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The concept of forest health has recently emerged as a focal concept for federal forest policy. At the same time, social and political conflicts over the characteristics of a healthy forest, and over the causes of poor forest health, underscore the lack of a shared understanding of what the term means. Here, social and political science approaches were used to investigate the social and political dimensions of the forest health concept. Using data from a survey of 482 residents of the Pacific Northwest, it was found that individuals' economic or environmental orientations, self-rated on a seven point scale, related strongly to their opinions regarding appropriate forest health management treatments as well as their perceived threats to forest health. While strong disagreements emerged over appropriate treatments for a forest described as "healthy," there was a general agreement that a forest described as "overstocked" should not be left to take its own course, but should be selectively thinned to improve its health. A review of all forest health-related legislation introduced into Congress between 1989 and the passage of the Healthy Forests Restoration Act (H.R. 1904) on November 21, 2003 revealed five distinct, but not mutually exclusive, policy packages

regarding forest health. The most common policy package during this period emphasized the protection of property from fire damage, although this approach was relatively uncommon in the early 1990's when other concerns dominated the forest health debate. Together these findings illustrate the range of forest health understandings in the social and political spheres and point to areas where general agreement exists, suggesting possibilities for future accord on forest health management.

Social and Political Dimensions of Forest Health

by
Jesse Abrams

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CONTRIBUTION OF AUTHORS

Erin Kelly assisted with data interpretation and writing of Chapter 2. Dr. Bruce Shindler assisted with manuscript preparation of Chapter 2. James Jared Wilton performed initial data collection and database creation for Chapter 2.

Dr. Bo Shelby assisted with manuscript preparation for Chapter 3.

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SOCIAL AND POLITICAL DIMENSIONS OF FOREST HEALTH

1. General Introduction

Over the last quarter-century, the term "forest health" has undergone a transformation from a relatively obscure ecological concept to the centerpiece of social and political conflicts over public land management (Kolb et al. 1994; Jenkins 1997; Wilton 2002). Within the past decade the term has appeared in the context of major pieces of federal forest policy such as the Northwest Forest Plan (1994), National Fire Plan (2000), Roadless Area Conservation Rule (2001), Healthy Forests Initiative (2002) and the Healthy Forests Restoration Act of 2003 (H.R. 1904). A major forest policy controversy erupted in the mid-1990's after Congress passed an appropriations bill containing a provision subsequently known as the "salvage rider." This language suspended environmental laws and judicial review for the harvest of dead or dying trees and "associated trees or trees lacking the characteristics of a healthy and viable ecosystem" (§2001(a)(3)). Public debates surrounding the salvage rider as well as more recent policies such as the Healthy Forests Initiative and Healthy Forests Restoration Act have underscored the importance of the social and political dimensions of the forest health concept.

A number of scholars, interest group representatives, and government researchers have attempted to provide meaningful definitions of forest health, but the term remains unclear even as it acts as a major driver of federal forest management. Terms such as "forest health," "forest ecosystem health," and "healthy forests" are all

conceptually related to the notion of "ecosystem health," which is often traced back to the writings of Aldo Leopold (Callicott 2000; Wilton 2002). While a variety of largely ecological-scientific definitions for ecosystem health – employing objective, quantifiable criteria – have been suggested (Costanza 1992), definitions of forest health usually include recognition of a subjective, social dimension. For example, the *Dictionary of Forestry*, published by the Society of American Foresters, defines forest health as

> The perceived condition of a forest derived from the concerns about such factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance – *note* perception and interpretation of forest health are influenced by individual and cultural viewpoints, land management objectives, spatial and temporal scales, the relative health of the stands that comprise the forest, and the appearance of the forest at a point in time. (Helms 1998)

In a similar vein, the U.S. Forest Service defined forest health in 1993 as "a condition where biotic and abiotic influences on forests (e.g., pests, pollution, silvicultural treatments, harvesting) do not threaten management objectives now or in the future." This definition emphasizes the role of human desires (management objectives) in the assessment of forest health.

While forest health is a central concept to modern federal forest management, its social and political dimensions are only beginning to receive academic attention. Kolb et al. (1994) broke new ground in separating the variety of forest health definitions into those that are "utilitarian," focused on commodity production and economic efficiency, and those described as "ecosystem," emphasizing natural conditions, biological complexity, and non-use values of forests. Jenkins (1997)

expanded on this notion to interpret controversy surrounding the forest health "crisis" of the mid-1990's. She argued, "the real crisis in our forest is that we cannot agree on what constitutes a healthy forest" (p. 14). Shindler et al. (2002) and Wilton (2002) examined the forest health perceptions of Pacific Northwest residents, finding significant differences between the perceptions of rural and urban respondents and presenting public opinion data on which forest health management decisions could be based.

Vaughn (2003) examined the political battles over elements of the Healthy Forests Initiative using theories of agenda setting, focusing events, and political rhetoric. She pointed to the important role strategic problem definition plays in the mobilization of political agendas. Nie (2003) used debates about forest health to illustrate the concept of "policy frames," causal stories that legitimize particular political solutions. He noted, "even if the various sides agree on what a healthy forest would look like, they usually disagree on what caused the problem and what therefore should be done about it" (p.321).

Taken together, these studies indicate that "forest health" is not a singular, cohesive concept, nor is it primarily a descriptive ecological concept. It is, rather, a term that varies in meaning depending on the social and political context within which it is used. This underscores the need for a closer examination of the social and political dimensions of forest health management. What do people mean when they talk about a "healthy" forest and how have understandings of forest health changed over recent years? What factors are believed to cause poor forest health and what

actions are appropriate for remediation? How do individuals' natural resource value systems relate to their views of forest health? What political and historical factors are important for understanding the development of the forest health concept? Answering questions such as these is an important step in moving forest health policies forward.

The studies presented here take off from the following assumptions about forest health: 1) the term has a strong normative element; 2) many understandings of the term are vague and implicit rather than clear and explicit; 3) definitions of the term vary according to personal and political preferences; 4) the increasing importance of the term in forest policy presents a need for further clarification of its definitions; 5) social and political research can contribute to a better understanding of the various forest health perceptions held by policymakers and members of the public.

The first study, "Value Orientation and Forest Management: The Forest Health Debate," uses data from a survey of Oregon and Washington citizens to explore the relationships between peoples' self-described environmental or economic orientations and their views of forest health. The specific issues examined are central to much of the public debate over forest health: what is the role of active management in achieving forest health? What forest health management practices are appropriate under specific forest conditions? What natural or human-caused factors are the greatest threats to forest health? Because of the strong normative dimension of the forest health concept, we can expect that peoples' individual environmental and economic priorities will influence their answers to these kinds of questions.

The second study, "What is 'Forest Health?': Trends in Public Policy from 1990 - 2003," takes off from the notion of different social understandings of forest health to examine the ways these understandings have become manifest in legislation introduced into Congress. The concept of "problem definition," which focuses on the implicit framing of public policy issues, is used to enumerate and describe various "causal stories" used by policymakers to characterize the forest health "problem." Because so little previous work has addressed the forest health concept from a political science perspective, this study should contribute much to our understanding of forest health issues.

A decade ago, Kolb et al. (1994, p. 14) wrote, "the growing use of the term [forest health] demands that natural resource managers understand health issues." The need to examine and understand the ecological, social, and political dimensions of the forest health concept still exists today. While the studies that follow use two different approaches – and different conceptual frameworks – for investigating the forest health concept, their purposes are similar: to gain more clarity on the varied definitions of forest health and the varied understandings of the forest health problem. Understanding the social and political dimensions of forest health is essential to crafting acceptable, sustainable forest management policies and practices.

2. Value Orientation and Forest Management: The Forest Health Debate

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Abstract

Among both forest practitioners and the general public, "forest health" has become an issue of contention. While the debate over which treatments will best achieve healthy forests has largely been framed by the popular media and politicians as a struggle between industry and environmentalists, the views of the general public remain unexplored. Survey results from Oregon and Washington residents were used to assess the relationships between respondents' self-described environmental or economic priorities (EEP) and the following two variables: 1) acceptability of forest management practices and 2) perceived threats to forest health. Findings indicate that active management is generally accepted by a majority of respondents, regardless of environmental or economic orientation. Disagreement emerged, however, when examining the appropriateness of specific management practices within specific forest conditions. Additionally, we found strong evidence for a relationship between self-described environmental or economic orientation and perceived threats to forest health: those with an environmental viewpoint tended to perceive human-caused factors as the largest threats, while those with an economic orientation saw naturally-occurring processes as the greatest threats. These findings suggest that it is not active management *per se* that is the issue of contention, but the specific contexts and circumstances, as well as management practices employed, that define the major divisions in the forest health debate.

Introduction

Recent national debates over forest health have illuminated a range of viewpoints regarding desirable forest practices and conditions. Two major endpoints of this ideological continuum have been clearly delineated by interest groups representing environmentalism on the one hand and resource extraction interests on the other. While the national debate has largely been framed by these interest groups, forest health perspectives of the general public have been less visible. It is not clear to what degree public perspectives have been adequately represented by the groups at these polarized endpoints. There is clearly a range of natural resource value systems among members of the public (Brown and Harris 1992), with nuances that may not be reflected in the arenas of interest group pluralism (Baker and Kusel 2003). The interests and demands of the public will ultimately affect how forest health policies are implemented and accepted. Thus, there exists a compelling need to understand citizens' expectations and desires regarding forest health policies (Shindler and others 2002a) and to explore factors that may help explain pubic perceptions.

High-profile wildfire seasons throughout the 1990's and 2000's have brought the issue of forest health to the public's attention. In the autumn of 2002, the Bush administration introduced the Healthy Forests Initiative as a means of addressing forest health on public lands. Elements of the President's plan were passed by Congress as the Healthy Forests Restoration Act of 2003 (H.R. 1904). The Act's focus is on reducing fuel loads on public forestlands considered to be at high risk of "catastrophic" wildfires. Treatments to reduce these fuel loads involve active

management of forest lands, including thinning and prescribed fires. Both the Presidential Initiative and the Congressional legislation have sparked public debate over the very definition of a healthy forest, and how healthy forest conditions can (or cannot) be met through management.

The forest health controversy appears to be a microcosm of the larger debate over the purposes and management of federal forestlands, and ultimately the role of humans in the forest. Much of the politics and rhetoric surrounding the forest health concept has involved normative judgments about human manipulation of federal forestlands. This has encompassed such topics as the land management role of the federal government, the fate of rural, forest-dependent communities, and commercial logging on public lands (Shindler and others 2002a).

Because of the importance of including public values in land use decision-making (Bliss 2000, Shindler and others 2002b, Kennedy and Thomas 1995), there is a need to examine public opinions about forest health. In this study, we focus on the Pacific Northwest of the United States, specifically Oregon and Washington (Figure 2.1). This region has been a major battleground for federal forest policy conflicts, most recently over forest health issues. Shindler and others (2002a) examined differences in the Pacific Northwest between rural and urban residents' perspectives on forest health conditions and management practices. In this paper, we draw on the same study to examine forest health and management and its relationship to people's self-described economic or environmental orientations. There is reason to believe that differences within this range of natural resource values translate into different

perspectives regarding forest health conditions and the appropriateness of management practices. Public concerns about forest health may not be as simple as being "for" or "against" a specific practice; rather, more thoughtful deliberation by land management professionals that reflects the nuances and range of public opinion is probably warranted.

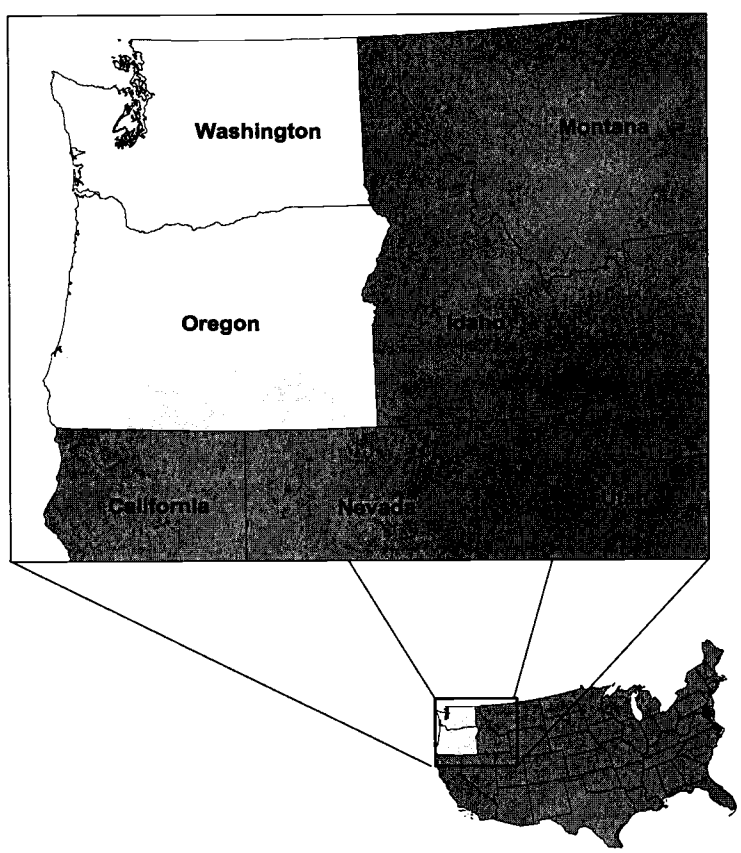

Figure 2.1. Survey respondents reside in Oregon and Washington, in the United States of America.

Background and Framework

Previous research has established strong evidence of links between social values and forest management preferences, and there is reason to believe that values may influence forest health perceptions as well (Kolb and others 1994, Jenkins 1997). Differing concepts of forest health may relate to notions of what are, and are not, appropriate human-nature interactions; the concepts of "biocentrism" and "anthropocentrism" help to illustrate these core understandings of human relationships with the natural world (List 1996). The biocentric viewpoint considers the natural world to be inherently valuable, outside of any material benefits it might provide to humans. The anthropocentric perspective, on the other hand, measures the value of the natural world in terms of its ability to provide tangible benefits, including economic benefits, to humans.

Individuals' environmental and economic orientations have been found to vary according to a number of demographic variables, such as gender, age, size of respondent's town, and levels of education and income. More environmental or biocentric orientations have been found to correspond with people who: are younger (Lowe and Pinhey 1982, Jones and Dunlap 1992, Steel and others 1994), hail from larger towns (Shindler and others 2002a), and have higher income and education levels (Vaske and others 2001). In addition, women have been found to have a more biocentric view of nature than men (Fortmann and Kusel 1990). Logically, economic orientations have been found to correspond to the following demographic factors: higher age, residence in smaller towns, and lower income and education levels.

Previous research has explored the relationships between these broadly-defined belief systems and perceptions regarding forest management issues (e.g., Shindler and others 1993, Brown and Harris 1992). Tindall (2003) pointed to differences between those with ecologically-oriented values and those with economically-oriented values regarding the visual acceptability of clearcutting and other management practices, with economically-oriented individuals showing more support for clearcutting. Steel and others (1994) found that respondents with a biocentric orientation were more likely to support policies that minimized human intervention in the landscape, such as banning clearcutting, establishing more wilderness areas and protecting old-growth forests. The anthropocentric respondents in this study favored economic uses of federal land, including logging in wilderness areas, emphasizing timber production, and setting aside environmental laws that conflict with resource-based employment. Brown and Reed (2000) found that respondents with an "economic" value orientation showed more support for human uses of the forest such as commercial logging, mining, and drilling and motorized recreation, while those with an "intrinsic" value orientation held negative attitudes toward commercial mining and logging and positive attitudes toward wilderness designation.

Because identifying a forest as "healthy" or "unhealthy" involves a normative evaluation of forest conditions, we would expect core values such as "biocentrism" and "anthropocentrism" to affect forest health perceptions. An individual's evaluation of the health of a forest involves more than just the forest itself; it entails the projection of that person's values, beliefs, and understandings onto the landscape

(Greider and Garkovich 1994). Research on perceptions of forest health has pointed to a discrepancy in conceptions among the public. Kolb and others (1994) describe two primary understandings of forest health: a "utilitarian" view, similar to anthropocentrism, in which the health of a forest is measured by its ability to provide material benefits to humans or meet specified management objectives, and an "ecosystem view," which emphasizes basic ecological processes and incorporates concepts such as "balance," "function," and "resilience." Jenkins (1997) expanded on this conceptual divide as a means of interpreting social and political responses to the "forest health crisis" of the mid-1990's, concluding, "the real crisis in our forest is that we cannot agree on what constitutes a healthy forest" (p. 14). As evidence, Shindler and others (2002a) found differences between urban and rural residents of the Pacific Northwest in their opinion of the health of Northwest forests and, to some degree, their selection of appropriate forest health indicators.

Environmentalist viewpoints, which can be described as ecosystem/biocentric (Brown and Harris 1992), are often believed to include a "nature knows best" philosophy (Hull and others 2001), suggesting a preference for more of a passive management approach to achieving forest health. This has often led to a characterization of environmentalists as advocating a "hands-off" management approach to federal forests, and has been a common element in policy debates surrounding forest health. For example, in 1992 Bob Packwood, U.S. Senator from Oregon, opined during a subcommittee hearing on forest health:

> Many in the environmental community believe people are incapable of good work where nature is concerned. They also believe the natural world is very fragile and that hands off is the best policy. [But] this could not be farther from the truth... We cannot walk away and leave these forests. We are going to have to do something to restore their health (Subcommittee on Public Lands, National Parks and Forests 1992, p. 80).

More recently, Arizona Representative Jeff Fluke complained of "so-called environmentalists who want nothing more than to stop all forest thinning" (Little 2003, p. 45).

At the same time, timber industry advocates, who tend to be more anthropocentric/ utilitarian (Brown and Harris 1992), have been portrayed as focused on the economic value of trees, often to the exclusion of all other forest uses. Bernard Zaleha, of the Idaho Sporting Congress, argued, "private corporations, and their servant, the Forest Service, are not in the business of protecting forests, but of logging, period" (Task Force on Salvage Timber and Forest Health 1995, p. 11).

Much of the recent controversy surrounding forest health – and now the Healthy Forests Restoration Act – has been portrayed as a battle between environmentalists, who desire a passive management approach to forest health, and timber industry advocates, who simply want to increase the amount of commercial logging on federal lands. This characterization overlooks the views of the general public, and it is the public that ultimately owns the federal forests (Stankey 1995). For example, Shindler and others (1993) found that over 40% of a random sample of Oregonians and citizens nationwide favored a balance between natural conditions and economic considerations. A thorough examination of the forest health issue must

necessarily include the value orientations of the general public and their opinions regarding specific elements of managing for forest health. This investigation uses the environmental and economic priorities of citizens of the Pacific Northwest to better understand their views of forest health.

Methods

A survey of federal forest conditions was distributed to 949 rural and urban households in Oregon and Washington (Figure 2.1) in 2001-2002. 482 surveys were completed and returned for a 51% response rate. Researchers employed a stratified random sample technique, with rural households over-sampled in order to ensure that this important demographic was included in adequate numbers. This survey was developed based on pilot studies involving focus groups in 14 communities and research objectives provided by the Region 6 Ecosystem Health team of the U.S. Forest Service.

This study used a seven-point Likert scale to assess environmental or economic orientation, with 1 representing "highest preference for natural conditions" and 7 representing "highest preference for economic considerations." We refer to this scale as the Environmental-Economic Priority (EEP) scale. We employed this continuum approach with the intention of capturing a more accurate reflection of public opinion than is commonly attained using dichotomous environmental or economic orientation measures. Respondents indicated their placement along this seven-point scale by

circling the number that best represented their preferred trade-off between economic and environmental priorities.

Two indices were created to test respondents' perceived threats to forest health. An index is a single variable created from a composite of separate, logically related variables (Babbie 1992). Each of the indices in our study included elements that fit logically together in a forest health paradigm. The NATURE-THREAT index measures agreement with the notion that naturally-occurring forest disturbances coupled with a lack of human intervention are the greatest threats to healthy forest conditions. This index includes potential forest health threats such as insect outbreaks, wildfires, and over-crowded stands (see Table 2.3). The HUMAN-THREAT index measures agreement with the idea that human intervention in natural systems and processes is itself the greatest threat to forest health, and so includes factors like over harvesting, forest fragmentation, and fire suppression (see Table 2.3).

We tested respondents' EEP scores (Figure 2.2) against their opinions regarding:

- the acceptability of active management generally,
- the appropriateness of particular management practices, and
- perceived threats to forest health.

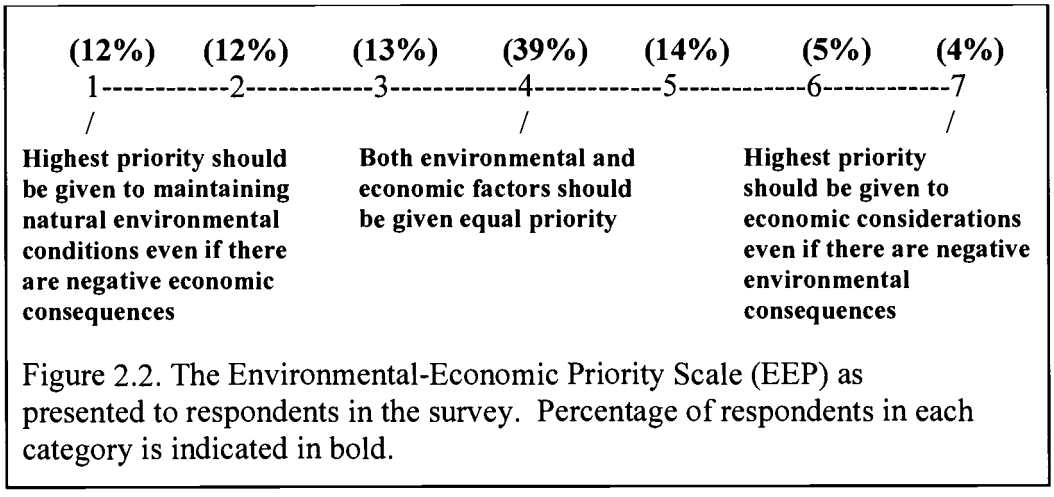

Figure 2.2. The Environmental-Economic Priority Scale (EEP) as presented to respondents in the survey. Percentage of respondents in each category is indicated in bold.

We investigated the notion that people's environmental or economic priorities, as represented by their EEP scores, are an influencing factor in their assessment of forest health conditions and management practices. Anthropocentric and biocentric perspectives correspond to the endpoints of our continuum, with low EEP scores reflecting biocentric views, and anthropocentric views indicated by high EEP scores. Specifically, we explored the following hypotheses:

H1: Respondents with lower EEP scores – a more environmental orientation – will show less support for active management generally than those with higher EEP scores.

H2: Respondents with different EEP scores (different economic or environmental orientations) will report different levels of acceptability regarding specific management practices to achieve forest health.

H3: Respondents with different EEP scores will have different perceptions of threats to forest health. Specifically, those with lower EEP scores (environmentally-oriented) will perceive human factors as larger threats, while those with higher EEP scores (economically-oriented) will perceive naturally occurring processes as larger threats.

Results

Demographics and the EEP Scale

The distribution of respondents across the EEP scale showed a relatively bell-shaped pattern (Figure 2.2). The largest single group indicated having equal priorities for economic and environmental concerns on the EEP scale. Overall, more respondents identified with an environmental orientation (37%) than an economic orientation (23%) on the EEP scale. The EEP scale, when used as a dependent variable and tested against demographic information (Table 2.1) yielded the following findings. Respondents' EEP scores were correlated with factors such as gender, age, size of town where the respondent resides, educational attainment, and income. In our sample, women tended to be slightly more environmentally-oriented than men. Higher EEP scores (more economically-oriented) correlated positively with: older respondents, people from smaller towns, and those with lower levels of education and income. Lower EEP scores (more environmentally-oriented) correlated positively with: younger respondents, people from larger towns, and those with higher levels of education and income.

Table 2.1.
Demographics of the Environmental-Economic Priority scale[a]

	Pearson's *R*
Gender (M=0, F=1)	-.097*
Age	.155**
Size of town (from "rural" to "city of >500,000")	-.235**
Education level (from "some high school" to "graduate/professional degree")	-.180**
Income	-.098*

a. Scale for the Dependent Variable (EEP scale) ranges from 1 = environmentally-oriented to 7 = economically-oriented

* = significant at $p \leq .05$
** = significant at $p \leq .01$

EEP as an Independent Variable

For the remainder of our analyses, we use respondents' EEP scores as the independent variable to investigate how well economic or environmental orientation correlates with various opinions surrounding the forest health concept.

Acceptability of management in general

Respondents were asked for their level of agreement on a five-point scale, from strongly agree to strongly disagree, with the statement: "sustaining healthy forests requires long-term active management." A test of correlation between respondents' EEP scores and their response to this question revealed no significant difference (Pearson's R = -.039, one-tailed p = .211), showing a lack of support for hypothesis H1. Respondents across the EEP scale showed high levels of support for active management. At least 82% of respondents in each of the seven categories answered that they strongly agreed or agreed with the statement. This finding contradicts the view that people with environmental orientations only accept a passive management approach to forest health.

Acceptability of particular management practices

Respondents used a five-point scale to rate whether particular practices were acceptable or unacceptable for purposes of achieving or maintaining forest health under two different forest conditions: "overstocked" and "healthy" (Table 2.2). An overstocked forest was defined in the survey as "one with dense stands of trees where tree growth and other vegetation is inhibited. May be subject to disease and insect infestation as well as wildfire." A healthy forest was defined as "one with sufficient numbers of green trees and plants, native wildlife habitat, stable soil, little disease or insect damage, and opportunities for recreation."

Table 2.2.
Overall acceptance levels and correlation between Environmental-Economic Priority (EEP) score[a] and approval of various forest management activities[b] under two forest conditions: overstocked and healthy

Management Practice:	*Forest Condition:*	
	Overstocked	Healthy
Selectively thin trees	88% .134*	50% .279*
Use prescribed fire to control forest fuels	39% .176*	27% .210*
Extinguish all forest fires	24% .178*	29% .186*
Clear-cut logging	12% .251*	7% .249*
Let nature take its course	8% -.170*	37% -.264*

a. The EEP score ranges from 1 = environmentally-oriented to 7 = economically-oriented
b. Respondents were asked to indicate what practices from a supplied list were acceptable under different forest conditions

* = significant at $p \leq .01$

Note: Positive correlation scores represent higher levels of support from economically-oriented respondents; negative scores represent higher levels of support from environmentally-oriented respondents

Under both conditions, selective thinning received the most support among respondents; 88% supported the practice in an overstocked forest while 50% expressed support for thinning healthy forests. Very few respondents supported the practice of

clearcutting as a management option for either overstocked forests or healthy forests. Extinguishing all fires and the use of prescribed fire were supported by between 24 and 39 percent of respondents, depending on condition (overstocked or healthy). As for letting nature take its course, 8% supported this option in an overstocked forest while 37% agreed with this approach in a healthy forest.

For all management practices, in both forest conditions, levels of acceptance correlated significantly with EEP scores (Table 2.2). Acceptance levels of all active management approaches (clearcutting, selective thinning, extinguishing all fires, and using prescribed fire) were correlated with higher EEP scores (more economically-oriented). Acceptance of "letting nature take its course" was correlated with lower EEP scores (more environmentally-oriented). Our findings provide support for hypothesis H2. We have illustrated these patterns graphically in Figure 2.3 by reporting scores for each activity across the EEP spectrum. Note that graphs in Figure 2.3 are not sufficient for statistical comparisons (recall that group 4 contains nearly ten times the number of respondents as group 7). Rather, they are provided here for visual reference.

In the context of a healthy forest, there was considerable disagreement over both selective thinning and letting nature take its course, with large correlation coefficients indicating strong relationships with EEP score (Table 2.2). The practice of thinning was supported much more strongly by economically-oriented respondents, while letting nature take its course showed greater support among environmentally-oriented respondents.

On the other hand, support for clearcut logging was low among all respondents under both overstocked and healthy forest conditions. Economically-oriented respondents were much more supportive of the practice in both conditions, but Figure 2.3 shows that support was consistently low among all EEP groups. There was a lack of general agreement on the use of prescribed fire and extinguishing all fires, but support for these practices showed relatively lower correlations with EEP score.

While a majority of respondents in all seven EEP categories agreed that maintaining healthy forests requires long-term active management, there is clearly disagreement regarding the specific types of management that are appropriate under different forest conditions.

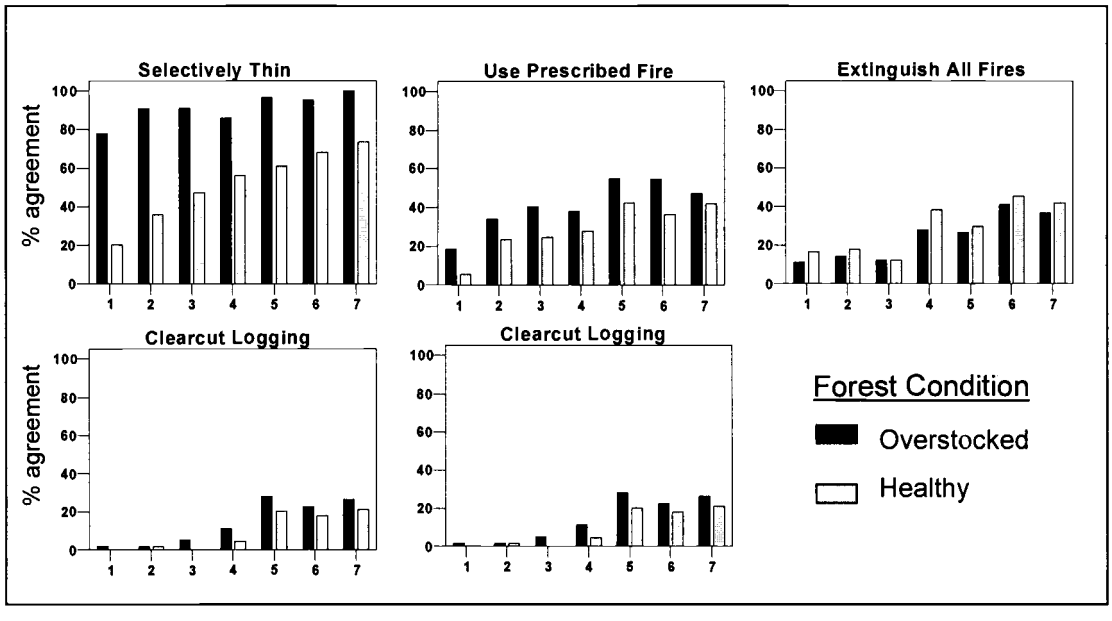

Figure 2.3 Percentage of respondents (Y-axis) agreeing with particular management practices on two forest conditions ("overstocked" and "healthy"). Respondents are grouped (X-axis) on a continuum from 1 = environmentally-oriented to 7 = economically-oriented.

Perceived threats to forest health

Respondents were asked to indicate perceived threats to forest health from a provided list. Responses were subsequently grouped according to two general approaches to viewing threats to forest health (Table 2.3). The HUMAN-THREAT index measures threats arising from human intervention and activity. The NATURE-THREAT index consists of threats that are naturally-occurring, or result from a lack of human intervention. We found very strong relationships between both indices and respondents' scores on the EEP scale (Table 2.3). Specifically, respondents with lower EEP scores (environmentally-oriented) were more likely to perceive human activities as threats to forest health. Conversely, EEP score correlated positively with the NATURE-THREAT index. Economically-oriented respondents were more likely to view natural disturbances and a lack of human intervention as threats to forest health. These findings provide support for H3.

Looking at respondents' ratings overall, it is clear that some factors are widely viewed as threats. Insect and disease outbreaks (90%), over harvesting (82%), over-crowded stands of trees (73%), impacts from motorized recreation (72%), and wildfires (70%) were the factors most commonly cited as threats. These represent both the HUMAN-THREAT and NATURE-THREAT approaches. Large numbers of respondents, regardless of orientation, view both human-caused and naturally-occurring factors as threats to healthy forests.

Table 2.3.
Indices created to assess perceived threats to healthy forest conditions[a] and percent of respondents answering "Agree" or "Strongly Agree" that the factor is a threat to forest health

HUMAN-THREAT index:		
Over harvesting	82%	Cronbach's Alpha: .72
Impacts from motorized recreation	72%	n 229
Road building in forests	54%	**Correlation**
Fire suppression	48%	**(with EEP scale[b]): -.523***
Too much forest fragmentation	43%	
NATURE-THREAT index:		
Insect/disease outbreaks	90%	Cronbach's Alpha: .69
Over-crowded stands of trees	73%	n 300
Wildfires	70%	**Correlation**
Too little harvesting	52%	**(with EEP scle[b]): .564***
Too many areas being set aside and "locked up" from management	48%	

a. Respondents were asked indicate 1 = strongly disagree to 4 = strongly agree that the stated factor was a threat to forest health. Respondents who answered "No Opinion" were excluded from this analysis.
b. The EEP scale ranges from 1 = environmentally-oriented to 7 = economically-oriented. Pearson's *R* test of correlation used.

* = significant at $p \leq .01$

Discussion

A number of interesting patterns emerged from this investigation. While respondents across the EEP spectrum showed high levels of support for active management generally, specific questions revealed sharp differences in what kinds of management were considered appropriate under different conditions. Furthermore,

respondents across the EEP spectrum disagreed on what kinds of threats to forest health (naturally-occurring or human-caused) were the most pressing.

Our results demonstrate that residents of Oregon and Washington can make distinctions between different forest health conditions and management practices, and that their evaluations of these are strongly related to core economic and environmental values. These values represent people's fundamental ideas regarding the relationship between humans and nature. A central finding of this study is that the divide between ecosystem and utilitarian perspectives of forest health, described by Kolb and others (1994), does exist and can be useful for explaining many of our results. At the same time, a majority of respondents fall somewhere in the middle along the EEP continuum, and cannot be said to espouse strictly "anthropocentric" or "biocentric" perspectives.

While there appears to be a consensus among respondents that active management is a necessary element in the maintenance of healthy forests, this agreement breaks down when respondents are asked to evaluate specific forest conditions and practices. Our results underscore the notion presented by previous researchers (Kolb and others 1994, Jenkins 1997, Shindler and others 2002a) that "forest health" is not a singular, coherent concept but rather includes multiple, contrasting social perspectives.

Much of the disagreement over appropriate practices may be explained by the contrasting management objectives of individuals with anthropocentric and biocentric outlooks. Steel and others (1994), Brown and Reed (2000), and Tindall (2003)

reported that anthropocentric individuals see resource extraction as an appropriate and desirable use for forests, so it follows that their views of forest health include a place for management activities that produce useable and salable goods. Under this view, factors such as wildfires, insects, and disease are considered to be forest health threats because they harm or devalue harvestable timber. As Kolb and others (1994) point out, the utilitarian view measures forest health primarily by assessing the health of individual trees.

Biocentric individuals, who tend to value forests more as natural ecosystems than as sources for human commodities, logically assess forest health in terms of natural ecosystem functioning, often at larger spatial and temporal scales. Activities that interfere with natural processes (such as fire suppression) or alter natural conditions (such as fragmentation or overharvesting) are considered to threaten forest health. On the other hand, naturally-occurring disturbance factors (such as disease and insects) are not necessarily indicative of poor forest health. Kolb and others (1994, p. 14) point out that "A dead tree is not healthy, but [under an ecosystem perspective] it may be part of a healthy stand."

Individuals preferring a balance between economic and environmental priorities perceive a variety of forest health threats, both naturally-occurring and human-caused, and appear to favor management intervention in some, but not all, circumstances. Their assessments of forest health tend to fall midway between the biocentric and anthropocentric perspectives. Individuals near the "middle" of the

biocentric-anthropocentric continuum may represent a silent majority, and a need exists to further examine their forest health perceptions.

It would be oversimplification to suggest that the entire forest health debate falls on either side of the environmental-economic divide. The widespread support for thinning of overstocked stands, broad agreement on a number of forest health threats, and the rejection of both clearcutting and of letting an overstocked forest "take its own course" suggest a region of accord among the general population. There appears to be agreement that forest health will not be achieved through industrial-style timber production, nor will it result from a lack of management in overstocked forests. By and large, people expect managers to apply active management to forests in poor health, but they do not believe traditional commercial forest management approaches are appropriate when the desired outcome is a healthy forest. These "sidebars" may be useful for beginning to build a broader societal vision of how to manage for healthy forests.

Levels of support for specific management practices are clearly contextual. Treatments that were judged to be appropriate in an overstocked stand (such as selective thinning) were not necessarily appropriate in a healthy stand. This suggests that respondents make distinctions between the restoration of degraded forests to a healthy condition and the maintenance of forests that are already healthy. There appears to be much greater agreement regarding appropriate management actions for an overstocked forest (thinning is strongly supported, passive management is strongly rejected) than for a healthy forest. While most respondents support some kind of

active management of "unhealthy" forests, there appears to be less agreement on whether currently "healthy" forests need management to remain healthy.

Anthropocentric individuals may not perceive a forest as "healthy" unless it provides some economic returns (such as would occur through thinning), while biocentric individuals may see such commercial activity as degrading a healthy stand that should essentially be "left alone." Disagreements regarding appropriate management practices for a currently "healthy" forest point again to the notion that contrasting management objectives (e.g. managing for economic outputs versus managing for "naturalness") lead to contrasting assessments of appropriate practices. This discord over how to manage healthy forests indicates an area of contention that land managers and policymakers will have to address with the public.

The relationship between economic or environmental orientation and attitudes toward the role of fire is likewise complex. While most respondents believed that wildfires are a threat to forest health, a division emerged over whether fire suppression is an appropriate response, or whether suppression itself constitutes a greater threat. Environmentally-oriented respondents point to past and current fire suppression as a cause of poor forest health, and see a place for "catastrophic change in vegetation composition" (Kolb and others 1994, p. 13) in a healthy forest. The greater support for fire suppression by economically-oriented respondents fits well into a "utilitarian" view of forest health, wherein humans are expected to prevent natural forces from causing tree mortality and the loss of economic potential. The support for prescribed fire by economically-oriented individuals indicates a positive attitude towards fire, so

long as it is controlled (rather than wild) and is applied in order to meet management objectives. Prescribed fire, then, is seen as a management tool rather than a "natural" part of a forest ecosystem.

Conclusions

These findings underscore the notion that the term "forest health" has important social dimensions, and that beliefs and opinions regarding forest health management must be made explicit. Members of the public possess a wide variety of views about what forest health threats are the most pressing and what actions are appropriate for achieving forest health. These views may differ widely from the forest health perceptions of land managers. Unless these various understandings are specifically explored, we can expect continued miscommunication as people use the same term – "forest health" – to refer to vastly different goals and expectations.

Portraying the forest health debate as a simple choice between active and passive management fails to address important elements of public opinion. Rather, major divisions appear to include differing perceptions of forest health threats and the appropriateness of specific practices within specific contexts. Findings here point to the need for more clarity regarding the components of a healthy forest, and how specific practices contribute to maintaining these conditions, as opposed to the question of whether or not management should occur at all. Because forest health perceptions appear to be related to management objectives, there is also a need for greater clarity regarding expectations for individual forests; whether a stand is

managed primarily for timber, wildlife, or fire protection (all of which could be components of a "healthy forest") will undoubtedly affect people's views of appropriate treatments.

Justifying a management action solely on the basis that it promotes "forest health" does little to address the complexities of public understandings of the term. Land managers will need to be explicit and specific about: 1) the current state of the forest (overstocked, fire-prone, "healthy," etc.); 2) proposed management practices (where, how, and why the practices will occur); and 3) assumptions regarding threats to forest health (including naturally-occurring and human-caused threats). In particular, they should take care to distinguish between management intended to restore stands that have become degraded over time and management to achieve other objectives in currently healthy forests. Too often, the nuances of public opinions are oversimplified, misrepresenting people's complex views of forest health. If "forest health" is going to continue to be an important focus of forest management and policy, we need to recognize the lack of universal agreement about the concept, and start grappling with the complexities of achieving and maintaining healthy forests.

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3. What is "Forest Health?": Trends in Public Policy from 1990 – 2003

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Abstract

"Forest health" has emerged as a focus of federal forest policy in recent years, even while a clear understanding of the term is lacking. Theories of problem definition were used to analyze the various definitions of "forest health" in legislation introduced into Congress between 1990 and the passage of the Healthy Forests Restoration Act in 2003. Five different approaches to forest health policy were found. Of these, the policy focused on fire prevention and the protection of private property has become dominant in recent years. Other forest health problem definitions focus on revising environmental laws, assisting rural communities, encouraging scientific research, and preventing resource extraction on public forestlands. These approaches have increasingly incorporated concerns with fire and property protection as a means of gaining political support. Throughout this period, competing "causal stories" have defined forest health in ways that produce desired political outcomes; in this sense, the forest health debate is a new framing of old political battles.

Introduction

On December 3, 2003, President George W. Bush signed into law H.R. 1904, the Healthy Forests Restoration Act (HFRA). This bill, which cosponsor Greg Walden called a "pinnacle of forest management - the most comprehensive piece of forest legislation to be enacted in at least a generation" (McCall, 2004), was not the first of its kind to be introduced into Congress, but was among a handful of forest health-related bills passed by both houses. For over a decade prior to the passage of

HFRA, the issue of "forest health" became an increasingly important focus of federal forest management. Some of the most divisive forest policy struggles of this period, including those surrounding the 1995 rescissions act "salvage rider" (H.R. 1944) and HFRA itself, involved vast disagreements about what it meant for a forest to be in good or bad "health" (Jenkins 1997).

Federal forest management is ultimately guided by the laws considered and passed by Congress, so examining Congressional definitions of forest health is an important element in understanding past trends and future trajectories in forest policy. Public policy, including forest policy, is largely shaped by what Congress considers to be "problems" and how these problems are defined (Stone, 1989; Rochefort and Cobb, 1994; Burstein and Bricher, 1997). In the present paper we examine how Congress has understood the concept of forest health on federal land over the years 1990-2003 by considering problem definitions implicit within introduced legislation.

Problem Definition and Policy Analysis

The problem definition approach to policy analysis has its roots in three complementary schools of thought (Rochefort and Cobb 1994). Theory of *social conflict in politics* emphasizes the role of power struggles and the fluctuation of public attention in the dynamics of public policy. The theory of *socially constructed reality* holds that problems do not exist objectively, but come to exist only when they are defined as problems. For example, Stone (1989) describes how rhetoric and image manipulation are used to transform "conditions" formerly attributed to nature or

accident into "problems" perceived as human-caused and requiring government intervention. Finally, problem definition takes lessons from *postmodernism*, with its focus on revealing the value systems and power structures invisibly embedded into the elements of social reality.

The problem definition approach to policy analysis assumes that the policymaking process is not rational and orderly[1], but more accurately resembles a "garbage can" (Fiorino 1995) or a "primeval soup" (Kingdon 1995). Theories of problem definition focus on the means by which problems are constructed and promoted in this nonrational policymaking environment, often through symbols, images, and stories. Stone (1989, p.282) describes problem definition as "a process of image making, where the images have to do fundamentally with attributing cause, blame, and responsibility." Policy analysis through problem definition explicitly investigates these symbols and images and the stories they convey.

Central to the problem definition approach to policy analysis is the concept of "causal stories" (Stone, 1989, 2002; Rochefort and Cobb, 1993), the implicit narratives underlying various policy alternatives. Political actors use causal stories to "describe harms and difficulties, attribute them to actions of other individuals or organizations, and thereby claim the right to invoke government power to stop the harm" (Stone, 1989, p. 282). Causal stories legitimize and support specific policies through implicit narratives which serve to: 1) define the nature of the problem, 2) assign blame to a particular set of people or actions, and 3) legitimize the intervention

of government. Solutions to the problem then follow logically from the way the problem is defined (Houston and Richardson, 2000).

For example, during his introduction of the Healthy Forests Initiative on August 22, 2002, President Bush declared:

> we have a problem with the regulatory body there in Washington. I mean, there's so many regulations, and so much red tape, that it takes a little bit of effort to ball up the efforts to make the forests healthy. And plus, there's just too many lawsuits, just endless litigation...there's a fine balance between people expressing their selves and their opinions and using litigation to keep the United States of America from enacting common sense forest policy. (Remarks in Central Point, Oregon, August 22, 2002)

The administration thus characterized the forest health problem primarily as one of ill-intentioned individuals and interest groups exploiting an overly complex set of environmental laws in order to stop common sense forest management. The policy proposal that followed logically from this definition of the problem was to revise existing forest policy, reducing environmental analysis and making it harder for individuals to challenge agency decisions. In contrast, environmental interests denied the existence of a forest health "crisis" (Aplet 1992) or defined it so as to blame resource extraction activities for declining forest health (DellaSala et al. 1995).

Problem definition analysis involves examining the causal stories embedded in policy alternatives to determine how they define the problem, assign blame for the problem, and envision government intervention. In the context of forest health policy, the fundamental questions are: 1) What is the forest health "problem," and what does it mean for a forest to be healthy? 2) What people, institutions, or actions are to blame

for a loss of forest health? 3) What is the role of government in addressing the forest health problem?

The Forest Health Concept

While "forest health," "forest ecosystem health," and "healthy forests" have become focal concepts for federal forest management in recent years, broad agreement about what these terms mean is lacking (Costanza, 1992; Kolb, Wagner, and Covington, 1994; Edmonds, Agee, and Gara, 2000; Wilton, 2002). An exploration of the varied scientific and popular understandings of forest health helps to illuminate Congressional uses of the term. Modern understandings of these concepts are often traced back to Aldo Leopold's notion of "land health" (Callicot, 1992; Kolb, Wagner, and Covington, 1994; Wilton, 2002), which he defined as "the capacity of the land for self-renewal" (Leopold, [1949] 1987, p. 221). Leopold's concept of land health has informed a variety of "ecological-scientific" definitions of ecosystem health and forest health (Haskell, Norton, and Costanza, 1992; O'Laughlin et al., 1994). For example, Costanza (1992) lists six general definitions of ecosystem health: health as homeostasis; as the absence of disease; as diversity or complexity; as stability or resilience; as vigor or scope for growth; and as balance between system components.

Recently, scholars have begun to explore "socio-political" definitions of forest health, although these usually incorporate ecological components. Explorations of the social dimensions of the concept often point to a divide between anthropocentric and biocentric views of forest health. For example, Kolb, Wagner, and Covington (1994)

describe two primary understandings of forest health: a utilitarian view, in which the health of a forest is measured by its ability to provide material benefits to humans (or meet specified management objectives), and an ecosystem view, which emphasizes basic ecological processes and incorporates concepts such as "balance," "function," and "resilience." Jenkins (1997, p.14) expands on this conceptual divide as a means of interpreting social and political responses to the "forest health crisis" of the mid-1990's, concluding, "the real crisis in our forest is that we cannot agree on what constitutes a healthy forest."

Ross et al. (1997) explored the metaphorical nature of the term "ecosystem health" in science and public policy. They emphasize the normative dimension of the term: "Ecosystems...are always silent and someone must (normatively) speak for nature and tell us what is to be considered sick or distressed" (p. 119). They observe, "More than a mere heuristic device, the metaphor [of ecosystem health] also sets the types of questions that are suitable for asking and provides a guide with respect to suitable answers" (p. 121).

Several authors have noted the symbolic power of medical or disease metaphors in the framing of policy issues (Rochefort and Cobb, 1994; Ross et al., 1997; Stone, 2002). Describing forest conditions as "healthy" or "unhealthy" not only provides a set of normative evaluations, it also creates a psychological connection to common human experiences of poor health, treatment, and recovery. Yet because of its reference to ecological – rather than human – systems, and because of the complexity of the biological and social dimensions of forest management, the term

"forest health" retains a high degree of ambiguity. Stone (2002, p. 157) argues that ambiguity is an essential component of the use of symbolism in politics, enabling "the transformation of individual intentions and actions into collective results and purposes."

The forest health concept can be clarified through problem definition analysis. Previous research has explored problem definitions in policy arenas such as affirmative action (Gamson and Modigliani, 1987), air bag safety (Houston and Richardson, 2000) and work, family, and gender (Burstein, Bricher, and Einwohner, 1995; Burstein and Bricher, 1997) through content analysis of Congressional hearings, committee reports, introduced legislation, and popular media. We follow these approaches in examining forest health problem definitions contained in legislation introduced into Congress. Forest health policy transcends any single branch of government, but our analysis focuses on Congress because of its central role in directing federal land management.

Methods

The Lexis-Nexis Congressional and Library of Congress THOMAS databases were used to search for all bills containing references to forest health, healthy forests, or ecosystem health in the context of forestlands anywhere within the bill text. Bills meeting the search criteria included both those in which "forest health" (or related terms) appeared in the bill text but was not an overarching focus, and those where forest health was referred to extensively throughout the bill text, and often in the title

as well. Only bills pertaining to health on federal forestlands (National Forest System lands or Bureau of Land Management lands) were included, and resolutions with no substantive provisions were excluded. The search period was from 1990 through the passage of HFRA on November 21, 2003[2]. In all cases, the latest (most recent) version of each bill was used for analysis.

Each bill was individually analyzed to extract forest health problem definitions. We paid special attention to language within the bill text implicitly or explicitly defining a "healthy forest" and attributing causal blame for unhealthy forest conditions to people, actions, or institutions. For example, language empowering one group of individuals (e.g. rural community members or scientists) indicates a story in which that group has historically been unable to contribute their full potential to creating healthy forests. Language disempowering another group (e.g. environmental organizations or timber companies) implies that they share at least some of the blame for unhealthy conditions.

After examining the various forest health problem definitions within the bills, the definitions were collapsed into major categories representing the "policy packages" appearing most frequently in introduced legislation. A policy package represents a coherent characterization of a policy problem, which may include a range of policy positions (Gamson and Modigliani 1987). Different policy packages contain distinct, though not necessarily mutually exclusive, problem definitions and causal stories (Burstein and Bricher 1997). It is not uncommon for single political actors to espouse multiple problem definitions (Houston and Richardson 2000), nor do

individual bills always represent single policy packages. Each bill considered here was coded for a single policy package if one was clearly dominant, or for two packages if both were important elements of the bill. Each bill was also coded for year of introduction, political party of the bill's primary sponsor, and whether it was an appropriations[3] or a substantive (non-appropriations) bill.

Results and Discussion

Numbers of bills

In total, 116 bills met the criteria for inclusion into the data set. Forest health-related bills were introduced each year from 1990 to 2003 (Figure 3.1), with the largest numbers introduced in 1995 (14), 2002 (18), and 2003 (20) and the smallest in 1990 (2), 1993 (3), 2000 (3), and 2001 (3). The large number in 2002-03 represents competing forest health bills crafted in response to the Bush administration's Healthy Forests Initiative, announced in 2002. The smaller peak in 1995 reflects battles between President Clinton and the Republican Congress over a variety of appropriations and rescissions bills containing forest health language.

Of the 116 bills, 78 (67%) were sponsored by Republicans and 38 (33%) by Democrats (Figure 3.1). Democrats sponsored a majority of forest health-related bills between 1990 and 1994, when that party controlled Congress. After the Republican Party took control in 1995, the majority of forest health-related bills were sponsored by Republicans[4]. Of the 28 bills including "forest health" or related terms in the bill title, Republicans sponsored 25 (89%), and Democrats sponsored just three (11%).

Twenty-two (19%) of all bills were appropriations bills and 94 (81%) were substantive. A total of 18 (16% of all bills) passed both houses of Congress; twelve of the passed bills were appropriations bills and six were substantive (Table 3.1).

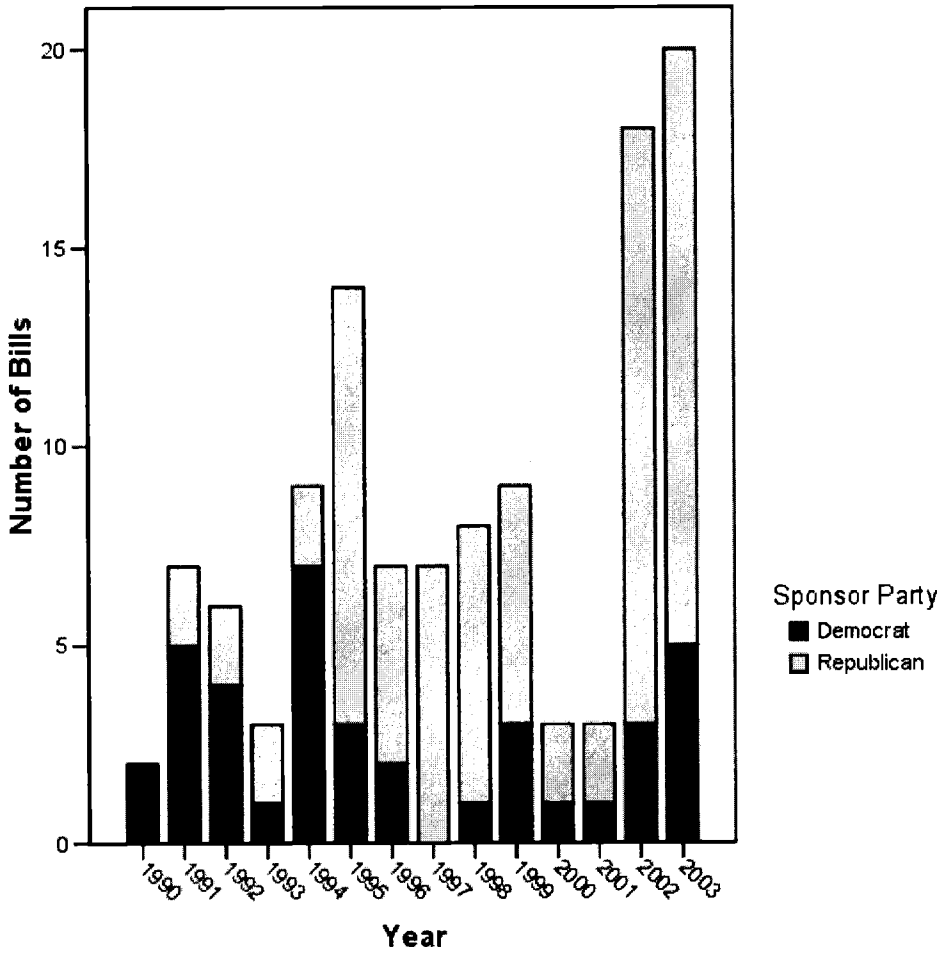

Figure 3.1. Forest health-related bills introduced into Congress between 1990 and 2003, separated by party of bill's primary sponsor.

Year of Passage	Bill Number	Name	Policy Package(s)	Important Provisions
1990	S. 2830	Food, Agriculture, Conservation and Trade Act	Scientific Research	Established the Blue Mountains Natural Resource Institute in Northeast Oregon
1991	H.R. 3245	Chattahoochee Forest Protection Act	Purely Descriptive	Authorized timber cutting to maintain forest health
1998	H.R. 2886	Granite Watershed Enhancement and Protection Act	Fire / Property Protection	Authorized demonstration projects to reduce risk of catastrophic fire
2000	H.R. 3388	Lake Tahoe Restoration Act	Fire / Property Protection	Mandated development of restoration options that would achieve forest health
2000	H.R. 2389	Secure Rural Schools and Community Self-Determination Act	Rural Community	Recruited local stakeholders in the design and monitoring of forest health projects
2003	H.R. 1904	Healthy Forests Restoration Act	Fire / Property Protection, Environmental Law Revision	Revised NEPA requirements and judicial review for fuel reduction and insect control projects

Table 3.1. The six substantive (non-appropriations) forest health-related bills passed by Congress between 1990 and 2003.

The set of bills meeting the search criteria included those that would obviously be thought of as forest health bills, such as the Healthy Forests Restoration Act of 2003 (H.R. 1904). Also included were bills such as those aimed at designating areas

of federal land as wilderness, controlling invasive species, allowing private contractors to enter into multiple-objective contracts with federal agencies (stewardship contracts), and revising government payments to counties containing federal lands.

Of the 116 forest health-related bills considered here, only one contained an explicit definition of forest health. The National Forest Health Act of 1993 (H.R. 229), sponsored by Idaho Democrat Larry LaRocco, defined forest health as:

> the condition of the forest in terms of its capacity to tolerate natural and human influences (such as insects, diseases, atmospheric deposition, silvicultural practices, harvesting practices, and wildfire) within the natural range of variability for the ecological system involved and the desired range of ecological variability for the land use in and around the forest unit. (§3(5))

Policy packages

Upon analysis of the 116 bills, several major "policy packages" were identified (Table 3.2). Each package represents a distinct forest health problem definition that may or may not be compatible with other definitions.

Fire / Property Protection

This package, which contains many elements of the Healthy Forests Restoration Act as passed by Congress, characterizes a healthy forest as one that doesn't burn (at least not in a catastrophic fashion) and therefore doesn't threaten homes or other property with the risk of fire damage. The accumulation of forest fuels is seen as a primary threat to forest health, as it can lead to the risk of destructive wildfire. Bills employing this narrative tend to emphasize the protection of property, particularly residential

Policy Package	What is a healthy forest?	What causes forests to become unhealthy?	Symbols Utilized	% All Bills[a]	% Democrat[b]	% Republican[b]
Fire / Property Protection	One that doesn't burn, doesn't threaten human property	Accumulation of forest fuels	Fire, Property Destruction	41%	24%	50%
Environmental Law Revision	One full of vigorous trees that can be harvested easily	Too many environmental and procedural laws	Gridlock, Dead Trees	28%	15%	32%
Rural Community	One that meets the needs of local communities	Declining capacity of rural communities	Community Health	19%	32%	17%
Scientific Research	More research needed to find out	Accumulation of forest fuels, insects, fire	Science	12%	12%	17%
Natural Ecosystem	One that is wild and untouched	Logging and road-building	Wild Nature, Clearcuts	8%	15%	7%
Purely Descriptive	undeterminable	undeterminable	varies	9%	6%	8%
Other	varies	varies	varies	14%	24%	8%

Table 3.2. Policy packages and accompanying causal stories and symbols identified from the analysis of forest health legislation introduced into Congress between 1990 and 2003. Note that individual bills may have been coded for up to two separate policy packages.

a. Percentage of all bills containing the policy package.
b. Percentage of Democrat-sponsored and Republican-sponsored bills containing the policy package, with appropriations bills (n=22) removed from consideration.

homes within the wildland-urban interface, and implicitly suggest that a low risk of fire is the hallmark of a healthy forest.

Under this definition, the forest health problem is that forest fuels have built up to the point that they threaten the safety of people and property located near forests. For example, the Nevada Forest Protection Act of 1995 (H.R. 596), sponsored by Nevada Republican Barbara Vucanovich, included a finding that "the risk of intense wildfires that pose a serious threat to the health of forest lands and watersheds can be significantly reduced by the reduction of excessive fuel accumulations, including slash piles and dead trees that become fuel ladders" (§2(4)) and stated that "the highest priority for fuel removal should be placed on areas where the population is greatest and the interface between urban and wild land creates a great fire threat to persons and property" (§2(5)).

Bills espousing this forest health problem definition utilize the psychologically powerful symbol of fire in supporting causal stories. Images of blackened, dead forests, charred homes, and other fire-related scenarios are often invoked to portray the consequences of poor forest health. Terms such as "catastrophic" and "devastating" are often used to describe the effects of forest fires on natural areas and human inhabitations.

In this package, the primary driver of forest health policy is the desire to control forest fires, particularly those that threaten human structures such as residences. These elements were all emphasized in HFRA (H.R. 1904) as passed by Congress. In promoting forest health legislation, President Bush said:

> Forest thinning projects make a significant difference about whether or not wildfires will destroy a lot of property...Our citizens must understand there are millions of acres of forest around this country that are vulnerable to catastrophic fire because of brush and small trees that have been collecting for decades. (Remarks in Summerhaven, AZ, August 11, 2003)

Significantly, HFRA was held up in the Senate until late-season wildfires in Southern California affected 750,000 acres, destroying thousands of homes and commercial properties (Jalonick, 2003; National Interagency Fire Center, 2004). Many Congresspersons presumably wanted to appear to be "doing something" to address the threat to their constituents' properties, and the protection of property seems to be a major policy goal on which disparate interests can agree. For example, the Sierra Club asserted on its website that "It's time for the Forest Service to make protecting our communities from fire its number-one mission" (Sierra Club, 2004).

The growing concern with property safety is likely a response to highly-publicized wildfire seasons in 2000, 2002, and 2003 that destroyed or threatened homes, government buildings, and other structures. While Congresspersons on either side of the ideological divide could argue about the forest health effects of clearcutting or wilderness designation, there were few who would publicly deny the virtues of protecting homes from wildfire.

Some bills in this policy package characterized fire purely in negative terms, while others made distinctions between desirable (low-intensity, controllable) and undesirable (high-intensity, uncontrollable) fire. In general, however, the bills in this package are related by a focus on fire risk and property damage risk as gauges of

forest health. Not all "Fire / Property Protection" bills agreed on the causes of the forest fuel accumulation that leads to unwanted wildfires, and many bills stopped short of identifying an ultimate cause. Some implicitly blamed an overabundance of environmental laws and judicial review as causal factors (see "Environmental Law Revision" description below), while others blamed factors such as past wildfire suppression or past timber harvesting. This disparity in causal stories corresponds to a divergence in policy direction: some bills proposed revising environmental laws as a means of achieving forest health, other bills proposed allocating more federal funds to fire prevention and control, while still others suggested making rural community members more active stewards of local forests.

Environmental Law Revision

This package reflects an approach to forest health that peaked first in 1995 following the "Republican Revolution" when Republican gains in the 1994 mid-term elections gave them control of both the House and Senate. It reemerged following President George W. Bush's introduction of the Healthy Forests Initiative in the fall of 2002 (Figure 3.2). According to this package, the primary forest health problem is that too much judicial oversight of agency actions, as well as the influence of environmental laws such as the National Environmental Policy Act (P.L. 91-190), Appeals Reform Act (P.L. 102-381) and others have prevented the application of forest management. This lack of management, in turn, has produced forests full of dead and dying trees, susceptible to fire, and/or susceptible to insect and disease

outbreaks. A healthy forest is implicitly defined as one that lacks high levels of tree mortality from insects, disease, fire, or other factors. Causal blame is attributed to a lack of active management, which is seen as a direct result of environmental laws and litigation.

In this approach, the forest health problem is defined so as to cast environmental laws in a negative light, and build support for restricting their application. For example, the Wildfire Prevention and Forest Health Protection Act of 2002 (H.R. 5309), sponsored by Arizona Republican John Shadegg, stated that "Use of existing administrative and legal processes to address the fire danger in the United States will not enable the Forest Service to take the immediate action necessary to reduce fuel loads to both improve forest ecological health and prevent the occurrence of wildfires likely to cause extreme harm to the forest ecosystem" (§2(8)). This inclusion of fire risk reduction as well as environmental law revision is an example of the way multiple policy packages can appear together in a single bill.

Common symbolism employed by proponents of this policy package includes gridlock, or more recently "analysis paralysis," which represents the outcome of an overabundance of environmental laws. Images of dead, diseased, and insect-infested trees are often invoked to symbolize the consequences of preservationist forest policies. Words such as "disaster" are used to describe forests experiencing mortality due to diseases and insects.

This package corresponds roughly to the utilitarian view of forest health as described by Kolb et al. (1994), which sees forests as standing capital in the form of

wood fiber. The health of the forest, in this view, is measured by the health of individual, living trees. Any elements that weaken or devalue the wood resource (e.g. insects, disease) or interfere with the harvest of the resource (environmental laws) are considered to detract from forest health. By interfering with forest management, environmental laws are blamed for leading to unhealthy forest conditions. This view of forest health is reflected in the testimony of Thomas K. Goodall, Timberlands Manager for the Boise-Cascade Corporation, who argued:

> complex Federal regulations have made it nearly impossible for our local Federal forest managers to do their jobs...[the regulations] often contradict each other, and they invite legal challenge. These regulations have caused gridlock...[which] has allowed the perpetuation of a forest health time bomb. (U.S. House of Representatives, 1997, p.97-98).

Blaming environmental laws for increased wildfire risk, rural economic hardship, and declining environmental quality was a popular approach with the regulatory reform-minded Republicans of the 104th Congress, elected in 1994. The "salvage rider," attached to a supplemental appropriations and rescissions bill (H.R. 1944) passed following the 1995 Oklahoma City terrorist attack, contained sweeping exemptions of environmental laws for federal timber sales of dead or dying trees as well as "associated trees or trees lacking the characteristics of a healthy and viable ecosystem" (§2001(a)(3)). This package is best understood as a reaction to other forest policy changes occurring during the study period, including the reduction in timber harvests throughout western National Forests as a consequence of endangered species listings and the increased success of environmental organizations in promoting

their agenda through the courts and administrative review processes. Blaming preservationist strategies for poor forest health was one way to mobilize public sentiment against environmental and procedural laws.

Nine (43%) of the 21 forest health-related bills introduced into the 104th Congress included provisions to limit the application of laws such as the National Environmental Policy Act and the Endangered Species Act, or to limit judicial review of agency actions. Eleven (41%) of the 27 forest health-related bills introduced following President George W. Bush's announcement of the Healthy Forests Initiative on August 22, 2002 did likewise. The Bush administration promoted this policy package through publications such as *The Process Predicament*, released in 2002 by Forest Service Chief Dale Bosworth.

Rural Community

This package focuses less on the causes of poor forest health and more on the solution; the major premise is that improving the social and economic condition of rural communities will improve the health of the forest. By extension it suggests that poor forest health is caused, at least in part, by poor community health. Bills of this nature often cite agents of forest mortality such as insects, disease, and fire as causing poor forest health, while a healthy forest is conceived as one that meets the needs of local communities by providing employment, clean water, and recreational opportunities. For example, the New Mexico Forest Health and Fire Prevention Act of 1998 (H.R. 4210), sponsored by New Mexico Republican Bill Redmond, included a

finding that "The health of the land is directly related to the economic health of the communities it surrounds. Management activities of forests should be designed to incorporate local communities in the management process" (§2(3)).

Symbols employed in this policy package include community health, which ties easily into the symbolism of forest health, and emphasizes the direct human benefits of forest health. The symbol of local knowledge is also common, representing a personal understanding of the landscape lacked by far-off bureaucrats or interest groups.

This package includes many bills providing new contracting authorities to federal land management agencies, or establishing training institutes or value-added research centers in rural areas. Other bills give rural communities more influence over forest management, either through the convening of multi-stakeholder advisory panels, or through the establishment of locally-controlled "charter forests." This policy package links the problem of declining forest health to the problem of declining rural vitality, positing that both can – and should – be improved together. This package found success with the passage of the Herger-Feinstein Quincy Library Group Forest Recovery Act as a rider to the supplemental appropriations bill H.R. 4328 in 1998 as well as the passage of the Secure Rural Schools and Community Self-Determination Act (H.R. 2389) in 2000 as a substantive bill (Table 3.1).

Scientific Research

Bills employing this package tend to include several forest health threats, such as disease, insects, fire, and invasive species, but suggest that not enough is known about forest health to prescribe solutions. These bills promote scientific research, often proposing research centers or scientific advisory committees as means of addressing the forest health problem. For example, the Sierra Nevada Forests Ecosystem Study Act of 1992 (H.R. 6013), sponsored by California Democrat Leon Panetta, proposed establishing a scientific research committee to produce (among other things) "An evaluation of the health conditions and trends" of various California ecosystems (§4(3)) and an "evaluation of the processes, activities, and other factors...which affect the health conditions and trends" of these ecosystems (§4(4)). Science and its contributions to human well-being are often used as symbols in the causal stories surrounding this policy package.

The "Scientific Research" package defines the forest health problem so as to fulfill three distinct purposes: 1) promote the gathering of more scientific data on which to base future forest health policy decisions; 2) allow Congresspersons to direct federal funds, in the form of research institutions, to their home districts; and 3) allow Congresspersons to address the forest health issue without arousing the ire of any particular constituency, as might occur through sponsorship of bills which designate new wilderness areas or suspend environmental laws. This package found its greatest success with the passage of the 1990 farm bill (S. 2830), which established the Blue

Mountains Natural Resource Institute in northeastern Oregon to study the causes and cures of declining forest health (see Table 3.1).

Natural Ecosystem

This package reflects a view that forest health is best promoted by minimizing economic utilization of the forest, allowing natural processes to occur unimpeded. The forest health problem is that past activities associated with resource extraction have degraded the naturally occurring state of forest healthiness. Bills employing this package tend to cite road building, logging, and grazing as threats to forest health, and implicitly attribute causal blame for poor forest health to ranchers, loggers, and the agencies that promote their activities. A healthy forest is seen as one with high water quality and biodiversity and lacking in human intervention. For example, the Public Lands Forever Wild Act of 2002 (H.R. 5748), sponsored by Georgia Democrat Cynthia McKinney, stated, "Fires, insects, disease and other natural destructive forces shall all be considered acts of nature and part of a healthy, functioning, and wild ecosystem. No further attempts to correct for such acts of nature shall occur on Federal public lands" (§3(d)). The bill prohibited any economic activities on federal lands.

This policy package utilizes images of wild, untouched nature to symbolize the health of a landscape lacking in human interference, and symbols such as clearcuts and sediment-laden water are used to represent the negative consequences of resource extraction activities. Words such as "loss" and "depletion" are used to describe the

effects of clearcut logging and other management practices. In this view, forests are seen as naturally functional ecological systems, and resource extraction activities are seen as detracting from the health of the forest. This perspective is encapsulated by the 1992 Congressional testimony of Richard T. Brown, Resource Specialist with the National Wildlife Federation: "Decades of road building, grazing, selective removal of the biggest and most valuable trees, and exclusion of fire have resulted in the degradation of soils and water, and the decline of fish and wildlife populations. These declines are the most important evidence of poor forest health." (U.S. Senate, 1992, p. 133-134). Bills employing this policy package tend to include provisions to limit logging, road building, and other development activities on public forestlands, and many are wilderness designation bills. Unlike the "Fire / Property Protection" and "Environmental Law Revision" packages, which focus on the human benefits of forest health (fire protection and wood fiber production, respectively), the "Natural Ecosystem" package focuses on the benefits of forest health to forest-dwelling species and ecosystem functioning.

Multiple Package Bills

Thirty-four bills (29%) coded for more than one policy package. The most common were "Fire / Property Protection" and "Environmental Law Revision" appearing together (19 bills), "Fire / Property Protection" with "Rural Community" (5 bills), "Fire / Property Protection" with "Scientific Research" (5 bills), and "Natural Ecosystem" with "Rural Community" (3 bills). None coded for both "Fire / Property

Protection" and "Natural Ecosystem." In a small number of cases, a single bill contained multiple policy packages because two individual forest health bills were stitched together under one title.

The large number of bills representing more than one policy package indicates that different forest health definitions are not necessarily mutually exclusive. Different packages can be complementary, with one set of factors as a proximal cause and another as an ultimate cause. For example, fuel accumulation leading to poor forest health may be "caused" by an overabundance of environmental regulations or by declining rural community capacity. However, there appears to be a limit to the complexity of causal stories surrounding forest health; overly complex causal stories "do not offer a single locus of control, a plausible candidate to take responsibility for a problem, or a point of leverage to fix a problem" (Stone, 2002, p. 197).

Bills With No Specific Definition

Ten bills (9%) used the term "forest health" (or related terms) but provided no implicit or explicit definitions; we refer to these bills as "Purely Descriptive." For example, the Interior appropriations bill for FY1994, H.R. 2520 (1993), contained language prohibiting timber sales on a National Forest in Arkansas, unless sales were necessary "as a result of natural disaster or a threat to forest health, or for maintaining or enhancing wildlife habitat, or habitat for endangered and threatened species, or for research purposes." The language gives no contextual clues as to what "forest health" should mean.

There are at least two possible interpretations of forest health in "Purely Descriptive" bills. Lawmakers may use the term in deference to agency definitions of forest health, avoiding overriding them with Congressional definitions. Alternatively, lawmakers may support "healthy forests" in the same way they support "sensible government," a "fair tax structure," or "strong public schools." The adjectives are essentially meaningless, implying no particular set of public policies. Despite their lack of clarity, "Purely Descriptive" bills are important because they represent attempts by Congresspersons to institutionalize an ambiguous term without providing any guidance as to what the term means. Forest health, in this sense, joins the lexicon of buzzwords such as "biodiversity," "sustainability," and "ecosystem management," all of which enjoy broad public support so long as they remain vague and undefined.

Trends in Policy Packages

Trends in the five major policy packages are shown in Figure 3.2. The data suggest competing (or simply unclear) forest health problem definitions during the early to mid 1990's, with fire and environmental laws emerging as dominant concerns by the early 2000's. The two most striking patterns are the trajectories of the "Fire / Property Protection" and "Environmental Law Revision" packages. The "Fire / Property Protection" package has moved from being a minor component of forest health legislation in the early 1990's to dominating forest health policy in the late 1990's and early 2000's. The "Environmental Law Revision" package has seen two major peaks: first in the 104th Congress (1995-1996), when Republicans made an

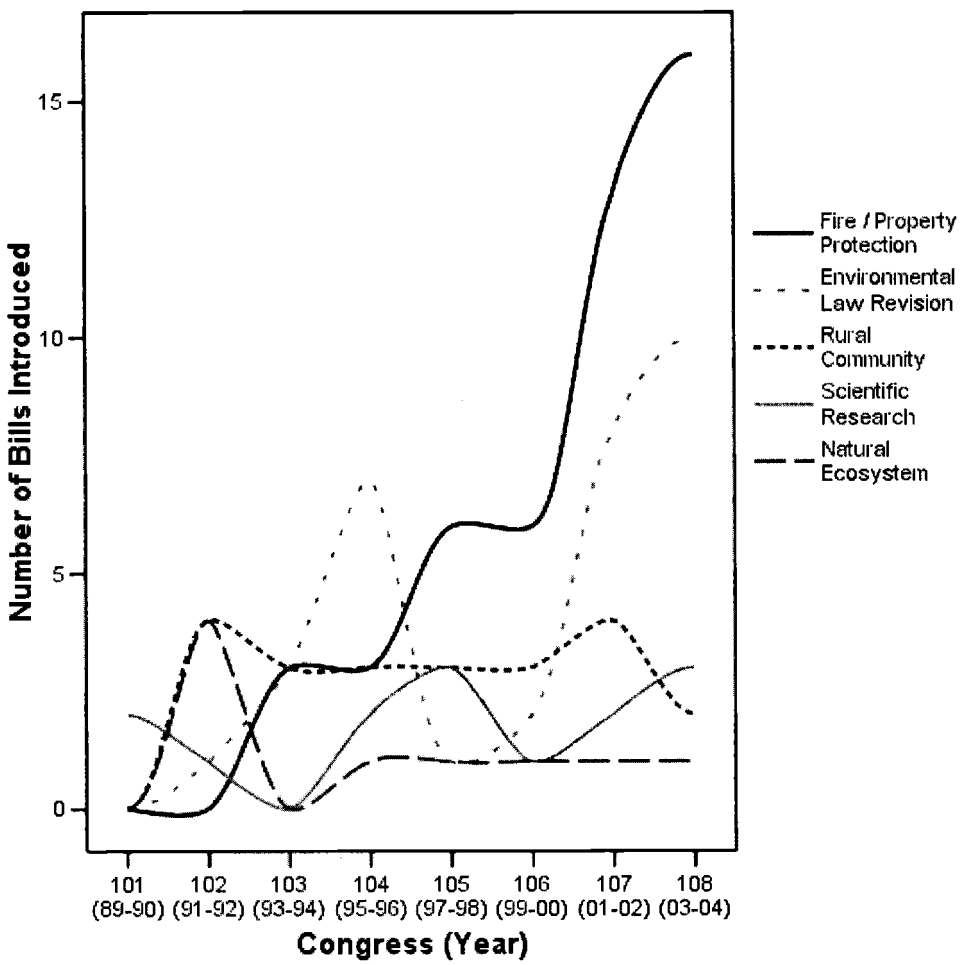

Figure 3.2. Trends in six kinds of forest health bills ("policy packages") introduced into Congress between 1990 and 2003.

initial effort to link environmental laws with poor forest health generally, and again in 2003, when both major parties included language limiting environmental laws and judicial review in bills otherwise focused on fire prevention. This second peak

probably represents successful alignment with the "Fire / Property Protection" package, making wildfire prevention an issue of environmental law reform.

The other major packages have made up a sizeable proportion of bills during certain periods, but overall they have appeared less frequently than the Fire / Property Protection and Environmental Law Revision packages. Ecosystem preservation, rural stability, and scientific research have all received Congressional attention, but they have not been the primary concerns of forest health legislation. It should be noted that HFRA, while largely concerned with issues of fire protection and regulatory reform, included language protecting old-growth forests, promoting rural well being, and supporting continued research, suggesting the continuing importance of these forest health policy packages.

While today we might assume that "forest health" concerns are fire and fuel load concerns, this was not the case in the early 1990's. Forest health policy became increasingly focused on fire issues during the late 1990's and early 2000's, most likely in response to high-profile fire seasons in 1994, 1996, 2000, 2002, and 2003. These latter three years saw heavy wildfire damage to residential properties, and public concern over wildfire damage opened a policy window for forest health legislation. During a time when major political rifts developed over issues such as old-growth harvesting, endangered species protection, and roadless areas, most parties could agree that protecting property from fire is a cause worthy of government action. Furthermore, it appears that other policy packages found their greatest successes by relating their basic premises to the issue of fire prevention; this happened in the case

of the "Environmental Law Revision," "Rural Community," and "Scientific Research" packages.

Fire / Property Protection and Environmental Law Revision bills have comprised a larger proportion of the forest health bills sponsored by Republicans while Rural Community and Natural Ecosystem bills have had more support from Democrats (Table 3.2). Commodity interests (largely represented by Republicans) and preservation interests (with largely Democratic support) have been jockeying for control of public land policy since long before the "forest health" concept emerged, and both sides have incorporated the issue into their broader political strategies. Commodity interests effectively used the concept to further their agenda, linking preservationist laws and strategies with destructive fires, tree mortality, and poor forest health. Preservationist interests were less effective in this regard, which is surprising given their ample lobbying power and political clout. This may be due to: 1) early "ownership" of the term by commodity interests; 2) a focus on arguing against the existence of a forest health problem, rather than the promotion of their own forest health definition; or 3) a focus on promotion of their agenda in venues other than Congress (such as the courts).

Conclusions

"Problems are defined in politics to accomplish political goals" (Stone, 2002, p. 231). In the case of forest health, long-standing public lands issues – logging, preservation, local community needs, and the role of science – have taken on new

faces, and aligned with new issues (e.g. fire) in order to gain traction in Congress. Though the language and symbolism have changed, the political goals have not.

Introduction of the forest health concept into the forest policy discourse has, however, transformed the framing of these old debates. The political argument that environmental laws are bad for the economy has changed into an argument that environmental laws are bad for the environment. Scientific research and aid to rural communities are now heralded as ways to protect homes from the ravages of wildfire.

Competing problem definitions of forest health have done more than simply represent normative judgments regarding what conditions should be considered "healthy." They have also attributed blame to various institutions and groups for causing environmental damage and, in some cases, for causing destructive wildfires. The success of any given package appears to be in part a function of how well its story resonated with the public and Congressional representatives. There is still much work to be done investigating the political dimensions of the forest health concept; this work will become increasingly important as forest health continues to be a focus of federal forest management.

The forest health concept has emerged as a modern-day driver of federal forest policy, even though its definition is vigorously disputed. The passage of HFRA indicates the importance of the forest health concept. While several previous forest health-related bills were passed by Congress and signed into law, HFRA is unique in its extensive focus on the forest health concept (previous enacted legislation mostly referred to forest health tangentially). It will be interesting to observe if – and how –

forest health problem definitions change post-HFRA. It remains to be seen whether forest health policy will continue to be dominated by concerns about fire and property protection, or if factors such as changes in party control of Congress or unforeseeable environmental changes will transform federal forest health policy.

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[1] This is not to say that the use of problem definitions in the promotion of political agendas is not politically rational, but rather that theories of problem definition reject the characterization of the policymaking process as a series of logical responses to objectively existing problems, or what Rochefort and Cobb (1993) refer to as the "rationality perspective."

[2] Both databases are limited to bills introduced in the 101st Congress (1989-1990) and subsequent Congresses. Because no forest health-related legislation was introduced in 1989, the study period is described as beginning in 1990 for the sake of clarity.

[3] All budget-related bills containing forest health language were appropriations bills (none were appropriations authorization bills). For this reason, they are simply referred to as "appropriations" bills.

[4] This pattern is due, in part, to the fact that appropriations bills are always sponsored by the majority party.

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4. General Conclusion

The studies presented here indicate a lack of agreement both among members of the general public and among policymakers regarding what a healthy forest is, what factors threaten the health of forests, and what actions are needed to improve forest health. This general lack of agreement has been noted by Kolb et al. (1994), Jenkins (1997), and Nie (2003), among others, but we can now expand on their work to offer a more detailed framework for understanding the forest health concept.

The utilitarian – ecosystem divide over forest health definitions offered by Kolb et al. (1994) does exist, but it only explains part of the story. There are some individuals who perceive forest health strictly in terms of economic productivity, and others who perceive forest health in terms of natural ecosystem functioning, but neither represents a majority of the population. Most residents in the Pacific Northwest appear to include both anthropocentric and biocentric considerations, to varying degrees, into their understandings of forest health. However, some of the greatest disagreements over forest health management appear to be between proponents of biocentric and anthropocentric value systems.

Areas of general agreement – support for thinning overstocked stands and lack of support for clearcutting – were found, along with items of particular disagreement, such as thinning and letting nature "take its course" in healthy forests. These areas of dispute point to aspects of forest health management that will require intense work and attention by forest managers. While the environmental or economic perspectives that

individuals possess cannot be expected to change, it may yet be possible to manage for forest health in a manner that is widely supported by the public.

From the analysis of introduced forest health legislation, the picture becomes somewhat more complex. Not only are utilitarian and ecosystem perspectives represented in bills considered by Congress (in the form of "Environmental Law Revision" and "Natural Ecosystem" policy packages, respectively), but several other forest health definitions have been offered as well. Probably the most important from a forest policy standpoint is the "Fire / Property Protection" definition, which has emerged as the dominant policy package in Congress. This approach can be seen as complementary to other forest health definitions, including utilitarian and ecosystem definitions, but its focus on the protection of property in the wildland-urban interface is clearly an important new emphasis that has received little attention in earlier social investigations of the forest health concept.

In addition, two other policy approaches have received a great deal of Congressional attention. The "Rural Community" policy package combines elements of the utilitarian and ecosystem forest health perspectives, but emphasizes the role of local knowledge and community capacity in the assessment of forest health. The "Scientific Research" package is based on the belief that not enough is yet known to make definitive conclusions regarding forest health, but that scientific research is central to discovering important forest health threats and proper cures. These various policy packages are more than just academic classifications; they represent distinct

(but not necessarily mutually exclusive) "stories" regarding what a healthy forest is, how forests become unhealthy, and what remedial actions are needed.

Taken together, these results suggest that policymakers and forest managers should exercise caution when describing management goals in terms of "forest health," for the simple reason that individual forest health understandings vary so widely. However, these same results point to concepts and language that can begin to clarify these divergent forest health definitions. Successfully implementing forest health policy will require more than a shared term, "forest health," but also shared understandings of specific management objectives and desired future conditions.

"Ecosystems...are always silent and someone must (normatively) speak for nature and tell us what is to be considered sick or distressed," writes Ross et al. (1997, p. 119). Here I have presented both lawmakers and the citizens they represent speaking normatively for ecosystems. How they characterize forest health says much about their personal and political philosophies regarding the proper uses of public and private forests, and what social groups should be empowered or disempowered to contribute to improved forest conditions.

Clearly, there are a great deal of conflicting perspectives and agendas surrounding the forest health concept. This should not, however, cause managers and policymakers to abandon the idea of forest health. These conflicts are manifestations of a larger social and political fragmentation that has been in existence since long before "forest health" became a management focus. Rather, there is a compelling need for clarity regarding different forest health visions and honest public discussions

about what would be required to achieve these visions. The studies presented here should help clarify the concept and pave the way for further investigations of the social and political dimensions of forest health.

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