

SOCIAL COMPLEXITY AND THE MANAGEMENT OF SMALL DIAMETER STANDS ON THE COLVILLE NATIONAL FOREST¹

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ABSTRACT

The disposition of small diameter forest stands is linked to forest health, ecological restoration, and timber harvest on public lands and is thus prone to conflict. Results of a qualitative social assessment that focused on small diameter stand management on the Colville National Forest in northeast Washington are presented to illustrate social complexity embedded in this issue. In this assessment, stakeholder groups are identified and described. Key questions associated with small diameter stands, including the desired silvicultural treatments for these stands, the values attributed to small diameter stands, as well as stakeholder relationships with the Forest Service are also addressed. With increasing emphasis on forest restoration in the West, integrating social and ecological complexities appears necessary to develop socially acceptable forest policy.

Keywords: small diameter stands, social assessment, CROP, stakeholder, social complexity

INTRODUCTION

An increasingly prominent issue facing managers of public forest lands is the management and treatment of overstocked, small diameter stands. The insect, disease, and fire hazards associated with the declining vigor of such stands pose technical and ecological challenges for land managers.

An emerging addition to these challenges is the beliefs, concerns, and attitudes toward natural resource policy issues held by stakeholder groups. This social complexity poses another consideration for managers. The disposition of such stands is often linked to forest health, ecological restoration, and timber harvest on public lands, and is thus prone to conflict. Social assessments are one of a set of new approaches that can be used by land managers to incorporate the often divergent views of the public. The differentiation of these viewpoints can be a way to find common ground in the often contentious debates that surround the management of public lands (Woolley and McGinnis 2000).

This *social* complexity rivals that of the technical and ecological issues involved in the management of these stands. A corollary to this is that managers must become more knowledgeable about this social complexity if they are to successfully address resource issues. To illustrate this, results of a social assessment that focused on small diameter stand management on the Colville National Forest (CNF) in northeast Washington are summarized.

History

The most outstanding feature of the timber on the Colville is the number of acres covered by 50-to 80-year-old trees. Most of these stands are the result of large wild-fires, which have burned over half of the forest between 1910 and 1936. Many of these burned areas have developed into overcrowded stands of small trees, which are growing slowly (CNF 1994).

For over twenty years, CNF managers have been concerned with the quantity and conditions of small diameter, heavily stocked stands across the forest. The IMOS (immature and overstocked) and "Thickets" programs of the 1970s and 1980s focused on stand inventory and treatment plans, and stand analysis and mapping, respectively. These programs targeted stands associated with under-productive growth and submerchantable wood products. However, the forest planning process preempted both studies. The project reemerged in 1989 as CROP (CReating OPportunities) and focused on the relationship between diameter classes, basal area and stocking levels to evaluate these stands' contribution to ecosystem management and forest health.

Continual studies, ambiguous results, and lack of funds appropriated to CROP program led to frustration. Many local residents expressed growing concern about the potential risks associated with older, less vigorous stands and the lack of resources available to the Forest Service to treat these stands.

In 1996, the U.S. Congress provided funding and legislation to initiate a comprehensive research program for densely stocked, small diameter stands on the CNF (Quigley 1997). Research objectives were to provide information and technology that enables land managers to better understand these stands and implement treatments that maintain or restore ecological processes, while providing sustainable flows of forest products to enhance community sustainability. As one component of the overall research, a social assessment was initiated to develop a systematic understanding of local views of and attachments to the forest, categorize the social dimensions of small diameter stands, and aid the development of future public involvement programs.

THE SOCIAL ASSESSMENT

Methods

Data were collected and analyzed following the precepts of the grounded theory method (Glaser and Strauss 1967; Glaser 1992). Representatives of stakeholder groups in each community adjacent to the CNF and Spokane, WA were interviewed to gather information about particular stake-

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holder groups. Forest Service staff identified key informants for interviewing. These informants were asked to provide referrals for future interviews, a technique known as chain referral sampling (Biernacki and Waldorf 1981). The process continued until the level of new information emerging was insignificant or nonexistent. This approach, sometimes also referred to as theoretical sampling, captures the *diversity* of stakeholders and viewpoints in a given population rather than focusing on a numeric estimate of the *frequency* of their occurrence.

This qualitative method was used in order to capture the “voices” and worldviews of stakeholders by enabling them to communicate their knowledge, views and values. In-depth semi-structured interviews with open-ended questions allowed the interviewees to freely express their views. Interviews focused on the nature of local attachments to the land, perceptions of forest management and its impact, and views about the small diameter stands. Considerable information also emerged about the complex relationships between stakeholders and the CNF.

Results

The following section presents the findings of the social assessment and includes descriptions of the categories of stakeholders, and the stakeholder groups’ concerns, beliefs and positions toward key questions associated with the CROP program and small diameter stands (see Findley et al. 2000 for further detail). The five stakeholder groups

identified were: civic representatives, commodity users, environmentalists, nonindustrial private forest landowners (NIPFs), and recreationists. Descriptions of the Forest Service and the Tribes are also included because of their role in forest policy issues. The descriptions of the stakeholders represent a broad definition of each group, and do not necessarily represent the diversity of viewpoints found within a particular group. The general concerns, commonly held beliefs about the CROP program, and the position taken by each stakeholder group are presented in Table 1. The groups’ concerns, beliefs, and positions toward key questions associated with the CROP program and small diameter stands are also summarized in Tables 2, 3, and 4. The key questions addressed in this paper are: values attributed to CROP stands, desired silvicultural treatments for CROP stands, and the relationship between the Forest Service and stakeholders.

Stakeholder Groups

Civic representatives are those holding elected, appointed, or leadership positions in the community. This group supports forest activities that further economic development and local quality of life, which can seem contradictory. They believe active management on the public lands can produce a valuable product and promote environmental integrity.

Commodity users include those connected to natural resource use, such as loggers, forestry consultants, and the

Table 1.—What general concerns do stakeholders have with respect to the CROP program?

Stakeholder Group	Key Concerns	Belief Statement	Position
Civic Representatives	quality of life, cultural values	Local forest conditions vary from other R6 national forests and within the CNF. Local residents often feel alienated by decisions made at Washington, DC and Portland, OR.	Make local decisions based on local conditions, variability, and impacts.
Commodity Users	forest health, timber	Forest and timber resources are limited, yet the demand for wood products continues to grow. Efficient use of these resources means implementing practices that promote forest health.	The Forest Service should actively manage these stands to enhance timber and other resources. Local timber supplies can be harvested in conjunction with ecologically sensitive practices.
Environmentalists	biodiversity	CROP is another attempt to reach ASQs (Allowable Sale Quantity). If there really are too many small diameter stands, let nature regulate change.	The Forest Service needs to respect nature and natural processes, thus, they should preserve the precious resources and biodiversity left in the national forests.
Forest Service	forest health, ecosystem elements	The feasibility to implement CROP depends on many variables: site specific characteristics, technologies, forest health conditions, management objectives, and funding. And, it must be socially acceptable.	Prescribe treatments based on site specific characteristics and grounded in larger program and landscape objectives.
Tribes	cultural values, spirituality	Tribes have unique standing and mandated consultation rights with federal agencies.	The Forest Service should formally consult with tribes on proposed actions. Traditional uses should be preserved for tribal members on the lands held in trust.

timber industry. This group advocates for prudent management of forests, grazing lands and mining resources for long-term sustainable use. Commodity users believe that resource use can occur while maintaining and even improving environmental integrity and contend that active management does not preempt noncommodity resource protection.

The environmentalist group includes those affiliated with environmental organizations and those independently interested in environmental advocacy. In general, they argue to conserve, and in some cases to preserve, the environment's components, processes, ecosystems, and spiritual, cultural and existence values.

There were two distinct subgroups of environmentalists, those who support a zero-cut policy and those who support some light impact harvest activities on national forests. "Zero-Cut Environmentalists" want nature to be the primary regulator of the forest, which promotes letting natural conditions and processes run their course while minimizing human intervention. "Light Impact Environmentalists" prefer a less drastic change in management direction for national forests. They think that restorative measures can intervene to help nature return to a more naturally resilient state.

Nonindustrial Private Forest Landowners (NIPFs) own as little as five acres to as much as 3,000 acres of private forest land in the study area and form a heterogeneous group whose level of management ranges from none to intensive. NIPFs face challenges of managing their own small diameter stands since many of these lands have recently undergone frequent harvests, leaving only sub-merchantable timber.

Recreational opportunities abound on the CNF. Membership within the recreationist stakeholder group is quite diverse and they sometimes voice competing positions on forest management policies. Local residents often view the national forest as an extended backyard; nonlocals often travel to public lands for recreation opportunities not otherwise available to them. Thus, access to these public lands is a key concern.

Tribes have sovereign nation status and therefore are categorized differently than the aforementioned stakeholder groups. A significant portion of the CNF was originally carved out of public domain lands that had from 1872 until 1892 been part of the Colville Indian Reservation (Deutsch 1956). As a result of this complicated history, three currently existing tribal governments (Kalispel, Spokane, and Colville Confederated Tribes) have legal rights to consultation in the management of the CNF.

Although tribal leaders interviewed for this project had little interest in small diameter stand management, they clearly expected their consultation rights be respected. Each of the three tribes is unique and has an individual agreement with the CNF, however, they have some common interests in preserving or reestablishing cultural ways of life that are linked to national forest policies.

Line officers and staff of the CNF comprise the Forest Service stakeholder group. Their stake in the CROP program differs from other stakeholder groups because they are the lead decision-maker for national forest management directions. With this role come responsibilities, some for-

malized through laws, regulations, agency directives, and case law; and some through informal, cooperative relationships with adjacent communities, landowners and other public land and resource managers.

Values Attributed to CROP Stands

The social complexity of these issues is reflected in the values stakeholders attribute to CROP stands (Table 2) and is related to their key concerns. Some groups attribute little or no value to these stands. Commodity users and civic representatives believe that these stands have no economic value. Lack of management will threaten communities and forests. Recreationists don't perceive recreational value in thick, stagnant stands that are difficult to hike or ride through, are aesthetically unappealing and that may limit future recreation opportunities.

Environmentalists, however, value the biodiversity and naturalness of these stands. For them, value is not defined by economics. CROP stands were in part created by catastrophic, yet natural events, and have their place in forest ecology. They hold that nature, not the economics of the timber market, should dictate treatment of CROP stands.

Desired and Appropriate Silvicultural Treatments

The stakeholder groups' views on silvicultural treatment of the CROP stands vary as well (Table 3). Not surprisingly, perhaps, civic representatives, commodity users, NIPFs, and recreationists favor silvicultural treatments of one degree or another. In their view, active management of these stands can prevent losses to fire, insect and disease, promote growth, and sustain the timber resource. Recreationists favor treatments that improve aesthetics and the recreation experience. Some NIPF landowners think that the lessons learned on private land are relevant and applicable to CROP stands. These include the use of selective cuts and maintaining fire resistant species.

Zero-Cut and Light Impact Environmentalists disagree with the above groups as well as with each other. While both subgroups believe that silvicultural treatments can have negative impacts on soil, water, and vegetation, Light Impact Environmentalists take the position that thinning in some CROP stands can improve stand conditions and health, but treatment should be done after a thorough assessment. Zero-Cut Environmentalists take the position implicit in their name, that no silvicultural treatments should be applied. This is in order to prevent irrevocable loss of the remaining species, habitat and natural conditions on public land.

Stakeholder Relationships with the Forest Service

The final key question concerns the relationship between the Forest Service and the stakeholder groups (Table 4). Stakeholder groups' relationships with the Forest Service vary, with some groups having cooperative and generally good relationships, while others are characterized by a low level of trust. Some stakeholders, such as the Light Impact environmentalists, see the potential for an improvement in their relationships with the Forest Service, while others, like the commodity users, attribute a deteriorating

Stakeholder Group	Key Concerns	Belief Statement	Position
Civic Representatives	quality of life, timber biodiversity	Communities are dependent on neighboring national forests for the quality of life and economic livelihoods of residents. CROP stands provide little economic value as is and poses potentially catastrophic risks. If forest conditions threaten current or future dependence levels, communities could experience a multitude of impacts or crises.	The Forest Service should prevent a forest health crisis and subsequent economic and social crises by treating CROP stands and keeping the forest productive.
Commodity Users	timber forest health biodiversity	CROP stands are stagnated, reducing growth and hindering natural regeneration, posing catastrophic risks. Forests could be irreparably damaged in their capability to provide habitat, healthy streams, timber, etc., if catastrophic fires occur. Active management can lessen the severity of catastrophic disturbances.	Foresters and industry can mitigate risks by implementing prudent management to promote effective and efficient use of forest resources rather than accumulating waste or loss. Intervene with thinnings and harvests to stimulate or regrow productive forests while extracting a merchantable product.
Environmentalists	biodiversity naturalness	CROP has its own place in forest diversity. How can humans define forest health—unknown, ecologically determined stage—and whether current conditions are a crisis? Crises are anthropocentric evaluations. Nature should be its own regulator, not society's economics.	CROP stands and forest health crisis are more accurately an economic crisis. Don't let the markets demand for timber resources cause/encourage the FS to harvest small diameter stands. Let nature run its own course.
Forest Service	forest health biodiversity	CROP stands, in acreage, exceed HRVs; they are stagnant and providing few benefits to other forest programs.	Bringing the forest back within HRVs reduces catastrophic risks to other forest programs and surrounding communities. Plus, the CROP program is a legislative directive.
NIPFs	individually defined	CROP stands may or may not fulfill private forestland owner's management objectives. Concerns about their own forest and CROP stands on the CNF can directly impact NIPFs.	The Forest Service can learn from and provide knowledge to NIPFs about treating CROP stands. Collaborative interaction benefits all parties.
Recreationists	recreation	CROP stands provide little recreation value, look unappealing and accumulate dead and dying snags.	Current and future recreation may be jeopardized.

relationship to Forest Service fears of appeals and concession to environmental pressure.

THEMES: MAKING SENSE OF SOCIAL COMPLEXITY

As various stakeholders identify fundamental concerns about the forest and develop their thoughts on its management, it is not surprising that managers face a plethora of contradictory positions. The often striking tenacity of these positions can usually be traced to deeply held beliefs. The following summarizes the social complexity surrounding the CNF small diameter stands. An analysis of this complexity yields a number of themes:

1. *These stands will undergo basic changes if silvicultural treatments are applied, but outcomes are neither clear nor simple.* Alteration of habitats, ecological processes, visual appearances, succession patterns and soil stability are among a long list of potential impacts. Because exact

responses to a particular treatment prescription (including no treatment) are not perfectly predictable, various stakeholder groups foresee different scenarios as possible effects of one treatment or another and often question motives underlying particular proposed approaches. Thus, subjectivity pervades the decision making process. This circumstance is further amplified by stakeholders' myriad definitions of small diameter stands' roles and values.

2. *People evaluated these treatments using a diverse set of individual experiences, connections to the forest, knowledge sources, cultural influences, and fundamental values.* Different backgrounds (e.g., time spent in the forest, residences proximate to forest lands, cultural backgrounds, work experiences, professional affiliations, education) shape people's views of small diameter stands, assessments of likely outcomes, and the need for particular silvicultural treatments.

Table 3.—What are the desirable and appropriate silvicultural treatments for CROP stands, if so desired?			
Stakeholder Group	Key Concerns	Belief Statement	Position
Civic Representatives	timber, forest health	Thinning and harvesting continue the renewability of timber resources and provides jobs, tax base, and school funds.	Use pro-active silvicultural tools. Don't wait for large, catastrophic fires to consume merchantable timber as well as diminish other forest resources.
Commodity Users	timber forest health	Silvicultural tools such as thinning, harvests, prescribed fire can actively reduce risks and improve forest health. Leaving it as is will only mean catastrophic results in time.	Thin in areas and for species that will grow upon release. Harvest and regenerate in areas beyond release. Use prescribed fire sparingly.
Environmentalists Light Impact	biodiversity	Thinning and harvesting have negative impacts on soil, water, and vegetation. Treatments also disturb habitat and increases noxious weeds. But, the proportion of CROP stands across the CNF poses risks unless some intervention occurs.	A thorough assessment must be undertaken so as not to jeopardize the ecology. Thin areas that bring forests back into HRVs. But this should not include new road building or significant changes to current roads.
Environmentalists Zero-Cut	naturalness	Thinning and harvesting have severe impacts on soil, water, and vegetation. It also disturbs habitat and increases noxious weeds.	Silvicultural practices are too much of a gamble that risks irrevocable loss of habitat, species, and natural conditions that remain on public lands. This is our legacy to future generations. Definitely no new roads or road improvements.
Forest Service	forest health, biodiversity	To provide structural, age, species, and size diversity by some silvicultural treatment in the form of thinning, harvesting, regeneration, and prescribed fire are necessary.	Use some combination of these treatments to achieve management objectives suggested in the CROP legislation.
NIPFs	forest health	Private lands have been cut over repeatedly, leading to less resilient species and stagnation.	Learn from private lands; don't high grade species, keep fire resilient species, and use selective harvest practices rather than clear cuts.
Recreationists	recreation aesthetics	Silvicultural treatments can improve some recreation (e.g., huckleberry picking) in the short-term; and, increase overall aesthetics in the long term.	Small entries, no clearcuts, and cleaned harvest areas reduce impacts on recreation. Close access temporarily, but reopen when safe to reenter area.
Tribes	cultural values spirituality	Tribes have unique standing and mandated consultation rights with federal agencies.	Consult with tribes to verify that traditional uses are not impacted by silvicultural treatments and management objectives.

HRV = Historic Range of Variation

3. *Perceived risks associated with alternative treatments (including no treatment) are significant decision variables in people's preferred management direction choice.* Regardless of a person's shared interest with a particular stakeholder group, the core of his or her position on small diameter stand treatments generally centered on minimizing losses of one type or another. The range of acceptable intervention can be linked to risks defined as unacceptable by stakeholders.
4. *Two fundamentally different positions concerning management emerge from this social assessment. Between these two distinct positions, however, a spectrum of mixed interests and voices exist.* Members of two stakeholder groups—Commodity Users and Environmentalists (specifically the Zero-Cut Environmentalists)—generally hold very different views of the situation, and therefore espouse opposing positions on forest management. In one sense, this polarization clarifies the discussion, illuminating differences and simplifying the discourse. However, by focusing on the extremes, the situation's complexity and the spectrum of interests somewhere in the middle can easily be overlooked.
5. *Support for or opposition to management alternatives for CROP stands is indicative of stakeholders' emotional attachments to forests.* People interviewed for this assessment exhibited passionate commitment to their positions on stand management alternatives and expressed strong desire to make responsible decisions about the forests they care deeply about.

Table 4.—How can the relationship between the Forest Service and stakeholders be described?			
Stakeholder Group	Key Concerns	Belief Statement	Position
Civic Representatives	forest health, quality of life	Residents of communities neighboring the CNF live here for many reasons that connect them to forest resources.	A cooperative relationship exists to support multiple use of the CNF. However, more emphasis should be placed on the severity of CNF management policy impacts on local communities.
Commodity Users	forest health, timber	The Forest Service has shied away from active management and bowed to environmental pressures. Local timber industries need the Forest Service and they believe that the Forest Service needs them.	The relationship has deteriorated because the Forest Service is afraid of being appealed. They don't want to lose their jobs by standing up for silvicultural practices that improve the forest but are criticized by environmentalists.
Environmentalists Light Impact	biodiversity, ecosystem elements	The local Forest Service is limited in their decision-making authority by top-down directives, especially ASQs. But they are receptive to the public and work with the environmental community to some degree.	Working relationship is improving but Forest Service employees are afraid of losing their jobs if they resist agency directives that overlook ecological impacts.
Environmentalists Zero Cut	biodiversity, naturalness	The Forest Service agency needs to change its mandate to preserve unique and precious resources that only can be found in the national forests. They are our "lungs and headwaters" and are too important to degrade for short-term economic benefits.	The relationship lacks trust because the Forest Service can't let go of the timber sale program regardless of its impacts on other resources.
Forest Service	all	The public includes local residents as well as all Americans. These are national forests and the Forest Service must respond to all American voices. However, local residents directly experience the impacts of CNF management activities.	The Forest Service can't be all things to all people. It has to follow all applicable laws and regulations. But, it needs creative input from the public to mitigate negative management activities.
Recreationists	recreation	The Forest Service has many informal partnerships with recreationists to maintain trails and facilities. Recreation is not always possible when forest access is restricted.	A good relationship exists, but permanently closed roads and the prospect of user fees worry some recreationists.
Tribes	cultural values, spirituality	Tribes have unique standing and mandated consultation rights with federal agencies.	The formal consultation process on a government-to-government basis has not occurred, violating legal agreements.

HRV = Historic Range of Variation ASQ = Allowable Sale Quantity

CONCLUSIONS

Change is inevitable in any social or ecological system. Dealing simultaneously and in an integrated manner with these systems is a reality that forest managers must face when dealing with questions of forest restoration. When evaluating changes (or lack thereof) to natural resources and the environment that people strongly value, policy debates will be vigorous, heartfelt and may seem intractable. To develop management directions, a flexible range of alternatives cognizant of the whole interest spectrum generated from diverse social sampling can benefit the decision process.

There is as yet no clear management direction to report for small diameter stands on the CNF. The authors make no claim that this or any social assessment will produce

"magic bullet" solutions to what Allen and Gould (1986) famously called the "wicked problems" of forest management. We suggest that managers and the public will find social assessment useful in understanding social complexity surrounding ecological complexities. We believe managers can integrate these complexities to move toward socially acceptable policies for natural resource management.

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