference between state and national TSI guidelines. For state forests, officials must prioritize TSI activities based on the relative rate of return on the investment (S1-1, pp. III-14 and III-17). In contrast, national officials must prioritize TSI activities based not only on financial considerations, but also on snag<sup>25</sup> management needs and other resource considerations (N1-1, pp. 4-70, 92, 105, 120, and 135). Thus there are more constraints on national forest officials than on state forest officials requiring activities to promote non-economic goals.

Case 2, Indiana State Forests and Hoosier National Forest, does not exhibit significant differences between state and national planning TSI requirements. The state document describes the goal of TSI activities as "to produce quality timber and maintain forest health, consistent with other forest benefits including wildlife, recreation, and watershed protection" (S2-5, p. E-1). The national forest Plan is similarly general, providing little specific guidance for TSI activities. For land in the timber base<sup>26</sup>, the Plan allows TSI work involving tree removal to enhance growth in young hardwood stands, vine control, and stand thinning.

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<sup>25</sup>A snag is a standing, dead tree that may provide useful ecosystem benefits such as wildlife habitat.

<sup>26</sup> Timber base is the area of a forest in which commercial timber sales are permitted.

Case 3, Washington State Forests and Gifford Pinchot National Forest, exhibits differences that support Hypothesis 6. The state planning document requires officials to perform TSI activities on "stands which will respond and produce an acceptable rate of return on investment," with the further stipulation that "the benefits must exceed the costs of fertilizing, thinning, and pruning" (S3-2, p. 50). The national Plan, on the other hand, addresses criteria beyond economic costs and returns. It requires officials to prioritize TSI activities "based upon stand condition, requirements for silvicultural prescription, and levels of benefits [not just economic] expected" (N3-1, p. 6-16).

In Case 4, the broad state planning document guiding management of Oregon State Forests is less specific than the state planning documents in any of the other cases. The document does not address TSI activities, though lower-level forest plans may specify them. Meanwhile, the national Plan includes both economic and non-economic criteria in its TSI requirements. TSI work is to be undertaken when the treatment is cost-effective and needed to achieve desired stand conditions (N4-3, p. IV-121). Thus TSI requirements in Case 4 do not support Hypothesis 6.

Overall, TSI requirements provide partial support for Hypothesis 6. In Cases 1 and 3, national agency officials face more requirements to seek non-timber benefits in TSI activities. Thus national Plans hinder officials' ability to pursue economic goals.

### Leave Trees

A significant difference in constraints relating to environmental protection is that of "leave trees." When timber is harvested, some trees may intentionally be left standing. Such leave trees provide valuable ecosystem benefits, particularly in terms of habitat. Management to maximize timber production typically does not involve leaving trees, because removal can provide additional timber as well as space for new tree growth. Thus leave tree requirements represent a reduction in timber production to provide ecosystem benefits.

In Case 1, the Ohio State Forests planning document does not specify the quantity of trees to be left in a harvest area. Rather, individual foresters on the ground exercise their own judgment in determining how many and which trees to leave in a harvest area (S1F5). In contrast, the Wayne National Forest Plan specifies the average number of trees to be left in each management zone. Similarly, in Case 2, the Indiana State Forests planning document does not address leave tree quantities, while the Hoosier National Forest Plan requires that trees for wildlife purposes be left in all stands in the timber base (N2-1, p. 2-31).

In Cases 3 and 4, state planning documents incorporate leave tree requirements from the state forest practices act. In both cases, the national Plan provides somewhat stricter requirements. Washington State Forest officials (Case 3) must leave, on each acre, a minimum of three trees at least ten feet tall and one foot in diameter, depending on needs of cavity nesting birds, plus two smaller "recruitment" trees, and two downed logs per acre in the western portion of the state (Washington Administrative Code 222-30-020 (11)). Meanwhile, the Gifford Pinchot National Forest Plan requires officials to retain, per acre, at least 15% of the trees associated with a stand, in sufficient quantity to support eight listed cavity-nesting bird species at 40% of their potential population levels and two listed cavity-nesting bird species at 100% of their potential population levels (N3-1, pp. 6-3 and 6-4). Standing, dead trees to be left on the national forest must be at least seventeen inches in diameter and forty feet tall. At least 240 linear feet of logs at least twenty feet long and twenty inches in diameter at the large end must be left (N3-1, p. 6-2).

Since a single Douglas fir tree may grow up to 240 feet tall, it is not clear whether requiring 240 linear feet of logs, as the national Plan does, is greater or less than requiring two downed logs, as the state planning document does. However, for standing leave trees, the national Plan's requirement to retain at least 15% of a stand is greater than the state planning document's requirement to retain at least five standing trees per acre. Moreover, the national Plan requires that standing, dead trees be at least forty feet tall, compared to state planning document requirements minimum requirement of only ten feet tall for standing, reserve trees.

In Case 4, Oregon State Forest officials must leave, on average per acre, a minimum of two standing trees at least thirty feet tall and eleven inches diameter at breast height, plus two downed logs each at least ten cubic feet and six feet long (1995 Oregon Revised Statutes 44-527.675 (1) (a-b)). Meanwhile, the national Plan requires national officials to retain leave trees at least twenty feet tall and twenty inches in diameter at breast height, in sufficient quantity to support at least 40% of the potential population level of specified cavity-nesting birds (N4-3 A2, pp. IV-47 and 48). National officials also must leave, per acre, a minimum of two downed logs each at least forty cubic feet in volume and twelve feet in length (N4-3 A2, p. IV-51). While requirements for standing trees to be left are not comparable across the agencies (state requirements are described in terms of number of trees, while national requirements are described in terms of habitat sufficiency), requirements for downed logs can be compared. The national Plan requirement to leave down trees that are forty cubic feet in volume and twelve feet in length is four times the volume and twice the average length per acre as the state planning document requirement.

Overall, national planning documents constrain officials' freedom to remove all trees within a given area more than do state planning documents. More restrictions to ensure that a specified quantity of "leave trees" remain illustrate differences in trade-offs between economic and non-economic benefits at different levels of governance. As suggested by Hypothesis 6, planning constraints hinder the pursuit of economic returns more on national than state forests.

### Riparian Areas

Riparian areas are lands that serve as a transition between aquatic and terrestrial ecosystems. Forest management activities may negatively impact riparian areas as soil is compacted, vegetation is removed, and roads or trails are established. In a majority of the cases, national officials face more stringent requirements than do state officials to protect riparian areas.

In Case 1, Ohio State Forests and Wayne National Forest, the national Plan places similar restrictions on activities in riparian areas as does the state planning document. National requirements for activities near any intermittent or perennial streams include minimum "filter strip" (buffer) widths on which earth-disturbing activities are not allowed unless special techniques are used (S1-1, p. 4-31). These minimum widths are based on an area's slope and site sensitivity. Moreover, operators may leave logging debris in permanent waters only where they benefit fisheries habitat or protect riparian values (S1-1, p. 4-31). The state planning manual requires minimum filter strip widths based on an area's slope, which are comparable to national minimum width requirements (S1-2, p. 33).

In Case 2, Indiana State Forests and Hoosier National Forest, the national Plan forbids commercial timber harvesting in riparian areas, except "to enhance or maintain riparian-dependent resources, to permit development of recreation access facilities, to provide for utilities, or to protect public safety" (N2-1, p. J-4). The state planning manual, on the other hand, allows multiple-use management in riparian areas, including commercial timber production, although non-timber resources are to be emphasized. Moreover, the national Plan specifies a more inclusive definition of riparian areas: the national Plan definition includes all watercourses regardless of flow (i.e., intermittent streams are included) (S2-5, p. J-2), while the state planning document includes only permanently flowing waters (S2-5, p. G-2).

Similarly, in Case 3, Washington State Forests and Gifford Pinchot National Forest, national officials face stricter riparian protection requirements than do state officials. The national Plan prohibits commercial timber harvest in riparian areas, while the state planning documents allows timber harvest in riparian areas (N3-1, pp. 2-4 and 2-7). In addition, the national Plan requires protection of all permanent as well as intermittent streams, while the state planning document requires protection primarily for permanent streams (S3-2, p. 35).

In Case 4, Oregon State Forests and Siuslaw National Forest, riparian protection requirements also are more stringent in the national Plan than in the state planning document. The national Plan establishes buffer zones, called "riparian reserves," about 520 feet on either

side of perennial streams and 260 feet on either side of intermittent streams (N4-6, p. 1).

Commercial timber harvests are prohibited within the buffers.

Riparian protection requirements in the state planning document in Case 4 come from forest practices act implementing regulations, which specify a range of buffer widths. In 1994, the agency developed a set of comprehensive riparian regulations aiming to allow timber harvest while protecting fish and wildlife habitat and water quality (S4-9, p. 1). Riparian widths on each side of a stream depend on stream size (small, medium, or large) and use (game fish, other fish, or domestic water use by a water permit holder). The most protective category is large streams with either game fish or with other fish plus domestic water use. In this category, the buffer is 100 feet. The least protective category is small streams without game fish or domestic water use, which requires no buffer. Within buffer areas, commercial timber harvesting is allowed, so long as a specified number of trees are left standing (S4-3, p. 25). Thus, compared to national plan requirements, state riparian protection is less restrictive, both in terms of buffer size and activities permitted within buffers.

Overall, in three of the four cases, national planning documents place greater restrictions on activities permitted within riparian areas than do state planning documents. Moreover, the definition of riparian areas is more inclusive on national than state forests in three cases. That is, a larger riparian area is protected. This results supports Hypothesis 6, as planning document constraints foster greater environmental protection, at the expense of resource development for economic returns, on national than state forests.

### Regeneration Harvesting

Silvicultural techniques describe methods used in harvesting timber. One somewhat controversial method is "regeneration harvesting," which involves the removal of all trees

within an area to create a forest opening in which tree growth will "regenerate."<sup>27</sup> Most foresters consider regeneration harvesting to be beneficial for promoting the growth of shade-intolerant species (those requiring substantial sunlight), many of which provide high-value timber, and for providing habitat favorable to certain wildlife species. However, many foresters recognize the esthetic drawbacks of regeneration harvesting, and numerous environmentalists have protested that this method damages forest ecosystems. Broadly speaking, regeneration harvesting promotes economic development of the timber resource while potentially detracting from esthetic values and forest ecosystem conditions. This trade-off of non-economic benefits for economic benefits provides a useful test of Hypothesis 6; greater restrictions on regeneration openings are expected at the national level. Analysis supports this hypothesis.

Planning documents for state and national forests restrict, through zoning, the amount of land on which regeneration harvesting may be conducted. They also restrict the maximum size of regeneration openings. In a three of the four cases, national planning requirements restrict regeneration harvesting more than do state planning requirements (see Table 5-3).

In Case 1, comparing the Wayne National Forest with Ohio State Forests, acreage on which regeneration harvesting is permitted differs in the predicted direction: 76.6% of national land and 89.9% of state land.<sup>28</sup> National officials also face greater constraints on maximum regeneration opening size. National officials may create openings of up to thirty acres on just 35.2% of the national forest acreage, compared to 61.9% of the state forest acreage where openings of up to twenty-five to forty acres are permitted (see Table 5-3).

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<sup>27</sup>Large openings are often called "clearcuts," whereas smaller clearings may be termed "gaps" or "group selection openings," but there is no universally agreed-on size to distinguish the two.

<sup>28</sup>National forest lands discussed in this analysis do not include areas congressionally withdrawn from timber production (e.g., Wilderness Areas and National Monuments). Rather, the emphasis is on lands over which national forest officials have authority to decide management direction. Similarly, state forest lands legislatively withdrawn from timber production are not included in acreage calculations.



In Case 2, officials are allowed to prescribe regeneration openings on a similar proportion of Hoosier National Forest (54.9%) as Indiana State Forest (55.3%) land. Moreover, national Plan opening size requirements are somewhat less restrictive than are state requirements. National officials may create clearcut forest openings up to five acres in size for hardwood and ten acres for pine species, and shelterwood<sup>29</sup> forest openings up to ten acres for all species (N2-1, p. 2-34). In contrast, state officials may create group selection forest openings for all species only up to five acres, or larger sizes with central office approval. A further state restriction is that cumulative opening acreage may not exceed 20% of the commercial acreage in a state forest management tract (S2-5, D-4). Thus evidence from Case 2 does not support Hypothesis 6.

In Case 3, riparian areas notwithstanding, 50.7% of Gifford Pinchot National Forest land is available for regeneration openings, while 90.5% of Washington State Forest land is available (S3-2, pp. 16, 17, and 27; S3E1). The national Plan permits regeneration openings up to a maximum of several different sizes, all smaller than the state forest planning document. On the national forest, the maximum opening size is sixty acres in western hemlock working groups and forty acres elsewhere (N3-1, p. 6-17). In management areas designated deer, elk, or mountain goat range, the maximum opening size is thirty or twenty acres. In contrast, the state planning document requires that regeneration openings generally will not exceed one hundred acres in size (S3-2, p. 48).

In Case 4, aside from riparian area restrictions described above, regeneration harvesting is permitted on 18.2% of Siuslaw National Forest land, compared to 98.2% of Oregon State Forest land. The national Plan permits openings of up to sixty acres in western hemlock working groups and forty acres elsewhere (N3-1, p. 6-17). The state planning documents sets a much higher limit, 120 acres normally but up to 240 acres if approved by the State Forester (ORS 527.740, 527.750).

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<sup>29</sup>Shelterwood cutting involves removing most trees from an area but leaving a small number of larger trees to shelter new growth.

Overall, in three of the four cases, restrictions on regeneration openings are greater in national than state planning documents. This difference includes both smaller areas open to regeneration harvesting and smaller maximum opening sizes allowed in carrying out regeneration harvesting. Thus data support Hypothesis 6 in a majority of the cases.

Table 5-3

Allowed Regeneration Harvest Zones and Opening Sizes

<u>Agency</u>	<u>Maximum Opening size</u>	<u>Proportion of forest in zone</u>	<u>Agency</u>	<u>Maximum Opening Size</u>	<u>Proportion of forest in zone</u>
<i>Case 1: Wayne National Forest and Ohio State Forests</i>					
National	30 acres	35.2 %	State	25 or up to 40 ac	61.9 %
	20 ac	32.5 %		2 ac for wildlife	20.0 %
	15 ac	5.2 %		"small" for vistas	<u>8.0 %</u>
	10 ac	0.5 %			
	5 ac	<u>3.2 %</u>			
	Total	76.6 %		Total	89.9 %
<i>Case 2: Hoosier National Forest and Indiana State Forests</i>					
National	10 or 5 ac	54.9 %	State	5 ac	55.3 %
<i>Case 3: Gifford Pinchot National Forest and Washington State Forests</i>					
National	60 or 40 ac	45.7 %	State	100 ac	90.5 %
	30 ac	0.5 %			
	20 ac	<u>4.5 %</u>			
	Total	50.7 %		Total	90.5 %
<i>Case 4: Siuslaw National Forest and Oregon State Forests</i>					
National	60 or 40 ac	18.2 %	State	120 / 240 ac	98.2 %

*Italics* indicates support for Hypothesis 6

Land Use Zones

Regeneration opening restrictions are a helpful indicator for testing agency planning document emphasis on economic development as opposed to non-economic benefits. A related indicator is land use zoning restrictions. Tables 5-4a through 5-4d display quantities of forest

land zoned for different uses, as specified in agency planning documents. While both national and state forest planning documents across the cases include multiple zones with varying primary uses, in Cases 2, 3, and 4, the state forest planning document specifies more acreage zoned more favorably toward economic development (commercial timber harvest) than does the national Plan. This result supports Hypothesis 6.

As Table 5-4a indicates, a similar proportion of land in Case 1 is zoned to promote economic development on Ohio State Forests and Wayne National Forest. Zones designate 88.4% of national and 84.4% of state forest lands as available for commercial timber harvest (SII4; N1-1, p. 4-162). On lands not available for commercial timber harvest, land zoned for intensive recreation or administrative facilities comprise 0.5% of national and 1.5% of state forest land, while lands zoned for dispersed recreation and resource protection comprise 11% of each. A lower proportion of national (0.1%) than state (2.0%) forest land is zoned for special protection, as natural area, cultural area, or research area. Thus evidence in this case does not support Hypothesis 6.

Table 5-4a

Quantity of Land in Different Intensity Zones, FY 95, Case 1

<u>Zone Description</u>	<u>National:</u>		<u>State:</u>		<u>Diff.<sup>a</sup></u>
	<u>Acres</u>	<u>Proportion</u>	<u>Acres</u>	<u>Proportion</u>	
Commercial Timber Harvest	198,611	88.4 %	149,306	84.4 %	4.0 %
Not Commercial Timber Harvest					
Intensive Recreation / Admin.	1,223	0.5 %	2,717	1.5 %	
Dispersed Rec / Resource Protection	24,715	11.0 %	19,433	11.0 %	
Protected / Special Areas	<u>78</u>	<u>0.1 %</u>	3,559	2.0 %	
Other			<u>1,772</u>	<u>1.0 %</u>	
Total	26,016	11.6 %	27,481	15.5 %	-4.1 %
Total Forest Acreage	224,627	100.0 %	176,787	100.0 %	

<sup>a</sup>Positive values indicate higher national value, negative values indicate higher state value.

However, in Case 2, Hoosier National Forest officials face stricter zoning requirements on management activities than do Indiana State Forest officials. Similar proportions of acreage are zoned for inclusion in the timber base, about 55% of the land in both the national and state forests (see Table 5-4b). However, a far greater share of national than state forest is zoned as resource protection or special areas. On the national forest, 25.0% of the total forest acreage is zoned for dispersed recreation and resource protection, and another 8.1% is zoned for special protection that discourages both vegetative manipulation and recreational use (N2-12). This compares with just 4.0% of the forest area on state forests zoned for special protection (S2-5, pp. D-3, N-3, N-4). Another interesting difference is the substantial quantity of state forest land, 40.8% of the total, that is not yet zoned, while all of the national forest is zoned.

Table 5-4b

Quantity of Land in Different Intensity Zones, FY 95, Case 2

<u>Zone</u>	<u>National:</u>		<u>State:</u>		<u>Diff.<sup>a</sup></u>
	<u>Acres</u>	<u>Proportion</u>	<u>Acres</u>	<u>Proportion</u>	
Commercial Timber Harvest	98,968	54.9 %	79,642	55.3 %	-0.4 %
Not Commercial Timber Harvest					
Intensive recreation	21,712	12.0 %			
Dispersed Rec / Resource Protect	44,969	25.0 %			
Protected / Special areas	14,560	8.1 %	5,741	4.0 %	
Total	81,241	45.1	5,741	4.0 %	41.1 %
Not Designated	0	0	58,727	40.8 %	-40.8 %
Total Forest Acreage	180,209	100.0 %	144,110	100.0 %	

<sup>a</sup>Positive values indicate higher national value, negative values indicate higher state value.

In Case 3, Gifford Pinchot National Forest land is more strictly zoned than is Washington State Forest land. Commercial timber harvesting is permitted in two types of

zones on the national forest, "matrix" and "adaptive management" areas, which total 50.7% of the national forest land (see Table 5-4c). This is a much lower quantity than state zoning, which designates 90.5% of the state forest land as "on-base" for commercial timber harvesting.

A national forest zoning classification where timber is not a goal, but certain stand treatments such as thinning are allowed, is "late successional reserve." The area in this designation comprises 41.6% of the national forest land (N3-1, p. 5-16). Officials manage late successional reserve zones for the creation of late successional forest conditions, with trees over eighty years old, a multiple-layered canopy, and substantial volumes of downed, dead material remaining on the forest floor. Operators must conduct any timber harvesting in this zone with thinning methods that encourage late successional conditions. Thus, this zone involves a much lower level of intensive management than is permitted on state on-base lands.

In Case 3, forest land zoned to exclude programmed timber harvest includes recreational as well as special and protected areas. On the national forest, 0.3% of the forest is zoned for intensive recreation or administrative facilities, while 7.1% is zoned for dispersed recreation and resource protection. Finally, 0.3% of the national forest is zoned for special protection, in "research natural areas," where officials must manage land to maintain biological diversity and encourage forest research, where human activities are not evident. On state forests, the "off-base" lands include zones where harvesting is temporarily deferred as part of an experimental forest or a research area (1.7% of forest acreage), where northern spotted owl habitat is protected (3.0% of forest acreage), and where trees are protected to be used as seed sources for genetic tree improvement efforts (0.1% of forest acreage). Other, unspecified, off-base lands comprise 4.7% of forest acreage.

Table 5-4c

Quantity of Land in Different Intensity Zones, FY 95, Case 3

<u>Zone Description</u>	<u>National:</u>		<u>State:</u>		<u>Diff.<sup>a</sup></u>
	<u>Acres</u>	<u>Proportion</u>	<u>Acres</u>	<u>Proportion</u>	
Commercial Timber Harvest	546,001	50.7 %	1,900,000	90.5 %	-39.8 %
Not Commercial Timber Harvest					
Deferred Harvest			36,400	1.7 %	
Late Successional Reserve	447,408	41.6 %			
Spotted Owl Habitat Protection			63,250	3.0 %	
Intensive Rec. / Admin. Facilities	2,809	0.3 %			
Dispersed Rec./Resource Protection	76,263	7.1 %			
Protected / Special Areas	<u>3,452</u>	<u>0.3 %</u>	2,417	0.1 %	
Unspecified			<u>97,933</u>	<u>4.7 %</u>	
Total	529,932	49.3 %	200,000	9.5 %	39.8 %
Total Forest Acreage	1,075,879	100.0 %	2,100,000	100.0 %	

<sup>a</sup>Positive values indicate higher national value, negative values indicate higher state value.

In Case 4, Siuslaw National Forest zoning is less conducive to timber harvesting than is Oregon State Forest zoning. On the national forest, only 18.5% of the forest is designated for commercial timber harvesting (see Table 5-4d) (N4-6). The remaining 81.5% is designated as late successional reserve, with no harvesting normally permitted in natural stands, and commercial thinning allowed in managed stands only as a tool to produce late successional habitat, not with a goal of timber production (N4-6).

The state forest has a much larger proportion of land zoned for commercial timber harvest. Timber production is the dominant use on 92.3% of the forest (S4F1, S4G1). The remaining 7.7% of forest acreage is excluded from commercial timber harvest, to protect scenic vistas or wildlife, or because the area is ecologically fragile (e.g., steeply sloped) or not productive for tree growth.

Table 5-4d

Quantity of Land in Different Intensity Zones, FY 95, Case 4

<u>Zone Description</u>	<u>National:</u>		<u>State:</u>		<u>Difference<sup>a</sup></u>
	<u>Acres</u>	<u>Proportion</u>	<u>Acres</u>	<u>Proportion</u>	
Commercial Timber Harvest	97,485	18.5 %	728,546	92.3 %	-73.8 %
Not Commercial Timber Harvest					
Delayed harvest			1,443	0.2 %	
Late Successional Reserve	<u>429,876</u>	<u>81.5 %</u>			
Scenic Buffer			5,740	0.7 %	
Game, Fish, or Fragile Area			5,696	0.7 %	
Unspecified			<u>47,721</u>	<u>6.0 %</u>	
Total	429,876	81.5 %	60,600	7.7 %	73.8 %
Total Forest Acreage	527,361	100.0 %	789,146	100.0 %	

<sup>a</sup>Positive values indicate higher national value, negative values indicate higher state value.

Overall, analysis of zone restrictions in planning documents supports Hypothesis 6. In three of the four cases, zone restrictions constrain economic development activities, especially commercial timber harvesting, to a greater degree on national than state forests.

Summary of Planning Document Constraints

In general, planning documents in each case specify more constraints overall, and more constraints fostering non-economic activities such as environmental protection, at the national than the state level, lending support to Hypotheses 5 and 6. As Table 5-5 indicates, for the first indicator, timber stand improvement, the national agency planning document includes stricter requirements for environmental protection in two cases, while requirements are similar in the other two cases. But for the second indicator, leave trees, the national planning document is stricter in all cases. For the third indicator, riparian areas, the national planning document is stricter in three cases, while requirements are similar in one case. For the fourth indicator,

regeneration openings, the national planning document is stricter in three cases, while the state planning document is stricter in one case. For the fifth indicator, zone restrictions, the national planning document is stricter in three cases, while requirements are similar in one case.

Table 5-5

Summary of Restrictions Included in Planning Documents

<u>Activity or Condition</u>	Agency Facing More Requirements for Environmental Protection:			
	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
Timber Stand Improvement	<i>National</i>	Similar	<i>National</i>	Similar
Leave Trees	<i>National</i>	<i>National</i>	<i>National</i>	<i>National</i>
Riparian Areas	Similar	<i>National</i>	<i>National</i>	<i>National</i>
Regeneration Openings	<i>National</i>	State	<i>National</i>	<i>National</i>
Zone Restrictions	Similar	<i>National</i>	<i>National</i>	<i>National</i>

*Italics* indicates support for Hypothesis 6

Planning documents are created with consideration of conditions on the ground in particular forests. Thus documents reflect the physical characteristics of a given forest. Even so, the systematic differences between state and national planning documents cannot convincingly be explained by physical differences between forests. As indicated in Chapter 2, selection of forest pairs within each case emphasized forests with similar physical attributes. Thus we must turn to other reasons to understand such marked differences in planning document constraints.

An important explanation for the systematic differences in planning document constraints involves public input. Development of the current national forest Plans involved a wide variety of interests, including environmentalists, trail riders, hikers, timber harvesters, oil and gas producers, bird watchers, and others. All of these groups had access to the national forest Plans while they were being formulated, and they were able to pursue their preferences



with officials creating the planning documents. Moreover, parties unsatisfied with national plans have taken advantage of their rights to appeal them.

Outside interests had less influence in state forest planning documents. In fact, in Cases 1 and 2, such documents were formulated exclusively by agency officials, without significant citizen input. While these officials may have tried earnestly to take multiple uses into account, they did not face the same pressures from those favoring uses without substantial, direct economic interests that did national officials. Even in Cases 3 and 4, which involved several public meetings in the state planning process, citizens had less power to pursue their preferences through legally sanctioned channels in state than in national planning.

The lower level of constraints requiring environmental protection at the state level has not gone unnoticed by environmental communities. For example, a group of environmentalists in Case 1 recently began to press for greater inclusion in future state planning processes, perceiving that a more open approach to planning might lead to planning document constraints that provide greater environmental protection than do the current ones.

Greater citizen input in national agency planning is evident in more than just planning document creation. Citizens also have greater input in national agency Plan enforcement and amendment. While officials' compliance with planning restrictions is monitored by their supervisors in national as well as state agencies, only in national forests are the restrictions subject to challenges by outside parties, with the power to force judicial review. Planning document requirements are legally binding on national officials, and changes to a national forest Plan are not valid unless they are made through a formal amendment process. State planning documents, on the other hand, are not legally enforceable by outside parties, and the documents may be amended internally, without citizen input.

Given these differences in planning document formulation and amendment, it is not surprising that, consistent with Hypotheses 5 and 6, national planning documents specify more constraints on officials than do state planning documents, and these constraints emphasize greater environmental protection on national forests than on state forests.

Recall also that national officials face more legal constraints from NFMA and NEPA, which require national officials to take specific actions to protect the environment. In addition, their efforts are subject to MUSYA, which specifies that management is not to be directed towards the greatest dollar return. State officials, on the other hand, face fewer such constraints to lessen environmental impacts. Moreover, as discussed above, the state statutory mandates include a directive to manage state forests for the profitable growth of timber (Case 1) or the production of timber for revenue (Cases 2-4).

### Conclusion

Analysis of statutory, regulatory, and planning document constraints facing officials allows empirical testing of Hypotheses 5 and 6. Comparisons of state and national rules about such constraints provide support for these hypotheses. Hypothesis 5 suggests that national officials face a greater number of constraints on their activities than do state officials. Statutes such as NFMA and NEPA, and their implementing regulations, address planning process requirements and constraints on forest activities on the national forests. State officials face far fewer legal restrictions.

Hypothesis 6 suggests that constraints foster greater efforts for environmental protection at the national level while constraints foster greater efforts for activities with substantial, direct economic benefits at the state level. Analysis supports this hypothesis. While state statutory mandates emphasize timber as a source of profit or revenue, the national statutory mandate specifically requires that officials not manage for the greatest economic return. Moreover, substantive statutory requirements in NFMA constrain national officials' ability to increase direct economic benefits, requiring numerous efforts to protect other resources such as rare species. In addition, planning documents require national officials to undertake higher levels of environmental protection than state officials.

These findings provide important lessons for policy making in federal systems. Choices about the level of government at which to assign policy making matter, as officials at lower levels face substantially different constraints than do those at higher levels. As Hecl (1978), Peterson (1995), and others have described, a wider variety of interests have access to decision making at higher levels of governance. This access largely results from statutory and regulatory constraints requiring higher-level officials to include more outside parties in policy processes and giving such parties avenues to appeal agency decisions. This greater access illustrates a tension inherent in democratic governance, between citizen access and cost effectiveness. Providing complex planning processes with citizen participation and recourse to appeals takes time and monetary resources.

Statutory and regulatory constraints also affect agency officials' activities on the ground. While civil servants do not face electoral defeat, their responsiveness to citizens can be enhanced by elected officials who create bureaucratic constraints. Thus it is through statutory and regulatory constraints that Peterson's (1995) functional theory can be extended to non-elected bureaucrats; officials at higher levels of governance face more constraints that inhibit pursuit of substantial, direct economic benefits. While analysis above provides strong evidence that this occurs in public forest policy, it also should apply to other policy areas. That is, where bureaucrats make trade-offs between economic and non-economic benefits, they are likely to face more constraints hindering the pursuit of economic benefits at higher levels of governance.

Planning documents reflect the preferences of those who create them. The greater public access involved in national planning documents leads to significantly more constraints on national than state officials. This is especially true with regard to activities that are not aimed at economic development or commodity provision, such as riparian area protection and land use zones prohibiting commercial timber sales. National officials face more constraints that impede high-volume, low-cost timber provision. State officials, in contrast, are less constrained in their pursuit of active vegetative manipulation to enhance timber benefits. Thus

planning document contents support the argument that policy processes differ systematically between levels of governance in a federal system. Providing greater citizen access to plan creation and enforcement leads to more constraints on bureaucratic actors. In this sense, national agency officials are less insulated from external pressures than are state agency officials.

Overall, statutes, regulations, and planning documents provide national officials with greater specificity about what may or may not be done on public forests. Many of these constraints emphasize environmental protection, even at the expense of economic benefits. Of course, statutes, regulations, and planning documents are words on paper. Learning about them does not tell us about activities that officials undertake on the ground. The question of whether such constraints actually lead to differences in outcomes at the state and national level is the subject of Chapters 7-9. But first, we must explore the connection between public participation requirements and resulting patterns of public participation. Chapter 6 examines whether differences in public participation requirements lead to differences, in practice, in agency officials' interactions with non-agency participants.

## Chapter 6: Interactions with Non-agency Participants

While examining officials' preferences, communities, and the incentives and constraints they face can provide valuable insights into their behavior, it also is important to investigate their interactions with people outside the agency. Indeed, these organizations are public agencies, ultimately accountable to the citizenry of the state or nation.

As indicated in Chapter 5, national officials face greater constraints requiring them to encourage public participation than state officials do. National officials also face external actors with potentially powerful tools to impact officials' activities: administrative appeals and lawsuits. In contrast, state officials face fewer legal requirements to pursue public input, and opponents of forest officials' activities have less legal power to block them.

Questions about patterns of interactions with outside parties are a mainstay of scholarship in bureaucratic politics. Especially with regard to the U.S. Forest Service (USFS), research has focused on relationships between agency decision makers and outside parties with strong preferences about forest management. Accusations of agency "capture" by commodity interests assume that interactions are a key determinant of agency policy outcomes (see, for example, Shepherd 1975). But little is known about interactions of agency officials at lower levels of governance.

In the context of federalism, scholars have suggested differences in communications across levels of governance. For example, Peterson (1981) and Heclo (1978) suggest that non-business interests are more active at higher levels of governance. If this is true, then non-business interests might also wield more influence at higher levels. Sabatier (1974) argues that parties seeking economic benefits advocate policy devolution to lower levels of governance, where they will find regulators more attuned to promoting economic development. Conversely, groups favoring greater environmental preservation have grown at the national level, increasingly focusing on national policies (Walker 1983, Schlozman and Tierney 1983).

Empirical evidence is needed to test these claims. Such evidence gleaned from careful analysis of one policy can provide valuable information applicable to other policy areas as well.

In this chapter, analysis of interactions focuses on the extent and diversity of public input as well as the perceived influence of participants. The following hypotheses relate to officials' interactions with non-agency participants:

Hypothesis 7: Compared to state forest officials, national forest officials devote more effort to seeking public input, and they receive a higher proportion of public input from those favoring uses without substantial, direct economic benefits.

Hypothesis 8: Non-agency participants favoring forest uses without substantial, direct economic benefits are more influential in national than state forest policy, while those favoring uses with substantial, direct economic benefits are more influential in state than national forest policy.

Testing these hypotheses will increase understanding of the importance of external interactions to agency officials and of characteristics of interactions across levels of governance in a federal system.

### Extent and Diversity of Public Input

Do systematic differences exist between state and national officials' efforts to involve non-agency participants in forest management decision making? Certainly one aim of national statutes such as NFMA and NEPA, as described in Chapter 5, is to increase public participation in policy processes. Hypothesis 7 suggests, first, that national officials expend greater efforts to foster public participation than do state officials, and, second, that they receive greater levels of public input from those favoring uses without substantial, direct

economic benefits. Analysis proceeds in three steps. First, analysis addresses officials' efforts to encourage public participation. Next, analysis highlights officials' views of the purposes of these efforts. Finally, analysis examines resulting patterns of communications achieved.

Analysis indicates that officials across both agencies provide channels for public input, but that national officials' efforts are somewhat more extensive than are those of state officials. National officials' stated purposes for seeking public input suggest a greater chance that public preferences will receive substantial weight in officials' decision making. But national officials do not engage in greater levels of communication with non-agency participants across the board; rather, they engage in more communication with non-agency participants favoring preservation. These results support Hypothesis 7.

#### Officials' Efforts to Encourage Public Participation

Officials can undertake a variety of efforts to encourage public participation in forest management. Public participation efforts can be examined in four categories: mailings, public meetings, working groups, and other efforts. Data suggest that differences between state and national agencies vary by indicator. One indicator, mailings, provides support for Hypothesis 7 across all four cases, while two indicators, public meetings and other efforts, support Hypothesis 7 in two cases, and one indicator, working groups, does not support Hypothesis 7.

#### *Mailings*

The first indicator, mailings, includes both agency newsletters and letters to targeted individuals regarding specific projects in fiscal year 1995. In all four cases, national officials undertook greater efforts to encourage public participation through mailings than did state officials.

In Case 1, both agencies maintained mailing lists of parties expressing interest in various issues. Exact numbers and expenditures for agency mailings were not available, although agency officials did provide different estimates regarding the number of recipients<sup>30</sup> on their mailing lists. The biggest mailing list for the Wayne National Forest included over 900 recipients, 300 of whom received a quarterly newsletter (N1E3). Ohio State Forest officials maintained a mailing list for the agency's quarterly newsletter, which personnel sent to nearly 5,000 recipients (S1K2). Despite a greater number of state agency mailings, the public input value of these mailings was substantially lower than from national agency mailings. While state officials typically produced a short document (four pages) that gave information about recent agency accomplishments, the national agency produced a longer document (typically sixteen pages) that not only described accomplishments, but also included a substantial list of dozens of proposed actions with information about which officials to contact for input (S1-10, N1-4). Thus the national newsletter was designed to solicit public comments more than the state newsletter.

In addition to encouraging public input more through newsletters, national officials in Case 1 also solicited input more frequently through letters sent to interested parties. One Wayne National Forest official indicated that agency personnel sent letters to a handful of people likely to be impacted by each non-trivial agency action (N1A1). For example, he estimated that a few dozen times in 1995, four or five parties received letters relating to proposed oil or gas permits. Additional national officials described similar letters related to other agency actions. Ohio State Forest officials, in contrast, did not indicate that such letters were an important part of their activities.

A good example of differences between state and national officials' efforts in Case 1 involves land purchase and exchange. One Wayne National Forest official said that proposed land purchases involved agency letters sent to county commissioners, the congressional

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<sup>30</sup>Recipients include individuals as well as interest groups. Officials could not provide estimates of the number of individuals involved in each interest group.



delegation representing that region, and sometimes state legislators as well (N1A1). State land adjustment, on the other hand, did not routinely involve such notification. State officials had more freedom to pursue land exchanges and purchases without seeking public participation. In fact, state officials had recently pursued a land exchange outside their agency's legal purchase boundary, with approval granted by the natural resources department, not legislative mandate. State officials preferred to pursue the purchase without public participation, because in a prior land purchase attempt, a vocal group of opponents had contacted the administrative agency with land transaction responsibilities and was able to block the transaction (N1F5).

In Case 2, Hoosier National Forest officials maintained a number of mailing lists relating to different issue areas. Several hundred parties received a quarterly newsletter, which provided extensive information about ongoing and planned activities and contact personnel for public input. Indiana State Forest officials, in contrast, did not provide a state forest newsletter for public distribution.

In addition to providing quarterly newsletters, national officials in Case 2 sent many letters to interested parties when specific projects were planned. For example, one Hoosier National Forest official described sending at least one such letter per month, to about fifty or sixty people (N2E2). Another national official sent 800 letters to individuals identified as having an interest in a proposal to allow a private organization to build a horse trail on the national forest (N2G2). Forestwide, officials sent approximately one letter per week (N2E2). These letters went to adjacent landowners as well as individuals who had expressed interest in a particular issue area.

On state forests in Case 2, Indiana State Forest officials reported contacting adjacent landowners before planned timber sales (S2F4). State officials also contacted groups directly affected by certain proposed activity. For example, one official contacted horse riders to inform them of plans to close a horse camp (S2F3). However, state officials did not provide as many systematic mailings, to as many people, as did national officials.

In Case 3, national officials mailed a newsletter semi-annually to interested parties. The newsletter, typically about forty pages, described all projects subject to NEPA requirements, including maps, schedules, and personnel to contact to provide input (N3-13). Gifford Pinchot National Forest officials sent this newsletter to about 400 recipients (N3M1). State officials, in contrast, did not provide a newsletter. While the state department of natural resources (of which the forest agency is a part) did print an annual report describing financial and project activities for the previous year, this report did not provide details about future projects, nor did it indicate which officials to contact to provide input (S3-5).

In addition to sending newsletters, officials used mailing lists to send letters to interested publics about upcoming projects such as timber sales. Gifford Pinchot National Forest officials sent letters to about 120 recipients for each timber sale and other projects for which they had completed environmental assessments (N3D1). Washington State Forest officials sent letters to interested parties for activities for which they had completed environmental checklists (S3I1). One state official estimated that the agency sent over twenty such letters per month, each to about a dozen recipients (S3N1). But state letters were related to a narrower range of projects; over 85% of the letters in one four-month period were for timber sales, with few letters related to other projects (S3N1).

In Case 4, national officials provided a quarterly newsletter highlighting proposed actions for which there was opportunity for public input. Siuslaw National Forest officials sent this newsletter to about 1,300 recipients (N4B1). Oregon State Forest officials also produced a newsletter, six times per year, which they sent to about 2,000 recipients (S4D1). Unlike the national agency's newsletter, this publication was designed more as a tool for sharing the agency's accomplishments than for encouraging public input regarding specific projects. In addition, state officials kept a mailing list of approximately 800 requesters who received a quarterly newsletter featuring updates on the long-range forest planning process (S4D1). They also sent a recreational newsletter to about 400 requesters (S4L1, S4-12 pp. B1-B3 & 2). While these recreational and planning newsletters encouraged public involvement in planning

processes, they generally did not provide information to encourage public participation in specific agency decisions. Thus, in Case 4, while state officials sent out a greater number of mailings, these mailings encouraged public participation in specific project decisions less than did national agency mailings.

In addition to newsletters, officials in Case 4 sent targeted letters related to specific projects. Siuslaw National Forest officials sent targeted letters to solicit public participation in agency decisions more than did state officials. One national official with recreational program responsibilities estimated sending about seventy-five different letters during the year, each going to an average of thirty parties interested in specific recreational use decisions (N4B1). For example, officials sent a letter to about 1,500 recipients regarding a proposed rule change affecting a popular recreational area (N4I1). National officials also sent letters relating to any project for which an environmental assessment was performed, such as timber sales, land exchanges, right-of-way grants, and special use permits.

Also in Case 4, Oregon State Forest officials sent notification letters to interested parties before a timber purchaser started operations (S4I1). However, state officials did not routinely send letters for other projects (S4L1). In fact, most recipients of timber harvesting notifications were not parties seeking to provide input into agency decision making, but timber consultants prospecting for business with the timber purchasers (S4I1). Thus, in Case 4, as in the other cases, national officials used newsletters and targeted letters to encourage public participation in agency decision making for specific projects more than did state officials (see Table 6-1).

Table 6-1

Comparison of Officials' Use of Mailings to Encourage Public Participation

	<u>Solicits Input for Wider Range of Specific Projects</u>	<u>Higher Frequency</u>	<u>Sent to More Recipients</u>
<b>Case 1: Wayne National Forest and Ohio State Forests</b>			
Newsletters	<i>National</i>	Similar	State
Letters	<i>National</i>	<i>National</i>	<i>National</i>
<b>Case 2: Hoosier National Forest and Indiana State Forests</b>			
Newsletters	<i>National</i>	National	<i>National</i>
Letters	<i>National</i>	<i>National</i>	<i>National</i>
<b>Case 3: Gifford Pinchot National Forest and Washington State Forests</b>			
Newsletters	<i>National</i>	<i>National</i>	<i>National</i>
Letters	<i>National</i>	Similar	Similar
<b>Case 4: Siuslaw National Forest and Oregon State Forests</b>			
Newsletters	<i>National</i>	State	State
Letters	<i>National</i>	Similar	Similar

*Italics* indicates support for Hypothesis 7

*Public Meetings*

The second indicator of efforts to encourage public participation is public meetings, which provide a means for a number of non-agency participants to communicate face-to-face with one another and with agency officials. Analysis focuses on meetings held by forest agency officials that are attended by non-agency participants. In two cases, national and state officials held similar levels of public meetings, while national officials held more public meetings in the other two cases.

In Case 1, national officials devoted greater effort to encourage public participation through public meetings than did state officials. For example, one horse rider described attending meetings with national officials two or three times per year, compared with only once

per year at the state level.<sup>31</sup> A chamber of commerce member said he had been to numerous meetings with national officials, where he expressed his concern over national officials' land purchasing activities. In 1995, Wayne National Forest officials initiated a series of quarterly "community of interest" meetings open to anyone interested. Each meeting attracted approximately thirty to forty people, with a diversity of interests including wildlife, environmental protection, horse riding, hunting, off-road vehicle (ORV) riding, private forest ownership, logging, community tax revenue, oil and gas production, and bird watching. About ten national officials participated in the meetings, including the forest supervisor, district rangers, and most program managers, where they shared information and answered questions. For the first meeting, a professional facilitator managed discussions. While several Ohio State Forest officials attended these national agency meetings, the state agency did not hold any meetings for such a large and diverse group of non-agency participants.

While state officials in Case 1 engaged in fewer public meetings, their use of public meetings has increased. In fiscal year 1995, Ohio State Forest officials held two informal<sup>32</sup> open houses, with a few officials present, at local forest offices to inform the public about forest management plans (S1G1, S1K1). They also held a public meeting for those interested in hearing about proposed agency rule changes. Moreover, one state official cited several examples of public meetings that the state agency sponsored to explain possibly controversial plans, such as expanding horse trails in one state forest and spraying a herbicide to fight gypsy moth infestation in another (S1I1). Even so, state officials did not hold as many public meetings as did national officials in Case 1.

In Case 2, neither Indiana State Forest nor Hoosier National Forest officials held formal public meetings. Several national officials expressed a belief that such public meetings

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<sup>31</sup>As described in Chapter 2, non-agency participants involved in forest policy (suggested by agency officials or other non-agency participants) participated in interviews via telephone.

<sup>32</sup>Officials differentiate between formal and informal meetings based on several factors. Formal meetings tend to have a structured format, with an agenda, and discussions among all participants together. Informal meetings feature individual officials who mingle and discuss issues with a few people at a time, without extended discussions among all participants together.

are often counterproductive: "We don't do formal public meetings any more because they're not useful for information sharing; you get people with their set agendas who don't work together" (N2E2). Another national official explained, "We've found that meetings often lead to shouting matches, with polarized viewpoints, and I've seen studies to back this up" (N2G2). Similarly, a state official said, "We avoid general public meetings much, since they can be rancorous and, with some quiet folks, not everyone gets to speak their mind" (S2C1).

However, officials in both agencies held informal open houses for public communication. Such open houses on the national forest usually were conducted in order to learn public views and concerns about particular proposed projects. Citizens had opportunities to discuss projects with national officials individually (N2G2). Approximately four open houses were held on the national forest in fiscal year 1995 (N2G3). At the state level, one state official estimated that the forest division held between three and ten open houses in a year (S2C1). He described a typical open house as devoted to a specific issue, with forest officials seated at different tables and the public invited to stop by and talk one-on-one. Thus in Case 2 state and national officials held a similar number of public meetings.

In Case 3, Gifford Pinchot National Forest officials held formal public meetings relating to issues involving hostility or a need for guidance from the public about forest management direction (N3E1). For the timber program, between four and six such meetings were held in fiscal year 1995, while about two to three public meetings were held for non-timber program areas (N3D1, N3J1). In addition, national officials held open houses or workshops about four times per month (N3B1). In these gatherings, officials and interested publics discussed plans for the forest's adaptive management area as well as specific issues such as damage caused by flooding. Some of these gatherings included forty to fifty public participants (N3B1).

State officials in Case 3 held fewer public meetings. Washington State Forest officials at the field level typically held one or two meetings per month, where they met with neighbors and other interested individuals about timber sales or recreational conflicts (S3B1, S3I1).

Traditionally, the timber sale process included a pre-harvest review meeting prior to each sale, but because of low participation from non-timber interests, one local-level forester stopped holding such meetings (S3I1). During creation of landscape-level plans for a particular forest, state officials sometimes held public meetings (S3B2).

In Case 4, Siuslaw National Forest officials hosted a variety of public meetings. One national official in the timber program estimated meeting with citizens about once per month to discuss policies and practices (N4F1). Another official worked with the Provincial Advisory Committee, which met quarterly to discuss implementation of the amended forest Plan (also called the "President's Plan") (N4C1). Officials also held public meetings relating to watershed analyses. About three watershed analyses were performed during the year, and each involved about five meetings attended by fifteen to twenty people (N4A1). National officials met with a recreation group once or twice during the year, and they hosted an annual open house focusing on recreation issues (N4I1). One national official working at the forest headquarters estimated that, forestwide, officials held between ten and twenty project-oriented public meetings during the year (N4J1).

State officials in Case 4 also hosted numerous public meetings for planning purposes. In creating a new regional forest plan, Oregon State Forest officials planned to hold five public meetings, in different locations, at each of five planning stages over a three-year period (S4D1). In addition, a comprehensive recreation plan for one state forest, completed over a two-year period, included over thirty-six meetings with user groups (S4-12, p. 2). The creation of the statewide forest planning document also included seven public meetings (S4-3, p. 5). Other than long-range planning, however, officials did not hold frequent public meetings to encourage public participation for activities such as timber sales (S4P1).<sup>33</sup> In fact, officials developed annual timber sale plans without public input, and those seeking a copy of such plans

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<sup>33</sup> It should be noted that national officials also held many public meetings and provided numerous opportunities for public input at the time they were creating the Siuslaw National Forest Plan prior to 1995.

were charged \$0.25 per page (S4A1). One state official commented, "Overall, we do little to encourage public input outside of [long-range] planning" (S4L1).

Thus, across the four cases, national officials undertook greater efforts to encourage public participation through public meetings in Cases 1 and 3, while effort levels were not clearly different in Cases 2 and 4. This result provides modest support for Hypothesis 7.

### *Working Groups*

The third indicator of officials' efforts to encourage public participation is the creation of working groups that include non-agency participants. At the national level, creation of working groups to address public forest issues is dampened by concerns about the Federal Advisory Committee Act of 1972 (FACA). In attempting to avoid advisory committee capture by narrow interests, FACA set limits on the use of advisory committees, and President Clinton's Executive Order 12838 (1993) prevented the creation of new advisory committees without a "compelling consideration" to justify their existence and Office of Management and Budget (OMB) approval. Thus national officials do not often invite non-agency individuals to join official advisory committees. Still, on occasion, national officials do create working groups for specific planning processes. In fiscal year 1995, national and state officials created similar levels of working groups across three cases, while in the fourth case state officials used working groups more extensively.

In Case 1, officials in both agencies used working groups to a similar extent. On Wayne National Forest, officials created committees of users to help in forest planning. For example, prior to 1995, national officials established a trails committee to gain input from a variety of interested parties. Officials incorporated such input into the development of a plan adding trails to the forest (N1D1). At the state level, a forest advisory council, appointed by the governor, included one representative from each of the following interests: forest-based research activities, small private forestland owners, large private forestland owners, pulp/paper



industry, other forest industries, soil science, forest recreation, and "the public." This council met quarterly and gave advice to the forest agency chief about priorities, long-term goals, and controversial issues, but generally not on site-specific planning.

In Case 2, officials used working groups to a similar extent in both agencies. Hoosier National Forest officials created task forces to deal with certain issues. For example, officials worked on a project designed to catalogue existing forest openings and decide which to maintain and where, if any, to create new ones. Officials invited non-agency participants from the U.S. Fish and Wildlife Service, state natural resources department, and a state university to provide input into this project (N2E2). In addition, prior to a Plan amendment, officials brought together over a dozen individuals representing diverse interests, and this group met repeatedly over the course of a year to provide recommendations for the amendment (N2H1).

State officials in Case 2 also fostered involvement in working groups. For example, Indiana State Forest officials established a horse riding task force to provide a public voice in planning for horse trails. In addition, a permanent working group established to address state forest issues included a broad array of interests, from timber to government agencies to environmental protection and many others. The state forester chaired this working group of about forty active members, which met twice a year. While a main purpose of the working group was to fulfill the "forest stewardship committee" requirement attached to some Federal grants, it did provide a forum for sharing ideas and concerns.

In Case 3, neither national nor state officials supported working groups at a high level. On Gifford Pinchot National forest, amendments to the existing forest Plan addressing northern spotted owl protection created a Provincial Advisory Committee. The committee, comprised of representatives from environmental groups, recreation interests, Native American tribes, timber producers, and counties, met bi-monthly to help officials set management priorities and to review all timber sales (N3F1, N3G1). Other than this committee, national officials did not include working groups as a substantial means to encourage public participation.

Nor did state officials in Case 3 make much use of working groups with non-agency individuals. The only example mentioned by Washington State Forest officials was in creating landscape plans for a particular forest. One state official said that, for some landscape plans, individuals representing diverse interests may be appointed to an advisory committee (S3B2).

In Case 4, officials encouraged public participation less on the national forest than on state forests. On Siuslaw National Forest, the Provincial Advisory Committee met quarterly to discuss implementation of the forest Plan amendments (N4C1). Officials also assembled two or three ad-hoc groups, which focused on particular issues and held several meetings over the course of two or three months (N4J1). On Oregon State Forests, officials used working groups more extensively. On the state's largest forest, recreational interests were represented on three committees: recreation advisory, which met quarterly; non-motorized trail planning, which met monthly; and motorized trail planning, which met about twice a month (S4J1). In addition, a "Forum Group" including diverse interests provided input to long-range forest planning (S4C1).

Overall, analysis of working groups does not support Hypothesis 7. National officials did not use working groups more extensively than did state officials. In fact, FACA and Executive Order 12838, which attempted to reduce the possibility of working group capture by narrow interests, made it difficult for national agencies to establish formal advisory committees.

### *Other Efforts*

A final indicator of officials' efforts to encourage public participation is the combination of other activities that officials described. National officials described higher levels of such activities than did state officials in two cases, while state and national officials in the other two cases described similar levels.

In Case 1, national officials undertook greater efforts to encourage public input than did state officials. Officials at both Ohio State Forests and Wayne National Forest distributed and

collected visitor comment cards (N1D1, S1J2), participated in fairs and trade shows (N1E2, S1C1), and attended other organizations' meetings to share information (N1C1, U1H5). But national officials also described the use of additional activities such as press releases, field trips, membership in community groups, and even door-to-door contacts to increase public participation (N1F2, N1E1, N1D2). At one point, this researcher observed a national official, whose primary job responsibility was not public relations, assisting a walk-in student to obtain information about a planned restoration project, taking time to sit down with him and provide a map with detailed explanations.

In Case 2, officials at both agencies reported similar levels of other efforts. Indiana State Forest and Hoosier National Forest officials described working with volunteers who help maintain trails or pick up trash (N2B1, S2F5), giving educational presentations to different groups (N2C1, S2F3), attending other groups' meetings (N2G1, N2K1, N2A2, S2D1, S2F3, S2C1, S2I1), and hosting field trips (N2K1, S2F3). National officials cited additional activities such as writing newspaper notices and soliciting input through comment cards (N2G1, N2G2), while state officials described conducting surveys to provide guidance in developing recreational policy (S2C1).

In Case 3, national officials undertook greater other efforts than did state officials. Officials at both Washington State Forests and Gifford Pinchot National Forest cited the use of one-on-one meetings with concerned parties (N3B1, N3E1, S3I1) and partnerships with groups helping with forest projects (N3B1, N3L1, S3I1). National officials described making public contacts through classroom visits, while a state official described staffing fair booths (N3L1, S3B1). But national officials described several additional tools not mentioned by state officials, including press releases (N3B1, N3G1), hosting field trips (N3B1, N3G1, N3A1, N3H1), and hosting campouts for inner city youths (N3L1). National officials also indicated higher levels of attendance at non-agency meetings; they attend meetings held by horse riding, motorcycle, snowmobile, mountain biking, wildlife, and environmental groups (N3E1, N3J1, N3L1, N3H1), and the forest supervisor attended between ten to twenty meetings of county

commissioners, civic organizations, and other groups in 1995 (N3A1). In contrast, only one state official indicated that attending other groups' meetings was an important part of public interaction (S3M1). This official attended between five and ten such meetings in 1995.

In Case 4, national and state officials undertook similar levels of "other" efforts to encourage public participation. Siuslaw National Forest officials described numerous efforts, including hosting forest field trips (N4K1), developing focus groups (N4A1, N4B1), holding one-on-one meetings (N4F1, N4A1, N4I1), attending meetings of non-agency participants (N4F1, N4G1, N4B1), and staffing county fair booth (N4G1). Similarly, Oregon State Forest officials encouraged public input through hosting forest field trips (S4I1, S4L1), developing focus groups (S4D1), attending meetings of non-agency participants (S4J1), hosting volunteer workdays (S4B1), and visiting schools (S4N1).

Overall, analysis suggests that national officials devote somewhat greater efforts than do state officials to encourage public participation (see Table 6-2). National officials in all cases devote greater efforts to mailings intended to solicit public input. National officials use public meetings more frequently than state officials in Cases 1 and 3, while in Cases 2 and 4 national and state officials host a similar quantity. National and state officials devote similar efforts to working groups and task forces in Cases 1 - 3, but state officials devote greater efforts in Case 4. Finally, national officials devote greater efforts to other public communications activities in Cases 1 and 3, while efforts are similar across the agencies in Cases 2 and 4.

These results provide modest support for the first part of Hypothesis 7. As hypothesized, national officials do indicate somewhat higher levels of effort to involving various publics in decision making processes than do state officials. This difference is especially evident in the use of mailings, but it is also present to some degree in the use of public meetings and other efforts.

Table 6-2

Summary of Officials' Public Input Efforts

<u>Tool</u>	Agency with greater efforts:			
	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
Mailings	<i>National</i>	<i>National</i>	<i>National</i>	<i>National</i>
Public meetings	<i>National</i>	Similar	<i>National</i>	Similar
Working groups	Similar	Similar	Similar	State
Other	<i>National</i>	Similar	<i>National</i>	Similar

*Italics* indicates support for the first part of Hypothesis 7

Officials' Stated Reasons for Engaging in Public Communications

In examining officials' activities to encourage public participation, it is important to understand the reasons why they undertake such efforts. As indicated in earlier chapters, legal mandates require certain national agency efforts, and public communication is viewed as an important part of the performance criteria for a number of officials in state and national agencies. Understanding the goals that officials have in communicating with the public sheds light on the participatory nature of these interactions. Officials seeking to *educate* the public are less likely to incorporate public input into their decisions than are officials seeking to *learn from* the public.

To illuminate officials' reasons for engaging in public communication, during interviews state and national officials were asked, "Why do you undertake efforts to communicate with the public?" While such a question does not require respondents to prioritize reasons or create exhaustive lists, it does provide useful insights into salient reasons. Table 6-3 combines all responses across all interviewees<sup>34</sup>, grouped into three categories: moral obligation, learning opportunity, and promotion of the agency.

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<sup>34</sup>Some interviewees listed one reason, while others listed multiple reasons.

The first category of responses is moral obligation. In this category, public communication is viewed as an end in itself, regardless of any instrumental benefits such as earning support for the agency or providing information to officials. The category includes responses focusing on a duty to the public, as well as those emphasizing the agency's mission. For example, a typical response categorized as moral obligation comes from one national official who said, "It's the public's forest -- they have a right to know what's going on" (N1D2). Another national official described the importance of being responsive to the public in order to uphold the agency's customer service mission (N1I1). A state official said, "We seek public input because I feel an obligation, since this is state land and these people have an interest in the property" (S2F3).

Comparing national to state officials' "moral obligation" responses yields mixed results (see Table 6-3). In Case 1, Wayne National Forest officials' responses are more likely than Ohio State Forest officials' responses to fall into the "moral obligation" category: five of fifteen (33%) national officials' responses, compared to just one of seven (14%) state officials' responses. But the reverse is true in Case 2; a higher proportion of Indiana State Forest (four of eight, or 50%) than Hoosier National Forest (three of eleven, or 27%) officials' responses cited moral obligation reasons for soliciting public participation. In Case 3, a similar proportion of responses by Gifford Pinchot National Forest (two of thirteen, or 15%) and Washington State Forest (one of seven, or 14%) officials cited moral obligation. In Case 4, four of fifteen (27%) Siuslaw National Forest officials' responses indicated moral obligation, while none of the seventeen (0%) Oregon State Forest officials' responses did. Thus national officials' responses cited moral obligation more than did state officials' responses in two cases, while the reverse is true in one case and proportions are similar in one case.

The second response category, "learning opportunity," includes responses indicating that public communication is valued for its contribution to better agency decision-making. This is an especially interesting response, in light of the high level of professionalism among foresters, who have been specially trained and are expected to have intimate technical

knowledge about the resources under their management. Responses in this category suggest that officials seek to learn from citizens. Public communication may contribute to better agency decision-making through providing agency officials with site-specific information about the forest. For example, one state official noted, "For our recreation plan, public input was important in bringing knowledge of the area, what the uses were, current problems, and historical background -- nobody knows the forest better than those who use it" (S4J1). Public communication also may provide officials with information about the preferences of various publics. For example, one national official said, "An important reason for communicating with the public is that we need to know what the public wants us to do on the land" (N4A1). Another national official described an incident where officials had planned to burn vegetation at one site without being aware of strong opposition, but once this opposition was communicated, the plans were changed (N1I3).

Comparing national to state officials' responses in the "learning opportunity" category yields mixed results (see Table 6-3). In Case 1, a similar proportion of national (five of fifteen, or 33%) and state (two of seven, or 29%) officials' responses cited learning opportunities. In Case 2, a higher proportion of national (six of eleven, or 55%) than state (none of eight, or 0%) officials' responses cited learning opportunities. Similarly, in Case 3, three of thirteen (23%) national but only one of seven (14%) state officials' responses cited learning opportunities. Finally, in Case 4, a similar proportion of responses in each agency (five of fifteen, or 33% of national officials' responses; five of seventeen, or 29% of among state officials) fell into this category. Thus a higher proportion of national officials' responses cited "learning opportunity" in two cases, while proportions are similar across agencies in two cases.

One likely explanation for a somewhat higher proportion of this response by national officials is job mobility. As described in Chapter 3, national officials tend to be more mobile, located at a particular forest for a relatively shorter period of time. Thus they may be more likely to recognize that they are missing much information about a particular forest and the preferences of people with an interest in how that forest is managed.

The third response category, "agency promotion," views public communication efforts as a protective mechanism to reduce the chances of future restrictions on agency activities. For example, one Ohio State Forest official noted that officials held two informal open houses in an attempt to head off a proposed clearcutting ban on one state forest and counter pressure to require formal public input processes (S1G1). An Indiana State Forest official said, "If we were to ignore public input, then the Legislature or the executive branch would step in and provide us with more detailed guidance" (S2C1). A Hoosier National Forest official noted, "The more public participation we get, the less likely we are to face appeals and lawsuits" (N2E2). The "agency promotion" category also includes responses indicating a desire to gain acceptance and support for present agency activities. For example, one Oregon State Forest official said it is important to engage in public communication "so the public is more receptive to our mission to actively manage forests for revenue" (S4N1). A Gifford Pinchot National Forest official said that public communication is crucial "to get support for our projects and give people a sense of ownership, which translates into them taking better care of the facilities" (N3E1).

In each case, state officials more frequently cited "agency promotion" reasons for undertaking public communications (see Table 6-3). In Case 1, four of seven (57%) Ohio State Forest officials' responses referred to agency promotion, while just five of fifteen (33%) Wayne National Forest officials' responses did. In Case 2, four of eight (50%) Indiana State Forest officials' responses referred to promoting the agency and its activities, compared to just two of eleven (18%) Hoosier National Forest officials' responses. In Case 3, five of seven (71%) Washington State Forest officials' responses cited "agency promotion," compared to eight of thirteen (62%) Gifford Pinchot National Forest officials' responses. Finally, in Case 4, twelve of seventeen (71%) Oregon State Forest officials' responses fell into this category, compared to just six of fifteen (40%) Siuslaw National Forest officials' responses.



Table 6-3

Officials' Stated Reasons for Engaging in Public Communications

<u>Reason</u>	Number of Responses:							
	Case 1		Case 2		Case 3		Case 4	
	<u>State</u>	<u>Nat'l</u>	<u>State</u>	<u>Nat'l</u>	<u>State</u>	<u>Nat'l</u>	<u>State</u>	<u>Nat'l</u>
1. Moral obligation								
Duty to the public	1	3	4	2	1	2	0	4
Agency mission	<u>0</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	1	5	4	3	1	2	0	4
Proportion of responses	14%	33%	50%	27%	14%	15%	0	27%
2. Learning opportunity								
Learn about specific forest sites	0	3	0	6	1	2	3	3
Learn public preferences	<u>2</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>2</u>
Total	2	5	0	6	1	3	5	5
Proportion of responses	29%	33%	0	55%	14%	23%	29%	33%
3. Agency promotion								
Preempt potential problems	2	2	3	1	3	5	6	3
Gain acceptance and support	<u>2</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>6</u>	<u>3</u>
Total	4	5	4	2	5	8	12	6
Proportion of responses	57%	33%	50%	18%	71%	62%	71%	40%
Total Proportion	100%	100%	100%	100%	100%	100%	100%	100%
Total Number of Responses	7	15	8	11	7	13	17	15

As Table 6-3 shows, important differences are evident with regard to officials' stated reasons for engaging in public communications. National officials are somewhat more likely than are state officials to indicate that the public has something to teach them about the forest they manage. In addition, state officials are more likely to pursue public communications for the purpose of increasing agency support and avoiding potential future problems. These findings suggest differences in the degree to which citizen participation is incorporated into agency decision-making. Arguably, officials who feel public input is useful for improving forest management will foster more meaningful public participation that actually shapes

decisions than will officials who feel that public communication is useful primarily as a means to promote what the agency is already doing and avoid future restrictions on agency activities.

### Actual Communication Levels

To complete analysis of official-participant communication, it is necessary to examine not only officials' efforts, but also actual communication levels achieved. This analysis relies on evidence derived from officials as well as from non-agency participants. While differences in communication with recreation interests are not clear, analysis does suggest substantial differences in patterns of communication with timber and preservation interests. More communication with timber interests occurs among state officials, while more communication with preservation interests occurs among national officials. This result supports the second part of Hypothesis 7.

### *Officials' Perceptions*

Information about officials' perceptions of actual communication levels across different interests comes from both officials' questionnaire responses and interviews. Results indicate that, while both national and state officials engaged in communication with a variety of interests, the balance of communications between preservation and timber interests was tilted towards preservation among national officials and towards timber interests among state officials.

A portion of the officials' questionnaire asked respondents to list and describe their "key contacts" (see Appendix 1). While many questionnaire respondents did not complete this portion of the questionnaire, stating that their key contacts vary substantially from issue to issue, a few respondents were able to indicate, overall, their key contacts. All "key contacts" representing preservation, off-road vehicle (ORV) riding, horse riding, hunting/wildlife, and

timber interests<sup>35</sup> are totaled, and the proportion of each is calculated. Results, displayed in Tables 6-4a and 6-4b, describe key contacts among three types of interest: recreation, preservation, and timber.

Patterns of recreation contacts are not clear. In Case 1, a higher proportion of state agency contacts than national agency contacts are horse riding and hunting/wildlife interests, while the proportion of off-road-vehicle (ORV) riding interests is similar. In Case 2, state and national proportions are similar across these recreation interests. In Case 3, national officials indicated a higher proportion of contacts with each of these recreation interests. In Case 4, a higher proportion of state agency contacts than national agency contacts are ORV riding, horse riding, and hunting/wildlife interests.

Unlike with recreation interests, communication differences with preservation and timber interests are clear. In three of the four cases, the proportion of preservation interest key contacts is substantially higher among national than state officials, while the proportion of timber interest key contacts is substantially higher among state than national officials. Specifically, preservation interests comprise a higher proportion of national than state officials' key contacts in Case 1 (75% vs. 6%), Case 2 (72% vs. 50%), and Case 4 (50% vs. 4%). National and state proportions are similar in Case 3 (47% vs. 50%). In contrast, timber interests comprise a higher proportion of state than national key contacts in Case 1 (18% vs. 0%), Case 2 (29% vs. 11%), and Case 3 (50% vs. 7%). Timber interests comprise a lower proportion of state (30%) than national (43%) key contacts in Case 4.

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<sup>35</sup>Hiking and camping interests did not appear on any key contact list.

Table 6-4a

Number of Key Contacts Identified by Agency Officials, Cases 1 and 2

Quantity and percent of contacts included in officials' lists of key contacts:

	Case 1				Case 2			
	National <sup>a</sup> :		State <sup>b</sup> :		National <sup>c</sup> :		State <sup>d</sup> :	
	<u>Qty</u>	<u>%</u>	<u>Qty</u>	<u>%</u>	<u>Qty</u>	<u>%</u>	<u>Qty</u>	<u>%</u>
Preservation	3	75	1	6	13	72	7	50
ORV	1	25	5	29	0	0	0	0
Horse	0	0	4	24	2	11	2	14
Hunt/wildlife	0	0	4	24	1	6	1	7
Timber	<u>0</u>	<u>0</u>	<u>3</u>	<u>18</u>	<u>2</u>	<u>11</u>	<u>4</u>	<u>29</u>
Total	4	100	17	100	18	100	14	100

<sup>a</sup>Responses from 5 national officials

<sup>b</sup>Responses from 3 state officials

<sup>c</sup>Responses from 3 national officials

<sup>d</sup>Responses from 5 state officials

Table 6-3b

Number of Key Contacts Identified by Agency Officials, Cases 3 and 4

Quantity and percent of contacts included in officials' lists of key contacts:

	Case 3				Case 4			
	National <sup>a</sup> :		State <sup>b</sup> :		National <sup>c</sup> :		State <sup>d</sup> :	
	<u>Qty</u>	<u>%</u>	<u>Qty</u>	<u>%</u>	<u>Qty</u>	<u>%</u>	<u>Qty</u>	<u>%</u>
Preservation	7	47	1	50	7	50	1	4
ORV	3	20	0	0	1	7	7	30
Horse	3	20	0	0	0	0	2	9
Hunt/wildlife	1	7	0	0	0	0	6	26
Timber	<u>1</u>	<u>7</u>	<u>1</u>	<u>50</u>	<u>6</u>	<u>43</u>	<u>7</u>	<u>30</u>
Total	15	100	2	100	14	100	23	100

<sup>a</sup>Responses from 7 national officials

<sup>b</sup>Responses from 4 state officials

<sup>c</sup>Responses from 6 national officials

<sup>d</sup>Responses from 7 state officials

To corroborate written responses, national and state officials in Cases 2-4 were asked, during interviews, to rank the amount of communication they had with various non-agency

participants. Results complement questionnaire responses (see Table 6-5). In each case examined, compared to state officials, national officials were more likely to list preservation interests among their most frequent contacts. In contrast, compared to national officials, state officials were more likely to include timber interests among their most frequent contacts.

Table 6-5

Officials' Descriptions of their Communications

Number and percent of officials indicating that they communicate most with the following interest:

<u>Agency</u>	<u>Timber</u>	<u>Preservation</u>	<u>Recreation</u>	<u>Total</u>
<b>Case 2: Hoosier National Forest and Indiana State Forests</b>				
National	0 (0%)	4 (57%)	3 (43%)	7
State	1 (20%)	1 (20%)	3 (60%)	5
<b>Case 3: Gifford Pinchot National Forest and Washington State Forests</b>				
National	0 (0%)	5 (50%)	5 (50%)	10
State	1 (20%)	1 (20%)	3 (60%)	5
<b>Case 4: Oregon State Forests and Siuslaw National Forest</b>				
National	2 (25%)	4 (50%)	2 (25%)	8
State	8 (80%)	1 (10%)	1 (10%)	10
<b>Total, all national</b>	<b>2 (8%)</b>	<b>13 (52%)</b>	<b>10 (40%)</b>	<b>25</b>
<b>Total, all state</b>	<b>10 (50%)</b>	<b>3 (15%)</b>	<b>7 (35%)</b>	<b>20</b>

In Case 2, four of seven (57%) Hoosier National Forest officials said that they communicate most with preservation interests, while three of seven (43%) said that they communicate most with horse riders (see Table 6-4). No national officials reported communicating most with timber interests. Among five Indiana State Forest officials in Case 2, three (60%) said that they communicate most with various recreation interests, one (20%) reported most communication with timber interests, and one (20%) reported most communication with preservation interests.

In Case 3, five of ten (50%) Gifford Pinchot National Forest officials said that they communicate most with preservation interests, while five (50%) said that they communicate most with various recreational interests, including motorized recreation, hiking, horse riding, and wildlife. No national officials reported most communication with timber interests. Among Washington State Forest officials in Case 3, three of five (60%) said that they communicate most with various recreation interests, one (20%) reported most communication with timber interests, and one (20%) reported most communication with preservation interests.

In Case 4, four of eight (50%) Siuslaw National forest officials said that they communicate most with preservation interests, while two (25%) said that they communicate most with various recreational interests (especially motorized recreation) and two (25%) said that they communicate most with timber interests. Among Oregon State Forest officials in Case 4, eight of ten (80%) said that they communicate most with timber interests, one (10%) reported most communication with recreational interests (especially motorized recreation), and one (10%) reported most communication with preservation interests.

Across the three cases, 52% of national officials indicated most frequent contact with preservation interests, while only 8% of national officials indicated most frequent contact with timber interests. In contrast, just 15% of state officials indicated most frequent contact with preservation interests, while 50% of state officials indicated most frequent contact with timber interests. Clearly, officials perceptions indicate different patterns of communications with non-agency participants, as suggested by Hypothesis 7.

### *Non-agency Participants' Perceptions*

Of course, communication is not a one-way street. To understand communication from the public's perspectives, interviews were conducted with a number of non-agency participants in each case (see Chapter 2). Interviewee selection was based on referrals from forest officials as well as from other non-agency participants, who suggested individuals actively participating

in public forest policy. To increase variation among interests, interviewees were selected from two distinct groups, preservation and timber. Their responses complement officials' responses regarding communication with preservation and timber interests. In three of the four cases, preservation interests reported more communication with national than state officials. In all four cases, timber interests reported more communication with state than national officials (see Table 6-6).

Table 6-6

Participants' Reported Communication with Forest Officials

Number of participants stating  
"I have more communication  
with the following agency officials:"

<u>Interest</u>	<u>National</u>	<u>State</u>	<u>Equal</u>	<u>Total</u>
<b>Case 1: Ohio State Forests and Wayne National Forest</b>				
Preservation	4 (80%)	0	1 (20%)	5
Timber	1 (25%)	3 (75%)	0	4
<b>Case 2: Indiana State Forests and Hoosier National Forest</b>				
Preservation	3 (38%)	4 (50%)	1 (12%)	8
Timber	0	5 (100%)	0	5
<b>Case 3: Washington State Forests and Gifford Pinchot National Forest</b>				
Preservation	4 (67%)	2 (33%)	0	6
Timber	0	4 (80%)	1 (20%)	5
<b>Case 4: Oregon State Forests and Siuslaw National Forest</b>				
Preservation	4 (100%)	0	0	4
Timber	1 (25%)	3 (75%)	0	4

In Case 1, Ohio State Forests and Wayne National Forest, most individuals favoring preservation indicated greater communication with national officials, while most individuals favoring timber production indicated greater communication with state officials. Four of five (80%) people favoring preservation said that they have more communication with national than

state agency officials, while one (20%) such individual indicated equivalent levels of communication across the agencies. An important factor is the existence of specialist positions within the national agency. As one respondent favoring preservation said, "I talk to national officials more, because with their specialists they are receptive to a broader spectrum of interests" (U1E7). Similarly, another person favoring preservation indicated that she felt more comfortable contacting the national agency than the state agency, because the former is staffed with a botanist who understands her concerns (U1E7).

In Case 1, three of four (75%) pro-timber interviewees reported higher communication levels with Ohio State Forest than Wayne National Forest officials. This reflects the fact that most of officials' contacts with timber users occurs in conjunction with timber sales, and, as will be described in Chapter 8, state officials sell a significantly higher volume of timber than do national officials. Moreover, one pro-timber interviewee described a close informal relationship with state officials: "We attend several state meetings, but a lot gets hashed out in coffee shops" (U1T3).

In Case 2, Indiana State Forests and Hoosier National Forest, individuals favoring preservation indicated somewhat more communication with state than national officials. Three of eight (38%) participants favoring preservation indicated greater communication with Hoosier National Forest officials, compared to four of eight (50%) who reported greater communication with Indiana State Forest officials. Those who reported more communication with national officials cited that agency's public notification efforts, including scoping letters, quarterly newsletters, and personal phone calls as helpful for staying in touch. One such individual also said he sees national officials at various forestry meetings around the state, and that he regularly meets with senior staff for specific issues as they arise (U2E8). Preservation-oriented individuals who report more communication with state officials described participation on a state forestry committee. They also described regular contacts with high-level agency officials. For example, one individual noted, "Sure, there's no required public input at the state level, but I can call up the state forester and give input" (U2E7). Ironically, one individual described



more frequent contact with state officials that came about as a reaction to previously low levels of communication. She was working on a special project for an environmental advocacy group aiming to increase communications with state officials, in order to reach the level already achieved with national officials.

In Case 2, all five (100%) individuals favoring timber reported more communication with state than with national officials. Timber contractors who are licensed by the state receive periodic mailings announcing state forest timber sales. Several individuals associated with timber interests sit on state forest committees. They also described communications through cooperation in forestry programs, such as "Project Learning Tree" (an educational program aimed at school children), logger training, cost sharing arrangements, and management of private timberlands. They also may contract to perform timber stand improvement work on state forests. Through a common interest in the profession of forestry, which traditionally emphasizes timber production, these individuals work on a professional level with state forestry officials, as both contractors and knowledgeable practitioners giving and receiving advice about forest management techniques.<sup>36</sup>

This close working relationship between timber interests and state officials stands in sharp contrast to timber interests' interactions with national officials, who provide fewer timber sale opportunities, and who do not contract for timber stand improvement work. Moreover, several timber users noted frustration at their efforts to communicate effectively with national officials. As one timber proponent noted,

We were involved with the national forest Plan back in the 1980s, and we would come in with rational support for our recommendations, but it seemed like the officials were not ready to use our input to change policy. I don't have extra time to do that any more, since it's of no use in changing things (U2T3).

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<sup>36</sup>This technical knowledge differs from the "learning opportunity" motive, described earlier in this chapter regarding reasons for public communications, in that it does not focus on public preferences or information about site conditions on the public forest.

Another timber user described frustration over the national agency's bureaucracy:

The national forest has too much red tape, too many hoops to jump through. If I bring them a good idea, they can't go with it. Hell, if they had a cockroach infestation at their offices, it would probably take a year to get through the red tape to get the exterminator in (U2T5).

In Case 3, Washington State Forests and Gifford Pinchot National Forest, four of six (67%) individuals favoring preservation reported more communication with national officials, while just two (33%) individuals reported more communication with state officials. An important factor in explaining communication levels in this case relates to the constellation of preservation interest groups working in the state of Washington. Recall that, compared to the Midwest cases, the Northwest cases include a much larger quantity of forest as well as timber production. As a result a wider variety of environmental groups are active in this region than in the Midwest. In fact, with a larger number of such groups vying for membership, work, and accomplishments, a common occurrence has been specialization among different groups (see Yaffee 1994, p. 229). Specifically, most environmental groups in Washington have created a niche by focusing on either national or state forest issues, but not both. For example, an environmental groups in Washington state works on national forest issues but not state forest issues, while another focuses on state and private forest issues. However, there is one environmental interest group that emphasizes both national and state forest issues. An advocate for this group explained that he has more communication with national officials because they provide greater opportunities for substantive input (U3E1).

Those favoring timber in Case 3 reported more communications with state officials. Four of five (80%) individuals favoring timber said that they have more communication with state officials, while one of five (20%) reported similar levels with national and state officials. This difference reflects several factors, including higher levels of timber sales on state forests (U3T1, U3T4, U3T5). One individual favoring timber expressed frustration at communicating

with national officials: "I don't provide much input on national forest projects, because it's frustrating to spend a day or two analyzing documents and sending in comments that I know will be dumped out of a mailbag and considered equally among many other comments" (U3T1). Another individual working in the timber industry noted, "I have a better rapport with state personnel because I know nearly everyone in the regional office. National personnel include more of a cross section of different personnel, with timber just a small part of the staff, so I don't know as many of them" (U3T5).

In Case 4, Oregon State Forests and Siuslaw National Forest, all four (100%) individuals favoring preservation reported more communication with national than state officials. One reason for this difference is the national agency's multiple-use mandate: "On the national forests, the same group of people deals with forestry, fish, and water quality issues, whereas the state is more fragmented by resource, so it's more difficult to communicate on non-timber issues" (U4E2). The difference in mandates also was noted by one pro-preservation individual: "We have less communication with state officials because their mandate is more narrow – to make revenue for the trusts" (U4E3). In addition, several preservation proponents cited the formal public comment processes required by NEPA and NFMA as making public involvement more accessible on the national forest than state forests (U4E2, U4E3, U4E4).

In Case 4, three of four (75%) individuals favoring timber reported more communication with state than national officials. One member of a timber company reported that his communications with agency officials are directly related to the number timber sales, and since state agency officials were more active in timber provision, he had more contacts with them (U4T4). Another individual favoring timber, a member of a county government, described sharp differences in state and national officials' efforts to communicate:

The state district forester attends our meetings periodically and informs us about state plans and harvest projections, and the state forester attends our annual meeting. With the trust relationship, state officials recognize our

annual meeting. With the trust relationship, state officials recognize our importance as a primary beneficiary. But to national officials, we're just one among many constituencies, no more important than any other. The only communication I have with national forest officials is when the district ranger comes by once a year to one of our meetings to present a report (U4T2).

The only timber proponent in Case 4 who indicated more communication with national officials noted that his organization focuses on national issues as its niche (U4T3).

It is clear, from the above analysis, that national officials in most cases devote greater overall efforts toward public input than do state officials. Moreover, national officials express somewhat different reasons for seeking public communications than do state officials; national officials are more likely to cite the importance of incorporating public input into forest management decisions. Resulting patterns of communications also differ, with national officials having a higher proportion of communications with preservation interests and state officials having a higher proportion of communications with timber interests. These findings support Hypothesis 7.

The choice of level of governance in which to vest policy responsibility is informed by analysis of communications between agency officials and publics. National officials are more likely to communicate with citizens favoring policies that promote activities without substantial, direct economic benefits. State officials, on the other hand, are more likely to communicate with those favoring economic benefits. This result reflects several factors, including the greater diversity of job positions, lower level of timber production, and more stringent rules requiring opportunities for public input into decision-making processes on national forests.

#### Influence of Non-agency Participants

Since a fundamental reason that non-agency participants provide input is to affect agency decisions, it is important to examine the amount of influence exerted by such input. Hypothesis 8 suggests that those who favor uses without substantial, direct economic benefits

are more influential in national than state forest policy, while those favoring uses with substantial, direct economic benefits are more influential in state than national forest policy. Analysis provides mixed evidence regarding Hypothesis 8: officials don't perceive systematic differences in influence, but non-agency participants do.

#### Officials' Perceptions of Influence through Communications with Non-agency Participants

To test Hypothesis 8, data analysis focuses first on officials' perceptions of influence. A standard questionnaire item asked officials to indicate, on a scale of 1 ("no influence") to 5 ("very influential"), the amount of influence of various participants in affecting forest management, through (a) communicating with agency officials (b) administrative or court challenges, and (c) pressure on legislators (see Appendix 1). A comparison of officials' responses to part (a), communicating with agency officials, is displayed in Table 6-7. Statistical analysis using two-sample t-test procedures does not support Hypothesis 8 for most types of non-agency participants.<sup>37</sup> Preservation proponents are the only non-agency participants whose influence is perceived to differ significantly (at the 0.10 level) in the predicted direction. Perceived influence of ORV riders differs at the 0.10 level, but in the opposite direction (the mean national official response is greater than the mean state official response).

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<sup>37</sup>See Appendix 3 for a more thorough description of the statistical tests.

Table 6-7

Mean Response Values, Officials' Perception of Influence through Agency Contacts

<u>Interest Type</u>	<u>National Officials</u>			<u>State Officials</u>			<u>Difference in Mean<sup>a</sup></u>	<u>p-value</u>
	<u>Mean</u>	<u>Std. Dev.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>N</u>		
Timber	2.90	0.94	31	3.15	0.83	33	-0.25	0.1341
Oil/gas	2.58	0.85	31	2.38	0.91	31	0.20	0.1782
Hunting/fishing	3.07	0.94	30	3.22	0.75	32	-0.15	0.2421
Camping	3.13	0.96	31	3.00	0.88	32	0.13	0.2897
Hiking	3.26	0.89	31	3.16	0.88	32	0.10	0.3255
Horse riding	3.48	0.89	31	3.44	0.84	32	0.04	0.4161
ORV riding	3.19	1.11	31	2.78	1.01	32	0.41	0.0636*
Preservation	3.10	0.83	31	2.75	1.05	32	0.35	0.0757*

<sup>a</sup>positive values indicate higher national mean, while negative values indicate higher state mean  
 \*significant at the 0.10 level

As Table 6-7 shows, national officials do not perceive that non-agency participants favoring uses without substantial, direct economic benefits (preservation, hunting/fishing, camping, hiking, horse riding, and ORV riding) are more influential through communicating with agency officials than do state officials. Nor do state officials perceive that non-agency participants favoring activities with substantial, direct economic benefits (timber and oil/gas/minerals) are more influential through communicating with agency officials than do national officials.

Officials' Perceptions of Influence through Multiple Channels

While differences among officials' perceptions about the influence of non-agency participants through communicating with agency officials does not vary systematically by interest type, perhaps non-agency participants' influence varies in other channels. For example, non-agency participants favoring commodity provision might be more influential on

state than national forests through pressure on legislators or through administrative appeals or court challenges.

To examine such additional channels of influence, officials' questionnaire responses about influence through (b) administrative or court challenges, and (c) pressure on legislators, are analyzed. Statistical analysis using two-sample t-test procedures does not support Hypothesis 8 for most types of non-agency participants.<sup>38</sup> In other words, data do not suggest differences across levels of governance in officials' perceptions about the influence of different types of non-agency participants.

Table 6-8 displays analysis of questionnaire responses indicating officials' perceptions of non-agency participant influence through pressure on legislators. For five of the eight interest types, state and national officials do not perceive significant differences in non-agency participant influence through this channel. The remaining interest types are more significant. At the 0.10 level of significance, national officials perceive greater influence from oil and gas interests than do state officials. This result is in the opposite direction than that suggested by Hypothesis 8. Similarly, at the 0.05 level of significance, state officials perceive greater influence from individuals favoring horse riding than do national officials – opposite the predicted direction. The only interest type for which questionnaire responses support Hypothesis 8 is preservation: national officials perceive preservation interests to be more influential than do state officials.

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<sup>38</sup>See Appendix 3 for a more thorough description of the statistical tests.

Table 6-8

Mean Response Values, Officials' Perception of Influence through Legislator Pressure

<u>Interest Type</u>	National Officials			State Officials			Difference in Mean <sup>a</sup>	<u>p-value</u>
	<u>Mean</u>	<u>Std. Dev.</u>	<u>N</u>	<u>Mean</u>	<u>Dev.</u>	<u>N</u>		
Timber	3.16	1.21	31	2.94	1.01	32	0.22	0.2148
Oil/gas	3.06	1.12	31	2.48	1.09	31	0.58**	0.0217
Hunting/fishing	2.87	1.11	30	3.03	0.90	32	-0.16	0.2606
Camping	2.61	0.99	31	2.91	0.96	32	-0.30	0.1187
Hiking	2.84	1.00	31	2.59	0.95	32	0.25	0.1612
Horse riding	2.74	1.12	31	3.16	1.02	32	-0.42*	0.0652
ORV riding	2.63	1.03	30	2.65	1.11	31	0.02	0.4830
Preservation	3.32	0.98	31	2.78	1.26	32	0.54*	0.0313

<sup>a</sup>positive values indicate higher national mean, while negative values indicate higher state mean

\*significant at the 0.10 level

\*\*significant at the 0.05 level

Table 6-9 displays analysis of questionnaire responses indicating officials' perceptions of non-agency participant influence through administrative appeals or court challenges. For seven of eight interest types, state and national response means are not significantly different. Only one interest type, preservation, indicates a significant (at the 0.05 level) difference. As predicted, national officials perceive preservation interests to be more influential through appeals or court challenges than do state officials. Preservation interests have been active over the past few years in pursuing their preferences through appeals and lawsuits at the national level, where legal requirements open the door for non-agency participants to stop or delay officials' efforts to undertake active vegetative manipulation (see Chapter 5).



Table 6-9

Mean Response Values, Officials' Perception of Influence through Administrative Appeals or Court Challenges

<u>Interest Type</u>	<u>National Officials</u>			<u>State Officials</u>			<u>Difference in Mean<sup>a</sup></u>	<u>p-value</u>
	<u>Mean</u>	<u>Dev.</u>	<u>N</u>	<u>Mean</u>	<u>Dev.</u>	<u>N</u>		
Timber	2.84	1.13	31	2.94	1.25	33	-0.10	0.3683
Oil/gas	2.61	0.99	31	2.31	1.17	32	0.30	0.1388
Hunting/fishing	2.73	1.14	30	2.88	1.24	32	-0.15	0.3210
Camping	2.35	1.17	31	2.69	1.28	32	-0.34	0.1433
Hiking	2.68	1.17	31	2.56	1.29	32	0.08	0.3563
Horse riding	2.45	1.12	31	2.69	1.38	32	-0.24	0.2299
ORV riding	2.39	1.09	31	2.65	1.30	31	-0.26	0.2003
Preservation	3.32	1.08	31	2.72	1.30	32	0.60**	0.0248

<sup>a</sup>positive values indicate higher national mean, while negative values indicate higher state mean  
 \*\*significant at the 0.05 level

Non-agency Participants' Perceptions of Influence

Finally, analysis turns to non-agency participants' perceptions of influence. Non-agency participants were asked to indicate whether their actions were more likely to have an impact on policies of the state or national agency. While some participants were not able to make such a comparison, because of limited involvement with one or the other agency, others did indicate their perceptions about influence (see Table 6-10). In contrast to officials' perceptions described above, results from timber and preservation interests do support Hypothesis 8. Those favoring forest uses with substantial, direct economic benefits (timber) perceived greater influence on state forests, while those favoring preservation perceived greater influence on national forests. Responses from recreational interests did not support Hypothesis 8; these interests did not systematically perceive greater influence on national forests.

Table 6-8

Non-agency Participants' Perceived Influence

Number and percent of participants perceiving more influence with the following agency:

<u>Interest</u>	<u>National</u>	<u>State</u>	<u>Equal</u>	<u>Total</u>
Case 1:				
Preservation	3 (75%)	0 (0%)	1	4
Horse riding	0	3	1	4
ORV riding	2	1	1	4
Timber	0 (0%)	1 (50%)	1	2
Case 2:				
Preservation	6 (75%)	1 (13%)	1	8
Horse riding	1	2	1	4
Timber	0 (0%)	3 (60%)	2	5
Case 3:				
Preservation	1 (100%)	0 (0%)	0	1
Timber	0 (0%)	4 (80%)	1	5
Case 4:				
Preservation	4 (100%)	0 (0%)	0	4
ORV riding	0	0	1	1
Timber	0 (0%)	3 (100%)	0	3
Total, Preservation	14 (82%)	1 (6%)	2	17
Total, Horse riding	1	5	2	8
Total, ORV riding	2	1	2	5
Total, Timber	0 (0%)	11 (73%)	4	15

In Case 1, Ohio State Forests and Wayne National Forest, three of four (75%) respondents favoring preservation who attempted to influence both agencies perceived greater influence in national policy, compared to none (0%) in state policy. In contrast, no (0%) timber advocate who attempted to influence both agencies perceived greater influence in national policy, compared to one of two (50%) in state policy. Three horse riders who attempted to influence both agencies indicated greater influence in state policy, compared to none in national policy. ORV user perceptions are mixed; two who attempted to influence both agencies perceived a greater influence in national policy, compared to one in state policy.

In Case 2, Indiana State Forests and Hoosier National Forest, six of eight (75%) individuals favoring preservation who attempted to influence both agencies perceived greater influence on the national forest, while only one (13%) perceived greater influence on the state forests. But among timber advocates who attempted to influence both agencies, none (0%) perceived greater influence on national forest policies, compared to three of five (60%) who perceived greater influence on state forest policies. Two horse riders who attempted to influence both agencies perceived greater influence on state forest policies than on national forest policies, compared to one who perceived the opposite.

In Case 3, Washington State Forests and Gifford Pinchot National Forest, the only preservation-oriented individual (100%) who dealt with both agencies described greater influence on the national forest than on state forests. In contrast, no (0%) timber advocate who attempted to influence both agencies indicated greater influence on national forests, while four of five (80%) indicated greater influence on state forests.

In Case 4, Oregon State Forests and Siuslaw National Forest, all four (100%) individuals favoring preservation who attempted to influence both agencies described greater influence on the national forest than on state forests. In contrast, all three (100%) individuals favoring timber who attempted to influence both agencies indicated greater influence on state forests.

Overall, fourteen of seventeen (82%) preservation proponents perceived greater influence on national forests, while one of seventeen (6%) perceived greater influence on state forests. In contrast, no (0%) timber proponent perceived greater influence on national forests, while eleven of fifteen (73%) perceived greater influence on state forests. Thus evidence from the four cases suggests important differences in non-agency participants' perceptions of influence. These differences support Hypothesis 8 for two types of interest: preservation and timber. Those favoring preservation perceived greater influence in national than state agency policies, while those favoring timber perceived greater influence in state than national agency policies.

This finding suggests that there are systematic differences in whose interests are favored at different levels of governance. As Peterson (1981) and Hecl (1978) have argued, non-business interests perceive greater influence at higher levels of governance. Such perceptions of differences in influence are reflected in Sagebrush Rebellion proponents, as described in Chapter 1, who demanded devolution of policy authority from national to state agencies in order to increase their ability to press for economic development of forests and range lands. More recently, many of the calls for devolution of public forests from national to state control come from those with an interest in using forests for higher levels of economic development (see also Chapter 1).

#### Explaining Differences in Participation and Influence

As described earlier in the chapter, officials and non-agency participants report more communication between officials and preservation interests in national agencies, and more communication between officials and timber interests in state agencies. These higher levels of communication match non-agency participants' perceptions of greater influence. Important explanations for these differences include legal constraints, agency composition, use outcomes, the scope of citizenry, and job mobility.

Officials across all of the agencies indicate support for increasing public input (Chapter 3). However, unlike state officials, national officials are required by NFMA and NEPA to provide formal processes for soliciting public participation and input (Chapter 4). In fulfilling these requirements, national officials provide more mailings, public meetings, and other efforts to encourage public input than do state officials. Preservation interests are likely to use such channels in communicating with agency officials, especially if they perceive that such communication can influence forest policy. In contrast, timber interests are less likely to communicate with national officials through these channels, as they are often frustrated in their perceived ability to influence policy. Recall, as described above, the comment from one timber

proponent who cited frustration in making significant efforts to provide detailed comments that are given no more weight than comments from many other interests (U3T1). Another timber proponent explained,

The national folks like to play the numbers game, saying 'We had X number of people at this planning meeting representing many different interests.' But the input they get doesn't matter in setting policies – the real decisions are made in Washington [D.C.] (U1T3).

Clearly timber interests make less use of these channels than do preservation interests.

Another legal constraint that favors the influence of preservation over timber interests is the appeals process established under NFMA and NEPA. The appeals process allows those opposed to timber harvesting and other vegetative manipulation activities on national forests to halt or delay such activities. In contrast, no laws or regulations can force national officials to provide timber. Thus, for the national forest, the deck is stacked in favor of those wishing to block active management. In fact, numerous appeals in the last few years by environmental groups have led to delays in national forest officials putting planned sales up for bid. On state forests, however, the opposite is true: few laws or regulations provide for preservation interests effectively to pursue administrative appeals of decisions to perform active management, so the deck is stacked in favor of those who prefer active forest management.

In addition to legal constraints, agency composition plays an important role in patterns of communication and perceived influence. Preservation interests reported feeling more comfortable and influential in communicating with officials specializing in non-timber aspects of forest management, such as botanists and wildlife biologists. These specialists, hired to perform non-timber work, can provide greater attention to watersheds, soil protection, species habitat, and other non-timber forest resources than can timber specialists and forester generalists responsible for a wide range of resources. Conversely, timber interests indicated better rapport with timber program officials. As described in Chapter 3, state and national

agencies differ in composition of personnel; state agencies include more personnel specializing in timber, while national agencies include more non-timber personnel. Thus differences in the range of agency positions foster different patterns of communication and perceived influence.

Another important factor accounting for differences in participation and influence across levels of governance is forest use outcomes. Most timber interests reported that their greatest levels of communication with agency officials occur during the course of timber sales. Through bidding, contract discussions, and harvesting activities, timber purchasers and loggers interact with agency officials to conduct timber operations. As will be described in Chapter 8, state officials provide much higher levels of timber than do national officials. Thus timber interests communicate more with state officials. In a sense, this creates a feedback loop: timber interests communicate more with state officials, which reinforces higher state timber production, which, in turn, reinforces more communication with timber interests.

Examination of forest use outcomes also helps in understanding communication between officials and recreation interests. As reported above, no clear pattern is evident regarding recreationist levels of communication or perceived influence with agency officials. A primary means of communication between recreation users and forest agency officials is through contacts on the forest during recreation activities. Thus we should see more communication with officials where ORV riders, horse riders, campers, hikers, and hunters spend more of their time. As will be described in Chapter 8, there is no clear difference between the quantity of recreation facilities across state and national forests. This finding suggests that recreation users do not systematically spend more time on state than national forests, or vice versa, so recreationist communication patterns are not expected to differ systematically by level of governance.

Another factor affecting participation and influence involves the scope of citizenry. Parties outside of a given state have a greater potential to influence the national forest (which belongs to all Americans) in that state than to influence the state forests in that state. One individual said, "Environmental groups have a bigger impact at the national level, because for

thirty-two cents [the price of a postage stamp] anyone in any state can hold up a timber sale on any national forest" (U1T2). Another individual said that ORV interests are disadvantaged by national, well-organized preservationist groups that have more influence on the national forest than do local people favoring motorized forest use (U1O5).

Finally, an important factor affecting patterns of communication and perceived influence is job mobility. As described in Chapter 3, state officials tend to remain in one location longer than do national officials. Thus they are more likely to forge long-term relationships with forest neighbors, who may be more likely to favor commodity use than do those living further away (Nash 1982, Tremblay and Dunlap 1978, Lowe and Pinhey 1982). As one timber proponent indicated, "National officials tend to move in and out a lot, so we don't know them as well as the state officials" (U1T3). Several horse riders indicated long-term friendships with particular state officials, and one ORV rider said that an effective way to increase one's influence in state decision making is to build good relationships with local officials. These comments suggest that an important avenue for influence is building long-term relationships with officials, which is easier with those officials who remain at a particular forest for a longer period of time.

### Conclusion

Analysis in this chapter has examined officials' interactions with non-agency participants. This topic is an important one, as tension between technical expertise and responsiveness to external demands is a hallmark of discussions about the role of public agencies in democratic systems of governance. Agency policies in forest management, or in any other area, depend not only on the expertise of bureaucratic officials, but also on their interactions with various "publics" outside the agency. Scholars have long criticized the phenomenon of agency capture by parties whose interests do not reflect broader interests of society (see, for example, Shepherd 1975). Thus it is important to learn about officials'

communications with various publics, and about the influence of those publics on agency policies.

In the context of federalism, a crucial question about policy processes centers on differences in communications and influence across levels of governance. First, Hypothesis 7 suggests that, compared to state forest officials, national forest officials devote more effort to seeking public input, and they receive a higher proportion of public input from those favoring uses without substantial, direct economic benefits. Second, Hypothesis 8 suggests that non-agency participants favoring forest uses without substantial, direct economic benefits are more influential in national than state forest policy, while those favoring uses with substantial, direct economic benefits are more influential in state than national forest policy.

Data analysis in this chapter supports Hypothesis 7. National officials devote somewhat higher levels of effort to encourage participation, through mailings, public meetings, and other efforts, than do state officials. Moreover, compared to state officials, a higher proportion of national officials report that an important reason for engaging in communication with the public is to learn from them, which suggests that public input is more likely to be incorporated into agency decisions. Resulting patterns of communication suggest differentiation by user type, as suggested by Hypothesis 7; both officials and non-agency participants indicate that national officials engage in more communication with preservation interests than do state officials, while state officials engage in more communication with timber interests than do national officials. This result reinforces the notion that, in thinking about the extent of citizen involvement and influence in bureaucracies within a federal system, it is important not to view "government" as a monolithic entity. Rather, differences exist among levels of governance. Thus decisions about the level in which to place policy authority have important consequences for citizen involvement and influence.

Data analysis in this chapter also lends some support to Hypothesis 8. Non-agency participants favoring preservation perceive that they are more influential in national than state forest policy, while non-agency participants favoring timber perceive that they are more



influential in state than national forest policy. However, agency officials do not perceive such a systematic difference. Further study is needed to account for this discrepancy between officials' and publics' perceptions, but factors that tilt the balance of communication and perceived influence toward preservation interests on national forests and timber interests on state forests include legal constraints, agency composition, use outcomes, and the scope of citizenry, and job mobility. These factors, described in policy process discussions in Chapters 3 - 5, illustrate important differences in policy processes across levels of governance in a federal system. With analysis of the final policy process component, interactions, in this chapter, we can now focus on linking policy processes to outcomes. Chapter 7 examines such links as well as the first type of policy outcomes, fiscal. Subsequently, Chapters 8 and 9 examine forest use and environmental protection outcomes.

## **Chapter 7: Linking Policy Processes to Outcomes**

Chapters 3 through 6 examined policy process variables, including agency officials' values and preferences, their communities, the incentives and constraints they face, and their interactions with non-agency participants. Analysis revealed systematic differences between levels of governance regarding several policy process variables. These findings suggest important differences between levels of governance in a federal system. Differences between state and national policy making are apparent in agency mission and goals statements, which promote public participation and non-economic benefits more in national than state forest management; legal and planning constraints, which are more numerous and encourage activities without substantial, direct economic benefits more at the national than state level; efforts to promote public participation, which are greater among national than state officials; communication patterns, which feature preservation proponents at the national level and timber proponents at the state level; and, finally, perceptions of influence, with parties favoring preservation perceiving greater influence in national policy and parties favoring timber perceiving greater influence in state policy.

While examination of factors affecting policy processes yields useful insights, investigation of outcomes carries the analysis a step further, providing valuable information about the impact of such differences on management results. Careful comparison fosters greater understanding of the consequences of decisions about where to place primary responsibility for a given policy. Empirical evidence generated in this analysis can better equip decision makers to consider the relative strengths and weaknesses of policy making at different levels of governance in a federal system.

But before turning to analysis of policy outcomes, it is important to establish links between specific policy process factors and policy outcomes. Understanding such links is the focus of the first part of this chapter. Subsequently, discussion turns to analysis of fiscal

outcomes. Forest use and environmental protection outcomes are the subjects of Chapters 8 and 9.

### Influential Policy Factors

Sorting out explanations for different state and national agency policy outcomes is difficult. It is clear that certain policy process elements differ between state and national agencies, as reviewed above. To investigate which of these independent variables are linked to outcomes, the standard questionnaire asked officials to indicate the relative influence of different factors on policy outcomes. Respondents indicated, on a scale of 1 ("no influence") to 5 ("very influential"), their perceptions of the amount of influence that each factor exerted on determining management activities (see Appendix 1). A total of seventy-five questionnaires were returned, out of eighty-seven sent, for a response rate of 86%. Results indicate that, across the cases, national officials perceived the most important factors to be laws and regulations, planning documents, and budgets. State officials in Washington and Oregon indicated the importance of these same factors, but state officials in Ohio and Indiana stressed the importance of agency personnel, existing forest uses, and budgets.

In Case 1, Wayne National Forest officials perceived the most important factors to be existing laws and regulations, legislative budget allocations, and agency supervisor budget allocations, all with a mean value of 5.0, followed by the planning document (the Plan), with a mean value of 4.5 (see Table 7-1). Ohio State Forest officials also perceived the most important factor to be legislative budget allocations (mean of 4.9), but the other most important factors included existing forest uses (4.4), local non-agency participants pursuing political channels (4.1), and agency personnel (4.0). Thus a significant difference is that national officials perceived that legal constraints and the forest Plan strongly affected agency policies, while state officials perceived that existing forest uses, local residents pursuing political

channels (e.g., contacting legislators), and officials themselves strongly affected agency policies.

National officials in Case 2, as in Case 1, perceived existing laws and regulations to be the most important factor affecting forest policy (4.8), followed by agency supervisor budget allocations (4.6), the forest Plan (4.5), and legislative budget allocations (4.4). Indiana State Forest officials, in contrast, indicated that the most important factor was agency personnel (4.4), followed by existing uses, communications with agency supervisors, and existing laws and regulations (4.2 each). Thus state officials indicated a more influential role for agency personnel, whereas national officials indicated greater influence from laws, regulations, the Plan, and budgets.

In Cases 3 and 4, national officials indicated the dominance of the same four factors as did their counterparts in Cases 1 and 2: existing laws and regulations, planning documents, agency supervisor budget allocations, and legislative budget allocations. Similarly, state officials indicated these four factors as most important. Thus state officials' responses in Cases 3 and 4 diverged from state officials' responses in Cases 1 and 2.

Table 7-1

Officials' Reported Important Factors Affecting Forest Policy

<u>Agency</u>	<u>Factor</u>	<u>Mean Response Value</u>
Case 1: Wayne National Forest and Ohio State Forests		
National	Existing laws/regulations	5.0
	Legislative budget allocations	5.0
	Agency supervisor budget allocations	5.0
	Planning document	4.5
State	Legislative budget allocations	4.9
	Existing forest uses	4.4
	Local citizens through political channels	4.1
	Agency personnel	4.0
Case 2: Hoosier National Forest and Indiana State Forests		
National	Existing laws/regulations	4.8
	Agency supervisor budget allocations	4.6

	Planning document	4.5
	Legislative budget allocations	4.4
State	Agency personnel	4.4
	Existing forest uses	4.2
	Agency supervisor communications	4.2
	Existing laws/regulations	4.2
<b>Case 3: Gifford Pinchot National Forest and Washington State Forests</b>		
National	Existing laws/regulations	4.8
	Planning document	4.8
	Agency supervisor budget allocations	4.6
	Legislative budget allocations	4.6
State	Existing laws/regulations	5.0
	Agency supervisor budget allocations	4.5
	Legislative budget allocations	4.4
	Planning document	4.4
<b>Case 4: Siuslaw National Forest and Oregon State Forests</b>		
National	Existing laws/regulations	4.7
	Legislative budget allocations	4.4
	Agency supervisor budget allocations	4.3
	Planning document	4.1
State	Existing laws/regulations	4.8
	Planning document	4.8
	Agency supervisor budget allocations	4.2
	Legislative budget allocations	4.2

Questionnaire results reinforce analyses presented in earlier chapters. Budget allocations are among the most influential factors in seven of the eight cases. As presented in Chapter 3, numerous officials in state and national agencies described the importance of budgets in shaping forest management activities. Budgetary resources affect job security, staffing levels, and equipment that officials need in order to undertake forest management activities. In analyzing differences between levels of governance, it is important to recall that, in most cases, budgetary incentives do not differ between state and national levels. Few state or national officials said that increasing activities such as timber sales that yield substantial, direct economic benefits, would lead to increased budgetary resources. Thus while budgets are

important factors affecting forest policy, systematic differences are not evident between state and national budget incentives.

In addition to budget allocations, questionnaire responses indicate the primary importance of statutes, regulations, and planning documents in influencing national forest policy in every case. As described in Chapter 5, national officials face considerable statutory, regulatory, and planning document constraints on their activities. Statutes such as the Multiple Use Sustained Yield Act (MUSYA), National Forest Management Act (NFMA), and National Environmental Policy Act (NEPA), and their implementing regulations, address management purposes, planning process requirements and constraints on forest activities on the national forests. Completed planning documents constrain activities related to timber stand improvement (TSI), leave trees, riparian areas, regeneration openings, and land use zones. Many of these constraints require activities that reduce opportunities for generating substantial, direct economic benefits, in favor of environmental protection.

In contrast, state officials in Ohio and Indiana indicated that statutory, regulatory, and planning document constraints were not as important. As described in Chapter 5, state officials in these cases do not face substantial planning process requirements. Nor do they face as many statutory or planning document constraints requiring activities that might hinder the pursuit of substantial, direct economic benefits such as timber sales. Thus state officials have more discretion in determining forest management activities. Agency personnel can rely on their own expertise in judging how best to manage the forest, emphasizing timber production while giving consideration to existing recreational uses (e.g., horse trails) that are compatible with active vegetative manipulation.

State officials in Washington and Oregon indicated differences from their counterparts in Ohio and Indiana. As on national forests, officials on state forests in Washington and Oregon indicated that statutory, regulatory, and planning document constraints are of primary importance. This result is not surprising given the trust mandate that officials in these states must follow. Of course, the nature of this mandate is very different from the multiple-use

mandate that national officials face. State trust mandates require the use of forests primarily for revenue generation, whereas the national mandate requires management for multiple uses, expressly not for the greatest dollar return. In addition, state officials in Washington and Oregon recently devoted substantial efforts to create forest plans, thus they view these plans as salient and important determinants of agency policy. Since these constraints are important determinants of policy outcomes, and they differ systematically between state and national agencies (Chapter 5), systematic differences in policy outcomes should be evident.

Clearly officials at different levels of governance face systematic differences in important policy process variables. This is an important empirical result, as it lends support to scholars who describe differences in policy processes and outcomes at different levels of governance (see, for example, Peterson 1995, Goetz 1995, Stein 1990, Moe 1989, Rowland and Marz 1982). This finding also supports analysis conducted in earlier chapters, providing additional sources of evidence to enhance the study's dependability and objectivity.

### Fiscal Outcomes

Policy outcomes are multi-faceted. Students of policy analysis have suggested numerous evaluative criteria for evaluating policy results, including physical outputs, distribution of benefits, and sustainability. Federalism scholars often emphasize evaluation of efficiency and cost effectiveness (see, for example, Ostrom, Tiebout, and Warren 1961; Nelson 1995; Stein 1990). Researchers examining natural resource policy have evaluated agency revenues and expenditures (e.g., Souder and Fairfax 1996, Leal 1993, Rice 1989, U.S. GAO 1996). But rarely have analysts systematically compared fiscal outcomes of higher to lower levels of governance in a given policy area.

One important contribution of this study is the careful analysis of such fiscal outcomes across levels of governance in several cases. Fiscal outcomes include timber sale profitability,

use fees collections, and fiscal transfers to local governments. Analysis tests the following three hypotheses:

Hypothesis 9: State forest policies generate a higher net profit from commodity sales than do national forest policies.

Hypothesis 10: State forest policies emphasize revenue from targeted beneficiaries (use fees) more than do national forest policies.

Hypothesis 11: State forest policies favor transferring funds to local governments more than do national forest policies.

### Profitability of Timber Sales

Forests can provide many commodities, including subsurface materials (such as oil, gas, and minerals), firewood, wild plants, and timber. In the study cases, forest agencies often lack control over the sale of subsurface materials, whose ownership may be with other agencies, different levels of government, or private parties. Firewood cutting usually is limited to remnants from trees cut for timber or other management purposes. Wild plants are collected in relatively small quantities. Timber sales, however, are largely under the control of the agency, and timber has a relatively high economic value. Thus analysis of agency officials' management of commodities for economic returns focuses on timber sales. Hypothesis 9 suggests that state forests generate a higher net profit from commodity sales than do national forests. Analysis supports Hypothesis 9; in all four cases, the state agency had lower costs and higher revenues per unit of timber, thus netting higher unit profit on timber provision.

As is common throughout the United States, agency officials in these cases generally do not harvest timber themselves. Instead, they sell the right to harvest timber to private



contractors who bid for individual sales, called "stumpage." The successful contract bidder agrees to pay a specified price and to abide by harvesting conditions described in a sale contract. The agency's net profit on a sale is calculated by subtracting costs of sale administration and timber growth management from the stumpage sale price. The agency's net profit per unit of output is measured by comparing costs and revenues per "board foot," a unit volume of wood measuring one foot by one foot by one inch.

Costs to provide timber can be grouped into two categories, sale administration and timber growth management. The first category includes costs associated with particular timber sales, including marking trees, soliciting and evaluating bids, meeting with purchasers, administering contracts, and monitoring for contract compliance. The second category includes labor and materials used to promote growth of trees for future timber. Common timber growth management activities include "cruises" to establish inventory levels as well as timber stand improvement (TSI) tasks such as pruning trees, cutting vines, and removing competing vegetation. In this second category, expenses are not matched with specific timber sales. For example, vine cutting costs in year 1 for trees that will be harvested in year 2 are tracked as timber management costs in year 1, even though revenue from those particular trees will be counted in year 2.<sup>39</sup> Nevertheless, timber growth management figures are included to provide the most accurate estimate of total costs associated with timber provision.

In Case 1, timber cost data in each agency are available for both sale administration and timber growth management activities. For fiscal year 1995, Ohio State Forest officials sold timber at a lower cost per board foot than did Wayne National Forest officials (see Table 7-2). Timber costs on state forests totaled \$483,665 to provide 5,415,472 board feet, which equals \$0.09 per board foot (S1-3, p. 27). Timber expenses on the national forest totaled \$211,868 to provide 1,500,000 board feet, or \$0.14 per board foot (N1-2, N1-3).

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<sup>39</sup>Officials generally do not track expenses to the degree that would be necessary for accrual to a particular tree over the life of the tree.

In Case 2, timber costs include sale administration activities but not timber growth management activities, since the state did not track the latter expenses (see Table 7-3). For fiscal year 1995, timber costs on Indiana State Forests were \$73,166 to provide 3,200,000 board feet, which equals \$0.02 per board foot (S2G1, S2-2). Timber costs on the Hoosier National Forest were considerably higher, totaling \$69,295 for 961,100 board feet, or \$0.07 per board foot (N2-3, N2J1).

In Case 3, timber costs include sale administration and timber growth management activities. Table 7-2 shows that, for fiscal year 1995, timber costs on Washington State Forests totaled \$19,048,783 to provide 607,300,000 board feet, or \$ 0.03 per board foot (S3-6). On Gifford Pinchot National Forest, timber costs were higher, at \$6,276,000 to provide 45,800,000 board feet, or \$0.14 per board foot (N3-2).

In Case 4, timber costs include sale administration and timber growth management activities. For fiscal year 1995, timber costs, as displayed in Table 7-1, on Oregon State Forests totaled \$7,880,968 to provide 126,594,000 board feet, or \$0.06 per board foot (S4-6). Timber costs on the Siuslaw National forest were substantially higher: \$3,158,800 to provide 8,900,000 board feet, or \$0.35 per board foot (N4-7).

Table 7-2

Comparison of Timber Revenues and Costs, Cases 1, 3, and 4, Fiscal Year 1995

<u>Agency Revenues</u>	<u>Timber Costs<sup>a</sup></u>	<u>Volume (mmbf)</u>	<u>Unit Revenues (per bf)</u>	<u>Unit Costs (per bf)</u>	<u>Unit Profit (per bf)</u>
<i>Case 1: Ohio State Forests and Wayne National Forest</i>					
State	\$2,106,247	\$483,665	5.4	\$0.39	\$0.09 \$0.30
Nat'l	\$ 153,569	\$211,868	1.5	\$0.10	\$0.14 -\$0.04
<i>Case 3: Washington State Forests and Gifford Pinchot National Forest</i>					
State	\$285,300,000	\$19,048,783	607.3	\$0.47	\$0.03 \$0.44
Nat'l	\$ 15,130,332	\$ 6,276,000	45.8	\$0.33	\$0.14 \$0.19

*Case 4: Oregon State Forests and Siuslaw National Forest*

State \$	64,165,957	\$7,880,968	126.6	\$0.51	\$0.06	\$0.45
Nat'l \$	2,882,790	\$3,158,800	8.9	\$0.32	\$0.35	-\$0.03

*Italics* indicates support for Hypothesis 9

<sup>a</sup>State and national costs include administration activities associated with timber sales (e.g., tree marking, road layout, sale advertising, contract administration) as well as timber growth management activities outside particular sales (e.g. pruning, weed control).

Table 7-3

Comparison of Timber Revenues and Costs, Case 2, Fiscal Year 1995

<u>Agency Revenues</u>	<u>Timber Revenues</u>	<u>Timber Costs<sup>a</sup></u>	<u>Volume (mmbf)</u>	<u>Unit Revenues (per bf)</u>	<u>Unit Costs (per bf)</u>	<u>Unit Profit (per bf)</u>
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*Case 2: Indiana State Forests and Hoosier National Forest*

State \$	854,561	\$ 73,166	3.2	\$0.27	\$0.02	\$0.25
Nat'l \$	17,575	\$ 69,295	1.0	\$0.02	\$0.07	-\$0.05

*Italics* indicates support for Hypothesis 9

<sup>a</sup>State and national costs include only sale administration activities (e.g., tree marking, road layout, sale advertising, contract administration), due to lack of available data for state timber growth management activities outside timber sales.

While national agency timber sales in all four cases exhibited higher unit costs, they also generated significantly lower unit revenues. In Case 1, for fiscal year 1995, Ohio State Forest revenue from timber sales was totaled \$2,106,247, from the sale of 5,415,472 board feet (S1-3, p. 27), or \$0.39 per board foot (see Table 7-2 above). Timber sales on Wayne National Forest generated \$153,569 from the sale of 1,500,000 board feet, yielding revenues of only \$0.10 per board foot (N113).

In Case 2, as shown in Table 7-3, Indiana State Forest revenue from timber stumpage sold in fiscal year 1995 totaled \$854,561 (S2-2). This revenue came from 3,200,000 board feet, for an average of \$ 0.27 per board foot. Hoosier National Forest timber sales, on the

other hand, earned just \$17,575 from 961,000 board feet, yielding \$0.02 per board foot (N2H1, N2J1).

In Case 3, Washington State Forest officials earned \$285,300,000 in fiscal year 1995 from the sale of 607,300,000 board feet of timber, for an average revenue of \$0.47 per board foot (see Table 7-2) (S3-5). Gifford Pinchot National Forest officials, on the other hand, earned \$15,130,332 from the sale of 45,800,000 board feet, or just \$0.33 per board foot (N3-3).

In Case 4, Oregon State Forest revenue in fiscal year 1995, displayed in Table 7-2, was \$64,165,957 from the sale of 126,594,000 board feet, or \$0.51 per board foot (S4H1). On Siuslaw National Forest, officials earned \$2,882,790 from the sale of 8,900,000 board feet, only \$0.32 per board foot (N4E1).

With lower costs and higher revenues, state timber sales generated significantly higher profits than did sales on the national forest. In Case 1, state unit profits were  $\$0.39 - \$0.09 = \$0.30$  per board foot, while national forest timber sales actually generated a net loss:  $\$0.10 - 0.14 = -\$0.04$  per board foot (see Table 7-2 above). In Case 2, state unit profits totaled  $\$0.27 - \$0.02 = \$0.25$  per board foot, while national sales actually generated a net loss,  $\$0.02 - \$0.07 = -\$0.05$  per board foot (see Table 7-3). In Case 3, state unit profits totaled  $\$0.47 - \$0.03 = \$0.44$ , while national sales generated a unit net profit of only  $\$0.33 - \$0.14 = \$0.19$  (see Table 7-2). In Case 4, state unit profits totaled  $\$0.51 - \$0.06 = \$0.45$  per board foot, compared to a net loss on the national forest,  $\$0.32 - \$0.35 = -\$0.03$  per board foot (see Table 7-2).

Why did state and national unit profits differ so sharply? This question is best answered by examining both cost and revenue components of timber provision. On the cost side, higher national expenses reflect three key factors. First, as discussed in Chapter 5, national officials must comply with a greater number of legal constraints affecting timber management, which require greater agency resources. For example, officials normally offer timber sales only after completing a thorough, interdisciplinary environmental assessment and

landscape-level analysis of the area in which the trees are located (N1H2). Officials charge the cost of such planning, required by the National Forest Management Act (NFMA), to timber growth management and sale administration accounts.

Second, national officials face substantial costs in addressing timber sales appeals, as provided under the National Environmental Policy Act (NEPA). Officials include expenses related to timber sale appeals in calculating timber costs. As one national official explained,

We spend a lot of time and money -- hundreds of thousands of dollars -- on the front end, trying to design appeal-proof projects. The actual benefits to all of this front-end work are minimal; it's a paper exercise that doesn't affect quality of work on the ground. We get paperwork proving we did a good job instead of needing to take people to the field to show them we did a good job (N2H1).

Third, timber provision exhibits significant economies of scale (USDA Forest Service 1995, p. 15; N2F1). Costs associated with sale design, setup, bid processing, and compliance monitoring are substantial even for small timber sales, where they contribute to high unit costs. Relatively low timber sale volumes exhibit higher unit costs to provide, which lowers unit profitability. In each case, the state agency sold a higher volume of timber than did the national agency (this result is discussed at length in Chapter 8). Thus three key factors explain higher timber provision unit costs on national than state forests: planning constraints, appeals processes, and economies of scale.

On the revenue side, timber unit revenue is lower on national than state forests across all four cases. The lower unit revenues that national agencies earn reflect several factors. A primary factor involves rules described in Chapter 5. Contractors complying with NFMA-mandated harvest contract requirements for environmental protection may perceive the requirements to be more constraining than are state requirements. As one national official explained,

The winning bids for our sales were on the low side, compared to prices for stumpage from state forests. Loggers on the national forest face stricter environmental regulations, higher road building standards, and bigger monetary penalties for damaged trees, that contribute to lower bids (N1I3).

Buyers also may be hesitant to purchase timber on national forests because they are aware that avenues for appeal, as granted by NEPA and NFMA, can delay harvest operations. In fact, a tactic of one environmental group in Indiana that opposes timber sales on national forests has been to tell potential timber buyers that they will challenge harvesting activities. A representative of the group described holding a rally to confront potential bidders: "We feel it is only fair that the bidders understand the full cost they will incur by buying these trees; these logging proposals will be challenged in every way possible" (Heartwood 1996).

A second reason for lower timber revenue on national forests relates to the tree species offered for sale. As described in Chapter 2, in each of the four cases, the state and national forests have a similar mix of tree species present. However, officials may choose to sell different species types. This happened in Case 2, where Indiana State Forest officials sold predominantly hardwoods such as oak, poplar, and beech, but Hoosier National Forest officials sold only pine trees, a softwood species with lower commercial value. As one national official explained,

The Forest Plan intent was to focus on hardwood harvesting, but so far we've only sold pine. We've focused on this softwood because it's not native, so it's somewhat more acceptable to those who oppose harvesting on the forest. . . . Hardwoods are a different bag -- selling them is likely to generate more controversy (N2E3).

Thus, with NEPA providing an avenue for opponents to delay or block a sale, national officials in Case 2 did not choose to sell hardwoods, which have higher commercial value but also higher probability of their sale being delayed by environmentalists using legal avenues.

A third reason for lower revenue per unit volume of timber on national forests relates to differing agency mandates, as described in Chapter 5. Recall that state statutes direct state agencies to pursue profitable growth of timber (Case 1) and activities that generate revenue (Cases 2-4). At the national level, however, the Multiple Use Sustained-Yield Act (MUSYA) mandates that forests are not to be managed for maximum fiscal returns. Thus timber sale objectives on national forests are less likely to focus on generating revenue or net profit than are objectives on state forests. Instead, national officials often refer to timber sales as a "tool" to achieve other management goals, such as improving forest health or creating habitat for certain wildlife (N4F1).

A fourth reason for lower revenue per unit volume of timber on national forests is that national officials face greater constraints on the type of timber harvesting allowed. Limits to regeneration harvesting on national forests, as stipulated by NFMA and in planning documents, can affect revenue. Instead of providing timber to for harvest in large regeneration openings, national officials must sell more timber for harvest by "thinning," which generally removes fewer large trees than does regeneration harvesting. Large trees typically have higher commercial value per board foot than do small trees. As one national official explained, "Typically we sell thinning harvests, featuring smaller logs with lower unit value -- about \$300 per thousand board feet. In contrast, bigger trees can bring over \$600 per thousand board foot" (N4F1).

Finally, as the volume of timber sold dropped on the national forests in the Northwest, local mills went out of business or switched their settings to process timber from alternative sources, such as private lands, which included different tree species and log sizes. The resulting decrease in demand meant fewer bidders, with subsequently lowered bid values for national forest timber sales (N3B2).

In summary, several factors combined to reduce unit revenues per board foot of timber sold on national forests compared with state forests. Contractors were likely to value national timber sales less than state timber sales if they foresaw greater expenses in meeting national

harvest operations requirements or greater risks of having their operations halted by appeals. Moreover, some national officials eager to avoid public controversy and timber sale blockages through appeals chose to sell less valuable -- but less controversial -- tree species. Differing statutory mandates directed forest management for different purposes; national officials more often described timber sales as a tool for achieving other resource goals, while state officials were directed to pursue timber sales to generate revenue and profit. Another constraint affecting national officials was harvest methods; NFMA and planning documents restricted regeneration harvesting to a greater degree on national forests, resulting in the sale of smaller trees with lower market values. Finally, as timber sales volumes dropped in the Pacific Northwest, certain mills left or converted to process logs from different sources, which reduced the number of bidders and, consequently, stumpage prices.

### Use Fee Collection

While timber may be the most obvious, it is not the only forest benefit capable of generating revenue. A number of other forest benefits for which officials may charge users include firewood, wood chips, decorative plants, mushrooms, rights-of-way, and recreational facility uses. Hypothesis 10 suggests that state forest policies emphasize revenue from targeted beneficiaries (use fees) more than do national forest policies. Data support this hypothesis in three of the four cases (see Table 7-4).



Table 7-4

Use Fee Revenues Collected, Fiscal Year 1995

<u>Agency</u>	<u>Revenue Collected</u>	<u>Forest size (ac)</u>	<u>Collected per acre</u>	<u>Proportion of Operating Expenses</u>
<i>Case 1: Ohio State Forests and Wayne National Forest</i>				
State	\$ 115,207	176,787	\$0.65	2.6%
National	\$ 39,576	224,627	\$0.18	1.1%
<i>Case 2: Indiana State Forests and Hoosier National Forest</i>				
State	\$ 676,179 <sup>a</sup>	144,110	\$4.69	26.5%
National	\$ 36,152	180,209	\$0.20	1.0%
<i>Case 3: Washington State Forests and Gifford Pinchot National Forest</i>				
State	\$2,773,014	2,100,000	\$1.32	6.3%
National	\$ 195,575	1,368,580 <sup>b</sup>	\$0.14	1.0%
<i>Case 4: Oregon State Forests and Siuslaw National Forest</i>				
State	\$ 99,396	789,146	\$0.13	0.6%
National	\$ 645,600	527,359	\$1.22	4.7%

*Italics* indicates support for Hypothesis 10

<sup>a</sup>From fiscal year 1994. Indiana State Forest officials could not provide data from fiscal year 1995, but they indicated data from fiscal year 1994 were close estimators for data from 1995.

<sup>b</sup>Since data include use fees collected from congressionally designated special forest lands (Wilderness Area and National Monument) which were not tracked separately, the forest acreage used for calculating use fees collected per acre includes these special areas (292,701 acres).

In Case 1, Ohio State Forest officials collected more use fees than did Wayne National Forest officials in fiscal year 1995. However, neither state nor national officials collected a substantial proportion of their agency's operating expenses from use fees. Revenue from state forest users for non-timber forest products, rights-of-way, special use permits, and leases totaled \$115,207 (S1-3, p. 28), or 2.6% of the state agency's total operating expenditures for public forest management (S1-3, p. 27). Calculating for forest size, the average amount was \$0.65 per acre. State officials did not collect any recreational use fees. The state forest agency retains all use fees collected by Ohio State Forest officials, which provides a source of revenue

to fund agency expenditures. However, as discussed in Chapter 4, officials did not rely on use fees as an important means to increase budgetary resources because of perceived high costs of collecting the fees. No state official suggested that increasing efforts to collect use fees would be a worthwhile endeavor for budget enhancement.

Ironically, financial considerations were a key reason that Ohio State Forest officials did not collect recreational use fees. The head of the forest agency waived the collection of all recreational fees because of liability laws, perceiving that if someone pays to use a trail or campsite on a state forest, then the agency would face a potentially substantial liability if he or she were to suffer injury (S1F5). If officials did not collect use fees, then the state would be less likely to be held liable for costs associated with injuries. Thus the hypothesis that state forest officials are more likely to encourage use fees than are national forest officials is not supported with regard to recreation fees. But the underlying theory that state officials emphasize economic concerns is supported; state forest officials reduced the potential for large economic losses by waiving use fees. At the same time, state officials did collect a high level of non-recreational use fees (see Table 7-4).

In contrast, Wayne National Forest officials did collect recreational use fees. One national official said that, while liability was linked to fee decisions, dropping fees to reduce liability had not been considered (N1D2). He cited as primary reasons the fact that there had been no liability problems recently on the forest, and the belief that dropping fees would not altogether eliminate potential liability for injury or damages.

Even so, national officials collected low levels of use fees in fiscal year 1995. Revenue from land uses, recreation fees, power line rights-of-way, and grazing contributed \$39,576, or 1.1% of the operating expenses for public forest management (N1-2, N1-3). Calculating for forest size, this totals about \$0.18 per acre. A primary reason for the low level of use fee collection on the national forest was legal constraints. By law, national forest officials retain only 15% of use fees collected, with the rest accruing to the U.S. Treasury. To gain use fees,

agency officials must expend funds to meet amenity standards described in Federal law, and they must arrange for fee collection. As one national official described,

We are considering charging entrance fees for ORV [off-road vehicle] trails. We've met with ORV users, and they agree that this would be a good thing if they can see some trail benefits from the funds. However, we can't afford to do that right now -- it's not generally cost effective to collect fees from such uses because we can't retain much of the fees collected to run the fee program. If we could keep more than 15% of the fees to apply to the fee program, then the ORV trails might pay their own way (N1C2).

In Case 2, Indiana State Forest officials collected substantially higher use fee revenues than did Hoosier National Forest officials. In the most recent fiscal year for which data were available (fiscal year 1994, which officials estimated as having similar use fee collection to fiscal year 1995), state forest officials collected \$ 676,179 statewide from use fees, including recreational use fees, firewood permits, and land use permits, for an average of \$4.69 per acre (S2-1). This amount equaled about 26.5% of the state forest operating expenditures (S2-4). The lion's share of use fees collected came from a variety of recreational uses, including gate admission, camping, cave tours, boat launch, and swimming. All recreational use fee prices were determined outside the forest agency, by a commission with responsibility across various state natural resource agencies. The state parks agency, which has considerable experience in generating income from use fees, provided leadership in fee-setting decisions (S2D1).

On Hoosier National Forest, officials collected only \$28,152 in use fees in fiscal year 1995, including land use permits and recreational user fees, plus \$8,000 in-kind from concessionaires, for a total of \$ 36,152, or just \$0.20 per acre (N2-2, N2G3). This total represented approximately 1.0% of the national agency's operating expenditures for public forest management (N2-3). Again, an important reason for the low level of use fee collection was the funding constraint that only 15% of use fees collected stays on the forest. Liability concern was not an important factor in use fee decisions (N2G3).

In Case 3, forest visitors value a variety of uses, including recreational as well as special forest products such as ferns, mosses, tree boughs, and mushrooms. Washington State Forest officials did not collect recreational use fees in fiscal year 1995, but they did collect substantial fees for a number of other forest uses. They collected approximately \$212,696 for special forest products, \$302,623 for special use permits, \$840,250 for right-of-way leases, and \$1,417,445 for leases for communication sites where antenna towers could be built, for a total of \$2,773,014, or \$1.32 per acre (S3-5, pp. 17, 28). This revenue represented about 6.3% of the agency's operating expenditures for public forest management.

As in Case 1, state officials in Case 3 did not collect recreational use fees because of economic considerations surrounding liability (S3D1, S3F1). Another reason was that use fees might not be retained by the forest agency. Without precedent to guide them, officials did not know whether future recreational use fees would accrue to funds for recreational facility operation and maintenance, or whether they would accrue to the state's general fund (S3B2). At the time of this study, the issue had yet to be resolved.

In Case 3, national officials collected a lower amount of non-timber use fee revenue. Gifford Pinchot National Forest officials collected \$192,020 for recreational use fees and \$3,555 for land use, power line rights of way, and grazing fees, for a total of \$ 195,575 in fiscal year 1995, or \$0.14 per acre (N3-14). This amount represented just 1.0% of the agency's operating expenses for public forest management. Use fee collection on the national forest was limited by the time and resources required for fee collection and for maintenance of facilities to the national standards required to charge fees. Such time and resources were in short supply, as budget appropriations were limited and only a small percent of use fees collected were retained at the local level. Instead of developing fee collection programs, officials were more likely not to charge for non-timber uses. Some officials explored alternative fund generating methods such as installing donations boxes, which provided small amounts of funds that could be used locally to support the facilities (N3F1).

In Case 4, Oregon State Forest officials collected substantially lower levels of use fees than did national officials. State officials collected fees for firewood permits, campground use, and "special sales," which included all additional revenues from uses such as special forest products, rights of way, and leases. In fiscal year 1995, state officials collected \$7,670 for firewood permits, \$17,987 for campground fees, and \$73,739 for special sales, a total of \$99,396 in non-timber use fees (S4-13). This amounted to an average of \$ 0.13 per acre and 0.6% of the agency's operating expenditures for public forest management.

State officials in Case 4 did not collect substantial recreational use fees in fiscal year 1995 because they began collecting such fees only within the last few months of the fiscal year. Historically, the Oregon State Forest officials did not collect any recreational use fees because state officials did not view them as an important revenue source. As one official said, "They're not a significant money maker -- we're lucky if we can cover costs with them" (S4I1). While officials did not cite liability concerns regarding charging more use fees, they did, as in Cases 1 and 3, indicate economic considerations that, ironically, led to lower use fee collection. In Case 4, the economic consideration was not liability, but opportunity cost. While state officials recognized the potential to substantially increase revenue from mushroom harvesting permits by auctioning rather than setting fixed prices, they also recognized that such auctioning would have required greater personnel time to administer and monitor. Since mushroom harvesting season tends to occur during prime timber harvesting season, diverting personnel to mushroom harvesting would have meant forgoing even greater revenue from timber production (S4H1). Thus economic considerations explain why use fees for certain special forest products were not higher.

National officials in Case 4 collected, in fiscal year 1995, \$448,800 in recreational use fees and \$196,800 in special forest product and other fees, for a total of \$645,600, or an average of \$1.22 per acre (N4-5, N4-2). This represented 4.7% of the agency's operating expenditures for public forest management. Thus national officials collected more use fees than did state officials in Case 4. However, as with other national forests, use fees represented a

small amount relative to the agency's operating expenditures. An important constraint on use fee collection was the national funding rule, described above, that stipulated most of the revenue so generated could not be retained at the local level.

Clearly, there are important differences between state and national use fee collection. In three of the four cases, compared to the national agency, the state agency collected a higher proportion of its operating expenses, and a higher amount per acre, in use fees. This result comes despite low recreational use fee collection in three states reflecting, in part, liability concerns. Why do national officials generally collect such low levels of use fees? The most important factor is the rule that apportions only 15% of use fees collected to the facility that generated them. Use fee collection requires resources for monitoring and enforcement of payment. Without additional appropriations to fund use fee collection, national officials lack the budgetary resources necessary to collect more use fee revenue.

An interesting recent development at the national level is the establishment of a pilot program to address use fee collection challenges. In April, 1996, Congress passed PL-104-34, authorizing 200 federal recreation sites to participate in a three-year fee collection project allowing retention of most recreation use fees on site. National officials in Cases 3 and 4 were enthusiastic about their participation in this pilot program, seeing it as a way to target additional funds to those recreational sites in highest demand (N4D1). Until this pilot program is expanded, we should not expect to see national agencies collecting as much revenue in use fees as do state agencies.

State agencies tended to collect more in use fees than did their national counterparts. This finding supports Hypothesis 10. Even so, in most cases the state agency collected only a small portion of its operating expenses in use fees. To explain this relatively low level of state use fee collection, it is necessary to examine more closely the mechanism by which use fees are expected to be greater at lower levels of governance. Stein (1990) supports this argument in his analysis of the provision of city services. He suggests that when services are financed by general taxes rather than by directed user fees, those with higher asset values (such as large

business firms or wealthy individuals) are more likely to move to jurisdictions with lower levels of general taxation. Hence, in Stein's analysis, a low level of use fee collection necessitates a higher level of general taxation and curtails economic development in a given jurisdiction.

But in translating Stein's argument to forest policy, a low level of use fee collection may, in fact, bolster economic returns. There are two primary reasons for this counter-intuitive outcome. First, charging use fees may increase liability for a forest agency, subjecting it to potentially large financial losses if a user is injured. Second, consider that, compared to timber production, use fees generally are collected on lower-value, dispersed uses. Collecting use fees requires non-trivial effort; personnel must spend time monitoring and enforcing, and costs of such efforts may exceed revenues gained from collection. Moreover, to the extent that non-timber forest products such as mushrooms are harvested at the same time as timber, diverting personnel to manage non-timber product programs may lead to lower overall revenue because of lower volumes of timber sold.

Thus in cases where state officials mentioned liability concerns (Cases 1 and 3), they are not likely to rely heavily on recreational use fees to generate revenues. In addition, in the case where state officials described opportunity costs of reducing personnel available for timber (Case 4), use fee revenues were not high. The only case in which use fees provided at least one fourth of the agency's operating expenses for public forest management was in Case 2, where state officials did not cite liability concerns and recreational use fees come from developed campsites, where collection and monitoring is much easier than it is for dispersed uses.

### Transfer Payments to Local Governments

Activities on public forests have important effects on local economies. Many rural communities near timber resources depend heavily on timber for jobs, income, and economic development (see Power 1996, Kusel and Fortmann 1991, Dietrich 1992). In fact, in a report

focusing on economic impacts of reduced timber sales resulting from spotted owl protection in the Northwest, analysts estimated that, compared to average annual harvest levels of 18,000 million board feet, every million board feet of timber harvesting decline is linked to twelve local jobs each averaging \$24,000 annual salary (Gilless et al. 1990, pp. 9 and 28). Similarly, others have estimated timber-related employment impacts in the Pacific Northwest to be eleven jobs per million board feet (see Satchell 1996, p. 76).

Another important economic issue in public forest ownership is its impact on local tax bases. Unlike most private lands, public lands are not subject to property taxes. For jurisdictions such as counties whose primary revenue source is property tax, there is concern that public lands deprive these jurisdictions of crucial tax revenue. To address this issue, public lands have been subjected to various revenue-sharing policies, whereby a portion of revenues earned on public lands are transferred to local governments (e.g. counties, townships, school districts, or other jurisdictions). Hypothesis 11 suggests that state forest policies favor transferring money to local governments more than do national forest policies. Data support this hypothesis.

In Case 1, state law required Ohio State Forest officials to share 50% of net timber and oil/gas/mineral revenues with the county and township of origin. For timber costs, accountants tracked statewide charges to a timber management charge code, which included both equipment and personnel costs, for a given fiscal year (S1A1). They added a charge of 15% (to account for a share of agency overhead costs) to generate total timber costs, which they subtracted from total timber revenues to yield a net timber profit figure. For oil/gas/minerals profit sharing, the agency did not track costs specific to oil/gas/minerals. Instead, revenues were multiplied by 90% to determine net profit. Net profit values from timber and oil/gas/minerals were combined to yield net commodity profit, which was divided equally between the state general fund (50%) and the county and townships (50%) from which the commodity was derived.

For fiscal year 1995, Ohio State Forest officials generated \$721,769 (\$719,015 timber plus \$2,754 oil/gas/mineral) for county and township governments across the state (S1-4).



Taking forest size into account, this amounts to about \$ 4.08 per acre (see Table 7-5). State officials used the payment transmittal to gain publicity and support from local governments. After the local forest supervisor received a check from the state forest agency headquarters, he requested a meeting with local government officials, often with local media present, to present the check. As one local forest official explained, "When I visit the county commissioners to give them a \$30,000 check, you should see the smiles on their faces" (S1E1).

National forest officials also faced legal requirements specifying revenue sharing with local governments. The Twenty-Five Percent Fund (16 USCA 500) required that 25% of gross revenues that the forest agency received from forest products and other payments must be paid to the state in which the national forest is located, to be distributed to the county from which the revenues were generated. In fiscal year 1995, Wayne National Forest officials generated \$ 15,554 for payment to county governments with land in the national forest (N1-3).<sup>40</sup> This amount equals just \$0.07 per acre (see Table 7-5). Thus the national agency transferred a much smaller amount to local governments than did the state agency in Case 1.

Revenue sharing rules in Case 2 resembled those in Case 1. Indiana State Forest officials shared 15% of net timber profit with local governments. Agency officials on state forests prepared cost summary sheets for each sale, including items such as tree marking, administration, boundary location, advertising, and equipment for road work (S1-6). Officials subtracted these costs from the winning bid revenue to determine net profit from each timber sale. Meanwhile, national officials in Case 2, as in Case 1, shared 25% of gross (not net) revenues for timber and other forest revenues with the county from which they derived the revenues. In Case 2, the state forest system shared \$120,867 with counties in fiscal year 1995,

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<sup>40</sup> Counties also receive payments from statutory Payments in Lieu of Taxes (PILT) from national forests located within the county. However, since these payments depend solely on statute, not forest officials' activities, they are excluded from this analysis. Even if they were to be included, the total transfers from the national forest and unit would still be far less than the totals from the state forest(s). For example, in Case 1 PILT payments totaled \$129,096 in fiscal year 1995 (N1N2).

or \$ 0.84 per acre (S2-2). Meanwhile, the national forest shared just \$ 13,755, or \$0.08 per acre, with counties (N2-4).

In Case 3, Washington State Forest officials managed state-owned lands in trust for a number of different beneficiaries, including various schools, colleges, universities and counties. For comparison with national revenue sharing, analysis focuses on state payments to counties. Counties received an average net of 35% of gross revenue earned on state forests located within their boundaries (S3-5). In fiscal year 1995, counties received a net transfer of \$36,669,172, or \$ 58.86 per acre (see Table 7-5), from state forest land revenues (S3-5, pp. 4, 29).

On the national forest in Case 3, the 1993 Interior and Related Agencies Appropriations Act (IRAA) altered the standard 25% payment to counties from national forest gross revenues. Counties affected by harvesting restrictions related to northern spotted owl protection were entitled to receive the greater of either 25% of national forest revenues or a moving percent (82% in fiscal year 1995) of the 1986-90 average annual payment. In fiscal year 1995, the latter formula provided a larger sum, and \$11,287,603, or \$ 10.49 per acre (see Table 7-5), accrued to counties in which the national forest is located (N3-4, p. 28). Nevertheless, this amount was considerably less than revenues earned by counties from state forest lands, as described above.

In Case 4, Oregon State Forest officials managed state-owned lands in trust for counties and schools. Again, the analysis here focuses on transfer payments to counties. On lands managed for the benefit of counties, the state agency transferred 63.75% of all revenues earned to the counties in which the forest is located (S4-7, p. 2). In fiscal year 1995, state officials generated \$31,803,700, or \$ 48.56 per acre (see Table 7-5), for counties (S4H1).

In Case 4, in fiscal year 1995, IRAA required Siuslaw National Forest officials to transfer to counties the greater of 25% of revenues earned or 82% of the annual average transferred between 1986 and 1990. National officials generated \$13,087,100, or \$ 24.81 per acre (see Table 7-5), for counties (N4-2).

Table 7-5

Revenue Sharing Transfers, Forest Agency to Counties, Fiscal Year 1995

<u>Agency</u>	<u>Accrued to Counties<sup>a</sup></u>	<u>Forest Size (ac)</u>	<u>Accrued per acre</u>
<i>Case 1: Ohio State Forests and Wayne National Forest</i>			
State	\$721,769	176,787	\$4.08
National	\$ 15,554	224,627	\$0.07
<i>Case 2: Indiana State Forests and Hoosier National Forest</i>			
State	\$120,867	144,110	\$0.84
National	\$ 13,755	180,209	\$0.08
<i>Case 3: Washington State Forests and Gifford Pinchot National Forest</i>			
State	\$36,669,172	623,000	\$58.86
National	\$11,287,603	1,075,879	\$10.49
<i>Case 4: Oregon State Forests and Siuslaw National Forest</i>			
State	\$31,803,700	654,991	\$48.56
National	\$13,087,100	527,359	\$24.81

*Italics* indicates support for Hypothesis 11

<sup>a</sup>For state agencies with legal trust relationships (Cases 3 and 4), dollar and acreage figure includes lands held in trust for the counties, not those held in trust for other beneficiaries (e.g. common school fund).

It is, perhaps, surprising that the state agency in each case transferred more funds to county governments than did the national agency. After all, in Cases 1 and 2, state revenue sharing was based on net rather than gross earnings, while national revenue sharing was based on gross earnings. Moreover, a narrower range of revenue sources were subject to sharing from the state than from the national agency. Given these differences, we might expect state agencies to transfer smaller sums to counties than do national agencies.

However, in all four cases, the state agency transferred more funds than did the national agency. The critical factor determining this outcome is the higher level of revenue-generating activities, primarily timber, on state forests which provided a higher revenue base to

which revenue sharing formulae were applied. Analysis of such activities is the focus of Chapter 8, where it is clear that state agencies generate a higher level of commodity outputs than do national agencies.

### Conclusion

Analysis in this chapter provides a link between policy process variables, described in Chapters 3 through 6, and policy outcomes. Questionnaire results regarding officials' perceptions of influential factors reinforce analyses presented in earlier chapters. Budget allocations are among the most influential factors in seven of the eight cases, but budgetary incentives do not differ systematically between state and national agencies. Instead, important factors that exhibit systematic differences between levels of governance are statutory, regulatory, and planning document constraints. It is through such constraints that the behavior of bureaucrats in forest policy, or any other policy area, can be affected. While bureaucrats have long faced criticism over the fact that they make and implement important policy choices without being directly accountable to the citizenry, it is important to recognize that bureaucratic behavior is not wholly insulated from public demands. Constraints created largely by elected officials are important factors shaping agency bureaucrats. These constraints help to explain differences in policy outcomes, including fiscal outcomes.

Examination of fiscal outcomes provides important information about the performance of state and national agencies. Proponents of policy devolution in a federal system often cite expected gains in efficiency or cost savings as a reason for granting greater responsibilities to lower levels of governance. Evidence presented in this study provides empirical support for this claim; state agencies generate higher economic profits than do national agencies. Analysis supports all three fiscal outcome hypotheses.

Hypothesis 9 suggests that state forest operations produce a higher net profit from commodity sales than do national forest operations. In all four cases, state timber provision

involved lower unit costs and higher unit revenues, for higher unit net profits. The higher national agency costs resulted from substantial, interdisciplinary planning and public input requirements; appeal response efforts; and lower sale volumes that reduced benefits from economies of scale. At the same time, national agency unit revenues were decreased when bidders found the stumpage less attractive because of numerous legal requirements and the potential for appeals; when officials sold less-controversial rather than higher-priced tree species; when officials pursued non-timber goals; and when constraints limited regeneration harvesting of larger, higher-valued trees.

Hypothesis 10 suggests that state forest policies emphasize revenue from targeted beneficiaries (use fees) more than do national forest policies. In three of the four cases, state officials collected more revenues from use fees than did national officials. An important cause of this outcome is the legal constraint that allowed only 15% of national forest use fees to stay on the forest, with the remainder going to the U.S. Treasury. While state officials in most cases collected substantially higher amounts in use fees, in three of the four cases they collected only a small share of their operating revenues, reflecting, primarily, two economic considerations. First, in some states agency officials expressed concern that charging use fees would expose them to higher liability in case of an accident, which could result in a significant economic loss for the agency. Second, because of the dispersed nature of most forest uses for which fees might be charged, fee collection costs may make such endeavors non-profitable.

Thus the promise of higher use fee collections at lower levels of governance comes with a caveat. While policies at lower levels of governance may yield outcomes with greater fiscal equivalence than policies at higher levels of governance, as Stein (1990) suggests, important obstacles to higher use fee collection remain even at these lower levels. Many critics of national forest fee collection restrictions argue that the rule requiring national officials to transfer 85% of collections to the U.S. Treasury should be changed. They claim that allowing agency officials to retain most or all of the use fees collected will lead to increase use fee collections, thus providing needed funds to enhance visitor benefits (see, for example,

Robinson 1975). In fact, the pilot program that currently allows national officials on selected forests to retain most fees collected at specific sites has been touted as an important means to ensure greater use fees will be collected and used on the selected forests. However, evidence from state forest officials allowed to retain substantial portions of the use fees they collect suggests that obstacles such as liability concerns, costs of monitoring and enforcement, and opportunity costs must be overcome before substantial levels of use fees will be collected.

Hypothesis 11 suggests that local governments receive larger forest revenue transfer payments from state forests than from national forests. This result touches on an important issue in intergovernmental relations. Officials in local government jurisdictions have reason to be concerned about land in their county that is in public ownership, since such land does not provide property tax revenue. In fact, in areas where Federal officials attempt to purchase land, they often face opposition from parties interested in maintaining sufficient funding sources for local government jurisdictions.

To compensate for lost property tax revenues, public land management agencies share their revenues with local governments. But such sharing is not equal across levels of governance. Evidence in this analysis suggests that local governments are likely to receive far higher fund transfer levels from state than national lands. Even though state officials in Cases 1 and 2 share net rather than gross earnings, and only for commodities (not recreation), they still transfer far higher funding levels to local governments than do national forest officials. Similarly, state officials in Cases 3 and 4 also transfer substantially higher funding amounts to local governments than do national officials. This result is linked to the fact that state officials provide more timber, with higher revenues, than do national officials. Chapter 8 explores such differences in timber outputs, as well as in recreational forest uses.

## Chapter 8: Forest Uses

Policy outcomes include more than just fiscal measures. Whether one is examining forest policy, natural resource policy more generally, or any other policy area, the results of activities can affect people in many different ways. Results also can affect non-human entities such as animals, streams, and ecosystems. Understanding policy outcomes in a federal system requires examination of differences across government levels. In forest policy, outcomes reflect a wide range of possible forest uses, as agency officials manage forests for some benefits but not for others. Before the question of appropriate levels of responsibility for public forests can be discussed meaningfully, it is important to understand whether the forest uses that officials promote or discourage differ systematically across levels of governance. Such understanding allows more informed choices about which responsibilities to place at different levels in a federal system.

Forest policy provides a particularly rich arena in which to examine differences across levels of governance, as forests are capable of providing benefits with a variety of characteristics. For example, commodity provision may foster intensive economic development; recreation facilities may promote dispersed economic development and individual non-monetary utility; and environmental protection may enhance common pool resources linked directly to human utility, such as global climate stabilization, as well as benefits that accrue primarily to non-human entities such as animal species. Certainly trade-offs among such different types of benefits are evident in policy areas beyond forest management.

Examination of forest uses addresses the following question: How do differences in policy processes across levels of governance affect policy outcomes? Given the systematic differences in policy process factors discussed earlier in the study, it is expected that state and national agency officials promote and discourage different forest uses.

For this analysis, forest uses include three general categories: commodity provision, recreation, and environmental protection. The latter is the subject of Chapter 9. For

commodity production, subsurface materials (oil, gas, minerals) may be provided, but timber is the most important product. Timber is measured in terms of gross quantity, proportion of annual growth (the maximum level of timber that could be produced without depleting the stock of trees), and agency expenditures. Recreation includes a variety of uses, such as hunting, camping, hiking, horse riding, and off-road-vehicle (ORV) riding. Recreation measures include perceptions as well as more objective output data relating to agency expenditures and the level of facilities maintained and added. Analysis tests Hypothesis 12: State forest policies promote uses with substantial, direct economic benefits more than do national policies, while national forest policies promote uses without substantial, direct economic benefits more than do state forest policies. Evidence strongly supports this hypothesis with regard to commodity provision but only partially supports it with regard to recreational use promotion.

### Commodities

A key difference hypothesized to exist between state and national agencies is the amount of commodities provided. If state agencies stress economic development more than do national agencies, then state officials should provide more commodities important for economic development than do national officials. Two key commodities are subsurface (oil, gas, and minerals) and timber. These outputs can provide important raw materials to fuel visible, concentrated economic development and employment opportunities in relatively high-paying jobs.

### Oil, Gas, and Minerals

Oil, gas, and minerals are potentially valuable products extracted from forests. But rights to subsurface commodities are distinct from land ownership; neither state nor national forest agencies own all of the subsurface commodities under their forests. Thus the impact of



agency officials' activities on the provision of these products is less significant than on the provision of other benefits.

For subsurface resources owned by the forest agency, officials can promote commodity provision through the sale of oil and gas rights to private parties (although they do not control when the purchaser will decide, if at all, to extract). The sale of such rights generates two types of revenue: lease rates for surface land and royalties on the value of the materials extracted. In most of the cases examined, physical capacity constrains subsurface productivity in both forests. Since non-trivial subsurface potential exists in only two of the eight agencies, this commodity does not provide a useful test of Hypothesis 12.

In Case 1, neither Ohio State Forest officials nor the Wayne National Forest officials collected significant revenues from oil, gas, or minerals in fiscal year 1995. The national forest agency did not collect any such revenue, while the state forest system generated just \$3,000 from oil and gas revenue -- most of which came not from production, but from Federal government payments for storing natural gas underground at a state forest (S1K2, S1G2).

But Wayne National Forest officials did undertake significant activities to increase oil, and gas provision in the future. They offered oil and gas rights sales on about 15,000 acres in fiscal year 1995, of which contractors purchased ten-year leases on 4,800 acres (N1-4, 6). The 1995 sales were estimated to generate about \$25,000 per year, 75% of which goes to the U.S. Treasury, with the remainder to be transferred to the counties of origin. Once oil and gas are recovered, additional revenue will be generated in the form of a 12.5% royalty on the value of resources extracted, to be distributed in the same manner (75% to the Treasury, 25% to counties).

State officials, in contrast, did not sell oil or gas extraction rights on any of the Ohio State Forests (S1G2). The primary reason for the large difference in oil, gas, and mineral development is physical capacity. Two of the national forest districts are located in regions that, historically, have yielded large quantities of oil, gas, and coal. In fact, the private lands purchased to create the national forest included many mined-over areas not well-suited to

agriculture or other private uses at the time (N1K1). State forest land, on the other hand, is relatively poorly-endowed with subsurface commodities. One state official noted that, even if the state agency were to increase efforts to sell subsurface rights, results would be limited because of a lack of interest among producers (S1K2). Another state official said that, in the forest where he works, the most recent oil and gas activity occurred over a decade ago, when one company sunk two wells that were not productive (S1E4).

In Case 2, neither national nor state officials heavily promoted subsurface commodity forest uses. Hoosier National Forest officials did not undertake any oil, gas, or mineral development work in fiscal year 1995 (N2A2). As one national official explained, "There is little oil or gas potential under our lands" (N2A2). On the state forest system, the only mining activity involved extraction of coal under one state forest and gypsum under another (S2G2). The state held no rights to royalties or other revenue from the gypsum, but it was entitled to royalties for the coal. However, coal revenues were trivial in fiscal year 1995; less than \$100 (S2A1). Statewide, little subsurface commodity development occurred because of a lack of known deposits (S2G2). Moreover, the state natural resources department had shown no interest in pursuing oil, gas, or mineral development under state lands, and there had not been significant pressure from commodity interests for such activities (S2A1). Thus the potential for subsurface commodity provision was low on both state and national forests in this case.

In Case 3, state officials promoted subsurface commodity uses more than did national officials. Washington State Forest officials encouraged subsurface commodity development as a means to generate revenue for the trusts, earning over \$1 million from leasing on state forest and non-forest lands in fiscal year 1995 (S3-5, p. 4). In contrast, there was little oil, gas, or coal potential on Gifford Pinchot National Forest; the only mining operations in existence were two minor ones, and there had never been active oil or gas leasing activities on the forest (N3-4, N3A1).

In Case 4, both Oregon State Forest and Siuslaw National Forest officials described low potential for subsurface development, due to lack of mineral, oil, and gas presence under public forests (N4G1, S4H1).

Thus, physical capacity, or lack thereof, appears to be the determining factor in subsurface commodity provision. In most cases, neither the state nor national agency pursued subsurface development because such resources were scarce. Since output levels cannot be attributed to agency policies, promotion of subsurface commodities does not provide a useful test of Hypothesis 12.

### Timber

A more useful indicator of agency officials' promotion of forest commodities is timber provision. Hypothesis 12 suggests that state agency officials provide a higher quantity of timber (a use with substantial, direct economic benefits) than do national agency officials. Analysis of timber volumes offered and proportion of agency expenditures devoted to timber promotion supports this hypothesis.

To compare state with national timber provision in a meaningful way, physical characteristics of tree growth must be controlled. This is achieved by including in the analysis the average estimated site productivity per acre, which reflects the capacity of land to grow trees. This value is similar across the state and national forest land in each case for which data are available (see Chapter 2). Multiplying site productivity per acre by forest size yields an estimated volume of tree growth that occurs annually in a given forest. These calculations are presented below in Table 8-1. According to Hypothesis 12, state agency officials should sell a higher proportion of their annual tree growth volume than do national officials. Data support this hypothesis.

Table 8-1

Volume of Timber Sold and Percent of Annual Growth, Fiscal Year 1995

<u>Agency</u>	<u>Timber Sold (mmbf)<sup>a</sup></u>	<u>Forest Size (acres)</u>	<u>Annual Estimated Growth (mmbf)</u>	<u>Share of Annual Est. Growth Sold</u>
<i>Case 1: Ohio State Forests and Wayne National Forest</i>				
State	5.4	176,787	27.6	19.6 %
National	1.5	224,627	32.3	4.6 %
<i>Case 2: Indiana State Forests and Hoosier National Forest</i>				
State	3.2	144,110	17.0	18.8 %
National	1.0	180,209	19.4	5.1 %
<i>Case 3: Washington State Forests and Gifford Pinchot National Forest</i>				
State	607.3	2,100,000	_b	--
National	45.8	1,075,879	--	--
<i>Case 4: Oregon State Forests and Siuslaw National Forest</i>				
State	126.6	789,146	789.1	16.0 %
National	8.9	527,359	527.4	1.7 %

<sup>a</sup>mmbf = million board feet

<sup>b</sup>data are not available for this case

*Italics* indicates support for Hypothesis 12

In Case 1, Ohio State Forest officials sold 5,415,472 board feet of the estimated 27,600,000 board feet of growth in fiscal year 1995, or about 19.6% of the growth. Wayne National Forest officials sold 1,500,000 board feet of the estimated 32,300,000 board feet of growth in fiscal year 1995, which equals just 4.6% of the growth.

In Case 2, Indiana State Forest officials sold 3,200,000 board feet, or 18.8% of the estimated 17,000,000 board feet of growth in fiscal year 1995 (S2G1). The same year, Hoosier National Forest officials sold only 961,100 board feet out of 19,400,000 board feet estimated growth, which equals 5.1% of annual growth (N2C1, S2-5 pp.4-1 and B-20).

In Case 3, Washington State Forest officials sold 607,300,000 board feet in fiscal year 1995, while Gifford Pinchot National Forest officials sold just 45,800,000 board feet , (S3-12,

p. 5; N3-4). Unfortunately, no reliable estimate of annual growth across state or national forest lands exists in Case 3. However, comparison of timber volume sold, taking into account forested acreage, indicates that state officials provided more timber: the state forest land area was about twice the size of the national forest land area, yet state officials sold over thirteen times the timber volume as national officials. Thus, on a per-acre basis, state officials sold a significantly higher amount of timber than did national officials.

In Case 4, Oregon State Forest officials sold 126,594,000 board feet, or 16% of the estimated annual 789,100,000 board feet of growth (S4H1, S4E1, S4A2). Siuslaw National Forest officials sold 8,900,000 board feet, just 1.7% of the estimated annual 527,400,000 board feet of growth (N4-2, N4C1).

In each case where data are available, officials at both agencies sold well below 100% of the annual growth, thus they did not deplete the timber resource stock. In other words, these are sustainable harvest levels. But the larger proportional volume of tree growth sold on state forests reflects greater timber provision by state than national officials, as Hypothesis 12 suggests.

In addition to volume sold, Hypothesis 12 also suggests that, compared with the national agency, a larger proportion of the state than the national agency's operating budget is spent on timber production, as state officials emphasize timber provision more than do national officials. To test this hypothesis, the portion of each agency's operating budget relating to public forest management is calculated for each agency (see Table 8-2).<sup>41</sup> In all four cases, the state agency devoted a higher proportion of its resources towards timber provision than did the national agency in fiscal year 1995.

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<sup>41</sup>Some of the agencies' expenditures are related to private forest land, for example, programs to help private forest owners reduce the threat of forest fires. Such expenditures not related to public forest management are separated so that analysis may focus on the public forest management aspect of agency responsibilities.

Table 8-2

Timber Expenditures, Fiscal Year 1995

<u>Agency</u>	<u>Timber Expenses<sup>a</sup></u>	<u>Total Operating Expenses</u>	<u>Share of Operating Expenses</u>
<i>Case 1: Ohio State Forests and Wayne National Forest</i>			
State	\$ 483,665	\$ 4,489,019	10.8 %
National	\$ 211,868	\$ 3,739,628	5.7 %
<i>Case 2: Indiana State Forests and Hoosier National Forest</i>			
State	\$ 73,166	\$ 2,548,991	2.9 %
National	\$ 69,295	\$ 3,642,007	1.9 %
<i>Case 3: Washington State Forests and Gifford Pinchot National Forest</i>			
State	\$19,048,783	\$43,742,935	43.5 %
National	\$ 6,276,000	\$18,710,900	33.5 %
<i>Case 4: Oregon State Forests and Siuslaw National Forest</i>			
State	\$ 7,880,968	\$17,522,595	45.0 %
National	\$ 3,158,800	\$13,864,700	22.8 %

<sup>a</sup>Expenses for Cases 1, 3, and 4 include sale administration and timber growth management costs, but in Case 2 they include only sale administration costs (due to lack of data availability). *Italics* indicates support for Hypothesis 12.

In Case 1, Ohio State Forest operating expenditures related to public forest management fall into six broad categories: timber management, forest operations, education and information, fire protection, law enforcement, and recreation. In fiscal year 1995, state timber management and sale expenditures were \$483,665, or 10.8 % of the total \$4,489,019 in operating expenditures for public forest management (S1-3, p. 27).

Wayne National Forest operating expenses related to public forest management include numerous line items, such as timber, fish, wildlife, recreation, ecosystem, soil and water, threatened species, general administration, law enforcement, fire, facilities maintenance, special uses, minerals, rangeland management, and road maintenance. National timber

management and sale expenditures for Case 1 in fiscal year 1995 were \$211,868, or 5.7% of the total \$3,739,628 operating expenditures for public forest management (N1-2, N1-3).

In Case 2, Indiana State Forest operating expenditures related to public forest management are tracked in several functional categories, including personnel, utilities/postage, contracted services, fuel/office supplies, training, equipment, and travel. Field officers track expenses for each timber sale. Unlike in Case 1, state officials in Case 2 do not track timber growth management expenses outside of particular sales. Thus the only figures available for timber provision expenditures are those directly related to timber sales. In fiscal year 1995, timber sale expenses statewide totaled \$73,166, which represented about 2.9% of the total \$2,548,991 operating expenditures for public forest management (S2-4).

In Case 2, Hoosier National Forest operating expenditures related to public forest management are tracked in several dozen line items. For comparison with state timber sale expenses, national timber sale expenditures used in analysis include timber sale expenses but not timber growth management activities outside of particular sales, which are excluded from state figures. In fiscal year 1995 Hoosier National Forest timber sale expenses totaled \$69,295, or 2.9% of the total \$3,642,007 operating forest expenditures for public forest management (N2-3).

In Case 3, Washington State Forest operating expenses are tracked biennially, so figures for fiscal year 1995 are best estimated by dividing biennial totals in half (S3G1). Operating expenditures relating to public forest management include categories such as administration, financial services, leases, public use, forest management, timber sales, recreation, mapping, and engineering support, among others. In fiscal year 1995, state timber management and sale costs totaled \$19,048,783, or 43.5% of the agency's total operating expenses for public forest management (S3-6).

In Case 3, Gifford Pinchot National Forest operating expenditures are tracked in several dozen line items. In fiscal year 1995, expenses related to timber management and sales

totaled \$6,276,000, or 33.5% of the agency's total operating expenses for public forest management (N3-2).

A similar difference is evident in Case 4, where state officials devoted a higher proportion of operating expenditures to timber provision than did national officials. Oregon State Forest operating expenditures relating to public forest management include administration, timber growth management, timber sales, miscellaneous land activity, engineering, recreation, and fire protection. Siuslaw National Forest operating expenditures relating to public forest management include similar activities in several dozen line items. In fiscal year 1995, state officials spent \$7,880,968 for timber management and sales, which totaled 45.0% of the agency's operating expenses for public forest management (S4-6). Meanwhile, national officials spent \$3,158,800 for timber management and sales, which totaled 22.8% of the agency's operating expenses for public forest management (N4-7).

Thus expenditure as well as output data indicate support for Hypothesis 12. State officials sold higher timber volumes than did their national counterparts in all four of the cases. In so doing, they spent a higher proportion of their agency operating expenses on timber provision. While timber expense proportions vary greatly between regions, in each case the national agency spent a lower proportion of its operating expenditures on timber provision. Thus the systematic difference between levels is apparent even across cases that vary greatly. Which factors explain this difference? As discussed in Chapter 3, officials across both agencies share similar values. But important differences are apparent in rules shaping officials' constraints, as well as in their interactions with the public.

An important reason for the national agencies' relatively low volume of timber sales involves the legal constraints requiring extensive pre-sale activities. In Cases 1, 2, and 4, national officials sold timber primarily from one district on the forest, after completing extensive interdisciplinary planning and analysis for the area. Reduced congressional budgets limited national officials' ability to hire additional employees to perform more of the required timber sale preparation work. As one national official explained, "We don't have enough



personnel to focus on sales in more than one area per year" (N113). Pre-sale requirements combined with limited budgetary resources thus reduced the acreage from which timber sales could be completed.

In addition, people who oppose timber sales on public forests can more easily delay or stop such sales on the national forest than on state forests, using administrative appeals or legal challenges provided through the National Forest Management Act (NFMA) and the National Environmental Policy Act (NEPA). For example, one Wayne National Forest official said that an environmental group was committed to appealing every timber sale on the national forest (N1C1). In Case 2, opponents appealed all three national timber sales offered between 1991 and 1995, and in Case 3 national officials faced over thirty appeals during fiscal year 1995 alone (N3G1). In contrast, state officials did not face opponents with such potent legal hammers.

Another reason for higher state timber sales relates to interactions with non-agency participants. State officials tended to interact with many people who supported increased timber sales. For example, the hand delivery of Ohio State Forest revenue-sharing checks to local government officials enhanced a close tie between the state official and the funding recipients. As one state official recognized, "Revenue that the agency earns and shares is very important to counties and townships in this region -- the local money has a multiplier effect" (S1J1). Recall, also, that nearly every timber proponent interviewed in each case reported more communication with state than national officials (Chapter 6).

### Recreational Uses

Of course, the value of a forest lies in more than just timber. People derive many different recreational benefits from forests. From the picnicker to the bird watcher, the casual walker to the hiking enthusiast, the mushroom gatherer to the deer hunter, the horse rider to the car camper, visitors may seek solace, excitement, relaxation, discovery, or social

interaction within the forest. Among these many and diverse uses, several are arguably the most popular or have the greatest potential impact on the forest: hunting, developed camping, hiking, horse riding, and ORV riding. Analysis below focuses on these uses, examining officials' and non-agency participants' perceptions, agency budget expenditures, and agency output quantities. Hypothesis 12 suggests that national policies are more likely than state policies to promote uses such as recreation that do not provide substantial, direct economic benefits. Analysis provides only partial support for this Hypothesis.

#### Officials' Perceptions of Agency Policies

An initial indication of the level of recreational benefits promoted in each agency can be gleaned from the perceptions of agency officials. The standard questionnaire given to officials (Appendix 1) included a section for respondents to indicate the response that best matched their views of agency policies regarding specific forest uses, including recreational activities. Each response fell into one of five categories ranging from "agency policies strongly disfavor" (-2) to "agency policies strongly favor" (+2) increasing the specified forest use. Statistical analysis using pooled t-tests supports Hypothesis 12 for only one of the five recreation types, developed camping (see Table 8-3). Response values for the remaining four recreation types do not differ significantly in the predicted direction.<sup>42</sup>

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<sup>42</sup>See Appendix 3 for a more thorough description of the statistical tests.

Table 8-3

Statistical Tests of Officials' Perceptions of Agency Policies Towards Recreation Uses

<u>Recreational Use</u>	State Officials:			National Officials:			<u>t-value</u>	<u>p-value</u>
	<u>Mean</u>	<u>Std. Dev.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>N</u>		
Hunting	0.56	0.79	39	0.55	0.71	33	0.105	0.4585
<i>Developed Camping</i>	0.03	0.85	38	0.39	0.93	33	-1.733	0.0438**
Hiking	0.66	0.71	38	0.58	0.94	33	0.420	0.3379
Horse Riding	0.50	0.76	38	0.52	0.80	33	-0.082	0.4676
ORV Riding	-.35	0.98	37	-.38	1.04	34	0.129	0.4490

\*\*Significant at the 0.05 level

*Italics* indicates support for Hypothesis 12

Recreation Expenditures

Budget expenditures provide a more objective indicator of the degree to which an agency promotes various recreational uses. While expenditures are not the same as outputs, they do provide a proxy for estimating the relative importance of recreation, compared to other outputs, to an agency. They also provide a common unit to measure resources devoted per acre, thus allowing valid comparisons across forests of different sizes. Since officials do not track expenditure data by specific recreation type (e.g., horse riding, hiking, hunting, developed camping, and ORV riding), this indicator is most useful as an overview of all recreation types. In the three cases in which both agencies track recreation expenditures, data indicate support for Hypothesis 12; national officials spent considerably more on recreation than did state officials, both as a percentage of agency operating expenditures and as dollars per acre (see Table 8-4).

In Case 1, in fiscal year 1995, Ohio State Forest officials spent \$205,023 on recreation, while Wayne National Forest officials spent \$497,591 (S1-3, p. 27; N1-2). As a percent of total agency expenditures, the state agency spent 4.6% of its total public forest operating

budget expenditures (\$4,489,019) on recreation, while the national agency spent 13.3% of its public forest operating budget expenditures (\$3,739,628) on recreation (N1-2, N1-3). When forest size is factored in, state officials spent an average of \$1.21 per acre, while national officials spent an average of \$2.26 per acre.

In Case 2, Indiana State Forest officials do not track recreation expenditure data, so no comparison with national officials is possible.

In Case 3, in fiscal year 1995, Washington State Forest officials spent \$1,809,500 on recreation, while Gifford Pinchot National Forest officials spent \$2,774,000 (S3-6, N3-2). As a percent of total agency operating expenditures related to public forest management, the state agency spent 4.1%, while the national agency spent 14.8%. When forest size is factored in, state officials spent, on average, \$0.86 per acre on recreation, compared to the national officials' expenditure of \$2.56 per acre.

In Case 4, in fiscal year 1995, Oregon State Forest officials spent \$577,360 on recreation, while Siuslaw National Forest officials spent \$1,347,400 (S4-6, N4-7). These amounts comprise 3.3% and 9.7%, respectively, of the state and national agency operating expenditures related to public forest management. On a unit area basis, the state agency spent an average of \$0.73 per acre, while the national agency spent an average of \$2.55 per acre on recreation.

Table 8-4

Recreational Expenditures and Operational Expenditures, Fiscal Year 1995

<u>Agency</u>	<u>Recreation Expenses</u>	<u>Total Expenses</u>	<u>Share of Operating Expenses</u>	<u>Recreation Expenses Per Acre</u>
<i>Case 1: Ohio State Forests and Wayne National Forest</i>				
State	\$205,023	\$ 4,489,019	4.6 %	\$1.21
National	\$497,591	\$ 3,739,628	13.3 %	\$2.26
<i>Case 2: Indiana State Forests and Hoosier National Forest</i>				
State	— <sup>a</sup>	\$ 2,548,991	—	—
National	\$741,892	\$ 3,642,007	20.4 %	\$4.12
<i>Case 3: Washington State Forests and Gifford Pinchot National Forest</i>				
State	\$1,809,500	\$43,742,935	4.1 %	\$0.86
National	\$2,774,000	\$18,710,900	14.8 %	\$2.56
<i>Case 4: Oregon State Forests and Siuslaw National Forest</i>				
State	\$ 577,360	\$17,522,595	3.3 %	\$0.73
National	\$1,347,400	\$13,864,700	9.7 %	\$2.55

<sup>a</sup>Data are not tracked

*Italics* indicate support for Hypothesis 12

Physical Outputs

In addition to recreation expenditures, physical outputs are important elements for analysis. Tables 8-5 through 8-9 below provide summaries of output measures pertaining to specific recreational uses. Since the forests being compared vary in size, a more meaningful comparison for some indicators requires values on a per-area basis. Thus data also are given per thousand acres.

## *Hunting*

Hunters on both state and national forests face state hunting laws (e.g., licenses and seasons), and game management is principally the responsibility of state game agencies, not state or national forest agencies. However, forest agency personnel can promote hunting through forest management activities. For example, officials can prescribe "game openings," areas where trees are removed not for their timber value but to provide edge habitat to promote deer, elk, and other game species that require grassy meadows for food. In addition, officials may provide facilities for hunters to use, such as hunters' camps and shooting ranges. Data suggest that, compared to state officials, national officials maintained larger amounts of game openings, but they did not create a higher amount of new game openings, nor did they provide higher levels of hunters' camps or shooting ranges.

The first indicator of officials' efforts to promote hunting is the creation and maintenance of game openings, which can increase populations of certain game species. Openings may involve efforts to remove trees to encourage grass, or to increase soft mast trees that supply food for grouse, turkey, and other game wildlife (N1-4, p. 10). In Case 1, in fiscal year 1995, neither state nor national officials reported creating many acres of new wildlife openings; Ohio State Forest officials created an average of 0.03 acres of openings per thousand acres, while Wayne National Forest officials did not create any (see Table 8-5). One national official explained that agency officials did not create any new wildlife openings because the agency acquires substantial additional acreage annually, and much of the newly acquired land is already in edge habitat (N1F1). Comparing existing wildlife openings reveals that national officials maintained an average of 3.56 acres of existing openings per thousand acres, compared to just 0.06 acres of openings per thousand acres on state forests (S1-7, N1I3). Thus state officials created more wildlife openings while national officials maintained more existing wildlife openings.

The second indicator of forest agency promotion of hunting involves hunter facilities, such as hunters' camps and shooting ranges. In Case 1, Ohio State Forest officials maintained more hunter facilities in fiscal year 1995. There were five shooting ranges and a hunters' camp on the state forests, compared to none of either on Wayne National forest (S1-8, N1D2). Thus state officials provided more hunter facilities than did national officials.

In Case 2, game opening creation and maintenance data mirror those in Case 1. Neither Indiana State Forest nor Hoosier National Forest officials created large quantities of new game openings (five acres on the state forests and none on the national forest) (S2G1, N2E3). However, national agency officials maintained a substantially larger amount of existing game openings than did state agency officials, averaging 11.65 acres of openings per thousand acres compared to just 0.36 acres of openings per thousand acres on state forests (S2B1, N2D1).

Hunter facilities differ somewhat across the agencies in Case 2. While no hunters' camps were present on the state or national forests, there were four shooting ranges on state forests, but none on the national forest. Thus one indicator of hunting promotion, shooting ranges, suggests greater provision by state officials, while another, game openings maintained, suggests greater provision by national officials.

In Case 3, data suggest greater hunting promotion by national than state officials, though this promotion is quite small. Neither national nor state officials created any new game openings, while Gifford Pinchot National Forest officials maintained forty-six acres of existing game openings and state officials did not maintain any. Neither state nor national officials provided hunters' camps or shooting ranges. A national official explained that hunters prefer dispersed sites, so there were no hunters' camps on the forest (N3H1).

In Case 4, Oregon State Forests and Siuslaw National Forest, limited data do not suggest greater hunting promotion by either agency. The Siuslaw National Forest officials did not create or maintain any game openings, while Oregon State Forest officials could not

provide information about whether any openings were created or maintained on state forests. Neither agency provided hunters' camps or shooting ranges.

Thus combined hunting data do not provide clear evidence for or against Hypothesis 12. On the one hand, in support of Hypothesis 12, national officials in all three cases where data are available maintained more acres in wildlife openings. On the other hand, they did not create more new game openings. Moreover, in two of the four cases neither state nor national officials provided hunters' camps or shooting ranges. In the other two cases, state officials provided more such hunters' facilities than did national officials. Thus the data are inconclusive; in some respects national officials promoted hunting more than state officials, but in others they did not.

Table 8-5

Agency Recreational Output Quantities, Fiscal Year 1995, Hunting

<u>Indicator</u>	<u>State</u>	<u>National</u>	<u>State per 000 acres</u>	<u>National per 000 acres</u>	<u>Agency<sup>a</sup> with Higher Outputs</u>
<b>Case 1: Ohio State Forests and Wayne National Forest</b>					
Game openings maint.(acres)	10	800	0.06	3.56	N
Game openings created (ac)	5	0	0.03	0	S
Hunters' camps (quantity)	1	0	0.01	0	S
Shooting ranges (quantity)	5	0	0.03	0	S
<b>Case 2: Indiana State Forests and Hoosier National Forest</b>					
Game openings maint. (ac)	52	2100	0.36	11.65	N
Game openings created (ac)	5	0	0.03	0	S
Hunters' camps (quantity)	0	0	0	0	=
Shooting ranges (quantity)	4	0	0.03	0	S
<b>Case 3: Washington State Forests and Gifford Pinchot National Forest</b>					
Game openings maint. (ac)	0	46	0	0.04	N
Game openings created (ac)	0	0	0	0	=
Hunters' camps (quantity)	0	0	0	0	=
Shooting ranges (quantity)	0	0	0	0	=



Case 4: Oregon State Forests and Siuslaw National Forest

Game openings maint. (ac)	?	0	?	?	?
Game openings created (ac)	?	0	?	?	?
Hunters' camps (quantity)	0	0	0	0	=
Shooting ranges (quantity)	0	0	0	0	=

<sup>a</sup>Key is as follows:     N: National agency  
                               S: State agency  
                               =: Similar across the two agencies  
                               ?: Data unavailable or incomparable

*Italics* indicates support for Hypothesis 12

*Developed Camping*

The term "developed camping" refers to visits to permanent campgrounds, which typically provide such facilities as water, toilets, picnic tables, campfire fixtures, and clearings for tents or trailers. Agency activities to foster this use include facility operation and construction. Data suggest that, compared to state forests, national forests included a higher level of existing developed campsites, but national officials did not construct more new campsites.

In Case 1, a higher number of existing developed campsites were to be found on Wayne National Forest than Ohio State Forests in fiscal year 1995. As indicated in Table 8-6, state forests contained an average of only 0.16 single campsites per thousand acres, while the national forest had an average of 0.54 single campsites per thousand acres (S1M1, N1-6). Moreover, the national forest included several group campsites, which accommodate substantially more people than do single campsites.

In Case 1, neither state nor national officials built any new campsites in fiscal year 1995 (S1G1, N1F2). One state official indicated that other natural resource agencies such as the parks department are better able to provide developed camping (S1E4). A national official cited the existence of campgrounds outside the forest as a reason for not constructing additional

campgrounds on Wayne National Forest: "We don't propose new campgrounds because we feel there are enough private landowners to provide an adequate supply" (N1F2).

In Case 2, Indiana State forests had a higher number of existing camping facilities than did Hoosier National Forest. An average of 4.05 single campsites per thousand acres, plus several group tent areas, were in operation throughout the state forest system in fiscal year 1995, compared to an average of 1.73 sites per thousand acres, plus several group tent areas, on the national forest (S2-3, N2-6). As in Case 1, neither state nor national officials provided any new campsites. Officials cited financial constraints that discouraged construction of new campgrounds. One state official noted, "There hasn't been much new development in the last few years because our budget has leveled off as costs have increased. Expansion costs future money for maintenance" (S2C1). A national official explained, "We haven't done much new construction because we're in a survival mode here, with the large budget cutbacks we've had" (N2G3).

In Case 3, Gifford Pinchot National Forest had a higher number of existing campsites than did Washington State Forests in fiscal year 1995, averaging 0.79 and 0.33 sites per thousand acres, respectively. But neither agency built a large number of new sites. National officials did not create any, while state agency officials created just six (an average of 0.003 sites per thousand acres). A national official said, "We haven't added sites in the last few years, even though our demand has increased, because we lack funds to maintain more" (N3H1). A state official explained that the number of state forest campsites has remained stable over the past several years (S3H1).

In Case 4, Siuslaw National Forest had a higher number of existing campsites, with an average of 1.08 sites per thousand acres, than did Oregon State Forests, with an average of just 0.15 sites per thousand acres. However, state officials built more sites than national officials, adding fifteen additional sites (average 0.02 per thousand acres) in fiscal year 1995, while the national officials actually closed a few campsites. The additional campsites on state forests

resulted from of legislation a few years prior that required state officials to develop a recreational plan for a large block of state forest (S4J1).

Thus, in three of the four cases, the national forest had a higher number of existing campsites than did state forests in fiscal year 1995. These data support Hypothesis 12. But, counter to the hypothesis, national officials did not build more new campsites in fiscal year 1995. In Cases 1 and 2, none were constructed by either agency, and in Cases 3 and 4, state officials built more.

Table 8-6

Agency Recreational Output Quantities, Fiscal Year 1995, Developed Camping

<u>Indicator</u>	<u>State</u>	<u>National</u>	<u>State per 000 acres</u>	<u>National per 000 acres</u>	<u>Agency<sup>a</sup> with Higher Outputs</u>
<b>Case 1: Ohio State Forests and Wayne National Forest</b>					
Campsites open	29	122	0.16	0.54	<i>N</i>
Campsites constructed	0	0	0	0	=
<b>Case 2: Indiana State Forests and Hoosier National Forest</b>					
Campsites open	584	312	4.05	1.73	S
Campsites constructed	0	0	0	0	=
<b>Case 3: Washington State Forests and Gifford Pinchot National Forest</b>					
Campsites open	700	849	0.33	0.79	<i>N</i>
Campsites constructed	6	0	0.003		S
<b>Case 4: Oregon State Forests and Siuslaw National Forest</b>					
Campsites open	121	567	0.15	1.08	<i>N</i>
Campsites constructed	15	-6	0.02	-0.01	S

<sup>a</sup>Key is as follows: N: National agency  
S: State agency  
=: Similar across the two agencies  
?: Data unavailable or incomparable

*Italics* indicates support for Hypothesis 12

## *Hiking*

Officials can encourage hiking by maintaining and constructing hiking trails. At both agencies in each case, visitors were allowed to hike on multiple-use trails, which frequently allow horse and/or off-road vehicle (ORV) use as well. But many hikers prefer the relative solitude of trails where only foot traffic is allowed, and agencies do provide such hiking-only trails. Analysis of hiking use focuses on those trails limited to hiking. Data suggest that, compared to state forests, national forests included a higher level of existing hiking trails, but that national officials did not construct more new trails.

In Case 1, more miles of hiking trails were present on the Wayne National Forest than on Ohio State Forests in fiscal year 1995 (see Table 8-7). Ohio State Forests had an average of 0.49 miles of existing hiking trails per thousand acres, compared to 0.69 on Wayne National Forest (S1-8, N1-6). Neither state nor national officials constructed new hiking trails in fiscal year 1995 (S1G2, N1D2). As one state official explained, "Even if we had the capital funds to build new trails, we wouldn't have adequate operating budget to support the additional maintenance costs" (S1G2). Of course, since the agency has flexibility in the allocation of its operating budget, this remark suggests that the state agency wouldn't prioritize additional trail maintenance above other functions like timber production.

In Case 2, more hiking trail miles were present on state forests than on the national forest in fiscal year 1995. Indiana State Forest officials maintained an average of 0.67 miles of hiking trails per thousand acres, compared to just 0.16 miles on Hoosier National Forest (N2-7). Neither state nor national officials added new hiking trail miles in fiscal year 1995. One state official cited staffing decreases that limited labor available for new construction (S2G1). On the national forest, the number of designated hiking trail miles had actually declined over the previous few years, in accordance with a comprehensive trail plan closing user-made, unofficial trails in order to decrease environmental damage and maintenance costs (N2-9).

In Case 3, Gifford Pinchot National Forest had seventy miles of existing hiking trails, an average of 0.07 miles per thousand acres, and added eight more, an average of 0.007 miles per thousand acres, in fiscal year 1995 (N3-11). State officials could not provide data regarding hiking trail miles existing or added statewide. Thus no comparison with state forests is possible.

In Case 4, Siuslaw National Forest had more existing hiking trails than did Oregon State Forests. The national forest had an average of 0.11 hiking trail miles per thousand acres, while state forests had an average of only 0.03 trail miles per thousand acres (S4J1). Both agencies exhibited similar levels of hiking trail construction; in fiscal year 1995 national officials built an addition average 0.006 miles per thousand acres, while state officials were in the process of planning an additional average 0.005 miles per thousand acres (S4J1, N4B1).

Considering hiking trails across the cases, data partially support Hypothesis 12. In two of the three cases for which data are available, the national forest had more existing hiking trails than did state forests in fiscal year 1995. However, national officials did not build more hiking trail miles than state officials. Instead, little new construction was performed by any agency in fiscal year 1995.

Table 8-7:

Agency Recreational Output Quantities, Fiscal Year 1995, Hiking

<u>Indicator</u>	<u>State</u>	<u>National</u>	<u>State per 000 acres</u>	<u>National per 000 acres</u>	<u>Agency<sup>a</sup> with Higher Outputs</u>
<b>Case 1: Ohio State Forests and Wayne National Forest</b>					
Trail miles open	87	154	0.49	0.69	N
Trail miles constructed	0	0	0	0	=
<b>Case 2: Indiana State Forests and Hoosier National Forest</b>					
Trail miles open	97	29	0.67	0.16	S
Trail miles constructed	0	0	0	0	=

Case 3: Washington State Forests and Gifford Pinchot National Forest

Trail miles open	?	70	?	0.07	?
Trail miles constructed	?	8	?	0.007	?

Case 4: Oregon State Forests and Siuslaw National Forest

Trail miles open	26	56	0.03	0.11	<i>N</i>
Trail miles constructed	4 <sup>b</sup>	3	0.005 <sup>b</sup>	0.006	=

<sup>a</sup>Key is as follows: N: National agency  
S: State agency  
=: Similar across the two agencies  
?: Data unavailable or incomparable

<sup>b</sup>Planned in fiscal year 1995

*Italics* indicates support for Hypothesis 12

*Horse Riding*

Horse riding is a popular recreational use on some forests. The degree to which agency officials promote this use can be measured in terms of horse trails as well as horse riders' campsites, which typically include facilities such as tethering posts, hardened parking areas to hold horse trailers, and horse watering areas. Data suggest that, compared to state forest officials, national forest officials added or were planning to add more horse riders' campsites and horse trails. However, national forests did not have a higher level of existing horse riders' campsites or existing horse trails.

In Case 1, Ohio State Forests had substantially more existing horse trails than did the Wayne National Forest in fiscal year 1995 (see Table 8-8). An average of 2.09 miles of horse trail per thousand acres existed on Ohio State Forests, compared to just 0.27 miles on Wayne National Forest (N1-6, S1-8). However, national officials were planning to add an additional ten miles of horse trail (average 0.04 miles per acre), while state officials were not planning to construct any more horse trail miles (N1-4, p. 3; N1D2; S1G2).

Results are similar for horse riders' campsites. In fiscal year 1995, Ohio State Forests had an average of 0.93 sites per thousand acres, while Wayne National Forest had none (N1-6,

S1-8). But state officials did not construct any additional horse riders' campsites in fiscal year 1995, while national officials were in the process of adding hardened parking areas, horse tether posts, and campfire facilities to an area on the national forest that traditionally held up to one hundred horses at a time (N1D2; N1-4, p. 2).

In Case 2, more horse trail miles existed on Indiana State Forests than on Hoosier National Forest in fiscal year 1995. An average of 1.63 miles of horse trail per thousand acres existed on state forests, compared to just 0.79 miles per thousand acres on the national forest (N2-8, S2E2). But national officials were more actively adding trail miles than were state officials. In fiscal year 1995, national officials built an average of 0.04 trail miles per thousand acres, and another 0.52 miles per thousand acres had been proposed for new construction on the forest (N2G3, N2-7). State officials, on the other hand, added an average of just 0.01 trail miles per thousand acres in fiscal year 1995.

In Case 2, Indiana State Forests and Hoosier National Forest had a similar number of horse riders' campsites, averaging 0.73 and 0.72 sites per thousand acres, respectively. Neither agency added horse riders' campsites in fiscal year 1995; in fact, during that year state officials decreased the number of sites by an average of 0.16 sites per thousand acres, as a result of a new horse riding policy that set minimum size standards for horse riders' facilities.

The only comparable data available in Case 3 are quantities of horse rider campsites existing in fiscal year 1995. Similar quantities were available on Washington State Forests and Gifford Pinchot National Forest, an average of 0.02 sites per thousand acres at each. The national forest had approximately 1,030 trail miles existing in fiscal year 1995, averaging 0.96 miles per acre, and two additional trail miles were added, averaging 0.002 miles per acre (N3-11). Trail mile data are not tracked on state forest lands.

In Case 4, data indicate a similar quantity of horse trails existing across the forests in fiscal year 1995. Oregon State Forests had an average of 0.05 miles of existing horse trails per thousand acres, compared to an average of 0.06 miles per thousand acres on the Siuslaw National Forest. But national officials exhibited more activity to add trails, building an average

of 0.03 miles per thousand acres, compared to an average of just 0.007 miles per thousand acres planned for state forests.

In Case 4, similar quantities of horse riders' campsites were open on state and national forests, with an average of 0.02 and 0.03 sites per thousand acres, respectively, in fiscal year 1995. Oregon State Forest officials added an additional average of 0.007 sites per thousand acres, while Siuslaw National Forest officials did not add any. The impetus for the state forest additions was a recreation plan mandated by the state legislature (S4J1).

Thus horse riding data across the cases suggest mixed support for Hypothesis 12. Supporting the hypothesis, in all three cases for which data are available national officials added (or planned to add) more trail miles. Moreover, in two of the three cases for which data are available, national officials added or proposed adding more additional horse riders' campsites than did state officials. But two indicators do not support the hypothesis. First, in no case did the national forest exhibit a higher quantity of existing horse trail miles. Second, horse riders' campsites were present in higher quantities on state forests in two cases, and in the other two cases quantities were similar across agencies.



Table 8-8

Agency Recreational Output Quantities, Fiscal Year 1995, Horse Riding

<u>Indicator</u>	<u>State</u>	<u>National</u>	<u>State per 000 acres</u>	<u>National per 000 acres</u>	<u>Agency<sup>a</sup> with Higher Outputs</u>
<b>Case 1: Ohio State Forests and Wayne National Forest</b>					
Trail miles open	369	61	2.09	0.27	S
Trail miles constructed	0	10 <sup>b</sup>	0	0.04	N
Horse riders' campsites	164	0	0.93	0	S
Horse riders' campsites added	0	multiple <sup>b</sup>	0	multiple <sup>b</sup>	N
<b>Case 2: Indiana State Forests and Hoosier National Forest</b>					
Trail miles open	235	142	1.63	0.79	S
Trail miles constructed	2	8	0.01	0.04	N
Horse riders' campsites	106	130	0.73	0.72	=
Horse riders' campsites added	-23	0	-.16	0	N
<b>Case 3: Washington State Forests and Gifford Pinchot National Forest</b>					
Trail miles open	?	1030	?	0.96	?
Trail miles constructed	?	2	?	0.002	?
Horse riders' campsites	38	23	0.02	0.02	=
Horse riders' campsites added	?	?	?	?	?
<b>Case 4: Oregon State Forests and Siuslaw National Forest</b>					
Trail miles open	40	31	0.05	0.06	=
Trail miles constructed	6 <sup>b</sup>	15	0.007	0.03	N
Horse riders' campsites	15	15	0.02	0.03	=
Horse riders' campsites added	6	0	0.007	0	S

<sup>a</sup>Key is as follows: N: National agency  
S: State agency  
=: Similar across the two agencies  
?: Data unavailable or incomparable

<sup>b</sup>Planned in fiscal year 1995

*Italics* indicates support for Hypothesis 12

### *Off-Road Vehicle Riding*

Off-road vehicles (ORV's), including all-purpose vehicles, all-terrain vehicles, four-wheel drive vehicles, and motorcycles, provide popular recreation for some users. Measures of agency promotion of ORV riding include ORV trail miles as well as ORV rider campsites. Data suggest that, compared to state forests, national forests had a somewhat higher level of existing trails and campsites, but national officials did not add more additional facilities.

In Case 1, Wayne National Forest had more existing ORV trail miles than did Ohio State Forests in fiscal year 1995 (see Table 8-9). State forests had an average of just 0.21 miles per thousand acres, while the national forest had an average of 0.49 miles per thousand acres (S1-8; N1-7, p. 7). Neither state nor national officials provided additional ORV trails in fiscal year 1995 (S1G2, N1D2). Neither state forests nor the national forest had any campsites designed for ORV riders, and none were added or planned to be added in fiscal year 1995.

In Case 2, both national and state officials prohibited ORV riding. Thus national officials did not promote this use more than did state officials.

In Case 3, Gifford Pinchot National Forest had 227 miles of existing ORV trails, an average of 0.21 miles per thousand acres, but national officials did not add any additional ORV trails (N3-11). Data are not available for the state agency in Case 3, hence no comparisons are possible in this case.

In Case 4, state and national trail quantity data are incomparable. Oregon State Forests had an average of 0.13 trail miles per thousand acres in fiscal year 1995. Meanwhile, the Siuslaw National Forest had no ORV trail miles *per se* in fiscal year 1995; instead it had a large riding area of approximately 900 acres, averaging 1.71 acres per thousand acres. Providing and maintaining trails is qualitatively different than providing and maintaining an open riding area, hence direct comparison is not meaningful.

A more useful indicator in Case 4 is the quantity of ORV riders' campsites. State officials did not maintain any existing ORV sites, but national officials maintained an average

of 0.46 sites per thousand acres. With a significantly higher quantity of sites already existing, national officials did not add sites in fiscal year 1995, while state officials planned to add an average of 0.02 sites per thousand acres.

Thus data for ORV riding provide mixed results regarding Hypothesis 12. In one of the two cases with comparable data, the national forest had a larger quantity of existing ORV trail miles. In the other case, officials prohibited ORV riding on both the state and national forests. In no case did national officials add more trail miles than did state officials.<sup>43</sup> Regarding ORV campsites, the national agency had a higher quantity in Case 4, but state officials in this case were planning to add more than were national officials. There were no ORV campsites planned or built on either the state forests or the national forest in Cases 1 or 2.

Table 8-9:

Agency Recreational Output Quantities, Fiscal Year 1995, ORV Riding

<u>Indicator</u>	<u>State</u>	<u>National</u>	<u>State per 000 acres</u>	<u>National per 000 acres</u>	<u>Agency<sup>a</sup> with Higher Outputs</u>
Case 1: Ohio State Forests and Wayne National Forest					
Trail miles open	38	111	0.21	0.49	N
Trail miles constructed	0	0	0	0	=
ORV campsites open	0	0	0	0	=
ORV campsites added	0	0	0	0	=
Case 2: Indiana State Forests and Hoosier National Forest					
Trail miles open	no ORV riding permitted				=
Trail miles constructed					=
ORV campsites open					=
ORV campsites added					=
Case 3: Washington State Forests and Gifford Pinchot National Forest					
Trail miles open	?	227	?	0.2	?
Trail miles constructed	?	0	?	0	?
ORV campsites open	?	?	?	?	?

<sup>43</sup> In fact, national officials in Case 1 recently (fiscal year 1996) created a rule closing ORV trails seasonally, decreasing this recreational benefit in order to reduce environmental damage and maintenance costs (N1-8)

ORV campsites added	?	?	?	?	?
Case 4: Oregon State Forests and Siuslaw National Forest					
Trail miles open	100	900 <sup>b</sup>	0.13	1.71 <sup>b</sup>	?
Trail miles constructed	100	0	0.13	0	?
ORV campsites open	0	241	0	0.46	<i>N</i>
ORV campsites added	15 <sup>c</sup>	0	0.02	0	<i>S</i>

<sup>a</sup>Key is as follows:    N: National agency  
                               S: State agency  
                               =: Similar across the two agencies  
                               ?: Data unavailable or incomparable

<sup>b</sup>Value is in acres of riding space, not trail miles

<sup>c</sup>Planned in fiscal year 1995

*Italics* indicates support for Hypothesis 12

### Summary of Recreational Uses

Data for recreational uses are not easy to untangle. Analysis is made more difficult by lack of data, especially for Case 3. While the lack of recreation facility data for Washington State Forests is frustrating for analysis, it does provide insight, suggesting that officials do not view such information as important for forest management. As one state official in Case 3 explained,

We're planning to do a survey of users to learn about demand and use. Not much has been done in the past to learn this. We're different than the USFS: they have a mandate for recreation, but ours is trust land and not mandated for recreation. We are directed to make income from the land, and recreation is allowed so long as it doesn't cut into that goal (S3H1).

Thus, traditionally, the state agency has undertaken little effort to enhance recreational opportunities.

In support of Hypothesis 12, national forests tend to have higher levels of existing recreational facilities for most recreation types than do state forests. This finding corroborates

expenditure evidence presented above showing that, in each case, the national agency spent a higher proportion of its operating expenditures on recreation than did the state agency. A primary component of recreation operating expenses is maintenance of existing recreation structures. National forests in most cases had higher levels of existing game openings, developed campsites, and hiking trails. Differences in ORV trails and campsites are less clear, with higher levels on the national forest in some instances but equal levels in others. The only type of recreation for which the national level provided uniformly lower quantities of existing facilities is horse riding.

Data regarding the addition of recreational facilities do not support Hypothesis 12. Instead, construction of additional recreational facilities is best explained by examining the relative levels of existing facilities. Where one of the agencies in a given case has a lower existing level of a certain type of facility, that agency is likely to pursue additions to reduce the disparity with the other agency. For example, in two of the three cases where the national forest had more existing developed campsites, state officials exhibited greater efforts to increase the quantity of developed campsites. Similarly, in both cases where the state forests had more existing horse trail miles, national officials were adding more horse trail miles than state officials.

The pressure to adjust facilities upward may come through individuals contacting agency officials, given the knowledge of relatively higher quantities offered by the other agency. Or it may be more formal, as illustrated by the state agency in Case 4. Prior to 1995, Oregon State Forest recreational facilities had been at a low level, because officials' management focus was primarily on timber resources. Over time, this low level of recreation provision led to problems such as user conflicts over scarce facilities, soil degradation, and worn out facilities (S4J1). However, forest officials were slow to address these problems. Eventually, state legislation forced the agency to develop a comprehensive recreation plan, which was recently completed and has led to increased attention to adding recreational facilities. Whether informal or formal, the ability of citizens to influence policy in a federal

system by comparing performance across jurisdictions and pressing for change is an important benefit of the existence of multiple levels of governance.

A word of caution is in order regarding analysis of recreational data. The direction of causality between specific recreational facilities and factors influencing agency officials is difficult to establish. For example, in Case 1 there are more horse trail miles and horse campsites on the state forests, and horse riders appear to be more active and influential in state than in national forest policy making (recall Chapter 6). Perhaps there are more horse facilities because the horse riders are more influential. Or, perhaps the horse riders communicate more, and are more influential, on the state lands because that's where the facilities that draw them are located, giving them a chance to meet state officials face-to-face.

### Conclusion

Data analysis partially supports Hypothesis 12: State policies emphasize uses with substantial, direct economic benefits, while national policies are more likely to promote uses without substantial, direct economic benefits. With regard to timber commodities, in each case state officials sold a higher volume and devoted a higher share of agency operating expenditures to timber provision. In the three cases where timber growth potential has been estimated, timber sale volumes at both forests were substantially below the estimated annual growth (e.g, between 1.7% and 19.6% of annual growth), so no agency was depleting its stock of timber. But in each of these cases state officials sold a significantly higher proportion of annual growth than did national officials.

These different levels of timber output reflect policy process factors described earlier in the study. In particular, constraints that require extensive pre-sale activities and give timber opponents greater power to challenge timber sales, as well as patterns of communication with various publics, are important determinants of policy outputs. Evidence suggests systematic differences across levels of governance in a federal system, with lower levels providing higher

levels of outputs with substantial, direct economic benefits. Higher levels are more limited in the provision of such benefits. This is an important empirical finding, as many natural resource policy debates involve choices among different types of outputs, some of which provide direct economic benefits. This result bolsters the argument that lower levels of governance are more likely to promote economic development as a priority than are higher levels of governance in a federal system (recall Chapter 1).

Recreational use data provide less clear support for Hypothesis 12. In each case where data are available, the national officials devoted a higher proportion of agency operating expenditures, as well as a higher amount of spending per acre, to recreation than did state officials. These data reflect the generally higher level of existing recreational facilities, such as campsites and trails, present on national forests. But officials did not perceive that national forest policies promote additional recreational uses more than do state forest policies. In fact, output data suggest that, in fiscal year 1995, national officials were not systematically adding more recreational facilities. Rather, in most cases, the agency that had a lower level of existing facilities tended to be increasing such facilities more than the agency that had a higher existing level. This makes sense in a federal system, where recreational users can visit different forests, compare output levels provided, and press for change.

The ability to experience varying levels of a government-supplied output, and subsequently to pressure agency officials or legislators for change, is one of the important benefits of a federal system. It is through such comparisons that citizens can increase public officials' responsiveness to their concerns. As citizens learn of supply opportunities from different jurisdictions, they can use this knowledge to press for changes in government supply. Federalism scholars often point to this responsiveness as a critical benefit of federal systems of governance, often focusing on theoretical arguments about how the existence of multiple jurisdictions enhances responsiveness (see, for example, Ostrom 1987). Analysis above provides empirical evidence to support this claim.

In addition to commodity and recreational outputs, another important agency output is environmental protection. In fact, for humans to gain continued benefits from a forest, the health of that forest must be assured. Environmental protection outputs across levels of governance are described in the next chapter.



## **Chapter 9: Environmental Protection**

Timber, recreation, and other forest uses that provide benefits to humans depend on healthy forests. As understanding of environmental interconnections deepens, it becomes increasingly evident that forest health includes more than just the protection of trees from wildfires, pests, and diseases. Rather, an underlying condition necessary for sustainable forest uses is a healthy forest ecosystem.

In addition to forest uses that provide direct benefits to humans, many scholars argue that forests should be protected because the organisms that inhabit them have a right to exist, regardless of their contributions to human well-being. A rich tradition of environmental ethics and environmental advocacy literature focuses on the importance of preserving ecosystems, such as forests, with minimal human degradation. In fact, in the Wilderness Act of 1964, the U.S. Congress declared the national importance of ensuring an "enduring resource of wilderness" (16 USCA 1131). Thus environmental protection is an important policy outcome.

In the context of federal systems, environmental protection provides a useful area in which to compare differences in policy outcomes across levels of governance. While environmental protection does not always conflict with economic development, in many instances efforts to increase environmental protection preclude certain economic development opportunities, especially those, such as timber, with substantial potential to harm environmental conditions. Thus trade-offs must be made between environmental protection and economic development. Such trade-offs are inherent in positive theories of federalism that suggest lower levels of governance are less likely than higher levels to forgo economic development in favor of other goals (see Peterson 1995, Short 1989, Lowry 1992, Moe 1989). Empirical evidence from the four cases in this study allows evaluation of this theory of federalism.

Ideally, policy analysis focusing on environmental protection would include careful investigation to measure directly the ecological conditions at specific sites. In fact, entire manuscripts have been devoted to examining small portions of forest ecosystems, even a single

tree. Such analyses would most appropriately be conducted by scholars in ecology, biology, botany, soil science, or other biological or physical sciences. However, measuring ecological conditions directly is beyond the scope of this study. Moreover, ecological conditions depend largely on micro-climate and other micro-level conditions, which cannot be perfectly controlled for across two forests.

Instead, this study focuses on forest officials' efforts to promote environmental protection. In this sense, environmental protection "outcomes" are more appropriately viewed as "outputs," that is, activities directed toward a particular end (outcome). Data gathered for this study permit comparison of agency officials' environmental protection outputs – the extent of their efforts to protect the forest environment. This is a useful comparison, since the aim of this research is to explain how policy process factors, described in Chapters 3 - 7, affect forest officials' behavior and resulting agency outputs. Data analysis tests Hypothesis 13: National forest policies promote environmental protection more than do state forest policies. Results are insightful for understanding natural resource policy more generally, or any policy area where outputs have the potential to affect environmental quality. If Hypothesis 13 is true, than decision-makers who desire environmental protection would do well to press for authority to be vested in higher levels of governance within a federal system, while those who are more concerned with economic development might prefer policy making at lower levels of governance.

Management for environmental protection is not easy to measure. Experts disagree about not only which management activities lead to healthier forest ecosystems, but also about what healthy forest ecosystems look like. No single indicator can measure accurately environmental protection efforts, but a number of indicators, viewed together, are useful in providing a multi-dimensional picture of environmental protection. Indicators examined below include five items: ecosystem management; provision of large, connected forest patches; rare species identification and protection; ecosystem research and monitoring; and soil and watershed protection and improvement. These indicators, taken together, suggest that national

officials provide more extensive efforts to promote environmental protection than do state officials.

### Ecosystem Management

Management at the ecosystem level, rather than on a species or stand basis, is one indicator of an output designed to increase environmental protection. While the term "ecosystem management" does not have a clear definition, a key component is integrated, holistic thinking and planning regarding ecological communities rather than individual species alone (More 1996). Franklin argues that holistic thinking is required to overcome the high expense and lack of knowledge that hinder humans' ability to manage on a species-by-species basis (1993, p. 130). Since many species have yet to be discovered,<sup>44</sup> and since our understanding of complex interactions among species is limited, it is important to focus on the ecosystem level. The primary indicators of ecosystem management for this study are officials' perceptions about agency promotion of ecosystem management and the extent of analysis undertaken prior to timber harvesting.

A recent shift in U.S. Forest Service (USFS) goals has included support for ecosystem management, defined as a process that involves the "integrated use of ecological knowledge at various scales to produce desired resource values, products, services and conditions in ways that also sustain the diversity and productivity of ecosystems" (USDA Forest Service 1993). Rather than focusing management efforts on a particular stand of trees or type of human benefits, planning overtly includes other aspects of the forest community, including soils, hydrology, plants, and animals. While this USFS shift has been well documented, including

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<sup>44</sup>While tropical forests are among the most diverse and species-rich ecosystems on the planet, it also should be noted that temperate forests contain an incredible abundance of species. For example, in the old-growth forests of the Pacific Northwest, a single tree can provide complex micro-ecologies for over 1,500 invertebrate species (Kelly and Braasch 1988, p. 7).

studies relating to national officials' attitudes about ecosystem management, little research has examined ecosystem management on state forests.

To compare ecosystem management across levels of government in this study, agency officials were asked about their perceptions of agency support for this approach. In addition, information about planning processes was gathered. Analysis of both of these items indicates that national officials practice ecosystem management to a greater degree than do state officials.

To obtain data about officials' perceptions of agency policies, one questionnaire item asked respondents to indicate, on a five-point scale from "strongly favor" (2) to "strongly disfavor" (-2), the degree to which their agency's policies support management "for forest ecosystems, even if that means reducing direct benefits to people" (see Appendix 1). Comparing across all four cases, statistical analysis using pooled t-tests, displayed in Table 9-1, indicates a difference that is significant at the 0.10 level in the predicted direction (national officials perceive their agency promotes ecosystem management more than do state officials).<sup>45</sup>

Table 9-1

Statistical Test of Officials' Perceptions of Agency Promotion of Ecosystem Management

<u>Agency</u>	<u>N</u>	<u>Mean Response Value</u>	<u>Standard Deviation</u>	<u>Pooled t-test:</u>	
				<u>t-value</u>	<u>p-value</u>
National	35	0.66	0.84		
State	38	0.39	0.82		
Combined	73			-1.35	0.0909*

\*Significant at the 0.10 level

Interview discussions elicited officials' views about ecosystem management, illustrating differences between state and national officials. For example, one state official in Case 1 said,

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<sup>45</sup>See Appendix 3 for a more thorough description of the statistical tests.

We can't stop managing a particular aspect just because we don't have complete information. We'll never have complete information for the whole forest. So, as foresters, our role is to manage for timber while promoting other interests (S1F4, S1F5).

In contrast, a national official in Case 2 said,

I'm a strong supporter of ecosystem management, which requires monitoring effects of actions for both compliance with plans/requirements and effectiveness. We go beyond the letter of the law in NFMA, so we can learn about the effects of our activities (N2B1).

Thus statistical analysis provides support for Hypothesis 13, but the p-value of 0.09 is not as low as the traditional benchmark of 0.05 or 0.01. Further evidence is needed. Moreover, questionnaire responses are not the best indicator of ecosystem management. Since individuals may not share a common definition of the term, comparisons do not provide a complete picture.

A better indicator of ecosystem management is the extent of analysis undertaken prior to carrying out forest management operations. While officials in both agencies consider a variety of ecosystem impacts in their management prescriptions, in all four cases, the national agency performs more extensive, interdisciplinary analysis than does the state agency.

In Case 1, at the state level, vegetative manipulation begins with a forester's cruise. An Ohio State Forest official gathers tree data from at least ten plots in each stand (an area of trees typically twenty to fifty acres in size, though sometimes as large as one hundred acres) (S1C1, S1-9). Plot data emphasize tree species, quantity, basal area, age, and merchantable volume, as well as the frequency of grape vines that reduce timber value (S1-9). In addition, the forester makes notes about any unusual cultural sites, species, soil conditions, or other features. The forester prepares a cruise report, recommending either no current action, a timber sale, or timber stand improvement activities such as cutting vines. The report typically does not involve interdisciplinary consultation with other personnel.

If the report prescribes a timber sale, the forester checks a state rare species database (maintained by a different state agency) to see if any rare species are listed in the vicinity. One state official cited an example where finding a rare species affected timber harvest plans (S1D1). However, another state official downplayed the impact of such findings management operations, contrasting state with national agency procedures: "I think that when an agency like the Forest Service has botanists, zoologists, and other such specialists, they go out of their way to make rare species a big deal. . . Here, rare species have not really affected our management activities" (S1J5).

The forester then prepares a cruise report, combining silvicultural recommendations based on timber enhancement with concerns for threatened species, water quality, and soil conditions. The forester's supervisor receives the cruise report and has responsibility for its approval. The supervisor routinely approves reports that do not indicate potential problems, but sometimes he may make a field visit (S1J3). For example, one timber sale recommendation near a horse trail led to a field visit and subsequent talk with a horse rider's group to inform members of the timber sale plans. For most cruise reports not recommending a timber sale, the process ends with the report being filed for future reference. But for reports recommending a timber sale, after the supervisor approves it, he sends it to the forest agency central office for approval at the next higher level.

At the central office, an official checks the prescription to see if the proposed harvest will enhance timber growth (S1F1). He also looks for potential problems. If he approves the sale, then he will send out bid notices to seek a purchaser of the right to harvest the timber.

In Case 1, forest management activities at the national level involve a higher degree of ecosystem analysis and interdisciplinary work. In the past, analysis focused only on the stand level, an area about 500 to 1,000 acres in size (N1-9). But now, before the forester's cruise, Wayne National Forest officials complete an "opportunity area analysis," typically 10,000 to 60,000 acres in size, including land outside of national forest boundaries (N1-9). Concurrently, officials conduct an environmental assessment (N1I3). These planning efforts

involve an interdisciplinary team that analyzes a wide variety of components, including cultural resources (archaeologist), biological resources (wildlife biologist, fisheries biologist, and botanist), visual quality objectives (landscape architect), soil and water resources (hydrologist and soil scientist), vegetative management (silviculturist), recreation (recreation planner), public involvement (public affairs officer), and transportation system (civil engineer) (N1-10).

The forester's cruise takes place within the broader planning of the opportunity area analysis and environmental assessment. Like state forest management, national forest management cruising focuses on information about trees. Officials collect plot data to tally tree species, size, age, and merchantable volume. But the cruise also includes information about slope aspect and steepness (topographic characteristics), seed production, and soil drainage. Officials note additional information regarding cultural features, exotic species, and previous land degradation.

After the environmental assessment and opportunity area analysis have been completed and provided for public comment, the deciding officer publishes a decision notice and then waits until the forty-five-day appeal period has ended. If no appeals are made, then the timber sale can be put up for bid.

In Case 2, at the state level, a long-term harvest schedule designates which forest areas are to be harvested in which years, according to timber maturity and stocking (timber volume) levels. In a given forest area, vegetative manipulation begins with a timber cruise. An Indiana State Forest timber resource specialist examines one point per two acres in the area scheduled to be inventoried. For each tree, the official collects data for species, diameter, height, and proportion of the tree that is of "sound" log grade. For the stand of trees he records information about slope aspect and steepness, location in management tract, timber type, timber stocking level, tree mortality, and presence of vines. Finally, the official notes any rare species he sees, including those in the understory. If he finds a rare species, the official notifies the state agency responsible for nature preserves to obtain advice about how to protect the species.

One resource specialist said he had only found rare species a couple of times over the past few years (S2H1).

Next, a state resource specialist uses the tree data to write a report and prescription for each forest area. If the stocking level is above a certain amount indicated for "good forestry," and if the trees are old enough to be attractive to prospective bidders, then the specialist prescribes a harvest. In such cases, the specialist next notifies the state agency responsible for historic preservation, which checks the area for old home sites and prehistoric artifacts. The forest agency does this as a way to protect such resources, though a specialist working at one state forest said that no historic findings occurred on the forest in the vicinity of timber harvests during fiscal year 1995 (S2H1).

Subsequently, the specialist marks which trees in the harvest area are to be cut. He also lays out logging roads and schedules equipment such as dozers to build them. Seeding and water diversion devices are used on the roads to reduce erosion. Then the local office sends notices to potential bidders.

Timber sales on the national forest in Case 2 involve broader analysis than do sales on state forests. As do national officials in Case 1, national officials in Case 2 first perform opportunity area analyses. Interdisciplinary teams examine a landscape-scale area (usually 1,000 to 10,000 acres) to identify the resource base as well as existing uses (N2E3). Hoosier National Forest officials use the completed opportunity area analysis to generate a list of potential projects (e.g., habitat work, soil improvement, trails, timber, cultural resources, etc), from which to set priorities.

Like state officials, national officials in Case 2 complete timber cruises. However, cruises on the national forest occur within a broader context of resource examination by archaeologists, biologists, and botanists (N2J1). Hoosier National Forest officials use data to prepare alternatives for public comment and evaluation in an environmental assessment. If no appeals are submitted within the decision period, then the sale is put up for bid as scheduled.



In Case 3, state officials begin the timber sale process with a five-year timber plan (S3B1). The plan guides which stands on Washington State Forests are to be cut during which time period, based on stocking levels, commercial value, and desired stand conditions. Based on the plan, northern spotted owl and marbled murrelet survey needs are determined, in order to avoid a "take" under the Endangered Species Act (S3-9). Where required, such survey crews complete the bird surveys prior to the timber sale. In addition, officials may complete a watershed analysis, which involves a landscape-level review of water quality, fish, erosion hazards, and other items (S3B2). However, watershed analyses are not required (S3D3).

Next, the unit forester holds a pre-harvest review before marking the sale boundary, designing roads, and cruising stands to estimate volume (S3-9). Before preparing a final sale notification and contract, state officials must complete two additional forms. The first is a State Environmental Policy Act (SEPA) checklist, which includes information about slope, soils, water quality and runoff, vegetation and wildlife, threatened or endangered species known to be near the site, environmental health hazards, esthetics, recreational uses, and cultural sites (S3-7). However, it is important to note that checklist completion is not usually an interdisciplinary endeavor. In fact, checklist instructions to the forester state, "In most cases you should be able to answer the questions from your own observations or project plans without the need to hire experts" (S3-7). The second required form is a Forest Practices Act (FPA) application, which includes information about riparian areas, wetlands, road construction, and harvest methods, and reforestation (S3-8).

Once these two forms are approved, the unit forester provides a complete sale proposal packet to the state agency's central office, for approval by a higher agency official. If the proposed sale is over twenty acres and \$100,000 appraised value, as most are, then it also must be approved by the Board of Natural Resources (S3C1). An agency representative presents such sales to the Board on a monthly basis. Since a majority of Board members represent trustees that receive income from timber sales, most proposed sales are approved (S3-2). Subsequently, the sale is put up for bid.

In Case 3, timber sales on the national forest go through an even higher level of comprehensive analysis than do those on the state forests. Long-term timber plans are included in the Gifford Pinchot National Forest Land and Resource Management Plan, a document that describes supply, management direction, and goals for forest resources such as timber, recreation, wildlife, old growth forest, scenery, water quality, native plant communities, wild and scenic rivers, and air quality (N4-3). As in other national forests, officials here complete interdisciplinary analyses as part of the environmental assessment process prior to putting a timber sale up for bid. A team of specialists in planning, soil science, hydrology, wildlife, fisheries, silviculture, engineering, geology, and sometimes archaeology gathers information and conducts surveys on a wide range of forest resources (N3C1).

In addition to the comprehensive analysis for an environmental assessment, national officials also must prepare interdisciplinary watershed analyses in areas designated as key watersheds, roadless areas, and riparian reserves (N4-3, pp. 2-10 and 2-14). These analyses include information about the watershed's historic and current conditions, capacity, and range of vegetation (N3I2). It is clear that national officials are going beyond minimum requirements for preparing watershed analyses, as they have completed such analyses for parts of the forest outside the areas in which watershed analyses are required.

In Case 4, state agency long-range plans traditionally focused on estimated timber sales volumes. As one official explained, "These forest plans were really timber management plans, without specific planning for other resources" (S4I1). Planned timber sale targets were adjusted through input from unit foresters, who identified conditions on the ground that affected harvest potential. In fiscal year 1995, these traditional long-range plans were being changed, and unit foresters were gaining an increasingly important role in determining timber sales. For example, unit foresters select candidate areas for harvest. As one such official described,

To select potential harvest units, I balance economic and silviculture factors. Rotation age for regeneration harvesting is typically seventy years on this

district, especially for sites with single species and low vertical diversity. For sites with underproductive stands we may go fifty years, and for areas with layered structure that are good for habitat we may go ninety years between harvests. For thinning, we aim for thirty-five-year-old stands, but we don't do all of the thirty-five-year-old stands due to operational considerations: we spread them out to reduce impacts on recreation, roads, and the environment and to have a manageable workload with our current number of employees. Also economics is important: in the 1980s we couldn't sell thinnings but today people want to buy them, so we're trying to catch up on the backlog of thinning needs (S4A2).

The unit forester prepares a sale proposal, which addresses wildlife and fish resources, and, if there are specific concerns, which also addresses soils and road building issues (S4I2). Each unit sale plan is reviewed by a wildlife biologist from outside the forest agency, who focuses on Endangered Species Act requirements for listed species (S4J1). Forest officials also may ask outside fisheries biologists for consultation if a stream is present within the proposed sale area.

The unit forester submits the completed unit sale proposal to the state agency's central office, where officials review the proposal and combine it with plans from other units into a statewide annual sale plan. Subsequently central office officials compile a quarterly list of all impending timber sales, including information about bidding. Each district manages the sealed bidding process for local timber sales, awarding the sale to the highest bidder (S4J1).

Thus, for the state agency in Case 4, analysis prior to timber sales focuses on a stand level rather than a landscape level. Moreover, comprehensive planning is generally limited to consultation with wildlife, fisheries, and perhaps soil specialists outside the agency, rather than a wide-ranging interdisciplinary agency team. In fact, long-range plans traditionally have focused on timber, not other forest resources. But it is important to note that, at the time of this study, state officials were in the process of creating a new long-range planning process that would provide more comprehensive analysis prior to timber sales. The impetus for this new approach was a desire to gain greater certainty in timber sales in the face of Endangered Species Act restrictions related to the northern spotted owl, marbled murrelet, and possibly (in

the future) certain salmon species. The state was developing a Habitat Conservation Plan which, if approved by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, would ensure continued timber sales even in areas where listed species exist (S4C1). The new planning process would support the Habitat Conservation Plan.

In Case 4, as in Cases 1-3, national officials perform more extensive, interdisciplinary analysis prior to timber sales than do state officials. The Siuslaw National Forest Land and Resource Management Plan addresses not only timber, but also resources such as recreation, visual resources, wildlife habitat, watershed condition, research opportunities, and cultural resources (N4-3).

Before proposing a timber sale, national officials prepare environmental assessments with the input of an interdisciplinary team of agency specialists in a variety of fields (N4H1). They also prepare either a landscape-level watershed analysis or a "late successional reserve assessment," depending on the management area where the proposed activity will take place (N4C1). These efforts generate information about a wide range of resources so that officials are able to manage for the forest ecosystem rather than just for timber.

Overall, as measured by levels of ecosystem management, national agency officials in all four cases exhibit greater environmental protection than do state officials. This finding supports Hypothesis 13. Differences are large in Cases 1 and 2, where state officials traditionally have not performed landscape-level, interdisciplinary analyses prior to timber sales. Differences are less pronounced in Cases 3 and 4, where state officials focus on certain non-timber resources prior to completing timber sales. However, even in these cases, national officials provide a higher degree of interdisciplinary analysis to support ecosystem management.

### Large, Connected Patches

Large, connected forest patches, which reduce habitat fragmentation, are associated with healthier forest ecosystems. While wildlife managers traditionally have favored fragmentation for its support of "edge" species such as deer and other preferred game animals, many scientists believe that fragmentation hinders sustainability. They argue that larger, connected habitat patches provide greater forest sustainability (Noss 1993) and that fragmentation is one of the greatest threats to sustainability (Parker 1993, p. 210). Indicators of fragmentation for this study include both land acquisition to increase forest continuity and silvicultural methods used. While state and national officials do not differ substantially on the first item, they do differ somewhat on the second, which provides weak support for Hypothesis 13.

In Case 1, both Ohio State Forest and Wayne National Forest officials placed a high priority on the acquisition of land adjacent to existing agency holdings. Such acquisition can have immediate financial impacts on the agencies, in terms of fewer forest boundaries to maintain (S1J4). As one state official indicated, "Our first priority [for land acquisition] is in-holdings surrounded on all sides. Another high priority is if an acquisition will allow us to connect different forest tracts" (S1G1). Similarly, a national official said, "In order to manage on a landscape or watershed level, we need to have control over [larger patches of] land" (N1G1).

Officials at both agencies actively pursued land acquisition opportunities. While state officials added only thirty-three acres to Ohio State Forests in fiscal year 1995, more was expected to be added in 1996, and in recent years officials have acquired up to 1,600 acres per year. Wayne National Forest officials added about 2,000 acres in fiscal year 1995, for a total of nearly 50,000 acres added within the last decade (N1-4, p. 9). Although much of the newly acquired land was in deforested, open fields, over time it can contribute to connected forest patches.

In Case 2, acquisition patterns at both Indiana State Forests and Hoosier National Forest favor large, connected patches. State officials acquired 133 acres in fiscal year 1995, about the same level of acquisition as in the previous few years (S2G1). While some of these 133 acres were donated, for lands that the agency actively seeks to acquire, high priorities were in-holdings, where acquisition would reduce the length of property boundaries (S2G1). Meanwhile, national officials added 902 acres to the Hoosier National Forest in fiscal year 1995 (N2H1). National acquisition priorities did not focus exclusively on reducing fragmentation, since the national forest had been able, partly through past land acquisition, to include one of the largest interior forest areas in the Midwest (N2E1). As one national official explained,

Traditionally we have focused on any parcel that would close up ownership because that reduces costs for boundary surveys, fire protection, etc. and helps avoid access problems. But now we look more for areas with unique values for threatened and endangered species, geological or recreational features, karst formations, or riparian areas. . . We've already ensured that a substantial amount of interior habitat will be protected (N2A2).

In Case 3, officials on both Washington State Forests and Gifford Pinchot National Forest prioritized land acquisition based, partly, on reducing fragmentation. State officials sought acquisition of land to block up holdings as well as to produce income (S3B2). In fiscal year 1995, state officials sold 5,684 acres of "special lands" best suited to non-timber uses to the state parks and state conservation area agencies, and they purchased 5,446 acres of land that would reduce fragmentation or be better suited to timber production (S4K1). On the national forest, priorities for acquisition included in-holdings as well as lands that could provide higher levels of northern spotted owl protection, if that land was contiguous to national forest land (N3J2, N3B2). Officials acquired about 310 acres of land for the national forest in fiscal year 1995.

In Case 4, in-holdings were a higher priority on Oregon State Forests than on Siuslaw National Forest, but only because national officials forest had succeeded, over time, in blocking up much of the forest land base. State officials described efforts in several counties to exchange with private or Federal owners in order to block up in-holdings (S4E1, S4K1). In fiscal year 1995, state officials purchased eighty-six acres of forest land (S4-10). On the national forest, officials had blocked up in-holdings in the past, so new acquisitions were prioritized largely on their value as habitat for certain rare species (N4I1). In fiscal year 1995, national officials gained 320 additional acres and disposed of 77 acres, for a net gain of 243 acres (N4-2). Thus, as in the previous three cases, both national and state agency officials pursued land purchases fueled, at least in part, by a desire to increase large, connected blocks of the forest.

In addition to land purchases, agency officials can increase the size of connected forest patches through choices about timber harvest methods. When stumpage is sold to the winning bidder, the contract between the bidder and the agency specifies the method to be used in harvesting timber. Two broad categories of harvest methods are (1) selective and (2) clearcutting and large regeneration openings. Selective harvesting involves removing single or groups of trees within a larger harvest area, thus retaining substantial forest canopy. Clearcutting and large regeneration openings, on the other hand, involve creating significant gaps where little or no forest canopy remains. In three of the four cases, national officials' harvest prescriptions featured lower levels of clearcutting and large regeneration openings (see Table 9-2).

Table 9-2

Levels of Clearcutting Prescribed in Timber Sales, Fiscal Year 1995

<u>Agency</u>	<u>Clearcut Acres Prescribed</u>	<u>Proportion of All Acres Sold</u>
<i>Case 1: Ohio State Forests and Wayne National Forest</i>		
National	0	0 %
State	42	3 %
<i>Case 2: Indiana State Forests and Hoosier National Forest</i>		
National	47 <sup>a</sup>	100 %
State	0	0 %
<i>Case 3: Washington State Forests and Gifford Pinchot National Forest</i>		
National	0	0 %
State	14,585	35 %
<i>Case 4: Oregon State Forests and Siuslaw National Forest</i>		
National	0	0 %
State	1,866	19 %

<sup>a</sup>Salvage sale (diseased and dying pine trees)

*Italics* indicates support for Hypothesis 13

In Case 1, neither state nor national officials prescribed clearcutting methods for a substantial portion of their timber sales, though state officials prescribed them more than did national officials. Ohio State Forest officials designated clearcutting on 42 of the 1,230 acres (3%) sold statewide in fiscal year 1995 (S1-3, p. 22). While state officials prescribed clearcutting on a small proportion of their harvest acres in fiscal year 1995, national officials prescribed even less. The Wayne National Forest timber sale of 1.5 million board feet on about 500 acres featured single tree selection, without any clearcutting (N1-4, p. 13; N1I3). In fact, officials had not prescribed clearcutting on the national the forest in several years, and one official predicted it wouldn't be used in the foreseeable future (N1B1).

In Case 2, clearcutting was not permitted on Indiana State Forests, and no state officials prescribed it in fiscal year 1995. At the national level, however, clearcutting was allowed. In



fact, in fiscal year 1995, the harvest prescription for all forty-seven acres of Hoosier National Forest on which timber was sold featured "clearcutting with reserves," a method of cutting all diseased and dying pines while leaving hardwood species (N2J1). This harvest was designed not so much as a way to encourage economic development, but as a tool for restoring native tree species to an area that had been planted in exotic pine trees several decades previously.

In Case 3, state officials prescribed a significantly greater amount of clearcutting than did national officials. State officials routinely prescribed clearcutting in order to increase production of Douglas fir, which generally grows best in a low-shade environment (S3D2). Clearcuts were usually areas thirty to forty acres in which nearly 100% of the forest was removed (S3C1). Of the 41,527 acres prescribed for harvesting in fiscal year 1995, 14,585 acres (35%) were designated clearcut (S3-10).

In contrast, national officials in Case 3 had replaced the concept of "clearcutting," referring to a systematic, over-time harvesting system in which all trees in the same forest area are periodically cut, with the concept of "regeneration openings" and "gaps," which do not entail removing all trees in the same place over time (N3-1, pp. 6-12, 13). In fiscal year 1995, no harvest prescriptions for Gifford Pinchot National Forest included clearcutting. Of the 2,443 acres of timber sold, 1,431 acres were to be harvested as commercial thinnings, leaving 40 to 70% of the forest standing, while the remaining 1,004 acres were prescribed as regeneration cuttings, leaving 40 to 85% of the forest standing (N3-4, p. 16; N3-8, N3-1, p. 6-12). One national official attributed the lack of traditional clearcutting to public opposition (N3K1).

In Case 4, state officials prescribed a higher level of clearcutting than did national officials. On state forests, of the 9,645 acres prescribed in stumpage sold in fiscal year 1995, 1,866 acres, or 19%, were designated clearcut (S4H1). Most clearcuts on state forests involved removing at least 90% of the forest in a given area, though in some cases only 70% of the forest is removed, in order to meet future forest structure goals (S4L1).

National forests in Case 4 prescribed substantially lower amounts of clearcutting. In all acres of stumpage sold in fiscal year 1995, the prescribed harvest method was commercial thinning (N4F1). This selective method typically involves removing leaving 60 to 70% of the trees in a given area (N4F1). National officials did not prescribe any clearcutting or large regeneration openings.

Considering harvest prescriptions across the cases, it is evident that national officials were less likely to create large forest openings that increase fragmentation than were state officials. The most dramatic difference is in Cases 3 and 4, where the predominant timber species, Douglas fir, benefits from large forest openings and state officials prescribe clearcutting more than national officials. But even in Case 1, where little clearcutting occurs, state officials prescribed more than national officials. Only in Case 2 did national officials prescribe more clearcutting than state officials, but this was for a special case in which pines were removed not for their timber value but because they were diseased and dying.

Thus, analysis provides weak support for Hypothesis 13 with regard to augmentation of large, connected forest patches. Land acquisitions do not indicate greater emphasis by national officials in blocking up ownership; in fact both agencies emphasize blocking up. But harvest prescriptions do suggest greater concern for promoting large, connected patches by national than state agencies.

#### Rare Species Identification and Protection

Environmental protection includes concern for all of the species that interact in a forest ecosystem. Many organisms contribute to the complex web of life in ways that are not well understood; the loss of one or a few key species can potentially cause a chain reaction that affects the health of the entire forest (Roush 1989). Thus environmental protection in the context of forest management includes the identification and protection of rare species. Data

suggest that national officials undertake proactive measures to identify and protect rare species to a greater degree than do state officials.

In Case 1, national officials performed more rare species identification and protection efforts than state officials. In addition to biological analyses for opportunity environmental assessments and opportunity area analyses, described above, Wayne National Forest officials performed other activities aimed at identifying and protecting rare species. In fiscal year 1995, national officials completed numerous such projects, including monitoring the population of a regionally sensitive sparrow and developing a management plan to enhance habitat for that species (N1-4, p. 2). National officials also contributed to an ongoing, joint effort with the U.S. Fish and Wildlife Service and a state university to monitor migratory songbird abundance and species richness. Other monitoring efforts aimed to provide information about certain species, for possible addition to rare species lists.

Such efforts on the national forest often were performed by one or more USFS staff specialists, including a botanist, two wildlife biologists, and two ecosystems technicians. These officials performed systematic, targeted surveys to discover rare species on national forest land. For example, after an individual reported seeing a rare species of clover near national forest land one summer, Wayne National Forest officials conducted a survey the following spring in an effort to determine whether the plant was growing on national forest land, so that they could take measures to protect it (N1J1). Recent monitoring surveys focused on hawk and snake species (N1-4, pp. 3, 5). In fiscal year 1995, national forest officials spent over \$20,000 on threatened, endangered, and sensitive species work.

While state officials in Case 1 consulted a rare species database managed by another state agency before starting major management activities, proactive species identification and protection efforts were limited. As one Ohio State Forest official explained, "We check timber sales areas in the rare species database [maintained by another state agency], but we don't go looking for species, and we don't inventory every acre" (S1H2). Projects involving rare species on state forests typically were performed by the state agency responsible for "natural

areas," with possible consultation assistance from forest agency officials (S1F5). For example, forest officials helped to identify areas potentially favorable for growing a particular plant species that provides habitat for a rare butterfly. One other, unusual effort described by a state official was a clearcut made to promote small mammals near the den of a rare species of rattlesnake (S1F5). Overall, however, state officials were less likely than national officials to undertake extensive efforts solely for the purpose of identifying or protecting rare species. The state did not track expenditures related to rare species.

Similarly, in Case 2, national officials performed more activities to identify and protect rare species than state officials. In fiscal year 1995, Hoosier National Forest officials spent \$ 22,904 on threatened, sensitive, and endangered species work (N2-3). They completed a number of projects, including permanent plot monitoring of a plant on the forest "species of concern" list (N2E2). When officials discovered bald eagles, a federally listed species under the Endangered Species Act, on the forest, they closed access to a trail near the roosting site and began monitoring the area to keep people away (N2A2). More broadly, national officials performed systematic inventories on over 15,000 acres to learn more about stream and terrestrial habitat for rare species (N2-10).

State officials devoted relatively lower levels of effort to rare species projects. Officials in a different state agency, "natural preserves," tracked rare species and led most rare species efforts on state forests. They also maintained a database of rare species throughout the state. Forest agency officials were able to check this database to see if a particular species was in the vicinity of planned management activity.

This is not to say that all rare species work on state forests was performed by natural preserves agency officials; forest agency officials contributed to these efforts. For example, on one state forest, a forest official tracked rare species discovered on the forest for addition the natural preserves database (S2E1). But this individual's rare species work was only part time, as he accomplished other forest management responsibilities such as timber management.

Moreover, most state forest officials' rare species work was cooperative rather than leading.

For example, on one state forest,

The [nature preserves agency] did a review of the property over the last two years, and they found a few areas they recommended we either classify as nature preserve or change management -- no timber or wildlife enhancement -- due to special habitat and the existence of rare species. We have had a couple of meetings with that agency to discuss this recommendation (S2F3).

It is important to note that such rare species work by a different state agency does not indicate a level of rare species work on state forests comparable to that on the national forest. In addition to the higher amount of work that they do directly, national officials also may gain assistance from outside agencies such as the U.S. Fish and Wildlife Service with regard to rare species. With national forest agency botanists and biologists on staff, more projects relating to rare species identification and protection occur on the national than on state forests.

In both cases in the Pacific Northwest (Cases 3 and 4), national officials performed more rare species identification and protection work than state officials. Prior to fiscal year 1995, national officials on Gifford Pinchot National Forest (Case 3) and Siuslaw National Forest (Case 4) had performed substantial rare species survey and research work in order to revise zoning in forest plans to expand protection for rare species such as the northern spotted owl. In fact, the 1990 U.S. Fish and Wildlife Service listing of the northern spotted owl as endangered throughout its range created significant constraints for both national and state officials. Across both agencies in both cases, officials were required to avoid harming these species -- a requirement that posed a potentially large threat to timber harvesting activities on the forests. As timber sale quantities on national forests in the Pacific Northwest fell dramatically, President Clinton convened a "forest summit" in Portland, Oregon, to lay the groundwork for revised national forest plans, which subsequently expanded protection for the

northern spotted owl as well as other rare species such as the marbled murrelet, which has been listed as a threatened species under the Endangered Species Act.

Following significant zoning changes and restrictions on where timber could be sold, prior to fiscal year 1995, national officials in Cases 3 and 4 reduced the level of resources devoted to identifying and protecting the northern spotted owl in 1995. However, they continued to perform work related to rare species beyond those listed by the U.S. Fish and Wildlife Service, illustrating their proactive efforts in rare species identification and protection.

Beyond listed species work, in fiscal year 1995, national officials in Case 3 completed projects related to wolves, amphibians and reptiles, birds, and mollusks, among other species. Gifford Pinchot National Forest officials surveyed close to 50,000 acres of national forest to learn more about gray wolf movements and aid in possible future recovery efforts of this rare species (N3-9, p. 6). In addition, national officials completed amphibian and reptile surveys at 126 sites, where researchers gathered information about species, habitat, and behavior (N3-9, p. 26). Also, scientists conducted goshawk surveys on 5,000 acres to develop guidelines for management practices that may be beneficial to these birds, whose population is low (N3-9, p. 17). In addition, officials focused on three rare mollusk species, conducting a survey that resulted in a timber sale modification to leave big leaf maples that provide habitat for the mollusks (N3-9, p. 22). The national agency spent about \$135,000 for threatened and endangered species work and an additional \$74,000 for wildlife, some of which contributed to projects related to rare species (N3-2).

State officials in Case 3 devoted substantial resources to identify and protect rare species likely to impact timber harvesting. As a response to Endangered Species Act listings, survey crews specializing in northern spotted owl and marbled murrelet species completed surveys aimed at avoiding undue risk prior to timber sales (S3D1, S3J1). In fact, state officials spent over \$7 million on threatened and endangered species surveys linked to timber harvest (S3-6). But state officials performed little work proactively to identify or protect rare species not likely to constrain the state agency's ability to sell timber.

In Case 4, national officials exhibited greater efforts toward rare species identification and protection than state officials. As described above, prior to fiscal year 1995, national officials had performed substantial amounts of research and monitoring to create a land management plan providing greater protection for rare species such as the northern spotted owl. Thus by fiscal year 1995, fewer resources were being spent for the owl and the marbled murrelet than state officials in Case 4 were spending (described below). However, national officials in fiscal year 1995 undertook numerous projects to identify and protect other rare species. Accomplishments included rare species habitat inventory on 10,000 acres of terrestrial and seventy-two miles of stream habitat (N4-8). National officials built eighty-one rare species structures, including snags for cavity-nesting birds and exclosures around snowy plover nesting pairs to keep people and other animals out. They also performed rare species terrestrial habitat enhancement, such as increasing preferred vegetation for a rare butterfly species, on fifteen acres (N4M1, N4-8). National officials spent over \$224,000 on threatened, endangered, and sensitive species and another \$240,000 on wildlife, some of which was for projects related to rare species (N4-7).

Like their counterparts in Case 3, state officials in Case 4 devoted substantial resources in fiscal year 1995 to identifying two rare species, the northern spotted owl and the marbled murrelet, which were subject to Endangered Species Act restrictions. Before completing a timber sale, the state was required to demonstrate to the U.S. Fish and Wildlife Service that no northern spotted owls or marbled murrelets would be harmed. This demonstration was achieved by performing survey activities, research, and habitat classification. In fiscal year 1995, the state agency spent more than \$1.6 million on such activities (S4N1).

But the state's rare species work was limited predominantly to efforts required in order to sell timber. Outside of timber sale concerns, state forest officials undertook little rare species work. As one state official explained, "For other rare species, we haven't found efficient methods and protocols, so we have not focused efforts on identification or protection" (S4N1).

Analysis of projects and resources devoted to identifying and protecting rare species provides support for Hypothesis 13. In each case, greater forest official activities to identify and protect rare species can be found on the national forest than on state forests. In Cases 3 and 4, where rare species have had the most impact on forest activities, via the Endangered Species Act, the state agencies did provide greater identification and protection work than did the national agencies. However, the national agencies had already devoted considerable resources to protection for these species prior to fiscal year 1995, establishing more restricted areas where timber harvesting would not be permitted. The state agencies, on the other hand, worked to meet Endangered Species Act requirements in a way that would enable them to continue timber production at levels similar to those in the 1980s. Yet states exhibited much less effort toward proactively identifying and protecting rare species that did not affect their ability to sell timber. Thus national officials across the four cases completed more work to identify and protect rare species than did state officials.

#### Ecosystem Research and Monitoring

In addition to identification of rare and threatened species, research and monitoring can be devoted to learning more about the broader forest ecosystem. Such activities occur outside the timber planning and sale process. In other words, the primary goal of such efforts is not to mitigate timber harvesting damage, but to generate information to be used in developing protection projects or to be factored into long-term decision making. Lee (1993) and other scholars advocate close monitoring in order to learn about the effects of human actions on the environment. Data analysis indicates that national officials devote greater efforts to ecosystem research and monitoring than do state officials.

In Case 1, national officials devoted considerable effort to ecosystem research and monitoring. In fiscal year 1995, officials spent \$545,810 on such efforts (N1-2, N1-3). These expenditures covered costs of data gathering, inventorying, and monitoring outside the scope of



particular timber sales. For example, this line item partially funded opportunity area analysis work. Another effort involved inventorying an aquatic ecosystem related to a creek. The most significant ecosystem research project was ecological classification efforts, which would help agency officials to better understand different ecosystems for future planning (N1I3).

In Case 1, the state agency devoted little effort to such ecosystem research and monitoring. As one Ohio State Forest official explained, "We don't do much ecosystem monitoring; just the cruise that focuses on overstory" (S1F4). The only ecosystem research work that state officials performed in fiscal year 1995 was a pilot study, based on federal Environmental Protection Agency (EPA) guidelines, that involved test plots to measure soil conditions, topography, vegetation, and other ecosystem components. But one official predicted that the study would not be continued, since "monitoring [the whole forest community] is time consuming and doesn't provide commercial timber information that we need" (S1F4).

In Case 2, national officials undertook numerous ecosystem research and monitoring activities in fiscal year 1995. For example, Hoosier National Forest officials completed research and analyses focusing on soil erosion and exotic species introductions (N2E2). National officials inventoried about twenty-five miles of streams and thirty-one miles of lakeshore (N2-10). Aquatic, riparian, and terrestrial inventory work involved botanists and biologists seeking an overall understanding of major vegetative communities, as well as special features, in different given areas (N2E3). In fiscal year 1995, national officials spent \$547,766 on ecosystem monitoring and research efforts (N2-3).

State forest officials in Case 2 devoted relatively fewer resources to ecosystem research and monitoring. Traditionally, monitoring and inventorying work on Indiana State Forests has emphasized timber resources, with non-timber resource data collection primarily a by-product of examining trees (S2E1). As one state official noted, "We're limited by manpower as to what we can monitor, even as we are increasingly recognizing how important the different resources

are besides just trees for timber" (S2C1). Thus state forest officials rely largely on the state natural preserves agency to provide them with information about broader ecosystems.

In Case 3, national officials undertook substantial ecosystem research and monitoring efforts in fiscal year 1995. Such efforts included comprehensive watershed analyses to determine watershed health, identify needed restoration projects, and define monitoring needs (N3-4, p. 23). In fiscal year 1995 national officials spent over \$1.7 million on ecosystem research and monitoring efforts (N3-2).

Compared to national officials, state officials in Case 3 performed less ecosystem research and monitoring. One Washington State Forest official explained, "Our focus for forest health is timber. The trust mandate requires management for present and future beneficiaries; if we put more resources into non-timber benefits, we might face lawsuits for mismanagement of the trust" (S3J1). Other state officials described a shift towards broader monitoring efforts. For example, one state official said, "The traditional inventory focused on trees and timber. But the new inventory designed to qualify for a HCP [Habitat Conservation Plan] with the U.S. Fish and Wildlife Service will include wildlife, dead trees, shrubs, herbs, etc." (S3K1). The state agency pursued a Habitat Conservation Plan in order to increase timber production in the face of Endangered Species Act restrictions that would otherwise constrain timber harvesting. Thus, instead of proactively seeking broader ecosystem inventorying, state officials were responding to a constraint imposed by the listing of the northern spotted owl and the marbled murrelet under the Endangered Species Act.

In Case 4, national officials completed numerous projects related to ecosystem research and monitoring in fiscal year 1995. In addition to forest planning, Siuslaw National Forest officials completed several watershed analyses, focusing on many aspects of the forest ecosystem. They undertook studies focusing on ecological impacts of fire and on plant associations linked to specific types of sites (N4M1). In fiscal year 1995, national officials spent over \$1.3 million on ecosystem research and monitoring efforts (N4-7).

On the state forest in Case 4, officials did not place such a high emphasis on ecosystem research and monitoring work. One state official said, "Other than owl and murrelet surveys, we do not generally do systematic surveys for non-timber resources on state forests. If we tried to do more comprehensive surveys, the counties would be upset that we're spending resources in this way" (S4N1).

But the state forest agency has contracted out aquatic surveys to another state agency (S4L1). In fiscal year 1995, aquatic habitat surveys were completed for about one hundred miles of streams (S4-8). One reason for these aquatic inventories was to provide information about a rare species of salmon which may become listed under the Endangered Species Act (ESA). Another reason was to support the state agency's Habitat Conservation Plan (HCP), which allows continued timber sales in areas where ESA-listed species may be present. Also in support of the HCP, the state was developing a new inventory system which would include items such as non-tree vegetation, cultural sites, and special forest products (S4O1, S4L1).

Thus the state agency was moving toward broader inventories, in support of ecosystem research and monitoring efforts rather than focusing on trees only. Even so, in fiscal year 1995, state officials performed lower levels of ecosystem research and monitoring than national officials. Interestingly, such state efforts were prompted by a national-level legal constraint, the Endangered Species Act. This event complements evidence, presented in Chapter 5, that national legal constraints force more environmental protection than do state legal constraints.

Overall, analysis of officials' efforts devoted to ecosystem research and monitoring supports Hypothesis 13. In each case, national efforts by forest agency officials included more work focusing on these non-timber projects than did state efforts.

#### Soil and Watershed Protection and Improvement

Soils and watersheds are critical forest ecosystem components. Activities to protect them include both minimization of harm during management activities and improvement work

to repair existing damage. Data indicate that, while officials in state and national agencies undertook similar levels of efforts to minimize harm, national agency officials performed more improvement activities.

Timber harvesting has long been known to have the potential to cause increased water runoff, which can lead to soil erosion and watershed siltation. Since agency officials generally contract harvesting operations with private parties, officials' efforts to minimize soil and watershed damage take the form of restrictions on contractees and monitoring for contract compliance. Contract restrictions and compliance monitoring efforts to protect soils and watersheds are similar across levels of governance.

In Case 1, efforts to protect soil and watershed on Ohio State Forests from timber harvesting damage center on "best management practices" (BMP's) for erosion control.. At the time of contract signing, state officials hold a pre-sale meeting with the contractor to discuss BMP's stipulated in the contract. BMP's are especially important for the use and maintenance of the road system, where most of the soil erosion occurs (S1-1, p. 8-11). Agency officials follow a set of BMP guidelines in laying out haul and skid roads, including keeping haul road grades less than 10% and skid road grades less than 20%, following contours along hillsides, and constructing sediment barriers at the base of slopes (S1-1, p. 8-11; S1-2, pp. 8-9]. Stream crossings are to be at right angles to the stream, using culverts or bridges (S1-2, p. 9). No cutting is to be done within twenty-five feet of a stream bank (S1-2, p. 32). During periods of inactivity, all active roads are to be graded and water bars installed (S1-1, p. 8-13).

BMP's include seasonal restrictions. Logging on state forests generally take place only between April 1 and December 1, to reduce damage from cutting in wet weather conditions that exacerbate erosion problems. However, the timber sale administrator may suspend operations during this period if weather conditions are likely to lead to erosion problems, and he may allow operations outside the normal logging period if weather conditions allow (S1-1, p. C-1).

After completing cutting on an Ohio State Forest, the contractor must immediately clear and smooth skid trails, logging roads, and loading areas, and he or she must construct water diversions on the trails and roads (S1-1, p. C-5). Usually the contractor also must supply and apply lime, fertilizer, seed, and mulch in specified quantities on all skid trails, haul roads, and decking areas to promote vegetative growth (S1-1, p. C- 6). To ensure contractor completion of contract requirements, the state requires a performance bond, typically 25% of the value of the highest-valued cutting section (S1-1, p. B-1).

BMP's are of no value unless they are followed. To monitor compliance, the state timber sale administrator spends time in the forest observing cutting operations. One state official estimated that he monitors loggers for a half-day at the beginning of the operation, then he visits them at least three times per week, an hour or two per visit. He explained, "During these visits I look for damage, such as skidder trails ripping up the ground, damage to other trees, inappropriate stream crossings, or skidder tracks that stray from the skidder trails" (S1E2). On the loggers' last day at a cutting section, the state timber administrator typically spends the whole day with the loggers, to ensure that they fulfill the BMP requirements for such items as cleaning up stumps and building water bars to reduce erosion (S1E2).

At the national level in Case 1, contractors face restrictions similar to those at the state level. Contracts typically include thirty or more clauses specifying practices to protect soils and watersheds. For example, loggers must install water bars when they cease operations (N1I3). Agency officials follow certain procedures when laying out the sale, including designating roads away from steep slopes, unstable soil, and stream banks (N1I1, N1B1). As with the state agency, national agency timber contracts generally allow harvesting only between April 1 and December 1, although the timber sale administrator can make exceptions based on weather and soil conditions (N1H2). Contractors also are required, typically, to prepare, seed, and mulch all constructed skid roads, using specified seed mixtures and quantities (N1-11).

A national official serving as timber sale administrator monitors contractor compliance on Hoosier National Forest. The contractor files an operating plan to indicate intended days of

operation, so the national official can plan visits and inspections. The administrator typically spends a half day with an operator, from one or two times each week to three or four times each week, depending on the contractor's reputation (N1I3, N1B1). Like state officials, national officials can use the performance bond (10% of the value of the entire timber sale) as a remedy, to encourage compliance with soil and watershed protection requirements (N1B1, N1I3).

To corroborate the finding that there is no significant difference between timber sale contractual requirements to protect soils and watersheds, a non-agency participant who had participated in timber sales on both forests was queried. He reported that, based on his experience, there was no systematic difference in stringency to protect soils and watersheds across the agencies (U1T3).

In Case 2, harvest contracts for Indiana State Forests and Hoosier National Forest require similar levels of soil and watershed protection. At the state level, standard logging contracts require contractors to mitigate damage:

The Purchaser must take whatever precautions are necessary, at the sole discretion of the Seller, to prevent soil erosion, water pollution, or other conditions detrimental to the environment on State or adjacent private lands. The Purchaser shall prevent rutting of skid trails, haul roads, and log yards. The Purchaser shall abandon all skid trails, haul roads and log yards in accordance with "Logging Roads and Skid Trails" specifications and/or at the discretion of the Seller (S1-1).

The "Logging Roads and Skid Trails" document specifies the creation of water breaks to reduce erosion, including diagrams and standards for water break construction, log landing area runoff, and bridges and culverts.

Contractors also must adhere to a checklist of erosion control items, including creating skid trails on grades of less than 10%, providing for good drainage on trails and roads, and diverting water flow into protected areas. After logging is complete, they must smooth roads

and trails, remove any logging slash from streams, seed certain areas to encourage vegetation, and put gravel on sensitive road areas.

To monitor compliance with such requirements, state timber sale administrators visit logging sites at least weekly. As one state official described,

We're required to visit logging jobs once per week, but we usually go out more often to monitor. If I go out on the first day and see something that disturbs me, if the crew is inexperienced, or if I haven't worked with them yet, then I may visit once a day, and if there are problems I might stay all day to monitor. With a good crew I may visit a couple of times per week, for a few hours at a time (S2E1).

Enforcement of contractor requirements is facilitated by a performance deposit. The contractor must submit 5% of the timber sale bid amount as a deposit. If the contractor creates excessive damage without mitigation, then the state timber sale administrator can recommend withholding the deposit. In reality, this threat is new; the performance deposit began just a few years ago. One state official said that he did not recall ever withholding any portion of any deposit, because contractors usually reach an acceptable level of compliance:

Of course, the perfect job would leave no damage and the whole area would be cleaned up, but in reality you have to look at "acceptable" instead of "perfect." There's always going to be some understory damage, which is usually acceptable, but we're more concerned about overstory damage or harming rare species (S2E1).

On Hoosier National Forest, contractors are required to follow numerous practices to minimize damage to soils and watersheds. The operating season is typically restricted to six months, May through October, when less damage is likely to occur, unless the timber sale administrator determines that ground conditions are acceptable for harvesting outside of this period (N2J1). The standard contract requires stream course protection measures such as

preventing debris from entering stream courses, building culverts or bridges to provide unobstructed flow, not dragging trees across stream courses, and not using wheeled or tracked equipment in stream courses (N2-11). It also requires operations to "reasonably minimize soil erosion," including sloping landing areas and constructing temporary drains. After logging, the contractor must maintain soil erosion control structures until they become stabilized, up to one year after harvesting (N2-11).

To ensure compliance with such requirements, the timber sale administrator visits logging sites about twice a week, usually for half of a day (N2J1). Similar to contractors on state forests, if contractors on the national forest fail to comply with contract requirements, then national officials may retain their performance bond.

In Case 3, loggers on state and national forests face similar requirements for soil and watershed protection. On Washington State Forests, contractors must construct water bars across haul roads, skid trails, and fire trails to control soil erosion and water pollution (S3-11, p. 15). No timber shall be felled into or dragged across designated streams, and any slash or debris falling into such a stream must be removed so that the natural stream bed and bank vegetation will not be damaged (S3-11, p. 16). Logging equipment may not operate within a riparian management zone or leave tree area (S3-11, p. 16). Skid road locations must be approved by the contract administrator before timber is cut (S3-11, p. 12).

A state official designated as timber sale administrator monitors contract compliance. This official visits logging sites to ensure that loggers are following contractual conditions. In the past, staff reductions led to low levels of on-site compliance monitoring. A recent audit of the agency's timber harvest management revealed deficiencies in monitoring. Thus monitoring efforts were stepped up in fiscal year 1995 to a minimum of one site visit per week during timber harvest operations. A typical visit lasts half of a day (S3D3). Performance security for large sales (valuing \$1 million or more) is typically set at \$100,000, but the security is rarely, if ever, withheld (S3D3).



Loggers working on Gifford Pinchot National Forest in Case 3 also face numerous requirements to protect soil and watershed during timber harvesting. For example, no debris may be left in stream courses, nor may timber be dragged across them (N3-10). Culverts must be built where necessary to prevent harmful runoff. Log landings must be ditched or sloped to prevent erosion. Where erosion control structures are needed, the contractor must build them and maintain them until the ground is stabilized, up to one year after harvest completion. After harvesting is done, the contractor must apply seed, fertilizer, and mulch as specified, and he must scarify designated landings, roads, and skid trails (N3-10). Moreover, the timing of timber harvest operations is usually restricted to protect northern spotted owl nesting, deer and elk winter range and calving areas, as well as times of wet soil that might lead to considerable damage (N3D2). The sale administrator can shut down a sale whenever conditions require it to protect resources such as soils and watersheds (N3D1).

The timber sale administrator visits a logging site periodically to check conditions. If damage occurs, he or she may suspend operations. One administrator estimated this happens about ten times per year, after which the contractor usually remedies the situation and continues (N3D1). A performance bond of 10% of the sale value is held by the national agency, in case a contractor fails to meet all contract requirements, including those relating to soil and watershed protection (N3D2). But rarely is money withheld for damage; one experienced administrator reported that in his over ten years on the forest, he's only withheld performance money a few times.

In Case 4, loggers face similar requirements for soil and watershed protection across levels of governance. Harvest contracts for work on Oregon State Forests require high levels of soil and watershed protection. For example, loggers must maintain roads to safeguard soil, water, and drainage structures and ensure that exposed soil will not erode (S4-11). The contract also limits logging systems to those that minimize soil disturbance, such as requiring use of preexisting skid roads and trails whenever possible and ceasing operations where soils are rutted or excavated to a depth of twelve inches or more (S4-11). The purchaser must

"Take all necessary precautions to prevent damage to stream banks, any stream course, lake, reservoir, or forested wetland within or adjacent to the timber sale area" (S4-11). The contract also specifies requirements for drainage culverts as well as seeding and mulching after operations are complete (S4-11).

To monitor contract compliance, the state timber sale administrator visits the site on the first day of operations, observing for a few hours or up to a whole day (S4L1). The administrator typically makes subsequent visits once or twice per week (S4L1). If there are non-compliance items, the administrator may suspend operations until the contractor remedies the problem. Of a dozen or so contracts per year, operations are suspended on about two (S4H1). Once harvesting is complete, the final inspection focuses on items such as water drainage, road grading, and slash treatment (S4L1). The administrator documents any problems in an inspection report and follows up with a letter, which usually results in an acceptable contractor remedy (S4L1). At stake is the contractor's performance bond, which is 20% of the timber sale value (S4A2).

Timber sales on the national forest in Case 4 also are subject to stringent soil and watershed protection requirements. The standard sale contract for harvesting on Siuslaw National Forest is nearly the same as that used by national officials in Case 3, as described above. Thus loggers must abide by requirements in treating stream courses, log landings, culverts, erosion control structures, and post-harvest seeding.

The timber sale administrator performs contract monitoring on national forest timber operations. The administrator meets with the contractor prior to the start of operations and then typically spends several hours on site the first day, followed by brief visits at least three times per week for the duration of timber harvesting operations (N4H1). The administrator documents any problems and works with the operators to solve them. If necessary, the administrator may write a "breach letter," warning of a breach in contract, but such a step is rare, occurring in less than 10% of the sales (N4H1). The next step, which is even more rare, would be to withhold a portion of the performance bond. One administrator said that the

agency's decreasing sale volume has improved compliance, as the more professional loggers continued to harvest timber while the less professional "farmers with tractors" have not (N4H1).

Overall, national and state contract restrictions and compliance monitoring to protect soils and watersheds do not differ significantly. Officials at both agencies undertake similar efforts to minimize soil and watershed harm during timber operations. However, outside of timber harvest operations, national officials devote greater efforts to improving soil and watershed conditions. In this indicator, data support Hypothesis 13.

In Case 1, national officials perform more reclamation work than state officials to reverse soil and watershed harm caused by past activities such as coal mining. In fact, in fiscal year 1995, Wayne National Forest officials spent over \$700,000 on soil improvement work. That year agency officials treated an eroded portion of a power line corridor, which had been damaged by user-developed ORV trails, by reforming the slope, constructing water bars, applying seeds, and installing fences to discourage further abuse (N1-13, p. 10). National officials also stabilized a section of an eroding stream bank and planted seedlings to reforest fifteen acres of riparian area (N1-13, pp. 9, 17).

At the state level, officials did not spend substantial amounts of money on reclamation projects. Such activities typically were funded by the state reclamation agency, which is responsible for any reclamation projects on state forests. Ohio State Forest officials indicated that, in fiscal year 1995, the reclamation agency performed work on three state forests, primarily to plug abandoned mines and plant trees. While output quantities were not available for such work, one official indicated that work on one of the three state forests covered fifteen acres of land reclamation (S1K1).

In Case 2, as in Case 1, national forest agency officials devoted greater effort to soil and watershed improvement activities than did state forest agency officials. A major emphasis on Hoosier National Forest was abandoned road work, which involved building water bars and seeding vegetation to reduce erosion, and installing gates and barrier posts to reduce motor

vehicle access (N2E3). National officials also performed wetlands restoration projects. In fiscal year 1995, national officials completed soil and watershed improvement projects on thirty-five acres the forest (N2-10).

State forest officials in Case 2 did not undertake as many soil or watershed improvement projects. While Indiana State Forest officials did work to bring all existing roads up to erosion standards, they did not take on any major projects to reforest open land or improve soil or watersheds in fiscal year 1995 (S2I2).

In Case 3, national officials performed more soil and watershed improvement activities than did state officials. A major emphasis on Gifford Pinchot National Forest was road restoration and closing, to minimize erosion problems (N3I1). Other soil and watershed improvements included seeding, tree planting, and erosion control blankets. Across the forest, such improvements were completed on over 150 acres in fiscal year 1995 (N3L1).

The state agency in Case 3 was less proactive in pursuing soil and watershed improvement projects. Instead, such projects were undertaken through programs outside of the agency. For example, a "Jobs in the Environment" program makes use of dislocated timber workers to improve watersheds across different forest ownerships, including the state. Program activities on state forest lands in fiscal year 1995 included road stabilization and stream bank protection (S3L1). But Washington State Forest officials did not perform substantial levels of restoration work.

In Case 4, national officials performed significant soil and watershed improvement efforts. In fiscal year 1995, Siuslaw National Forest officials completed soil and watershed improvement work such as pulling back slide material and scarifying the ground to encourage vegetation on 178 acres (N4-8). Officials stabilized drainage on 282 miles of road and decommissioned another 30 miles of road to reduce erosion (N4-8). In addition, officials completed 140 miles of riparian improvement activities, such as planting hardwood and conifer trees that will provide natural stream structures, growing herbaceous cover to control erosion, and removing noxious weeds (N4M1, N4-8).

Unfortunately, data are not available regarding state agency soil and watershed improvement activities in Case 4. Work is undertaken at the forest unit level, often mixed with other forest management activities, so data are not available to specify activities across Oregon State Forests for the fiscal year. The fact that officials do not track these activities statewide may be an indication that they do not receive high levels of attention. But without such data, no comparison can be made with national officials' efforts in Case 4.

### Conclusion

In evaluating relative levels of effort by national and state officials regarding environmental protection, it is necessary to examine multiple indicators. Analysis of such indicators suggests support for Hypothesis 13: National forest policies promote environmental protection more than do state forest policies. In most cases, national officials exhibit greater levels of ecosystem management, reduction in fragmentation through harvest methods, rare species identification and protection, ecosystem research and monitoring, and soil and watershed improvement (see Table 9-3). While most of the indicators support Hypothesis 13, a few do not. Instead, two indicators exhibit similar levels of environmental protection across the agencies: augmentation of large, connected patches through land acquisition, and mitigation of soil and watershed damage during timber harvesting.<sup>46</sup>

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<sup>46</sup>This result puts Leal's (1993) study in proper perspective. Leal argues that in Montana, national forest officials did not provide greater environmental protection than state forest officials. But Leal's indicator of environmental protection was the extent to which timber harvesters followed Best Management Practices (BMPs) during harvest operations. As the evidence in this chapter shows, even if protection of soil and watershed during harvesting is similar across agencies, other environmental protection indicators are likely to show that national officials provide higher levels of environmental protection.

Table 9-3:

Comparison of Environmental Protection Efforts

<u>Indicator</u>	Agency with Greater Environmental Protection Efforts			
	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
Ecosystem management	National	National	National	National
Augmenting large patches				
Land acquisition	Similar	Similar	Similar	Similar
Harvest methods	National	State	National	National
Rare species	National	National	National	National
Ecosystem research / monitor	National	National	National	National
Soil and watershed				
Protection	Similar	Similar	Similar	Similar
Improvement	National	National	National	— <sup>a</sup>

<sup>a</sup>Data not available (state agency does not track).

The relatively higher level of environmental protection achieved by national officials is not surprising in light of the constraints facing these officials, as described in Chapter 5. The national agency mandate does not place high priority on forest management for economic returns. Laws such as the National Forest Management Act (NFMA) and the National Environmental Policy Act (NEPA) require interdisciplinary analysis of a wide range of resources, not just timber. They also provide greater opportunity for those interested in environmental protection to delay or block activities that may adversely affect the forest ecosystem. Moreover, a given national forest is subject to input from citizens across the country, including those farther away who may tend to favor forest preservation over active management, while state forests encompass a much smaller geographical region of citizen input. Thus the institutions affecting forest officials and interested citizens are critical in shaping agency outputs that favor greater environmental protection at the national level.

Support for Hypothesis 13 provides empirical evidence that different policy outcomes are likely at different levels of governance in a federal system. This study examines forest policy, but there are many other policy areas in which decisions are made regarding which

outputs and outcomes to pursue. Often, such decisions involve choices between economic development and other goals such as environmental protection, wealth redistribution, and serving a particular clientele. As this analysis shows, higher levels of governance are likely to favor non-economic development goals than are lower levels of governance. In contrast, as described in Chapters 7 and 8, lower level governments are the more likely locus of policy output trade-offs that favor economic development. Therefore, the question of in which level to vest authority for a particular policy area has significant importance in determining the types of outcomes likely to be achieved.

## Chapter 10: Conclusion

As described in the opening pages of this manuscript, citizens and policy makers alike continue to debate the merits of devolving policy authority from national to state levels. Questions about forest and other natural resource policies in a federal system are salient and important to many people. Disagreements about appropriate use and management of these resources have resulted in physical violence, illegal actions, lawsuits, petitions, and legal reforms, and legislative proposals. In arguing about appropriate levels of governance, proponents of state primacy claim that states would provide more effective and efficient policy administration, while proponents of national control claim that national officials are better able to pursue multiple policy goals. Unfortunately, such normative claims rarely are accompanied by solid, empirical evidence about differences across levels of governance.

This study aims to provide such empirical evidence. Through careful case selection and analysis of a policy area, public forest management, in which both state and national levels of governance exercise authority, this study addresses the question: To what extent do state and national policy processes differ, and what effect to these differences have on policy outcomes? The Institutional Analysis and Development (IAD) framework emphasizes several key components, including attributes of the physical world, institutions (rules), and attributes of the community within which individuals act, all of which affect actors in action situations. Patterns of interaction among actors in action situations lead to outcomes. Thus analysis in this study emphasizes agency officials and their communities, incentives and constraints that they face, patterns of interactions, fiscal outcomes, and forest use outcomes.

Findings reported in this study foster greater understanding of natural resource policy processes and outcomes in the United States. In addition, lessons from forest policy can provide insights into broader questions about differences inherent in different levels of



governance in a federal system. These questions apply not only to forest or natural resource policy, but also to other areas where public policy involves trade-offs and decisions within a system of multiple jurisdictions.

### Summary of Findings

The preceding chapters have examined differences in policy processes and outcomes between state and national management of public forests. Through systematic comparisons of a number of factors in four carefully selected cases, several important patterns are evident.

Analysis in Chapter 3 suggests that state and national forest officials hold similar values and preferences about forest management and use. An important basis for these similarities is educational influences, as a vast majority of officials share a common disciplinary background in forestry. Moreover, the higher average tenure and mobility within national agencies may help to offset greater national agency job diversity that might otherwise engender heterogeneity in officials' values and preferences. However, differences between officials' communities are evident in mission and goals statements; national mission and goals statements include more elements that may hinder providing substantial, direct economic benefits than do state mission and goals statements..

As discussed in Chapter 4, evidence does not indicate systematic differences between state and national officials regarding budgetary or performance evaluation incentives. While officials consistently rank budgets among the most important policy factors, in most agencies, officials feel unable to affect significantly their budget levels, no matter what strategies they pursue. Thus budget incentives do not encourage state more than national officials to pursue economic development or timber provision. Similarly, performance evaluations do not provide greater incentives for state officials to pursue such activities. In fact, officials across the agencies described other criteria, including personnel supervision, teamwork, and external relations, as more important than specific outputs in performance evaluations.

Analysis in Chapter 5 indicates important differences in constraints that state and national officials face. On national forests, statutes such as the Multiple Use Sustained Yield Act, National Forest Management Act, and National Environmental Policy Act, and their implementing regulations, address decision-making processes and specific forest management techniques and purposes. These rules constrain national officials' ability to increase direct economic benefits, requiring numerous efforts to protect other resources, such as rare species. They also encourage public access and influence in policy making. In addition, planning documents require national officials to undertake substantial efforts to protect the forest environment and to involve the public in agency decision making. State officials, in contrast, face fewer constraints on their ability to pursue activities such as timber provision that yield substantial, direct economic benefits. State forest agency mandates emphasize timber as a source of profit or revenue rather than as just one of many equally-valued resources. State planning documents provide officials with greater freedom to pursue economic development without significant public input.

Chapter 6 investigates the final set of policy process variables, interactions with non-agency participants. Compared to state forest officials, national officials devote more effort to public input, and they receive a higher proportion of public input from those favoring uses without substantial, direct economic benefits. State officials, in contrast, receive a higher proportion of public input from those favoring timber. Non-agency participants favoring preservation perceive greater influence among national officials, while those favoring timber perceive greater influence among state officials. Factors that tilt the balance of communication and perceived influence toward preservation interests on national forests and timber interests on state forests include legal constraints, agency composition, and scope of citizenry.

Differences in policy processes affect policy outcomes. As discussed in Chapter 7, policy process factors closely linked to policy outcomes include budget allocations and, especially on national forests, legal constraints such as laws, regulations, and forest plans. Systematic differences in legal constraints lead to differences in both fiscal and forest use

outcomes. One type of fiscal outcome is net profit from timber provision. National timber provision exhibits higher unit costs and lower unit revenues, for a lower unit net profit, than state timber provision. The higher national agency timber costs result from substantial, interdisciplinary planning and public input requirements; appeal response efforts; and relatively lower sale volumes that reduce benefits due to economies of scale. At the same time, national agency timber revenues are decreased when bidders find the stumpage less attractive because of numerous legal requirements; when timber for sale is pine trees, for non-timber goals, rather than commercially more valuable hardwoods; and when regeneration harvesting is limited.

Another important fiscal outcome is use fee collection. State forest policies emphasize revenue from targeted beneficiaries (use fees) more than do national forest policies. A key determinant of this outcome is the legal constraint that allows only 15% of national forest use fees to stay on the forest, with the remainder going to the U.S. Treasury. But although state officials in most cases collect substantially higher amounts in use fees, they typically collect only a small share of their operating revenues, which reflects two key economic considerations. First, in some states agency officials expressed concern that charging use fees would expose them to higher liability in case of an accident, which could result in significant economic loss for the agency. Second, due to the dispersed nature of most forest uses for which fees might be charged, high fee collection costs may make such endeavors non-profitable.

The third important fiscal outcome is the transfer of funds to local governments. This is a particularly important outcome in a federal system where resource ownership by one level of government impinges on the capacity for actors at another level to collect revenue. In the case of public forests, land that is owned by a national or state agency is not available for generating county tax revenue. Instead, counties receive a share of revenue generated on the forest. Thus local government actors have a strong interest in alternative revenue possibilities from the forest land. Data in this study indicate that state agencies transfer substantially greater revenue sums to county governments than do national agencies. This result reflects the much greater quantity of timber provision on state than national forests.

Forest use outcomes, discussed in Chapter 8, also exhibit important differences between state and national agencies. With more formal channels for public input, especially for those wishing to block timber sales through appeals, and with substantially more pre-sale planning requirements, national forests produce lower timber volumes than do state forests. But provision of recreational facilities does not differ systematically across levels of governance. National officials devote greater expenditures to recreation, but recreational facilities are not uniformly greater on national forests, and national officials do not increase facilities more than state officials. As expected in a federal system, the agency with lower levels of existing recreational facilities tends to increase facilities more than the agency with higher levels. A federal system facilitates this result when citizens learn about costs and opportunities fostered by one government jurisdiction and press for other jurisdictions to provide comparable results.

The same elements that constrain national officials' ability to produce large volumes of timber at high levels of profit also lead to greater environmental protection efforts, as described in Chapter 9. Legal constraints to protect the environment lead to extensive planning and analysis prior to timber sales, as well as non-timber projects to identify and protect rare species, and to protect soils and watersheds. Legislative line item budgets for reclamation, rare species projects, and other such ecosystem protection efforts provide resources to hire specialists and perform the work. National Plans address these activities and include goals to direct management efforts. State forest agencies, on the other hand, devote less effort to environmental protection activities.

The findings reported in Chapters 3 through 9 have important implications for both natural resource policy and federalism more generally. The following sections examine these implications.

## Policy Implications for Natural Resource Management and Public Agencies

Public agencies play a critical role in natural resource policy. Forests, range lands, wilderness areas, wildlife refuges, parks, and many other important natural resources remain in public control. In addition, a substantial portion of natural resources in private hands are subject to regulation from public agencies at various levels of government. This study provides results relevant to natural resource policies and public agencies. In particular, data analysis is instructive for several important issues, including policy outcomes, appropriate levels of governance, recreational uses, management of agency culture, and budgetary incentives.

Current institutional arrangements reduce national officials' ability to turn a profit on timber provision in the national forests – an important fiscal outcome. Clearly, spending more money than is earned from timber sales does not provide net economic benefits to U.S. taxpayers. While money that is spent to sell timber on national forests benefits timber companies and their employees, it is doubtful whether most Americans would favor such a use of tax money. Those who justify the higher unit costs and lower unit revenues for national timber based on greater environmental protection must recognize that the goal of environmental protection would be served better by spending funds currently lost on timber sales to undertake efforts to protect the forest ecosystem. For example, had the \$3,158,800 spent on timber sales in the Siuslaw National Forest in fiscal year 1995 (which generated a \$276,010 net loss) been spent on erosion control instead, then the national land would have more intact forest as well as higher levels of watershed improvement.

It is evident from this study that state control promises higher economic returns than does national control. State foresters have greater freedom from constraints that hinder the provision of economic benefits and that allow timber harvesting opponents to delay or block proposed sales. Thus it is on state forests that natural resources are more intensively managed for economic development. Conversely, national foresters are more successful in pursuing

policies without significant, direct economic benefits. It is on national forests that one would be likely to find more management for environmental protection.

As suggested by Moe (1989), Rowland and Marz (1982), Lowry (1992), and other scholars, in the face of interjurisdictional competition for industry, and in the face of trust mandates to generate revenue (Souder and Fairfax 1996), state legal constraints are less likely to include environmental protection standards that inhibit economic development than are national constraints. Thus neither national nor state level responsibility should be considered uniformly "better." Rather, the desirability of control by different levels of governance depends on the criteria used. The existence of responsibilities at both levels in a federal system provides opportunities for a mix of both economic and environmental benefits.

But the existence of multiple jurisdictions also provides the possibility of specialization across levels of governance, with each focusing on what it does best. Why shouldn't national forests be managed to generate non-timber benefits and state forests to generate economic benefits? Certainly evidence suggests poor economic performance on national forests, and many environmental advocacy groups have called for cessation of all timber sales on national forests. But a drawback of this specialization approach is that managing exclusively for timber production on state forests may reduce important environmental benefits. For example, state forests may provide critical habitat for certain species, without which the species could become extinct even as national officials work to protect them on national forests.

Moreover, concentrating on economic benefits from state forests begs the question, Why should state governments continue to own forests, rather than selling them to private owners who might better manage forests for economic returns? If the reason is a responsibility to create income for trust beneficiaries, then perhaps the states would do better by selling timber land and converting the assets into higher yielding investments.

These questions are not merely academic musings. Rather, they involve real policy choices in natural resource management. For example, several scholars at the University of Washington, which receives trust revenue from state forest management, argue that the state

should convert assets from forests to more lucrative investments, such as stocks (Brune 1996). Others have called for the transfer of Federal forests to states. Activists recently circulated petitions to urge Idaho Governor Phil Batt to declare state ownership of the over 33 million acres of Federal land in the state (Rauber 1995). In Oregon, Representative Jim Bunn proposed a bill in Congress calling for the transfer of 2.5 million acres of timber-rich Federal land to the state, a move supported by counties in which the land is located (Register-Guard 1996). Similarly, Utah Representative Jim Hansen called for a bill to transfer control of certain Federal land to the state (Rauber 1995).

These debates also touch on a forest use that continues to grow in importance: recreation. As timber harvest volumes declined in the Pacific Northwest, many formerly timber-dependent communities attempted to shift from timber to tourism as an important economic resource. To this day, hikers, campers, hunters, horse riders, ORV riders, and other recreationists continue to visit public forests in ever greater numbers. Which level of governance is best positioned to meet increasing recreational demands? Nelson (1995) argues that state agencies would enhance recreational facilities more successfully if some present national forest lands were transferred to state control. He believes that new political pressures would encourage state officials to favor recreation.

But analysis in this study does not support this claim. State officials do not provide more recreational facilities than national officials, nor do they spend as much money on facilities. Moreover, pressure for increased recreational facilities comes from citizens who are able to compare provisions across different jurisdictions and press for change on those forests that provide fewer facilities. Such citizen comparisons are an important benefit of the existence of recreational responsibilities in multiple jurisdictions, as currently exists between national and state forest agencies. Transferring large amounts of forest land from national to state agencies is not likely to result in increased recreational facilities. In fact, state officials are likely to pursue timber, not recreation, as a primary goal, especially in states where a trust mandate

directs them to allow recreation only to the extent that it does not interfere with revenue generation through timber and other commodity provision.

Administration of natural resource policy most often lies in the hands of public agencies. Officials in such agencies create and implement natural resource policies in central office headquarters as well as in many dispersed field offices. An important question in natural resource policy is how an agency manages its organizational culture to unite employee behavior across numerous geographic locations. Kaufman's (1960) seminal work in USFS administrative behavior suggested the importance of homogeneity of preferences and unity of mission. He argued that higher-level agency officials fostered homogeneity and unity within the organization, in part through promotion from within and frequent employee relocation to tie individuals more closely to the agency than to the broader community in a particular geographic location. The "esprit de corps" and shared common vision among agency officials are important reasons for USFS policy successes (Clarke and McCool 1985).

But divergence from shared norms and preferences is likely to result when the types of job positions within an organization become more diverse. When an organization hires more specialists with duties different from traditional job positions, a wider array of points of view is introduced into the organizational culture. Increasing job position diversity has occurred in the USFS since it began hiring numerous resource specialists, yet, interestingly, homogeneity of preferences about forest resource use and management is no less among national than state officials. Two competing explanations for this similarity in homogeneity exist. Perhaps the similarity in disciplinary background (forestry) explains the similar levels of homogeneity. If so, then an agency seeking homogeneity and unity should hire individuals with a common disciplinary background. In contrast, perhaps the USFS practices of emphasizing promotion from within, which increases average length of tenure, and providing higher employee geographic mobility lead to similar levels of homogeneity. If this is true, then an agency seeking homogeneity and unity should emphasize promoting from within and increasing officials' geographic mobility. Further analysis of factors contributing to intra-agency



homogeneity is needed to determine which of these two variables is more important in managing agency culture to foster homogeneity of officials' preferences.

Many studies of public agencies and bureaucratic behavior emphasize the importance of budgetary resources (see Niskanen 1971, Arnold 1979). Evidence from analysis presented here supports the critical role of budgets in affecting agency policies. Officials across the agencies consistently ranked budgetary resources as a key factor. Not only are budgets similarly important across levels of governance, but budgetary incentives are similar as well. Neither state nor national officials described strong incentives to provide certain outputs as a means to augment budgetary resources. In most cases, external forces affecting budgetary resources available to agency officials leave little room for official strategic behavior to augment budgets. Institutional arrangements such as legislative budget allocation and authorization procedures reduce incentives for agency officials to emphasize certain forest outputs over others. Thus the checks and balances inherent in the U.S. democratic governance system impede officials' ability to pursue successfully budget maximization.

An important result from this study addresses the common criticism that USFS officials face substantial budgetary incentives to harvest timber regardless of net profitability (Budiansky 1991, O'Toole 1988, Rice 1989). The Knutsen-Vandenberg (K-V) Act allows national officials to retain a portion of gross receipts at the local level, for use in projects related to the timber sale area. Thus, on the surface, this seems to provide a strong incentive to sell more timber. However, national officials do not view the K-V Act as an important factor in timber sale decisions, and they may qualify for only limited amounts of funding for projects within a small geographic area. Thus claims of widespread, negative impacts of the K-V Act miss the mark.

#### Broader Implications for Federalism

Although this study focuses on policy processes and outcomes in one particular substantive policy area, it has broader implications for public policy in federal systems.

Findings inform debates about several subjects, including the importance of institutions, the functional theory of federalism, possibilities for innovation, inter-jurisdictional competition, economic efficiency, the impact of participants at different levels of governance, and intergovernmental relations.

First, institutions matter in shaping policy processes and outcomes; there are key differences between national and state institutional arrangements that influence agency officials' behavior. National officials face greater institutional constraints affecting their activities than do state officials. These constraints contribute to lower levels of timber production, at higher unit costs and lower unit revenues. Subsequently, less revenue is transferred to local governments. At the same time, national officials devote greater efforts toward environmental protection than do state officials.

Thus changes in institutional arrangements can provide a means to influence policy processes and outcomes. Rules can be changed through elected representatives, who enact laws affecting agency official behavior. This finding provides important opportunities in a democratic polity, as bureaucratic preferences are not the most important factors determining policy processes and outcomes. In fact, officials across the agencies share remarkably similar views about a range of issues, from charging use fees and favoring local economic development to increasing recreational uses. Analysis does not support the traditional view that state officials have lower qualifications (White 1963). Rather, it supports more recent arguments in state resurgence literature, which suggest that state and national agencies do not attract individuals whose characteristics and qualifications differ systematically (see Cigler 1993, Eisinger 1988). Thus differences in policy processes and outcomes are not caused by differences among individual official characteristics. Instead, factors such as institutional arrangements are crucial.

Second, this study provides extension of the functional theory of federalism that emphasizes elected officials (Peterson 1995). According to this theory, elected officials face electoral pressures that affect the policies they pursue. Those at lower levels of governance

emphasize developmental policies, which enhance the jurisdictions' resources by increasing business and employee tax revenues. Since mobility of firms and individuals across lower levels of jurisdiction is often high, local officials who emphasize policies that hurt economic development spur firms to leave, which results in voter displeasure and elected officials' failure to retain office. Thus those elected officials at lower levels of governance who favor policies that promote economic development are more likely to win and remain in office. In contrast, elected officials at higher levels of governance do not face firms with such mobility, thus they can pursue policies that are less favorable to economic development without a high likelihood that they will be defeated in the next election.

But elected officials are not the only players in public policy. Much of the work of "government" is performed through bureaucrats, who implement, interpret, and "fill in the details" of broader legislative mandates. Thus it is important to examine whether the functional theory of federalism applies to their actions as well. This study suggests that it does. Although agency officials are not elected, they are affected by elected officials who create legal constraints. These legal constraints, in turn, have important effects on bureaucratic behavior, fostering behavior to promote economic development more at lower levels of governance and environmental protection at higher levels of governance. Such differences in constraints are likely to occur across different substantive policy areas. Further study outside of forest policy would provide additional empirical evidence about the quantity and types of constraints facing bureaucrats at different levels of governance.

Third, an important potential benefit of federal systems is innovation. The existence of a variety of agencies and multiple jurisdictions provides opportunities for experimentation, adaptation, and adoption of successful policies. Data collected in this study suggest that both state and national agencies can provide innovation, but that we should expect systematic differences in types of innovation. Specifically, state agency innovations are more likely to focus on timber provision and revenue enhancement, while national agency innovations are expected to focus on innovations in environmental protection.

For example, an important innovation by Oregon state officials has been the creation of a Habitat Conservation Plan (HCP). In order to continue timber harvest despite listing under the Endangered Species Act (ESA) of forest-dwelling species, the state agency has developed an HCP. By proposing to provide late-successional habitat in different locations throughout time ("structure-based management"), state officials can avoid designating substantial acreage as off-limits to commercial timber harvest. Washington state officials also have developed an HCP to allow continued high levels of harvesting. Moreover, they have taken a leading role in leasing communication tower sites on public forest land, in order to generate income.

National agency officials, on the other hand, are innovating in policies whose main goal is not to increase commodity provision. In Washington and Oregon, national forests include newly-created Adaptive Management Areas designed, in part, as purposive experiments to learn about effects of various practices on forest ecosystem conditions (see, for example, Shindler et al. 1996). Thus innovation type varies across levels of governance, with lower levels more likely to innovate in revenue enhancing and economic development activities and higher levels more likely to innovate in outputs such as environmental protection. In other policy areas, innovations might differ by level of governance according to their contributions to economic development.

Fourth, in a federal system, an important benefit is the existence of multiple jurisdictions, which gives citizens opportunities to compare performance and seek change in jurisdictions that don't "measure up." Federalism scholars often point to such responsiveness as a critical benefit of federal systems of governance, often focusing on theoretical arguments about how the existence of multiple jurisdictions enhances responsiveness (see, for example, Ostrom 1987). This phenomenon is evident in public forest policy. For example, it is clear that national officials face more constraints requiring public access to forest planning and decision making. Citizens knowledgeable about national forest policy processes have sought to increase access to state processes. In Ohio, preservation interests pursued, through legislators, a ban on commercial harvesting and constraints requiring agency officials to conduct more

formal, open decision-making processes. In Oregon, environmental advocates sued the state forest agency, claiming its decision-making processes were arbitrary and demanding greater access and more open processes. These levelling attempts affected officials' behavior. Ohio State Forest officials enacted a moratorium on commercial harvesting from a particular forest, and they undertook greater efforts to inform the public about planned forest activities. Oregon State Forest officials created rules codifying existing planning processes.

Comparison and levelling across jurisdictions is evident in recreational facility provision as well. Rather than one level of governance systematically providing higher levels of both existing and new facilities, the addition of new facilities is linked to existing facility levels. Where one of the agencies in a given case has a lower existing level of a certain type of facility, that agency is likely to pursue additions to reduce the disparity with the other agency. Thus comparisons among jurisdictions allow citizens to pursue activities that bring the outputs of one jurisdiction in line with another.

Fifth, greater economic efficiency is not guaranteed at lower levels of governance. While use fee collection can increase efficiency (Robinson 1975), and, as Stein (1990) suggests, lower levels of governance collect higher levels of use fees, there may be impediments to agency officials collecting substantial amounts of use fees. In fact, state officials in this study collected a rather small amount (compared to their overall public forest expenditures). Impediments to higher use fee collection are inherent in a governance system with checks and balances, as legislative budget allocations and authorizations reduce the ability of agency officials to benefit from use fees that they collect. Liability concerns, costs of monitoring and enforcement, and personnel opportunity costs also represent obstacles to increasing use fee collection.

In addition, employee evaluative criteria can inhibit officials from emphasizing economic efficiency and cost effectiveness. In this study, state officials reported that supervisors did not weigh heavily their economic outputs. Instead, criteria such as constituent communications, public safety, and teamwork were viewed as more important. These diverse

criteria illustrate that, despite the value often placed on cost-effective and economically efficient administration of government policy, performance measures in a public agency cannot be reduced to fiscal results. In federalism debates centering on economic efficiency at different levels, it is important to recognize the wide range of goals that citizens demand of public organizations at any level.

Thus, devolving policy responsibility to lower levels of governance will not lead to high levels of fiscal equivalence unless policy makers overcome disincentives for agency officials to collect use fees. This lesson, clearly illustrated by institutional arrangements that reduce state forest officials' incentives to collect use fees, is applicable to policy in any area where agency decision makers have the potential to generate revenue from service recipients.

Sixth, citizens can press for agencies to fulfill particular goals through a variety of channels. In a democratic polity, the degree to which citizens are allowed to participate in agency decision-making processes is an important question. This question emphasizes the fundamental tension between agency officials' expertise and responsiveness, as relying on bureaucratic expertise insulated from public opinion is likely to decrease bureaucratic responsiveness to particular citizens' demands. This tension is evident in forest management, as public forest professionals rely on their judgment about how to best manage forest resources but also may be required to solicit citizen participation in decision making.

Comparing across levels of governance in a federal system, scholars have argued that officials at higher levels undertake planning and decision-making activities that are more open and inclusive of citizen participation (see Peterson 1981). Analysis in this study supports this argument. Across the four cases, national officials face more requirements to include a wide variety of citizens in planning and implementing forest management activities.

Such requirements foster differences in citizen participation across levels of governance. As suggested by a number of scholars, parties whose primary goal is not economic benefits are more active at higher levels of governance (Peterson 1981, Hecl 1978, Sabatier 1974, Walker 1983). In this study, analysis indicates that national agency officials

communicate more with parties favoring non-economic benefits (preservation), while state officials communicate more with parties seeking economic benefits (timber). Subsequently, those favoring preservation perceive greater influence with national officials, while those favoring timber perceive greater influence with state officials.

Differences in communication and perceived influence reflect a number of factors, including legal requirements, agency job position diversity, and the scope of citizenry. Without legal requirements for extensive citizen involvement, state officials tend to have most of their public contact during timber sale contract administration. Thus the citizens with whom they interact the most are those favoring timber provision. In addition, on national forests, appeals processes allow timber opponents to halt or delay harvesting, while no laws can force national officials to provide timber. Thus the deck is stacked in favor of those wishing to block timber harvest. In contrast, on state forests, timber opponents do not have such potent legal hammers to stop timber harvesting.

Job position diversity within an agency also affects communication and influence patterns. Many citizens interested in non-timber resources, such as birds, feel more comfortable communicating with an official who is a specialist in that resource. Such specialists can provide greater attention to watersheds, soil protection, species habitat, and other non-timber forest resources than can timber specialists or foresters responsible for providing high volumes of timber. Clearly, such non-timber specialists are more likely to be found on national than on state forests.

The scope of citizenry inherent in different levels of governance also affects patterns of citizen participation. Individuals residing outside of a given state are able to influence national more than state forest policies in that state. Fundamentally, the national forest in a given state belongs to all U.S. citizens, while the state forest belongs to the citizens or trust beneficiaries within the state. In fact, members of an environmental advocacy organization who lived outside of the Pacific Northwest successfully pursued their preferences regarding rare species protection on national forests in Oregon and Washington, but not on state forests in the region.

Those living further away from a forest are more likely to favor its preservation rather than use for timber or other commodities (Nash 1982, Tremblay and Dunlap 1978, Lowe and Pinhey 1982). Thus the scope of citizenry helps to explain why parties favoring economic development have more communication and perceive more influence with state officials, while parties favoring non-economic forest policies such as preservation have more communication and perceive more influence with national officials.

These factors help to explain differences in participation across levels of governance. For those who value public input and influence, higher levels of governance may be more appropriate. Of course, greater public involvement often reduces the ability of bureaucratic experts to carry out activities in a timely and cost-effective manner. This trade-off should be an important consideration in decisions about the appropriate levels of responsibility for various policies.

Seventh, while this study emphasizes comparisons of state with national levels of governance, it is important to note that federalism is more than competition among jurisdictions. An important literature in intergovernmental relations focuses on interactions among actors at various levels of governance. A key component of intergovernmental relations is fiscal relations, the flow of funding and influence between levels of governance (Swartz and Peck 1990, Oates 1991).

This study includes analysis of an important aspect of fiscal relations, revenue sharing. This component of intergovernmental relations is especially important for natural resources that are publicly owned. Lower levels of governance, such as counties, that rely heavily on property taxes are greatly affected by public ownership of natural resources, since public land owners generally do not pay property taxes. In fact, in regions where national officials attempt to purchase land for public ownership, they often face opposition from parties concerned about maintaining the property tax base for local government jurisdictions.

To make up for this property tax shortfall, public owners may be required to share a portion of revenues with counties. Each of the eight public forests in this study is subject to



revenue sharing requirements. Systematic differences are evident in revenue sharing amounts; state agencies share more funds with county governments than do national agencies. From the county government's perspective, then, the question of which level of government owns and manages public forests is critical. In fact, county officials are often at the forefront of proposals to transfer Federally-managed lands into state or local ownership (Larson 1995, Register-Guard 1996).

Overall, careful examination of forest policy across state and national agencies provides insights into broader questions about federalism. Institutions provide a critical means to affect policy processes and outcomes, and understanding institutional arrangements allows extension of the functional theory of federalism to non-elected officials. Possibilities for innovation are evident, though different types of innovation are likely at different levels of governance. Inter-jurisdictional competition allows citizens to press for change when comparisons reveal that the policies of certain jurisdictions are less satisfactory than others. Lower levels of governance are more likely to generate net profits from operations and exhibit fiscal equivalence, but, even so, lower level officials face obstacles to economic efficiency. Patterns of interactions and influence differ across levels of governance, with those favoring economic development policies more active and influential at lower levels. Finally, in intergovernmental relations, revenue transfer amounts vary by governance level; counties receive more funds from state than from national officials. Such questions and concerns are common to a variety of policy areas outside of public forest management, including natural resources as well as other areas where trade-offs are made between the pursuit of economic development and other goals.

### Conclusion

The question of appropriate jurisdictions for various government activities continues to be a fundamental issue in American politics. Answers to this question should be based on solid empirical evidence about policy processes and outcomes across levels of governance.

Ironically, despite the seriousness with which advocates for greater national or state control pursue their arguments, little research has compared policy processes and outcomes systematically across levels of governance. Instead, scholarship has emphasized understanding difficulties in implementing national policy directives at state and local levels (see Pressman and Wildavsky 1984, Derthick 1971). Other studies have examined policy at just one level of governance (Lowry 1992, Rabe 1986, Ringquist 1990, Clarke and McCool 1985). Thus this study provides important empirical evidence about policy making in different jurisdictions within a federal system.

As this study shows, it does make a difference whether policy responsibility lies in a higher or lower level of governance. National agency officials creating and implementing public policy face systematically different policy process constraints than do state agency officials. These differences affect officials' behavior and resulting policy outcomes. Therefore, advocates of policy change may pursue two divergent strategies. First, they may advocate transferring policy authority to the level of governance most likely to perform as they prefer. Those favoring policy outcomes without substantial, direct economic benefits would do well to advocate authority at higher levels of governance. Second, they may advocate changing policy process constraints. Changing agency officials' behavior may be achieved through changing the laws that constrain officials' activities.

The likelihood of success under these different strategies cannot be determined from this study. Further attention to this question would provide valuable insights. In addition, rigorous, systematic comparison of other policy areas across levels of governance could prove useful in understanding federalism more broadly. It is time to move beyond normative debates of federalism and focus greater attention on rigorous, empirical comparisons of specified policy areas across levels of governance. Only through such work will we be prepared to make informed decisions about appropriate responsibilities in federal systems.

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APPENDIX 1

Standard Questionnaire for Agency Officials

## QUESTIONNAIRE

### PART 1a: FOREST MANAGEMENT ISSUES

Please circle the response that best indicates how you feel about the following issues as they relate to land managed by your agency. Also indicate the degree to which you believe agency policies favor or disfavor these items:

#### (Example) Using prescribed fire as a management tool

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

#### 1. Increasing, or establishing new, recreational user fees

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

#### 2. Including clear cutting as a silvicultural option

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

#### 3. Giving extra weight to local economic considerations in decision making

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

#### 4. Actively converting non-native stands to native stands

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

#### 5. Increasing efforts to seek public input in management decisions

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

#### 6. Managing for forest ecosystems, even if that means reducing direct benefits to people

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**7. Increasing the following forest uses:**

**Timber**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Oil/gas/minerals**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Hunting/fishing**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Developed camping**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Hiking trails**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Horse trails**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Off road vehicle trails**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Wilderness/preservation areas**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Other: \_\_\_\_\_**

I ... Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor  
Agency policies...Strongly favor Favor Neither favor nor disfavor Disfavor Strongly disfavor

**Part Ib: Influence on Forest Management Activities**

Please indicate, on a scale of 1 to 5, the amount of influence you believe that each of the following has on determining management activities on the forest(s) for which you have responsibility:

	Very influential		Somewhat influential		No influence
Existing laws and regulations:	5	4	3	2	1
Existing forest uses:	5	4	3	2	1
Forest Plan or Land Management Manual:	5	4	3	2	1
Expertise/beliefs of agency personnel on the forest(s):	5	4	3	2	1
Higher agency officials, through evaluating & communicating with subordinates:	5	4	3	2	1
budgets:	5	4	3	2	1
Legislature, through communicating with agency personnel:	5	4	3	2	1
budgets:	5	4	3	2	1
Local residents, through communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People living outside the local area, through communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People favoring timber, through communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People favoring oil/gas/mineral uses, through communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People favoring hunting/fishing, through communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1



People favoring developed camping, through					
communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People favoring hiking, through					
communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People favoring horse riding, through					
communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People favoring off-road vehicle use, through					
communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
People favoring wilderness/preservation, through					
communicating with agency personnel:	5	4	3	2	1
administrative or court challenges:	5	4	3	2	1
pressure on legislators:	5	4	3	2	1
Other: _____	5	4	3	2	1

## PART 2: KEY CONTACTS

Please indicate, to the best of your recollection, the following information about those people outside the agency whom you consider to be key contacts (Please include as many people as you consider to be key contacts. If additional space is needed, feel free to may write on back of this form.):

### *Example*

1. Name of Individual: *Bill Smith*
2. Phone/Address (if available): *(614) 555-1234; PO Box 100, Athens, OH 45700*
3. Group Affiliation (if any): *Audubon Society, Athens Chapter*
4. His/Her Main Forest Concerns: *Riparian protection, less timber harvesting*
5. Contact Type & Frequency: *I call him for all Environmental Assessments (monthly).  
I meet with him on the Athens Watershed Committee quarterly.  
He phones me about specific issues once or twice a week.*
6. Usefulness of Input: *A lot of his phone calls involve details better handled by others, but the contacts are helpful in my understanding of where the environmentalists stand on certain decisions. His input often fails to consider the needs of the local forest community.*

---

1. Name of Individual:

2. Phone/Address (if available):

3. Group Affiliation (if any):

4. His/Her Main Forest Concerns:

5. Types and Frequency of Contacts:

6. Usefulness of Contacts:

---

1. Name of Individual:

2. Phone/Address (if available):

3. Group Affiliation (if any):

4. His/Her Main Forest Concerns:

5. Types and Frequency of Contacts:

6. Usefulness of Contacts:

---

Others (Please continue listing items #1-6 for each key contact. If additional space is needed, you may write on the back of this sheet.):

**\*\* Note: The actual form sent to officials included five pages like this one for Part 2 \*\***

APPENDIX 2

Interview Guide

## APPENDIX 2

### Interview Guide

1. [Education, Work] Tell me about your education background & work experience
  - degree type
  - major
  - years with agency
  - years in various locations (mobility)
2. [Your responsibilities] Tell me about your responsibilities in this position.
3. [Affiliations] What are your civic or professional affiliations?
4. [Public input] Tell me about your public input efforts. Do you actively communicate and seek public input? If so, through what channels? How often, for each channel? Why do you undertake such efforts?
5. [Budget - receive] How important is your budget? How do you receive revenues for forest management? What could you do to increase your revenues? Which areas tend to receive the most funding? Why is this?
  - Appropriations
  - User fees
  - Timber sales
  - Other
6. [Budget - allocate] Do you allocate a budget? How do you decide how much to allocate where?
7. [Performance reviews] How often do you have a performance evaluation with your supervisor? What criteria does your supervisor look for most in these evaluations? What rewards are available for good work, and who tends to get them (bonus, raise, promotion)?
8. [Mission stmt] What is the agency's mission statement? May I see a copy?
9. [Timber volume] In this district, what was the volume of timber sold in FY 95? Harvested? How many acres by which silvicultural methods? What percent is this of the annual growth? How are timber volumes determined?
10. [Timber sale process] Walk me through the timber sale process.
11. [Soil/water] How is soil and water protected during timber harvesting? (BMP's; contract clauses)
12. [Oil/gas/minerals] In this district, how much oil/gas/mineral was sold in FY 95? Revenues and expenditures? Potential?

13. [Forest health] How do you measure the health of the forest? What efforts are undertaken?
14. [Rare species] Efforts to identify/protect rare species?
15. [Reclamation] Reclamation of damaged soil/water? Activities, expenditures.
16. [Land purchase] Tell me about the land purchase and exchange processes. Walk me through the process. Which lands have priority for acquisition?
17. [Legislator impact] How much impact do legislators have on your activities? How much impact do various citizens' groups have?
18. [Planning documents] Tell me about the process of deciding what to do on each part of the forest.
19. [Legal constraints] What legal requirements affect how you do your work?
  - decision making
  - substantive

APPENDIX 3

Statistical Tests for State and National Differences

### APPENDIX 3

#### Statistical Tests for State and National Differences

This appendix contains information about the statistical tests conducted throughout the study. Data reported below is supplemental to data reported in the main body of this manuscript, Chapters 3, 6, 8, and 9.

#### Officials' Length of Employment with their Agency (Table 3-3b)

Pooled t-tests were performed using the software package Stata 3.1. Computer calculations of t-values and corresponding p-values were conducted with the assumption of equal variances between the two populations (state and national officials). The values are as follows:

<u>Agency</u>	<u>N</u>	<u>Mean Length of Employment (years)</u>	<u>Standard Deviation</u>	<u>Pooled t-test:</u>	
				<u>t-value</u>	<u>p-value</u>
National	42	18.6	7.47		
State	44	13.8	6.87		
Combined	86			-3.08	0.0028

Additional calculations were performed without the assumption of equal population variances, and the results were virtually identical to those listed above under the assumption of equal population variances.

#### Officials' Mobility within their Organization (Table 3-4b)

Mobility was measured as the average number of years per location that an official spent within the organization. For national officials, the organization was the U.S. Forest Service, while state officials' organizations were the state forest agencies. Pooled t-tests were performed using the software package Stata 3.1. Computer calculations of t-values and corresponding p-values were conducted with the assumption of equal variances between the two populations (state and national officials). The values are as follows:

<u>Agency</u>	<u>N</u>	<u>Mean Number of Years per Location</u>	<u>Standard Deviation</u>	<u>Pooled t-test:</u>	
				<u>t-value</u>	<u>p-value</u>
National	42	5.1	3.02		
State	44	7.3	3.52		
Combined	86			2.99	0.0037



Additional calculations were performed without the assumption of equal population variances, and the results were virtually identical to those listed above under the assumption of equal population variances.

### Questionnaire Responses (Table 3-6)

Questionnaires were distributed to forest agency officials in each of the eight agencies. A snowball sampling method was used as interviewees suggested others who might be interested in completing questionnaires. A total of seventy-five of eighty-seven were returned, for a response rate of 86%.

Responses to each of the fourteen questionnaire items were aggregated into two categories by agency type (state and national). For each agency within each questionnaire item, the distribution of responses was examined for normality. Responses to seven of the questionnaire items exhibited a normal distribution across both agency types. For these normally distributed responses, pooled t-tests were performed using the software package Stata 3.1. Computer calculations of t-values and corresponding p-values were conducted with the assumption of equal variances between the two populations (state and national officials). Statistical data are as follows:

#### Mean Response Values from Officials' Questionnaires, Part I (Table 3-6)

<u>Item</u>	<u>State Officials:</u>			<u>National Officials:</u>			<u>t-value</u>	<u>p-value</u>
	<u>Mean</u>	<u>S.D.</u>	<u>N</u>	<u>Mean</u>	<u>S.D.</u>	<u>N</u>		
Manage w/ ecosystem focus	0.62	0.99	39	0.78	0.90	36	-0.74	0.461
Increase horse trails	0.13	1.01	39	0.26	1.01	35	-0.55	0.584
Increase hiking trails	0.56	0.85	39	0.97	0.75	35	-2.18	0.033*
Increase oil/gas/minerals	-.51	0.89	39	-.43	0.82	35	-0.42	0.673
Increase timber	0.44	1.02	39	0.17	0.85	36	1.24	0.220
Increase hunting/fishing	0.58	0.78	40	0.60	0.70	35	-0.15	0.885
Favor local economic develop.	0.53	0.79	40	0.50	0.70	36	0.15	0.884

Additional calculations were performed without the assumption of equal population variances, and the results were virtually identical to those listed above under the assumption of equal population variances.

Responses for the remaining seven questionnaire items were not normally distributed. Clearly, responses to these items were not most frequently in the middle of the -2 to 2 scale. For example, officials across both agencies consistently valued increasing ORV trails at -2 or -1. For these non-parametric distributions, the pooled t-test is not an appropriate technique. Instead, a non-parametric test such as the Kolmogorov-Smirnov (K-S) Test is needed. The K-S Test involves measuring the maximum difference, D, between the cumulative frequency distributions of the two samples (Blalock 1972, p. 262). The maximum difference is used to calculate a p-value for each sample, and for the samples combined. Results, from the software package Stata 3.1, presented below, show a p-value of less than 0.05 for only one questionnaire item:

Mean Response Values from Officials' Questionnaires, Part II (Table 3-6)

<u>Item</u>	<u>State Officials:</u>			<u>National Officials:</u>			<u>D</u>	<u>p-value</u>
	<u>Mean</u>	<u>S.D.</u>	<u>N</u>	<u>Mean</u>	<u>S.D.</u>	<u>N</u>		
Charge recreational use fees	0.60	0.90	40	1.20	0.72	35	0.243	0.159
Increase public input	0.90	0.93	40	1.11	0.85	36	0.131	0.858
Increase developed camping	-.21	0.95	39	0.31	1.05	35	0.261	0.112
Increase ORV trails	-.77	1.09	39	-.56	1.11	36	0.094	0.993
Convert to native species	0.71	0.90	38	0.94	0.89	36	0.146	0.759
Increase wilderness/preservatn	0.03	1.27	39	0.36	0.99	36	0.190	0.417
Allow clearcutting	1.48	0.60	40	0.42	1.30	36	0.506	0.000*

Intra-Agency Variance Among Officials' Responses (Table 3-8)

Questionnaire response data are used to compare homogeneity of beliefs and preferences across officials in different levels of governance. Responses to each of the fourteen questionnaire items were aggregated into two categories by agency type (state and national). For each item, a test for difference in estimated population variance was performed using the software package Stata 3.1. To test the hypothesis that state and national standard deviations are identical, two-tailed p-values were calculated. Complete statistical data are reported in Table 3-8.

Complete questionnaire response data are as follows:

<u>Statement</u>	<u>State:</u>					<u>National:</u>				
	<u>Number of responses per category:</u>					<u>Number of responses per category:</u>				
	<u>-2</u>	<u>-1</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>-2</u>	<u>-1</u>	<u>0</u>	<u>1</u>	<u>2</u>
Managing with an ecosystem focus	0	6	11	15	8	0	4	7	18	7
Increasing horse trails	2	8	15	11	3	1	8	10	13	3
Increasing hiking trails	0	4	14	16	5	0	1	7	19	8
Increasing oil/gas/mineral extraction	4	17	14	3	1	3	13	15	4	0
Increasing timber	2	5	10	18	4	0	8	16	10	2
Increasing hunting/fishing opportunities	0	3	15	18	4	0	0	18	13	4
Favoring local economic development	0	3	17	16	4	0	3	13	19	1
Charging recreation use fees	1	4	9	22	5	0	1	3	19	12
Increasing public input	0	3	10	15	12	0	2	5	16	3
Increasing developed camping	1	18	9	10	1	1	9	6	16	3
Increasing ORV trails	12	12	10	4	1	9	10	9	8	0
Active conversion to native species	0	4	10	17	7	1	1	6	19	9
Increasing wilderness/preservation areas	5	10	8	11	5	0	7	15	8	6
Allowing clearcutting	0	0	2	17	21	4	3	13	6	10

Officials' Perceptions of Non-agency Participant Influence (Tables 6-6, 6-7, 6-8)

Pooled t-tests were performed using the software package Microsoft Excel 5.0. Computer calculations of t-values and corresponding p-values were conducted with the assumption of equal variances between the two populations (state and national officials). A one-tailed test is appropriate because the hypothesis for each interest type states that officials at one level of governance perceive greater influence from a particular interest type than do officials at the other level of governance. Complete statistical data are included in Tables 6-6, 6-7, and 6-8. Additional calculations were performed without the assumption of equal population variances, and the results were virtually identical to those listed above under the assumption of equal population variances.

Officials' Perceptions of Agency Policies Towards Recreation Uses (Chapter 8)

Pooled t-tests were performed using the software package Microsoft Excel. Computer calculations of t-values and corresponding p-values were conducted with the assumption of equal variances between the two populations (state and national officials). A one-tailed test is appropriate because the hypothesis states that national officials perceive their agencies promote each recreational use more than do state officials. The values are as follows:

<u>Recreational Use</u>	<u>State Officials:</u>			<u>National Officials:</u>			<u>t-value</u>	<u>p-value</u>
	<u>Mean</u>	<u>S.D.</u>	<u>N</u>	<u>Mean</u>	<u>S.D.</u>	<u>N</u>		
Hunting	0.56	0.79	39	0.55	0.71	33	0.105	0.4585
Developed Camping	0.03	0.85	38	0.39	0.93	33	-1.733	0.0438
Hiking	0.66	0.71	38	0.58	0.94	33	0.420	0.3379
Horse Riding	0.50	0.76	38	0.52	0.80	33	-0.082	0.4676
ORV Riding	-.35	0.98	37	-.38	1.04	34	0.129	0.4490

Additional calculations were performed without the assumption of equal population variances, and the results were virtually identical to those listed above under the assumption of equal population variances.

Complete response data are as follows:

<u>Type of Use</u>	<u>Number of responses per category:</u>					<u>Mean</u>
	<u>-2</u>	<u>-1</u>	<u>0</u>	<u>1</u>	<u>2</u>	
Case 1:						
Hunting						
State	0	1	6	2	2	0.45
National	0	0	2	3	1	0.83
Developed camping						
State	1	2	5	2	0	-.20
National	0	2	0	4	0	0.33
Hiking						
State	0	1	6	2	2	0.45

National	0 2 0 3 1	0.50
Horse riding		
State	0 0 5 4 2	0.73
National	0 2 0 3 1	0.50
ORV riding		
State	0 4 6 1 0	-.27
National	0 2 1 3 0	0.17

Case 2:

Hunting		
State	0 0 2 5 2	1.00
National	0 0 3 4 1	0.75
Developed camping		
State	0 2 6 1 0	-.11
National	0 2 2 3 1	0.38
Hiking		
State	0 0 3 6 0	0.67
National	0 0 4 3 1	0.63
Horse riding		
State	1 0 5 3 0	0.11
National	0 1 3 3 1	0.50
ORV riding		
State	4 4 1 0 0	-1.33
National	4 2 2 0 0	-1.25

Case 3:

Hunting		
State	0 1 5 1 0	0.00
National	0 2 2 6 0	0.40
Developed camping		
State	0 2 5 0 0	-.29
National	0 2 4 4 0	0.20
Hiking		
State	0 0 4 2 0	0.33
National	0 3 3 2 2	0.30
Horse riding		
State	0 0 5 1 0	0.17
National	0 0 6 3 1	0.50
ORV riding		
State	0 3 2 0 0	-.60
National	1 3 4 1 1	-.20

Case 4:

Hunting		
State	0 0 5 6 1	0.67
National	0 0 6 3 0	0.33
Developed camping		
State	0 2 4 4 2	0.50
National	0 1 3 3 2	0.67

Hiking		
State	0 0 2 8 2	1.00
National	0 0 2 6 1	0.89
Horse riding		
State	0 0 4 7 1	0.75
National	0 0 4 5 0	0.56
ORV riding		
State	0 2 4 5 1	0.42
National	0 4 4 2 0	-0.20

Officials' Perceptions of Agency Promotion of Ecosystem Management (Chapter 9)

Pooled t-tests were performed using the software package Microsoft Excel 5.0. Computer calculations of t-values and corresponding p-values were conducted with the assumption of equal variances between the two populations (state and national officials). A one-tailed test is appropriate because the hypothesis states that national officials perceive their agencies promote ecosystem management more than do state officials. The values are as follows:

<u>Agency</u>	<u>N</u>	<u>Mean Response Value</u>	<u>Standard Deviation</u>	<u>Pooled t-test t-value</u>	<u>p-value</u>
National	35	0.66	0.84		
State	38	0.39	0.82		
Combined	73			-1.35	0.0909*

Additional calculations were performed without the assumption of equal population variances, and the results were virtually identical to those listed above under the assumption of equal population variances.

Complete response data are as follows:

<u>Agency</u>	<u>Number of responses per category:</u>					<u>Mean</u>
	<u>-2</u>	<u>-1</u>	<u>0</u>	<u>1</u>	<u>2</u>	
Case 1						
State	0	2	6	3	0	0.09
National	0	1	0	5	1	0.86
Case 2						
State	0	3	4	2	0	-0.11
National	0	1	3	4	0	0.38
Case 3						
State	0	0	1	4	1	1.00
National	0	1	3	5	1	0.60
Case 4						
State	0	1	2	8	1	0.75
National	0	1	2	5	2	0.80

## TOMAS M. KOONTZ

### Education

Ph.D. in Public Policy, May 1997

Indiana University: Department of Political Science, School of Public & Environmental Affairs

M.P.A in Environmental Policy & Natural Resource Management, 1993

Indiana University: School of Public and Environmental Affairs

B.A. in Business Administration with Honors, French minor, 1989

University of Puget Sound (Tacoma, Washington)

### Academic Experience

#### Teaching

Associate Instructor, V100, Intro. to Environmental Policy, Spring 1997

Teaching Assistant, Y773, Empirical Theory and Methodology, Spring 1995 & 1996

Writing Tutor, Indiana University Writing Tutorial Services, 1994-95

Teaching Assistant, V264, Urban Policy, 1993-94

Teaching Assistant, E200, Environment and People; E400, Natural Resources, 1991-92

#### Research

Research Assistant, Workshop in Political Theory and Policy Analysis, 1994-96

Environmental Fellow, Center for Urban Policy and the Environment, 1992-93

Intern Evaluator, U.S. General Accounting Office, 1992

#### Service

Indiana University North Central Association Accreditation Committee, 1995-1997

### Publications and Professional Presentations

"Federalism and Natural Resource Management." 1996. Paper presented at Midwest Political Science Association Annual Meeting, Chicago, April 18-20. Also poster presented at Western Political Science Association Annual Meeting, San Francisco, March 14-16.

"Natural Resource Policy on Public Lands: Comparing U.S. State and National Forests." 1996. Colloquium presentation at Atkinson Graduate School of Management, Willamette University, Salem, Oregon, September 27.

"Book Review: Ray Raphael's *More Tree Talk*." 1995. *Illahee: Journal for the Northwest Environment* 10(4): 324-5.

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