

THESIS

THE SELECTION OF SPECIES OF CONSERVATION CONCERN UNDER THE USDA
FOREST SERVICE'S NEW PLANNING REQUIREMENTS FOR WILDLIFE

Submitted by

Summer Star Grimes

Department of Forest and Rangeland Stewardship

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Master's Committee:

Advisor: Courtney Schultz

Barry Noon

Tony Cheng

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ABSTRACT

THE SELECTION OF SPECIES OF CONSERVATION CONCERN UNDER THE USDA FOREST SERVICE’S NEW PLANNING REQUIREMENTS FOR WILDLIFE

In 2012, the USDA Forest Service finalized a planning rule that represents the most significant change in federal forest policy in nearly 30 years. All 155 national forests (and 20 national grasslands) must eventually update their management plans in accordance with the new regulations, which have significant implications for wildlife conservation planning. The agency selected eight “early adopter” forests as the first to implement the new planning rule. Given the contentious history of wildlife planning on national forests, there is a high level of interest amongst many audiences in the implementation of the new rule’s language – specifically for a new category of species: “species of conservation concern” (SCCs). The new rule requires the agency to maintain the viability of SCCs on national forests; however, due to uncertainty regarding the new rule’s language, concern exists regarding the management of and planning for SCCs. This research investigated the process of policy implementation during the early stages of forest plan revision on three adjacent early adopter forests to provide insight into the factors that are likely to influence wildlife planning decisions for SCCs across all national forests.

Approximately 20 qualitative, semi-structured interviews with agency staff and external environmental partners revealed that traditional challenges of policy implementation were a continued barrier to wildlife planning; however, interviews also revealed cautious optimism that the agency is experiencing a positive paradigm shift in how they address ecosystem management, enabling them to move beyond administrative borders and see forests as part of a

broader ecosystem – potentially resulting in a more integrated approach to wildlife management and habitat conservation. This study provides valuable insight into early-stage procedural determinations for wildlife planning on national forests for at-risk species and can serve as a valuable source of ‘lessons learned’ for subsequent forest plan revisions.

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INTRODUCTION

Since the 1950s, wildlife conservation planning on public lands has been a topic of intense debate and interest, and there is no public land management agency for which this issue has been more controversial than the U.S. Forest Service (Corbin 1999, Hoberg 2004). In 2012, the Forest Service finalized regulations under the National Forest Management Act, providing direction and guidance for developing and updating forest plans, collectively known as the “2012 planning rule.” These regulations represent the most significant change in federal forest policy in nearly 30 years and have major implications for wildlife conservation planning (Schultz et al. 2013). Following finalization of the new planning rule, the Forest Service announced their selection of eight “early adopter” forests across the nation. These forests were chosen as the first of 155 to implement the new planning rule “because of their urgent need for plan revisions, the importance of the benefits they provide, and the strong collaborative networks already in place” (USDA Forest Service 2012). This study focused on three adjacent early adopter forests in California to observe the process of plan revision as it relates to wildlife, specifically regarding the selection of, and planning for, a new category of species that was introduced in the new rule: species of conservation concern (SCC).

Given the contentious history of wildlife conservation planning on national forests, there is a high level of interest amongst many audiences in the interpretation and implementation of the new rule’s language as it relates to wildlife. Through a review of available planning documents as well as interviews with agency staff and external partners who were involved in planning, this paper identifies emerging challenges and opportunities associated with the new rule’s requirements and describes the process by which early adopter forests are selecting SCCs,

designing associated plan components, and addressing species viability. I also draw upon the literature on policy implementation and planning to understand the influence of agency behavior on the process of interpreting and implementing the new planning requirements.

Historical Context: National Forest Planning

To better understand the significance of the new planning requirements, it is first necessary to provide a historical context of the development of wildlife conservation planning for national forests. In 1897, the Forest Service passed the Organic Administration Act, which directed the agency to improve and protect forests, maintain water flows, and ensure sufficient timber supplies through the creation of national forests (Rasband et al. 2009). Until the 1950s, this mission remained relatively uncomplicated and uncontroversial because the management of range, timber, and non-commodity resources rarely interfered with each other (Wilkinson and Anderson 1987). However, the increased demand for national forest products and recreational access in the 1950s began to create conflict between timber and preservation interests, attracting congressional and public attention. In response, Congress passed the Multiple-Use Sustained-Yield Act (MUSYA) in 1960 – the agency’s first mandate to consider a wide range of factors in national forest planning including recreation, resource extraction, fish and wildlife resources, and wilderness. However, “multiple-use” did not become, in practice, a governing principle on national forests as the agency continued to prioritize timber extraction (Hirt 1994). In response to this and other factors, Congress then passed the National Forest Management Act (NFMA) in 1976, which required the development of individual forest plans for national forests and created a three-tiered, regulatory approach to planning where national-level regulations (top tier) are used to govern the development and revision of forest plans (second tier), which then govern

site-specific plans for forest-level projects and other activities (third tier) (Rasband et al. 2009). In addition to new planning requirements, the NFMA also included new substantive requirements for resource protection such as the “diversity provision,” which requires the agency to “provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives” (16 U.S.C. § 1604 (g)(3)(B)).

In 1982, based on the recommendations of a Congressionally mandated committee of scientists, the Forest Service promulgated the first planning rule (47 FR 43037), which included interpretations of the NFMA’s diversity provision that, among other things, committed the agency to maintaining the viability of *all native vertebrate species* on each national forest. This effectively made wildlife a “controlling and co-equal factor” in forest management (Wilkinson and Anderson 1987).¹ In the wake of the 1982 planning rule, wildlife conservation interests, inspired by a string of legal victories, began to lean heavily on judicial interpretations that consistently ruled in favor of species “viability” to protect large areas of old-growth forest habitat from development and resource extraction (Hoberg 2004).

In 1997, the Clinton administration convened a second committee of scientists to make recommendations for a new planning rule that would better accommodate current science, while also extending protections for biodiversity (Noon et al. 2003). However, the Bush administration suspended this rule in 2000 and issued its own planning rules in both 2005 and 2008 (also with revised wildlife conservation planning requirements); neither survived judicial review. As a result of these failed revisions, nearly all existing forest plans have been written and implemented under the provisions of the 1982 rule. In 2012, after a lengthy public involvement

¹ See Table 1 for a description of the wildlife planning requirements in various versions of the planning rule.

period, but without input from a formal committee of scientists, the Obama administration issued a new planning rule (77 FR 21162). So far, the new rule has survived legal challenge and a number of national forests are revising their forest plans in accordance with the 2012 planning rule.

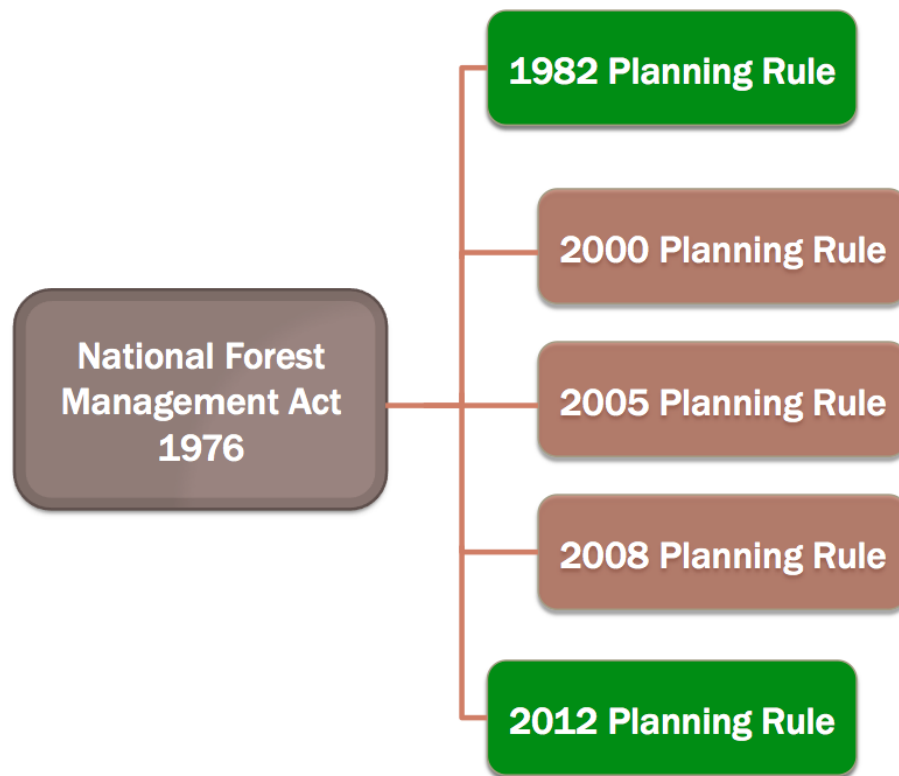


Figure 1: USFS Planning Regulations Since 1976

The 2012 planning rule requires a three-part cycle of planning: the first stage involves the assessment of resources to determine current forest conditions and trends; the second stage involves the formal preparation of draft and final forest plans as well as associated environmental impact assessments (as required by the National Environmental Policy Act of 1970); and the third stage involves monitoring and subsequent revision and updating of forest plans (36 CFR

§219.5). During plan revision, the rule also requires the creation of “plan components” to guide future project and activity decisionmaking (36 CFR §219.7(e)(1)) and requires the use of best available science to inform management and planning decisions (36 CFR §219.3). These plan components include: desired conditions (specific characteristics toward which management of the land and resources should be directed), objectives (desired rate of progress needed to achieve desired conditions – as is financially feasible), standards (set to ensure achievement of objectives, mitigate effects, or meet legal requirements), guidelines (set to ensure that standards remain on target), and suitability of lands (identification of specific lands in a plan area that are suitable for the desired conditions).²

The 2012 planning rule represents the most significant change in federal forest policy in nearly 30 years and has major implications for management, particularly for wildlife conservation planning (Schultz et al. 2013). The rule includes both new and revised requirements for wildlife and ecosystem planning that no longer require the agency to maintain the viability of *all* native vertebrate species on each national forest (as was mandated in the 1982 rule). The 2012 regulations focus instead on ecological integrity and adopt a species management approach that the agency describes as a combination of coarse- and fine-filter methods (36 CFR. 219.9; US Forest Service 2012). Coarse-filter approaches focus on broad habitat components that are required to maintain ecological integrity (see 36 CFR. §219.8, §219.9, §219.12). The Final Environmental Impact Statement for the new planning rule explains that maintaining ecological integrity is the best hope for conserving biodiversity (36 CFR §219.9(a)(1); USFS 2012).

² All parentheticals are direct definitions from 36 CFR §219.7(e)(1) of the rule.

Table 1: USFS Planning Rules: Relevant Viability and Diversity Provisions			
Planning Rule	Scientific Input	Viability Language	Other Diversity Provisions
1982 Rule 47 FR 43037 Sec. 219.19	Committee of Scientists (per NFMA requirements)	“Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area.....a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area.” (Sec. 219.9)	<ul style="list-style-type: none"> Habitat must be well distributed and support a minimum number of reproductive individuals Requirement for consultation with biologists to assist with coordination of planning Use of Management Indicator Species (MIS) to indicate the effects of management activities
2000 Rule 65 FR 67514 Sec. 219.20	Committee of Scientists (Recommended the use of focal species)	<p>“...the proposed rule affirms the Forest Service’s commitment to the viability of all species in accordance with the NFMA requirement to provide for the diversity of plant and animal Communities...” (65 FR 67518)</p> <p>“The viability of each species listed under the Endangered Species Act as threatened, endangered, candidate, and proposed species must be assessed. Individual species assessments must be used for these species.” (65 FR 67574)</p> <p>“The Department...believes that viability should be interpreted in the broadest manner.” (65 FR 67565)</p>	<ul style="list-style-type: none"> “Individual species assessments must be used for [ESA] species.....For all other species... a variety of approaches may be used, including individual species assessments and assessments of focal species or other indicators used as surrogates in the evaluation of ecological conditions needed to maintain species viability.” (65 FR 67574) “The Forest Service Deputy Chief for Research and Development must establish, convene, and chair a science advisory board to provide scientific advice on issues identified by the Chief...[and]...at least one regional science advisory board must be available for each national forest and grassland.” (65 FR 67577)
2005/2008 Rule 70 FR 1023 Sec. 219.10 73 FR 21468 Sec. 219.10	N/A No formal consultation with any external group of scientific experts	N/A – No viability language in either Rule	<ul style="list-style-type: none"> Ecosystem diversity: Plan components must establish a framework to provide the characteristics of ecosystem diversity in the plan area. Species diversity: The responsible official may determine if additional provisions are needed to address endangered species or species of concern and interest per multiple use objectives
2012 Rule 77 FR 21162 Sec. 219.9	No formal Committee of Scientists Only informal consulting with scientific panels at the Washington Office	“....requires the responsible official to develop coarse-filter plan components, and fine-filter plan components where necessary, to provide the desired ecological conditions necessary to maintain viable populations of species of conservation concern within the plan area, or to contribute to maintaining a viable population of a species of conservation concern across its range where it is beyond the inherent capability of the plan area to maintain a viable population of that species within the plan area.....A [viable population] continues to persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments.” (77 FR 21175)	<ul style="list-style-type: none"> Ecosystem Integrity: the plan must include plan components, including standards or guidelines, to maintain or restore the ecological integrity (“the quality or condition of an ecosystem when its dominant ecological characteristics occur within the natural range of variation...” (Sec. 219.19)) of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore their structure, function, composition, and connectivity. Ecosystem Diversity: Plans must include components to maintain or restore the diversity of ecosystems and habitat types in the plan area

Ecological integrity is defined in the rule as:

“The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence” (36 CFR. §219.19).

Fine-filter approaches, which consist of species-specific plan components (discussed in detail below), must:

“....provide the ecological conditions necessary to: contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern within the plan area” (36 CFR §219.9(a)(2)(b)).

According to many wildlife biologists, conservation planning should involve a balance between coarse-filter (i.e. habitat-based) approaches, and fine-filter assessment and monitoring (i.e. the measurement of species-specific populations and trends through detection/non-detection, sign, surveys, genetic evaluation, historical presence/absence data, etc.) (Noon et al. 2003; Noon et al. 2012; Schultz et al. 2013). Historically, agencies have relied on coarse-filter methods to address the conservation of biological diversity because monitoring individual species, at landscape scales, was not feasible given the cost of traditional survey methods and the large number of species on public lands (Noon et al. 2012). However, the scientific literature suggests that the use of coarse-filter methods alone is not sufficient because these methods oversimplify how animals use habitats and often over-estimate the presence and viability of species on the planning landscape (Noon et al. 2003; Noon et al. 2012). Therefore, scientists suggest coarse-filter methods be combined with fine-filter methods because neither method alone can “prescribe the extent or area of habitat necessary to maintain viable populations of plant and animal species

on the landscape” (Noon et al. 2003). More specifically, they suggest that the fine-filter methods in this combination should focus on the monitoring of threatened, at-risk, and rare species, along with a modest number of focal species, selected with complimentary and comprehensive functional roles (Noon et al. 2012; Schultz et al. 2013). It is important to note that in the 2012 rule the Forest Service characterizes fine-filter approaches differently from the general scientific community, labeling their fine-filter approach as the identification and maintenance of ecological (i.e. habitat) conditions required to support the persistence of at-risk species (e.g. the protection of nest cavity trees for the Red-cockaded Woodpecker [*Leuconotopicus borealis*]), with no discussion about the direct measurement of species (77 FR 21212-13; FSH 1909.12, ch. 20, sec. 23.13).

The 2012 rule introduces an important new category of at-risk species, called species of conservation concern (SCC). SCCs are defined as:

“...species, other than federally recognized threatened, endangered, proposed, or candidate species, that [are] known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species’ capability to persist over the long-term in the plan area” (36 CFR §219.9(c)).

Due to uncertainty surrounding the rule’s updated language, there is a high level of interest within the scientific community regarding the management of and planning for SCCs, as well as other at-risk species. According to the new rule, if coarse-filter approaches are deemed insufficient for the persistence of at-risk species, habitat management components that will contribute to the recovery of individual species (fine-filter approaches) must be added to the plan (36 CFR §219.9(b)(1)). However, if the plan is deemed sufficient, no further components or consideration is required. The rule commits to maintaining the viability of SCCs (36 CFR

§219.9(b)(1)(a)) but does not require the direct monitoring of these species (36 CFR §219.12) (which is a source of concern and confusion for some in the scientific community). There is also a separate requirement under the new planning rule to designate and directly monitor the status of focal species on each national forest to inform whether coarse-filter approaches are effectively maintaining ecological integrity (36 CFR §219.12(a)(5)(iii)). However, unlike SCCs, there is no requirement to maintain the viability of focal species, as they are only intended to serve as indicators of ecological integrity (36 CFR §219.19; FSH 1909.12, ch. 30, §32.13(c)). Potentially, although the rule does not address this issue, any SCC can also be designated as a focal species, and this is the only scenario where the agency would be required to both directly monitor an SCC's status as well as ensure its persistence.

Institutional Factors that Affect Policy Implementation and Planning

In order to discuss the innate complexity of environmental policy implementation, it is first necessary to provide background information from the public administration literature regarding the factors that influence policy implementation. The passage of policy is a considerable accomplishment; however, successful passage does not guarantee successful implementation. Any sampling of literature regarding environmental policy will reveal that implementation is greatly complicated by agency history, deadlines, bureaucratic processes, budgets, legal interpretations, trust, special interests, collaboration, and various other influences, and each of these influences can vary greatly by agency, region, goal, and stakeholder involvement (Biber 2009; Brunner and Steelman 2005; Daniels and Walker 2001; deLeon and deLeon 2002; Fiorino 2001; Gofen 2013; Lipsky 1980; Matland 1995; Sabatier et al. 1995; Stern et al. 2010). Lachapelle et al. (2003) identified five dominant barriers that can impede the

natural resource planning process (noting that no barrier occurs independently, without overlap), including: inadequate goal definition, procedural obligations and inflexibility (capacity for planning), trust, and institutional design (shown in Figure 2 below). This section focuses on these barriers, with insights from the broader literature, as they relate to the implementation of environmental policy.

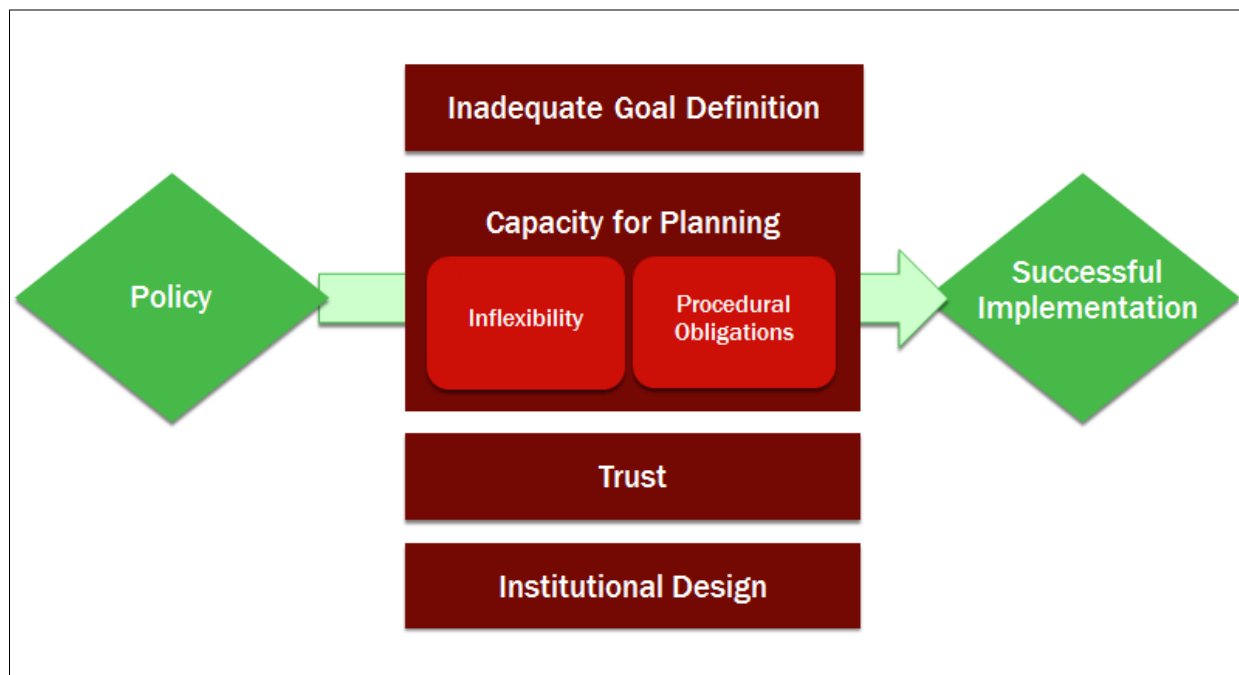


Figure 2: Potential Barriers to Natural Resource Planning

Goal Definition

To achieve effective policy implementation, laws must be relatively clear, understandable, and unambiguous, and objectives must be prioritized with an indication of how statutes are supposed to work together (Nie 2004). The language generally found in environmental policies is often ambiguous, leaving room for interpretation or discretion, which can complicate the planning process (Lachapelle et al. 2003; Wilkinson and Anderson 1978;

Wilkinson 1992). Some feel that increased discretion can serve as a strength by empowering the agency (i.e. the experts) to make informed decisions when necessary and appropriate for resource management (Bohte and Meier 2000; Lachapelle et al. 2003; Wilkinson and Anderson 1978; Wilkinson 1992). However, while increased ambiguity may serve as a strength in environmental policy by allowing “experts” to make site-specific decisions, it requires that implementors be fairly like-minded and have complimentary goals with the agency as a whole (deLeon and deLeon 2002). When implementors are in strong disagreement or are confused about the interpretation of policy into management decisions, discretion can lead to a form of gridlock, and implementation may be significantly delayed (Biber 2009; Stankey et al. 2003; Wilkinson and Anderson 1978). Conversely, there is concern that increased discretion serves as a weakness by allowing political actors at higher levels (e.g. Congress or the national offices of an agency) to pass tough decisions down the line and rely on agency personnel to translate abstract policies where they may be subsequently influenced by competing obligations (Bohte and Meier 2000; Nie 2004). A lack of top-down guidance and clarity can amplify the significance of discretion at the operational level and enable agency personnel to “act based on personal inclinations or external pressures and accountabilities” (Stern et al. 2010), defend their interests and seek their own science as part of their defense (Brunner and Steelman 2005), and focus on producing measurable short-term outcomes (Biber 2009; Stern et al. 2010).

Discretion in the case of wildlife policies is especially problematic. Scholars have noted that under a multiple-use mandate, if protective regulations are not specific, wildlife conservation planning will likely end up as a secondary objective by allowing space for varied implementation across management units and leeway for managers to pursue and prioritize other management goals (such as those that create revenue or have measurable accomplishments over short time

frames) (Biber 2009). This can leave managers who *are* committed to the protection of biodiversity without a solid legal framework to support wildlife management decisions that may be challenged by competing internal and external interests (Biber 2009; Schultz et al. 2013). Schultz et al. (2013) claim that the new planning rule requirements for wildlife leave increased room for discretion, which may provide valuable opportunities for site-specific interpretation. However, they also note that the lack of a clear policy direction during the planning process and the potential for variable field-level implementation may generate significant conflict, both among staff internally and with interested members of the public, regarding interpretation of the regulations.

Capacity for Planning

An agency's capacity for planning is tied to a variety of factors such as budgets, timelines, staff experience, procedural obligations, and overarching policies. Historically, forest planning has required much more time and resources than expected, and associated complications have highlighted the importance of many difficult and highly discretionary issues such as wilderness designation and at-risk species management and protection (Doremus 2001; Jones and Callaway 1995; Sample 1992; Wilkinson and Anderson 1987). For example, it is widely recognized in the literature that funding greatly impacts the Forest Service's ability to plan for natural resource management on national forests and maintain the intent and terms of those plans (Biber 2009; Stankey et al. 2003; Wilkinson and Anderson 1978). Agency budgets and Congressional appropriations play major roles in "determining the balance of program activities that will take place on national forests, facilitating – or frustrating – the implementation of [forest] plans" (Sample 1992). More generally, Congress can influence forest management

decisions and policy implementation through statutory obligations, setting the agency's budget through appropriations, attaching policy riders to funding bills, setting timber harvest targets, and even lobbying or pressuring personnel (Jones and Callaway 1995). Forest Service Chief Dale Robertson, at a joint oversight hearing before Congress, said, "Ultimately the rate at which we are able to implement each [forest] plan – and the relative emphasis given to each component of the plan – reflects national priorities and constraints that are resolved as...the Congress appropriates funds" (Jones and Callaway 1995; Robertson 1989). This hurdle can be particularly problematic for wildlife planning. In 2009, Biber reported that the Forest Service has an historical "reluctance to compile information about the impacts of its management practices on other goals, especially relating to wildlife;" referencing a 1991 GAO (Government Accountability Office) report that found "the BLM and [Forest Service] provided minimal funding for wildlife protection and regularly decided against more wildlife protection in their planning processes." They went on to say, "The lack of funding and prioritization had its greatest impact on the collection of information about wildlife resources on the public lands." An additional OTA (Office of Technology Assessment) report in 1992 declared that "the agencies regularly failed to fulfill planning commitments to monitor impacts of land-use decisions on wildlife." Ultimately, Congress, by failing to provide adequate funding, can serve as a primary obstacle to the Forest Service's implementation of policy, regardless of any other structure or support that may be in place.

Issues of capacity also come into play as agencies attempt to balance rigid timelines with the actual time required for planning. As reflected in the literature, many procedural requirements of natural resource policies are inherently time-consuming (e.g. the NEPA process), and some scholars note:

“The laws themselves are not necessarily the problem. The problem, many say, lies in the delays associated with their implementation, which are sometimes due to agency regulations but also stem from excessive environmental analyses by agency personnel who are anxious to cover themselves in the event of potential appeals and litigation” (Moote and Loucks 2003; Norris-York 1996).

In the wake of new policy, it is not unreasonable to assume that additional time may be required in order for an agency to effectively digest and interpret new planning language, to assemble planning teams with appropriate experience and expertise, establish realistic completion deadlines, and accommodate public comment windows, among other tasks. In order to successfully navigate updated approaches to planning, the agency needs time as well as updated support structures and institutional culture to support the significant changes to their planning framework (Stankey et al. 2003).

The planning process may also be influenced by various procedural obligations stemming from overarching policies, such as public participation requirements. In addition to complying with their multiple-use mandate, the Forest Service is required to solicit public comment during various stages of rulemaking and land use planning in accordance with the Administrative Procedures Act of 1946 and the National Environmental Policy Act of 1970. The 2012 planning rule further codifies the requirement and puts a greater emphasis on the use of collaboration (a.k.a. public participation) to inform the planning process (36 CFR. §219.4). There are three basic stages of public participation in natural resource management: notification (agency must notify the public that a decision process is beginning), scoping (identifying the public’s interests, goals, and concerns), and commenting on draft decisions (usually via public hearings or public comment letters) (Daniels and Walker 2001; Wilkinson and Anderson 1987). However, there is no mandate for the agency to do more than simply *consider* public input which can become an issue when the public fails to recognize their input in finished products (Daniels and Walker

2001). Although this is a valid concern, it is important to remember that with regards to environmental policy, it is very difficult to make science relevant to the general public in a meaningful way (Daniels and Walker 2001; Koontz and Thomas 2006; Schultz 2008) – in other words, if the public cannot fully understand the science, it is difficult for them to provide meaningful or even useful feedback for the agency. The true challenge is in finding ways to increase inclusivity of a decision process while increasing the quality and utility of technical expertise (Daniels and Walker 2001; Koontz and Thomas 2006). The existence of this paradox often results in a frustrated public that feels like the agency treats collaboration as a statutory hurdle rather than an effective policy tool. Although the literature strongly suggests a positive correlation between trust, collaboration, and policy implementation, other research suggests that it is difficult to show that collaborative efforts have any impact whatsoever on environmental outcomes (such as biological diversity or other measures of environmental quality) (Koontz and Thomas 2006). While public participation can produce valuable information for the agency, it also has the potential to influence implementation by negatively impacting timelines and budgets if the general public is confused about agency decisions or science, or if the agency is diligently working to increase collaboration beyond the minimum requirement (Daniels and Walker 2001).

Trust

As identified in the literature, trust can play a significant role in influencing policy implementation. There is no universally accepted scholarly definition of trust, which varies between disciplines and individuals; however, there is a fundamental agreement that trust is a “willingness to be vulnerable” and is a psychological state that experiences ebbs and flows over time (Rousseau et al. 1998; Stern and Coleman 2014). Rousseau et al. (1998) explain, “Trust is

not a behavior (i.e. cooperation) or a choice (i.e. taking a risk), but an underlying psychological condition that can cause or result from such actions.” Earning and maintaining trust for agency/governmental management of natural resources is difficult, and inadequate levels of trust can greatly impact policy implementation (Leahy and Anderson 2008, Rousseau et al. 1998; Smith et al. 2012; Stern and Coleman 2014). Smith et al. (2012) suggest that members of the public who exhibit greater levels of trust “generally do not become involved in resource management because they already trust that the agency is looking out for their welfare.” This highlights the importance of maintaining positive relationships between the agency and those who become involved in forest planning, as they will likely have below average levels of trust in the agency’s ability to successfully implement new policy. However, the importance of trust-building comes with a caveat as some scholars contend that, due to decreased levels of involvement from those with high levels of trust, “high levels of trust may ultimately reduce the effectiveness of the democratic process within resource planning and management frameworks” (Parkins 2010). Therefore, policy implementation must foster enough trust to legitimize agency planning goals and processes without overshadowing healthy skepticism from stakeholders that may serve to keep agencies accountable and aware of possible inefficiencies, errors, or oversights during the planning process.

Institutional Design

As identified by Lachapelle et al. (2003), institutional design (inspired by agency culture and the distribution of power) has a prominent influence on the implementation of environmental policy, and the Forest Service is no exception. Policy implementation within an agency is affected by both top-down guidance and the actions of “street-level bureaucrats” who are

influenced heavily by their local culture and partners (deLeon and deLeon 2002). Sabatier et al. (1995) explain, “planning decisions made by the U.S. Forest Service are a function of hierarchical controls, bureaucratic conservatism, the professional/policy orientation of agency officials, the strength of local constituency groups, and officials’ alleged desire to maximize budgets.” The Forest Service is highly decentralized (with staff spread between national headquarters, regional offices, forest supervisor offices, and ranger districts), and “this decentralized management approach is widely regarded as one of the keys to the agency’s success, effectiveness, and esprit-de-corps” (Sample 1992). Yet, there are many challenges associated with decentralization, one of which can be the suite of conflicting mandates, influences, and approaches at multiple levels within the organization. In cases where an agency is highly decentralized, local influences and political pressures can be highly influential – and lead to mixed results – when they are not countered by a clear mandate and a strong sense of agency mission and purpose (deLeon and deLeon 2002).

There are also mixed reviews in the literature regarding the benefits of increased agency discretion (as it relates to natural resource management) because of the fundamental tension that exists between accountability and flexibility in public policy (Wilkinson 1992; Hoberg 2004; Sousa and Klyza 2007; Biber 2009). Sousa and Klyza (2007) suggest that as the pendulum swings toward more flexibility, accountability is necessarily compromised, and argue that the “green state” or suite of environmental laws passed in the 1970s focus heavily on increasing agency accountability and limiting the political influence of interest groups, which at the time were believed to have unduly influenced agency activities. In response, the 1990s saw an increased emphasis on collaborative conservation as a way to overcome the bureaucratic gridlock that had come to dominate natural resource policy (Wondolleck and Yaffee 2000).

While the pairing of increased discretion and collaboration can lead to innovative solutions and ideas when laws or regulations have been highly constraining, any savvy political observer would be concerned when an agency gives itself increased flexibility (or discretion), as it has in the case of the new wildlife planning requirements. This is especially true when observing a decentralized system with limited top-down control, because increased agency discretion does not simply increase the ability of decision-makers to respond to changing conditions and local needs; it also leads to decreased accountability and unleashes the power of hidden incentives that affect all bureaucracies (Sousa and Klyza 2007; Biber 2009).

Summary and Research Objectives

In summary, considering the implications of the new requirements for wildlife conservation planning on national forests, this study utilized the opportunity provided by early adopter forests to ascertain how the agency is interpreting and implementing the language of the new rule as it relates to wildlife planning, specifically with regard to species of conservation concern (SCC). As discussed, policy implementation is greatly complicated and influenced by a variety of factors including (but not limited to) formal guidance, capacity, bureaucratic processes, discretion, trust, collaboration, and institutional design. This study investigated how these factors influenced the implementation and interpretation of wildlife planning requirements during the early stages of plan revision on early adopter forests. This study was also designed to contribute to the applied literature on wildlife conservation planning on national forests.

The first objective of my study was to: a) understand the process that the Forest Service is using to select SCCs and, b) identify how the agency is planning for their protection. The purpose here was to describe the actual species selection process and understand how species

planning decisions are being informed by the prevailing science as well as through discretionary interpretations of the policy. The second objective of my study was to identify the internal and external perceptions of the emerging opportunities and impediments of the new rule, specifically for wildlife planning. Lastly, my third objective was to understand the general administrative challenges associated with implementation of the new planning rule to determine how, and to what extent, the factors that influence policy implementation also influence the agency's planning for wildlife.

Early adopter forests can provide valuable insight into important early-stage, procedural determinations for wildlife planning on national forests. Therefore, they can serve as a source of 'lessons learned' for subsequent forest revisions, and these lessons can potentially help to alleviate some of the innate tensions that exist during policy implementation and planning. Through interviews with agency personnel as well as external environmental partners, the intent of this study, more generally, was to highlight various perceived challenges and opportunities for wildlife planning under the new rule as they relate to the selection of SCCs, the development of plan components, capacity for planning, trust and transparency, and the effects of an expedited planning process.

METHODS

This study focused on the early adopter forests in the Sierra Nevada Bioregion of California: the Sierra National Forest, the Sequoia National Forest, and the Inyo National Forest. These forests are in Region 5, the Pacific Southwest Region of the National Forest System (see Figure 3). I chose to focus on the early adopter forests in this region because it enabled me to look at variation across forests in a single region, while also considering the relevant regional and national guidance. Additionally, these three forests consist of nearly 4.5 million acres, roughly 40% of the 11.5 million acres of land under the Sierra Nevada Forest Plan, and contain numerous sensitive and imperiled species that rely on the sustained health of their ecosystem.



Figure 3: Region 5 Early Adopter Forests (USFS 2012)

Methods were nested in a pragmatic worldview, designed to investigate a topic of practical value to practitioners (Creswell 2008). I conducted a mixed methods study involving interviews and a review of agency documentation available online to the public. Using an

interview guide with a set of predetermined questions, I conducted semi-structured interviews (see Appendix A for interview guides). This format enabled me to explore topics as they arose while also providing interviewees with the flexibility to emphasize personal areas of perceived importance or expertise (Charmaz 1991). I created similar, but tailored, sets of questions for three categories of interviewees: regional and forest level agency personnel, and external environmental partners. To answer my research questions, I developed three categories of questions: 1) Questions regarding the process of species selection and sources of information or guidance that the agency is using to navigate the SCC requirement, 2) Questions regarding whether change is occurring and what is driving this change, and 3) Questions regarding the internal and external perceptions about the opportunities and impediments associated with implementing the new rule.

Interviews were confidential and recorded, although one interviewee declined to be recorded. A total of 18 individuals were interviewed between May and August, 2014. Initially, I contacted individuals directly involved in forest planning in Region 5, including both Forest Service personnel and external stakeholders; this is known as purposive sampling – whereby interviewees are identified based on their expertise and professional positions (Singleton and Straits 2009). I then used snowball sampling, which relies on referrals from the original list of participants, to identify additional interviewees (Singleton and Straits 2009). I transcribed all recorded interviews, which I then analyzed using a coding methodology. This was based on a modified grounded theory approach where I followed an iterative process of open coding to identify and label recurrent themes in my transcriptions (Creswell 2008; Strauss and Corbin 1990). My initial codes were closely linked to broad research questions, and additional codes were created during my data analysis process to inductively identify key themes and findings

across interviews (see Appendix B for additional coding detail). I summarized key findings and highlighted important quotations according to the major themes identified in interviews.

Limitations of Study

This study drew upon information obtained during 18 semi-structured interviews with USFS personnel as well as external environmental partners. To determine my list of interviewees, I identified all staff in Region 5 who were directly involved in forest plan revision of the three early adopter forests in the Sierra Nevada Bioregion of California. During my research, Region 5 was moderately understaffed and a few key positions were vacant, contributing to a low number of available sample units; however, every key person in this region who was directly involved with forest plan revision and SCC identification and planning decisions was interviewed for this study. Additionally, all external partners who were directly involved with plan revision (in a consulting capacity) were also interviewed, bringing the total number of interviewees to 18. Due to the relatively low number of USFS staff interviewees, and their requests for confidentiality, individual or descriptive position titles were intentionally omitted from this thesis. Instead, titles such as “agency planner,” “agency biologist,” or “external partner” were used.

RESULTS

Identifying, Selecting, and Planning for Species of Conservation Concern

To direct implementation of planning requirements and help articulate agency goals, the Forest Service is required to develop a national Land Management Planning Handbook, known as “directives” (77 FR 21178). Directives provide a detailed interpretation of regulatory language and are intended to guide forests as they create or revise their plans. In February of 2013, the agency released a proposed handbook (FSH 1909.12), referred to as “draft directives,” outlining how the agency should implement various aspects of the 2012 planning rule, including the selection of SCCs. In January of 2015, final directives were released. The information herein provides an overview of the associated SCC selection requirements in the final directives, as well as Region 5’s interpretation of the language. At the time of this study’s interviews, the directives were only available in draft form.

The final directives explain that in order to be considered an SCC, a species must be native and established, or becoming established, in the plan area (FSH 1909.12, ch.10, sec. 12.52(c)(1)) and that best available science must also indicate that there is “substantial concern about the species’ capability to persist over the long-term in the plan area” (FSH 1909.12, ch.10, sec. 12.52(c)(2)). Sources of best available science can include scientific literature, species studies, habitat studies, analysis of local information, or can be the result of an expert opinion or a panel’s consensus (FSH 1909.12, ch.10, sec. 12.53). A species may not be labeled as an SCC if their status is considered to be secure and their long-term persistence is not at risk, if there is insufficient science to conclude that there is a substantial concern about their ability to persist, if their occurrence is thought to be “accidental,” or if they are well outside of their current range

(“transient”) ((FSH 1909.12, ch.10, sec. 12.52(c)(2)). The rationale for designating a species, or for demoting a species from SCC consideration, must be well documented (FSH 1909.12, ch.10, sec. 12.52(b)(3-4)).

During the selection process, adherence to NatureServe species rankings (Table 2) is required (FSH 1909.12, ch. 10, sec. 12.52(d)). NatureServe, a nonprofit conservation organization, endeavors to “provide a scientific basis for effective conservation action” through the accumulation of information about rare and endangered species from federal and state natural heritage and conservation data centers (NatureServe 2014). Originally the brainchild of The Nature Conservancy, in coordination with various federal and state agencies, NatureServe was formally established in 1994 to serve as a non-profit database of information collected from state natural heritage programs. Its purpose is to assist in the protection of species by making scientific information more widely accessible (NatureServe 2014). According to a 2003 memorandum of understanding between the agency and NatureServe, the Forest Service considers NatureServe to be “the leading source for detailed information on the nation’s rare and endangered species and ecosystems.”

<i>Table 2: NatureServe Species Rankings</i>		
G (Global)	G1 Critically Imperiled	Very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
	G2 Imperiled	High risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
	G3 Vulnerable	Moderate risk of extinction or elimination due to fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

T (Intraspecific Taxon)	T#	Refers to plant or animal subspecies, varieties, and other designations below the species level. The “T-rank” follows the species’ global rank and cannot imply that the subspecies is more abundant than the species. (e.g. G5T1 is acceptable; G1T2 is not)
S (State/Province: Subnational)	S1 Critically Imperiled	Very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
	S2 Imperiled	High risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

The directives outline separate selection criteria for species that *must* be considered for SCC lists and species that *should* be considered for SCC lists (Table 3) (FSH 1909.12, ch.10, sec. 12.52(d)). Very generally, species that *must* be considered are at high or very high risk of global extinction or elimination, and species that *should* be considered are at moderate risk of extinction or elimination globally and high to very high risk of elimination at the subnational level (Table 2). However, for those species that *must* be considered, if it is demonstrated and documented that known threats are not present or relevant in the plan area, the species does not actually have to be considered (FSH 1909.12, ch. 10, sec. 12.52(d)(2)(a)). Species that are already listed as endangered or threatened under the Endangered Species Act of 1973 will not be included as SCCs, as the planning rule has separate requirements for these species. The iterative process of species selection for potential SCC lists is reflected in Diagram 1.

Table 3: SCC Consideration Requirements

Species that *must* be considered for SCC lists:

- NatureServe status rank of **G/T1-2***
**unless it is demonstrated and documented that known threats are not currently present or relevant in the plan area*
- Species that were Federally delisted (i.e. no longer listed under the Endangered Species Act) within the last 5 years
- Any delisted species for which agency monitoring is considered necessary

Species that *should* be considered for SCC lists:

- NatureServe status rank of **G/T3 or S1-2**
- State or tribally listed Threatened or Endangered species
- Species listed on other Federal, State, Tribal, etc., lists as a high priority for conservation
- Species identified as SCCs on adjoining National Forest System plan areas
- Species petitioned for Federal listing that have received a positive “90 day finding”
- Best available science indicates that there is local concern regarding the species’ capability to persist, long-term, in the plan area due to:
 - Declining trends in population or habitat
 - Restricted ranges
 - Low population numbers or ecological conditions (habitat)

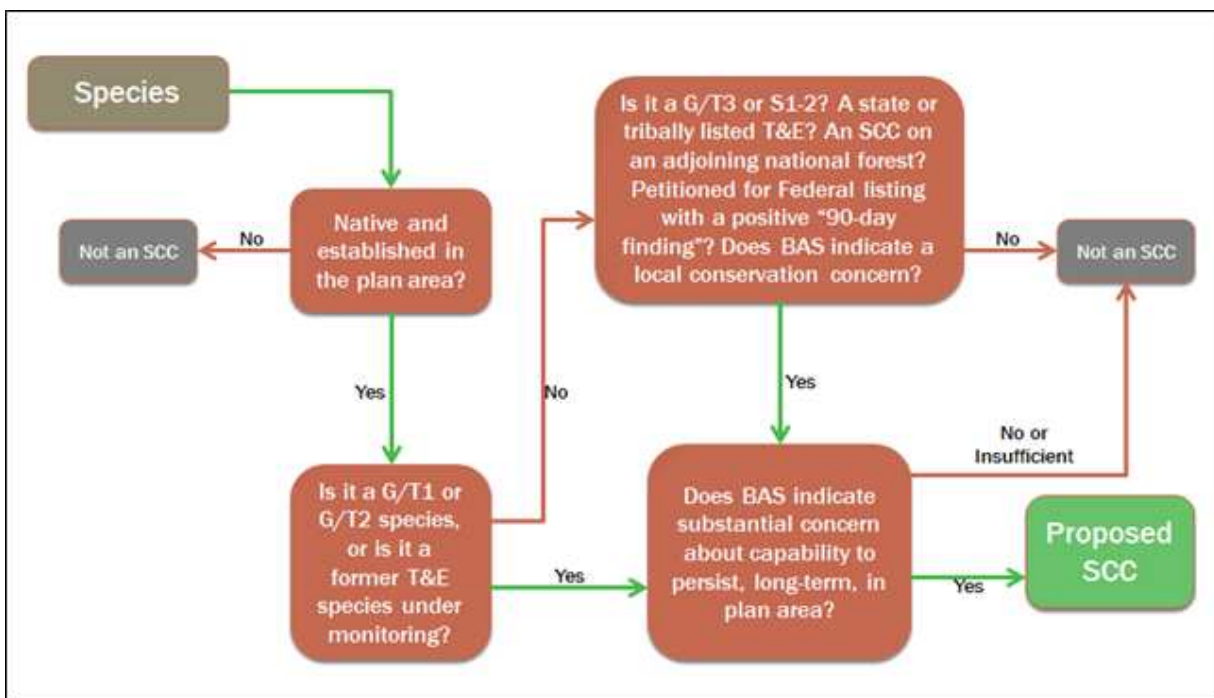


Figure 4: Iterative Process of SCC Selection

Region 5 is unique compared to other regions in that they have multiple early adopter forests. Therefore, they decided to take a regional approach to planning and species selection, creating two primary teams – the “core” and “extended” teams – to guide forest plan revision. The core team includes regional office planning staff that specializes in ecosystem planning, recreation, fire, hydrology, and public affairs. The extended team includes forest-level staff and biologists and serves as an advisory resource to the core team for specific questions regarding individual species and habitats on those national forests.

The region first developed a Bio-Regional Assessment, intended to inform and guide individual forest assessments in the Sierra Nevada region (USDA Bio-Regional Assessment 2013). This assessment did not identify SCCs nor did it define the process of selecting SCCs – its only purpose was to consolidate information generated through My Forest Place and the Living Assessment (virtual planning venues for Region 5 collaboration and information sharing), and was supported by a Science Synthesis (sponsored and created by the Pacific Southwest Research Station and in draft form at the time of the assessment). Using the Bio-Regional Assessment as a template, the three California early adopter forests created their own individual forest assessments in which they identified potential at-risk species. Combined, a preliminary total of 256 SCCs were reported in the three forest assessments, including: 39 birds and mammals; 167 plants; 27 fish, amphibians, and reptiles; and 13 invertebrates. The Forest Service noted that these lists were preliminary and could be refined at any point during plan revision. To create the preliminary lists and streamline the selection process, the core team ran a query in the NatureServe database (using parameters outlined in the draft directives) at multiple spatial scales in order to create a robust list. They also ensured that sensitive species identified by sister and state agencies (e.g. the California Department of Fish & Wildlife) were considered.

Interviewees emphasized that this step was used as an additional and voluntary precaution in Region 5 to reduce the chance that a species was overlooked or unaccounted for in NatureServe. According to interviewees, subsequent steps will include further evaluation of proposed species to create final SCC lists as well as the development of plan components for each SCC with the intention of providing appropriate ecological conditions (habitat) for all identified at-risk species. According to interviewees, once each forest plan is finalized and implemented, those plan components are expected to ensure the persistence of each SCC. However, according to interviewees, the Forest Service expects these next steps to be more complex, challenging, and controversial compared to the fairly straightforward and iterative process of species identification.

Planning for Species Under the 2012 Planning Rule: Perceived Strengths and Weaknesses

Addressing Ecosystem Integrity and Species Viability

During interviews, agency staff articulated that the species selection process outlined in the draft directives follows the intent of the NFMA, which, staff noted, is meant to “protect species from potentially harmful management activity.” Staff believed that revised forest plans will better protect species through the development of updated plan components including the assessment of land suitability, a description of desired ecological conditions, management objectives, and standards and guidelines. Regional staff acknowledged that this is a predominately coarse-filter approach to wildlife management. However, their assumption is if they manage for a broad-spectrum of ecosystems, then the majority of species and their associated viability needs will be satisfied. A number of staff members articulated that the

agency, very broadly, is primarily mandated to manage habitats and resources for multiple-use. Given this mandate, and considering the relationship of sensitive species to ecosystem integrity and diversity, one interviewee explained, the most important thing the agency can do “is create sustainable, quality, ecosystems that have habitat [components] that can help to sustain viable populations.” A perception among staff was that the increased focus on ecological integrity, coupled with species-specific plan components “where needed,” would result in a stronger framework for protecting biodiversity than the previous rule – which had little emphasis on coarse-filter approaches for maintaining broad ecological integrity and diversity and relied, instead, on assessing and maintaining habitat for individual at-risk species.

Agency planners also reported that they find strength in the new approach to planning because they feel that it provides a window to discuss habitats that are often overlooked or less favored. For example, due to the historical interest in timber, stakeholder concern, and litigation, Region 5 generally focused very heavily on old growth forest and its associated species. One agency interviewee expressed that while these forest types are very important, they are equally as important, for example, as early- and mid-seral forests. According to interviewees, adequate desired conditions were not written into previous forest plans for ecological types such as those – many of which are critically important habitats for bird and mammal species. Agency staff noted that the rule’s new direction now also affords them the opportunity to effectively discuss options for the management of shrub- and field-dependent species in addition to forest-dependent species.

External environmental partners expressed their appreciation for what they view as a paradigm shift in how the agency is approaching the management of sensitive species within the context of ecological systems. One person explained,

“Species were typically an afterthought and something to mitigate for. Generally, [the agency] responded to [management questions such as] ‘is our management going to trigger a viability call and what can we do about it?’ Now, the focus is on the likelihood of a species’ persistence in the plan area and what can be done to contribute to its recovery and expand its probability of viability. [Management] is moving toward an affirmative paradigm for wildlife conservation as opposed to [it remaining] just a subject of mitigation.”

However, external partners also expressed concern over the lack of discussion and transparency regarding SCC viability requirements and decisions that are being used to inform the next stages of planning. They also worried that a predominately coarse-filter approach to planning may result in an unacceptable loss of population numbers even though the species, overall, may still be considered viable or persistent by definition. For example, one participant said, “this may mean that you can lose an owl in over half of its range and it [could still be considered] ‘viable’ and persist.” To avoid losing sight of biological significance, external stakeholders hope for the incorporation of multiple species-specific (fine-filter) plan components to ensure the conservation of sensitive species over a wide range.

NatureServe’s Utility

During interviews, agency staff expressed their appreciation for a nation-wide database from which they can source information about potential species of concern; however, they also acknowledged various inherent weaknesses of the database. Agency staff explained that NatureServe itself does not generate any new information; it only serves as a database to consolidate and house existing scientific information. Therefore, the accuracy of the database is directly tied to the quality of information received from contributing sources. Interviewees explained that if a state has not received sufficient funding to maintain their database, species’

rankings may be erroneous in NatureServe – i.e. a species that is not truly very rare may be classified as such, simply because the information gathered by a state heritage program indicating otherwise had not been entered due to lack of staff or funding. Staff expressed that this issue can be further compounded by the fact that research focused on new species, speciation issues, or naming new species is in sharp decline. They acknowledged that the technology now exists to improve understanding of species relationships (through improved sampling methods, genetic testing, speciation discoveries, etc.), but few scientists and researchers are conducting the level of research required to verify and update the thousands of species in NatureServe. For example, species that were once defined as morphometrically different, and are currently described as so in scientific databases, may not necessarily be different and vice versa. To illustrate this point, a staff member used a scenario involving the Slender Salamander (*Batrachoseps spp.*), which was ranked as a G3 species (*should* be considered) in NatureServe and whose populations were believed to be morphometrically the same. However, a recent genetic study, discovered by an agency staff member, demonstrated that the salamander population was, in fact, five separate species. Their status was updated to a G1/2 (a *must* consider species) and they were placed on the preliminary SCC list due to their survival risk as well as their reliance on local water resources.

Interviewees also expressed that while NatureServe can be an effective tool for identifying and ranking species sensitivity, it may fail to provide the detail needed to inform subsequent planning and the development of components for a species' protection. To demonstrate, one person gave the following theoretical example: agency biologists may know that a butterfly species is associated with sagebrush; however, they may not know its pollinator plant, how much sagebrush it needs, where it lays its young, etc. They expressed that it may be

hard to declare, scientifically, that the agency can provide sufficient protection for this species given the lack of information and the fact that the agency does not have the capacity, the time, or the mandate to conduct supportive species studies.

The Challenge of Developing Plan Components

The new rule requires the responsible official to ensure that plan components, whether broad or species-specific, “provide the ecological conditions necessary to...maintain a viable population of each species of conservation concern within the plan area” (CFR §219.9(a)(2)(b)). According to agency biologists, the use of plan components may be an advantage of the new rule because the question of species viability can now be addressed at the plan level rather than at the project level. In other words, one interviewee explained that the agency is now “front loading” forest plans. The hope, expressed by regional staff, is that this new way of addressing at-risk species concern will promote better biological decisions up front while liberating limited time and management resources on individual forests. Forests can then use those resources to focus on additional site-specific, species-level, details beyond plan-level components, as needed and required. One planner stated that “our goal is to create and maintain sustainable ecosystems that have integrity” so there is more room to adaptively adjust to changing conditions where it is most needed.

Agency staff seemed mostly confident in their ability to create the necessary plan components; however, some expressed concern over developing plan components for species that do not have unique habitat types. Using one person’s example of aquatic insects, it may be fairly straightforward to establish components to protect “lake” or “pond” conditions in a plan area for at-risk aquatic species. However, the task becomes more difficult for widespread and

far-ranging species whose requirements may be spread out and diverse. One staff member stated, “Depending on the nature of the species, and how widespread they are, you may not be able to have a 1-to-1 relationship [between the species and the component].” An additional challenge expressed by staff is closely tied to the butterfly example above; the agency may know that the development of components is necessary to protect an at-risk species, but they may not have enough information to make a scientifically defensible decision about specific components that are needed to ensure its persistence.

For external partners, the late timing of species listing decisions in relation to the creation of plan components was worrisome. They expressed confusion over the agency’s order of decisionmaking regarding species (e.g. the decision to generate and publish a Notice of Intent with a detailed Proposed Action and draft plan components before final SCC decisions were made). They felt that proceeding with the creation of plan components before the species list was finalized, and before an ecosystem conservation strategy was determined, creates a “moving target,” making it “nearly impossible for [them] to comment on the proposed action,” in a meaningful way and in a reasonable time-frame. They also lack confidence that the agency will have enough time, itself, to give meaningful consideration to external comments if the draft plan is initiated and possibly released as final before the SCC list is finalized. Stakeholders from the environmental community feel that logistically, the development of desired conditions and plan components for wildlife should be among the first steps of planning, stating: “Species should be at the forefront instead of a second or third consideration in planning. While the plan and the handbook may be trying to transition to a more affirmative way of [planning for species] on Forest Service lands, [we] are not seeing that in practice, yet.” As clarified in comments released by Defenders of Wildlife, “Standards and guidelines are developed for individual species

determined to be a viability risk under the coarse-filter ecosystem approach. It is not possible to develop species-level plan components until all potential SCCs have been identified and screened through ecosystem plan components.”

Other Challenges Associated with Interpreting and Implementing the New Rule

Low Level of Formal Direction for Early Adopter Forests

The most common challenge expressed by agency staff was regarding the low level of direction available for early adopter forests as they began the revision process. Nearly all staff members believed that the entire planning process should have been more structured and were confused about why the directives had not been finalized prior to any plan revision. Although staff believed that the lack of direction greatly complicated the early stages of revision, most did not believe that it would ultimately compromise the rest of the process. Most staff expressed that many valuable lessons were learned along the way; however, neither staff nor external interviewees were confident that the early adopters would be able to serve as proper “role models” for future revisions given the uncertainty surrounding planning decisions through most of the early revision period. For example, regarding wildlife planning decisions, one participant expressed frustration that major concepts (e.g. “coarse-filter” and “fine-filter”) “were not properly fleshed out in the early stages of revision” and, as a result, most participants were not yet versed enough in the new rule or its intent to effectively think about *how* to use the tools to achieve conservation objectives as they contributed to the planning framework.

Staff members also stated that the overall lack of direction complicated the agency’s ability to facilitate a high level of transparency, and therefore trust, with external stakeholders.

This concern was validated by interviews with environmental partners who expressed that they were very unclear about the processes being used to guide SCC decisions aside from the iterative process outlined in the draft directives. One person stated, “the public does not have any clue what method is being adhered to, if any...The forests [we have] spoken with are not in a position to put forward a real structured portrayal of the methods that they are following. [We] don’t get the impression that they have a real structured process in place.” In response to this belief, in an effort to help “jump start” the agency’s process, an external partner reported that they provided Region 5 with a step-by-step guide that could be used to inform the agency’s species-selection and component decisions, including: diversity evaluations that spoke to ecological integrity; diversity and ecological conditions for at-risk species; and a template to help organize species-specific details including habitats needed, necessary ecological conditions, spatial scales, habitat connectivity, current conditions and trends in the plan area, stressors, and threats. External interviewees were unsure if the agency already had any such template or decision-making outline in place prior to receipt of their document, and they had no indication that the agency would utilize their suggestions.

Expedited Plan Revision and Capacity for Planning

As reiterated by various Forest Service staff, the Chief’s broad planning goal is to facilitate the development of quicker, cheaper, less process-onerous forest plans of higher quality, clarity, and transparency. According to staff, the creation of forest plans took too long under the 1982 planning rule (often requiring 6-8 years for completion) and during these long windows, they struggled to keep the public engaged, often experienced analysis paralysis, and the expense of creating or updating each forest plan became too expensive. Therefore, the

language of the Forest Service’s 2012 planning rule implies that all forests, including early adopters, are expected to follow an expedited timeline for plan revision. All staff members believed that this is a reasonable goal; however, most did not believe that an expedited process was a realistic expectation of the early adopter forests (see Figure 5 for Region 5’s planning timeline). One interviewee stated, “The problem with this process is that we are under a very tight deadline” and expressed concern regarding the resulting quality of the final product given the large learning curve following promulgation of the new rule. They appreciated the minor time extension that was granted following the assessment phase but were nervous about the timing of the release of final directives in relation to the relatively unforgiving planning deadline. External partners shared this concern, one of which stated:

“the manic pace [of revision] is causing both the staff and the product to suffer...To be honest, [agency staff] seem completely overwhelmed. Not just about species selection, but everything. And the manic pace in which they are trying to get their work done...it seems like they are behind much more than we had anticipated.”

Both internal and external interviewees believed that the assessment process, specifically, took too long within the context of the agency’s timeline, and that this mainly complicated the agency’s ability to meet the revision deadline. Yet, most also felt that the time used by early adopter forests was necessary because they were the first to translate the rule’s language into practice (although some further expressed that the assessment and need-to-change products were not of sufficient quality considering the amount of time used). Most interviewees felt that their time could have been better allocated toward more informative tasks such as the development of desired conditions and species monitoring strategies if formal guidance had been available.

Many interviewees mentioned that reduced capacity, stemming from staffing changes and large gaps in leadership, contributed to the challenge of plan revision in Region 5. Staff felt that overlapping roles and responsibilities were poorly defined due to vacant staff positions, which exacerbated their feelings of an unclear direction for the three simultaneous revisions in the region. Although they expressed that the process of revision may have suffered due to a lowered capacity for planning, staff also felt that using a regional approach to planning greatly helped to alleviate some of the symptoms and it better enabled them to share the burden at various levels and stages of the process. Additionally, many echoed one interviewee's opinion that the agency is "dealing with some of the most complex management that I think any natural resource agency has to deal with." Going forward, staff stressed the importance of "developing a plan for plan revision" so the work is staggered properly, as well as ensuring that the people who develop the plan for revision have sufficient planning experience. As expressed by one staff member, "a lot of folks who are involved with the planning process don't know much about large-scale planning. They just haven't had the experience."

Although staff openly discussed these weaknesses, they also expressed that they viewed the process as a valuable source of lessons learned for future revisions and acknowledged that this was a first attempt at post-rule revision. They believed that subsequent forest plan revisions would not take nearly as long to complete due to the efforts of early adopter forests and their willingness to be transparent and open about the process.

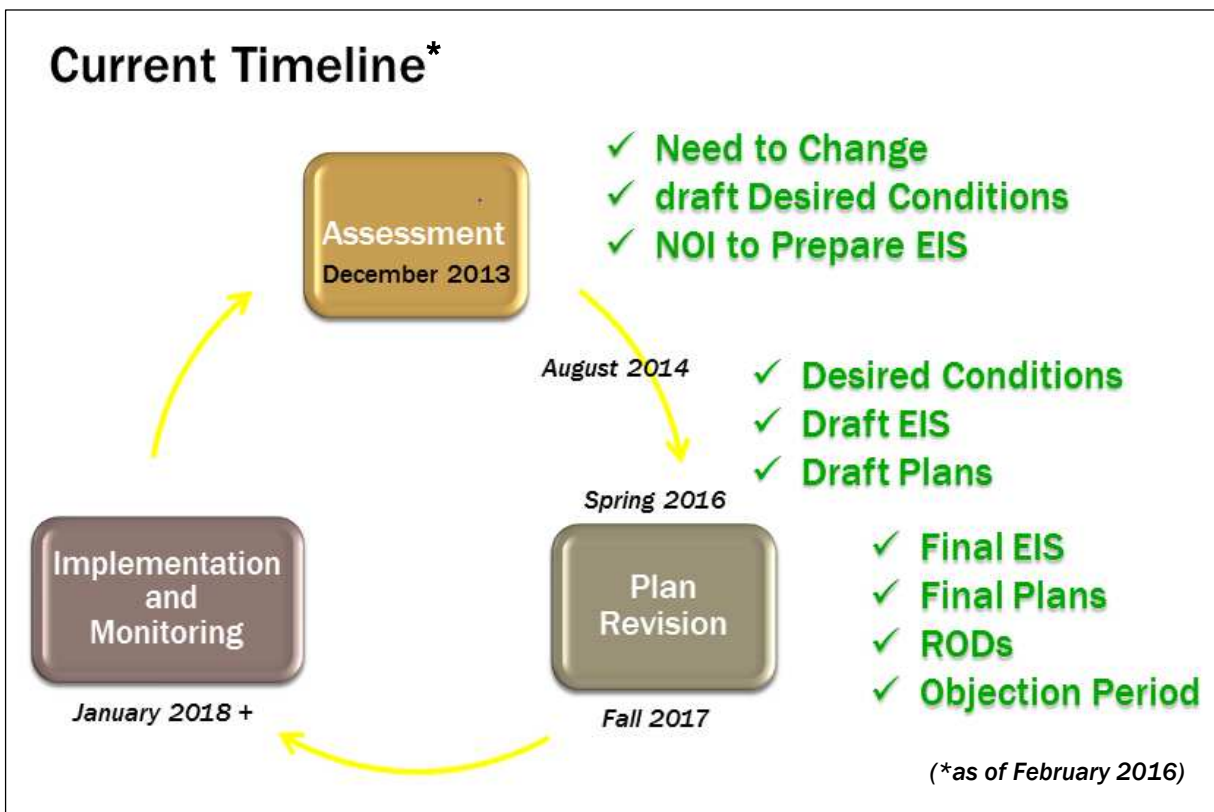
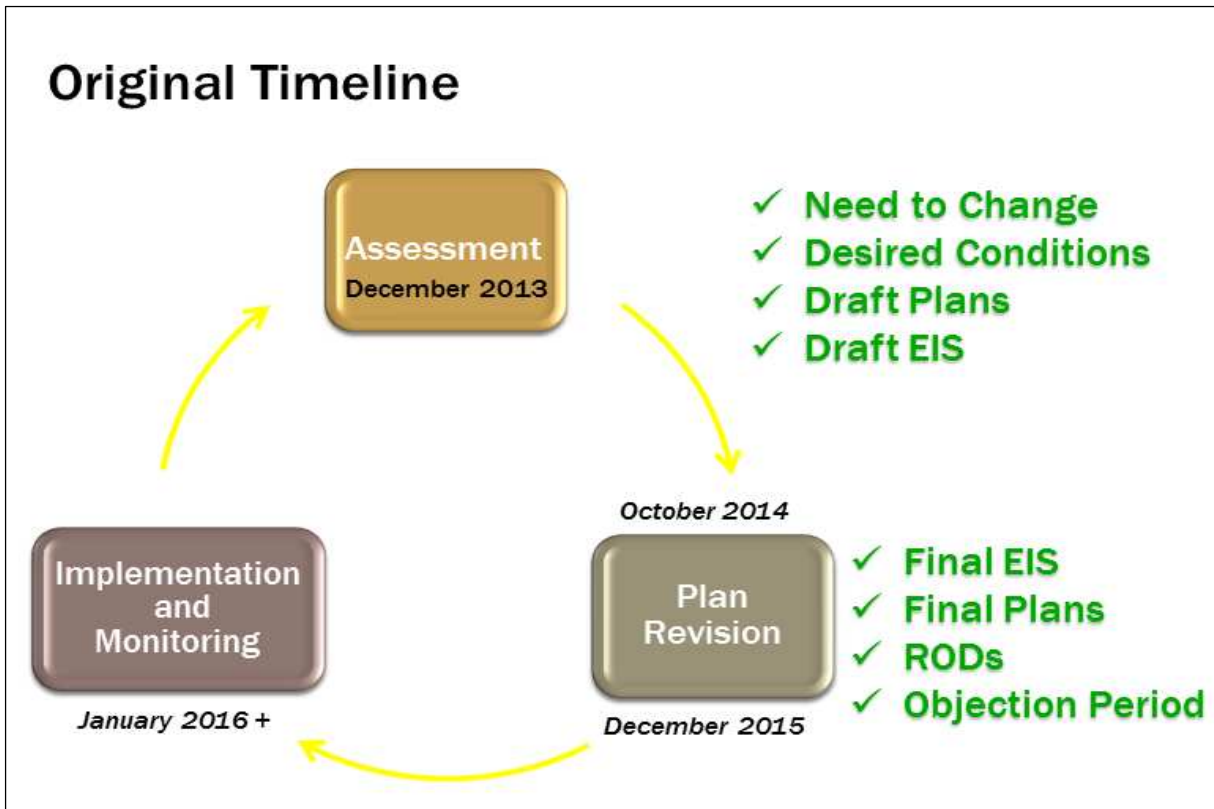


Figure 5: Original and Revised Planning Timeline for R5 Early Adopter Forests

DISCUSSION

This research offers insight into important early-stage procedural determinations for wildlife planning on national forests and demonstrates the continued challenge of policy implementation in land management planning. As stated by Schultz et al. (2013), and echoed in interviews with agency staff and external environmental partners, “the new planning rule has the potential to be a highly effective framework for wildlife conservation on national forests.” This study examines the process by which Region 5’s early adopter forests are selecting SCCs and planning for their protection through the lens of policy implementation. Understanding how the agency is interpreting the rule’s language regarding species selection and planning can provide important insights into whether the agency will be able to make effective wildlife planning decisions and whether these decisions are consistent with the intent of the 2012 planning rule. This research also shows that the traditional challenges of policy implementation (goal definition, capacity for planning, trust, and institutional design) as identified by Lachapelle et al. (2003) remain a continued source of impediments to wildlife planning despite the rule’s updated language. For instance, during the early stages of forest plan revision on early adopter forests, interviews revealed that the lack of sufficient formal direction, a lowered capacity for planning, an expedited timeline, and a perceived lack of transparency exacerbated the challenges of efficient policy implementation. Through interviews with agency personnel as well as external environmental partners, this study shows that these aforementioned factors played the largest roles in influencing the implementation and interpretation of wildlife planning requirements during the early stages of plan revision on early adopter forests.

Perspectives on the Wildlife Conservation Strategy Employed Under the New Rule

Over the last several decades, numerous articles and books have focused on how the Forest Service conducts and implements wildlife conservation planning and management as part of their biodiversity conservation strategy (Biber 2009; Hoberg 2004; Noon et al. 2003; Schultz et al. 2013; Wilkinson and Anderson 1987). Scholars have asserted that the protection of both federally listed and non-listed wildlife species on national forests is a critical aspect of this strategy and have expressed concern that changes to the regulatory language may leave room for insufficient species protection (Schultz et al. 2013). For example, the 2012 planning rule does not include language from the 1982 planning rule that requires the agency to maintain the viability of *all vertebrate species*; instead, the new rule suggests a combination of coarse- and fine-filter methods to maintain ecological integrity, focusing very heavily on the use of ecological conditions (i.e. habitat) to provide information about the status of at-risk species. Interviewees confirmed that a habitat-based approach and a focus on ecosystem integrity form the core of their wildlife conservation strategy under the new rule. Yet, the use of habitat as a proxy for species viability or persistence is still not a well-founded approach according to the scientific literature, which is why experts recommend the direct monitoring of species (Cushman et al. 2010; Noon et al. 2012). As articulated by Cushman et al. (2008) following a study on birds in Oregon:

“Measured habitat was a weak proxy for species abundance and vegetation cover type was a weak proxy for habitat...a single, generalized characterization of habitat is unlikely to provide a reliable basis for multi-species conservation efforts...[and] evaluation of landscape pattern is unlikely to be an effective replacement for the direct monitoring of species population size and distribution.”

While concern exists regarding the selection and management of SCCs, until plans are finalized, management projects are implemented, and monitoring occurs, the true effectiveness

of managing more generally for SCCs and biodiversity, primarily through the development of habitat-based plan components, will remain unknown. In the long run, because SCC monitoring is not required, it is unclear how anyone will know whether plan components for these species are adequate. In the interim, external interests remain vigilant about the inclusion of species-specific plan components (i.e. habitat protection requirements) for at-risk species in final forest plans.

Another major challenge in the early stages of plan revision stemmed from uncertainty surrounding the intent of the rule as it relates to the persistence, or viability, of SCCs. At the time of this study (nearly two years after Region 5 began the process of plan revision), and although preliminary SCC lists and draft plan components had been created, there was little focus on SCC viability or the plan components needed to ensure their persistence – both major facets of the new planning rule. As mentioned earlier, this was a concern to stakeholders who felt that a thorough ecological conservation strategy should use SCC viability requirements to inform every stage of planning rather than fitting them in as an afterthought. Failure to establish viability requirements for SCCs before the drafting of plan components presumably diminishes what staff reported as a strength of the new planning process – the ability to “front load” forest plans by directly incorporating species viability concerns into plan components.³ To take better advantage of this strength, linking species viability requirements to plan components during draft stages of planning would ensure their consideration throughout the entire planning process as well as provide stakeholders with the opportunity to comment on the approach.

According to the new rule and the final directives, SCCs and focal species (another category of species in the 2012 rule) are to compliment each other as part of the biodiversity

³ As discussed on pages 34-35.

conservation strategy – yet there is confusion about *how* this will happen in practice as SCC viability must be maintained with no requirement for direct monitoring, and focal species must be monitored with no requirement to maintain their viability.⁴ Naturally, this begs the questions: If a focal species (intended to serve as an indicator of overall ecological integrity) is in decline, what will be the resulting course of action if there is no mandate to maintain their persistence? And how will this impact the ability to estimate SCC viability, particularly if it hinges on ecological integrity? Additionally, at the time of this study, staff and external partners reported a near-absence of discussion about the identification or role of focal species for the Region 5 forests. It is important to note that focal species do not have to be formally identified until monitoring plans are developed in the draft forest plan; however, given their purpose as indicators of ecological conditions, and their centrality in the conservation biology literature as the essential fine-filter component of biodiversity conservation planning, it is worrisome that as of two years into the planning process, the region had not yet considered or communicated their strategy for identifying this important category of species. As it relates to wildlife, determining the success of policy implementation may need to be tied to how well forest plans and projects are maintaining species viability and ecological conditions. Monitoring is a crucial assessment tool for making these determinations, and a “lack of monitoring data [can be] a critical limitation in understanding cumulative impacts to species” (Schultz 2012). These findings make it apparent that significant challenges still exist regarding species selection, the assessment of viability, and the development of associated plan components and monitoring objectives.

While traditional challenges of wildlife planning appear to persist at the early stages of post-2012 forest plan revisions, various strengths of the new rule are also emerging. There is a

⁴ The only exception is if an SCC is chosen to serve as a focal species; this scenario would require the direct monitoring of the species as well as the maintenance of a viable population.

much broader focus on the maintenance of ecological integrity and its role in preserving biodiversity. Much scientific literature highlights biodiversity as a necessary component in the maintenance of ecological systems; therefore a stronger focus on ecological integrity in forest planning led many of those whom I interviewed to assume that ecosystem-focused management will result in sustained and improved environmental conditions. Another strength, as staff mentioned, is tied to the agency's ability to now "front load" new forest plans with components for specific species rather than leaving these decisions solely to project-level decision-making and assessment. When species decisions are determined only at the project-level, there is heightened risk of missing the cumulative impacts of planning – especially for wide-ranging species or populations that do not end at administrative (i.e. forest) borders (Schultz 2010). This strength also pairs well with Region 5's regional approach to planning. In their decision to consolidate their efforts and conduct three simultaneous revisions, they were able to consider a more comprehensive list of species and draft ecological objectives at a larger scale – presumably reducing the potential cumulative impacts of planning even further. However, the true success and effectiveness of these presumed strengths will likely only be realized after planning is complete and management approaches are observed in practice.

Administrative Challenges of Implementing the New Rule

This study highlights various challenges of policy implementation as identified in the public administration literature, five of which include: inadequate goal definition, procedural obligations and inflexibility (both of which related to capacity for planning), trust, and institutional design (Lachapelle et al. 2003). I found that the most influential, early-stage, administrative challenges for Region 5's early adopter forests were tied to the expedited process

of plan revision, inadequate goal definition, capacity for planning, and trust; although at this stage, trust existed as a subsurface influence rather than a formal challenge or impediment.

The expedited process of revision, paired with reduced capacity, proved to be very challenging for the three forests in Region 5. There was good reason to believe that early adopters would need additional time to be successful, as the new planning rule presents a significantly updated framework for planning that includes new concepts and encourages adaptive approaches to management. Following the completion of Region 5's early adopter forest assessments (December 2013), they were initially given two years to complete the entire plan revision phase (December 2015). However, according to an updated timeline released in May 2015, Region 5 anticipated only the release of a draft Environmental Impact Statement by the end of 2015 rather than final planning documents.⁵ As of January 2016, no draft EIS had been released by Region 5 and only one of eight early adopter forests had released a draft plan despite the original goal of December 2015. Ultimately, the planning timeline was extended and the release of final plans are anticipated in the winter of 2016; however, a large amount of the initial groundwork, data compilation, and research that informed draft components were completed prior to the initial extension under the pressure of an expedited revision process. Considering the initial speed of revision, without the guidance of finalized directives, concern existed among interviewees that the region's final products may suffer. The Chief's desire for expedited and less process-onerous forest plan revisions may ultimately be a reasonable request; however, considering the major learning curve following the promulgation of the 2012 planning rule, this was likely an unreasonable expectation of early adopter forests, especially before final directives were issued.

⁵ Notably, the agency's internal directives for interpreting the rule were not issued in final form until January 2015, nearly three years after the promulgation of the 2012 planning rule.

A few symptoms of inadequate goal definition were also noticeable during the early stages of plan revision in Region 5. As articulated by Nie (2004), in order to achieve effective policy implementation, laws and their objectives must be relatively clear and understandable; however, the literature asserts that environmental policies are often ambiguous, which can complicate the planning process (Lachapelle et al. 2003; Wilkinson and Anderson 1978; Wilkinson 1992). Through my interviews with agency staff, I observed evidence of this assertion. Increased levels of confusion and frustration among interviewees stemming from uncertainty about the rule's updated and somewhat vague planning language, including new terminology related to species planning requirements and the creation of associated plan components, resulted in various planning delays. This study revealed that a lack of clarity regarding the new rule's language, combined with the absence of formal guidance in the form of final directives, seemed to result in various wildlife-related planning decisions being pushed down the road or avoided altogether.⁶ Although waiting for final directives was frustrating and confusing for agency staff, it is important to recognize that early adopters in Region 5 likely played a crucial role in raising initial questions and concerns while following draft directives – a process that may have been necessary to properly finalize them. This provided a valuable opportunity to highlight areas of concern and confusion in 'real time' to better assist subsequent plan revisions. During interviews, staff commented that they were in communication with the Washington Office regarding suggestions and critiques of the draft directives. I cannot confirm that Region 5 directly influenced the final directives, but major sources of confusion that stemmed from the draft's language (or lack thereof), indicated by staff and external partners during interviews, were noticeably clarified or addressed in the directives' final form. Perhaps, as encouraged by a recent Government Accountability Office report (GAO, 2015), this reflects an

⁶ As discussed on pages 43-44.

improvement in the agency's historic inability to effectively engage in information-sharing to improve landscape-scale projects.

Regarding the process of planning, decreases in both funding and staff have challenged the agency's nationwide capacity for many years, and Region 5 was no exception. Most staff lacked direct experience with planning and even fewer had both ecological *and* planning experience. However, Region 5's decision to take a regional approach to planning enabled them to pool resources and draw on the experience of those who have been involved with prior plan revisions. This approach also seemed to encourage complimentary ecological decision-making that extended beyond individual forest borders. These approaches could greatly benefit other regions that share similar challenges of reduced capacity, although it is too early to determine the true benefit of this method over other regional or single-forest planning efforts.

In addition to the challenges tied to the rule's interpretation and each forest's capacity for planning, forests will also be challenged by low levels of trust and high expectations from the external community. As the Forest Service moves even further from a production-oriented agency to one that incorporates broad ecosystem integrity and ecological health, this major paradigm shift will require significant trust building. Therefore, as identified in the literature, trust building must remain a priority during planning because inadequate levels of trust can negatively impact policy implementation, especially in the case of natural resource policy (Daniels and Walker 2001; Leahy and Anderson 2008; Smith et al. 2012). Trust may not be truly fostered until the first plans are completed and the agency's management intentions and methods are finalized and apparent; however, that does not remove the importance of constructing a transparent foundation from which to build enduring trust. Trust can play a significant role in influencing policy implementation, so it is crucial for the agency to maintain

positive and transparent relationships with external partners and stakeholders. This study revealed a healthy and constructive level of skepticism from external stakeholders and environmental partners that I would not yet define as especially negative or damaging. As noted by Parkins (2010), skepticism from stakeholders can be a valuable part of public lands planning and, as they would predict, it appears that the lack of complete trust did play a valuable role in holding the agency accountable and aware of potential inefficiencies in their early-stage decision-making processes regarding species selection and management.

Sparked by the passage of the new rule, the Forest Service is experiencing a cultural paradigm shift in how they address ecosystem management. Initially, the Wilderness Act of 1964 signaled a public shift toward non-commodity values of public lands, and the passage of environmental laws during the 1970s helped to transform this shift into operational longevity (Wilkinson and Anderson 1987). However, as numerous scholars report, the paradigm shift has not been an easy transition due many influences, including the agency's deeply-rooted forester culture, mixed messages regarding multiple-use management, litigation, budgetary appropriations, pressure from presidential administrations, public and special interests, agency capture, etc. (Biber 2009; Jones and Callaway 1995; Nie 2004; USDA 1994; Wilkinson and Anderson 1987). Despite these challenges and various critiques, agency members expressed resounding confidence that their attempt to move beyond administrative borders and see forests as part of a broader ecosystem should result in a more integrated approach to wildlife management and habitat conservation. According to the rule, as well as interviews with various agency staff, plans will aspire to be more strategic and less prescriptive, allowing room for adaptive and novel approaches to management. While this is an encouraging aspiration, the use of adaptive and novel approaches for management is a challenge in itself. The literature contends

that adaptive processes are possible, but only if agencies have the institutional culture to support them (Stankey et al. 2003). Stankey et al. (2003) explain that examples of successful adaptive management remain elusive and its success depends on an ability to embrace risk, embrace uncertainty, and relies heavily on monitoring to determine the effectiveness of management – three things with which the Forest Service has historically struggled or is mandated to avoid. This does not imply that adaptive processes are impossible; it merely highlights the importance of supporting a paradigm shift that can breach the agency's long-lived institutional boundaries.

Conclusion

The aforementioned challenges related to implementation of the SCC requirements of the 2012 planning rule may, ultimately, be uniquely tied to early adopter forests due to lack of sufficient direction, heightened confusion about the interpretation of the new rule's language, and the fact that early adopters represent the first attempt to revise forest plans using language that has been significantly updated. Yet, although some issues (such as how to manage the process of revision under an expedited timeline) may work themselves out organically prior to subsequent forest revisions, there is an inherent complexity contained within the agency's regulations that will continue to present major challenges as future forests plan for wildlife, such as: the cost of monitoring, obtaining relevant and up-to-date scientific information to inform species decisions, various competing stakeholder interests, budget changes, presidential administrations, future lawsuits, etc. Despite these guaranteed challenges, it is important for remaining forests, which have yet to revise their plans, to consider the lessons learned from early adopters to avoid reinventing the wheel and, ideally, improve the efficiency of their own processes. Successful implementation will require considerable work and it is crucial that the

agency remains cognizant of and prepared for the potential impediments to implementation, especially as it relates to wildlife planning.

Future studies regarding this topic should focus on how the agency plans to self-assess to determine if it is meeting management goals, and how and whether it is able to overcome persistent impediments to successful planning and policy implementation. Additional aspects of SCC selection, planning, and management also are ripe for future research. As of 2016, nearly all national forests have yet to update their forest plans in accordance with the 2012 planning rule's regulations. Examples of future research might include: the comparison of regional planning approaches vs. individual forest planning approaches; comparing the effectiveness of at-risk species management (specifically the planning and management of SCCs) after plans are implemented and monitoring occurs; evaluating the effectiveness of using Focal Species as indicators of SCC viability; and whether the maintenance of ecological conditions is providing enough protection for SCCs and other at-risk species.

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APPENDIX A:

INTERVIEW GUIDES

INTERVIEW GUIDE: USFS REGIONAL STAFF

1. What is your general impression of the new rule's language and intent?
2. Within the context of your position, can you describe your role and level of involvement with plan revision in the region so far?
3. Do you feel the rule offers a new direction for resource management and planning?
 - a. If so, can you elaborate on any new opportunities?
 - b. Any major challenges?
 - c. How does the staff seem to be coping with the new direction so far?
 - d. Do you feel that there has been sufficient communication across the agency (horizontally and vertically)?
4. Thinking about the 3 simultaneous forest plan revisions in Region 5:
 - a. Can you provide your understanding of R5's regional approach to planning?
 - b. Do you think this approach would have been feasible without R5's history of regional efforts?
 - c. What are the emerging opportunities and challenges related to taking a regional approach to planning?
5. The Chief has stated that this new planning process will focus on the development of quicker, cheaper, and less process-onerous forest plans. At this early stage of revision, does that seem like a reasonable and achievable goal?
6. What are your thoughts on the expedited rate of plan revision?
 - a. In hindsight, are there any changes that you think could have been made to further expedite and streamline the process?

7. Have you had any involvement with the creation of the draft directives and/or the final directives (currently in revision)?
 - a. Do you have any concerns regarding the current revision timeline and the absence of final directives?
8. Have you had any involvement with the interpretation of wildlife planning standards under the new rule?
 - a. Any thoughts on the SCC selection process outlined in the draft directives?
9. Thinking purely procedurally, from your professional perspective as a *[title]*:
 - a. Do you see any new *procedural or managerial* benefits of the new requirements?
 - b. Any new challenges?
10. [If applicable] Now, thinking specifically about wildlife, from your professional perspective as a *[previous/current]* natural resource professional:
 - a. Do you see any new benefits for wildlife?
 - b. Any new challenges?
11. Before we conclude, is there any information that you think is important that you would like to add?

INTERVIEW GUIDE: USFS FOREST-LEVEL STAFF

Thinking about your role, as well as species decisions:

1. Can you describe your role and level of involvement with the revision process so far?
2. Were you involved with the interpretation of wildlife planning standards under the new rule?
3. More specifically, have you been involved with the identification of potential SCCs?
 - a. If so:
 - i. Can you describe your specific role and understanding of the process?
 - ii. What is your perspective re: strengths and weaknesses of the process?
 - iii. Who has been involved in (or influencing) SCC decision-making?
 - iv. Any insight into the regional or national guidance being used?
 1. Thoughts on the SCC selection criteria outlined in the draft directives?
 2. Any concern about differences in draft vs. final directives?
 - v. What is your level of confidence in being able to navigate the BAS science requirement when selecting/planning for SCCs?
 - vi. Besides the science, are any other notable factors coming into play and influencing SCC decision?
 - vii. How does the process compare to past sensitive species planning approaches?
 - b. If not:
 - i. Any insight into the process?

4. In your position, will you have any involvement with developing species monitoring plans or viability assessments? Has there been much discussion about this?

Taking into account that the new regulations are a major change for the agency, I'm interested in how the agency is navigating these changes:

1. To what extent are you receiving guidance, support, or input from the WO, RO, research stations, or other early adopter forests?
 - a. Do you feel that this guidance is sufficient regarding the implementation or interpretation of the new regulations?
 - b. Additionally, do you feel that there is sufficient communication within the agency (horizontally and vertically)?

Thinking about the language in the new regulations:

1. From your professional perspective as a *[position/title]* do you see any *procedural or managerial* benefits of the new requirements? Any challenges?
2. Now, thinking specifically about wildlife, from your professional perspective as a *[scientific title if relevant (i.e. wildlife ecologist)]* do you see any potential benefits for wildlife? Any challenges?
3. Do you have any insight into how your peers feel about the new wildlife requirements and/or the new rule as a whole?

Before we finish, would you like to add any information that you think is important?

INTERVIEW GUIDE: EXTERNAL PARTNERS

Thinking about your role as well as species decisions:

1. Can you each describe your role and level of involvement with Region 5's plan revision process?
2. Have you had any involvement with the identification of potential SCCs?
 - a. If so:
 - i. Can you describe your understanding of the process?
 - ii. Who has been involved in the decision-making?
 - iii. What is your perspective re: strengths and weaknesses of the process?
 - iv. Any insight into regional or national guidance being used?
 1. Thoughts on the SCC selection criteria outlined in the draft directives?
 2. Any concern about differences in draft vs. final directives?
 - v. Level of confidence in the agency's navigation of the BAS science requirement and how they are dealing with uncertain scientific information? [May be too early to comment on this.]
 - vi. Besides the science, what might be coming into play and influencing SCC decisions?
 - b. If not:
 - i. Any insight into the process?
3. At this point, has there been much discussion of monitoring and assessment of species viability? Do you have any concerns or confusion regarding these topics?

Taking into account that the new regulations are a major change for the agency, I'm interested in how the agency is navigating these changes:

2. From an external perspective, do you have any insight about whether the agency appears to have sufficient guidance and support to implement the provisions in the new rule?
[May be too early to comment on this.]
3. Do you feel that there has been sufficient communication within the agency (horizontally and vertically) as well as with external stakeholders?
4. Do you feel collaborative opportunities have been useful and positive experiences?

Thinking about the language in the new regulations:

4. From your professional perspective as a [*position/title*], do you see any new *procedural* benefits of the new requirements? Any challenges?
5. Now, thinking specifically about wildlife, from your professional perspective as a [*scientific title if relevant (i.e. biologist)*], do you see any potential benefits for wildlife? Any challenges?
6. Any perspective about how other stakeholders view the new wildlife requirements and/or the new rule as a whole?

Before we finish, would you like to add any information that you think is important?

APPENDIX B:

DETAIL ON CODING METHODOLOGY

Coding Methodology: Expanded Details

All recorded interviews were transcribed and analyzed using a grounded theory process of open coding (Creswell 2008; Strauss and Corbin 1990). Initial codes were closely linked to broad research questions (bolded in Table 4) and additional codes were created during data analysis where I used constant comparison to identify key themes across interviews (italicized in Table 4). The same codes were used to analyze interviews with agency staff as well as external partners, and multiple codes often applied to single quotations.

Table 4 below provides an example of the codes used during analysis of this research as well as an explanation of each category's intent.

<i>Table 4: Transcript Codes and Associated Explanations</i>	
Codes	Explanation of Use in Transcripts
Interpretation: <ul style="list-style-type: none">- <i>ecological/wildlife</i>- <i>procedural</i>- <i>intent</i>	Interpretation of the rule's language and/or intent. Mainly related to ecological/species and procedural decisions.
Guidance: <ul style="list-style-type: none">- <i>formal document</i>- <i>interaction</i>	Guidance received from the Washington Office, Regional Office, best available science, etc. Formal written guidance as well as personal interactions between individuals.
Lessons learned: <ul style="list-style-type: none">- <i>procedural</i>- <i>capacity</i>- <i>in/experienced staff</i>- <i>funding</i>- <i>subsequent revision</i>- <i>opportunities and/or challenges</i>	Lessons learned during the revision process. Frequently related to: capacity, lack of guidance, order of processes, staff experience, etc. Often expressed as tips for future forest revisions.
Species of Conservation Concern (SCC)	Direct mention of SCCs
Trust	Expressions of trust and/or mistrust toward the agency, individuals, documents, etc.

Organization	Related to agency structure, culture, transparency, Region 5's approach.
Collaboration	Evidence of collaboration among staff or with external stakeholders.
Litigation	Any mention of litigation or reference to court cases (not common)