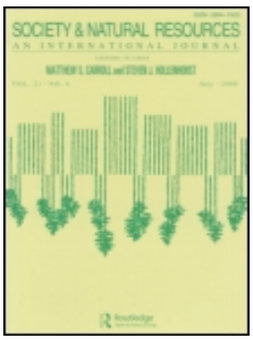

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William A. Warren

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Articles

What Is a Healthy Forest?: Definitions, Rationales, and the Lifeworld

WILLIAM A. WARREN

EcoSocial Analysts, LLC, Moscow, Idaho, USA

First appearing in political discourse in the late 1980s, forest health (FH) has been a contentious concept in federal resource management for almost two decades, particularly in the western United States. One of its more recent expressions was the FH legislation passed in December 2003, which seeks to reduce the risk of wildfire on public lands while providing jobs in the forest industry. Using interview data collected in 1997 from 25 "leaders" in federal forest policy in Idaho, this paper explores the concept of FH: what it is, who says so, how best to implement it, the underlying rationale used to defend it, and the role that the concern with FH plays in the informant's lifeworld.

Keywords community forestry, environmental ideology, environmental values, forest health, forest management, natural resource management, natural resource policy, structuration theory

The intractability of the debate over management of federal forests is well known (Bosworth 2002; U.S. Forest Service 2002; Veneman 2002). One issue of contention has been over "forest health" (FH) concomitant with concern over the effects of fire suppression on national forests. For example, Partridge and Bertagnolli (1995) argue that there is no FH problem, and use of the term by forest agencies is "impossible to define . . . obscures the purposes for its resurrection," and minimizes the importance of nontimber forest resources. Similarly, The Wilderness Society and National Audubon Society (1996) and Peters et al. (1996) consider FH to be a fabrication of the timber industry, which is only concerned with the health of trees for timber production. By contrast, Neuenschwander (1996), O'Laughlin (1996), and Oliver et al. (1997) contend that the nation's forests are in a health crisis that only large-scale and decisive timber management actions can correct.

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Address correspondence to William A. Warren, PhD, EcoSocial Analysts, LLC, PO Box 9964, Moscow, ID 83843, USA. E-mail: EcoSocialAnalysts@verizon.net

What is a "healthy" forest? How can it best be achieved? Whose definition of FH is the "right" one? The research reported here sought to find out how a group of federal forest policy "leaders" construed the concept of FH as a way of understanding what they thought a forest "should" be. Another research objective was to look at the more fundamental assumptions that inform the concept of FH.

The Term "Forest Health"

Although politicization of the term FH is relatively recent, the expression appears in forestry literature as early as 1930 in an article entitled "The Health of the Forest," by Harvard University's professor of forest pathology J. H. Faull, in *The Illustrated Canadian Forest and Outdoors*. Faull's paper employs a medical model of FH, where dead and dying timber constitutes an "unsanitary environment" whereby "disease producing organisms multiply" (2). Tree thinning is recognized as a prophylactic measure for better sanitation and the destruction of infectious agents.

The beginning of the expanded use, meaning, and controversy over the term FH may have begun with a set of congressional hearings on the issue in 1987, which resulted in "Forest Health Through Silviculture and Integrated Pest Management: A Strategic Plan" in 1988 (USFS 1994). This plan was later amended after further congressional hearings in 1993 as the public debate over FH intensified (USFS 1994). Congressional hearings, FH bills, and conflict over the meaning of FH, even among natural resource professionals, continued through the 1990s (e.g., DellaSala et al. 1995; Neuenschwander 1996; O'Laughlin 1996; Oliver et al. 1997; Partridge and Bertagnolli 1995; Peters et al. 1996; Society of American Foresters 1997; Sampson, Neil, and Adams 1994; Wright 1996).[1] The debate over FH intensified in the current decade with the passage of President George W. Bush's Healthy Forest Restoration Act (Bush 2003), and the publicity surrounding large wildfires on Western public lands that destroyed private property and took the lives of firefighters (e.g., Society of American Foresters 2004; Graham 2003).

Geographic Setting

To look at the issue of FH grounded within a specific context, as well as in a more abstract sense, this study was confined to a particular geographic location. The Clearwater River basin in north-central Idaho was selected for several reasons; principal among these are its nationally significant public lands and associated resources,[2] the broad spectrum of local interests engaged in influencing federal forest policy in the basin (see Methods section), the author's (at the time) 20-year association with the area, the serious FH issues recognized in the basin (Quigley and Arbelbide 1997, vol. II),[3] and the ongoing Interior Columbia Basin Ecosystem Management Project (Quigley and Arbelbide 1997) that provided a wealth of up-to-date ecological, historical, social, and natural resource background information for the study.

The Clearwater basin is over 9600 square miles (larger than the state of Vermont), with over two-thirds of that area in forest (Nez Perce Tribe and IDFG 1990). Forest types include ponderosa pine (*Pinus ponderosa*), grand fir (*Abies grandis*)/Douglas fir (*Pseudotsuga menziesii*), and cedar (*Thuja plicata*)/hemlock (*Tsuga heterophylla*), with spruce (*Picea engelmannii*)/fir (*Abies lasiocarpa*) forests at the higher elevations. The major commercial tree species in the region include Western white pine (*Pinus*

monticola), Douglas fir, Western larch (*Larix occidentalis*), ponderosa pine, grand fir, lodgepole pine (*Pinus contorta*), and Western red cedar (DeLucia 1983).

Methods

An interpretive or "qualitative" methodology (Weber 1978, chap. 1; Schutz 1970; Outhwaite 1986) was used to gather interview data from 25 informants in 1997 on the topic of FH and then code the results to identify repeated themes or categories. Analysis involved discerning patterns between themes and among informants, a process of "mining" the data for sociological insight, and theoretical explication and development (Glaser and Strauss 1967; Denzin and Lincoln 1994; Creswell 1994). In addition to FH, interview topics included informants' conceptions of institutional decision-making, "ultimate life concerns," and preferences for federal forest management.

A "key informant" (Burdge 1998) sampling strategy was employed where informants were chosen based on their "leadership" position in influencing federal forest policy in the case study area. A key informant sampling strategy has several advantages, including reducing the "population" of potential informants, and producing informants with extensive knowledge and thought-out opinions regarding the subject under enquiry, characteristics that are well-suited to the intensive interview approach of qualitative sociology. In addition, these informants were actively engaged in influencing federal forest management policy, thereby avoiding the question of whether stated values corresponded with actual behavior.

Chain referral (Brandenburg et al. 1995) and "maximum-variation" (McCracken 1988) sampling were used to identify informants not already known by the investigator and obtain as wide a range of perspectives on the topic of interest as possible. The resulting group of informants came from six nominal groups: those employed as owners, managers, consultants, lobbyists, or union representatives in the timber industry; federal forest managers; forestry professors; professional environmentalists; resource policy leaders of a local Indian tribe; and "independents" (individuals recognized by the press and policy leaders as influential and knowledgeable but not formally associated with any forest policy group).

It is important to note that this study was not designed to "test" (falsify) a hypothesis, nor was it designed to "sample" some population to make quantitative inferences about the proportional makeup of that population regarding a set of characteristics. Rather, the goals were to describe and understand, in as rich a detail as possible, *what* conceptions of FH were *present* among the *informants selected*, *why* they took a particular position, and *how* it related to the rest of their life experience, and then to produce an etic explication of these data that would provide theoretical insight and suggest the data's larger relevance beyond this case study.

Results

Nearly all of the 25 informants interviewed expressed an affinity for the Clearwater River basin as a place and were concerned with the condition of the landscape. Most used the area for recreation and considered it a preferable place to live because of its ecological variety, scenic beauty, and outstanding outdoor recreational opportunities. Interestingly, most informants also shared significant childhood experiences relating to forests, and no obvious relationships were found between informants' views of FH and level of education, age, economic status, or length of residence in the area, a

finding that differs from some survey research linking demographic characteristics with environmental concern (e.g., Mertig and Dunlap 2001), suggesting that such relationships could be different among policy "elites" than among the general public. Informants were also similar in that all characterized those holding definitions of FH different from their own in negative terms (e.g., biased, "wing nuts," greedy). Each viewed him- or herself as having the "correct" or "true" perspective on FH.

Primary differences among informants centered on divergent notions of what a forest "should" be and of what constitutes appropriate forest management. These differences were found to be associated with primary value commitments, notions of institutional legitimacy, and views of the appropriate relationship between people and "nature."

Conceptions of FH

Informants' definitions of FH were categorized into four principle groups; referred to as "Natural Forest" (NF), "Productive Forest" (PF), "Historic Forest" (HF), and "Community Forest" (CF). Since informants' definitions of FH were associated with their positions on federal forest management and assumptions of the appropriate human–nature relationship (and were often discussed together), the presentation follows the same pattern.

It is important to keep in mind that the four classes of informants are generalizations or "ideal types" whose characterization is dependent on their relative distinction from one another. Not all variability of approaches to specific issues among individual informants within the same group is elaborated in order to focus on a generalized model of the policy positions based on dominant shared themes. For a more detailed treatment of variability among informants on specific issues, see Warren (1998).

Natural Forest Informants (NFs) Versus Productive Forest Informants (PFs)

To NFs a healthy forest is one with little or no evidence of commodity extraction or other forest management. Type, age, condition, and composition of trees are of little consequence to NFs as long as the condition of forest stands are "natural," meaning uninfluenced by the actions or presence of humans. However, NFs frequently mentioned the presence of fish and wildlife species as an important criterion for health.

> A fully functioning forest, clean water, abundant fish and wildlife, genetic and biotic diversity, fire . . . no roads . . . *a forest that man hasn't laid his hands on*. (NF)

To NFs the extent of human influence on a forest is inversely proportional to its health. For example, what NFs considered to be "pristine" forest areas in the Clearwater basin—primarily federal roadless lands and designated wilderness—were considered most healthy. NFs universally saw forest management practices such as roading and logging (especially the scale and manner of such activities) as the most damaging to FH.

> It's too much. It's too much development. . . . My whole experience is I never saw the Forest Service back out of a watershed because it was over-, overimpacted, and there's some grossly overimpacted,

> overdeveloped watersheds from the standpoint of too much harvest and too many roads. (NF)

The PF definition of FH was almost the direct opposite of the NF view, so that the primary cause of unhealthy forests is a *lack* of human intervention (i.e., vegetation management). Also in contrast to NFs, PFs focused primarily on tree species composition and tree stand characteristics as their litmus test for FH, although they also mentioned wildlife, fish, and clean water as important. PFs preferred seral tree species such as ponderosa pine, white pine, and larch, and regarded other species and stand conditions (depending on the forest type) as illegitimate (especially stands composed of grand fir, decadent lodgepole, and dead and dying trees of any species).

> Overstocked with wrong species. (PF)

> Later seral species with all their faults . . . reduce less desirable species and favor more desirable species . . . too many of wrong species such as grand fir and Douglas fir. (PF)

As part of their concern with tree species composition, PFs expressed a strong desire to reestablish white pine to its former dominance in the forest.[4] NFs, on the other hand, despite consistently referring to the importance of establishing and protecting the full compliment of indigenous wildlife diversity (e.g., bringing back extirpated large mammals like the timber wolf and grizzly), never mentioned the extirpation of white pine, or the changes in forest community structure that resulted, as a FH issue.

"Waste" was a term often used by both NFs and PFs in describing FH, but in opposite ways. PFs regarded dead trees and downed wood in the forest as "wasted" fiber commodities that could have been used by society and provided jobs and other economic support to local communities. Another aspect to such waste was the potential loss of forest resources from an increased threat of fire and insect outbreaks (although PFs did recognize the need for some snags and downed wood as habitat for wildlife).

> A forest with dead trees can't be healthy . . . fire danger increases. . . . It's a crime not to take out dying white pine worth $400 on the stump. (PF)

By contrast, NFs used "waste" to describe the effects of timber management (i.e., logging), which "uses up" resources such as biodiversity, fish and wildlife habitat, water quality, and wilderness.

Criteria that characterized FH for PFs included a lack of dead and dying trees, low to moderate stem densities (i.e., number of individual tress per unit area), and a dominance of seral tree species such as white pine and larch. This characterization is reinforced by the PF view that private industrial forestlands are healthier than public forests because private forests are actively managed to achieve these conditions.

NFs and PFs also held conflicting conceptions of appropriate forest management. PFs generally had a coarse filter approach to forest management. That is, if the vegetation is managed "properly" (e.g., correct spacing, age classes, species composition), the other forest resources (e.g., fish, wildlife, water) will take care of themselves and need less direct management. By contrast, NFs had a "hands-off" "management" philosophy.

The opposing conceptions of FH between PFs and NFs is conveniently illustrated by two informants who both cited the same watershed within the Clearwater basin, the NF to epitomize the ideal of FH, and the PF to represent the antithesis of FH.[5]

> Kelly Creek . . . is sacred to me, [it] has an enormous wildlife population, it has clean water, it has native fish that are healthy, it has all the components that, in my opinion, make an ecosystem work. . . . There are places on the Clearwater National Forest where the pieces aren't all there and it doesn't work. Kelly Creek is one of the places where all the pieces are there. (NF)

> Yes, very definitely it [Kelly Creek] is an unhealthy forest. . . . It is a waste. . . . At 80, 90 yrs old, lodgepole pine is over-matured. . . . Those crowded stands are falling apart. (PF)

Historic Forest Informants (HFs)

HFs, like PFs and unlike NFs, focused on forest vegetation conditions as their primary criteria for health, and they had a coarse filter approach to management similar to that of PFs.

> Health of vegetation is the key to wildlife and other aspects of the forest. (HF)

Also like PFs and unlike NFs, HFs believed that a proactive program of timber management is the best way to return forests to a healthy condition.

> Timber harvesting [is] most important to maintaining FH. (HF)

However, they differed from PFs in two major respects: (1) The determination of health tended to be evaluated at the landscape scale rather than stand level (the emphasis of PFs), and (2) rather than being concerned with establishing a particular set of conditions, such as optimum spacing of trees, HFs sought to reproduce what they believed to be the matrix of forest structures and successional stages that existed prior to Euro-American settlement of the region. HFs wanted to see disturbance patterns (both human-induced, such as logging and controlled burns, and "natural," such as wildfire) mimic those of the "pre-European" forest.

> We know that the historic range was tolerable . . . know that forest biota could survive, and was adapted to, historic condition, but can't predict how it would adapt and survive to a different, man-created condition. (HF)

Unlike PFs, HF informants tended to see fire and other natural disturbance sources as compatible with FH, but noted that such disturbances are now at "unnatural" scales of intensity in the Clearwater basin because of past fire suppression and timber harvesting methods. To HFs, corrective management, including logging, is needed to thin stands and bring the forest within what HFs term the "historic range of variability" (HRV).

"Nature as guide" essentially sums up the HF management philosophy, with the primary goal of producing historic ecosystems and only secondarily the production

of commodities. Although part of this fits the NF view, the two differ significantly in their approach (principally, whether humans should be involved) to obtaining "natural" (but for HFs that means historic, not necessarily an absence of human influence) conditions.

Community Forest Informants (CFs)

The CF concept of FH is best described as holistic and context-specific. These informants included all aspects of the forest—state of the vegetation, wildlife, soil, rare species—as well as local human communities and economies, as essential components. Unlike NFs, PFs, and HFs, who all had a more abstract definition of FH (e.g., productive, natural, or historic) and the type of management needed to achieve it, CFs were more context-specific in their criteria for what constituted FH. For example, CFs did not advocate taking the forest back to pre-Euro-American settlement conditions as did HFs (interesting in itself, as CFs included American Indians), nor did they see FH as being represented by "natural" conditions, because they saw a clear role for human use and manipulation of forests. Rather, CFs had what could be called an "it depends" attitude regarding FH and forest management, with more interest in what was appropriate in a particular set of circumstances, with an attention to "spirit of place" and avoiding generalized prescriptions or definitions of FH.

> I'm wary of taking it all back to natural processes; humans are part of it too, we are natural. Let's look at what is there now. . . . Provide a variety of values to citizens that are sustainable, understanding the values of individual parcels of land, not one set way, not one set way to do things. . . . Can't add up functions, components of land like an appraiser, rather it must be understood from a spirit of place. . . . Be wary of general prescriptions; all these ecosystems are more complex than that. (CF)

The CF inclusion of human communities as inseparable from FH was perhaps the most unique and important quality of their definition of FH. They saw human communities as dependent on the forest for spiritual (e.g., "places of power"), economic, and cultural needs, so that any assessment of FH must give equal consideration to the human community as well as the nonhuman flora and fauna.

> Traditional food, medicine, plants are the mainstay of community. The Nez Perce community reflects the state of the environment . . . so don't only look at the physical and biological perspective, also [look at the] spiritual–cultural perspective. . . . So, we must balance the spiritual integrity of the land with health care, education, and employment needs. (CF)

> Spiritual, biological integrity of landscape. . . . For entire forest to be healthy . . . all components must be healthy. . . . We can't live in isolation from nature. (CF)

According to CFs, managing forests for the production of commercial wood products is therefore a legitimate part of a healthy forest because it supports the economic and cultural needs of communities. CFs were similar to NFs in their regard for the noncommercial components of forests, and, like most other informants

(including many PFs), considered the scale and extent of logging and roading practices of the past as inappropriate. CFs advocated alternative approaches to forestry that are more sensitive to other forest resources (e.g., horse logging), but, unlike NFs, believed it is beneficial and necessary for humans to interact with forests to maintain ecological/community/economic health.

> Don't stop all logging or timber industry but extract in a way that doesn't change the sustainability of forest. . . . [Conduct] balanced management where all factors are taken into consideration. (CF)

Institutional Legitimacy

Informants' views of FH were found to be associated with conceptions of institutional legitimacy. NFs and CFs, for example, saw social institutions such as the market economy, traditional forestry science and management, political decision making, and other traditional Western (European) cultural norms (e.g., private property, progress, industrial capitalism) as illegitimate. Many NFs and CFs located the root causes of what they perceived to be abuse of the forest environment (i.e., lack of FH) ingrained in European institutions of "use and abuse" (NF).

> I think it's real difficult in the American culture to impart a philosophy of conservation. I don't think we hit the ground here with that kind of philosophy, and we never have had it, and I think there is just a very small percentage of the culture that really has a sensitivity and knowledge for conservation. (NF)

CFs and NFs expressed concern over the power of corporations in the current capitalist economy, including their influence on government. Many NFs saw the very term of FH as the propaganda of timber corporations, designed to gain support for increased harvest of national forest timber. Such corporations were viewed as having their way against the will of "the people" by corrupting the political process.

> The linkages between the politicians, industry, and the Forest Service leadership, they're really tight, and that troika keeps the thing going and it leads to things like watershed health problems and the loss of fish habitat and the loss of fish stocks and wildlife habitat, because it's so lucrative, and these are the people that are pushing the FH concept because it gives them a rationalization for engaging in, maintaining the status quo and engaging in more, more development and more subsidies for the timber industry. (NF)

PFs, on the other hand, assumed the legitimacy of the market economy, and the practice of forestry to meet consumer demand, but saw management agencies such as the USFS as hamstrung by abuses of executive and administrative power within the Clinton presidency (e.g., Kathleen McGinty, Environmental Policy Advisor to the President, and Jim Lyons, Undersecretary of Agriculture, were frequently mentioned). The Clinton administration was seen as "micromanaging" public lands and allowing (or even encouraging) environmental groups to stop forest management projects via chronic lawsuits and appeals.

PFs saw forestry science as the primary institutional logic that should govern forest management, and political interference with the appropriate exercise of this institution within the Forest Service as the core management problem affecting the federal forests of the Clearwater basin. PFs did not see themselves as greedy or unethical (as NFs viewed them), but sincerely dedicated to using forest resources in a manner that would protect and maintain forest resources while providing income to their families, jobs to local communities, and domestically produced commodities to meet consumer demand.

HFs did not stress the question of institutional legitimacy, and were ambivalent or cynical with regard to institutional issues. Instead, they emphasized new forestry science and new ecological approaches to forest management such as HRV. Their institutional focus was thus on the legitimacy of scientific research and the need to implement its findings in new forest management approaches.

Personal Values and Ultimate Concerns

To conclude the interviews, informants were asked questions about their basic life values, regardless of whether they perceived such values as having any relevance to their views on FH. This was an attempt to delve deeper into an informant's "life-world" to see if revealed differences about ultimate concerns were related in a meaningful way with their expressed views on FH and the appropriate relationship of humans to the nonhuman world.

Unique among all informants, NFs' professed ultimate concerns centered on the condition and protection of forests and wildlands. NFs described a "calling," to devote their lives to working for the protection of forests from the perceived threats of humanity—in particular, from institutions they deemed illegitimate. Their values and beliefs could be called a "totalizing" ideology or discourse: a system of thought that seemed to influence all aspects of their life, and acted as the overriding framework within which the rest of their concerns were oriented. This tendency was further expressed in NFs' association of religious or spiritual experiences with "wild" forests.

> I try to cut down on the use of wood products. . . . I try to cut down my consumption of just about anything that would have an impact. I recycle, I walk to work a lot, I don't use paper towels. (NF)

> When I am in a natural forest ecosystem I'm relating to a spiritual side of me. . . . Without visitation of those kind of natural ecosystems I would be somewhat lost, and have a really hard time functioning in my life. . . . Natural settings [are] my whole concept of what religion is, and it's not just forests, it's deserts and other landscapes too. (NF)

In contrast to NFs, other informants did not solely, or even primarily, focus on FH or natural resource issues when questioned about their most important life concerns, even though they had strong views on forest management and FH. For PFs, "ultimate concerns" included family, religion, community, and social issues.

> Most important part of my life is wife and family. (PF)

> Breakdown of family . . . degree of single-parent families . . . illegitimate kids, moral breakdown, lack of respect, worship of the self [have] gone way beyond what is good for us. (PF)

CFs were most similar to PFs in that primary concerns centered around people, family, and community, but unlike PFs, they discussed these always within the context of what they considered their larger community—the nonhuman natural world—and the intertwined destiny of both. CFs considered personal health and happiness for their families, as well as maintenance of their culture, of equal importance to, and interrelated with, the quality of forest landscapes.

There was no pattern or association evident in core life concerns with the HF conception of FH. HF informants expressed a variety of issues as life concerns, expressing moderate concerns for both people and the natural world. Professed religious associations among HFs included Christian, non-Christian (e.g., Buddhism), and atheist/agnostic, but HFs did not attribute any association between their religious views and their conceptions of FH, as did NFs, for example.

Summary

The principal findings of this study are that: (1) distinct differences exist between federal forest policy leaders' conceptions of FH in the Clearwater basin; (2) conceptions of FH are closely tied to philosophies of appropriate forest management; (3) these different conceptions of FH reflect divergent views on the appropriate relationship of humans with nature/forests in general; and (4) associations exist between conceptions of FH and the legitimacy of social institutions, and to a certain extent, fundamental personal statements of "ultimate life concerns." Table 1 summarizes the attributes of each FH theme, and Table 2 lists the nominal group membership represented by each FH theme.

Discussion

The goal of this study was not only to discover and describe conceptions of FH, but also to obtain an understanding of the rationales for a given conception of FH within the context of the informant's lifeworld (Schutz 1970). Other scholars who have conducted similar studies (e.g., Wilson 1997; Kempton et al. 1996; Hull et al. 2002; Skogen 2003) suggest that there are relationships between specific natural resource policy positions and "deeper" value and belief commitments. This study develops that notion by explicating these relationships within the larger context provided by a conceptual model of social structure.

Structuration theory, particularly as developed by Sewell (1992) and Friedland and Alford (1991) (although usually classified as "new institutionalism," their model is consistent with a structuration approach), was the sociological model chosen as a heuristic for explicating the relationships found in this study. Structuration theory has been applied to natural resource sociology and socioecology more generally by Warren (1998, 2005).

The "structuring" of social systems can be conceptualized as consisting of two primary dimensions: a "horizontal" dimension made up of institutional realms (government, religion, etc.) and the relationships between them (the "intersection of structures," according to Sewell 1992), and a "vertical" dimension expressed as the degree of "cultural depth" of the "institutional logics" (Friedland and Alford 1991) or "cultural schemas" (Sewell 1992) constituting social institutions, as well as their physical and behavioral expression at multiple spatial, temporal, and organizational scales (Warren 2005; Friedland and Alford 1991; Sewell 1992).

Table 1. Summary of major associations with FH categories

FH category	Indicator of FH	Forest management	Institution of forest governance	Ultimate concerns
Productive forest (PF)	Managed forest	Intervene (more management)	Ideally legitimate but corrupted	Family, community, economy
Historic forest (HF)	Historic forest	Intervene (more management)	Legitimate/illegitimate	People and forest management
Community forest (CF)	All components present—connections, soil	Sensitive, small-scale, context-specific management	Illegitimate	Human community/culture and forest interrelated—sustainability
Natural forest (NF)	Unmanaged forest	Leave alone	Illegitimate	Stopping human manipulation of forests

Table 2. Nominal group membership of informants in each FH category

FH category	Forest industry	Forest manager	Forest scientist	Environmentalist	American Indian	Unaffiliated
Productive forest (PF)	6	3	2	—	—	—
Historic forest (HF)	1	2	—	1	—	—
Community forest (CF)	—	—	1	—	2	1
Natural forest (NF)	—	—	—	4	—	2

"Structures" (or "institutional logics"[6]) consist of "schemas" (mental models) and "resources" (the cultural and "natural" entities to which a schema applies—e.g., forests) organized in a nested hierarchy that expresses of their cultural "depth," or degree of generality and presupposition. "Deep" schemas (or structures) inform more "surface" schemas that exist in discursive consciousness as specific transformations (applications) of deeper schemas (Sewell 1992). Deep structures are more resistant to change than surface structures, apply to a wider range of circumstances in place and time, and are less dependent on context.

A structuration approach therefore provides a means to organize various conceptions of forests and their management using the notion of scale, as well as a model for understanding why some forest policy debates are more resistant to resolution when the conflict is between deep structures and large-scale institutional behaviors. The deep structures that are most basic to the lifeworld of policy actors tend not to be expressed in discursive consciousness and thus are not addressed explicitly in forest policy disputes. The informants in this study demonstrate how different, and sometimes conflicting, schemas can be applied to the same resource (i.e., forests of the Clearwater basin), and how FH schemas fit within larger (and culturally deeper) institutional logics of forest management and humanity's relationship with "nature."

For example, the CF structure of FH is based on seeing humans as part of the forest, with the health of the forest dependent on a syncretism of ecological, economic, cultural, and community criteria. However, because FH was also dependent on the circumstances of a particular place according to the CF view, an appropriate human–forest relationship could take on many different forms.

The CF view is in contrast to the other three FH structures, which, although concerned with issues of human well-being and context (the PFs), conceive forests as something "out there" that humans apply management to (or humans are kept out of—NFs), and have criteria for health that are confined to the "nonhuman" realm (e.g., tree spacing, historic, "naturalness"). Drawing on Latour's (1993) model of culture–nature dualisms, the CF structure could be described as one of "mediation" between culture and nature, whereas the others (PFs, HFs, and NFs) are more characteristic of the "purification" dimension typically ascribed to modernism, where human culture and nature are viewed as distinct.

A further difference among informants in the underlying ("deeper") structures of the human–nature relationship is how PFs, CFs, and HFs view the relationship between society and nature as unproblematic, whereas NFs express a structure of human alienation from the "natural world," where a healthy forest is "one that man hasn't laid his hands on." Using terms such as "processes," "functions," "components," and "interconnections" that could get out of "balance" if humans interfered, NFs describe forests as delicately and precisely engineered (as if by an entelechy), where everything that happened "naturally" was not simply a chance event that could have been otherwise, but a necessary "function" within an intricate determinate system.

> When you take something out such as a predator, it gets out of *balance* and *natural processes* and *functions* don't work. (NF) [emphasis added]

> I live in the woods and I see how it *functions*. It's astounding. You can't predict which trees will go down in winter. Trees that I select to leave are

> the ones that go down. This is an example that we just don't know enough about the forest to manage it. (NF) [emphasis added]

Such functionalist language is replete within environmental and ecological discourse and is a phenomenon ripe for analysis by comparison with the defunct structuralism within sociology. But the point I want to make here is that this notion forms a deeper structure among NFs that informs (in part) their schema of FH.

Also different from the other informants (CFs, HFs, and PFs) is the NF tendency to see issues of FH and management within the context of a general moral struggle. NFs seem to draw schemas from large-scale institutional realms outside of forest management or ecological science, such as the moral-religious, in the sense that Durkheim (1995) described: "a unified system of beliefs and practices related to sacred things" (44). For example, NFs refer to places in nature as "sacred" and express a deep spiritual affinity with wild forests. (Although CFs share somewhat similar views, they expressly include people within their concept of FH.) "It's a spiritual or religious issue—we need to let natural processes play themselves out" (NF). NFs overwhelmingly express that their activism and concern for forests constitute an ultimate life concern that pervades their lifeworld. NFs' institutional logic of the appropriate human–nature relationship seems to constitute "a unified system of beliefs and practices" that directs their behavior in other institutional realms.

Although other informants (PFs, HFs, and CFs) consider FH and management important aspects of their lives, these issues do not appear to have the extent or intensity of lifeworld "saturation" as they do for NFs. The ultimate personal concerns of PFs, HFs, and CFs include family, friends, community, religion (as distinct from their concerns with forest management), and social issues such as crime and ethics. PFs and HFs tend to compartmentalize their involvement and concern with FH and management as one among other—and often more important—aspects of their lifeworld.

Another finding was the virtual unanimity among informants in attributing FH problems (however defined) to institutional forces beyond the scale of the local river basin, rather than to any capriciousness of nature or idiosyncratic decisions by local managers. This and subsequent work (Warren and Rollins 2001, 2003) suggests that local "fixes" will not mollify an overriding dissatisfaction with the formal decision-making institutions that govern federal forest management. Informants view change in these large-scale institutional processes as necessary for the achievement of FH, and some make the Foucaultian observation that it is not only the particular ideologies (institutional logics) enacted by social institutions that are problematic, but the institutional expression of power itself. In agreement with some informants in this study, advocates for community forestry and local decision-making (e.g., Baker and Kusel 2003; Kemmis 2001), and members of local natural resource-dependent communities (Warren and Rollins 2001, 2003), Foucault advocates the return of "local, subjugated knowledges" and local forms of resistance as the antidote to large-scale administrative forms of power (Foucault 1980, 83; Rouse 1987).

Policy Implications

The appropriate state of a forest, whether it is characterized by "health," ecosystem "integrity," or "stability," is described through fundamental cultural value

preferences that manifest themselves in political power struggles over the appropriate state of "nature." There is no objective or scientific measure of an ideal forest condition that is uninfluenced by human desires, norms, or needs (Busch 1989; Gordon 2002; Kay 1993; Lackey 2001). The common use of such terms in much of natural resource science and ecological discourse masks the political nature of any pronouncements of what a forest or ecosystem should be. The political nature of the term health and the focus of informants on questions of institutional legitimacy as the cause of "unhealthy" forests add support to the assertion by Lachapelle et al. (2003, 475) that "natural resource planning is . . . an intrinsically political process" that should be described as "politics with science advisors, instead of science with political meddlers. The root of the problem is not that it [resource management] has become too political: it is simply not political enough" (Burchfield 1998, 36).

This perspective is in stark contrast to the institutional logic of the Progressive Era that underlies resource management science and gave birth to the state-centered resource management bureaucracies of today. The institutional logic of the Progressive Era (and more broadly that of the modern nation-state; Weber 1978, chaps. 3 and 11) assumes that experts will use the "best science" to impartially determine what is in the public's best interest. Not only is this logic antiquated in its sociological and ecological naiveté, but many in the public (including informants in this study) do not give legitimacy to a particular forest condition because it is deemed best by management "experts" or governance institutions, but rather *use the condition of the forest (as determined by their own criteria) to judge the legitimacy of social institutions influencing forest management*. Thus, a conflict exists between the underlying institutional logic of forest governance and the criteria the public uses to grant institutional legitimacy.

This study supports the notion that resource conflict is primarily about competing "deep structures" and disparate lifeworlds rather than the more superficial (and vocal) policy positions that clash in the public arena. One PF informant trenchantly described the social expression of this deep structural divide in local communities:

> You take these communities here and you can go out and attend a function and socially be with people who have different religious beliefs, who are different, and people have some tolerance and understanding of different religions. We have a lot of Mormons in and around this area and that doesn't even get mentioned or talked about. We have different political views, we have a mixture of Republicans and Democrats. We will all go to the same social events and kid with each other. But when it comes to environmental beliefs, you don't see a mixing of it. There is this terrible intolerance and so it carries over socially. (PF)

Structuration theory offers an interpretive framework to such relationships that may provide additional insight and broader application of this and other similar case studies on resource conflict.

In response to a reviewer's request to speak about which one of the FH conceptions seems to be "winning" in the policy debate, and which one might provide the best route out of current policy conflict or gridlock, it is the author's view that the NF conception of FH is the most problematic because (1) it views humanity as alienated (even ontologically distinct) from nature along with the accompanying

concept of (non-human-influenced) nature as perfect or necessary rather than the scientific view of configurations in nature being a product of chance and their particular history, and (2) there is a strident moralistic and doctrinaire quality to the NF view and a high degree of lifeworld saturation compared to the other FH conceptions. These fundamental aspects of the NF structure of FH suggest a zero-sum relationship between humans and forests that would likely make the NF position highly resistant to compromise or dialogue with those holding the other structures of FH found in this study, which saw human manipulation of forest structure as compatible with FH.

In contrast, the CF forest health conception is most compatible with (1) the contemporary understanding of ecological processes and their relationship with social systems such as the context sensitivity and chance-driven nature of ecological systems and the realization of the ideographic versus nomothetic nature of ecological knowledge (e.g., Wu and Loucks 1995; Kapustka and Landis 1998; Pritchard and Sanderson 2002; Schrader-Frechette and McCoy 1993; Brown et al. 2001), (2) the increasing archaeological and paleontological evidence that humans have dramatically altered and constructed ecosystems for millennia even in the most remote and supposedly pristine parts of the planet such as Amazonia (e.g., Heckenberger et al. 2003), as well as in the Clearwater basin (Laliberte and Ripple 2003; Lyman and Wolverton 2002; Johnston 2004), (3) the Darwinian model of biological evolution that places humans squarely within, rather than outside of, "nature" and ecological systems (Christensen et al. 1996), and (4) the increasing awareness that forest, wildland, and social sustainability are best served by recognizing human communities, economies, and cultures as legitimate and beneficial parts of the landscape and ecological systems (e.g., Knight et al. 2002; National Science Foundation 2000; Peterson 2000; Lee and Field 2005).

Unfortunately, today's environmental laws and regulatory machinery, as well as the environmental and wilderness activist movements, were largely conceived under a now antiquated view of ecological systems (Wiener 1996; Profeta 1996; Botkin 1996) that seems to support the NF view of humanity's alienation from nature. This, and the unwieldy administrative apparatus of the nation-state (vs. the ideographic, context-specific, and ever-changing state of socioecological reality), and the seeming dominance of popular environmentalism that largely shares the view of NFs that the only legitimate nature is one where humans have little or no influence (e.g., Dizard 1995; Hull et al. 2002), are in my judgment major (and large-scale) institutional obstacles within contemporary society that will have to be overcome if federal land management is to be transformed from its current (if often forced) emphasis on a preservationist logic to one of cultural and natural resource sustainability at all socioecological scales.

Conclusion

A healthy forest is what those that hold—at any given time—the greatest social power to influence policy say it is. A given forest condition represents what Sewell (1992) terms the instantiation of the schema(s) that produced or maintain it, and thus represents the outcome of the perennial conflict of power dominance in society. The changing forest landscape in the Clearwater basin, from that created by American Indians, to the early European settlers, to modern commercial timber companies, to the environmental movement, represents the instantiation of the contest for social power between conflicting institutional logics of what a

forest should be and the appropriate relationship of humanity with the "natural" world.

Despite its use in forest science discourse, resource managers and the public must realize that the term health (and other similar evaluative concepts) does not describe an objective, scientifically derived state but a socially constructed ideal that is fundamentally political, the different conceptions of which cannot be adjudicated by recourse to science or "facts" (see Szerszynski 1998 for an insightful explication of this problematic). Perhaps the public interest would be better served by a change of focus within the forest policy debate, from arguing about what is the scientifically "correct" forest (a meaningless question)—and increasingly, what is a legal forest—to a more Habermasian public discourse on how to develop institutions of public governance that have the greatest probability of determining what is a socially *just* forest (or allocation of forests), given the diverse (and considerable magnitude of) needs and wants of humans.

Notes

1. A brief chronology of government policy statements and stakeholder lawsuits surrounding the issue of forest health in the interior Columbia River basin is presented in Quigley and Arbelbide (1997, vol. I).
2. The Clearwater basin contains nationally significant public resources that have been a priority to national conservation and environmental groups since at least the early 1980s. These public resources include some of the largest remaining Forest Service roadless lands in the nation, the Selway–Bitteroot Wilderness (over 1.3 million acres, the third largest Wilderness in the continental United States, www.wilderness.net), National Wild and Scenic Rivers, ESA-listed salmon runs, a recently introduced wolf population, and a proposed site for grizzly bear introduction by the U.S. Fish and Wildlife Service.
3. Evidence indicates that these forests experienced a high incidence of wildfire prior to modern methods of fire suppression (Cooper et al. 1987). Today, the Clearwater basin is considered to have a much greater percentage of its landscape at risk of catastrophic fire than it did in the 19th century (Quigley and Arbelbide 1997, vol. II) because of changes in forest structure (e.g., buildup of fuels, high stand densities, disease) resulting from fire suppression and the logging practices used during much of the 20th century.
4. White pine was a dominant tree species in the area, and was the major draw for large timber companies at the end of the 19th century. Subsequently, white pine blister rust (an inadvertently introduced pathogen of white pine) and some logging practices have severely reduced the presence of mature white pine in the forests. There continue to be attempts to reestablish blister rust–resistant strains of white pine.
5. The area referred to is an inventoried roadless area characterized by large shrub fields that contain few trees except for densely stocked lodgepole stands about 80–90 years old. Severe stand replacing fires enveloped the area in the summer of 1910.
6. Friedland and Alford's (1991) term "institutional logic" is essentially the same concept as Sewell's "structure," except that Friedland and Alford stress schemas as associated with behaviors vs. schemas and resources. Both concepts form the same fractured and process view of social structure consisting of nested hierarchies of cultural models and practices. Institutional logic is used in this paper to refer to large-scale structures that form major institutional realms within society, as for example capitalism or environmentalism.

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