Ecosystem Management in the USDA Forest Service: A Discourse Analysis

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ABSTRACT

This dissertation examines the environmental discourse of the USDA Forest Service, focusing on the language of ecosystem management (EM). A two pronged approach was employed: eleven interviews were conducted with agency executives (chapter two); thirty-three interviews were conducted with agency staff specialists and decision-makers, working at the agency's operational levels (chapter three and four). Differences between how agency executives view EM and how agency operators view EM were identified. Chapter two shows that agency executives generally believed that the process of EM is ingrained in the agency. Chapter three explores this assertion at the forest and district levels, and reveals conflicting stories concerning the current practice of EM. Agency operators explained EM as a process driven by ecological science, but also revealed an alternate planning process. The alternate planning process is driven by the agency's budget and strict employee roles. Through qualitative analysis of interviews with agency operators, a model of how agency operators construct agency planning was created. It illustrates the potential mismatch between planning focused on ecological science and an agency focused on budgets, cost-benefit calculations, and strict employee roles. The model also shows that agency operators described active and passive publics in their constructions of agency planning. Chapter four focuses on these constructs of the public, and shows how they are partly created by agency interpretations of the public involvement processes required by the National Environmental Policy Act (NEPA). In some cases, the agency applies a standard for public participation (*substantive sieve)* that requires publics to couch their concerns in scientific or legal terms. Publics that are able to navigate the *substantive sieve* are typically viewed as active

publics, while those that cannot meet this standard are viewed as passive publics. A feedback mechanism was identified between constructs of the public and agency process; constructs of the public shape agency process and agency process shapes agency constructions of the public. The dissertation concludes by showing that agency focus on budgetary targets and the use of the *substantive sieve* can be understood as attempts to instill accountability into a decentralized agency with an ambiguous mission.

Dedication

To my Dad, Dr. Richard L. Predmore Jr., for the trips to Yellowstone, the Tetons, Yosemite, and Pisgah, that inspired my work.

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The author would like to thank all participants from the USDA Forest Service for their willingness to provide an insiders view of the agency. It is my sincere hope that some of the ideas in this dissertation are of use to the agency.

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Attribution

Chapters two, three, and four are individual manuscripts that have either been published, are in review, or will be submitted in the near future. Co-authors are listed in the order that they will appear in journal articles. The order of authorship is indicative of the level of contribution made by co-authors. The ideas and insights in each article are my primarily my own. The co-authors, however, made significant contributions to these chapters in the following ways: clarified ideas in the early stages of writing; aided the organization of ideas; suggested content for conclusions; and improved writing. I am grateful to the co-authors for their help in all of these capacities.

Chapter 1: Introduction

Environmental discourse has been described as dysfunctional and impoverished (Norton 2005). Language is the medium through which we conceptualize problems and communicate with one another. As a result, it may limit and/or dictate our attempts to deal with natural resource problems. As such, the language of natural resource management is itself worthy of study. Bentrupperbaumer et al. (2006; p.723) summarized the importance of language saying:

> "The language of natural resource and protected area management directs many planning and policy decisions, as well as on-the-ground management, and the larger research and monitoring enterprise. This *management discourse* reflects and creates particular understandings and constructs relating to environments, threatening processes, impacts, and management responsibilities and roles."

One common language for discussing what environmental quality is, and how to achieve it, is ecosystem management (EM), an approach that emerged from the conflict over public lands in the 1990's. This new suite of ideas associated with EM was classified by some as a paradigm shift and by others as a natural progression in management philosophy. Either way, EM was a new language emblematic of a change in thinking about the human-environment relationship. This new approach was adopted in 1992 by the USDA Forest Service, and soon other major federal land management agencies followed suit. Implementation of this approach stayed at the administrative level; ecosystem management was never approved in Congress. Despite this limitation, the language of EM persists within the Forest Service, and the lack of a legal statute has created the institutional space for experimentation with ecosystem management (Butler and Koontz 2005; Phillips and Randolph 1998). Using interviews with agency personnel, this study aims to understand how the ideas associated with EM have been interpreted and used in agency

policy and planning. The results provide insight into how EM ideas are being used in the administration of 191 millions acres of federal public lands.

The following four chapters share insights concerning USDA Forest Service environmental policy and planning developed from an inductive, qualitative analysis of 44 interviews with agency employees. Each chapter is a stand-alone product. The order of the chapters is reflective of the sequence in which they were produced, with each chapter building on the insights of the previous chapter. Chapter two explores how 11 executives in the agency understand (EM), as well as their beliefs concerning EM's current relevance in agency policy. Findings from chapter two are placed in the context of national-level politics, mainly by outlining the changes in agency planning regulations that occurred in the transition from the Clinton to Bush Administration.

Chapter two reveals that the agency executives interviewed believed that the process of EM is ingrained at the agency's operational level. Chapter three builds on this initial finding by examining how 33 agency operators construct EM. Participant constructions of EM are analyzed in relation to the rational, expert-driven planning approach that has historically been associated with the agency. To accomplish these objectives, interviews with agency operators became far less-structured compared to those conducted with agency executives. Although EM was always introduced in the course of interviews, the interviews became increasingly focused on how agency operators constructed on-the-ground decisions.

The analysis in chapter three revealed that agency operators use a variety of constructed publics in their descriptions of agency environmental planning strategies. Chapter four addresses the role of constructed publics more deeply, focusing on how agency operators construct the public and how these constructs are related to National Environmental Policy Act-mandated

(NEPA) public involvement processes. The analysis presented in Chapter four uses the same 33 interviews conducted with agency operators. The data from those interviews was also complemented by an analysis of the Council of Environmental Quality's (CEQ) NEPA regulations, as well as Forest Service training materials. Both of these sources provided additional detail on how the agency views the role of the "public" in agency planning. The concluding chapter synthesizes the findings of chapters two, three and four, and relates them to the agency's mission.

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Chapter 2
Ecosystem Management in the USDA Forest Service: A Persistent Process but Dying Discourse[1]

S. Andrew Predmore, Carolyn A. Copenheaver, and Michael J. Mortimer

Abstract

Eleven executives of the USDA Forest Service were interviewed to explore the current status and meaning of ecosystem management (EM). The main method of inquiry was open-ended questions, but these questions were complemented by a questionnaire, designed to elicit further conversation about ideas often associated with EM. Participants indicated that EM is still practiced by managers but is seldom used in the agency's environmental speech. The idea that EM is of declining importance to the agency's discourse was also supported by the lack of agreement in participant definitions of EM, where the importance of 'scale' and 'systems thinking' were the only commonly included ideas in participant definitions of EM. Participants commonly noted the ambiguity and controversy surrounding objectives-oriented components of EM, while process-oriented components were widely accepted by our participants. Our analysis suggests that despite the reduced importance of the term ecosystem management, many of EM's component ideas, particularly those addressing management processes, continue to compete in the agency's broader environmental discourse.

Keywords: ecosystem management, environmental discourse, USDA Forest Service, policy

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Introduction

Ecosystem management (EM) received considerable scientific and administrative attention in the 1990s. In 1992, an ecosystem approach to public land management was adopted by the USDA Forest Service, and soon the other major federal land management agencies, such as the Bureau of Land Management (BLM), the Fish and Wildlife Service (FWS), and the National Park Service (NPS), followed suit (United States GAO 1997). In the early and mid-1990s there were numerous efforts to define EM (Christensen et al. 1996, Grumbine 1994, Lackey's 1998) and these contributions often included adaptive management, a systems approach to management, incorporating public values, and sustaining ecological process. While a broad consensus emerged concerning the components of EM, questions concerning EM persisted. Fitzsimmons (1998) questioned the practicality of the ecosystem construct in management. Other questions followed concerning how to balance EM's focus on science with its insistence on collaboration and open decision-making (Cortner and Moote 1999). Multiple versions of EM emerged, often with fundamental differences in their degree of biocentrism or anthropocentrism (Stanley 1995). These questions and others surrounding EM led many to label it as one of the many fuzzy concepts in natural resource management (More 1996). Policy ambiguity produces both costs and benefits for public land management agencies. Ambiguity may impede coordination between land management agencies or increase the discretion of agency operators. While operator discretion may be desirable in some respects, it may also expose agency decisions to increased public scrutiny, in the form of administrative review or litigation (More 1996).

Despite the disadvantages of policy ambiguity, agency discretion in implementation provides a potentially rich resource regarding experimentation with EM. Even without a clear

mandate from Congress, federal land management agencies have pushed forward with EM as a means to meet their complex legal mandates (Keiter 1994). Experimentation with EM has also persisted because of the problems it can address, such as the loss of biodiversity or the mismatch between management objectives and ecological scales (Haeuber 1998). After more than a decade of experience with EM, it is time to revisit the concept and learn from agency experience (More 1996).

Given the abundance of articles defining, describing, and highlighting components of EM in the 1990s, there has been relatively little subsequent work on the implementation of EM. There are a few notable exceptions. Phillips and Randolph (1998) compared Forest Service plans written before and after the adoption of EM and found increases in the use of language associated with EM: increased agency references to adaptive management, maintaining species viability, acknowledgement of ecological pattern and process, and sustaining ecosystem health were found in the post-EM plans. Butler and Koontz (2005) identified six key objectives to Forest Service operationalization of EM including: collaborative stewardship, integrated scientific information sources, integrated social and economic information sources, adaptive management, interagency cooperation, and sustainability. A subsequent questionnaire of all agency line officers suggests that the Forest Service has achieved some success with respect to all six objectives (Butler and Koontz 2005). In contrast, Rigg (2000) found considerable problems in the implementation of EM on the Sequoia National Forest, both in the integration of public values and in conducting a collaborative process alongside adaptive scientific management.

Although these studies contribute to our understanding of EM in practice, they offer little insight into how the *meaning* of EM has evolved since its inception. There are several reasons

that the meaning of EM must be explored to fully understand its impact on public land management. First, EM has and continues to be a fluid and evolving concept. Second, given the Forest Service's broad discretion under its multiple-use mandate and the continued confusion over the agency's mission, EM's meaning and application is likely to be highly variable through time and through different administrative levels of the agency (Thomas 2000). Thirdly, policy implementation itself may contribute to change, and we know that it is not simply a top-down process; rather it is also a learning process, in which the policy is molded to fit the context in which it operates (Schofield 2004).

This study explored the meaning of EM through purposive interviews with agency executives who are intimately involved with the agency's policy choices. The interviews were conducted to answer three main questions: (1) from the perspective of agency executives, how relevant is EM to current land management practices? (2) What is the current meaning of EM, from the perspective of agency executives? And (3), how do our participants relate individual components of EM to the agency's current environmental discourse?

Methods

Eleven interviews were conducted with Forest Service executives, eight of whom work in the Washington, D.C. office and three of whom work in regional offices or research stations. Due to difficulties with access, a snowball sampling procedure was used to identify willing and qualified participants (Babbie 2007). Prestige and agency experience were also factors in the choice of participants; all had considerable experience with past and present land management policies, and each individual had over 18 years of experience with the agency. We strove to conduct all interviews in person, but scheduling difficulties required that four be conducted over

the telephone. Interviews lasted between 24 and 87 minutes and were conducted by the same researcher (Predmore).

The goal of this qualitative study was not to *test* social theory, but rather to learn how our participants construct the meaning of EM. We were less interested in assessing the *reality* of EM within the agency and cannot claim to have done so with a small purposive sample. The sample of key informants was intended to provide a rich description how EM is understood by agency executives (Miles and Haberman 1994).To better understand our participants, one must consider the different work objectives and motivations of agency executives compared to those working at the operational level. For example, executives work to garner political support for the agency and maintain its bureaucratic autonomy, while operators often work to satisfy rules and meet peer expectations (Wilson 1989). With this context in mind, conclusions were drawn from iterative analysis of interview transcripts, in which themes were repeatedly developed and validated with the aim of producing insights that are intimately linked with the data (Taylor and Bogdan 1998).

The interviews were guided by a series of open-ended questions. Example questions include: How would you explain EM to the public or, what is the current role of EM in the management of National Forest System lands? Open-ended questions and subsequent probe questions typically comprised the majority of the interview time. These open-ended discussions were followed by a questionnaire which was completed as part of the interview, in which participants were asked to rate and discuss the importance of EM components to current agency management. The main purpose of the questionnaire was not to attain our participant's ratings, but to quickly cover a list of terms commonly associated with EM in an effort to elicit conversation on a variety of EM components. Participants were encouraged to "talk the interviewer through their responses." The order of the interview was important. By asking the

open-ended questions first, we ensured participant conceptualizations of EM would not be influenced by the components of EM listed in the questionnaire. Components listed in the questionnaire were intentionally inclusive in nature and were drawn from the literature defining EM, relying heavily on Grumbine (1994), Brussard's (1998) list of procedures for implementing EM, and the objectives of Forest Service EM compiled by Butler and Koontz (2005). We chose not to define the many ambiguous components of EM, like ecosystem integrity, because we thought that ambiguity would entice further explanation and conversation. The discussion of ecosystem management and its components were separated in an effort to better understand the overall trajectory of agency environmental discourse.

Two participants did not wish to be recorded, so hand written notes were taken and transcribed immediately following the interview. All other interviews were recorded and transcribed verbatim. Organization of discursive themes was conducted in NVivo 7 (QSR international 2006). In keeping with our aim of describing how our participants construct EM, quotes are used throughout the results to support our conclusions.

Results and Discussion

Current Relevance

Participants commonly described EM as something the agency practices, but also as language helpful in describing the agency's management. Participants who spoke of EM as a management practice deemed it a "decision-making framework" which entails an expansion in the "number of objectives" for agency management. For participants who conceptualized EM as a language, they referred to it as a "terminology", a "vocabulary," or as an "idea." Only one participant referred to EM as a "policy." The majority of participants separated the practice of

EM from the language of EM. This separation allowed them to convey their opinion that EM is a dying discourse, but a thriving practice. Additionally, distinguishing between talk and action was used to convey that speaking about EM is no longer necessary because EM is "fundamental" to the agency's operations, agency "doctrine", or as one participant hesitatingly called it "standard operating procedure." The following excerpt represents this point of view:

> I think that it [EM] plays a very large role in how we manage at the project level, the forest level, and above. It's probably matured to the point where we don't even have to talk about it; it just is.

A smaller group of participants conveyed that EM is totally irrelevant to the agency both as a language and practice (Table 2.1). One participant did not distinguish practice from discourse and indicated EM's continued relevance to the agency (Table 2.1). Even this participant, however, showed some hesitancy concerning its current importance within the agency saying: "well, I guess its still there in a way although I think we have scaled back our expectation a little bit…" Overall, our participants showed reservations about the importance of EM as a practice, a language, or both.

Table 2.1. Compilation of participant responses to open-ended questions on the components of EM. Participants H, I, and J, were asked to describe what has replaced EM in terms of achieving environmental quality, while participants who believed it to still be relevant, were asked to define EM.

	Status of EM				Achieving environmental quality									
					Means					Ends				
Participants	Inactive discourse	Active practice	Active—does not distinguish action and talk	Inactive practice	Recognize import. of scale	Systems thinking	Adaptive management	Include public values	Active management	Sustainability	Structure, function, process	restoration	Forest health
E			X		X	X	X		X	X	X	X	X
G	X	X			X	X			X		X	X	
K	X	X			X	X	X	X		X			
F	X	X			X	X		X		X	X		X
C	X	X			X	X	X						
B	X	X			X	X	X						
A	X	X			X								
D	X	X											
H	X			X	X	X				X			
I	X			X	X					X	X	X	X
J				X									

The diminishing importance of EM to agency discourse is further supported by the lack of consistency among informants' definitions of EM (Table 2.1). Discourse has been defined as a "shared way of apprehending the world," and without shared meaning, a concept becomes socially inconsequential (Dryzek 2005, p.9, Mead 1934). Part of having shared meaning, for a broad concept like EM, would include some agreement on its main components. Without some shared meaning, we can expect EM to lose its function in communication and eventually fall out of use.

The interviews generated further evidence that EM is of declining importance in the agency's discourse. When asked to define EM or to share initial reactions to the phrase, several

participants contrasted the term to the agency's past, "traditional" management. While the context offered in some questions solicited this type of response, this manner of understanding was repeated when the conversation shifted to the *current* importance of EM. Ecosystem management was described as a movement away from being "timber-centric" or more broadly as a departure from managing "single resources" towards more "holistic" management. Comparison with "traditional management" meant that with the arrival of EM, new values found equal footing with timber, water, recreation, wildlife. Previously these new values had only functioned as "constraints" to traditional management. While also grounded in a contrast with the past, one participant understood EM less as a real change, and instead conveyed that EM was a "sign on the wall" to show that the agency was realigning itself with the current "social environment."

Shared-Meaning

Although a main theme across all interviewees was inconsistency in the definition of EM, more than half of the participants included the related ideas of scale and systems thinking in their definitions of EM or environmental quality. When discussing scale, participants most often mentioned the importance of considering broader spatial scales in management. Whereas previously the agency made decisions on a "stand by stand basis," with EM decisions are made at a "larger" or "landscape" scale. Participants also noted that this broad perspective should lead to more cooperation with adjacent landowners in order to accommodate the scale of natural systems. Participants also conveyed that the recognition of multiple ecological scales presents practical, but not insurmountable management problems. As one participant explained, a landscape or ecosystem can be the space "under a rock" or the earth itself and as a result, the challenge is to match the spatial scale with the technical problem at hand. Less commonly,

participants acknowledged the need to understand how systems operate over extended temporal scales.

Participants also commonly conveyed the importance of systems thinking to EM or to the broader goal of environmental quality. Systems thinking entails an understanding of "interconnectedness" and "connectedness" of systems. Hierarchy of scale and nested systems were also discussed, with an emphasis on the need to "think both horizontally and vertically about how your place fits into the larger scheme." Further, one participant noted that systems thinking directly influences management because the identification of key elements within a system may facilitate efforts to "tip the system" to a desired condition. The conceptualization of nature as a system was linked, for some participants, to the support of adaptive management (Table 2.1). When this link existed, participants found that the complexity of systems leads to "humility" or "quickly takes you to the realization that you can't understand the system entirely."

Replacing EM

For participants who considered EM as irrelevant as a language and practice, we asked what has replaced EM. Participants in this group replaced EM with what are best described as objectives of management, such as restoration, sustainability, and the continued delivery of ecosystem services. The replacement of EM with objectives suggests that participants mainly conceptualized EM as an objective. Not surprisingly, participants who conceptualized EM in this manner often failed to acknowledge the many process oriented components of EM, in particular adaptive management (Table 2.1). In addition, those who rejected EM's relevance attributed this failure to the inability to agree on an objective for management. For one participant, EM was crippled by the failure "to come together for a common natural resource

objective" because of politics with a "small p." Another informant makes a similar argument, again focusing on the objectives of EM as problematic.

> The problem with just saying ecosystem management is [that] it doesn't tell you anything about what the goal is—because you can manage for a variety of different things. And people asked that question from the very beginning, ecosystem management for what? You have to define what it is that you want. So talking about restoration I think is an advance, because it is at least saying what we are managing for.

The participants who conveyed that EM is dead in both practice and discourse provided insight into why they believe this had occurred; the objectives of EM were and continue to be contested territory.

The Controversial and Ambiguous Objectives of EM

Controversy around EM's objectives was also evident in the questionnaire portion of the interview, where participants often indicated that the objectives of EM are unimportant to current agency management (Figure 2.1). Like many of the components listed in Figure 1, the idea of ecological sustainability has not always been associated with EM, but has been emphasized in some definitions (Grumbine 1994, Christensen et al.1996). Before discussing participant responses to this idea, it is important to first clarify what is meant by ecological sustainability. In order to sustain economic productivity and to meet socio-cultural needs, functioning ecosystems are necessary and therefore should take precedence in management. In other words, human desires must operate under the constraints imposed by the ecosystem (Grumbine 1994, Cortner and Moote 1999). The idea of ecological sustainability was a particularly controversial objective-

oriented component of EM, with just over half of participants agreeing to its importance (Figure 2.1). Nearly every participant qualified their response in some manner.

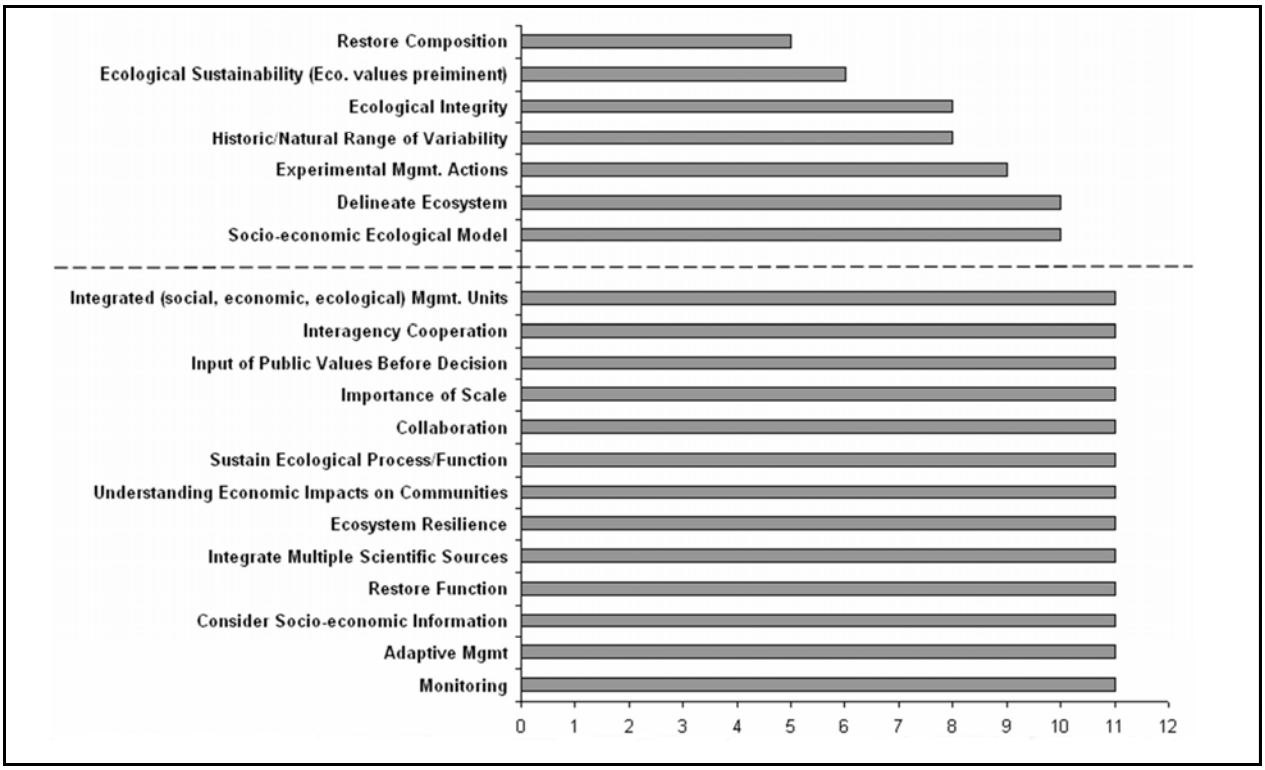

Figure 2.1 Participant responses to the questionnaire regarding the importance of ideas/terms often associated with EM to Forest Service management.

These qualifications on the subject of ecological sustainability revealed a remarkable degree of agreement on the topic. The differences in their answers are more reflective of a difference in the way they approached the subject of ecological sustainability, and less of an actual difference in philosophy. For participants who agreed to the importance of ecological sustainability, they were generally speaking about relatively small scale management decisions. Although the agency is typically accepting of many human uses, this does not mean "anything anywhere." To further reassure that at some scale the environmental concerns are preeminent, one participant provided the example of "the quantity of timber harvested today versus 20 years ago."

Those who did not find ecological sustainability important generally approached the question from a broader spatial scale, often the forest-level or above. For example, one participant spoke of the need to protect salmon habitat (relatively small spatial scale) from human impacts, but noted that excluding human access becomes problematic at broader scales; the ensuing economic and social "disruptions" may erode the "social will to protect those places." Viewing the question with a clear demarcation of spatial scales, however, did not completely alleviate the concerns over the idea of ecological sustainability. Controversy persists because "...some managers draw the line [between human desires and ecological concerns] in one place and others in another place." Sustainability, and the balance between its three main elements, continues to be a topic of ongoing negotiation.

> We are actually trying to stay out of those types of dichotomies. It's not a choice of one or the other. It's the recognition that if you want to have benefits to human society, you have to have a healthy ecosystem; they come from there; like milk comes from cows. We get that all balled-up all the time and sometimes people push on the benefit side too hard and in other places people get devoted to creating some—forget that they [ecosystems] need to be managed….

An equal source of concern among participants was our question regarding the importance and success of the Forest Service in restoring forest composition to a baseline condition (Figure 2.1). Even when participants agreed that restoration was important, their responses were usually qualified. A common qualification was that restoration, with a goal of achieving a specific composition, was only an acceptable objective if it restored function, an objective around which our participants shared a greater degree of agreement (Figure 2.1). Another common concern among participants was the ambiguity of the endpoint of restoration. The use of the historic range of variability (HRV) or natural range of variability was rejected by

participants as an aim for restoration. Participants either found the HRV to be wholly irrelevant due to climate change, or responded that HRV is important not as an objective for restoration, but rather as something for managers to "understand." There is some concern that the agency has become too proficient at managing for the HRV:

> If ecosystem restoration means restoring those ecosystems to their historic range of variability or to a natural range of variability, I am less certain that is what we ought to be doing than I used to be. Ten years ago I would have argued hard that is exactly what we should be doing.

In addition to debate about the endpoint of restoration, participants also noted ambiguity in the term restoration itself and where it should be applied, further reinforcing the idea that objectives have been problematic for EM:

> **Participant:** Restoration of ecosystem function, is it important? Yes. The reason I laugh is because restoration means different things to different people. It seems to me that for many restoration means salvage after fires and reforestation or just generally after catastrophic events.
> **Interviewer:** What might it include in your view?
> **Participant**: Well, restoring to resiliency, redundancy, small watersheds or specific streams that have nothing to do with salvage.

Another objective often associated with EM is ecological integrity and its importance to agency management was a topic of debate among participants (Figure 2.1). A main source of concern was the humanizing of ecosystems and/or the ambiguity of ecological integrity. Unlike with restoration to a baseline condition, however, a few participants readily accepted the importance of ecological integrity, reiterating the idea that the objectives associated with EM continue to be contested ground. Among those participants who believe ecological integrity is still important, some qualified their support by asking what is ecological integrity, or by

lamenting the fuzziness of the concept. For those who indicated that ecological integrity is of no relevance, ambiguity was the main reason for their lack of support:

> …..I still struggle to know what the hell it means, integrity. We want honest ecosystems that don't cheat on their taxes? We use the word and we kind of know what it means. The exact processes and structure and composition that make for a healthy system, but what the hell does that mean? We kind of know what human health means; the absence of pain and the probability of near term death. As a metaphor I understand it perfectly, as a concept it is not as useful. We are in favor of it and we promote it, but its utility as a practical guide for managers is overrated.

The ambiguity of these objectives has placed participants in an uncomfortable trap, where the agency has used and supported terminology with an unclear meaning. Another participant expands on this idea and suggests that ambiguous objectives become especially problematic at operational scales.

> I think that [integrity] is another one that obfuscates to the public what you are actually talking about. Ok here is an example; we have this rule about twenty-four heartbeats in the wilderness. Your group can only be twenty-four. I don't want any more because it will disrupt the ecological integrity; well, that doesn't help me! Was it noisy? What environmental factor are you talking about? You're never going to get there if you talk about ecological integrity.

The ambiguity of EM's objectives is at least partly rooted in the differing ways the terms are leveraged in the broader political context. Restoration is a prime illustration. In the Clinton Administration's 2000 revision of Forest Service planning regulations the aim was to restore ecological sustainability, while under the Bush Administration's Healthy Forest Restoration Act (2003), restoration mainly refers to efforts at reducing hazardous fuel loading (Federal Register

2000). Our participants clearly recognize the different ways the term restoration has been used and hold differing convictions on what it should mean.

Similarly, our participants' discussions of sustainability are better understood when placed in political context. In talking about sustainability at broad spatial scales and insisting on balance between the ecological, social, and economic, many of our participants employed sustainability as defined in the recent planning regulations developed under the Bush Administration (Federal Register 2008). In contrast, other participants expressed support for ecological sustainability, an idea that was at the heart of the Clinton Administration's attempt to reform forest planning (Federal Register 2000, Hoburg 2004). Finally, some participants, by differentiating spatial scales, were able employ both definitions of sustainability and accommodate either political context.

Although many of the objectives of EM are clearly embedded in political controversy, other ends-oriented components in the questionnaire received less scrutiny from participants. For example, ecosystem resilience, a concept of more recent popularity, was generally accepted as important, although several participants noted that it is not yet well enough understood to be put into practice (Figure 2.1). Restoration of ecosystem function was also more readily accepted than the restoration of composition or ecological integrity (Figure 2.1).

There are two explanations for the acceptance of resilience and ecosystem function suggested by our interviews. First, participants repeatedly spoke about the word "management" and insisted that "we can't leave people out" of EM, emphasizing that at some point all management is a reflection of anthropocentric values, even wilderness. Perhaps even more revealing was the manner in which one participant asked if management was a required part of EM. Participants revealed both an anthropocentric worldview and a belief in the need for active

management. Restoration to a baseline or ecological integrity both imply that all the components of ecosystems must be present, which may conflict with the agency's culture of active management and tolerance of resource use. In contrast, the concepts of resilience and function are perceived as more forgiving objectives and thus are less threatening to agency culture.

Perhaps a more plausible alternative explanation for why resilience and ecological function were more broadly accepted can be found in an emerging construction of nature among participants. Participants seemed troubled by ecological integrity and restoration to a baseline because they conflict with the emerging dynamic view of nature. While ecological principles contained within EM can be credited with starting this change, climate change seems to be the most powerful force in their construction of a dynamic view of nature. Participants routinely argued that integrity and HRV as a baseline are irrelevant in the age of climate change. As one participant put it, "going back to presettlement vegetation makes no sense, because that was the coolest period in the last six thousand years."

In contrast to the objectives-oriented components of EM, the process-oriented components garnered broad support among our participants (Figure 2.1). Among these many process-oriented components of EM, the only disputed components were delineating the ecosystem, using a socio-economic ecological model, and experimental management actions. The few participants who disputed the importance of these ideas were generally unsure whether these components were feasible or practical for the management of National Forest System lands.

Conclusions and Implications

From the perspective of our participants, there has clearly been a decline in the importance of EM. This conclusion is supported by the changes and proposed changes in Forest Service planning regulations that have occurred since the mid-1990's. In the 1995 proposed planning regulations EM was the guiding philosophy (Federal Register 1995). In the 2000 planning regulations ecological sustainability overtakes EM in importance, and by 2008 the term ecosystem management is not a part of the agency's planning guidelines (Federal Register 2000, Federal Register 2008). Although we cannot definitively explain EM's demise, our interviews offer some insights. First, EM means different things to different people and thus it either never became a functional aspect of agency discourse or has deteriorated. Secondly, EM has become politically identified, at least for some agency employees, with ambiguous and highly contested objectives for natural resource management. As one participant put it, EM now "has that flavor that you are going to be more environmental."

In this context, the decision to abandon the phrase EM is entirely rational. It allows the many process-oriented elements of EM, many of which had broad support among our participants, to persist in practice or in the discourse, independent of the political trappings of EM. Despite the diminishing importance of the phrase itself, many of the elements of EM have persisted in the agency discourse, particularly those associated with management process. For example, in the 2008 Forest Service planning rule, adaptive management and collaborative public participation are operating in the "tournament of competing agendas" outside the umbrella of EM (Hull et al. 2003, Federal Register 2008).

The survival of EM components in the environmental discourse will be determined by many factors, but our analysis suggests that an ability to accommodate diverse and emerging

social constructions of nature will play a prominent role. Accommodating these social constructions is no easy task. Our analysis has shown the fluidity of social constructions of nature and its impact on the support or opposition of EM. For example, HRV is of diminishing importance due to climate change and its transformative effect on the construction of nature. At the same time, ideas which are more consistent with a dynamic view of nature and the uncertainties of climate change, like resilience, garnered increased support among our participants.

Another factor that clearly impacts the continued use of environmental discourse is ambiguity. In this study, if management ends were labeled as ambiguous, it was an indictment of that term and its usefulness to management. From this perspective, natural resource management ideas, whether associated with EM or not, must avoid the *ambiguous* label to persist in the environmental discourse. For proponents of particular approaches to natural resource management, the need to avoid this label is real. As an example, one of our participants noted that a "secondary problem" with adaptive management is that there are "…multiple definitions of adaptive management floating around out there."

Although ambiguity was viewed negatively by our participants, this quality can be viewed as a positive in some contexts. Norton (2005) calls these ambiguous terms "bridge terms" because they are both normative and scientific, thus expanding their political appeal. As an example, consider the term forest health, which has different meanings for different people, yet holds some meaning for nearly everyone and is difficult to oppose on its face (Warren 2007). Ambiguous "bridge terms" serve their purpose at the broadest scales, such as in national-level politics, where the difficulty in opposing ideas like "health" may contribute to political success.

Although a lack of shared meaning for EM could be viewed as troublesome, it would be most problematic if the agency itself employed highly variable environmental rhetoric—an issue this study did not address. Instead, we uncovered variability among the agency's leadership regarding individual constructions of nature and support of EM. This phenomenon may be viewed by the agencies critics as a welcomed departure from its past culture of conformity—especially given that diversity seems apparent within the agency's leadership (Tipple and Wellman 1991).

Finally our participants provide a rationale for continuing the exploration of EM at the district and forest levels. What exactly is this "doctrine" of EM that our participants believe persists in practice? Is it true that only process-oriented components persist? Our participants have also suggested that the language of EM has had real power in the agency, like in elevating the status of new ecological values to the level of recreation, range, timber, watershed, and fish and wildlife, expressly written in the agency's legislative mandate. Further studies of the agency's discourse at the operational level may help in answering these lingering questions.

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Chapter 3
Constructing Action in the USDA Forest Service: Balancing Science, the Agency, and the "Public" in Planning

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Abstract: We interviewed 33 USDA Forest Service line officers and scientific specialists to understand how they construct ecosystem management (EM) at the forest and district levels. We present a conceptual model of agency planning and illustrate how two different planning processes were constructed through alternate versions of science, the agency, and the "public." Each of these three elements can serve as a driver or constraint to EM planning and are discussed in the context of both of these roles. When these three elements functioned as drivers of EM, participants constructed a flexible and integrative agency, which empowered scientific specialists, who in turn, elevated the role of science in planning. Participants also described science, the agency, and the public as constraints to EM. When these elements functioned as constraints, an alternate planning approach was constructed, which relies heavily on cost-benefit calculations, budgets and outputs, and a limited role for agency scientific specialists. We conclude that the EM that participants described reinforces rational planning, however, it also signals an internal shift in power within the planning process, from official agency decision-makers to scientific specialists. Finally, we conclude by discussing some of the incompatibilities between an agency which places science in forefront of planning, and an agency that continues to emphasize budgets and cost-benefit calculations in planning.

Introduction

In 1998, the editors of *Landscape and Urban Planning* (LUP) devoted an entire issue to explore the emerging natural resource management approach called ecosystem management (EM). During this time, the academic community had reached some level of agreement on the general meaning of EM (Grumbine 1994, Lackey 1998), but there was still plenty to learn from practice and application. Definitions of EM typically included ideas about management objectives, such as ecological integrity, ecological restoration, or ecological sustainability. They also included a new process orientation that included a systems view of nature, emphasis on ecological rather than jurisdictional boundaries, and increased data collection and research within an adaptive management framework (Grumbine 1994, Brussard et al. 1998).

As the EM concept matured, scholarly interest shifted to questions about the practice of EM (Brussard et al. 1998), learning from early EM efforts, and identifying factors that may impede implementation (Cortner 1999, Fitzsimmons 1999). For example, Cortner (1999) outlined the potential cultural and jurisdictional challenges associated with implementing EM in federal land management institutions. Internal conflicts within the EM process were also identified, such as how to integrate the increased reliance on scientific expertise with the call to incorporate public values into management (Lackey 1998). Acknowledging some of these internal conflicts and the breadth of the EM concept, several authors noted that the implementation of EM would be an experiment in natural resource management (Slocumbe 1998), and that the process of EM would be likely to evolve (Szaro et al. 1998).

After more than 15 years of EM in the USDA Forest Service, we seek to understand how the process of EM has evolved through practice (GAO 1994). This paper focuses on EM as a planning process or a "process of linking knowledge to action" (Friedmann 1993: p. 482). Our

overall approach was to focus on EM and planning as a social construction (Berger and Luckmann 1966). Social constructivist approaches to politics and planning have been embraced by many (Hajer 2005) including Fisher and Forester (1993: p.3), who submit that "policy analysis and planning are practical processes of argument." Social constructivism and discourse analysis have contributed to the study of environmental politics by showing that nature is often an object of political conflict, and by identifying the presuppositions that shape our understandings of policy problems and their potential solutions (Hajer 2005). Similar approaches have been used to identify the societal controls on the constructions of Pacific salmon (Scarce 1999), examine the social construction of working forests (Wolf and Klein 2007), and identify alternate discourses concerning fire regimes (Goldstein and Hull 2008).

Because of its potential to challenge traditional rational planning, we used EM as a starting point for our exploration of current agency planning. Past explorations of EM, and even more recent studies of its implementation, show that EM may have taken Forest Service planning in two distinct directions: EM could simply be an approach that reinforces expert-driven management, or it could signal a dramatic shift away from rational planning and thus redistribute power in agency planning. We investigate the direction of agency planning by examining how forest-level and district-level agency employees construct EM.

Given the Progressive Era roots of the Forest Service, one could argue, and indeed Dryzek (2005) suggests, that EM could easily be absorbed into an administrative rationalist discourse where management is expert-driven. *Administrative rationalism* closely mirrors what Scott (1998) calls *authoritarian high modernism*, in which the power of expert scientists rests in their ability to quantify and control nature for the good of the public. The primary means through which administrative rationalism is operationalized is through rational planning, with a primary

focus on the efficient progression through goal setting, identification of alternatives, evaluation of means, and implementation (Hudson 1979, Friedmann 1993).

There are certain elements of an *administrative rationalist* discourse and rational planning theory that are deeply embedded in the USDA Forest Service. For example, Tipple and Wellman (1991) reassessed Forest Service agency culture and suggested that the agency still values efficiency and economy as detailed in Kaufman's (1960) *The Forest Ranger*. These values are reinforced by the National Forest Management Act (NFMA, 1976) and the National Environmental Policy Act (NEPA, 1970) which are built around rational planning theory, in which experts make predictions and forecasts with the aim of achieving quantifiable objectives (Hudson 1979). NEPA in particular fits well within rational planning, because it requires the formation of a team of scientific specialists who develop alternatives, the quantification of the potential effects of management, and typically includes instructions to view substantive (non-values-based) public comments as a source of data (Poisner 1996). Given the agency's statutory obligations under NEPA and the NFMA, and the agency's traditional focus on efficiency, it may be that EM is not a shift away from *adminstrative rationalism,* but instead just a shift towards reliance on ecological expertise (Stanley 1995).

Although the agency certainly has a history of *administrative rationalism*, the EM concept draws from the many alternatives to rational planning, and in some ways directly challenges the administrative rationalist discourse. Among the many alternate planning theories—incremental, transactive, advocacy, and radical—is an acknowledgment of scientific uncertainty, recognition that planning is normative and political, an effort to empower the public through a transactive process, as well as an effort to equally value experiential knowledge and expert knowledge (Hudson 1979, Friedmann 1993, Lawrence 2000). Ecosystem management

mirrors some of these alternate planning theories in several ways. By calling for collaborative planning processes, EM opens the door for politics and values to play an expanded and even explicit role in agency planning. Recent studies of the agency and EM implementation (Tipple and Wellman 1991, Butler and Bodine 2008, Bulter and Koontz 2005) show that agency decision-makers increasingly value collaborative efforts as well as representativeness and responsiveness. These findings suggest that the agency may, to some degree, be open to the idea of shifting power in planning from experts to the public.

Ecosystem management's potential challenges to an *administrative rationalist* discourse extend beyond an insistence on a larger role for the public. For example, consider adaptive management, which focuses on experimentation and monitoring and is based on an open-admission of scientific uncertainty (Holling and Meffe 1996). The rationale for adaptive management is at least partly rooted in humility, or specifically an acknowledgement that scientific understandings of nature are incomplete and require continuous learning. One might posit that humility towards nature could erode the power of scientific specialists and reallocate power in planning within or beyond the agency. The idea of collaborative adaptive management illustrates this potential. Many advocating for this planning approach suggest that adaptive management should be combined with a collaborative process, thus producing a platform for social learning and the emergence of experiential knowledge, both of which challenge rational planning (Folke et al. 2005). Finally adaptive management and EM are also associated with a belief in a complex and dynamic nature, as opposed to a predictable equilibrium nature, and this different view of nature can shake the foundations of rational planning under NEPA (Thrower 2006).

Methods

The lead author conducted 33 interviews with Forest Service employees working on two national forests located in the eastern United States. Participants were not selected to represent a population, but rather to provide a range of informed perspectives from which we could build our understanding of EM. In an effort to gather a variety of accountings of EM, we interviewed 9 line officers (the agency's official decision-makers) and 24 scientific specialists. The two national forests have different organizational structures, but we chose to interview specialists who work in each of the major specialty groups on each forest including: forest ecology/ecosystems/planning, fire/safety/timber, lands/engineering, and recreation/heritage. All specialists were involved in at least one of the following planning activities that could be affected by EM: budget, NEPA project-level planning, forest-level planning mandated by NFMA, or informal support for line officers.

Semi-structured interviews were conducted by the lead author and ranged in length from 34 minutes to 86 minutes. All participants were asked to define EM, assess its current relevance, and give examples of projects or activities that they felt typified an EM approach. Subsequently, the many components of EM outlined by Grumbine (1994) and Brussard et al. (1998) were introduced, and participants were asked to explain how these ideas relate to EM and influence agency management. The interviews led to broader conversations about how participants work towards (process) and define environmental quality (objectives)—the two essential features of EM.

Initial analyses and interviewing occurred concurrently, allowing us to alter interviews in an effort to sharpen our focus on management process (Charmaz 2006, Strauss Corbin 1990). We specifically sought variation in the participants' accountings of the EM process and planning in

general, with the aim of improving the potential for theoretical insight (Potter and Wetherell1987). All interviews were transcribed verbatim. A fluid and iterative coding process was performed using NVivo 7 software (QSR 2006). Initial codes were exhaustive and numerous but became more focused as our theoretical sensitivity increased (Strauss and Corbin 1990). We conducted our analysis from the perspective that language is active and performative. As a result, we tried to decipher what the participant was trying to convey with a particular sentence, paragraph, or section of the interview (Potter and Whetherell 1987). After theoretical categories were established, diagrams were developed to aid in the visualization of theory. Finally, an initial draft of this manuscript was shared with participants and their insights were used to sharpen our understanding of agency planning (Charmaz 2006). Quotes from participants are used throughout the results and discussion to support our conclusions.

Results and Discussion

We identified three drivers of participant constructions of EM: knowing nature through science (science/nature), the agency (Forest Service), and the public. Each was used separately and in combination by participants to construct agency action. The following series of idealized hypothetical statements is followed by a quote from our interviews, which illustrates what we mean by constructing action through science/nature, the agency, or the public:

1) I know nature through science, therefore we need to do x.
   Example: "You know it [nature] needed for us to restore fire to that landscape, first of all."

2) I know what the agency requires/encourages/ suggests therefore I need to do y.
   Example: "[agency budget] controls everything that happens; they may not want to admit it. They want to say that this is how we achieve this, this is how we get to it, but the budget drives it."

3) I know what the public wants, therefore we need to do z.
   Example: "I think there's a lot of compromise on our part, especially, to do what the public wants. Basically, we work for the public."

A complete picture of planning and the EM process requires an understanding of how participants piece together different versions of these three elements. We begin our explanation of EM by showing how participants described nature as-defined-through-science, the agency, and the public to create a common understanding of EM process. Science/nature is discussed first, followed by a discussion of the agency and the public. We then re-examine these three elements and how participants used them to construct an alternate version of natural resource planning, in which the role of science is dramatically reduced. Our discussion of this alternate form of planning begins with an analysis of how the agency, followed by science/nature, and then the public, can each function as constraints on EM planning.

The Drivers of EM—Science/Nature

A prominent role for science, particularly ecology, was a dominant theme in our participants' descriptions of EM. In many cases, nature as defined by science was the key ingredient in constructing agency action. In talking about EM, participants commonly used science to identify a need to act on nature's behalf, and in this sense, their scientific constructions of nature were the baselines from which they constructed agency action. Because understandings of nature itself play such a strong role in the EM process, we list the commonly discussed properties and dimensions of nature (Table 3.1).

Table 3.1. Properties of scientific/ecological nature which were used to guide agency planning. Quotes indicate the words of participants.

Nature's Components	Empowered Properties	Dimensions
ecosystem	natural disturbance (fire) "fire dependent" forest composition function, physical/biological processes	within historic or natural range of variability v. outside of range; altered; out of condition altered v. natural impaired v. proper, natural, all the pieces
forests	health diversity mast production	impacted/decline v. pristine structural; age-class diversity; avoid scarcity of certain structures (e.g. savannahs) adequate v. declining
landscapes	broad scale genetic interchange	connectivity v. fragmentation adequate v. inadequate
species/wildlife/biological	habitat diversity population	degraded v. intact endangered, threatened, sensitive v. viable, sustainable steady v. declining
soil	chemistry	appropriate range v. acid
watershed	Health/Function	"reamed-out" v. acceptable structure adequate fish passage v. blockage

Participants described an EM process where the agency plans to work on behalf of a multitude of scientifically-defined properties of nature. The properties become important in management both because of the sheer number of attributes considered and because new scientifically-defined broad-scale entities, such as ecosystems, landscapes, and watersheds, were often the centerpieces around which the agency plans. Under an EM planning process, science and sometimes nature-through-science, achieves primacy, because management is situated within the scientifically-defined condition of landscapes, watersheds, and ecosystems. These entities shape the EM process through the idea that management should "fit the ecosystem," and

operate "within the confines of what that ecosystem does and how it functions." The following excerpt illustrates how science can be the key feature in EM planning by determining what should occur in a watershed.

> "…we go in and we conduct watershed assessments and start to understand what the conditions are out there; what are some of the overriding processes in terms of the hydrology, in terms of rainfall, in terms of the geology that drives the water chemistry; looking at some of those things that can affect ecosystem process and function. And we say through these assessments, what can we change out there to start to put in place more long-term goals for this area? And that really is what dictates how we try to bridge the gap between what we have and maybe where we want to go…"

Science, and sometimes nature, also assumed a position of primacy when participants talked about restoration, a process they commonly associated with EM. Again, ecological science played a central role by showing that nature is outside of an ideal condition, and therefore a remedial action is needed. Often these examples involved prescribed fire, in which the rationale for action was the need to "put fire back into the ecosystem," to "mimic" past disturbance regimes, or to restore a forest that is "out of condition" in terms of species composition. This same logical sequence occurred with respect to other components of nature such as streams, forest structural diversity, forest composition, and wildlife habitat.

The prominent role of science in the EM process became even more apparent when participants described nature as dynamic. Those who subscribed to this idea described nature in a constant state of flux, rather than one that moves towards a steady-state or climax condition. Dynamic nature was used by participants in several ways, most notably embodying an administrative rationalist discourse by calling for more data and more science. The following explanation of why the agency should use adaptive management exemplifies the prevailing logic:

> "[Interviewer]: And why do you need that flexibility….
>
> [Participant] Well, because the ecosystem, the forest is a very dynamic thing and you can use the best science and use your best knowledge of the area to anticipate

> how the resources are going to respond to an activity, but nothing's for sure. You just never know what all the factors are going to be or come into the equation, and you can have a variation of responses so [we need to be] monitoring those responses and then adjusting accordingly."

Adaptive management, through the sequence of scientific monitoring and evaluation, can enhance the manager's knowledge of nature and thus improves his/her ability to work on nature's behalf or plan management to suit nature. With this logic, the role of science in the agency process is extended beyond its traditionally prominent role in determining what ought to occur. Under adaptive management, science should also be applied after the action has taken place, to properly adjust to an ever-changing nature. The implication is that the eye of science should always be trained on nature, and, as a result, the administrative rationalist discourse is expanded and solidified in the agency.

The Drivers of EM—the Agency

We have illustrated how science, and sometimes nature-through-science, can have an elevated role in the EM process. In order for our participants to construct fully an EM process however, they merged these ideas about science/nature with specific versions of the agency and the public. In this section, we outline how participants described a Forest Service that supports an expanded role of science in agency process, empowers scientific specialists, and achieves "integration." We explore each of these characteristics of the agency in turn.

Given the strong role of science in EM planning, it is not surprising that EM was described by participants as an effort to use "science more in management," employ "science-based management" or apply "sound science in an integrated fashion." As we have argued previously, the call for more science is partly rooted in the construction of dynamic and complex

nature. At the same time, however, this faith in science is an agency attribute rooted in its culture, history, and legislative mandate. One participant explained that not only are the complexity and uncertainty of nature "a call to find out more about them [ecosystems]," but also that the agency requires the use of "best available science" because it is "really built into our planning regulations." This reflects that a focus on science can be driven by views of nature or by agency culture or structure.

Whether based in ecological nature or the agency, the increase in scientific management under EM elevates the role of the scientific specialists in the agency. Indeed, some participants viewed EM planning as a "grassroots effort" in which the agency's specialists, or "the botanist, the biologists, the fire ecologists," are the primary advocates. The empowerment of agency scientific specialists occurs in several ways, despite the fact that they are not the agency's official decision-makers. First, some forest-level specialists manage their program area and its budget, such as wildlife or fisheries. In this role, specialists are able to shape the allocation of funds so that the associated work is "in the context of ecosystem management and landscape level looks at issues."

Aside from budgetary responsibilities, participants empowered specialists in their descriptions of EM through a loosening of traditional organizational roles. In contrast to the agency's past where line officers were the primary experts (Kaufman 1960), line officers described themselves as "generalists" who do not have to be "an expert in every area," but rather need to know "just enough" knowledge to know if someone is "snowing" her/him. Participants indicated that the line officer-as-generalist has consequences for how agency decisions are made. Outside of the role of expert, at least some district rangers approached the complexity of natural

systems with humility, and as a result increasingly relied on agency specialists to help them make district-level decisions, such as when, where, and how much management should occur.

One district ranger, when asked to explain his/her decision-making indicated that at this point "I bring in my experts," particularly the timber management assistant and wildlife biologist, and "if I don't rely on all that experience, I'm crazy." For those line officers who empowered scientific specialists, their reasoning was rooted in their humility regarding their understanding of the environment, as well as the wealth of experience that specialists have on the district. The following excerpt typifies the empowering of specialists, due to both a respect for their expertise, as well as recognition of the value of their personal judgment.

> "…one of the advantages I have is that most of my staff has been on this district, because it's such a great place, for twenty plus years…that's a huge advantage for me and that's what makes this huge district work. I have people who know the ground really well and so when they talk about the places that need restoration or that have opportunities for management, they know what they're talking about because they've been over most of the district."

When talking about EM planning, participants provided accounts of how specialists and line officers interact. This form of interaction in an EM process was deemed "integration" by participants. Nearly all participants used the word "integration" to refer to combining available scientific expertise in planning, often in association with the agency's primary planning tool, the NEPA process. The idea of doing "integration" is in a sense codified in NEPA, which requires the formation of interdisciplinary (ID) teams to perform environmental analyses prior to management actions (40 CFR 1507.2 (a), 40 CFR 1508.14). Indeed, some participants could not separate EM from the NEPA process and believe the two to be highly compatible, an assertion that has also been supported in the academic literature (Phillips and Randolph 2000).

Participants, however, illustrated that only a certain construction of the NEPA process is supportive of EM.

Our investigation into the term "integration" revealed two distinct understandings of the term within the NEPA process—one that fully supports a scientific EM process, and one that constricts the role of scientific specialists in the agency.

> "I'm not saying this happens every time, but generally speaking when we know we're going to go in an area and do some veg. management, we bring all the different specialties to the table at the very beginning and we say ok, we want to do some management in here. What do we know already about the area, what do we need to find out, what are our opportunities, and not just for the management of the timber or the removal of the timber, but for all the resources in that area? And then we work through the process with the mindset of bringing everybody along from the very beginning."

The above quote illustrates an agency in which the values and judgments of specialists are represented in a planning process which aims to determine a collective "vision for a piece of land." This is markedly different from a construction of NEPA planning in which specialists enter the discussion in a post-decisional manner and are only consulted for the purposes of risk analysis or to offer impact mitigation advice. This alternate construction of the NEPA process and its ramifications for EM will be covered more thoroughly in a subsequent section, which explains how the agency can also be a constraint to EM.

The Drivers of EM—the Public

The various publics, both passive and active publics, were a part of participants' descriptions of the EM process. Some participants' EM language typified an administrative rationalist discourse, with an underlying logic that agency experts are well-equipped to make decisions that *serve* the public. Several participants related the development of forest plans to EM, and in this process the agency "listens" to interest groups and "considers what the public

wants." Similar language, implying a more passive role for the public, was used to describe the role of public comment in the NEPA process. Perhaps the construction of an inactive or passive public should be expected, given that EM, as participants have described it, is primarily a scientific endeavor.

On occasion, participants outlined an active role for the public in EM, but this role was granted with some measure of hesitance or reluctance. Some participants wanted a more prominent role for the public in planning, but their hesitation was based in their belief that the agency is ill-equipped and uncomfortable with the ideas of a planning process which further empowers the public. The following quote comes from a discussion about the possibility of a collaborative effort in which the public helps determine the objectives on a national forest:

> It's very difficult for people, it's a huge, huge internal shift and our agency has not assisted people with that. You would either need to do it through modeling from leadership and hold people [in the agency] accountable for that product with the public, or it wouldn't work.

For other participants an active role for the public in planning does exist, but it is granted with reluctance. In other words, in the forests and districts where this study was conducted, the active public in planning is not something the agency has chosen, but rather exists because of appeals, litigation, or the threat of judicial review.

Some participants noted that on some occasions this pressuring public indirectly encouraged a NEPA process which is compatible with EM. In this scenario, the public pressured the agency to devote more time internally to deciding what should occur on the land, and less time analyzing post-decisional impacts. One participant indicated that working longer in the planning process (deciding what to do collectively) created a more "environmentally sound" proposal, and one that could survive public scrutiny. Another participant reiterated this role of

the public by detailing how people working in timber management are the best integrators, because they have "been beaten over the head so much." Participants also outlined a less sophisticated role for the public in the NEPA process, by explaining that the increasing length and technical rigor of NEPA documents is a direct result of scrutiny by special interest groups, loaded with expertise of their own. In nearly all cases, the active public in agency planning was described as organized and scientifically literate.

The idea of a public that increases the scientific rigor of the agency was also important in participant's descriptions of adaptive management. Nearly all discussions about adaptive management, apart from those related to dynamic and complex nature, were tied to the need to make sure a prescription achieved the desired objective. In these cases, there is a need to learn about nature through adaptive management, not so that nature is better understood and served, but for the purpose of ensuring that the agency is meeting "commitments that were made in the NEPA decision." The active public which demands that these commitments be met hasincreased and reinforced the role of science in agency planning.

Constraining EM—the Agency

Although the public, the agency, and nature itself were all described by participants as drivers of an EM planning, participants also constructed another planning process in which these elements function as constraints to EM. We begin our discussion of constraints to EM with a discussion of the agency, because the agency was the most important feature of our participants' descriptions of this alternate planning process. In constructing a Forest Service that is supportive of EM, participants provided an image of an agency in which scientific specialists are empowered in planning and in some cases work on behalf of nature. Another construction of the agency also emerged in the interviews, in which the power of the specialist was diminished.

This alternate vision of the agency typically stemmed from a dialectic where EM was an ideal in constant comparison with the "reality" of agency planning. The alternate agency that emerged from these conversations was a compartmental and functional agency, operating under an inflexible budget where decisions are made through cost-benefit calculations.

A "compartmental" agency, as our participants sometimes described it, is one where communication is difficult, because specialists work in their "own little area." Participants emphasized that compartmentalization is particularly problematic for communication between program areas. They noted that EM is used by certain traditional specialties (soils, ecology, biology, etc), but is not a common language for other program areas, such as engineering/lands or recreation/heritage. Although a "compartmental" agency poses challenges to EM, the strict adherence and reinforcement of formal job responsibilities is potentially more problematic.

Participants illustrated how strictly defined roles for specialists and line officers affect planning. One specialist summarized job responsibilities in the following way:

> "… In the Forest Service, scientists don't make decisions; they give advice and they do levels of risk management. So, if you are going to assign risks to something, you have to have the scientific information to be able to develop your risk."

This quote suggests a constrained role for the specialists in the planning process. Rather than being a member of a team whose judgment is valued early in the process, the participant constructs specialists who must communicate their views in scientific terms, after the decision to conduct management has already been made. This kind of planning process is not about making collective decisions (integration) as we described earlier, but instead it is about "identifying potentially affected resources and analyzing actions." Or alternatively, NEPA planning is used to "just validate or to clear that decision and move on." The result of this shift in the timing of

specialist input in the NEPA process is a turn towards sophisticated mitigation and risk analysis for all resources, in which the role of the specialists and their science in planning is constrained; science is used to justify action, not plan action.

This alternate NEPA planning process is also linked with a different construction of the line officer. The line officers were not always described by themselves or by specialists as generalists who rely on their specialists in decision-making. Instead, some line officers described a process where science played a minimal role and they relied heavily on their own expertise, "gut" feelings, or their desire to "do the right thing out there." Although always well-intentioned, this kind of line officer may frustrate specialists whose power in planning is based in how and when the specialist is involved in planning, as well as the relative weight given to science in planning. Several participants described project scenarios in which a NEPA process that they thought was consistent with EM had occurred, but the line officer's decision did not heed the scientific recommendations produced in the process:

> "[The line officer] appeared to discount all, a lot of, what we felt was really important ecosystem management type stuff, in terms of watershed condition and wildlife resource needs and restoration needs."

A rudimentary understanding of the decision-making calculations the line officer must make clarifies how science, often ecology, and the EM process can become marginalized in line officer decision-making. The line officer makes decisions under the stresses of reduced staff, an unwieldy and unpredictable annual budget process, and output targets filtered down to the forest and districts from Washington D.C. and the Regional offices. All of these realities place the line officer in the position of making cost-benefit judgments on behalf of the agency. In participants' descriptions, targets were particularly powerful in constructing district-level decisions. Targets are a byproduct of the line-item budget which includes requests for forests and districts to meet

specific metrics: miles of roads maintained, miles of roads reconstructed, timber sale volume, acres of improved wildlife habitat, and miles of stream restored.

The focus on budgets and targets powerfully shapes the agency. First, the targets contribute to the "functionalism" in the agency, a term used to describe an agency in which actions are closely tied to the elements in the budget. As a result of this "functionalism," it becomes difficult to plan around the broader natural system or to consider how management activities may interact at broader geographic scales. Instead, nature is reduced to its fine-scale components, such as miles of stream restored, acres of wildlife habitat created, or board feet of timber produced, and the agency becomes more about producing those specific outputs. The constraints on EM imposed by a cost-benefit planning model, however, goes much deeper than "functionalism." As one participant put it, "…money still drives the agency in a lot of ways." Projects may become less about empowering nature through science or fitting management to the system, and more about making sure that the "payouts" are there, or in the case of timber sales, that projects can "carry themselves."

This type of cost-benefit calculation can extend beyond the decisions of whether or not to act, and into the questions of where, how and how much. For example, one participant noted that planning a prescribed burn, and how much to burn, is partly based on financial calculations and logistics—where are there pre-existing fires lines so that the agency can avoid constructing new fire lines? Cost-benefit calculations can also alter larger-scale planning and decision – making, such as planning on an entire national forest unit. One participant explained how this can occur by describing how a forest-wide prescribed burning program is created. This occurs when there is national or regional priority to conduct prescribed burning. Because there are substantial funds supporting the priority, it behooves each forest, for the sake of employee

salaries and its own vitality, to pursue the money associated with a burning program. According to the participant, however, pursuing that money is a misallocation of priorities from an EM standpoint, because the forest faces several more pressing ecological concerns. The following quote summarizes the mismatch between an agency managed through economic calculations and the EM process:

> **"**…the agency is still an output—widget agency; they still want to know how many acres of this and how many acres of that, and how many board feet of this are you going to produce. And, as long as that is your guiding factor and you have to produce widgets, you can't always do ecosystem management."

The problem is exacerbated by the fact that line officers and area program managers (wildlife, fisheries, recreation, etc) are judged, in part, on their ability to meet targets. As one specialist noted, despite the Chief of the Forest Service's interest in "kids in the woods," the target for environmental education has disappeared. The result is that environmental education can be dropped from the program of work, and it will not be "a black mark on my record."

In total, this alternate form of the agency constrains EM. At the operational level, a focus on budget, through targets, reinforces an agency culture geared towards "getting things done." In this administrative and cultural setting, monitoring and evaluation, as well as the role of science in general may become secondary. As a result, it is difficult to fit management to the scientific/ecological status of the forest.

Constraining EM—Science/Nature

In addition to the agency itself, alternate constructions of nature and the public can also constrain a scientifically-driven EM process. We outlined our participants' accounts of a dynamic, complex, large-scale nature, which requires additional science in order to properly fit management activities within nature's constraints. An alternate nature is one that science can

simplify, measure, and control, and as a result plays a diminished role in planning and decision-making (Scott 1998). This nature was described by participants in a few cases using terms like "age-class diversity" and "mast production," with the end goal of maintaining outputs of timber volume and wildlife (Table 3.1).

Although this alternate nature was not commonly described, perhaps due to our focus on EM, it did emerge when participants explained EM through a comparison of the new agency with the old Forest Service. Participants outlined an older agency that only empowered one component of nature—the forest stand and its ability to produce marketable timber. One participant began this contrast by saying that the old agency "…just wanted to get the cut out and that was their only concern, and we'll be damned if we care about some stupid plant or animal...." Although the complete model of a simplified and controllable nature was never fully articulated by our participants, the quote illustrates that the agency, at least in the past, only granted power to a few facets of nature—those which can create commodities.

Constraining EM—the Public

Finally, some participants also described a public that actively eroded the scientific EM process. This was the same organized and scientifically literate public that has also pushed the agency towards more scientific management. Much like our previous discussion of an active public, it is worth noting that the public's role is not always granted voluntarily, but can be a direct byproduct of the agency's legal framework. In the recent past, the agency conducted "Opportunity Area Analysis," which was essentially an examination of broad-scale resource conditions through a single NEPA process. These large scale analyses served the agency in two capacities: (1) they were efficient by allowing the agency to do one large-scale analysis from which small projects could be tiered; and (2) this way of operating was "good ecosystem

management," because it allowed the agency to know the broad-scale resource conditions and conduct management that fit that ecological context. As participants tell the story, the litigation and appeals filed by the public made "Opportunity Area Analysis" impossible to continue, because there was not a large enough "output" to make it a "wise investment." In this scenario, the public itself functions as a powerful constraint on the agency's efforts to plan around broad-scale scientific resource conditions (do EM). In response to the public, the agency has resumed small-scale NEPA analyses, which are less conducive to the broad-scale planning typically associated with EM.

Constructing a Planning Process

We have introduced the duality of nature, the agency, and the public and how each can become either a driver or a constraint to an EM process. The use of these three elements created different versions of the agency's planning, with important implications for the distribution of power in planning (Figure 3.1). Each circle in the diagram represents a construction of science/nature, the agency, and the public, which are the main elements of agency planning (constructed action). The size of these elements is meant to correspond to the relative power that these different constructions are given by participants. Position in the diagram represents the direction the element moves the planning discourse (e.g. Agency2 moves the discourse away from Science/nature2 and Public2). Further, the distance between Agency2 and Science/nature2 is meant to highlight that the two powerful constructions of the agency and science/nature were not used in combination to describe a planning process.

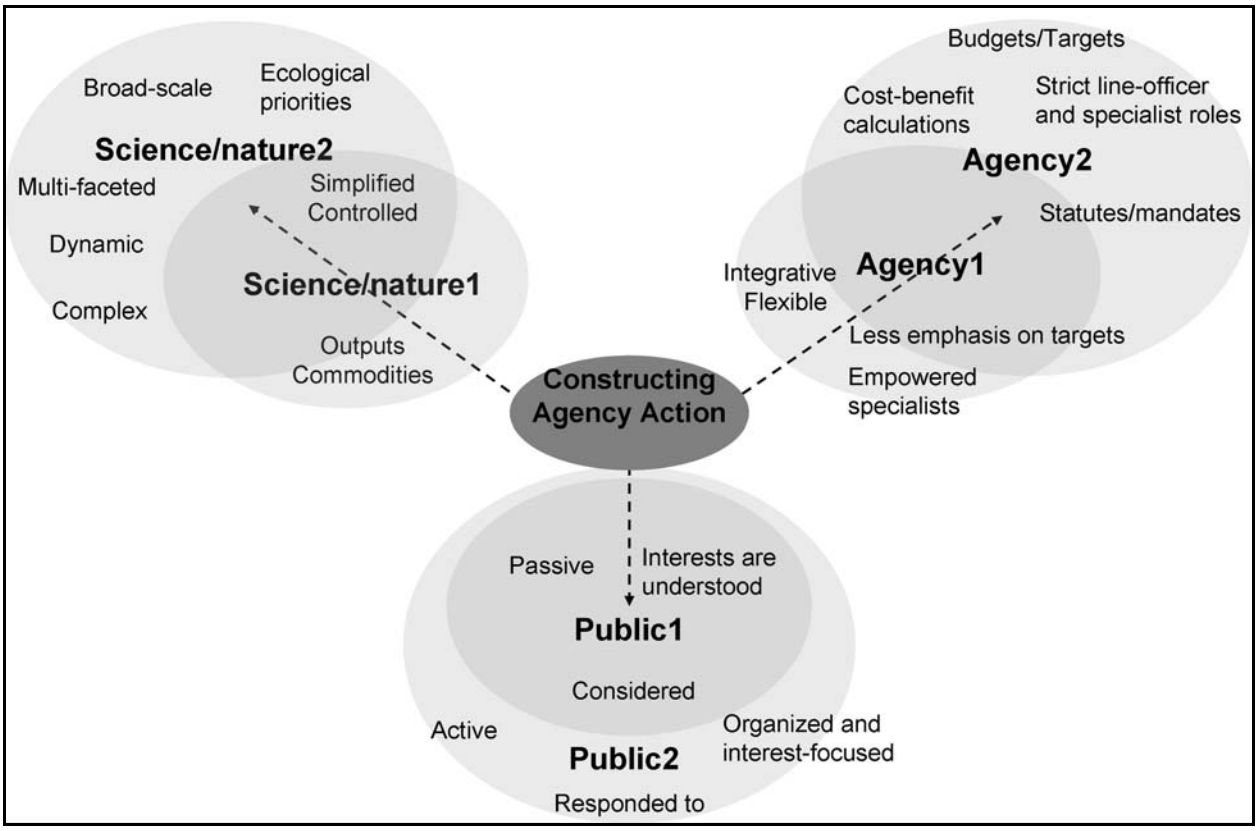

Figure 3.1. Conceptual model of the drivers and constraints of the EM process. Participants combined versions of science/nature, the agency, and the public to construct a planning process.

The full construction of an EM process combines Agency1, Science/nature2, and Public2. The EM process we have described is still identifiable with *administrative rationalism* and rational planning due to the emphasis on scientific expertise. The process does differ from *administrative rationalist* discourse of forest planning which combines Agency2, Science/nature1, and Public1. As we discussed at length, both of these versions of agency process were constructed by participants. It appears however, that Science/nature1 now has a smaller role in the agency and is perhaps being absorbed into Science/nature2. At the same time, participants noted that Public2, due to court standing and the appeals process, cannot be ignored.

The overlap in the three drivers/constraints is intended to depict these complexities and the fact that these constructions are not always totally distinct.

Although EM, as described by agency employees, still relies heavily on expertise in planning, our interviews suggest that EM discourse represents power shifts in planning, which distinguish it from *administrative rationalist* discourse. Specifically, ecological science and the vision of nature it creates have become far more influential. As discussed previously, in an EM process, science often identified the needs of nature or the condition of nature from which participants built a rationale for working on nature's behalf. This power shift cannot occur, however, if Agency2 is the predominant version of the agency. For example, even if a Science/nature2 is constructed, it will not become powerful in planning if it is not coupled with an agency (Agency1) that values the input of scientific specialists. We suggest that if Agency2 and Scientific-nature2 are combined in planning, the result is that ecological science will be used to justify agency actions, rather than as a source of information from which agency action is planned. As we have outlined in detail, Agency2 and Science/nature2 are in many ways incompatible.

Regardless of which agency was constructed, accounts of EM planning typically situated power somewhere between the agency and science/nature. We found, however, that humility, particularly humility towards Science/nature2, can redistribute power in planning. As we have noted previously, most often humility towards nature was linked with adaptive management, which reinforced the need for more science and solidified the increased role of science in planning. For a few participants however, humility towards nature did lead to an argument for increasing the role of the public in planning. One participant expressed that the complexity of natural systems (Science/nature2) overwhelms the ability of science to understand nature, and

diminishes the importance of science in determining how to manage. The following quote establishes this line of thought:

> "You start out thinking that if I could just figure out enough significant digits, I'd know the answers. And, if the computer was big enough, ecosystem management would work, right?"

After expressing the limits to the role of science in planning, the participant argued that power in planning should shift to the public. For participants that aligned with this logic, the question of how to empower the public was a point of departure. Some participants believed that they could empower the public in an *administrative rationalist* sense, through their own expertise and knowledge of the local, socio-economic context (Public1). Others, who approached nature with humility, were also humble about their own ability to know what the public wants. This logic was accompanied by arguments for a collaborative process in which the public determines what should occur on national forests—an argument with more substantial repercussions for the distribution of power in planning.

Those that argued for a shift in power to the public through collaboration readily acknowledged that this was not a realistic solution within the constraints of agency management. In other words, they were keenly aware of their embeddedness in the agency (its process, structure) and recognized that this sort of departure from *rational planning* was possible only in theory. Indeed, embeddedness in agency process was often in the background of our interviews and was largely responsible for the dialectic between EM and what our participant's believed to be the "reality" of agency planning. It makes sense then, that participants could not shatter the discourse of *rationalism* in their descriptions of EM (through collaboration), because they are cognizant of the many constraints imposed by the agency. Participants' language suggests that

EM in practice is something new in it's restructuring of the agency and the role of science/nature, but not radically new, because of its continued reliance on scientific expertise.

Conclusion

We found three drivers of USDA Forest Service planning at the forest and district levels. Different versions of the agency, the public, and science/nature create alternate planning strategies with ramifications for allocation of power in planning. The variability in the planning processes articulated by participants may be the result, at the operational scale, of the agency's unclear legislative mission (Thomas 2000). Among our participants, there was variability concerning whether the agency, science/nature, or the public has primacy in the planning process. Apart from the issue of primacy, we believe the role of the constructed public in planning requires additional inquiry; the distinction between an active and passive public is only the beginning of a very complex story. There are multiple publics within these two broad categories, and the role of the active public within the model was highly variable, sometimes supporting Science/nature2, but also sometimes supporting Agency2.

Despite these limitations, the study establishes a model of what EM has become in the Forest Service—a reorganization of administrative rationalism, constructed through new versions of science/nature and the agency. Descriptions of EM also suggest that the agency must, if it wishes to support the scientifically driven EM outlined by participants, resolve the incompatibility between ecological nature (Science/nature2) and a powerful, economically-driven agency (Agency1). Finally, the agency must confront the fact that moving towards rational planning in an EM manner, does not address the challenges posed to this model by an active public. In other words, even if the agency plans to work towards the EM our participants

described, it will still be faced with the challenge of balancing the role of the public with its reliance on expert management.

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Chapter 4
Constructing the Public: The Substantive Sieve and Personal Norms in USDA Forest Service Planning

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Abstract: We explore how employees of the USDA Forest Service construct the public. Our analysis revealed that constructs of the public are shaped by guidance associated with the National Environmental Policy Act (NEPA) and by the personal norms of agency operators. Guidance associated with NEPA processes works to filter out normative public involvement, based explicitly in public values, in favor of more scientific/technical/and legal public involvement. We have termed this process the *substantive sieve,* through which non-"substantive" comments do not receive full consideration. This phenomenon can dictate which publics are most heavily involved in agency planning and how they are involved. As a result, agency operators identify "active" publics who penetrate the sieve and "passive" publics who do not. Agency operators build on this distinction through their personal norms. We present two of the most common constructions of the public, the *silent majority* and *interested-extremes,* and demonstrate how they are invoked in normative arguments for maintaining agency power in planning. Constructs of the public and the *substantive sieve* reinforce one another, and this can lead to a costly scientific competition between the agency and the public. Finally, we suggest that agency operators can break this negative feedback between the NEPA process and constructs of the public through a consistent effort to represent and respond to normative publics during agency planning.

Introduction

Federal land management in the United States has been described as a "grand experiment" in sustainability—an attempt to administer a social, economic, and ecological balance (Johnson et al. 1999). One way the social is integrated into federal land management is through public involvement, legally required by the National Environmental Policy Act (NEPA 1969) and other planning statutes (National Forest Management Act 1976, Federal Land Policy and Management Act 1976). As part of the sustainability equation, public involvement can impact management outcomes in at least two ways: (1) it can supply the decision-making process with new information, which may be used to alter the agency's decision; or (2) it can function as a venue through which the public can pressure agency decision-makers into different outcomes (Dreyfus and Ingram 1976). Public involvement may also help build or damage trust between an agency and its publics, which in turn can help or hinder an agency in the achievement of its mission (Stern 2008, Stern 2008a). For example, the degree to which a public involvement process is viewed by the public as consistent with American democratic norms (e.g. representative government, responsiveness of government, social justice), may dictate whether the process builds or deteriorates agency credibility (Susskind and Cruikshank 1987).

Public land managers have broad discretion in fulfilling legal public involvement requirements (Mortimer 2002). As a result, the process may take a variety of forms including: newsletters, public hearings, public comment periods, focus groups, workshops, collaboration, mediation, and others (Force and Forester 2002). Because different formats for public involvement can lead to different results, research suggests that the goals for a given process should dictate the method of involvement chosen. For example, if the goal is social learning, then small groups may work best (Daniels and Walker 1996). Alternatively, if the goal is for the

process to represent all interests, then public participation might include aggressive measures to identify and engage underrepresented groups (McCool and Guthrie 2001).

Despite advances in researchers' understandings of public involvement, practical concerns persist concerning how it can be integrated into federal land management, which has historically been a scientifically-based, rational planning process (Walker and Daniels 2001; Smith and McDonough 2001). Rational planning and public involvement are in some ways incompatible, because public involvement can entail a shift in power (ranging from minor to significant) from agency experts to the public (Arnstein 1969) Attempting to involve the public within a rational planning framework can create a variety of difficulties including: alienating the public because decisions appear to have already been made prior to involvement; the potential for involvement and compromise leading to undesirable outcomes; reduced efficiency; and investment in collaborative approaches which do not guarantee success (Germain et al. 2001, Wondelleck and Yaffee 2000). Legally mandated public involvement in particular has been identified as problematic; its procedures often are not inclusive of the broader public, do not improve agency decisions, and may contribute to the polarization of interested publics (Innes and Booher 2004).

Recognizing these complexities and difficulties, research has most commonly addressed public participation in two ways; it has been studied as a means for improving environmental outcomes, and it has been examined as a process that is itself worthy of improvement (Parkins and Mitchell 2005). Public participation research regarding federal agencies in the U.S., however, can often oversimplify or overlook the nebulous nature of the public. In some instances, researchers have been unclear and inconsistent concerning which public(s) they are

studying (Billgren and Holmen 2008). In other cases, the public has been explicitly constructed by the researcher in order to move forward with other research questions (Overdevest 2000).

Some researchers have approached the nebulous and constructed public directly, as a topic of practical and theoretical importance. Cheng (2003), for example, suggests that constructing the public according to "place" may improve public participation by ensuring that the process is initiated among participants who have a shared, place-based identity. Research in international conservation has gone a step further by showing that some of the most well-intentioned efforts to construct the "right" public may be problematic. Agrawal (1999) argues that relying on the convenient construct of "community" to achieve successful conservation may produce disappointing results. According to Agrawal (1999), communities with a set spatial scale, as well as a homogenous social structure and norms, are typically a "myth." Brosius (1998: p. 165) goes further to suggest that constructs of the public or community may be "creatively shaped to fit larger institutional interests."

In this paper, we also explore the public as a social construction (Berger and Luckmman 1966). Examining the public from this perspective is not without precedent. The "public interest" for example, has been studied as a construct that is often manipulated in political discourse (Stone 2002). Schneider and Ingram (1993) argue that understanding the social construction of "target populations" in public policy can reveal much about the allocation of government resources. For example, the poor can be constructed as either lazy or as disadvantaged, and this initial framing may dictate whether that group is construed as undeserving or deserving of government assistance (Schneider and Ingram 1993). We examine how federal land managers construct the public for two main reasons. First, constructions of the public are partly expressions of agency norms. As such, they may serve as indicators that help

explain administrative outcomes on public lands (Lindblom 1959; Meier and O'Toole 2000). Second, constructs of the public may dictate which publics are served by the agency and how.

We argue that constructions of the public derive from agency processes/structure and the personal norms of agency operators. In explaining our theory, we first show how agency process, focusing on NEPA public involvement, plays a role in forming the agency's constructed publics. Second, we show how norms create more complex and complete constructions of the public. These constructed publics are used by agency operators to define appropriate roles for the public in agency planning and management. Third, we show how these constructions, which are partly a byproduct of NEPA, also may impact how the agency conducts its NEPA processes. Finally, we discuss the implications of our theory for public involvement and public land management.

Our insights are based in over ten years of experience researching public land management agencies. Our conclusions, however, are grounded primarily in an analysis of 33 interviews, conducted on two national forests, with line-officers (agency decision-makers), resource specialists (hydrologists, silviculturalists, biologists, etc), planners, and public affairs specialists, all of which have been involved with forest-level planning, district-level planning, or both. We refer to those USDA Forest Service employees interviewed generically as "operators," because they work on the district or forest-level, the agency's operational level. Interviews were initially focused on ecosystem management and how its associated concepts are situated within agency planning. As constructs of the public emerged in interviews they were increasingly explored through questions aimed at identifying the "public" and its role in agency planning. All interviews were transcribed verbatim and coded using NVivo 7 (QSR International 2007).

In keeping with a discourse analysis, our analytic focus was our participants' language, not the participants themselves (Potter and Wetherell 1987). Using this methodology, sample

size is less important than variation and recurrence of our participants' constructions of the public. Recurrence is important because it can be used to clarify how certain constructions are used. Variation in our participants' speech is important in the process of refining emerging theory. We coded our data with a particular focus on how participants used constructs of the public and the underlying purposes of their use (Potter and Wetherell 1987). Through an iterative process of coding, memo writing, and diagramming language use, our aim was to produce a generalizable theory of the constructed public. The supporting quotes used in the remainder of this manuscript were taken directly from interviews with agency operators.

1. NEPA, the *Substantive Sieve,* and the Process-Public

In this section we outline the main ways public involvement in NEPA has been interpreted by the Council on Environmental Quality (CEQ) and agency training materials, and illustrate how these processes create passive and active publics. We focus our analysis on the NEPA process, because it is embedded in nearly all Forest Service planning efforts, ranging from broad-scale planning such as the development of NFMA forest plans on national forests, to project-level planning. As a result, the NEPA process often forms the context of agency-public interactions, and thus, plays a role in forming agency constructions of the public.

1.1 NEPA background. NEPA has been interpreted by the courts as a mainly procedural statute, requiring federal agencies to conduct a specific sequence of environmental analyses (Rasband et al. 2004). Agencies are required to prepare an Environmental Impact Statement (EIS) for "all major federal actions significantly affecting the quality of the human environment (42 U.S.C. § 4332(2) (C))." Environmental Assessments (EAs) are sometimes written to determine if a federal action is "significant." If the action is deemed "significant," then a full-blown EIS is required.

Regardless of which environmental document (EA, EIS, or both) is prepared, these documents are intended to serve three primary functions: they disclose likely environmental impacts; detail alternatives to the proposed action; and identify trade-offs associated with the proposed action and alternatives (Rasband et al. 2004). In serving these functions, NEPA documents have become an integral part of USDA Forest Service decision-making, while also making it more time consuming and expensive (Ackerman 1990).

The NEPA process includes the following steps: agency development of purpose and need for action; public notice of agency action; formal request for initial public comment (scoping); development of draft EA/EIS; public comment period; final EA/EIS and agency decision. An EIS requires that the agency conduct public involvement (obtain comment) early in the process through scoping and later in the process, after and environmental document has been written (42 USC § 4331 (a); 40 CFR §1503.1, 40 CFR §1501.7). In contrast, in the development of an EA, agencies have considerable discretion concerning public involvement, only having to involve the public to the extent practicable (40 CFR § 1501.4 (e) (2)). Although agencies must respond to comments in the final EIS or consider them in the EA, they have discretion concerning how they address them (40 CFR § 1503.4(a) (b)).

1.2 Interpreting NEPA comments and the *Substantive Sieve.* CEQ NEPA regulations state that comments may impact agency planning in the following ways: clarify the scope of the project, aid in identifying significant issues, alter the types of environmental analysis conducted, or modify the alternatives that are given full analysis in the NEPA environmental document (40 CFR § 1503.1 and §1501.7). They also provide guidance on how agencies should use the comments received during NEPA public involvement—guidance that has been further

interpreted by the Forest Service. CEQ regulations and agency interpretations in concert suggest that comments must meet a scientific standard to capture the agency's attention and potentially impact agency planning (Table 4.1). In the scoping stage, the CEQ states that comments need to be "significant." Similarly, comments received after the draft environmental document is complete should be "substantive." The USDA Forest Service has clarified what it means for a comment to be "significant" or "substantive" in their guidance documents; comments which meet this standard are not based on "opinion" nor are they "conjectural." NEPA regulations and the agency's interpretations of those regulations suggest that for comments to receive the agency's full consideration, they must be scientifically-based or be expressed in terms of science (Table 4.1).

Table 4.1. Interpretations by the CEQ and the USDA Forest Service concerning how to handle public comment received through the NEPA process.

Interpretations of NEPA public involvement (Source)	Timing
Use "…the scoping process not only to identify significant environmental issues deserving of study, but also to de-emphasize insignificant issues, narrowing the scope of the environmental impact statement accordingly." (CEQ, 40 CFR 1500.4(g))	Scoping
Non-significance is defined as those comments that are "conjectural in nature and not supported by scientific evidence." "Non-significant issues" are unlikely to be used to "formulate alternatives." (USDA Forest Service Forest 2007, Unit 9: 3-4)	Scoping
Responsible official is directed to "consider all substantive comments." (CEQ, 36 CFR 215.6)	Draft EIS/EA
Non-substantive comments are those that "do not warrant a detailed response" and this includes those that are "just opinion, general comments, or position statements." Non-substantive comments do not warrant detailed consideration because they do not cover "effects" and instead are about "their like or dislike for the proposal." (USDA Forest Service 2007, Unit 14: 20)	Draft EIS/EA

Our interviews with agency managers often reflected this standard. The term "substantive" from the NEPA regulations was repeated in reference to a scientific standard that must be met in order to influence the development of alternatives or impact project-level

decision-making. At the same time, the term "substantive" was also used to convey that comments that address specific environmental regulations, or are couched in legal terms, also receive additional consideration. For example, a comment that references "some type of endangered species" is a comment that the agency must "listen to." The following quote from our interviews gives a fuller explanation of what some agency managers considered "substantive" and explains how they handle public comment:

> Participant: You know it has to be a substantive comment—that's the term. If they don't have substance, if they are full of emotion, then they will not necessarily guide change.
> Interviewer: So what do you mean by substantive?
> Participant: It needs to be legal and scientific. It's not enough to say you don't like something.
> Interviewer: What do you think of that way of handling comment?
> Participant: I think it's a bad thing, because there are a lot of things we do in the [agency] that are not based on scientific fact. We make a lot of decisions based on policy and things that have very little to do with the scientific data.

We have named this standard for handling public comment the *substantive sieve,* because it in effect filters out normative comments in favor of legal or scientific comments. Although the *substantive sieve* is not endorsed by, or applied by all agency operators, when it is applied, it creates an extremely narrow legal/scientific role for the public. The public that chooses to navigate this system in an effort to influence formal agency planning and decision-making is well-served by conforming to this role.

1.3 Creating publics with the *substantive sieve.* The *substantive sieve* may be applied at any stage in the NEPA process. As a result, it is an important aspect of the context in which agency operators interact with the public. We argue that, in setting this context, the *substantive sieve* plays a powerful role in creating agency constructs of the public. Specifically, the

substantive sieve creates the passive and active publics that were commonly articulated by agency operators in our interviews.

To illustrate the *substantive sieve's* role in creating passive and active publics, it is useful to consider what type of public might emerge from the repeated use of the *substantive sieve* in handling public comment. One would expect that a portion of the public would eventually fill the legal/scientific role created by this process. This public which does participate (active) might exhibit an ability to explain its opinions in legal or scientific terms. Further, one could expect that other segments of the public which are unable to meet the legal and scientific standards of the *substantive sieve* might choose to no longer participate (passive). Perhaps due to the length of the process, one might also expect that only those with a clear interest would continue to participate.

Indeed, these very attributes of the public that are logically connected to the *substantive sieve* were commonly discussed in our interviews with agency operators. The following quote outlines many of the features of an active public and specifically links these attributes with the *substantive sieve.*

> "Our laws are such that they enable our citizenry to comment on what we do with a federal action. More people with more leisure time, more money…having a say in what we do—a real say, a legal say. It has forced us to consider their concerns. Lots of interest groups have developed into very formal organizations of their own and have staff capable of examining what we do…"

As the quote illustrates, the active public is commonly made up of primarily those who have the capability and resources to communicate in scientific and legalistic terms.

Others, who do not have those capabilities and resources, commonly make up the passive publics that operators commonly described. According to one agency operator,

the passive public is the "average citizen" whose voice the agency does "not hear as much" because "they don't get paid to come to our meetings and they have their own jobs." In keeping with the idea that the passive public is the "average citizen," they also do not have clearly articulated views regarding what should occur on public lands and often have difficulty couching their concerns in legal/scientific terms. For example, one agency operator explained that "unless they [particular publics] have that knowledge and they are willing to tell you what they want, it's very hard to implement what they're saying."

The role of the *substantive sieve* in forming agency constructions of the public is likely magnified when applied repeatedly. Publics that regularly cannot pass through the *substantive sieve* either learn to speak the language of NEPA or become part of the passive public that does not participate in agency planning.

Agency operator constructions of the public, however, are much more complex than the simple distinctions between the active and the passive public that we have outlined. The *substantive sieve* only shapes part of the foundation of these constructs. The personal norms of agency operators create much more complex constructs of the public.

2. Complete Publics: Adding Norms to the Process-Public

Active and passive publics created by, and in the context of, the *substantive sieve* are normatively imbued with additional meanings and invoked for specific purposes by agency managers. Personal or moral norms, defined as "self-expectations that are based on internalized values" (Schwartz 1968, Harland et al.1999; p. 2507), build a more complete picture of a given public's identity. These more complete and complex public identities are used in operator

discourse to make normative arguments about what a given public's role *should* be in agency planning.

To illustrate the normative aspects of constructed publics, we discuss two constructs of the public which emerged most commonly over all of our work, which we have labeled the *silent majority* and the *interested extremes* (Table 4.2). Our intent in this section is *not* to provide a full list of constructed publics—they are innumerable, complex, and often intertwined. Instead, we focus on two example constructions in an effort to illustrate the creative roles of both the *substantive sieve* and personal norms (Table 4.2). The constructions can be considered ideal-types that represent only one idealized version of the various manifestations that can be included within each label (Weber 1949). The normative features build on the process attributes of the public that are logically tied to the *substantive sieve* (e.g., passive v. active, scientifically literate v. scientifically illiterate). In this section we focus on the normative aspects of the constructs and explain how they can be used in agency discourse.

Table 4.2. Two example constructions of the public described in interviews with Forest Service operators.

	Example Constructs of the Public	
	1. *Silent majority*	**2. *Interested extremes***
Process attributes (*substantive sieve*)	passive; participates in disproportionately low numbers; poor understanding of agency planning process; scientifically illiterate; little free time/employed	active; participates in disproportionately high numbers; understands agency planning process; scientifically literate; wealthy; ample time to participate
Normative attributes	moderate and supportive of agency actions	organized; oppositional; unrepresentative of the broader public; distrustful; unreasonable
***Ideal* role in process**	*should* be engaged and *have increased* role in agency planning	*should have reduced role* in agency planning
Invoked:	to maintain agency control	to maintain agency control

2.1 Silent majority

> There is a silent majority. When I was on the ___district we had a pretty active group of people who were opposed to our management; they were very vocal, they were very active, and they were very organized. And, as the planner, I felt pretty beat-up; I just felt so war-weary with them. But when I would go to my church and go to the local community or talk to my friends, or my kids' friends' parents and other folks, most people said 'those folks, you know, they don't represent us in any way. We think what you're doing is fine, and we don't have a problem with it.' Well, lots of times, if everything is fine, people don't speak up. So how do you get the pulse on those people? That's a big challenge.

The quote above shows how agency operators assigned additional attributes to the passive public. In naming the passive public the *silent majority*, agency operators have normatively adjusted the identity of this passive public. In the quote above and whenever the *silent majority* was invoked by our respondents, silence was used as evidence that the "majority" is generally pleased with agency management. The labeling of the passive public is used to build a normative argument that this group *should* be served, because they represent the public at-large. The term is also intended as a contrast with the active public, which does not represent the "majority" or the public at-large. Also typically added to these arguments is the idea that the "majority" is moderate in its beliefs concerning resource management. By serving this group, agency management can claim to be responding to the "majority" of public values.

In the above quote, the *silent majority* is identified as "local." In this sense, the "local" public is a subset of the *silent majority*.[1] The identity of the "local" *silent majority* was often expanded to create a social justice argument for working on this public's behalf. This social justice argument is institutionalized in the Forest Service

[1] The "local" public as a *silent majority* is an ideal type. We acknowledge that in other contexts local publics have been active in federal land management, such as in the Wise-Use movement in the western U.S. (McCarthy 2001).

(Secure Rural Schools and Community Self Determination Act 2008, Payment in Lieu of Taxes Act 1976) and thus, this normative construction is linked to the agency's mission. Some agency operators argued that the agency should continue its historic function as a local "industry" by describing this group as resource-dependent, poor, and suffering from high unemployment rates. In light of these attributes, the agency has a responsibility to help the local public "survive" or "change" to prevailing economic conditions.

This local public was also constructed to suggest that they should be encouraged to play a more active role in agency planning. For example, several managers indicated that because the local public is the agency's "neighbor" with whom they have a long-term relationship, their public comments should receive closer attention than those received from more geographically distant publics. Some managers even indicated that the *silent majority* and "local" public should have an active role in agency processes and suggested ways this could occur, including: rescheduling and reformatting forest-level (NFMA) planning to accommodate these groups; reinterpreting NEPA comments from these publics so they meet the "substantive" standard; visiting local civic groups; writing to local newspapers; and even reopening NEPA processes in which the *silent majority* was perceived to be inadequately represented.

An operator's personal norms create a more complete construct of the *silent majority*, built on the passive public initiated through the *substantive sieve*. By identifying these publics as the *silent majority*, and "local" in this particular case, agency managers normatively created publics with a specific purpose.

2.2 Interested extremes

> Participant: Usually there are a couple of loggers that are ranting and raving because we are not logging enough. And, there are some people that are aligning with the environmentalists, because they like mountain biking and hiking, and they think that is the way to better protect their interests. And, there are a lot of middle-of–the-road people that came because they are curious, and they think things are pretty good.
> Interviewer: It is good that some of them show up…
> Participant: Yeah, but you don't always get those. Usually, when you have an axe to grind, that is when you come.

The quote above illustrates the construction of a more specific active public. Active publics, according to this construction, are not the "middle-of-the-road people," but rather they are interest-focused and extreme. Although the *substantive sieve* forms the basis for the *interested extremes*, the construct has powerful normative components as well.

Framing the active public as extreme vitalizes operator arguments for limiting this public's role. Agency operators expressed their view that this public is extreme in several ways. First, they make the argument that the active public does not represent the public at large. Second, operators suggested that this public, often deemed "special interest groups," are extreme because they are unwilling to participate in good faith in formal agency planning. As one operator explained, this public is not interested in what the agency might view as reasonable issues, like "method of cut." Rather they "want to stop you dead in your tracks" over an "un-crossed t or un-dotted i." This public also has the expertise and resources to advance its "extreme" agenda. As one operator noted, the *interested-extremes* "have specialists on staff and sometimes large legal staffs" that allow them to "scrutinize what we do."

The *interested-extremes* and the *silent majority* were often invoked in tandem, to make an argument for maintaining agency control in planning; the *silent majority* needs representation and the *interested-extremes* are over-represented. Despite the way these constructs are invoked, agency operators consistently noted that the *interested-extremes* have power in agency planning. This public is distinguished by its ability to permeate the *substantive sieve* by couching their opinions concerning what should happen on public lands in legal or scientific terms.

3. Feedback between Process and Publics

We have explained agency constructions of the public as founded in agency process, namely the *substantive sieve.* Managers normatively create more complete ideas about the public and their ideal role in agency planning. In this section, we alter the order of our argument to show that these constructs of the public can also alter the agency's NEPA processes. As the *interested extremes* were the dominant construct of the active public invoked by our respondents, we show in this section how this particular construct of the public can alter agency process.

According to agency operators, the *interested extremes* are able to navigate the *substantive sieve,* and the agency has responded to their influence. As one operator explained, the agency has altered its NEPA process in "certain ways that are a direct result of past public interaction." One of these changes includes a move towards environmental documents (EA/EIS) that are loaded with "technical jargon and endless data tables." Indeed, many public land managers noted that NEPA documents have increased in length and in scientific detail over the course of their careers (see Stern and Mortimer 2009). According to one operator, this particular response to the *interested extremes* has "become ingrained in our culture."

Some agency operators also conveyed an awareness of how increasingly technical documents may compromise the communicative worth of NEPA documents:

> "Our documents unfortunately end up being written for a small segment of the population that is generally just opposed and they are paid to oppose us; that is why those documents are so hard to read. You have to make them bulletproof, and that does exclude people. You mail that [the document] to a neighbor, and they think, 'oh this is the big government and they're going to do what they want.'"

The example above of an agency which responds to the *interested extremes* helps to clarify the link between agency processes and constructions of the public. Earlier we showed how the *substantive sieve*—as part of the NEPA process—helps create constructs of the public. Our explanation of the increased technical rigor of agency environmental documents illustrates that this relationship can also work in the inverse, where constructs of the public shape agency processes (Figure 4.1).

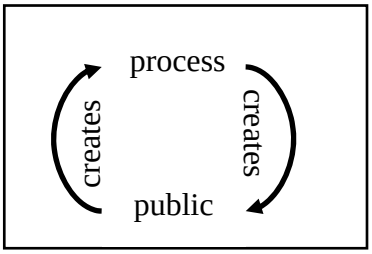

Figure 4.1. The feedback relationship between constructs of the public and agency processes.

In response to *interested-extremes*, some agency operators chose to reinforce the *substantive sieve* by producing documents targeted for only that audience. These highly technical documents are often incomprehensible for the lay public and may serve as an additional obstacle facing normative publics that seek to influence agency planning (Sullivan et al. 1996). This example shows that a feedback mechanism operates between agency constructs of the public and agency processes (Figure 4.1). This feedback mechanism causes constructs of the

public and agency process to reinforce one another; a more scientific process creates a more scientifically literate active public and vice versa.

Constructs of the public are formed by both agency process and personal norms (Table 4.2). In addition, constructs of the public and process feed into one anther. In Figure 4.2, we attempt to show how the constructed publics we have described and the NEPA process may interact. Our model assumes that the public enters the NEPA process with normative ideas concerning what should occur on public lands. The normative public which seeks to influence agency planning is often confronted by the *substantive sieve*. The *substantive sieve* is an important part of the NEPA process, because it colors agency communication with its publics; it alters both agency language and listening. The agency's use of scientific and technical language may discourage some publics who are unable to converse in this language and cause them to disengage or never engage in the NEPA process. In this sense, the presence of the *substantive sieve* and its effects on agency communications can function as a buffer to normative publics. A portion of the normative public is turned away from full engagement in the NEPA process, which is depicted in Figure 4.2. The language aspect of the *substantive sieve* can also affect the public inside of the NEPA process by making it more difficult for some publics to understand the proposed action and make constructive comments. The *substantive sieve* may also work to filter what agency operators choose to hear and consider in planning. Because agency operators form at least a portion of their ideas about the public within the process we have described, they are likely to construct ideas about the active public that are similar to those we outlined as *interested extremes.*

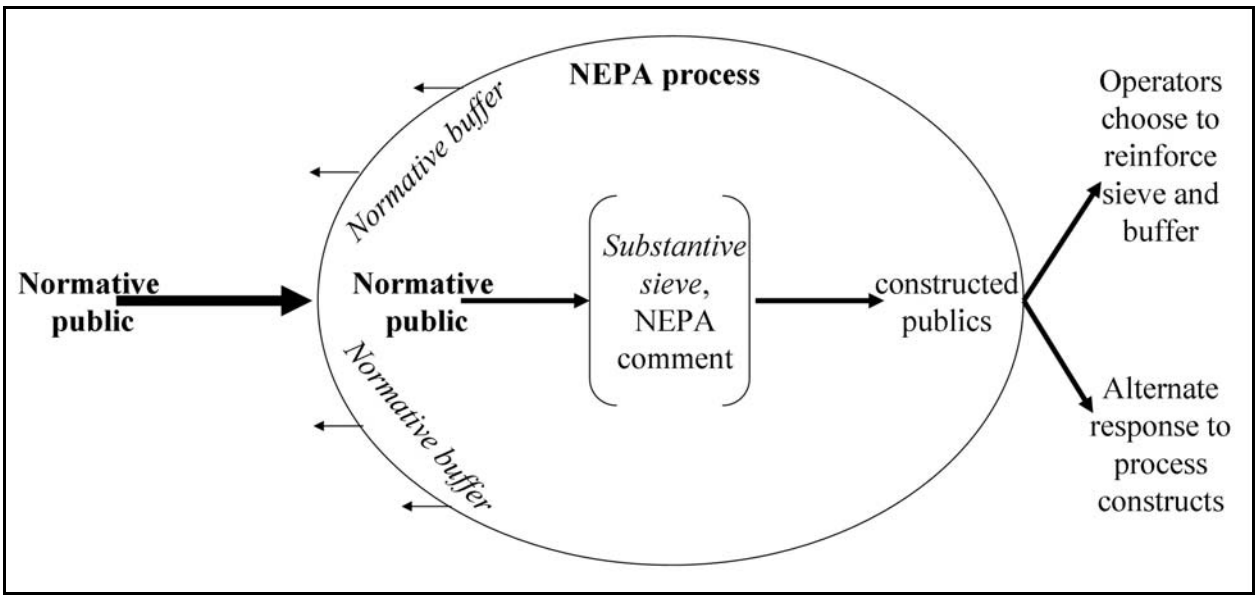

Figure 4.2. A model of interactions between constructed publics and NEPA processes.

At any point in this process, agency operators can choose to respond to the constructed public and the process in one of two ways: (1) they can choose to respond mainly to the *interested-extreme* and reinforce the *substantive sieve*; or (2) they may choose to augment or alter agency process in another way. If they choose option one, they will be targeting their documents increasingly towards surviving the scrutiny of the *interested extremes*, rendering it largely incomprehensible to the broader public. Option one also involves maintaining a focus on scientific exchange or legalistic jargon as standards for communicating with the public. Many agency operators are cognizant of the negative consequences for agency-public communication that can result from reinforcing the *substantive sieve.* In light of this realization, operators may choose to make concerted efforts to have interactions with the broader public, outside of formal NEPA public involvement. Or they may decide to alter these formal public involvement procedures and revise how they handle non-scientific and non-legally based comments. We now turn our attention to the ramifications of our model and the associated choices facing public land managers.

Conclusions and Implications

The USDA Forest Service has shifted from an agency focused mainly on efficiency to one concerned with responsiveness and representativeness (Tipple and Wellman 1990). Constructions of the public, based in agency planning processes and operator personal norms, may compromise the agency's efforts to represent and respond to its publics. NEPA processes are a major venue through which the agency communicates with its publics, and the *substantive* sieve shapes these agency-public communications. When applied by agency operators, full consideration is given only to the comments of the scientifically and technically articulate publics. The repeated use of the *substantive sieve* may discourage participation from publics that are unable to meet this standard for communication. In these respects, the *substantive sieve* warrants attention due to its potential to threaten agency attempts to equitably represent and respond to its publics. The internal threat posed by the *substantive sieve* suggests that a complete picture of agency responsiveness and representativeness requires an analysis of how the public involvement process itself functions to include or exclude publics.

The personal norms of agency operators, as reflected in constructs of the public, may also undermine agency responsiveness and representativeness. For example, our analysis of the *silent majority* and *interested-extremes* constructs shows how these constructs are invoked separately, and in tandem, as a rationale for maintaining agency control over planning. Preconceived notions about publics and what their roles ought to be may dictate how operators conduct public involvement and which publics they respond to within the chosen process. The potential for personal norms to impact administrative outcomes has been recognized and has been identified in the Forest Service. For example, Stern et al. (2009) showed that the factors that team leaders in the NEPA process felt were important to NEPA success were also those elements of the

process that they believed were best implemented. In sum, constructions of the public, as byproducts of agency process and personal norms, can impact agency efforts towards representativeness and responsiveness. Because these ideals influence the public's perception of a fair process, failure to meet this standard can damage trust between the public and the agency (Smith and McDonough 2001; Stern 2008a).

Although understanding process-based and normatively-based constructions of the public is important, the main contribution of this paper is to identify how these constructs operate in agency planning. Specifically, it shows how constructs of the public impact, and are impacted by, agency process. This feedback mechanism has tangible and often negative consequences for the agency. If an agency operator is mainly concerned about the *interested extremes* and feels compelled to respond to this public, this can lead to a reinforcement of the very processes (*substantive sieve*) which helped create this public. When this occurs the agency becomes increasingly focused on addressing and responding to *interested extremes,* often to the detriment of the other interested publics.

Breaking the negative feedback loop between the *interested extremes* construct and the *substantive sieve* is a challenge. Many agency operators feel that the risk of litigation compels them to employ the *substantive sieve*, by bulletproofing documents and filtering normative comments (see Stern and Mortimer 2009). These agency efforts to be scientific are partly rooted in an effort not to appear "arbitrary and capricious" in its NEPA implementation, and thus avoid exposing the agency to litigation under the Administrative Procedures Act (APA 1946). This approach to NEPA is also reasonable given the recent history of the Forest Service. Litigation against the agency has risen since the 1990's, with NEPA being the most commonly cited statute (Keele et al. 2006). Although it may appear to be advantageous to respond to only the *interested*

extremes in the NEPA process, the ensuing technical and scientific competition between this public and the Forest Service has proven costly. At least in part due to litigation or the threat of litigation, a large portion of the agency's work force and money is now devoted to completing scientifically and legally competitive NEPA analyses (Ackerman 1990; Management Analysis 2007; Stern et al. 2009). In addition to these financial burdens, additional scientific information has failed to produce lasting agency-public consensus on the management of national forests (Healy and Ascher 1995).

On its face, the agency and its operators appear to be left with two choices, neither of which seems ideal: (1) they can reinforce the *substantive sieve,* respond mainly to the *interested-extremes,* and marginalize and lose the trust of normative publics for which the process is prohibitive; or (2) adjust the *substantive sieve,* simplify agency language, work to include normative publics, all at the risk of exposing the agency to further legal challenge. Although the agency cannot abandon the *substantive sieve* due to the threat of enforcement under the APA, we suggest that option 2 warrants additional agency consideration. Despite the real risk of litigation, agency operators are afforded adequate discretion under NEPA to alter public involvement processes. NEPA does not say that norms must be eliminated in public involvement; rather the CEQ regulations simply suggest that the agency categorize comments as either "substantive" and "significant." An alternative approach to normative comments in an EA or EIS might include the following: (1) summarize normative comments, with the explicit aim of showing that these comments have been heard by the agency; and (2) show how normative comments are considered in light of the agency mission, as well as the purpose and need for the project; (3) avoid overly-scientific and legalistic NEPA documents that contradict a central aim of NEPA—to disclose the effects of the proposed action. There is some room for adjusting the *substantive*

sieve and these efforts may have a positive affect on agency-public relationships. Discontinuing the use of the *substantive sieve* may alter the feedback mechanisms that appear to reify some of the most detrimental relationships between the agency and its publics.

Reducing the influence of the *substantive sieve,* however, is unlikely to quickly solve the problems of representativeness that seem to persist in NEPA public involvement. Nor is the idea of more thoroughly considering normative arguments in public participation intended to suggest that NEPA should, or can, become a vote-counting procedure. Despite these limitations, altering the use of the substantive sieve may have positive affects. Eventually, this change may expand the agency's interested publics. Perhaps more importantly, a deliberate inclusion of normative comment may eventually alter the behavior of active, oppositional publics. If the agency is able to show that it hears and responds to normative comments, some of these oppositional publics may disengage from the costly scientific and legal competition that has plagued the agency. This potential stems from the fact that many of the agency's opponents disagree most over the inherently normative decisions concerning what should occur on public lands, and less about the scientific and technical aspects of how to management public lands.

Innes and Booher (2004) have argued strongly that legally-required public involvement does not work. Although our analysis in large part supports this conclusion, we suggest that the discretion afforded agency operators concerning how they conduct NEPA public involvement offers some opportunity for reform. This study suggests that breaking the negative feedback between constructions of the public and the NEPA process would be a key step. In our discussions with agency managers, they did, on occasion alter the *substantive sieve* and allow the normative public to enter the NEPA process. Examples included: maintaining a recreation area where community baptismal ceremonies are conducted despite a cost-benefit analysis which

recommended closing the site; or re-opening a NEPA process after a decision notice had been issued in response to public outcry concerning the closure of a scenic overlook. We suggest that altering the *substantive sieve* may improve agency-public relationships and slowly diminish the tendency for the public and the agency to engage in a costly and exclusive scientific competition. All steps involving the consideration of normative comment, however, must be done consistently rather than sporadically, or risk further erosion of the public trust. By reforming public participation that is legally required by NEPA, the agency may be able to work towards its goals of representativeness and responsiveness, without adding appreciably to the agency's procedural burdens.

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Chapter 5: Conclusions

Chapters two and three both showed that EM and its associated ideas about the means and ends of natural resource management persist in the agency's language. EM, however, is not the only language of natural resource management used by the agency. Rather, it is one of many ideas, ranging from contemporary ideas like ecosystem services to more traditional ideas, like rational planning. These languages make up the linguistic resources through which the agency continues to interpret its ambiguous mission: to "sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations."

Chapter two shows that, even among a small sample of 11 agency executives, there is considerable disagreement concerning the objectives of public land management. Not surprisingly given the link between means and ends, chapter three illustrates variability in how agency operators construct Forest Service planning. For example, agency operators described two ways in which ecological science is used in agency planning: it can be used either early in the process to help decide what should occur on the land (EM); or, it may be used after a decision has been made, primarily to document the impacts of that decision. The results of Chapter four are also indicative of an ambiguous agency mission. Agency operators constructed a variety of publics, each of which was associated with different ideas about their appropriate role in agency planning. In sum, the ambiguity of the agency's mission is evident in agency employees' descriptions of the agency's ends, its means, and the publics it aims to serve.

The ambiguity of the agency's mission can be both an advantage and disadvantage for agency employees. Chapter two presented one advantage of ambiguity, showing how ambiguity

allows executives to adapt the end goal of agency management to suit prevailing political conditions. EM, and its ends-oriented components, appears to have been abandoned by agency executives in the effort to stay aligned with the shifting priorities of presidential administrations. Another advantage of ambiguity is that it enables decentralized decision-making on public lands. Making decisions at a local scale can be advantageous in natural resource management in at least two respects. First, local decision-makers (district ranger) as opposed to a centralized decision-maker can bring a more thorough understanding of resource conditions to decision-making. This is especially advantageous given the diversity of forest ecosystems administered by the agency. A second way that decentralized decision-making can be beneficial is by improving public involvement. Research indicates that public involvement or collaboration is more likely to succeed at reduced or local scales (Cheng 2003; Elliott et al. 2003). This type of contextual decision-making, with consideration of the local environment and its people, would be much more difficult to achieve from the agency's regional offices or Washington, D.C.

There are also disadvantages to decentralized decision-making. First, there is potential for local public interests to be more heavily weighted in decision-making, compared to the interests of more distant publics. Although added weight to local interests is not necessarily "bad," it does complicate the agency's efforts to serve the national interest. Another potential drawback of decentralized decision-making is the lack of accountability. Given the ambiguity of the mission, it may be difficult to evaluate and document the performance of local decision-makers to Congress or the American people. Finally, an ambiguous mission can also lead to inconsistent goals through the hierarchy of the agency; the objectives and decisions made by district rangers may not be similar to those of their superiors in the supervisor's office, the regional office, or the Washington office.

Other research has recognized the agency's struggle to balance the advantages and disadvantages associated with decentralized decision-making (Culhane 1981). One of the ways the agency has sought to achieve this balance is through rules and guidelines, often deemed hierarchical controls. These controls may take a variety of forms, all of which are designed to maintain professionalism, neutrality, rationality, and efficiency at the agency's operational levels (Sabatier et al. 1995). Sabatier et al. (1995) showed that hierarchical controls are a relatively weak influence on agency decision-making. This study shows, however, that these hierarchical controls do persist and continue to impact the agency's planning processes and communications with the public.

Chapter three showed how powerfully budget targets maintain the goal of efficiency at the forefront of agency planning. Budgetary controls (targets) and strict agency roles crippled attempts to use ecological science early and extensively in planning. Line-officers are partially evaluated on their ability to meet targets. As a result, targets may be more important in choosing what should occur on public lands than the scientific information concerning resource conditions. In addition to altering the role of science, budgetary controls may also limit the agency's ability to enter into an honest discussion, either internally or with its publics, about appropriate objectives on public lands. This occurs because, at least in some cases, budgetary controls have decided local objectives or narrowed the room for negotiation. In continuing to place importance on budgetary controls and targets the agency is sacrificing the primary advantages of decentralized decision-making including: making use of a contextual understanding of the natural system; and, the potential to engage local publics concerning what should occur on public lands. The use of these "targets" however, ensures that the agency can measure and report its productivity.

Hierarchical controls on agency language can also have a negative affect on agency communications with the public. Chapter two showed the fluidity and controversy over ideas concerning environmental quality at the executive level in the agency. Despite the lack of agreement at the executive level, agency operators noted that they felt pressure from their superiors to use the newest word for environmental quality, whether it is sustainability, resilience, or forest health, in agency planning documents. Rather than allowing agency operators to choose how to communicate with the public, there were attempts to impose certain languages at the operational-level. Agency operators indicated that these terms were often received by the public with skepticism, and often created problems for agency-public communications. Again, this attempt at hierarchical control can undermine the advantages of decentralized, contextual agency-public communications.

In similar fashion, the *substantive sieve* and the associated problems raised in chapter four, are related to agency attempts to impose hierarchical controls and maintain accountability. The NEPA regulations and recommendations that helped create the *substantive sieve* originate at the national-level. The *substantive sieve*, because it originates at the national level, can be understood as an attempt to limit or control the agency operator's investment in public involvement. The rationale for its use is at least partly tied to the need to ensure that operators are meeting targets and efficiently implementing projects. Some agency operators have absorbed and implemented the *substantive sieve*, perhaps due to the pressures to efficiently implement projects. Although the agency may gain a measure of efficiency from employing the *substantive sieve,* chapter four illustrates that the exact tradeoffs associated with its use are not clear. The *substantive sieve* may have negative consequences for agency-public trust, which in turn may reduce agency efficiency.

This study does not offer any quantitative estimates of the tradeoffs between hierarchical controls and decentralized decision-making. The study does, however, offer some information that may assist the agency in these deliberations. First, the controls that are currently in place are in some cases damaging the agency's ability to use scientific information in planning. Second, they are also in some cases creating roadblocks for engaging the public in an honest dialog about what should occur on national forest lands. Given these concerns, and the agency's clear interest in "collaboration" and the use of "best available science," these controls may warrant reevaluation by the agency (Federal Register 2008).

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Appendix A: Copyright Permission

S. Andrew Predmore
321 Cheatham Hall
Virginia Tech
Blacksburg, VA 24061

March 9, 2009

Managing Editor *Journal of Forestry*
5400 Grosvenor Land, Bethesda, MD 20814-2198

Dr. Mr. Walls:

I am writing to confirm our recent telephone conversation regarding the manuscript titled "Ecosystem Management in the USDA Forest Service: A Persistent Process but Dying Discourse (*Journal of Forestry*, 2008 106(6): 339-345). I am completing my doctoral dissertation at Virginia Tech. I would like your permission to reprint the above named article as a chapter of my dissertation.

The requested permission extends to any future revisions and editions of my dissertation, including non-exclusive world rights in all languages, and to the prospective publication of my dissertation by UMI Company. These rights will in no way restrict republication of the material in any other form by you or by others authorized by you. Your signing of this letter will also confirm that you own [or your company owns] the copyright to the above-described material.

If these arrangements meet with your approval, please sign this letter where indicated and fax this document to me at 540-231-3330. Thank you very much.

Sincerely,

S. Andrew Predmore

PERMISSION GRANTED FOR THE
USE REQUESTED ABOVE:

Matthew Walls, Managing Editor, *Journal of Forestry*

Date: 3/16/09

Appendix B: Internal Review Board Approvals

VirginiaTech

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FWA00000572(expires 1/20/2010)
IRB # is IRB00000667

DATE: September 27, 2007

MEMORANDUM

TO: Michael J. Mortimer
Stephen Predmore

Approval date: 9/26/2007
Continuing Review Due Date:9/11/2008
Expiration Date: 9/25/2008

FROM: David M. Moore

SUBJECT: **IRB Expedited Approval:** "Implementation of Ecosystem Management by the USDA Forest Service" , IRB # 07-461

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective September 26, 2007.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.
3. Report promptly to the IRB of the study's closing (i.e., data collecting and data analysis complete at Virginia Tech). If the study is to continue past the expiration date (listed above), investigators must submit a request for continuing review prior to the continuing review due date (listed above). It is the researcher's responsibility to obtained re-approval from the IRB before the study's expiration date.
4. If re-approval is not obtained (unless the study has been reported to the IRB as closed) prior to the expiration date, all activities involving human subjects and data analysis must cease immediately, except where necessary to eliminate apparent immediate hazards to the subjects.

Important:
If you are conducting **federally funded non-exempt research**, this approval letter must state that the IRB has compared the OSP grant application and IRB application and found the documents to be consistent. Otherwise, this approval letter is invalid for OSP to release funds. Visit our website at http://www.irb.vt.edu/pages/newstudy.htm#OSP for further information.

cc: File

VirginiaTech

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FWA00000572(expires 1/20/2010)
IRB # is IRB00000667

DATE: August 26, 2008

MEMORANDUM

TO: Michael J. Mortimer
Stephen Predmore

Approval date: 9/26/2008
Continuing Review Due Date:9/11/2009
Expiration Date: 9/25/2009

FROM: David M. Moore

SUBJECT: **IRB Expedited Continuation 1:** "Implementation of Ecosystem Management by the USDA Forest Service" , IRB # 07-461

This memo is regarding the above referenced protocol which was previously granted expedited approval by the IRB. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. Pursuant to your request, as Chair of the Virginia Tech Institutional Review Board, I have granted approval for extension of the study for a period of 12 months, effective as of September 26, 2008.

Approval of your research by the IRB provides the appropriate review as required by federal and state laws regarding human subject research. As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.
3. Report promptly to the IRB of the study's closing (i.e., data collecting and data analysis complete at Virginia Tech). If the study is to continue past the expiration date (listed above), investigators must submit a request for continuing review prior to the continuing review due date (listed above). It is the researcher's responsibility to obtain re-approval from the IRB before the study's expiration date.
4. If re-approval is not obtained (unless the study has been reported to the IRB as closed) prior to the expiration date, all activities involving human subjects and data analysis must cease immediately, except where necessary to eliminate apparent immediate hazards to the subjects.

cc: File