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CUMULATIVE EFFECTS ANALYSIS IN U.S. FOREST SERVICE

DECISION-MAKING

By

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Dissertation

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Cumulative Effects Analysis in U.S. Forest Service Decision-Making

Committee Chair: Dr. Martin Nie

This dissertation investigates the U.S. Forest Service's (USFS) implementation of the cumulative effects analysis (CEA) requirement under the National Environmental Policy Act (NEPA). The CEA regulation requires federal agencies to provide an analysis of environmental effects, with consideration of past, present, and foreseeable future actions by both public and private parties, often on broad geographic scales. Studies in the late 1990's found that compliance with CEA requirement was highly variable across agencies. Of late, judicial enforcement of the CEA requirement has been on the rise with the USFS the focal agency in the majority of decisions.

This study investigates USFS implementation of the CEA requirement, with a focus on wildlife, and uses the Idaho Panhandle National Forest (IPNF) as a case study. Case law and NEPA document analysis, along with semi-structured interviews, are used to investigate: legal standards for CEA and wildlife analysis, the current state of CEA practice, impediments to implementation, and opportunities for improvement.

The case law analysis reveals that plaintiffs have successfully challenged the agency for failure to consider other relevant projects in a CEA, lack of rationale for findings, reliance on stale data, and failure to include CEA at the appropriate junctures in the planning process. Findings from the IPNF case study indicate that landscape-level analysis and the inclusion of past actions in CEA continue to be major challenges in implementing the requirement. Confusion over the nature of the requirement, limited monitoring data, and lack of time and funding impede the agency's ability to effectively conduct CEA.

Cumulative impacts to wildlife are measured in terms of changes to suitable habitat. No clear picture is provided of changes to habitat availability or population status over time. The efficacy of using habitat as a proxy for species presence is questionable, as is the scientific foundation of some tools used by the IPNF to support its wildlife CEA. Recommendations, such as improved monitoring, better understanding of species-habitat relationships, and options for increasing the scientific credibility of agency decisions, are discussed herein as ways to improve wildlife planning and CEA on USFS lands.

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CHAPTER ONE: INTRODUCTION AND RESEARCH DESIGN

1.1 An Introduction to Cumulative Effects Analysis

Cumulative effects analysis (CEA) under the National Environmental Policy Act (NEPA) requires agencies to consider the effects of their actions when seen in concert with other actions over long temporal and broad spatial scales. In this way, it requires federal agencies to look beyond the incremental impacts of a single decision, which may be individually insignificant but may cumulatively contribute to significant environmental change. Thus, CEA at its best has the potential to prevent what has been called the “tyranny of small decisions” (Odum, 1982). This project investigates several questions related to the current status of CEA, focusing specifically on how the U.S. Forest Service conducts CEA for wildlife.

CEA is a requirement under NEPA, this nation's overarching articulation of a national policy for environmental protection. The primary action-forcing mechanism of NEPA is the requirement that agencies perform environmental impact analysis (EIA). According to this process, before a project is implemented, federal agencies must explore and document alternative approaches to the project and describe the potential environmental effects of each alternative. The broad purposes of NEPA are to force agencies to consider the environmental effects of their actions and to provide a means to involve and inform the public in federal agency decision-making.

The focus of this research is the requirement under NEPA that, as part of EIA, agencies analyze the cumulative effects of their proposed actions. NEPA regulations,

which were originally promulgated by the Council on Environmental Quality (CEQ) in 1978, define cumulative effects as:

[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.¹

According to this regulation, agencies are required to look at the cumulative effects of their proposed project combined with the effects of all relevant past, present and future actions, regardless of jurisdiction or resource ownership. One author writes that cumulative effects analysis "is one of the most difficult tasks a NEPA practitioner faces when preparing an Environmental Assessment or Environmental Impact Statement", and, "[i]f one examines what is being required...it is apparent that this is a nearly impossible demand--at least, to do so comprehensively and perfectly" (Smith, 2006, p. 228). Indeed, the potential scope of a CEA can be enormous. For example, CEQ's own guidance document on cumulative effects analysis estimates that "one mile of the delta of the San Francisco Bay may be affected by the decisions of more than 400 agencies (federal, state, and local)" (CEQ, 1997a, p. 1).

While CEA may be a seemingly unwieldy requirement, it is the primary aspect of a NEPA analysis that requires agencies to take a synergistic and sweeping view of the ecosystem-level effects of their projects. Legal scholar Terence Thatcher (1990) argues that CEA is an essential part of NEPA analysis, which was meant to move the federal government beyond crisis management and incremental decision-making and towards "the early identification of environmental consequences of government action and the

¹ 40 C.F.R. §1508.7 (2008). CEQ regulations define cumulative effects and cumulative impacts synonymously and the terms are used interchangeably throughout this research (40 C.F.R. §1508.8 (2008)).

understanding of government proposals in a larger environmental context" (Thatcher, 1990, p. 612). He goes on to say, "[T]he most complete analysis of cumulative impacts, while potentially daunting in scope, represents the best hope to achieve NEPA's mandate to 'deal[] with environmental problems on a preventive and an anticipatory basis'" (Thatcher, 1990, p. 612-613, quoting Senator Jackson, NEPA's primary proponent in Congress).

Legislative history and common law prior to 1978 indicate that CEA always has been understood to be fundamental to the implementation of NEPA.² The CEA regulation was not formally promulgated until 1978, but cumulative effects analysis had been emphasized in CEQ guidelines as early as 1973 (Thatcher, 1990).³ As for the writing of the formal regulations, these were developed as part of a thorough and responsive dialogue between CEQ, federal agencies, and other interested parties, and have remained relatively unchanged since they were written (Caldwell, 1998).⁴ Therefore, when the cumulative effects requirement was officially written into administrative law in 1978 it was nothing new or surprising to the agencies, and it is here to stay as long as NEPA remains law.

To date, the CEA requirement has yet to be implemented to its full potential, for numerous reasons, including the lack of monitoring data, funding, and adequate training for performing CEA (Burris & Canter, 1997b; Smith, 2006). Agency compliance with the CEA requirement in the past has been limited. For example, studies during the 1990s that looked at cumulative impacts analysis in samples of environmental

² This background is discussed in detail in chapter two.

³ CEQ guidelines for completing EIA were announced in 38 Fed. Reg. 20550 (August 1, 1973).

⁴ The original NEPA implementation regulations, found at 40 C.F.R. §1500-1508, were issued by CEQ in 1978 and became effective in 1979. The NEPA regulations are found at 40 C.F.R. §1500-1508 (2008).

assessments (EAs) found that less than half of the federal agency EAs reviewed even mentioned cumulative impacts (Burris & Canter, 1997a; McCold & Holman, 1995). The majority of the EAs that included cumulative effects analysis often presented limited support for their conclusions or failed to include important aspects of the analysis. A study on CEA in environmental impact statements (EISs) from the 1990s determined that “inconsistencies and inadequacies still exist” in the analyses and that there is a “lack of adequate documentation of the CEA process (or lack of adequate CEA procedures in general)” (Cooper & Canter, 1997, pp. 385, 405). These findings beg the question of why CEA is (or was) mediocre or absent in so many EAs and suboptimal or occasionally absent in many EISs. It is possible that prior to 1997, when CEQ issued their guidance document on CEA, the agencies did not have clear guidance as to how to comply with the cumulative effects requirement (Smith, 2006). Furthermore, in terms of the CEA requirement, the agencies had not faced a great deal of litigation and judicial review on the issue prior to the late 1990s.

Whatever the explanation, the tide seems to be turning with regard to judicial enforcement of the CEA requirement. Smith (2006) reports that cumulative effects challenges in the Ninth Circuit Court of Appeals have increased in recent years, and in the majority of cases tried between 1995-2004 agency CEAs were ruled inadequate. The Forest Service (USFS) faced the majority of these challenges, losing 69% of the cases overall and 87% of the cases brought with regard to the adequacy of their analysis of past, present and foreseeable future impacts (Smith, 2006). It should be acknowledged that Smith (2006) considered only published cases, which might have led to underestimations of the Forest Service’s success rate in court (Keele et al., 2006).

Nonetheless, the USFS's record for cumulative effects litigation stands in contrast to findings that between 1989-2002 the USFS won 73% of all cases decided in court (Keele et al., 2006). Given the recent litigation on this topic, one would expect that the USFS is under increased pressure to perform CEA adequately. A regional NEPA planner with the USFS stated, for example, that in response to the considerable amount of litigation on this topic, Region 1 now includes CEA in 100% of its NEPA documents and has prepared a thorough training on the legal requirements and best practices for completing CEA in EAs and EISs.⁵

Since 1997, almost nothing has been published about the state of agency compliance with the CEA requirement, and no study has looked specifically at how the USFS deals with the requirement. Numerous questions remain unanswered, including whether the USFS includes CEA in all of their EAs and EISs, how they actually perform CEA and define the scope of the analysis, how the case law has affected agency compliance and how it varies across federal circuit courts, and whether the current practice of CEA by the USFS effectively captures important broad scale environmental effects. This research aims to fill in some of the gaps in our knowledge of how the USFS is doing CEA.

Many of these questions get at the most complex and contentious issues around CEA and EIA in general. For example, there is significant debate over the appropriate scale for CEA. Spalding and Smit (1993) write, "One approach views CEA as an extension of the analytical component of EIA..., while the other regards it as a correlate

⁵ Joan Dickerson, Region 1 NEPA specialist, *personal communication* (October 10, 2006).

of regional or comprehensive planning” (p. 588). These conflicting views involve debate about both appropriate scale and overall intent of CEA.

It is also unclear how to perform CEA for projects that might affect something like global climate change, clearly a cumulatively significant effect, when an individual project has only minor contributions. It is not realistic to prepare an EIS for every project that contributes CO₂ to the atmosphere, but the question remains of when to analyze the combined effect of many small actions. In other words, when do agencies look at the bigger picture? McCold and Saulsbury (1996) explain that in such cases programmatic assessment of cumulative impacts would be appropriate, allowing for serious deliberation about social values around appropriate resource use. In reality, though, agencies often reserve CEA for project-level analysis when the details of on-the-ground activities are clearer. Moreover, if the 2008 USFS planning regulations remain in place and forest plans no longer are accompanied by EISs, the heavy lifting of CEA for numerous resources will have to be done at the project level.⁶ However, preparers of EAs and project proponents often do not see the need to address such complicated issues because they view their project as having relatively minor impacts (McCold and Saulsbury, 1996). These questions of scale and when to report incrementally minor but cumulatively significant impacts are some of the fundamental challenges and conundrums of CEA.

Despite the challenges, the CEA regulation is a critical piece of U.S. public land law and reflects principles of ecosystem management by requiring federal agencies to take a large-scale look at the environmental effects of their actions (Phillips &

⁶ The Forest Service planning regulations were announced at 73 Fed. Reg. 21468 (April 21, 2008) and can be found at 36 C.F.R. §219 (2008).

Randolph, 2000). It cuts right to the heart of NEPA and its intent, making it an important area for further research. Numerous factors of considerable importance, such as private land development, the use of scientific information in EIA, and the need for ecological monitoring systems, are part and parcel of the CEA issue. Furthermore, CEA reflects some of the most important issues currently at the center of debate regarding NEPA and forest planning. The significance of the regulation, its relationship to important issues in forest planning, the increase in case law and renewed focus on CEA, and the relative dearth of literature on the topic make this subject ripe for study.

1.2 Theoretical Context of the Study

Research on CEA provides an excellent opportunity to explore applied and theoretical aspects of public land policy and planning. In addition to being a topical question of relevance to USFS personnel, environmental advocates, NEPA practitioners, and others, it is also a vehicle to explore several broader and more theoretical issues: 1) the efficacy of the synoptic or rational planning model under NEPA and its effect on agency decision-making; 2) the incorporation of scientific information and the role of scientific uncertainty in public lands policy and decision-making; and 3) the interplay of political institutions and other interest groups in public land law and policy. Included below is a discussion of these theoretical frameworks, which served to guide the design of this inquiry.

CEA as Part of the Synoptic Planning Paradigm

This project provides a lens for examining the broader purpose and paradigm of NEPA. Law professor Bradley Karkkainen explains, "NEPA seeks to improve environmental outcomes by forcing comprehensive disclosure of expected consequences of agency actions" (2002, p. 903). However, the Act does not require agencies to choose a more environmentally benign course of action nor does it specify how agencies should respond to environmental risk. Instead, by requiring analysis and disclosure of environmental consequences, NEPA is meant to lead to more rational and environmentally sound courses of action. In this way NEPA exemplifies a faith in rational planning and synoptic analysis and is often portrayed as a classic representation of this planning paradigm (Rasband et al., 2004).

There is significant debate over the synoptic planning model as to whether it is feasible within the context of U.S. bureaucratic decision-making and whether it affects agency decision-making as it is meant to. In an early critique of the paradigm, Sally Fairfax (1978) explains that the intent of NEPA is to support and encourage rational decision-making but that this is something agencies are not capable of doing, due to both the influence of politics and the way bureaucracies operate. If this is accurate, one might conclude that NEPA rests on a shaky foundation.

However, it would be false to characterize NEPA as having a single, clear intent. Dreyfus and Ingram (1976) describe the search for Congressional intent behind NEPA as "about as scientific as the voodoo practice of reading the future in a random pile of chicken bones" (p. 254). They explain, "There were many House and Senate participants in the legislative process, and each had diverse interests and perspectives; it

would be impossible to unravel their separate intentions” (Dreyfus & Ingram, 1976, p. 254). Echoing this, Professor Paul Culhane (1990) argues that, rather than being representative of a single intent, NEPA is a package of intents. He explains that the passage of NEPA can be understood as the result of a "garbage can" model of organizational choice" where the influence of policy entrepreneurs, creative problem definitions, and policy windows of opportunity coincide in unpredictable ways during the writing and passage of a statute. The result is that the Act combines the goals of advocates for clearer synoptic planning procedures, ecologists and others promoting ecosystem-level analysis, members of Congress interested in the presentation of alternatives alongside project proposals, proponents of increased judicial oversight of authority delegated to executive agencies, and advocates of public participation. Therefore, it would be an oversimplification to argue that NEPA was meant to work in a single way or towards one particular goal.

There is also considerable debate as to the effects of NEPA and whether it leads to more environmentally benign choices, given that it does nothing more than force agencies to consider and document environmental effects. It is likely that agencies are guided primarily by their enabling statutes, over which NEPA has no overriding authority, and by factors such as agency capture and budgetary incentives (Fairfax 1978). Professor Fairfax (1978) writes, "The general opinion is that NEPA has improved agency decision-making processes by altering internal agency deliberations and by opening them to public scrutiny and participation” (p. 743). However, she argues that NEPA has not actually accomplished these goals but instead has drawn attention away from the more important task of reforming agency mandates. On the

other hand, others have argued that NEPA serves as a clearinghouse for environmental information and works to promote environmentally benign choices by discouraging projects that would be revealed by the NEPA process to be environmentally egregious (Rasband et al., 2004). Rasband et al. (2004) also write, “NEPA has provided constant pressure on agencies to broaden their missions to consider and adopt environmental values. And it has spurred agencies to modify proposals and mitigate adverse impacts” (p. 283).

The investigation of CEA and its effects on decision-making provide a vehicle for contributing to and informing the debate around the rational-synoptic planning paradigm. This research was designed to lend insight, based primarily on the case study examined herein, into how NEPA analysis affects the decision-making process. Through consideration of these issues, this project contributes to the ongoing evaluation of this planning paradigm and provides a look forward towards the inevitable next iteration of public land law. Indeed, as we will see, federal land agencies such as the USFS are reconsidering the synoptic planning model and adopting approaches that are meant to be more flexible and adaptable.⁷

Scientific Information and Uncertainty in CEA

Another central area of inquiry in this study is the role of empirical information in CEA. Survey respondents in a 1997 study indicated a large role for professional judgment in CEA decision-making (Burris & Canter, 1997b). McCaffrey and Graham (2007) explain that the interdisciplinary (ID) teams that prepare NEPA documents often

⁷ See for example the new USFS planning regulations announced in 73 Fed. Reg. 21468 (April 21, 2008) and found at 36 C.F.R. §219 (2008).

lack members with the appropriate expertise to analyze certain resources, training for interpreting new findings, easy access to relevant information, and strategies for responding to uncertainties in the data. There also tends to be a continuum of approaches for CEA from qualitative methods that are less complex and sometimes unvalidated, but easier to use, to more quantitative methods developed by researchers, but which require expert operators (MacDonald, 2000). This project provides insight into how ID teams utilize empirical information and apply it in their CEA. For instance, I consider how ID teams integrate scientific information into wildlife CEA and whether monitoring data is available to support CEA.

A key aspect of the way science is used in CEA is how the agency responds to scientific uncertainty. Sample (1991) writes that a lack of scientific information, uncertainty about the appropriate scale of analysis, problems with monitoring, uncertainty about private land activities, and a lack of knowledge of how activities will act synergistically, all have been barriers to completing CEA for the USFS. Assuming these issues persist, how do agency personnel respond to these challenges and complete CEA despite the numerous and critical gaps in their knowledge? This research allows for investigation into the role scientific uncertainty plays in USFS decision-making, insight into how the agency plans in the face of vast uncertainty, and a look at the ways that various interest groups portray scientific uncertainty. Additionally, the case law review provides an opportunity to consider the role of the courts in this matter and understand how they have ruled in cases involving both data and methodological uncertainty.

The challenge of dealing with uncertainty or knowledge gaps, which affect a number of aspects of CEA, is one of the most prominent and recurrent themes in natural resource management.⁸ When we ask how the USFS deals with the effects of past actions, we run into the problem of whether the information on the effects of past management actions is even available. Similarly, knowledge gaps are the central challenge in doing wildlife viability analysis. There is a need for more information with regard to species/habitat relationships, species distribution and abundance, and the effects of management actions on individuals or populations. Knowledge is also limited in more mundane areas, such as whether timber sales proceed as planned or whether certain management practices are implemented as promised in a NEPA analysis.

The presence of data gaps and scientific uncertainty is widely regarded as the central challenge in natural resource management (see for example, Doremus, 2008, on data gaps in natural resource management; Glicksman, 2008, on data gaps in USFS wildlife management; and Schultz, 2008, on the challenges of scientific uncertainty in forest planning). Although the challenges posed by the ubiquitous presence of scientific uncertainty have been discussed for years, of late more attention has been drawn to other factors that lead to data gaps. In a recent article, Doremus (2008) emphasizes that uncertainty is a result of more than a simple lack of data or knowledge, and she introduces a more complex conceptualization of data or knowledge gaps, suggesting that information supply in natural resource management is analogous to the complex process

⁸ There is a distinction to be made between data and knowledge gaps. In forest management, data gaps often have to do with a lack of monitoring or inventorying data. For instance, the question of how much old-growth exists on a forest or how many goshawk nests are present in an area would be considered data gaps. A knowledge gap has to do with a broader conceptual understanding of a system. Doremus (2008) makes a similar distinction between the quest for knowledge of complex systems versus routine data collection over time. The two are certainly related but are different enough that it is useful to draw a distinction between them.

of the supplying oil, with steps for exploration and extraction to refinement and consumption.

As Doremus (2008) explains, “Despite wide recognition that natural resource management decisions are heavily dependent on the supply of scientific information, little attention has been paid to the processes by which that information is supplied” (Doremus, 2008, p. 407). There may be information that has been collected but has not been refined or delivered efficiently, in the sense that it has not been organized or interpreted in a way that is useful to managers, not collected in a strategic or consistent manner, or not made available to the people who need it. Shortages in the supply of knowledge can result from various “leaks along the pipeline,” as Doremus (2008) puts it, and what seems from the outside like a simple lack of information often, in fact, is the result of a far more complex problem of information supply and delivery. In summary, Doremus (2008) explains:

There certainly are problems of limited scientific effort, but there are also problems of limited communication, of information that is not well-matched to the management problem, and of institutions not capable of responding to information.... Failure to get useful information to the right people can undermine decisions just as surely as failure to generate information. The same is true for failure to make effective use of available information (Doremus, 2008, p. 413).

Also critical to CEA and dealing with uncertainty is the subject of environmental monitoring by federal agencies. At present, agencies do very little to determine whether their predictions and planned mitigation measures are accurate or effective. Dinah Bear (2003), who served as General Counsel for CEQ, writes, "While neither an easy nor an exclusive remedy, one significant step the government could take to improve the quality of information would be to implement post-decisional NEPA monitoring and mitigation" (p. 944). The lack of post-decisional monitoring and analysis, she argues,

"[Is] the dynamic that has made NEPA documents the one-shot deals that they usually are, rather than the living libraries that they could become" (Bear, 2000, p. 945).

Karkkainen (2002) echoes this point, explaining that the predictions in any NEPA document are always "inexact and contestable" and in fact are often inaccurate, according to the few studies that have been undertaken. He goes on to say, "[B]ecause NEPA does not require follow-up monitoring, actual impacts remain undisclosed and there is no assurance that mitigated impacts remain below EIS-triggering thresholds" (Karkkainen, 2002, p. 903). Monitoring and adaptive mitigation, Karkkainen (2002) argues, are essential to fulfilling the goals of NEPA.

Without a commitment to monitoring and data collection it is difficult for agencies to accurately assess cumulative effects either before or after a project has begun. This research investigates the current and potential role of monitoring systems in supporting CEA within the context of the case study. Early research on CEA found that a lack of monitoring and coordination between agencies was a barrier to successful analysis (Burris & Canter, 1997b). An important issue, then, is whether monitoring systems in the National Forest system are improving and, if so, how such data contributes to CEA. Investigation of these questions serves to reveal the role of empirical information in decision-making and the importance of monitoring data both for pre-decisional EIA and post-decisional evaluation.

The issue of responding to scientific uncertainty is also an excellent avenue for exploring some of the complicated aspects of the science-policy interface. Ruhl (2004) explains that in cases involving scientific uncertainty there is a spectrum of possible responses from decision-makers, ranging from a precautionary response on the more

risk-averse end to a “sound science” response on the more risk-prone end. At present, most agencies respond to scientific uncertainty on a case-by-case basis according to their professional judgment (Ruhl, 2004). This status quo may be problematic because in cases involving scientific uncertainty, agency decisions necessarily entail value-based choices that involve risk preferences. Failure to acknowledge this encourages and allows decision-makers to disguise the inevitable value-based choices that are involved in making the leap from science to policy. Thus, the issue of how agencies behave in the face of scientific uncertainty involves important questions about how federal agencies respond to risk of environmental harm, whether there should be a prescribed response, and whether there is adequate transparency and opportunity for public deliberation in such cases.

The issue also is part and parcel of a broader and widely-acknowledged problem sometimes referred to as the “science charade”, in which science is used as justification for decisions that are actually based on political or social preferences (Doremus, 1997; Wagner, 1999). Such use of science capitalizes on the presence of scientific uncertainty and can be a significant driver of political conflict. Various parties may frame scientific information to suit their political goals while simultaneously making claims of objectivity and disguising their preferences with selected scientific information. Many players, including scientists, politicians, and managers, have incentives to frame questions as if science can provide the answers and to justify their decisions based on scientific information (Adelman, 2006; Ludwig et al., 2001; Wagner, 1999).

As part of the investigation into the use of scientific information, this project looks specifically at how the IPNF conducts wildlife CEA, how it incorporates new

methods and knowledge into that analysis, and how wildlife analysis should evolve in the future. This topic has been an issue of considerable debate in forest management and has been the subject of numerous lawsuits brought against the USFS. Planning for species viability was one of the primary issues raised in *Sierra Club v. Marita* (1995), *Inland Empire Public Lands Council v. USFS* (1996), *Sierra Club v. Martin* (1999), and *Lands Council v. Powell* (2004), all important and contentious cases decided in the U.S. Circuit Courts. Debates about biodiversity protection also of course were central to the spotted-owl crisis in the Pacific Northwest in the 1990s (Hoberg, 2004). This research investigates how strategies for wildlife analysis have changed over the years, and what the agency could be doing differently, given the available scientific methods and information.

The Role of Political Institutions and Interest Groups in CEA Implementation

Research on the implementation of the CEA regulation presents an opportunity to investigate the interplay of the various political groups and institutions that affect bureaucratic behavior and decision-making. One of the goals of this research is to identify the numerous factors that affect how CEA is done by the IPNF and to highlight how different players portray these factors when it comes to regulatory implementation. For example, agency personnel might emphasize the role of training or budgets in determining how they do CEA, while others might point to the powerful role of environmental litigants, the media, political appointees, or the judiciary.

Also important are the ways that different political institutions affect agency processes and outcomes. It is well-established that all of the major branches of

government are involved in determining how a federal bureaucracy operates. Congress, for example, acts through a number of different routes and primarily through the annual budgeting process. It is responsible for setting the agency's budget and determining how much money the agency receives for different programs, such as, in the case of the USFS, general administration, timber harvest, or soils management. Farnham (1995), in a study of USFS budget requests and appropriations, found that Congress guides agency priorities through this process and that USFS budget requests tend to follow the previous year's appropriations rather than vice versa.

Beyond budgeting, there are a number of other ways that Congress can influence agency behavior. Jones and Callaway (1995) explain that Congress has become more involved in agency decision-making over time through a variety of mechanisms, including the annual budgeting process but also through oversight hearings, by putting direct political pressure on decision-makers within the agency, and by passing legislation, including appropriations riders. All of these factors affect and may even impede agency change (Jones & Callaway, 1995; Jones & Mohai, 1995). Such actions serve as strong signals of Congressional preferences to the agency, which is apt to avoid conflict (Jones & Callaway, 1995). Jones and Callaway (1995) write, "The Forest Service is receptive to external feedback, such as that from Congress and the public, and responds proactively by adjusting its decision and actions to minimize the anticipated conflict before it can occur" (p. 347). Wood and Waterman (1991) lend support to this notion, arguing that agencies anticipate the political preferences of Congress and respond accordingly.

Factors within the agency can also affect how requirements like CEA are implemented. Some have characterized the USFS as being slow to change because it is a closed organization that adheres to strong central values and socializes its employees to adhere to such values (Mohai, 1995). Wood and Waterman (1991) find in their research that the level of centralization within an agency determines to some extent its amenability to external control. They write, “The greater the centralization of agency decision-making processes, the greater the executive control over bureaucratic outputs” (Wood & Waterman, 1991, p. 822). Depending upon the level of agency decentralization, activities might be affected to varying extents by outside political influences and internal culture.

However, Wood and Waterman (1991) also identify a strong role for the executive in controlling federal agencies through the appointment and removal of higher-level agency personnel and the exertion of control over agencies through the Office of Management and Budget (OMB). They explain that early theories of political-bureaucratic relations argued that there was very little connection between executive politics and agency behavior. Later theories emphasized agency capture and “iron triangles”, whereby public interest groups and Congress had far more control over agency behavior than the president (Wood & Waterman, 1991). However, in their thorough study of agency behavior, they find that “political appointment—a shared tool of the president and Congress—is very important” (p. 822). They also concur with other researchers (cited therein) that organizational restructuring, OMB guidance and oversight, and Congressional oversight and appropriations are all significant in affecting agency behavior.

The courts also have considerable power to define how a regulation is implemented. Mortimer (2002) writes that Congress has numerous incentives to delegate responsibilities to federal agencies, resulting in both significant administrative discretion and the shifting of the policy-making venue both to the agency and to the courts. Particularly when an agency's mandate leaves room for vast administrative discretion, as is the case with the USFS, political conflict shifts from Congress to the agency and the courts (Nie, 2004). Congress uses various tools in its legislation to control the extent of judicial review of a statute and can strategically shift policy-making to the courts. Therefore, when we look to understand the role of the courts, we must be aware that they not only interpret laws but also make policy to a significant extent.

In terms of the CEA regulation, the role of the courts in setting policy is significant. Because the directive is so broad, it is left to the courts in large part to determine what constitutes a reasonable application of the standard. Numerous influential cases have been brought to court by environmental groups and have resulted in decisions that have forced the agency to change how it complies with the requirement (Smith, 2006). Indeed, when faced with a requirement as difficult to implement and interpret as CEA, the courts and the agency inevitably engage in a kind of back-and-forth. The agency takes a stab at implementing the requirement, the courts evaluate whether the approach is adequate, and a sort of negotiation ensues until some set of practices are adopted that are both practicable for the agency and acceptable to the courts. However, it would be false to think of this process as having a clear stopping point. The acceptability of an approach will change depending on the court, the

availability of scientific information, the nature of complaints from the public, and the specifics of a case or project.

In general, legal decisions have had substantial effects on National Forest management. In their review of litigation and the USFS between 1971-1993, Jones and Taylor (1995) find “a dramatic increase in the use of litigation as a tool to force change within the agency, particularly in the Ninth Circuit” (p. 310). Court decisions, they determine, have had a substantive effect on agency activities, and this has served as an incentive to continue using litigation as a tool to challenge agency actions. Particularly, they find that environmentalists have had greater success in court as compared to other interest groups and are consequently motivated to continue pursuing their goals through litigation. In a follow-up study, Malmshiemer et al. (2004) find that litigation against the USFS has continued to increase between 1993-2001 according to similar patterns of success for different groups of litigants and in the different circuit courts. They also emphasize the role of increased publicity and delay of actions in motivating litigants to sue the agency, even when success rates are less than 50%. Thus, the role of the public in influencing agency behavior through litigation is hugely important.

The public also has a role to play through the NEPA notice and comment process, although the purposes and effects of this form of public participation are not entirely clear. The public participation requirements in NEPA seem to provide an avenue for public input on the goals and potential effects of particular proposals. However, statements of preferences from the public are notoriously fed into a black box of decision-making, and the agency is not under any obligation to factor public preferences into their decisions. This research investigates the role of public comment

on CEA, how such comments affect decision-making, and what public interest groups aim to achieve through this process, if anything beyond setting the stage for potential litigation.

It is also important to note that the public also can affect decision-making in more diffuse ways. Wood and Waterman (1993) write, “[I]nterest groups exert constant pressure on bureaucracies through their lobbying activities, litigations, and publicity. News media coverage of agency activities can alter the visibility and perception of agency programs. The status of some policies is also determined by more diffuse factors like changing public opinion....” (Wood & Waterman, 1993, p. 501). Therefore, there are a number of ways in which the public may have a significant role in determining the current status of how CEA is done and defining the debate over the future of the regulation.

This research looks at how these various institutional forces and players affect how CEA is done by the USFS and also considers how various forces may work as impediments to improving the CEA process. The in-depth case study and associated interviews allow for a nuanced investigation into these topics. On a broader scale, the research serves as a vehicle for discussing the complicated interplay of factors that affect regulatory implementation.

1.3 Applied Aspects of the Research

During the research design phase, numerous individuals at the USFS indicated interest in this topic and recommended various possible lines of inquiry, including a detailed account of the relevant case law across federal court circuits, research on

different approaches to CEA across USFS regions, and investigation into the role of the judiciary in determining requirements for EIA.⁹ One of the foremost experts on CEA case law noted that there is a need for a thorough qualitative analysis of the state of CEA in NEPA documents.¹⁰ In their findings from research on NEPA implementation by various federal agencies, Stern and Mortimer (2007) explain that CEA is one of the more important topics requiring research and training, according to NEPA practitioners. They also emphasize the general need for more empirical research on NEPA implementation. Therefore, there are a number of questions about the current practice of CEA that both practitioners and applied researchers believe are of immediate and practical interest for those involved and interested in forest planning.

Furthermore, the importance of this topic to the future of public lands management cannot be overstated. CEA involves many critical issues, such as interagency coordination, ecosystem management, and transboundary environmental effects analysis. This topic also gets at the intersection of public and private lands. The CEA requirement is one of the only statutory or regulatory tools that forces federal agencies to take a large-scale look at their proposed actions, including the effects of activities on private land. As private timberland divestment and development becomes increasingly common, particularly in the West, consideration of the effects of these activities on public lands will only become more critical. To date, courts have yet to consistently enforce the aspect of the CEA requirement that emphasizes consideration of non-federal lands (Hartt, 2002). This aspect of CEA could prove enormously influential

⁹ David Seesholtz and Sharon Friedman, both USFS employees, suggested potential areas of research during conversations in June, 2007.

¹⁰ Michael Smith, *personal communication* (June 19, 2007).

but has yet to be implemented fully. However, as we will see, consideration of private lands has been a major issue in some recent CEA cases, such as *NRDC v. USFS* (2005).

CEA is also central to the controversy regarding the role of NEPA in forest planning, which is currently in a state of disarray. In 2005 the Bush administration promulgated new planning rules under the National Forest Management Act (NFMA) and suggested that National Forest plans would henceforth be categorically excluded from NEPA analysis.¹¹ These regulations were later enjoined, but the administration in 2008 finalized new planning rules that are nearly identical to the 2005 rules.^{12,13} When the current rules were proposed in 2007, the USFS emphasized that forest plans must become “more strategic”, “less prescriptive”, and “adaptable and based on current information and science.”¹⁴ Some consider the current rules to be a thinly disguised effort to shirk the responsibilities of complying with NEPA, while others acknowledge that the forest planning process needs to be rethought. The question of how and when to conduct CEA, whether it is at the plan or project level or in NEPA documents at both levels of planning, is representative of many aspects of the debate over the role of EIA in forest planning. Questions abound as to the importance of NEPA analysis in planning and decision-making, the appropriate scales of analysis, and the role of empirical information in forest planning.

These issues are particularly important in terms of wildlife analysis. In recent testimony to the House Natural Resource Committee on the current state of forest planning, Barry Noon, one of the foremost scientific authorities on biodiversity issues in

¹¹ 70 Fed. Reg. 1023 (Jan. 5, 2005).

¹² The 2005 planning rules were enjoined in *Citizens for Better Forestry v. USDA*. (N.D. Calif. No. C 05-1144 PJH, Mar. 30, 2007).

¹³ 73 Fed. Reg. 21468 (April 21, 2008).

¹⁴ 72 Fed. Reg. 48513, 48516 (August 23, 2007).

forest management, identified cumulative effects as one of the four most important aspects of NEPA analysis in forest management and one that is threatened by the proposed planning rules (Oversight Hearing, 2007). Furthermore, because the proposed regulations eliminate key provisions for species protection, Noon expressed serious concern about the future of biodiversity protection by the USFS. His testimony indicates that the issue of CEA as it is done for biodiversity is of utmost importance in the current debate over forest planning.

Also relevant to this study is the issue in National Forest management of excluding smaller projects from NEPA analysis. A recent GAO report found extensive use by the USFS of Categorical Exclusions, a tool under NEPA that allows an agency to exempt some smaller or less impactful actions from NEPA analysis (GAO, 2006).¹⁵ With numerous Categorical Exclusions of smaller projects and efforts to exempt forest plans from NEPA analysis, we might ask when the synergistic and large-scale effects of numerous agency actions will be analyzed. We could expect this to happen at the project level, but, as discussed earlier, it is questionable whether the project level is ideal for getting at synergistic effects of many actions. The question remains as to when and at what scale CEA should be undertaken. Meanwhile, the CEA in those EAs and EISs that are completed becomes more important when seen in this context.

1.4 Research Methodology

This section outlines the research objectives and protocol for this project, which considers the current state of CEA as done by the USFS with a focus on wildlife

¹⁵ GAO (2006) found that in the review period between 2003-2005 nearly 3/4th of vegetation management projects were categorically excluded under NEPA, accounting for almost half of the acreage treated.

analysis. In brief, the research provides a thorough review of the relevant case law and the legislative and administrative history behind the CEA regulation. This analysis sheds light on questions regarding judicial interpretations of the requirement and the legislative intent behind CEA as part of EIA. The other major piece of this research utilizes a case study of CEA on the Idaho Panhandle National Forest (IPNF) in order to look in detail at how CEA is currently done, strengths and weaknesses in the analysis, the effects of the judiciary and other political actors on CEA implementation, and impediments to improving CEA practice. The case study includes analysis of NEPA document and interviews with USFS personnel and other interested parties. The sections that follow discuss the project objectives, research questions, and protocol in detail.

Project Objectives and Research Questions

The broad objectives of this research are to answer the following questions:

- 1) What is the legislative and administrative history of the CEA regulation and how has it been interpreted and applied by the federal courts?
- 2) What processes, analytic tools, and sources of information does the Forest Service use for doing CEA for wildlife, and what does the analysis look like in NEPA documents?
- 3) What are the most important factors that affect CEA implementation?
- 4) How do various players define a successful CEA and what are some potential ways to improve how CEA is done in the future?

These main objectives can be broken down into more specific research questions that are answered at various stages of the research. Table 1.1 details how these research

questions relate to the objectives and the different phases of the research, which are described in more detail below.

Table 1.1 Objectives, Research Questions, and Research Approach

Objective 1: What is the legislative and administrative history of the CEA regulation and how has it been interpreted and applied by the federal courts?	
Research Questions	Research Phase
1.1: What is the legislative and administrative history of the CEA requirement and regulation (from 1969-2007)? How has the requirement been interpreted by the courts, USFS, and CEQ?	Review of legal case history, legislative and administrative records, and relevant academic literature. Interviews also shed light on this question.
1.2: How have the courts interpreted the CEA requirement specifically in the context of National Forest management? Has the judiciary been consistent in its interpretation of the requirement in the federal circuit courts?	Review of legal case history, legislative and administrative records, and relevant literature.
Objective 2: What processes, analytic tools, and sources of information does the Forest Service use for doing CEA for biodiversity, and what does this analysis look like in NEPA documents?	
Research Questions	Research Phase
2.1: Are the National Forests including CEA in all EAs and EISs and what does the analysis look like in NEPA documents (i.e. scale, empirical basis, predictive models, clear descriptions of effects)?	Document analysis.
2.2: What processes do the National Forests use in implementing the CEA requirement? How is CEA incorporated into the planning and decision-making processes? How does it affect decision-making substantively and/or procedurally?	Evidence of CEA's effects on decision-making in NEPA documents; interviews.
2.3: What information, analytic tools, and guidelines are available and incorporated into CEA? What guidance is available from the agency? What scientific tools and training are available?	Document analysis and interviews.

Objective 3: What are the most important factors that affect CEA implementation?	
Research Questions	Research Phase
3.1: What factors within the agency affect how CEA is done by the National Forests? Are there political and/or institutional impediments to implementation?	Interviews.
3.2: How do executive politics, such as budgeting or appointments, and Congressional input affect CEA implementation?	Interviews.
3.3: What has been the role of the judiciary in determining how CEA is implemented by the National Forests?	Case law analysis, document analysis, and interviews.
3.4: What has been the role of the public in affecting implementation of the CEA requirement, either through litigation or public comment?	Case law review, public comment on projects, and interviews.

Objective 4: How do various players define a successful CEA and what are some potential ways to improve how CEA is done in the future?	
Research Questions	Research Phase
4.1: How do various players define a “good” or successful CEA?	Interviews.
4.2: How might implementation of the CEA requirement evolve in the future? What are the perspectives of CEQ, higher-level decision makers in the USFS, and other interested parties?	Document analysis and interviews.
4.3: What could the agency be doing differently for CEA in terms of biodiversity, given the information and methods available? Are there exemplars from other agencies or organizations that can serve as useful models?	Interviews and literature review.

Research Approach

Because of the near absence of recent, policy-oriented research on CEA, particularly with respect to how it is done by the USFS, there are a number of different possible avenues for pursuing this topic. Intensive document analysis, a survey, or in-depth case studies all would be useful approaches with their attendant strengths and weaknesses. One option, for example, would be to conduct a broad-scale, qualitative, and empirical document analysis for a random sample of NEPA documents. While this approach would allow a researcher to answer a number of valuable questions, it also would be a limited approach in some ways. One could determine whether the agency is including CEA in all documents, for all resources, whether CEA is listed in the table of contents, etc., in a sort of accounting based on NEPA documents. However, such an approach would not provide insight into several compelling questions, such as whether the analysis utilizes up-to-date empirical information, what the role is of CEA in decision-making, and whether it captures important environmental issues or uses appropriate scales of analysis, according to different parties. Likewise, a survey might be useful for investigating issues such as whether the agency provides training and emphasizes the importance of CEA. However, without any clear sense of the current state of CEA, barriers to its implementation, or any definition of what constitutes an adequate or “good” CEA, a survey at this point would be premature and would fail to answer many of the research questions discussed herein.

In order to achieve the research goals discussed earlier, it is more useful to combine several research methods while focusing on a single case study.¹⁶ This research utilizes a single National Forest case study and combines traditional legal and policy analysis with document analysis and interviews. This makes it possible to provide a legal and administrative history of the regulation, an understanding of what is presented in NEPA documents, and an array of perspectives on the larger context of CEA practice.

A case study approach allows the researcher to investigate research questions in depth. The approach is also ideal for descriptive and exploratory studies that focus primarily on questions of “what” and “how” (Gerring, 2004). The obvious weakness of the approach is that the research will not be as representative of other National Forests as it might be with a broader research design. In this case, this trade-off is acceptable and warranted for several reasons. For one, previous policy-oriented research on CEA has been broader in scope and has not offered the intensive investigation undertaken in this research. In a situation such as this, when the research in the field includes very few in-depth studies, a case study is particularly justified (Gerring, 2004). For this specific topic, my goals of understanding the role of strict legal interpretations, identifying cutting-edge CEAs within the agency, looking to future possible changes to implementation, and revisiting a National Forest where science and biodiversity planning have historically been contentious, all provide justification for the use of an in-depth case study approach.

¹⁶ Gerring (2004) defines a case study as “an intensive study of a single unit for the purpose of understanding a larger class of (similar) units” (p. 342). Depending on the nature of the phenomenon of interest, a case study can be defined as anything from a nation-state to a person. In this case, I have chosen to define a single National Forest as a “case”, whereas in other research I might define a single EIS as a “case”.

This approach does not allow for findings that are entirely generalizable to all National Forests, but does reveal findings that are relevant in several ways beyond the single case study. Although the case law varies by region, all National Forests are bound by the same laws and regulations and are required by law to implement the CEA regulation. Therefore, many findings are relevant and informative for other National Forests, particularly those forests in the same Region or under the jurisdiction of the same courts. Other National Forests and Regions may benefit from research on how CEA is being done in other parts of the agency. Furthermore, research on CEA methods and processes, along with an understanding of how CEA for wildlife might develop in the future, is relevant for any group undertaking forest planning whether it is at the federal, state, or private level.

Finally, it is important to note that this research does not involve hypothesis-testing. Instead, the general logic of this study can be characterized as inquiry-guided, which relies on “the dialectic interplay of theory, methods, and findings over the course of a study” (Mishler, 1990, p. 416). In other words, all phases of the research build upon earlier phases of the study, and the research itself guides the final literature review. While I developed a conceptual framework before beginning the research in order to guide my inquiry, much of the discussion found in the following chapters includes literature that was accessed and included based on findings that emerged during the research process.

The Selection of the IPNF Case Study

Several factors, including the role of litigation and interest from outside groups in USFS activities inform the choice of the case study for this research. The Ninth Circuit hears the majority of cases for the USFS and is generally considered the most friendly to conservation interests (Smith, 2006). CEA litigation in the Ninth Circuit has increased in recent years, and federal agencies, particularly the USFS, have lost the majority of these cases. Most of these losses have revolved around National Forests in Region 1 (the Northern Region) of the USFS (Smith, 2006). Therefore, it is valuable to consider a National Forest from Region 1 in order to understand what CEA looks like in an area that has faced the strictest legal interpretation of the standard. The IPNF is the most obvious choice in Region 1 because of several recent landmark decisions on CEA and wildlife analysis involving this National Forest. Because of the attention paid to these issues in Region 1 and on that National Forest, we might expect the IPNF to be doing a particularly strong job with CEA. The following is a summary of the reasons why the IPNF is used as the case study for this research:

- It is in Region 1 and under the jurisdiction of the Ninth Circuit.
- The most recent and contentious CEA case lost by the USFS, *Lands Council v. Powell* (2004), involved a project on the IPNF. This case was precedent-setting in terms of CEA and drew specific response from CEQ as to the requirements of CEA. The case continues to be cited in public comment in many EAs/EISs in the region and also is cited as precedent in later CEA cases. It is critical to understand how this case has affected CEA for this National Forest and, by extension, other National Forests within the jurisdiction of the Ninth Circuit.
- *Lands Council v. Powell* (2004) also was contentious in terms of biodiversity planning, scientific uncertainty, and the use of up-to-date data and models. This research is an excellent opportunity to revisit the issues of scientific uncertainty and the role of science in biodiversity analysis and consider how these issues have evolved on this National Forest.

- In all EAs/EISs reviewed as part of my preliminary analysis, CEA was one of the primary aspects of NEPA analysis criticized by environmental groups. Many of these groups, including The Lands Council and The WildWest Institute, are actively involved in challenging National Forest management and bringing successful legal challenges against the USFS within the Ninth Circuit. Research on the IPNF allows for investigation into why the issue is so contentious in the area, a look at the effects of the comments and litigation brought by these groups, and consideration of perspectives from all players on how CEA is done and should evolve.
- CEA was a primary challenge in a more recent case on the IPNF, *Lands Council v. McNair* (2007). This case also dealt with standards of judicial review for agency science used in support of project analyses. The case is central to understanding current judicial standards for both science and wildlife analysis. Indeed, the subject matter of this case was so contentious that it was accepted by the Ninth Circuit for an *en banc* hearing at the request of the USFS (*Lands Council v. McNair* (2008)).

Research Protocol

This research included several phases of inquiry, which are described below in detail. A general overview of the entire research approach is provided in this section. Further detail, particularly on the case law analysis and the document analysis, is provided in subsequent chapters.

Legislative, Administrative, and Legal Case History

A primary phase of this research involved developing a history of the regulation, including when it came into law, how it is related to earlier NEPA guidelines and case law, and how it is related to the statute itself. For research of the legislative and administrative history of CEA, I used the Lexis-Nexis Congressional database, which includes Congressional hearings and documents, and literature from other sources, such as law review articles and publications on the history of NEPA. I also considered

sources of information or guidance on CEA that have been developed by CEQ and the USFS.

The overall goal of the case law review was to analyze some critical pieces of early NEPA case law that inform how CEA is done currently and then use that analysis to provide a broader context for an investigation of more recent CEA case law involving the USFS. Early case law was found through the WestLaw and Lexis-Nexis Academic databases and with the help of legal and policy literature on the history of cumulative effects and cumulative actions cases under NEPA. The development of the legal history of the requirement considered several critical cases from prior to 1998. These cases were relevant, for example, in terms of standards established with regard to agency discretion for deciding the scope and scale of NEPA or analytical requirements for cumulative or connected actions.

Beyond this general review of the background and relevant case law for understanding the CEA requirement, I completed a thorough review of all of the case law related to CEA involving the USFS at the circuit court level for the last ten years (1998-2007). This case law was found using WestLaw and Lexis-Nexis Academic and includes all published cases in which CEA was a major issue.

IPNF Document Analysis

The IPNF case study involved both a document analysis and series of semi-structured interviews with personnel on the IPNF, members of environmental groups who have participated in IPNF projects, scientists, and regional and national level staff with insight relevant for this study. The document analysis included timber-related

project EISs from 2002-2003 and 2006-2007. A primary goal was to familiarize myself both with the design of recent projects and the nature of the CEA in the NEPA documents for those projects. A familiarity with methods used to do CEA, along with information from public comments, gave me the necessary background in order to conduct the interviews. This allowed me to delve more deeply into questions of how the CEA is done, how it affects decision-making, and how various parties respond to criticisms of CEA practice.

Another major purpose of the document analysis was to document the nature of the CEA analysis in the EISs. For this secondary aspect of the document analysis, I utilized criteria developed by other researchers (Burris & Canter, 1997a; McCold & Holman, 1995) as checklists as I evaluated these documents. Examples of criteria included items such as: Is there a CEA for all resources?; Are predictions of cumulative effects supported by evidence?; Are past, present, and future actions identified?; Are activities on private land considered?; Is the scale of analysis explicit?; and, Does the scale of analysis vary by resource? These questions get at both the nature of the CEA documentation and the nature of the analysis. A thorough list of these questions was developed based on similar studies done in the past and is discussed in more detail in chapter three.

This checklist approach was not used to rank EISs in terms of quality, nor to provide a complete assessment of the quality or accuracy of the analysis. For instance, if I came across an EIS that reported no significant cumulative effects for a specific resource, it would be difficult for me to know if this was accurate. I could, however, document whether the statement was supported and explained in the EIS. In a study

similar to this, Burris and Canter (1997a) explain that this method does not allow a researcher to assess how well a CEA was done but can allow one to highlight general trends and/or deficiencies.

The document analysis also involved a more qualitative component. Based on criticism from the public and issues raised in litigation and appeals, I identified several important factors to look for in my review of the documents. For instance, I was interested in documenting the nature of the empirical and scientific information in CEA. A consistent criticism from the courts has been that agencies in their CEA describe the nature of alternatives rather than providing an analysis of effects. Therefore, I looked for evidence of this in the documents reviewed and pulled out relevant examples. For the wildlife analysis, I undertook a thorough, qualitative review of how the analysis was conducted and presented, in order to provide the reader with a comprehensive look at how CEA is done for wildlife and to set the stage for considering criticisms, strengths, and weaknesses of the current approach. Through the use of a checklist approach along with a qualitative investigation of the nature of CEA in these documents, I provide an empirical understanding of what the CEA looks like in the IPNF's recent EISs.

EISs were reviewed for 2002-2003 and 2006-2007. I chose to review EISs and not EAs for two reasons: EISs would include a more detailed CEA and would be done for those projects likely to have significant effects. The time frames were chosen so that I could 1) understand the current state of CEA practice on the IPNF; 2) familiarize myself with recent project analyses and public comments prior to interviews; and 3) compare EISs from before the *Lands Council v. Powell* (2004) decision and afterwards.

I considered projects that were classified as “fuels treatment” or “forest products” projects and made this choice for several reasons. The majority of USFS litigation historically has challenged logging projects (Keele et al., 2006), and it is these projects that are traditionally most contentious and viewed as being at odds with conservation interests. Furthermore, all of the CEA case law mentioned in this chapter, both at the district and circuit court levels, as well as the majority of the case law emphasized by Smith (2006) for the USFS involved timber-related projects. Therefore, I anticipated that timber-related projects in particular would involve detailed CEAs that might be particularly relevant for wildlife. Focusing on timber-related projects also served to focus my analysis, giving me some similarities between projects and effects in order to aid in my own comprehension.

Interviews on the IPNF and Beyond

This research also involved in-depth interviews with IPNF personnel and other parties interested and involved with CEA. The model for these interviews and analysis was informed in part by several other recent policy studies that focused on similar issues (Butler & Koontz, 2005; Pralle, 2006; Stankey et al., 2003). For example, Stankey et al. (2003) utilized literature review combined with in-depth interviews to investigate implementation of adaptive management by the USFS in the Northwest. Their project design and research questions, which focus on “what” and “how” questions in terms of agency implementation of a specific mandate, have much in common with this research approach. Their interviews were qualitative and semi-structured, which allowed them to create interview guides informed by their literature review as well as their review of

specific adaptive management projects, while also maintaining the flexibility for interviewees to guide the direction and depth of the interview based on their own perspectives.

The interview approach of this research was similar. The interviews were semi-structured and used an interview guide rather than an interview schedule. Interview guides were tailored to different parties according to their roles, and the questions asked were informed by the earlier phases of the research. For example, my review of the EISs allowed me to familiarize myself with projects occurring on the IPNF and to develop specific questions based on my reading of the CEA in NEPA documents and the agency's responses to the public comment therein. Based on my legal and administrative review I pursued topics that I identified as important based on agency documents, administrative records, plaintiff briefs, and other literature. The general interview guides I used for USFS and non-USFS personnel are included in Appendix A.

A consideration of question ordering and phrasing informed the development of the interview guide, but interviewees and I both guided the discussion and the amount of time spent on particular topics based on the individual's interests and areas of expertise. This semi-structured format allowed for the exploration of topics as they arose, providing an opportunity for interviewees to emphasize and focus on what they felt was most important, and also allowed for the revision and improvement of questions over the course of the research.¹⁷ Throughout the interviews, I would take the time to summarize, reflect, and clarify what the respondent had said in order to facilitate my own

¹⁷ These consideration follow the recommendations of Charmaz (1991) and Kvale (1983).

understanding and analysis.¹⁸ My goal was not to conduct identical interviews or minimize my role as the researcher. Instead, my role was interpretive in that I guided the interview, clarified responses, and interpreted aspects of the content.

Interviewees were chosen through both purposive and snowball sampling. In other words, I identified respondents beforehand based on my knowledge of their role in the CEA process and also asked interviewees for recommendations of other people I should talk to. On the IPNF, I interviewed forest-wide environmental coordinators, NEPA coordinators at the district level, project leaders, biologists, and line officers.¹⁹ At the regional level I interviewed regional biologists, NEPA appeals and litigation specialists, other NEPA specialists, individuals in the Office of General Counsel, and people with particular expertise in other areas, such as wildlife planning and monitoring. A number of members of environmental groups who have submitted comments or been involved in litigation on the IPNF were interviewed. This group included forest watch coordinators, NGO directors, attorneys, and scientists. A total of 31 individuals were interviewed for this project, and interviews lasted approximately one hour.

The USFS specifically requested that I not tape-record interviews with their staff. Given the ongoing litigation on the IPNF with regard to CEA, several USFS personnel at the Regional office, upon finding out about this work, expressed concern that I had conducted any interviews at all. Rather than tape-record, I took detailed notes during interviews and typed up these notes immediately following the interviews along with my own observations. For this reason, very few direct quotes are included as part of this analysis, and for the most part I focus on themes that were brought up repeatedly by at

¹⁸ For more on this approach, see Charmaz (1991).

¹⁹ Line officers are individuals with formal decision-making authority in the agency. At the National Forest level this would include district rangers and forest supervisors.

least several interviewees. Many of my questions required little interpretation and evaluation of meaning. For example, the response to a question such as “Was there monitoring data available for the CEA for this project?” was relatively straightforward. However, in my efforts to understand general barriers to CEA implementation, my interview analysis often involved looking at the interview as a whole for emergent themes. Individual interviews were analyzed for content, after which similar content and themes from different interviews was condensed and summarized.

1.5 Summary

This research answers a number of critical questions on a topic of great importance in National Forest management. The approach draws information and perspectives from multiple sources and allows for the development of in-depth and nuanced answers to the research questions. The ultimate goal of the research is to provide an analysis with findings that are clear and supported with data, to effectively synthesize the information from multiple sources, and to provide an overview of CEA practice that will have practical applicability to decision-makers.²⁰

The findings in the chapters that follow should help interested parties understand more about the current state of CEA, factors that affect implementation, and ways CEA might evolve in the future. The remainder of this document is organized as follows. Chapter two discusses the legal/administrative history of the CEA requirement and presents the findings of the case law analysis. The results of the document analysis are discussed in detail in chapter three. Although the document analysis entailed in-depth

²⁰ Patterson and Williams (2002) put forth three criteria for evaluating qualitative research. They are persuasiveness, insightfulness, and practical utility. I find these to be useful guiding concepts, particularly as they are defined therein, for a final research analysis.

consideration of the public comments on CEA in the EISs reviewed, I reserve my discussion of criticisms, strengths, and weaknesses of the IPNF's approach to chapter four, which is dedicated to a critical analysis of how CEA is currently practiced on the IPNF. Chapter four also looks at some broader themes that emerged from this research, including limitations to the way wildlife viability analysis is done, the need for increased monitoring of management actions, institutional factors affecting CEA implementation, and numerous impediments to improving the state of CEA and wildlife analysis in general. Chapter five then looks broadly at the major lessons of this research, recommendations, and some ways CEA might evolve in the future.

CHAPTER TWO: HISTORY AND LEGAL INTERPRETATION OF THE CUMULATIVE EFFECTS ANALYSIS REQUIREMENT

Cumulative effects analysis (CEA) has been part of National Environmental Policy Act (NEPA) documentation since the early days of the act's implementation. The legislative history of NEPA's passage indicates that cumulative impacts were always intended to be one of the central aspects of NEPA analysis. Regulations specifically emphasizing cumulative impacts were not written until 1978, but early case law and guidelines from the Council on Environmental Quality (CEQ) emphasized the need for CEA.¹ Although CEA has been an issue raised in litigation for decades, in recent years environmental plaintiffs have brought an increasing number of complaints regarding CEA against the U.S. Forest Service (USFS) and have met with considerable success in court. The requirement continues to be a controversial issue in National Forest management, and the judiciary is actively involved in defining the parameters of how CEA is implemented. The purpose of this chapter is to provide an overview of the origins of the requirement and how it has been interpreted by agencies and courts.

The chapter begins with a look at the history of CEA and how it fits into the broader concept of NEPA analysis. I consider CEQ's role in writing NEPA regulations and defining the baseline requirements of CEA. In section 2.2 I then discuss some important examples of how the judiciary interpreted the CEA requirement during the first three decades of NEPA implementation. The cases discussed, such as the U.S. Supreme Court decision in *Kleppe v. Sierra Club* (1976), are critical to understanding generally how agencies are required to approach CEA. In this section, I also explain how the

¹ The NEPA regulations at 40 C.F.R. §1500-1508 were first issued by CEQ in 1978 and became effective in 1979. The CEQ guidelines of 1973 were announced in 38 Fed. Reg. 20550 (August 1, 1973).

requirement is similar but distinguishable from other NEPA concepts such as connected and cumulative actions. In section 2.3 I discuss more recent cumulative impacts case law, covering in some detail the findings of recent studies that have examined the rise in CEA case law beginning in the late 1990s.

The remainder of this chapter is devoted to a review of all cumulative impacts case law from U.S. Circuit Courts involving the USFS over the last ten years (1998-2007). During this time the USFS saw a rise in challenges brought against them regarding the adequacy of their CEA. Section 2.4 analyzes these cases in detail, looking at the nature of the challenges and holdings by the federal appellate courts. The analysis is divided into sections according to the various types of CEA challenges in order to provide a sense of the major issues raised in court. For example, I consider CEA cases brought with regard to categorical exclusions, quality of scientific data, and scale of analysis.

The next chapter looks at how the USFS actually presents CEA in their NEPA documents, and that discussion focuses primarily on CEA for wildlife. In order to understand legal requirements for USFS wildlife viability analyses, the last section of this chapter discusses some of the cases that establish the requirements for how the USFS must analyze effects on wildlife species. A number of these cases also involve the issue of how courts review the scientific basis of agency decisions and effects analyses. Of late, these questions of scientific reliability and validity often are intertwined with questions about the quality of USFS wildlife analysis. In order to give the reader some background on these topics, Section 2.5 provides a primer on these issues through a

discussion of some Ninth Circuit cases that are key to contextualizing the discussion that follows in later chapters.

2.1 History of the CEA Requirement

The National Environmental Policy Act of 1969 (NEPA) was meant to alter agency decision-making by forcing agencies to explicitly consider the environmental effects of their actions and explain their choices on the public record. As law professor Bradley Karkkainen explains, "NEPA seeks to improve environmental outcomes by forcing comprehensive disclosure of expected consequences of agency actions" (Karkkainen, 2002, p. 903). However, the act does not require agencies to choose a more environmentally benign course of action nor does it specify how agencies should respond to environmental risk. Early Supreme Court interpretations of NEPA made it clear that the Act's requirements were primarily procedural and not substantive in nature.² Despite language in Section 101 of NEPA, which clearly states that the purpose of the Act is to protect the environment, the Court ruled that those statements do not require a particular response from agencies.³ Agencies are obligated to consider, document, and analyze potential environmental effects, but are not required to choose the most environmentally preferable course of action.

As mentioned in chapter one, forest policy professor Sally Fairfax (1978), writing several years after NEPA's passage, argues that although NEPA was supposed to lead to increased internal deliberation and transparency in the decision-making process, it had

² NEPA was established as a primarily procedural statute in *Strycker's Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223 (1980), and *Robertson v. Methow Valley Citizen Council*, 490 U.S. 332 (1989).

³ 42 U.S.C. §4331 (2000).

the unfortunate effect of drawing attention away from the more important task of reforming and clarifying agency mandates. The information disclosure required by NEPA certainly has resulted in more environmentally friendly decisions, but factors such as budgetary incentives, agency mandates, and bureaucratic inertia, according to Fairfax (1978), hugely influence how agencies make decisions. Also recall from chapter one that NEPA cannot be characterized as having a single intent and, in fact, incorporated a variety of goals. Some of the purposes behind NEPA include: clearer planning procedures, ecosystem-level analysis, exploration of alternatives in project design, and increased transparency, judicial oversight, and opportunities for public participation (Culhane, 1990).

A thorough analysis of NEPA and its effects is beyond the scope of this project, but it is against this backdrop that we must understand the CEA requirement. CEA is arguably fundamental to any NEPA analysis and can be understood as one facet of the synoptic planning requirements of NEPA. At the same time, when we ask how it was meant to alter agency decision-making, who it was meant to benefit, or, more simply, what was the intent of the CEA requirement, we have to recognize that there are no straightforward answers to these questions.

The Authority of CEQ and Early NEPA Regulations

The CEA requirement is found in the NEPA regulations promulgated by the Council on Environmental Quality (CEQ) in 1978.⁴ These regulations guide agencies in their preparation of environmental impact statements and compliance with Section 102 of

⁴ These regulations are found at 40 C.F.R. § 1500-1508 (2008).

the act.⁵ Sections 201-207 of NEPA outline the responsibilities of the CEQ, but nowhere in the act itself does it state that CEQ will interpret NEPA or promulgate any regulations.⁶ Its responsibilities as outlined in the act are, in part, "to formulate and recommend national policies to promote the improvement of the quality of the environment."⁷ CEQ's job is to assist the President in his assessment of the state of the national environment and to generally guide and shape national environmental policy.

Lynton Caldwell, one of the foremost scholars on NEPA and a principal architect of the act itself, explains that CEQ was located in the Executive Office of the President in order to assist the president in fulfilling his managerial duties vis-à-vis the federal agencies (Caldwell, 1998). Because NEPA was applicable to all federal agencies and its requirements cut across jurisdictional boundaries, CEQ would help to oversee and coordinate federal projects that affect the environment. CEQ also was to fulfill "an interpretative or quasi-adjudicative function" with regard to NEPA implementation and agency coordination (Caldwell, 1998, p. 39).

The CEQ regulations were written in accordance with these interpretive responsibilities under NEPA. While the legislative history indicates there was concern that agencies would not know how to write environmental impact statements (EISs), no specific provisions were included in NEPA for regulations that would guide agency compliance with section 102 (Caldwell, 1998). In 1973, CEQ issued guidelines to assist in the completions of EISs,⁸ and eventually, in 1978, as authorized by President Carter through Executive Order 11991, it issued regulations that provided clear requirements for

⁵ 42 U.S.C. §4332 is commonly referred to as section 102.

⁶ 42 U.S.C. §§4341-4347 (2000).

⁷ 42 U.S.C. § 4344 (2000).

⁸ 38 Fed. Reg. 20550 (August 1, 1973).

EISs.⁹ Caldwell (1998) explains that these regulations were meant to assist agencies in improving upon some of the "inexperienced fumbling attempts to meet the NEPA mandate" which were not uncommon during the first decade of NEPA compliance (Caldwell, 1998, p. 44). He also notes that regulations were developed with the cooperation of federal agencies and involved a thorough and unusually responsive dialogue between CEQ, federal agencies, and other interested parties.

In summary, although the act did not originally authorize CEQ to promulgate regulations, it appears that it was always assumed to be CEQ's role to interpret aspects of the act and coordinate activities across federal agencies. Given this coordinating role and the responsibility to promote a national environmental policy, it follows that CEQ was the appropriate body to take on the role of issuing regulations to clarify agency responsibilities under NEPA. The CEA requirement was made into formal administrative law with the writing of these regulations.

The CEA Requirement and its Derivation from NEPA

Because the cumulative effects requirement is so broad and difficult to comply with, one might ask whether the requirement follows logically from the language of the act itself or whether it is in any way a CEQ creation. In order to gain perspective on this question, it is useful to step back for a moment and consider some background on NEPA. For a number of reasons, including the emphasis on the need for both a long-term perspective on environmental effects and coordination across federal, state and private actors, the passage of NEPA was a monumental step in natural resource policy. As

⁹ 40 C.F.R. §1500-1508 were issued in 1978 and became effective in 1979. The NEPA regulations currently are found at 40 C.F.R. §1500-1508 (2008).

Senator Jackson, NEPA's primary sponsor in the Senate, put it, "[NEPA]...is in my judgment the most significant and important measure in the area of long-range domestic policymaking that will come before the 91st Congress. Without question, it is the most significant measure in the area of natural resource policy ever considered by the Congress."¹⁰

Indeed, the sweeping language of the Act gives testament to the grand vision of NEPA. The purpose of NEPA, as stated in the Act is: "To declare a national policy which will encourage productive and enjoyable harmony between man and his environment [and] to promote efforts which will prevent or eliminate damage to the environment and biosphere..."¹¹ And Section 101 of NEPA states:

[I]t is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.¹²

In the reports and debates that preceded NEPA's passage, Congress repeatedly emphasized that, in the pursuit of short-term and economic goals, the people of the U.S. had caused serious harm to the environment.¹³ A Senate report from the Committee on Interior and Insular Affairs, which unanimously sponsored and supported NEPA, states:

S. 1075 [the Senate version of the bill] is also designed to deal with the long-range implications of the crucial environmental problems which have caused great public concern in recent years. The principle threats to the environment and the Nations' life support system are those that man has himself induced in the pursuit of material wealth, greater productivity, and other important values. These threats...were not achieved intentionally. They were the spinoff, the

¹⁰ 115 Cong. Rec. (Senate) 19008, 19009 (July 10, 1969) (Remarks of Sen. Jackson).

¹¹ 42 U.S.C. §4321 (2000).

¹² 42 U.S.C. §4331 (2000) (commonly referred to as Section 101).

¹³ See for example, S. Rep. No. 296, 91st Cong., 1st Sess. 5 (July 9, 1969), 115 Cong. Rec. (Senate) 19008 (July 10, 1969), 115 Cong. Rec. (House) 26569 (September 23, 1969), and H. Rep. No. 378, 91st Cong., 1st Sess. (July 11, 1969).

fallout, and the unanticipated consequences which resulted from the pursuit of narrower, more immediate goals.¹⁴

In this way, the legislative history of NEPA indicates Congress' desire to improve upon the mistakes of the past by looking beyond incremental decision-making by independent government agencies to consider long-term and cumulative effects. As Senator Jackson explains in a 1969 Senate Committee report:

As a result of [the] failure to formulate a comprehensive national policy, environmental decisionmaking largely continues to proceed as it has in the past. Policy is established by default and inaction. Environmental problems are only dealt with when they reach crisis proportions.... Important decisions...continue to be made in small but steady increments which perpetuate rather than avoid the recognized mistakes of previous decades.¹⁵

Part of the intent of NEPA, then, was to force federal agencies to look beyond the immediate effects of their projects and their own jurisdictional boundaries and provide a larger-scale analysis of their contribution to the state of the environment. Debate in the House in particular emphasized the need for coordination across federal agencies, and consideration of the activities by state, local, and private entities.¹⁶ Others in the House described the need for in-depth and broad scale study of the ecological effects of projects over both the long and short term.¹⁷ Such comments in the House focused primarily on

¹⁴ S. Rep. No. 296, 91st Cong., 1st Sess. 5 (1969). This report is also published in full at: 115 Cong. Rec. (Senate) 19008 (July 10, 1969) as part of a Senate floor debate on bill S. 1075 (the Senate version of NEPA).

¹⁵ S. Rep. No 296, 91st Cong, 1st Sess. 5 (1969), p.5.

¹⁶ See, for example, remarks by Representative Pelly in a House debate on NEPA found at 115 Cong. Rec. (House) 26569, 26574 (Sept. 23, 1969). Pelly stated that current institutions "cannot accomplish the task of coordinating the activities and often conflicting interests of our Federal agencies, State and local governments, and private industry."

¹⁷ See, for example, remarks by Representative Leggett in the House debate on NEPA found at 115 Cong. Rec. (House) 26569, 26584 (Sept. 23, 1969). Leggett explained, for example, "When a Federal project, such as the Peripheral canal project, irreversibly changes the ecology of a vast region there needs to be in depth study of the total environmental effects of such a program." He also stated, "There is a definite need for a consistent and expert source of review of national policies, environmental problems and trends, both long and short term."

the importance of CEQ, which, once established, guided the agencies to participate in the consideration of long-term effects across jurisdictions.

The notion of CEA also follows from other language in the Act itself. Under Section 102 of NEPA, agencies must report on "the environmental impact of the proposed action" and "any adverse environmental effects which cannot be avoided should the proposal be implemented."¹⁸ The act also specifies that the EIS should discuss "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity."¹⁹ It is implied that the scope of an EIS is meant not only to consider the immediate effects of a project but also how it might impact the environment in the long-term, through indirect or cumulative effects with other projects.

Admittedly, the precise terminology of "cumulative impacts" is not found in the legislative hearings that preceded NEPA's passage. However, the cumulative effects requirement represents some of the core goals of NEPA: to consider long-term environmental effects, look beyond incremental decision-making, and consider the effects of the actions of multiple actors. When seen in concert with the sweeping environmental goals articulated in the statement of purpose and Section 101 of NEPA, the language in Section 102, and the legislative history of NEPA, CEA is a logical interpretation of the act itself and is not misrepresentation of intent beyond what is articulated in the statute. Furthermore, the CEA requirement was a codification of NEPA common law that had been established during the 1970s, as is discussed further in the following section. CEQ guidelines also emphasized the importance of cumulative

¹⁸ 42 U.S.C. § 4332(C)(i) and (ii) (2000).

¹⁹ 42 U.S.C. § 4332(C)(iv) (2000).

impacts as early as 1973. Therefore, when the CEA requirement was included in the 1978 regulations, it was nothing new or novel.

What Does the CEA Requirement Entail?

CEQ regulations require the consideration of three kinds of impacts: direct, which happen at the same place and time as the project, indirect, which result from the project but occur at a more distant place and/or time, and cumulative impacts.²⁰ The regulations further recommend that agencies analyze in concert proposed projects that could be considered “cumulative actions” and include analysis of these projects in the same EIS.²¹ The message from CEQ is consistent: agencies should analyze the effects of their projects not only in isolation but also with a look at their cumulative effects with other activities.

However, despite the consistent message as to the importance of CEA, there has remained a considerable lack of understanding and compliance with regard to the cumulative impacts requirement. For example, studies conducted in the mid- and late nineties indicated that less than half of the EAs reviewed contained any cumulative impacts analysis (McCold and Holman, 1995). Those that did contain a section on CEA often concluded that there were no cumulative impacts from the proposed actions and provided no supporting evidence or analysis. Professor Michael Smith writes, “In the 15-year period following the release of the 1979 version of the CEQ Regulations, cumulative impact analyses were often ignored or given very little attention in many agency NEPA documents, and court cases challenging cumulative impact analyses became increasingly common” (Smith, 2006, p. 229). He goes on to explain that during the nineties, “A

²⁰ 40 C.F.R. § 1508.25(b)(3)(c) (2008).

²¹ 40 C.F.R. § 1508.25(a)(2) (2008). The difference between cumulative effects and cumulative actions is explained in more detail in section 2.2 below.

general consensus emerged that there was a lack of a clear definition of exactly what a cumulative impact analysis was supposed to cover, along with proper procedures to follow in preparing one” (Smith, 2006, p. 229).

In response to this confusion, in 1997 CEQ published a handbook to cumulative effects analysis entitled "Consider Cumulative Effects Under the National Environmental Policy Act." This handbook does not have the force of law but is often referred to as the primary guide for federal agencies and their preparation of cumulative impacts analyses. Because the CEA requirement seems hugely comprehensive in scope and practically unmanageable if it were to be done for every project, we might look to CEQ's handbook for clarification of what is required in a CEA.

CEQ emphasizes that CEA is a crucial aspect of environmental impact analysis, and one that has only become more important over time. The handbook elaborates on this point and states:

Evidence is increasing that the most devastating environmental effects may result not from the direct effects of particular actions, but from the combination of individually minor effects of multiple actions over time.... The fact that the human environment continues to change in unintended and unwanted ways in spite of improved federal decision-making resulting from the implementation of NEPA is largely attributable to this incremental (cumulative) impact (CEQ, 1997a, p. 1).

In these statements the CEQ handbook echoes the concerns of Congress in enacting NEPA and emphasizes the continued importance of CEA analysis for meaningful NEPA compliance.

The most difficult aspect of CEA, the handbook goes on to explain, is defining the scope of the analysis. If it is too large the CEA analysis will become "unwieldy"; if it is too small the analysis will miss important considerations. It goes on to emphasize the role of "scoping" in helping the NEPA practitioner to identify potential cumulative

effects and properly define the boundaries for each resource considered. CEQ points to tools such as GIS mapping and monitoring data on ecological indicators to help practitioners determine cumulative effects.

In the handbook CEQ discusses the importance of considering each resource in turn at the appropriate scale and focusing on effects that are "meaningful" (defined by whether the effects are of interest to affected parties). It also acknowledges that effects almost always will have to be considered beyond political and administrative boundaries. Clearly, the NEPA practitioner has her hands full: she has to figure out what effects are meaningful and worthy of analysis, what is the relevant scale of analysis for each resource (and the scale might be different for every resource), and facilitate the completion of an analysis that will require data and information from numerous sources, potentially across many jurisdictional boundaries.

From the looks of the guidance in this manual, CEA is a huge task. The CEQ handbook provides an list of activities that would have to be considered for a CEA for a BLM mining project, and no less than 26 public projects involving four agencies and 12 environmental issues are listed as relevant. Is this really what is required for every EIS? And if so, how is accomplishing this possible? We might assume that such large-scale analysis would be handled or assisted by a programmatic EIS.²² However, this is not always the case, as we will see, because CEA often is reserved for the project-level analysis when the nature of actual activities is more clearly defined. Perhaps an agency like the USFS has adequate and up-to-date monitoring data and ecological models so that

²² By a "programmatic EIS" I mean one that might accompany a regional planning effort, such as a BLM resource management plan or USFS forest plan. Other programmatic EISs include those that would accompany a forest-wide travel management plan or a region-wide species management strategy.

any proposed project can be analyzed as part of an ongoing cumulative effects assessment. However, this seems unlikely given that several experts point to the lack of monitoring data as a serious weakness of federal agencies' compliance with NEPA (Bear, 2003; Karkkainen, 2002).

CEQ offers some consolation to the NEPA practitioner by saying that she should aim "to focus on important cumulative issues, recognizing that a better decision, rather than a perfect cumulative effects analysis, is the goal..." (CEQ, 1997a, p. vii). In other words, an important question is whether additional analysis will inform the alternatives analysis and help the decision-maker with the decision at hand. A CEA is not necessarily about providing a perfect analysis for each resource, and this reminder should help practitioners understand how to limit a CEA. Also, it is critical to recognize that NEPA imposes no requirement to generate new information. Therefore, if the information needed for a cumulative effects analysis is not available, planners do not have to design scientific models or conduct new research. As Thatcher (1990) explains, "Reasonable efforts to acquire knowledge must be made...and gaps in our understanding must be admitted and their significance explained" (p. 644). The agency has the difficult task of collecting what information is available but has no obligation to generate new information.

Despite the publication of the CEQ handbook, according to Smith (2006), there still exists considerable confusion as to how to conduct a cumulative impacts analysis. He reports that in a recent survey of NEPA practitioners, training for cumulative impacts analysis was identified as one of the most critical areas where more training is necessary (Smith, 2006). Several authors have indicated that CEA case law sends mixed signals

and that the courts do not always enforce all aspects of the CEA requirement, although this is to be expected to some extent given that courts make decisions based on the specific facts of particular case (Caldwell, 1998; Hartt, 2002; Thatcher, 1990). Overall, however, it seems there is still a lack of clarity on the legal requirements and processes for completing a CEA.

2.2 An Overview of Early CEA and CEA-Relevant Case Law

Cumulative effects analysis has been an aspect of NEPA implementation since the early 1970s, and federal courts have required that agencies perform CEA since as early as 1975. This section considers important examples of CEA case law from the 1970s through the early 1990s and also explores how the courts have ruled on related issues, such as that of cumulative actions.

Cumulative Actions, Connected Actions, and Cumulative Impacts

In the years after NEPA's passage, common law played a significant role in fleshing out the requirements of the act. In 1976, in one of the most important, early NEPA cases, Supreme Court Justice Marshall wrote, "[T]his vaguely worded statute seems designed to serve as no more than a catalyst for development of a 'common law' of NEPA. [T]he courts...have created such a 'common law'. Indeed, that development is the source of NEPA's success."²³ When CEQ promulgated formal NEPA regulations in 1978, those regulations generally reflected the trends from NEPA common law up

²³ *Kleppe v. Sierra Club*, 427 U.S. 390, 421 (1976).

until that point (Thatcher, 1990). Therefore, it is useful to look at early NEPA case law, which provides the foundation for how the CEA requirement has been interpreted.

There are a number of requirements under NEPA that force agencies to consider environmental effects from multiple projects in concert. One of these, of course, is the CEA requirement. However, cumulative actions and connected actions requirements also demand an evaluation of effects beyond the level of a single project. In many cases, even today, courts deal with the question of which of these cumulative effects requirements is triggered. Is the issue at hand one of connected or cumulative actions, in which case a single programmatic EIS is required? Or is this a case requiring analysis of cumulative effects of multiple projects, for which a programmatic EIS is not necessarily required? These regulatory requirements are closely related and get at the same underlying goal of inter-project analysis. For this reason, and because some of the relevant legal standards are applicable across these different requirements, a brief review of the case law on all three issues is necessary.

The first cumulative effects case heard by a federal appellate court was *Natural Resource Defense Council, Inc. v. Callaway* (1975), which involved an Army Corps of Engineers proposal to dump waste off the coast of Connecticut. The Corps conducted its EIS as if its project could be analyzed in isolation, despite the existence of several other pending proposals for projects by other entities, both private and public, that would dump waste at or near the same site. The court required that the Corps consider the impact of its proposal when seen in concert with similar proposals and actions by other parties. In essence, the court required a cumulative effects analysis. According to Thatcher (1990), the decision was based in large part on the legislative history of NEPA and “pushed

NEPA law in a new and logical direction” (p. 614). The requirements set forth by the court by today’s standards are relatively mundane and are now accepted as basic CEA practice; however, at the time, the decision sent an important message that CEA must be included in environmental impact analysis.

A year later, an important and still oft-cited NEPA case, *Kleppe v. Sierra Club* (1976) (hereinafter *Kleppe*), was decided that dealt with the question of cumulative actions. At issue in this case was a decision by the Department of the Interior not to prepare a programmatic EIS for coal-related projects in the Northern Great Plains region. The plaintiffs contended that the projects should have been considered cumulative actions, which are defined in the regulations as actions that, “when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.”²⁴ However, the U.S. government argued that the other projects had not been formally proposed and were not part of a single, comprehensive coal-development strategy. The U.S. Supreme Court sided with the government, ruling that agencies only are required to prepare a programmatic EIS when multiple proposals are pending review for the same region and could be considered cumulative actions. Importantly, according to the decision in *Kleppe*, these actions must have ripened into actual proposals for a programmatic EIS to be required, although it can be difficult to pin down exactly when a proposal has been made formal.²⁵ Additionally, the agency is entitled to deference in deciding how the region is defined and what projects are included in a programmatic EIS.

²⁴ 40 C.F.R. § 1508.25(a)(2) (2008).

²⁵ Justice Marshall wrote a compelling dissent in this case as to why this decision limits the impact of NEPA. By not requiring work on an EIS before a formal proposal is made, argued Marshall, the Court seriously limited the effects of NEPA, which was meant to inform agencies in the course of developing a proposal.

While *Kleppe* speaks to the analysis of cumulative actions under NEPA, it does not specifically address the analysis of cumulative effects. Again, these are two different concepts in the CEQ regulations, although they clearly share the goals of inter-project and regional analysis. We can understand this distinction more clearly by looking at the Sierra Club's claims in *Kleppe*. The Sierra Club was interested in forcing the agencies to conduct a region-wide analysis of the effects of coal development in the region. Legally, there were at least two ways the Sierra Club could have approached this problem.²⁶ The Sierra Club's approach was to challenge the decision not to prepare a programmatic EIS. Because the Court decided that only actual proposals must be considered in a programmatic EIS, and there was no pending proposal for a regional coal-leasing program, the Sierra Club lost the argument for a programmatic EIS.

However, another tactic would have been to challenge the adequacy of the cumulative effects analysis in a single EIS. The Court explained this in *Kleppe*, writing that the Sierra Club's claims could have been understood as "an attack on the sufficiency of the impact statements already prepared...on the coal-related projects that the [agencies] have approved..." (p. 408). However, it goes on to explain that it cannot consider the adequacy of any EIS as "the case was not brought as a challenge to a particular impact statement" (p. 408). Thus, this case did not directly address cumulative impacts analysis in a single EIS but, instead, addressed the issue of cumulative actions.

The distinction between cumulative actions and cumulative effects is crucial. Thatcher (1990) highlights the following excerpt from *Oregon Natural Resources*

²⁶ This analysis draws upon that of Thatcher (1990) and of the Court in *Kleppe*.

Council v. Marsh (1987) as a useful clarification of the distinction between the two concepts:

The “cumulative impact” regulation requires the Corps to evaluate “the incremental impact of the action when added to other past, present, and reasonably foreseeable actions.” 40 C.F.R. § 1508.7. Although the CEQ guidelines require that “cumulative actions” be considered together in a single EIS, 40 C.F.R. § 1508.25(a)(2), and “cumulative actions” consist only of “proposed actions,” this does not negate the requirement of 40 C.F.R. § 1508.7 that the Corps consider cumulative impacts of the proposed actions which supplement or aggravate the impacts of past, present, and reasonably foreseeable actions (pp. 1497-1498).²⁷

In other words, cumulative impacts analysis requires the consideration of the effects of multiple projects in concert even if a single programmatic EIS is not required for those actions. CEA is also not limited to proposed actions but may include other reasonably foreseeable actions. In summary, because a court has limited power to require a cumulative impacts analysis in the shape of a programmatic EIS, cumulative impacts analysis in a single EIS is one place where agencies can be legally required to look at the broad-scale impacts of their actions in concert with foreseeable future actions that have not yet ripened into formal proposals.

One other important lesson relevant for CEA should be taken from *Kleppe*. The Court made it clear that reviewing courts would defer to agency expertise when it comes to deciding the appropriate scale of an analysis. This does not mean that an agency can arbitrarily define the scale of analysis in a project-specific or programmatic EIS. However, if it provides a reasoned explanation justifying its choice, a reviewing court will defer to the agency’s judgment, even if the court believes a better choice might have been made.

²⁷ *Oregon Natural Resources Council v. Marsh*, 832 F.2d 1489, 1497-1498 (9th Cir. 1987).

The decision in *Kleppe* was somewhat ambiguous in several other areas. For example, the Court indicated that an agency is entitled to discretion in deciding when a programmatic EIS is necessary, leaving open the question of whether an agency could go forward with several projects that might be part of a larger set of cumulative actions, without preparing an EIS before beginning *any* of the projects. In *Connor v. Burford* (1988) the court dealt with precisely this issue. In that case the court required the Bureau of Land Management (BLM) and USFS to prepare an EIS on oil and gas leases in the Flathead and Gallatin National Forests. All of the leases were approved at the same time, although the lessees had not yet developed site-specific proposals. The court reasoned that the agency could not approve some leases and prepare an EIS later because the agencies might miss the point where cumulative impacts became significant. Although the Supreme Court stated that courts would defer to an agency's discretion in deciding the timing of a cumulative actions EIS, the court in this case found that the agency's failure to undertake such an analysis prior to any action unjustifiable. This case illustrates the difficulty in understanding, in terms of legal requirements, exactly when a planned action might be considered a formal proposal and at what point the cumulative actions requirement might be triggered. There is no hard and fast rule as to when a programmatic EIS is required, and courts will rule differently on this matter depending on the specific of the case at hand.

Also related to CEA is the idea of connected actions. When multiple projects are connected, an agency must analyze the cumulative effects of those projects in a single

EIS, even if not all of the connected actions have ripened into obvious proposals.²⁸ The Ninth Circuit’s ruling in *Thomas v. Peterson* (1985) is a classic example of a case of connected actions. In this case, the USFS prepared an environmental assessment (EA) on a road that would be used for timber harvest. The agency analyzed the effects of the road in isolation, concluding that it would have no significant impact, and did not include the effects of the planned timber sale in the EA. The court ruled that the agency could not analyze the effects of a road built for timber sale without also considering the effects of the timber sale at the same time, since the actions were clearly connected. Courts generally use the “independent utility” test to determine whether separate actions should be consider connected. If a single action does not necessarily trigger another and has a utility apart from another action, a court will not consider the two actions connected.²⁹ The analysis of connected actions is another way courts can require the analysis of cumulative effects of multiple but interdependent projects.

CEA-Specific Case Law in the 1980s and Early 1990s

In the decades after NEPA’s passage, the appellate courts decided a number of cases that established CEA as a clearly enforceable requirement in NEPA analyses. Recall that in 1975 the Second Circuit made clear that CEA was a binding requirement in *Natural Resource Defense Council, Inc. v. Callaway* (1975). A Fifth Circuit decision, *Fritiofson v. Alexander* (1985), dealt with an Army Corps of Engineers’ EA for the

²⁸ Connected actions are defined in CEQ regulations as actions which “(i) Automatically trigger other actions which may require environmental impact statements[;] (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously[;] (iii) Are interdependent parts of a larger action and depend on the larger action for their justification.” 40 C.F.R. § 1508.25(a)(1)(i)-(iii) (2008).

²⁹ See also *Native Ecosystem Council v. Dombeck*, 304 F.3d 886 (9th Cir. 2002).

approval of a permit to fill a portion of a wetland on Galveston Island in Texas. The loss of the wetland from the permit area alone was not considered biologically significant, but when seen in concert with foreseeable broader scale development on the island implicated more significant effects. The court's decision is a little confused, but it held that the Corps must analyze the cumulative effects of their actions in concert with reasonably foreseeable future actions involving wetland development, even when future actions had not ripened into specific proposals. As an aside, in terms of forest management, the precedent set in this case is interesting to consider in terms of proposed land exchanges or road easement decisions that might have an impact on the pace of private timberland divestment and development. Given the precedent set in this case, the agency might have to consider the potential long-term effects of their actions on private timberland slated for harvest and the potential for subsequent residential or commercial development.

Other appellate court cases sent a similar message to the agencies regarding the CEA requirement. In *LaFlamme v. FERC* (1988) the Ninth Circuit required that the Federal Energy Regulatory Commission assess the cumulative impacts of all proposed and existing projects in a watershed and ruled that it was insufficient to consider the effects of single projects in isolation. In an early challenge to the geographic scale of a CEA, the D.C. Circuit ruled in *NRDC v. Interior Department* (1988) that Interior was required to consider cumulative impacts to migratory whale and fish species resulting from multiple off-shore oil and gas projects in both the Pacific and Alaskan regions. According to Thatcher (1990), cases such as this, involving effects to a target resource, such as a specific species, or effects to a distinct geographic area, generally have been

more compelling to reviewing courts than more general “bigger is worse” claims in terms of cumulative effects challenges.

In *City of Tenakee Springs v. Clough* (1990) (hereinafter *Tenakee Springs*), which dealt with a timber sale contract in the Tongass National Forest, the court addressed several aspects of the CEA requirement. First, it held that the agency was required to analyze cumulative effects of the current proposed sales in concert with reasonably foreseeable future sales (in this case these sales had already been announced by the agency through published notices of intent). The agency also could not disaggregate their analysis area-by-area as to avoid considering cumulative impacts.

In response to the court’s clear requirement of a CEA, the USFS explained that it had already analyzed cumulative impacts in its 1979 forest plan. The court found this argument disingenuous for several reasons. For one, the agency was required to analyze cumulative impacts on subsistence users, in accordance with the Alaska National Interest Lands Conservation Act of 1980, which was passed *after* the forest plan was completed. Secondly, the court found the forest plan EIS to be quite general with no site-specific analysis of the timber harvesting projects at issue. The agency then tried to argue that it would perform a CEA in the upcoming revision of the forest plan. However, the court held that NEPA clearly requires an analysis of effects *before* a planned action is undertaken. Therefore, the agency could not wait to conduct its CEA in an upcoming plan revision. The court concluded that the lack of CEA in the EIS under review could not be justified without consideration of other current and foreseeable projects, nor could the CEA in the forest plan EIS substitute for analysis at the project level.

Tenakee Springs (1990) is a good example of what several authors have referred to as a “shell game”, by which an agency justifies a lack of NEPA analysis in one document by suggesting that it will be or has been done in another NEPA document (Feller, 1995; Nie, 2006). For example, in justifying the absence of CEA in a project-level EIS, an agency might claim that it either already analyzed cumulative impacts at the plan level, or that it will do so in an upcoming plan. Alternatively, an agency might defend a lack of cumulative effects analysis in a programmatic EIS by explaining that it will conduct the CEA at the project level. But when pushed at the project level, the USFS often claims that certain types of analyses are beyond the scope of project level analyses. As we will see, an agency does have some leeway to decide the appropriate timing of a CEA. However, courts have not been blindly deferential in this area and generally require some sort of CEA at *both* the programmatic and project levels.

An important Ninth Circuit case from the early 1990s that dealt with the CEA issue at the plan level was *Resources Limited v. Robertson* (1993) in which the plaintiffs challenged the Flathead forest plan EIS. The plaintiffs argued that the agency should have analyzed the effects of non-federal actions as part of the plan’s CEA, but the agency responded that it did not need to analyze non-federal actions because such actions are out of the agency’s control. The court made it clear that a forest plan EIS (a programmatic NEPA document) must include a CEA and that to exclude non-federal actions from a CEA is contrary to the plain meaning of NEPA regulations. However, the court also acknowledged that it is not entirely clear whether this aspect of a CEA, that is, the analysis of private land activities, must occur at the programmatic level. It held in this case that the agency did not have to analyze non-federal cumulative impacts “on the

condition that the Forest Service must analyze such impacts, including possible synergistic effects from implementation of the Plan as a whole, before specific sales” (*Resources Ltd. v. Robertson*, 1993, p. 1306). Given the facts of this case, the court decided that the best time to analyze cumulative impacts of activities on non-federal lands would be at the project level. Nonetheless, this case is often cited in reference to the clear requirement for a CEA in a forest plan EIS. Based on this case and others described later in this chapter, it is generally expected that courts will look for some degree of CEA at both the project and plan level.

Based on the first two decades of CEA case law, Herson and Bogdan (1991) conclude that by the early 1990s the CEA requirement under NEPA had been established as a legally enforceable requirement. Writing in the early 1990s they conclude, “[T]he courts appear ready to reject NEPA documents (both [EAs] and EISs) on the grounds of inadequate cumulative impact analysis” (Herson and Bogdan, 1991, p. 106). Particularly, agencies had been required to analyze similar actions in close proximity, foreseeable future actions, and in some cases even nonfederal actions outside of their control (Herson & Bogdan, 1991). As part of the recommendations to practitioners, Herson and Bogdan (1991) emphasize that agencies must be particularly careful not to improperly segment connected actions or ignore similar actions in the same region that are under the agency’s control. Courts will not expect the unreasonable, however, and will defer to an agency’s CEA if the analysis was reasoned and demonstrated a good faith effort at NEPA compliance. As we will see, more recent case law reviews reiterate essentially the same message to agency NEPA practitioners.

2.3 Recent CEA Case Law in the Ninth Circuit

A review of Ninth Circuit CEA case law from 1995-2004 found that the number of cases involving federal agencies and CEA challenges has been on the rise in recent years (Smith, 2006). In Smith's (2006) look at CEA case law, he found that nearly half of the published cases involving cumulative effects had been decided in the last three years of his analysis period (2002-2004) and that plaintiffs met with more success in those years than in previous years. The majority of these cases involved the USFS, which lost 69% of the published cases decided by the Ninth Circuit over the ten-year period. Smith (2006) explains that the most common challenge to CEAs and the most common reason agencies lost in court was an inadequate analysis of past, present and reasonably foreseeable future projects. Agencies also lost a number of cases because their CEAs lacked supporting data or rationale.

Despite the agencies' losing record, however, Smith (2006) concludes that the court does not expect the impossible. He writes:

[I]n nearly all cases [the agencies] are not losing these court cases because their cumulative impact analyses are not perfect, but rather because they either have *no cumulative impact analysis at all in their NEPA document; they leave out obvious or critically important other past, present, and especially reasonably foreseeable future projects in their analysis area; or the analysis consists solely of undocumented assertions/conclusions of no impacts without any supporting analysis or rationale to back up that claim* (Smith, 2006, p. 238, emphasis in original).

Based on his analysis, Smith (2006) offers several recommendations for practitioners. Agencies must document other relevant projects in their CEAs, support their claims with data and reasoned analysis, make a good faith attempt to comply with NEPA (but also know that the court does not expect perfection), and be careful not to tier to non-NEPA documents or programmatic EISs with no site-specific information. He

concludes that there is little evidence that the court is pushing the requirements of NEPA in new directions or requiring more than was intended by Congress and CEQ (although he suggests that *Lands Council v. Powell*, a case from 2004 discussed in further detail below, may be an exception).

One issue to consider is whether CEA challenges have been on this rise in the Ninth Circuit because the court has become relatively more sympathetic to plaintiffs on this issue over the years. In fact, there is some indication that the court in the CEA cases from 1998 was relatively more favorable towards plaintiffs challenging timber sales. In her analysis of Ninth Circuit case law involving timber sales in the 1990s, Brown (1999) writes that the court in three CEA/USFS decisions in 1998, *Neighbors of Cuddy Mountain v. USFS* (hereinafter *Neighbors I*), *Idaho Sporting Congress v. Thomas*, and *Blue Mountains Biodiversity Project v. Blackwood* (hereinafter *Blue Mountains*), engaged in particularly factual and meaningful review of the basis of USFS decisions. In cases prior to 1998, Brown (1999) explains, the Ninth Circuit had failed in a number of cases to closely examine the details of agency decisions and had essentially denied plaintiffs any meaningful judicial review of the issues raised. The court's more careful review in *Neighbors* and *Blue Mountains*, she argues, "represents the proper application of the arbitrary and capricious standard" (Brown, 1999, p. 681). She argues that in *Neighbors* and *Idaho Sporting Congress v. Thomas*, "[T]he court did not unquestioningly resort to deference to agency decision making, but instead looked at the facts alleged to support the Forest Service's conclusions. This is factually informed judicial decision making, which properly balances the agency's hard look burden and discretion with the prerequisites of the law" (Brown, 1999, p. 661). According to Brown (1999) these cases,

represented something of a judicial course correction, away from cases in previous years when the Ninth Circuit had been overly deferential, and towards the proper application of standards of judicial review.

As discussed earlier, prior to 1998 the Ninth Circuit had established the CEA as an enforceable requirement of NEPA. However, Brown (1999) argues that the 1998 decisions signaled that the level of scrutiny applied to agency decisions might be significantly ratcheted up in the future. Considering that all three of those cases dealt with CEA challenges and that the analysis was ruled inadequate in all cases setting important precedent in terms of CEA standards, it is very possible that the Ninth Circuit post-1998 became a more favorable environment for plaintiffs bringing CEA challenges against the USFS.

2.4 Case law from 1998-2007 involving the USFS and CEA

This analysis takes a similar approach to Smith's (2006) study, analyzing CEA case law for a ten-year period (1998-2007), but with a specific focus on USFS case law and a look at all federal circuit courts. Circuit court cases were chosen to limit the scope of the analysis and because, as Smith (2006) explains, "Appeals Court cases...usually end up being the final word on most NEPA issues" (p. 229). The Supreme Court hears very few NEPA cases, leaving the circuit courts to flesh out the details of NEPA compliance.

Methodology

Cases were identified for the years 1998-2007 by searching both Lexis-Nexis and WestLaw for any cases containing the phrases “cumulative impacts” or “cumulative effects” and in which the USFS was a primary defendant.³⁰ Only published opinions, which are selected for publication because they set legal precedent, and those involving CEA challenges under NEPA were included in the sample. The search yielded 19 cases for the ten-year period, with 16 in the Ninth Circuit, three in the Tenth Circuit, and no published opinions on the CEA issue from any other Circuit Court. The three Tenth Circuit cases are from 2006 and 2007 only. In the Ninth Circuit, cases were identified in all years except 2001 and 2002, and there was no discernable trend in the number of cases involving CEA and the USFS over the analysis period. The agency faced anywhere from 0-3 challenges per year, with an average of 1.5 cases per year over the 10-year period. Table 2.1, included at the end of this chapter, provides an overview of the cases analyzed by year along with the court’s decision on the CEA challenge.

Results

In the CEA cases identified in the Ninth Circuit, the USFS’ lost 12 of the 16 challenges brought with regard to the adequacy of a CEA, giving the agency a 25% success rate. The USFS won all of the challenges in the 10th Circuit. The most common challenge, and most common reason the agency lost, was a failure to include in the CEA an adequate analysis of relevant past, present, and/or reasonably foreseeable future

³⁰ One case with the words “cumulative effects” in the decision was excluded from the sample (*Colorado Environmental Coalition v. Dombek* (185 F.3d 1162, 10th Cir. 1999). CEA was not a primary challenge raised in this case but instead just one of numerous complaints about the general inadequacy of the EIS.

projects in the area.³¹ In other words, the agency often lost the CEA challenge because of a failure to analyze the effects of past projects, other concurrent projects that the court ruled should have been part of the CEA, or cumulative impacts in light of proposed or foreseeable future projects. Another common challenge and reason the agency lost was because the CEA was too general, lacking either adequate data, a clear rationale for conclusions about environmental effects, or any detail about expected effects. A summary of the main challenges and holdings from each case, along with brief notes on other important aspects of the decision, are provided in table 2.2, which is included at the end of this chapter.

Judicial Standards of Review

Before looking at specific cases, it is important to bear in mind several background standards that guide judicial review of administrative decision-making. The Administrative Procedures Act of 1946 (APA) applies to all U.S. federal agencies and places broad parameters on the judicial review of agency decisions. Section 706 establishes what is known as the "arbitrary and capricious" standard, by which courts can set aside agency decisions if they are not supported by a clear underlying rationale.³² Decisions must be supported by some evidence, or, at least, cannot be entirely contrary to the evidence available. For example, in *Northern Spotted Owl v. Hodel* (1988) the court used the APA to set aside the U.S. Fish and Wildlife Service's (USFWS) decision not to list the northern spotted owl. All expert opinion on the matter suggested that the owl

³¹ Of the 16 cases on CEA in the Ninth Circuit, 9 involved challenges on this issue. The agency lost 7 of those 9 cases.

³² 5 U.S.C. § 706 (2006).

should be listed, and the agency offered no evidence to support its decision to the contrary.

Under the APA, courts employ a "hard look" standard by which they ensure that agencies have based their decisions on relevant information and have explained how they arrived at those decisions (based on precedent set in *Citizens to Preserve Overton Park v. Volpe* (1971)). By this standard, courts evaluate whether decision-makers have considered the relevant scientific information, and generally require agencies to explain how they have evaluated competing or uncertain scientific claims (Doremus, 2004). This said, the standard of review under the APA is relatively narrow, and agencies enjoy substantial deference from the courts as long as they provide a clear rule-making record and a reasonable rationale for their decisions.

Courts afford several types of deference to federal agencies based on the constitutional separation of powers. One form of judicial deference was established in *Chevron U.S.A., Inc. v. Natural Resource Defense Council* (1984). According to this important case, when a court is evaluating whether an agency's interpretation of a law is defensible, it first asks whether Congress was clear on the issue in the statutory language. If so, the agency must follow the statutory language. If not, the agency is allowed deference in their interpretation, as long as its reading of the statute is reasonable. Courts are also highly deferential when technical and scientific information is involved. Consider, for example, *Marsh v. Oregon Natural Resources Council* (1989), in which the Court explained, "Because analysis of the relevant documents 'requires a high level of technical expertise,' we must defer to 'the informed discretion of the responsible federal

agencies."³³ These standards of deference should be borne in mind throughout the following analysis. Such standards, along with the APA and "hard look" doctrine, are relevant for understanding judicial review of agency action under both NEPA and the National Forest Management Act (NFMA), which comes into play in some of the cases discussed below.

Analysis

Rather than cover in detail of all 19 cases analyzed in this study, this section considers cases in sections according to the major types of CEA challenges. This approach allows for a broad look at the lessons to be taken from recent CEA case law involving the USFS. In the following sections, I discuss the primary CEA issues that have been raised in court in order to provide an overview of the types of CEA challenges and a sense of how the courts have ruled on these topics. Two of the most common challenges raised involve the lack of supporting detail or decision rationale in a CEA and the failure to sufficiently analyze the effects of other past, present, or reasonably foreseeable actions as part of a CEA. Other issues discussed herein include problems with the science behind a CEA, challenges to the chosen scale of analysis, the issue of tiering CEA to another document or postponing it until a later analysis, and CEA for projects that are implemented under a Categorical Exclusion (CatEx) category under NEPA. The primary goals of the analysis are to provide insight into the different types of

³³ At page 1861, citing *Kleppe v. Sierra Club*, 427 U.S. 390 (1976). The Court also cites the classic statement of this type of deference from *Baltimore Gas & Electric v. NRDC*, 462 U.S. 87 (1983): "[A] reviewing court must remember that the Commission is making predictions, within its area of special expertise, at the frontiers of science. When examining this kind of scientific determination, as opposed to simple findings of fact, a reviewing court must generally be at its most deferential."

CEA complaints that plaintiffs have raised in court and a look at the factors that contribute to whether a CEA is deemed adequate.

Issue 1: Lack of Detail or Clear Rationale

The first Ninth Circuit case included in this analysis serves as a useful jumping off point for considering CEA challenges. In *Neighbors of Cuddy Mountain v. USFS* (1998) (hereinafter *Neighbors I*) the plaintiffs challenged the EIS for a timber sale on the Payette National Forest in Idaho. They charged that the USFS' analysis of cumulative effects on old-growth habitat lacked detail and in particular failed to analyze in any detail three other reasonably foreseeable sales slated to occur in the same roadless area, known as Cuddy Mountain. In exploring the potential effects of this sale and others on old-growth habitat and dependent species, the CEA included statements such as: "There is some risk that the remaining mature and old growth forests on Cuddy Mountain may not be adequate in size, if isolated from adjacent suitable habitat, to maintain the dependent species" (Grade/Dukes EIS as cited in *Neighbors I* (1998) at p. 1379). The EIS also stated that monitoring should be done in order to have the information necessary to assess cumulative impacts on old-growth dependent species.

As for the other proposed sales in the area, the agency included no detail about the amount of old-growth that would be cut in each of the proposed sales or whether any of the sales would impact the same home ranges of pileated woodpeckers, an old-growth management indicator species (so designated by the USFS). The court explained, "The sole reference to future sales stated, 'Future timber sales over the next several years would propose to treat additional old-growth habitat'" (*Neighbors I*, 1998, at p. 1379,

citing the Grade/Dukes EIS). This statement suffers from a common shortcoming in many of the CEAs that are deemed inadequate: it describes actions, in this case in very general terms, rather than analyzing effects to a particular resource, such as old-growth dependent species and their habitat. In other words, the agency discloses the fact that additional old-growth habitat will be treated, but does not then translate that in terms of how it will actually affect wildlife populations.

As a whole, the CEA lacked any quantified or detailed information, without which, the court explained, “[N]either the courts nor the public, in reviewing the Forest Service’s decision, can be assured that the Forest Service provided the hard look that it is required to provide” (*Neighbors I*, 1998, p. 1379). Both NEPA and NFMA planning regulations in effect at the time, according to the court, required more detailed information about effects on habitat resulting from multiple projects in the same area. All of the projects had been formally proposed and thus were “reasonably foreseeable.” The projects would take place in the same roadless area and all had the potential to affect old-growth habitat in that area. Therefore, the agency was required to analyze the combined effects from these sales in as much detail as possible and to justify their conclusions about cumulative effects. The Ninth Circuit concluded by stating, “General statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided” (*Neighbors I*, 1998, p. 1380). This statement is cited repeatedly by the court in many of the CEA cases that followed *Neighbors I*. As for the agency’s intention to monitor in order to facilitate a more complete CEA in the future, the court ruled that the agency cannot defer a CEA to a later date as NEPA requires such analysis before a project takes

place. Even if monitoring information is limited, a CEA must be completed in the NEPA analysis.

As in *Neighbors I*, a number of cases involve complaints that a CEA is too general, lacks analysis of effects, or lacks a transparent rationale for its conclusions. For example, in *Muckleshoot Indian Tribe v. USFS* (1999) (hereinafter *Muckleshoot*), a case involving the EIS for the Huckleberry Land Exchange, the Ninth Circuit also found the CEA to be far too general. It observed that the EIS contained twelve sections on cumulative effects but that “these sections merely provide very broad and general statements devoid of specific, reasoned conclusions” (*Muckleshoot*, 1999, p. 811). Again, the agency’s CEA described activities but failed to analyze effects. The CEA for several alternatives described the amount of land to be exchanged and made predictions about whether it would be subject to commercial harvest. However, the CEA lacked any analysis of the potential effects of those activities on resources, except to say that the lands the USFS received in the land exchange would be expected to develop greater species diversity over time.

The court was dissatisfied with the lack of analysis of the possible effects of increased harvesting on lands transferred out of federal ownership and reiterated that a CEA must include enough detail to assist decision-makers and the public in assessing how cumulative impacts might differ across alternatives and how those impacts might be mitigated. The analysis also was deemed “far too general and one-sided” (*Muckleshoot*, 1999, p. 811) in that it considered only possible beneficial effects, which were contingent upon future funding and action by the agency, on the lands transferred to the USFS.

The same issue arose again in a slightly different form in *Oregon Natural Resources Council Fund v. Goodman* (2007), a case in which the plaintiffs challenged the EIS for the proposed expansion of the Mt. Ashland Ski Area in the Rogue River National Forest. In this case the agency failed to discuss cumulative impacts on the Pacific fisher (a wildlife species) from the project in conjunction with two other future projects. The agency argued that it did not have to provide such an analysis because the predicted impacts of the ski area expansion were modest. But the court made it clear that such conclusory statements, based on expert opinion but without any explanation of the underlying rationale, will not receive deference from a reviewing court.

In summary, the Ninth Circuit has established that a CEA must include detailed information, a clear analysis of effects, and an explanation of the rationale behind conclusions in a CEA. In cases where the agency clearly analyzes effects, the court has upheld their decisions. In some cases, plaintiffs express discontent with the outcome of a CEA but fail to highlight enough deficiencies in the analysis to convince the court that the CEA is inadequate. For example, in *Cold Mountain v. Garber* (2004), the plaintiffs were dissatisfied with the agency's conclusions that helicopter hazing associated with a bison herding facility in the Gallatin National Forest would not significantly effect bald eagle survival. However, the court found that the USFS engaged in a sufficient CEA based on the information available to them at the time and in fact secured an incidental take statement from the U.S. Fish and Wildlife Service based upon its CEA with regard to bald eagles. Likewise, in *Environmental Protection Information Center v. USFS* (2006) plaintiffs argued that a watershed model used to analyze cumulative impacts overlooked significant effects. However, the plaintiffs failed to highlight a specific

deficiency with the model. The court found that the agency analyzed effects on both a project and watershed level and that the model provided a sufficient amount of detail to meet NEPA requirements.

One case from the Tenth Circuit also dealt with the issue of whether a CEA included sufficient detail. In *Utah Environmental Congress v. Richmond* (2007) the plaintiffs argued that the CEA in an EIS failed to meaningfully or realistically analyze effects of the project on water quality and fish populations. However, the agency pointed to several models it had used to analyze cumulative effects and emphasized that NEPA does not prohibit the approval of projects with negative effects, as long as the effects are disclosed. The court agreed, stating that the plaintiffs seemed to disagree with the agency's decision rather than point to any real deficiency in the CEA.

Issue 2: Analysis of Past, Present and Reasonably Foreseeable Future Effects

Another common CEA challenge, and one that also was an issue in *Neighbors I*, is the issue of whether the agency has adequately included other past, present, and reasonably foreseeable future projects in its analysis. This was the most common complaint in recent CEA cases, and the most frequent reason the USFS' CEAs were ruled inadequate. Between the years 1998 and 2007, 11 of the 19 cases reviewed involved this issue and the agency lost 9 of those 11 cases for failure to comply with this aspect of the CEA requirement. Recall, for example, that in *Neighbors I*, the agency provided some general information about predicted cumulative effects of all proposed timber sales in the roadless area but no specific information about individual sales or combined effects on

old-growth habitat and old-growth species. The court ruled that the agency must provide specific information about individual proposed sales in its CEA.

A primary reason the agency lost in *Blue Mountains Biodiversity Project v. Blackwood* (1998) was also due to the failure to analyze other proposed sales as part of the CEA in an EA prepared for the Big Tower salvage timber sale. In this case, the agency had proposed five timber sales at the same time and as part of a coordinated fire recovery strategy in a single watershed. However, nowhere in the Big Tower EA did the agency analyze the cumulative effects from these coordinated actions. The court ruled that not only was a CEA required for all the projects, but that the cumulative actions requirement (as discussed in *Kleppe*) was triggered. Therefore, the agency was required to prepare a single EIS to examine the effects of all five projects that had been formally proposed as part of a single recovery strategy.

The court declined to require the same, however, in *Earth Island Institute v. USFS* (2003), in which the plaintiffs charged that the agency should have prepared a single EIS for two salvage projects on neighboring National Forests, both of which had been planned in response to a single fire. In this case the fact that the projects would take place on two separate forests, proceed on separate time schedules, and be supervised by different personnel led to the court's acceptance of the agency's decision to analyze the projects in separate NEPA documents. Nonetheless the court ruled the CEA in one of the EISs inadequate because it failed to analyze the cumulative impacts of the project on a spotted owl activity area in the neighboring forest.

In *Muckleshoot* (1999), discussed earlier, the court made it clear that the USFS had to analyze the combined effects of the proposed land exchange with the effects of

timber harvest on lands exchanged in previous years and the potential effects of another proposed future land exchange in the same area. The agency argued that the future land exchange was too speculative, but the court noted that it had already been announced in a press release and that a proposal for the exchange had been drafted a full year prior to the issuance of the EIS for the Huckleberry exchange. However, in *Environmental Protection Information Center v. USFS* (2006) the court accepted the agency's position that it need not include in its CEA an analysis of a reasonably foreseeable future project. In that case, the details of the future project, known as the Meteor sale, were deemed too speculative at the time the EA was prepared to allow for a useful CEA. Furthermore, the agency briefly addressed the cumulative impacts expected from the Meteor sale in their response to public comments on this issue.

Other cases involved distinct circumstances with regard to the issue of other past, present, or reasonably foreseeable future actions in the CEA area. For instance, in *Selkirk Conservation Alliance v. Forsgren* (2003), which involved an EIS regarding the granting of an easement to Stimson Lumber to access its lands via National Forest land, the court dealt with the question of whether the agency should have analyzed future sales as part of its CEA. Because of predicted effects on grizzly bears, the agency and Stimson spent several years developing a Conservation Agreement that would guide Stimson's activities for all current and future projects in the area. The court reasoned that a CEA need not analyze specific future projects in this case if the CEA analyzed instead the effects of the Conservation Agreement as a whole. The court did note throughout its opinion, however, that the decision hinged upon the expected enforcement of the agreement.

The issue of analyzing past projects and the extent of the detail required in such analyses has become a matter of significant debate in the last several years. This issue was central to *Lands Council v. Powell* (2004) (hereinafter *Lands Council*), a challenge to the Final EIS (FEIS) for the Iron Honey project on the Idaho Panhandle National Forest (IPNF). The issue of cumulative impacts from past projects was particularly important in this case. The project was supposed to be a watershed restoration project but included logging in an area where nearly 40,000 acres had been harvested since the 1960s. Furthermore, in the project area all but two of 14 watersheds were considered by the USFS either to be not functioning or functioning at risk. Given this history of heavy management in the Iron Honey project area, plaintiffs were particularly interested in the cumulative impacts of past management actions and also wanted to know how the proposed actions would serve to improve conditions, whereas previous timber sales had degraded resource conditions.

In its assessment of this matter, the court wrote: “The [FEIS] generally describes the past timber harvests...and asserts that timber harvests have contributed to the environmental problems in the Project area. But there is no catalog of past projects and no discussion of how those projects (and differences between the projects) have harmed the environment” (*Lands Council*, 2004, p. 1027).³⁴ The EIS made general statements by decade, such as, “The most intensive harvests occurred in the 1960’s with over 5,900 acres harvested, of which 2,400 acres were clearcuts” (Iron Honey FEIS, 2002, p. III-2). However, this level of detail was not provided for every decade. For instance, no

³⁴ A catalog of past actions is generally understood to be similar to a list. Sometimes past action catalogs include the names and dates of various activities. Catalogs of timber sales often include the name and date of the sale along with some information on the number of acres treated and the method used.

information was disclosed for the 1970s making it unclear if no harvest occurred or if those harvests simply were not disclosed. Furthermore, no list or catalog of each specific sale was provided, which made it difficult to know where, when, and how much of the area's timber had been harvested. The court made it clear in its decision that it already had been established as a general rule under NEPA that a CEA must include, at a minimum, a catalog, or list, of other past, present, and future projects *and* information on the environmental effects of these projects. Therefore, the vague discussion in the Iron Honey EIS of prior harvests and their general effects was deemed unsatisfactory, particularly given the facts of this case.

In *Lands Council* (2004) the court held that such a cataloging of projects and project effects was necessary for a CEA and also emphasized the role of such cataloging in informing an alternatives analysis. In fact, the latter point seemed to be the court's primary problem with the agency's failure to describe in detail past projects and project effects. The court repeatedly explained that a detailed accounting of past projects and their effects would help both the agency and the public analyze the potential effects of the proposed project. The court also noted that the information requested would not be difficult or particularly cumbersome for the agency to generate.

The *Lands Council* decision was highly controversial. Was the agency really required to list every past project and the effects of each project on individual resources in order to comply with the CEA requirement? To the Forest Service it seemed that following the court's direction precisely would be impossible, in large part because it simply does not have monitoring data on the effects of all individual past projects. While the Regional office and the IPNF worked to provide some guidance to staff members as

to how to comply with the decision, in 2005, also in response to the decision in *Lands Council*, CEQ issued a memorandum entitled “Guidance on the Consideration of Past Actions in Cumulative Effects Analysis” (CEQ, 2005).³⁵ In this document, which still guides CEA practice, CEQ explained that the NEPA regulations do not specifically require agencies to catalog all relevant past actions. A detail cataloging of past projects and their effects is only necessary to the extent that such a process would assist the agency in identifying cumulative effects or determining the effects of alternative proposed courses of action. The CEQ memo emphasized that agencies have significant discretion to decide whether such a cataloging is necessary and asserted, “Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions” (CEQ, 2005, p. 2). NEPA decision makers are reminded to limit the information in a NEPA document to what is useful and relevant to decision makers and the public. As we will see in the following chapter, the CEQ memo has significantly influenced how the IPNF currently analyzes past actions in CEAs.

There are several problems with CEQ’s position that an agency usually can analyze cumulative impacts based on current aggregate effects. For one, as the court explained in *Lands Council* (2004), information on the specific effects of past actions can inform decision-makers and the public in evaluating the alternatives for the proposed action and understanding their potential environmental effects. Secondly, as Grothaus (2007) explains, in an article specifically addressing the CEQ memo of 2005, “When relevant prior actions are lumped into the environmental baseline and considered in the

³⁵ The memo can be accessed at: http://ceq.hss.doe.gov/NEPA/regs/Guidance_on_CE.pdf (last accessed Feb. 4, 2009).

aggregate, the lessons of such actions are effectively removed from the decision making process. Such aggregation may also lead to a false sense of security, in which prior degradation is taken for granted because it is considered part of the environmental baseline” (p. 888). As we will see in the chapters to come, these concerns are especially relevant in the context of CEA for wildlife species.

Grothaus (2007) also considers the question of whether the CEQ memo, which seems to contradict the Ninth Circuit’s position at least to some extent, is due any deference from the courts, and he concludes that it is not. He analyzes case law involving similar types of guidance issued by federal agencies and several Supreme Court cases that deal specifically with the issue of deference afforded to agency interpretations of statutes or regulations. Because the CEQ guidance was not subject to public notice-and-comment, seemingly conflicts with the intent of NEPA and the CEA regulation itself, and was written by CEQ, a body with no enforcement power over NEPA, Grothaus (1997) concludes that federal courts should not offer any deference to the memo. In the Ninth Circuit, so far, the appellate court has not attributed much importance to the memo, although several district courts have suggested that the memo is authoritative (Grothaus, 2007). It remains to be seen whether the Ninth Circuit will again address the specific issue of whether the CEQ guidance is authoritative in the circuit. For now, at least in the appellate court, agencies are clearly required as part of their CEA to catalog past actions *and* their environmental effects.³⁶ The question that remains is how exactly the agency

³⁶ See *Great Basin Mine Watch v. Hankins* (456 F.3d 955, 9th Cir. 2006), in which the Ninth Circuit ruled that listing actions without providing an analysis of their effects was unsatisfactory to fulfill CEA requirements. Also in 2006, the court found that the NMFS *did not* have to list past actions as part of its CEA, but only because in that case the project was found to have negligible effects on the resource in question (see *Northwest Environmental Advocates v. National Marine Fisheries Service*, 460 F.3d 1125, 9th Cir. 2006).

should get at the environmental effects of past actions and whether that must be done by addressing effects of individual actions or alternatively by considering the aggregate effects of many actions.

Since *Lands Council* was decided in 2004, other Ninth Circuit cases involving the USFS have dealt with the requirement to catalog past actions and their environmental effects. The issue was raised again in *NRDC v. USFS* (2005) (hereinafter *NRDC*), in which the Natural Resources Defense Council challenged the adequacy of the EIS for the 1997 Tongass National Forest Plan. The court ruled the EIS inadequate for a number of reasons, one of which was the failure to analyze the cumulative effects resulting from logging on non-federal timberlands. In its decision, the court reiterated its holding from *Lands Council* (2004), emphasizing that a CEA requires at a minimum a cataloging of relevant past, present, and reasonably foreseeable future actions along with a discussion of the environmental effects of those actions. More recently, the court again cited this aspect of *Lands Council* as a binding requirement in *Oregon Natural Resources Council Fund v. Goodman* (2007) (hereinafter *ONRC*). At least for now, in the Ninth Circuit the holding from *Lands Council* with regard to CEA of past actions stands as valid precedent.

Issue 3: Challenges to the Science Used in CEA

Several cases analyzed for this research involved challenges to the quality of the science used in support of a CEA. For example, another key issue in the *Lands Council* (2004) decision dealt with the complaint that the data used to analyze cumulative effects on the availability of Westslope Cutthroat Trout habitat was outdated. The court agreed with the plaintiffs, noting that the agency had not collected trout habitat data for 13 years

and that “the data...was too outdated to carry the weight assigned to it” (*Lands Council*, 2004, p. 1031). Current information on trout habitat was necessary, in the court’s opinion, for understanding the cumulative effects of the proposed and past timber harvests on both trout habitat and populations. Rather than include up-to-date data in its EIS, the court stated, the agency used “stale” habitat data to predict effects on the species. This was deemed unacceptable as a basis for the conclusions in the agency’s CEA. The court noted that it does not require all data to be immediate, but that in this case the data were too outdated to be used as they were in support of the CEA.

The scientific quality of models also has been raised in court with regard to CEA. This issue also came up in *Lands Council* (2004), in which the court found several problems with the scientific methodologies used by the USFS to estimate effects. For instance, the Lands Council argued that a Water and Sediment Yields model had a number of shortcomings, a point that the agency conceded to the court. Because these shortcomings were not discussed in the EIS, the court ruled that the agency had not satisfied NEPA, given its heavy reliance on the model in the EIS and failure to disclose all of the relevant problems with the model.

Issues about the quality of the science underlying CEA models have come up in other cases. In *Environmental Protection Information Center v. USFS* (2006), plaintiffs challenged the use of a cumulative watershed effects model but, according to the court, failed to point out any obvious faults with the model. The court ruled that it had no reason to question the USFS’ methodology in this case and that the model was sufficiently detailed and quantified to satisfy NEPA requirements.

In *ONRC* (2007), the plaintiffs challenged the use of a Water Erosion Prediction model and claimed it had several shortcomings. The court ruled that NEPA does not require the best scientific methodology be used, only that the agency adequately disclose the shortcomings and assumptions in predictive models. The agency did so in its EIS, and the court ruled in its favor. The plaintiffs also challenged the use of an Equivalent Roadless Area model to measure cumulative impacts, but, again, the court found no reason to question the agency's methodology. According to the court, the USFS had adequately disclosed the nature of the model, which included enough detailed and quantified information to satisfy NEPA requirements. In summary, agency models can be imperfect and have a number of shortcomings, but, in order to satisfy NEPA, the agency must disclose those limitations in its EISs.

Issue 4: Problems with the Scale Chosen for a CEA

An important aspect of a CEA is the scale chosen for the analysis. Courts have required that both the temporal and geographic scales of the analysis be explicitly stated and justified as part of a CEA. Generally, as long as the agency provides a reasonable explanation for its choice and does not contradict statements or choices about scale that have been made in other federal environmental analyses, courts have upheld their decisions.

In *Native Ecosystems Council v. Dombeck* (2002) (hereinafter *NEC*) plaintiffs complained that the agency failed to analyze the cumulative effects of several amendments to road density standards for a number of timber sales planned on the Gallatin National Forest. The court first asked whether the agency should have prepared

a programmatic EIS for the road density standard amendments that accompanied the timber sales because these actions might be considered either connected or cumulative actions. It found that the compendium of amendments could not be considered connected actions because they had independent utility. Whether the timber sales might be considered cumulative actions was a closer call, but the court emphasized that the challenge was brought with regard to whether the plan amendments, not the timber sales, were cumulative actions. It found that the amendments had not been developed as part of a comprehensive plan and could not be considered cumulative actions.

Next the court turned to the question of whether the road density standard amendments required a CEA in the particular EA at issue in this case, and on this point the court ruled in favor of the plaintiffs. The court stated, “The importance of ensuring that EAs consider the additive effects of many incremental environmental encroachments is clear” (*NEC*, 2002, p. 896). In the decision the court noted that federal agencies prepare 45,000 EAs a year as compared to about 450 EISs. Thus, it explained, EAs must consider cumulative impacts, otherwise the cumulative effects of these many smaller actions might be missed. Especially in the case of timber sales, the court explained, the cumulative impacts of individually minor effects would be easy to underestimate and must be considered in the CEA in an EA.

With regard to the road density amendments for multiple timber sales planned on the Gallatin National Forest, the court held that these must be analyzed together as part of a CEA. The agency argued that this was not necessary because the various timber sales and road density standard amendments were widely dispersed throughout the forest.

However, the court disagreed with the agency about the appropriate scale of analysis. It explained:

The national forest was the geographic unit within which the Forest Service chose to set forth binding road density standards in the Forest Plan.... Unless the cumulative impacts of these amendments are subject to analysis *even though distantly spaced throughout the Forest*, the Forest Service will be free to amend road density standards throughout the forest piecemeal, without ever having to evaluate the amendments' cumulative environmental impacts (*NEC*, 2002, p. 897).

In this case, because the USFS had a forest-wide road density standard, it was required by the court to conduct a CEA for road density standard amendments at a forest-wide scale. In other words, the agency could not choose a scale for its CEA analysis in this EA that conflicted with the choice of scale for a resource in its forest plan.

NEC also involved a challenge brought under the Endangered Species Act, and the court's decision on that point also dealt with a CEA issue. Although this was not a CEA challenge under NEPA, the holding is relevant for understanding how the Ninth Circuit views the issue of the appropriate scale of analysis for cumulative environmental impacts. In the USFS's biological assessment of the project's impacts on grizzly bears, the agency chose a cumulative effects area that failed to analyze the effects on grizzly bears in light of a nearby sheep grazing allotment less than two miles away from the project area. The agency provided no explanation for their choice of scale for the CEA in the biological assessment and no justification for why the grazing allotment had been left out of the analysis area. The court ruled the choice arbitrary, particularly given that another EIS had acknowledged the significant impact of the grazing allotment on grizzly bears and that the timber sale at issue in this case would clearly affect grizzly habitat.

Two lessons should be taken from this. First, the agency has to provide reasonable justification for its choice of the size of a cumulative effects analysis area. Secondly, if

the choice appears arbitrary in light of other NEPA analyses or agency documents, a court is far less likely to defer to an agency's decision without adequate justification.

The issue of scale for a CEA for wildlife was raised again in *Idaho Sporting Congress v. Rittenhouse* (2002) (hereinafter *Rittenhouse*), a challenge to several timber sales on the Boise National Forest. In this case, the agency again got into trouble for making choices and conclusions in an EIS that conflicted with statements in another USFS report. This 1996 Monitoring Report for the Boise National Forest stated, with regard to several species that use old-growth habitat, "Forest Plan direction is inadequate to provide for habitat needs, because the habitat needs of these species *must be addressed at a landscape scale*" (p. 973 of the *Rittenhouse* decision, citing the 1996 Monitoring Report). However, the Long Prong EIS at issue in this case analyzed cumulative impacts to several species using their "home range" as the scale of analysis. The court held that the agency must prepare a new or supplemental EIS that was consistent with the conclusions of its own scientists in the monitoring report. Absent a clear rationale for choosing a smaller scale of analysis that contradicted conclusions from its own documents, the choice of the scale for the CEA was deemed arbitrary and capricious.

In several other cases, however, the agency's choices with regard to the scale of a CEA were upheld. For instance, in *Neighbors of Cuddy Mountain v. Alexander* (2002), a case that revisited the EIS for the same sale (Grade-Dukes) challenged in *Neighbors I*, the agency's choice of scale for the CEA was deemed appropriate. In this case the agency conducted an extensive CEA but chose to analyze the effects of the sale only for the west side of the National Forest. The plaintiffs argued that the CEA area should have included the east side of the forest, but the court found that the agency had made a reasoned

decision and explicitly justified its choice in the EIS. The court therefore deferred to the agency's choice as to the appropriate scale of analysis.

Both the geographic and temporal scope of the CEA in the Stimson Project EIS were challenged in *Selkirk Conservation Alliance v. Forsgren* (2003) (hereinafter *Selkirk*). Recall that this case involved an EIS analyzing the effects of granting Stimson Lumber Company an easement to access private inholdings in the Colville National Forest. Plaintiffs claimed that the CEA should have included a proposed Stimson project on the neighboring Idaho Panhandle National Forest. However, the agency explicitly considered including this project in its CEA and decided not to, based on an analysis of the relevant watersheds, wildlife activity areas, viewsheds, and transportation systems. Furthermore, an agency biologist expressed concern that including the nearby project could make environmental effects appear less significant. In light of the reasoned justification for its choice, the court upheld the agency's determination of the appropriate geographic scale of a CEA.

In *Selkirk* plaintiffs also challenged the fact that the agency only analyzed cumulative effects for a three-year period into the future. The USFS chose this short time frame despite the fact that the Conservation Agreement established with Stimson ran for five years. Furthermore, a USFS wildlife biologist had originally chosen a ten-year time frame for the cumulative effects analysis. Stimson Lumber Company advanced the only argument before the court in defense of this choice. It explained that the USFS chose this short time period because of the uncertainty of the regulatory environment surrounding the Conservation Agreement. Three years was the longest time frame that the agency could be sure which rules from both the state and the USFS would govern Stimson's

activities. However, the court noted that the agency certainly could have made a decent guess at what Stimson's activities would be in years four and five, despite some uncertainties as to future regulations. Nonetheless, although the court agreed that a longer time frame would have been preferable, it did not find the three-year time period arbitrary. It reasoned that the agency had some information available for a longer time period but had the most information available for the three-year period. Therefore, the choice of a three-year time frame for a CEA was not arbitrary and capricious. Again, provisions in the Conservation Agreement stating that it would be revised in light of new information were critical to the court's decision to uphold the less-than-ideal time frame for the CEA.

Issue 5: Postponing a CEA or Tiering to Another Environmental Analysis

Another recurrent issue in a number of the CEA cases reviewed involved situations where the agency postponed a CEA or tiered a CEA to another document. This issue is closely related to the shell-game, discussed earlier in the context of *Tenakee Springs* (1990). In that case the USFS first tried to argue that it had analyzed cumulative impacts in its forest plan, and then, when the court found the forest plan analysis insufficient, argued that it would analyze cumulative impacts in its upcoming forest plan revision. The notion of the shell-game refers to just this type of scenario wherein one is directed to various stages of planning in search of an environmental analysis that, in the end, does not appear to have happened at all.

This issue arose in *Muckelshoot* (1999), in which the agency argued that it had analyzed cumulative impacts in the forest plan, to which the Huckleberry EIS had been

tiered. The court noted first that an agency cannot tier to a non-NEPA document such as a forest plan (the Huckleberry EIS tiered to the forest plan, not the EIS for the forest plan). Secondly, the court found that nothing in the forest plan examined the specific effects of this land exchange, which was still too speculative at that time to be adequately evaluated, nor did it analyze the effects of logging on lands exchanged in previous years. The court concluded, “If we were to adopt the Forest Service’s approach, the cumulative impacts of lands exchanges would escape environmental review” (*Muckleshoot*, 1999, pp. 810-811).

The issue of postponing a CEA was central in *High Sierra Hikers Association v. Blackwell* (2004) (hereinafter *High Sierra*), in which the plaintiffs argued that the USFS must complete an EIS to analyze the cumulative effects of issuing multi-year permits to private outfitters in two wilderness areas. In this case the district court had ruled against the agency, finding that the issuance of such permits was likely to contribute to significant cumulative effects, triggering the requirement for an EIS. The agency agreed that such an EIS was required but explained that it would prepare the EIS once it decided how to move forward with their wilderness management plans. The Ninth Circuit upheld the district court’s decision to provide plaintiffs with injunctive relief, stating that NEPA requires an analysis of effects prior to agency activities and that such analysis could not be postponed.

The court also dealt with the issue of postponing CEA in *NRDC* (2005), which dealt with the failure of the agency to analyze cumulative effects of timber harvest on private lands in their 1997 Tongass forest plan. The Forest Service argued that the plan was only a guidance document and that specific cumulative impacts would be analyzed at

the project level when the details of specific activities were more concrete. Here the court referred to their decision in 1993 in *Resources Ltd. v. Robertson*, in which they established that a forest plan EIS always requires a CEA. However, in *Resources Ltd. v. Robertson* the court allowed the agency to defer consideration of effects resulting from actions on non-federal lands until project-level analyses. In *NRDC*, the court decided otherwise, holding that the forest plan must include a CEA cataloging and analyzing the impacts of high-volume timber harvest on private lands.

There are several factors that likely led the court to judge that in this case such a CEA must be done at the plan level. Over five percent of the forest in southeast Alaska is owned by non-federal entities, and those lands have been heavily logged. The forest plan called for high levels of logging on adjacent and nearby lands with serious implications for old-growth habitat and species. The court reasoned:

At least in the particular circumstances of this case, the cumulative impacts on wildlife viability from continued “highgrading” by non-federal entities, as well as by the Forest Service...ought to be considered in a single, programmatic EIS.... A cumulative effects analysis in a programmatic EIS is necessary here for the Forest Service and public to make a rational evaluation of this proposed federal actions balancing the competing goals of timber harvest, environmental preservation, and recreational use in the Tongass (*NRDC*, 2005, p. 816).

In other words, given the potential role of the CEA at the plan level to inform multiple-use decisions in the plan, the court opined that in this case a CEA for non-federal actions should occur at the programmatic level.

Although the court provided a rationale for its decision in the case of the Tongass forest plan revision, the direction from the courts on this issue is somewhat muddled. There is no clear answer as to whether the court will require a CEA that looks at activities on private lands in a forest plan EIS. The decision will depend on the circumstances of the case and very likely on the panel that hears the case.

Issue 6: Cumulative Effects of Categorically Excluded Projects

A final and critical issue that arises in case law from both the Ninth and Tenth Circuits is the issue of cumulative impacts as a result of projects done under a categorical exclusion (CatEx).³⁷ Categorical exclusion categories define types of projects that can essentially be expedited through the NEPA process. These categories are supposed to identify types of projects that will not have significant effects on the environment; for such projects no EA or EIS is completed. Managers are required to do some scoping and to issue a decision memo detailing the nature of the project and why it fits into a particular CatEx category.³⁸

Prior to 2003, the USFS had one CatEx category for vegetation management projects. As part of the Bush administration's Healthy Forests Initiative (HFI) of 2002, the USFS expanded its use of CatExes and in 2003 created four new CatEx categories for vegetation management projects (GAO, 2006). GAO (2006) explains, "Little is known about the Forest Service's use of these categorical exclusions because, prior to 2005, the agency did not maintain nationwide data on their use" (pp. 1-2). However, a GAO study on the use of vegetation management CatExes between 2003-2005 found that nearly 75%

³⁷ The categorical exclusion provision is found at 40 C.F.R. §1508.4 and reads: "'Categorical exclusion' means a category of actions which do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect in procedures adopted by a Federal agency in implementation of these regulations (Sec. 1507.3) and for which, therefore, neither an environmental assessment nor an environmental impact statement is required. An agency may decide in its procedures or otherwise, to prepare environmental assessments for the reasons stated in Sec. 1508.9 even though it is not required to do so. Any procedures under this section shall provide for extraordinary circumstances in which a normally excluded action may have a significant environmental effect."

³⁸ There are also USFS CatEx categories for activities that do not require a decision memo. These include activities such as routine building maintenance or the issuance of administrative procedures (see GAO, 2006 at footnote 8).

of such projects are now completed under a CatEx, accounting for almost half of the acreage treated by the USFS (GAO, 2006).

In terms of CEA, plaintiffs have brought both facial and applied challenges to CatEx categories and projects—in other words, challenges to the promulgation of the categorical exclusion category as a whole and challenges to particular projects done as CatExes. A recent case from the Ninth Circuit dealing with this issue is *Sierra Club v. Bosworth* (2007). At issue in this case was the Fuels CatEx category, or CatEx category 10, created in 2003, which allowed for categorical exclusion for all fuels reduction projects up to 1,000 acres and prescribed burn projects up to 4,500 acres across the entire National Forest system. The plaintiffs argued that the agency should have prepared an EIS before promulgating the category, establishing that the category would not have significant cumulative impacts as a result of the implementation of numerous categorically excluded projects under the Fuels CatEx.

Some additional background is necessary to understand this case. CEQ regulations regarding CatExes state that agencies may “identify categories of actions which do not individually or cumulatively have a significant effect on the human environment.”³⁹ Additionally, agency procedures are supposed to provide information on “extraordinary circumstances in which a normally excluded action may have a significant environmental effect”, in which case an EA or EIS would be required.⁴⁰ Importantly, as the court noted in *Sierra Club v. Bosworth* (2007), just before creation of this category,

³⁹ 40 C.F.R. § 1508.4 (2008).

⁴⁰ 40 C.F.R. §1508.4 (2008). The extraordinary circumstances issue is addressed in the USFS handbook in Ch. 30. The handbook lists resources conditions, such as the presence of endangered species, wilderness and roadless areas, wetlands, and other factors that “should be considered in determining whether extraordinary circumstances related to a proposed action warrant further analysis and documentation in an EA or an EIS...” (section 30.4).

the USFS changed its direction on “extraordinary circumstances.” Beginning in 2007, various resource conditions, such as the presence of highly erosive soils, roadless areas, or areas with threatened or endangered species, that beforehand *automatically* triggered the extraordinary circumstances condition and required the completion of an EA or EIS, now only require *consideration* of whether the provision is triggered and an EA or EIS is required. In other words, managers can now use their judgment in deciding whether the potential effects on these resource conditions require more analysis than would be done for a CatEx.

In their decision regarding the Fuels CatEx, the court stated that an EIS is not required as part of the process of creating a CatEx category, but that a CatEx category can only be created if the agency determines that the category includes projects will not have significant cumulative effects. Therefore, even though an EIS is not required, a CEA is still required as part of the process of creating a CatEx category, and the court found numerous reasons why the agency’s CEA, or lack thereof, was inadequate. The agency conceded that it never conducted a CEA for the category as a whole but argued that CEA would be conducted at the project level. The court found this argument to be in direct contradiction with the intent of a CatEx category, which should be made for a group of projects that together would not have significant cumulative impacts. In essence, a CatEx category should relieve decision-makers of the need to determine in every case whether cumulative effects are likely, except in cases of extraordinary circumstances. A CEA for the category was particularly important in this case, according to the court, given the nationwide scope of the category and its potential to affect over a million acres per year. As the court explained, “[I]f assessing the cumulative impacts of

the Fuels CatEx as a whole is impractical, then use of the categorical exclusion mechanism was improper” (*Sierra Club v. Bosworth*, 2007, p. 1028).

Further problems with the agency’s analysis regarding the potential effects of the Fuels CatEx hark back to criticisms from the court from other CEA cases. For example, the USFS had conducted a “data call” as part of the process of creating the Fuels CatEx to consider approximately 2,500 previous fuels reduction projects and their effects. The report summarizing the results of the data call included many sections entitled cumulative effects, but the court found that these sections lacked detail or provided little support for summary conclusions of no significant cumulative impacts.⁴¹ The court wrote, “The Forest Service does not reveal its methodology or offer any quantified results supporting its conclusory statements that there are no cumulative impacts—it argues only that through the exercise of its expertise it determined that there was no such impact. This is insufficient” (*Sierra Club v. Bosworth*, 2007, p. 1028). Moreover, the agency made the mistake as it did in *Muckleshoot* of emphasizing solely the potential beneficial effects of projects without conducting a broader analysis of overall environmental effects.

Projects in the data call also sometimes included mitigation measures to minimize effects, but, as the court noted, CatEx projects do not require mitigation measures. Therefore, the category was deemed to lack the specificity that would be needed to justify its use. The CatEx “fail[ed] to identify the maximum diameter of species of trees that are permitted to be logged”, specified “no limit on the proximity of different projects under the Fuels CatEx, nor any cap on the number of projects in a particular watershed,

⁴¹ Numerous projects in the data call were found to have had potentially significant effects on wildlife, soils, and water quality but the report concluded these effects were either localized, temporary, or of minor significance. Some of the projects analyzed as part of the data call *did* have significant cumulative impacts, but the report on the data call does not give any information as to what types of projects might lead to significant effects.

ecosystem, or endangered species habitat area,” and lacked restrictions on thinning and road densities (*Sierra Club v. Bosworth*, 2007, pp. 1032-1033). For these reasons, the court issued a nationwide injunction on the Fuels CatEx for the lack of CEA or any detailed analysis of potential effects.

Two cases in the Tenth Circuit also centered around the CatEx issue. *Colorado Wild v. USFS* (2006) involved a facial and applied challenge to CatEx category 13, which is for small-scale timber projects and replaces a former CatEx category that was similar in scope. As part of developing the new CatEx category 13, the USFS undertook several levels of analysis. For one, it considered all of the projects that had been conducted under the former CatEx category in 1998, prior to the creation of the new category. It also selected 154 previous timber projects that either 1) had been approved under the former CatEx category, 2) had been approved after an EA or EIS was completed but which could have fit within the definitions of the former CatEx, or 3) were small in scope. Importantly, none of the projects selected had predicted significant effects. In other words, the USFS *selectively chose* 154 timber projects that were predicted not to have significant effects. USFS teams also conducted post-implementation monitoring to verify that no significant effects had occurred for those projects. Based on this review the USFS created three new CatEx categories. Category 12 allows for live timber harvests under 70 acres in size, category 13 allows for salvage harvests under 250 acres in size, and category 14 allows for harvest of insect-infested or diseased trees on sites less than 250 acres in size.

The plaintiffs in *Colorado Wild v. USFS* (2006) challenged the creation of category 13 for its failure to adequately consider cumulative impacts. Specifically, the

plaintiffs challenged the methodology used to create the category. The size limit of 250 acres was chosen because it was just below the average for all salvage projects reviewed by the USFS during its process of creating the new CatEx categories. The plaintiffs explained that the median size of such projects was 50 acres, but that the average size was skewed because of the presence of several very large projects, including one of 9,000 acres, in the pre-selected sample. Essentially, the environmental groups took issue with the fact that the USFS found a few large projects that had no predicted significant impacts and included these in a selected sample of projects. Indeed, the USFS process was biased. Either it should have removed the statistical outliers from their sample or undertaken the analysis based on some sort of random sampling method. However, the court did not find that the plaintiffs had met their burden of showing that the large projects in the sample were unusual or ought to have been excluded from the analysis. The plaintiffs suggested that what made the large projects insignificant in terms of effects was the limited amount of timber per acre, and that some sort of timber volume limit ought to be part of the consideration when creating a CatEx category. However, according to the court, the plaintiffs failed to demonstrate clearly that this was an issue for the projects selected by the USFS.

Compounding the USFS' inadequate analysis, according to the plaintiffs, was the fact that the CatEx category allowed for a ½ mile of temporary road construction under the new CatExes. To come up with this limit, the USFS noted that 35 of the projects it selected included an average of one-half mile of temporary road, even though 119 of the projects it selected had no road construction at all. In determining the amount of road to be constructed the USFS did not take the average road length across all projects. Instead,

it first removed all projects with no roads from its sample and then took an average for the remaining projects. This approach was inconsistent with their process for setting an acreage limit and reeked of selective data use in order to come up with a desired outcome. There appeared to be limited objectivity in the USFS' process for determining what types of salvage projects ought to be categorically excluded. Nonetheless, the court in this case deferred to the USFS' methodology. Noting its "admittedly lay perspective" on these statistical issues, the court refused to substitute its judgment for the agency's. The court's conclusions in this case are worrisome. One has to wonder whether plaintiffs failed to make their case clearly as to the methodological problems with the USFS's approach or whether the court simply did not get it. In general, the level of review as to the nature of the agency's approach to analyzing CEA before making a CatEx category appeared somewhat more relaxed in the Tenth Circuit than what was undertaken by the Ninth Circuit.

As for CEA, the environmental groups in this case contended that, particularly given the deficiencies in how this CatEx category was created, its use might lead to significant cumulative impacts. The court's response was that agencies are required to conduct scoping even on CatEx projects. In this process, the court reasoned, project managers determine whether extraordinary circumstances might exist, which would then trigger the need for more detailed environmental review. This provision, according to the court, provides a safety net for cases when a project or multiple projects in the same area might have significant cumulative effects. The plaintiffs also expressed concern that the agency might break up bigger projects into smaller ones that fit under this CatEx category. Despite the fact that they cite numerous cases in which the agency was found

to do just this, the court stated that it had no choice but to trust that the agency would observe the law in its application of this CatEx.

Another Tenth Circuit case from 2006 involved an applied challenge to a project on the Fishlake National Forest. In *Utah Environmental Congress v. Bosworth* (2006), plaintiffs argued that the Seven Mile Project, approved under CatEx category 14, failed to include an adequate CEA. The plaintiffs charged that the agency failed to conduct a CEA for indicator species or create a large enough cumulative effects boundary. The court reasoned that requiring a CEA for a project approved under a CatEx category would render the whole notion of CatExes useless. The court also noted that a CEA should already have been conducted when the category was promulgated but did not review whether this was the case, as the category as a whole was not challenged by the plaintiffs.

The court further explained that the only reason a CatEx might be required in this case would be if extraordinary circumstances were present and wrote:

We agree that it may be conceptually possible for a large number of small projects to collectively create conditions that could significantly affect the environment. But the regulation itself contains a provision to address that concern, namely the extraordinary circumstances exception. And the extraordinary circumstances safety-valve is more than capable of addressing specific harms allegedly created by specific projects... (*Utah Environmental Congress v. Bosworth*, 2006, p. 741).

This is a bit confusing—in one breath the court says the potential for cumulative impacts from many projects should be considered prior to the promulgation of the category and in the next says that this is dealt with through the consideration of extraordinary circumstances. All in all this seems to place a considerable burden on the extraordinary circumstances provision for catching potential cumulative impacts, which is somewhat worrisome given the flexibility the agency now has to determine if such circumstances exist and warrant preparation of an EA or EIS.

The plaintiffs also noted that the decision memo for the Seven Mile project acknowledged potential effects to several sensitive species and that, therefore, the extraordinary circumstances provision should be triggered. However, the court found that such effects were not predicted to be significant and therefore did not require further analysis. Extraordinary circumstances, according to the USFS handbook, only exist when there may be a potentially significant effect (Forest Service Handbook, Ch. 30). It would be fair if at this point the reader is thoroughly confused. Is it not easy to imagine multiple projects with individually less-than-significant effects to sensitive species that would be cumulatively significant? When and how would this situation be detected? And is an EA not the proper document for determining effects to a particular resource or are not significant? Is this an appropriate determination to make for a CatEx project, for which a proper CEA is not even conducted?

Given this maze of questions regarding the nature of cumulative impacts and CatEx categories, one cannot envy the position of the public or of agency staffmembers, all of who must wade through this complicated decision-making framework. Agency personnel are left to sort through these court decisions and figure out whether they must consider cumulative effects as part of scoping or considering extraordinary circumstances, or whether the heavy-lifting for CEA was adequately handled during the creation of the category. If some sort of CEA has to occur for CatExed projects, it is unclear what form this analysis should take, given that courts have said a CatEx project does not require a CEA. Indeed, several people in Region 1 during the interviews for this research expressed that they were confused about the current state of these CatEx categories, having received direction from the agency to do some kind of CEA for such

projects, despite the fact that the whole point of a CatEx category is to obviate the need for such analysis. The current situation may be the inevitable result of the improper creation of CatEx categories that include projects that may have cumulatively significant impacts. As noted earlier, the number of projects completed by the USFS under a CatEx category has been significant in recent years (GAO, 2006), and it appears that the definitions of these categories push the boundaries as to the types of projects that can be approved without more detailed environmental analysis.

In summary, it is clear that the agency has the responsibility of ensuring that projects that fall into CatEx will not have significant cumulative impacts, but it is less clear that the agency is meeting its obligations in this area. As the court explained in *Utah Environmental Congress v. Bosworth* (2007):

[R]elatively little analysis is required of the Forest Service once it determines that a project fits within the four corners of a categorical exclusion. This is because the Forest Service previously did the heavy lifting when it created the categorical exclusion—it conducted an extensive environmental analysis and determined that any project approved under a categorical exclusion would not produce a significant or cumulative effect on the environment in the absence of extraordinary circumstances (p. 750).

This is the ideally how CatEx categories are meant to work; the problem is that it is unclear whether the agency really has done this heavy-lifting for some of the current CatEx categories. The Ninth Circuit found that, at least for one category, the agency had not met its responsibilities in this area. It seems the Tenth Circuit has deemed that as long as a CatEx category stands, scoping, the illegality of segmenting projects, and the extraordinary circumstances provision are adequate for preventing cumulative impacts. However, the burden of determining whether cumulative impacts may arise is supposed to be handled *before* the creation of a CatEx category. Therefore, it is, to say the least, confusing that the Tenth Circuit, in what appears to be a highly deferential position on

this matter, now allows this to occur as part of scoping and consideration of extraordinary circumstances. Compounding this problem is the fact that extraordinary circumstances no longer automatically trigger the need for an EA or EIS.

At present, USFS staff determine whether cumulative impacts will occur during scoping and consideration of extraordinary circumstances. However, these are improper tools for conducting CEA. That type of analysis is precisely what an EA or EIS is for, and is why CatEx categories are supposed to include only activities which have already been determined not to have an individually or cumulatively significant impact. The unfortunate fact is that both the Tenth Circuit's position on this matter and the USFS' use of CatExes for projects that may have significant cumulative impacts are unsatisfactory and skirt the requirements of NEPA and CEA. Undoubtedly, the current legal and administrative decision-making frameworks, as a result of this confused direction from the courts and questionable use of CatExes by the agency, are serious impediments to effectively conducting CEA, especially for CatExed projects.

2.5 Judicial Review of USFS Wildlife Analysis

The final section of this chapter provides a brief overview of the USFS' requirements to protect biodiversity and considers how the Ninth Circuit has ruled in some key cases involving the review of science and wildlife analyses done by the USFS. The discussion starts with an overview of the USFS regulations regarding wildlife protection and then goes on to look at how these requirements have been interpreted in the Ninth Circuit. This primer is necessary in order to provide a foundation for the

following chapters, in which I discuss legal requirements for wildlife planning on USFS lands and look in detail at how CEA is done for wildlife species.

In order to understand the USFS' requirements for wildlife protection, a little background on USFS planning rules is necessary. In the original NFMA, Congress, in a move that has been characterized as reflective of "a deep congressional distrust for the capacity of the Forest Service to develop regulations in a manner reflecting the new statutory standards," required the Forest Service to convene a Committee of Scientists to flesh out the meaning of the statutory language in NFMA (Hoberg, 2004, p. 6).⁴² In 1982, the first planning regulations were promulgated based on the Committee's recommendations, and those regulations served as the basis of forest planning until 2000.⁴³

In recent years, the planning regulations have been the subject of much debate and change. A second Committee of Scientists was convened in 1997 and new regulations were promulgated based on their recommendations in 2000.⁴⁴ The Bush administration replaced these regulations in 2005, without soliciting the advice of another Committee of Scientists.⁴⁵ Despite the presence of the 2000 and 2005 regulations, in recent years some National Forests had already begun to revise their forest plans according to the 1982 regulations and have continued to use these regulations as a basis for their revisions. In 2007, the Bush administration's 2005 planning regulations were enjoined by a Northern California District Court for lack of compliance with the NEPA and Endangered Species

⁴² The committee of scientists language is found at 16 U.S.C. § 1604(h) (2000).

⁴³ The planning rules can be found at 36 C.F.R. § 219.

⁴⁴ 65 Fed. Reg. 67514 (November 9, 2000).

⁴⁵ 70 Fed. Reg. 1023 (Jan. 5, 2005).

Act.⁴⁶ After complying with its procedural obligations, the USFS in 2008 issued its final planning rule, which was not substantially different than the 2005 rule, although this iteration went through the NEPA process.⁴⁷

A considerable amount of controversy has revolved around biodiversity protection under NFMA. The diversity provision is a substantive requirement of the NFMA and states that the USFS shall specify guidelines that "provide for diversity of plant and animal communities...."⁴⁸ The 1982 regulations gave further definition to the diversity provision, stating that the agency must "maintain viable populations" of vertebrate species.⁴⁹ A number of cases involved arguments about the methodologies used to meet this "viable populations" standard, and courts usually deferred to the agency's choice of approach. In the 2008 rule, the viability language from the 1982 regulations no longer exists. Instead, the USFS now will focus broadly on preserving ecosystem diversity in order to protect species and also, at its own discretion, will manage for selected species-of-concern and species-of-interest in accordance with overall multiple-use objectives.⁵⁰

The IPNF's 1987 Forest Plan, which is still in effect and is based on the 1982 regulations, states that the forest will maintain viable populations of vertebrate species in the planning area (generally understood to be the entire forest). In order to understand the IPNF's responsibilities in terms of wildlife populations, we need to consider how the Ninth Circuit has interpreted the viability provision from the 1982 regulations. An often referenced case that clarifies the standard in the Ninth Circuit for how the regulation is

⁴⁶ *Citizens for Better Forestry v. USDA*. (N.D. Calif. No. C 05-1144 PJH, Mar. 30, 2007).

⁴⁷ 73 Fed. Reg. 21468 (April 21, 2008).

⁴⁸ 16 U.S.C. § 1604 (g)(3)(B) (2006).

⁴⁹ 36 C.F.R. § 219.19 (2000).

⁵⁰ 36 C.F.R. § 219.10 (2008).

interpreted is *Inland Empire Public Lands Council v. USFS* (1995) (hereinafter *Inland Empire*). At issue in this case was the EIS for eight timber sales in the Upper Sunday watershed of the Kootenai National Forest. The plaintiffs, a cohort of environmental groups, charged that under NFMA, the USFS was required to conduct population viability analysis for the seven sensitive species analyzed in the project's EIS. They charged specifically that the USFS had fallen short of their duties to maintain viable populations specifically because it "never examined the species' population size, their population trends, or their ability to interact with other groups of the species living in neighboring patches of the forest" (*Inland Empire*, p. 758). They also charged that the USFS could not limit its viability analysis to the project area because doing so violated the CEA requirement under NEPA.

In order to understand the relevance of this case, we must consider the 1982 viability regulation in full. It states:

Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, 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. In order to insure that viable population will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area. (36 C.F.R. §219.19 (2000)).

The real question in this case was not whether the USFS is required to maintain viable populations of species on each National Forest; all parties agreed on that point. The disagreement revolved around the methodology used to meet that substantive requirement. The USFS' approach, which is not different from what is done today, was to estimate the amount of habitat necessary to maintain a viable population (although for some species this minimum amount of habitat was never determined) and the amount of

habitat that would be affected for each species under various alternatives in an EIS.

Plaintiffs argued that the regulations required the Service to analyze actual population numbers and trends as well as linkages between populations, but the court ruled that the Service's reading of the regulation was not arbitrary and capricious. It explained that the regulation clearly states *habitat* must be provided to support minimum viable populations and must be well distributed in the planning area. Although population data would be beneficial, explained the court, it is not required by the regulation.

The essential question is whether maintaining habitat for species actual ensures survival or presence of that species. The USFS asserted in *Inland Empire* that maintaining habitat fulfilled their obligation to maintain viable populations, and the court found it a reasonable assumption that habitat preservation leads to species preservation. In other words, the court deemed it appropriate that the USFS use habitat as a proxy for determining population viability. In general, the USFS still maintains the position that its responsibility to provide habitat, while it is a state's responsibility to monitor populations.

Another important aspect of *Inland Empire* involved the issue of management indicator species (MIS), or species that are chosen to serve as a sort of bellwether for a group or guild of species with similar habitat requirements. The 1982 viability regulation stated that for these species the USFS is supposed to evaluate the effects of projects "in terms of both amount and quality of habitat and of animal population trends."⁵¹ For the Upper Sunday project at issue in *Inland Empire* the USFS had chosen the pileated woodpecker as an MIS and had not evaluated population trends for the woodpecker. The USFS' estimates were only of habitat availability. The Service argued that there was no

⁵¹ 36 C.F.R. §219.19 (2000).

cost-effective way to monitor woodpecker populations and that habitat analysis fulfilled its obligations to monitor the MIS' population viability. The court agreed that this was reasonable, again stating the habitat evaluation was a suitable proxy for population monitoring. Therefore, *Inland Empire* firmly established in the Ninth Circuit the validity of the USFS' use of MIS as proxies for other species and of habitat as a proxy for population numbers. This methodology, referred to as the "proxy-on-proxy" method for meeting the Service's obligations to maintain viable populations on its lands, continues to be acceptable in the Ninth Circuit today.⁵²

Inland Empire is often cited as a case of considerable judicial deference in terms of the agency's scientific methodological choices. As Smith (2007) explains, "The Court did not scrutinize the FS's habitat modeling methodology, neither in terms of how habitat was actually inventoried, nor how the percentages of necessary habitat had been created" (Smith, 2007, p. 72). Additionally, although the court agreed that the maintenance of viable populations was a strict substantive standard, it never explained how monitoring habitat alone fulfills this standard. Instead, it only found the assumption that habitat does serve as an adequate proxy for population numbers reasonable and not contrary to the language of the regulations. As we will see, the Ninth Circuit has taken more of a scrutinizing look at the agency's scientific methodologies for providing for species protection since *Inland Empire*. Nonetheless, for environmental groups and for wildlife populations, *Inland Empire* was a critical loss in the Ninth Circuit. The USFS had won the argument that habitat monitoring alone was sufficient to meet their wildlife protection

⁵² Other circuits have held in some cases that the USFS *is* obligated to monitor actual population trends. In *Sierra Club v. Martin*, 168 F.3d 1 (11th Cir. 1999) the Eleventh Circuit held that the Service was required to monitor population numbers. While the court acknowledged that its interpretation differed from that in the Ninth Circuit, it also explained that the circumstances of review, particularly the language of the specific forest plan at issue, were different.

duties. The problems that result from this decision are discussed in great detail in the chapters that follow, as we look at how the IPNF currently conducts wildlife CEA.

As for the CEA challenge in *Inland Empire*, the court also ruled in favor of the USFS' chosen methodology. The plaintiff's charged that the USFS scope of their CEA for wildlife species was too small, being limited to the project area. Interestingly, the court dismissed this, saying it was not a CEA challenge. It noted that CEA challenges usually involved the issues of whether other projects had been included in the analysis but did not usually involve the issue of geographic scale of the analysis for a single project. The court's position on this issue changed over time, and, as we have seen, plaintiffs have since brought successful challenges to the scale of analysis of the effects of a single project. In this case, the court also noted that the USFS did extend its analysis beyond the project area for some species, which may have contributed to its decision.

As for close review of the science underlying species viability analysis, in later years the Ninth Circuit began to look more closely at the quality of data underlying USFS wildlife analyses. For example, in *Idaho Sporting Congress v. Thomas* (1998) the court affirmed the proxy-on-proxy method as valid but stated that the Service had to address the quality and adequacy of fish habitat in its environmental analysis. The court also made it clear that in NEPA analyses scientific conclusions could not rely only on expert opinion but needed to be supported with hard data that was available to the public. In *Idaho Sporting Congress v. Rittenhouse* (2002) the court invalidated the USFS' use of the proxy-on-proxy method, because in that case the Service's own scientists stated that the agency's methodologies for ensuring the viability of old-growth dependent species and for estimating the presence of old-growth habitat were both unreliable and inaccurate.

Judicial review of USFS wildlife analyses and particularly the scientific basis of such analyses has become especially controversial due to a series of decisions between 2004-2008 involving Region 1 National Forests. The story begins with the Iron Honey decision, *Lands Council v. Powell* (2004), which was discussed in previous sections. Recall that in *Lands Council* (2004) the court made several important decisions regarding the scientific foundation of the agency's environmental analysis. For one, it stated that the IPNF could not use "stale" habitat data in support of its effects analysis for a trout species. Furthermore, the court stated that the agency must disclose the shortcomings in its watershed analysis model. The court also found that the USFS' use of a spreadsheet model that estimated soil conditions on the project site based on general data on IPNF soils and aerial photographs was unreliable for ensuring that soil quality standards were being met in the project area. Although this particular methodology had been ruled inadequate in a previous district court case, the USFS argued that the methodology was sound and that the court should defer to its technical expertise. However, the court found that the USFS had done nothing to verify the predictions of the model. It concluded, "Under the circumstances of this case, the Forest Service's basic scientific methodology, to be reliable, required that the hypothesis and prediction of the model be verified with observation" (*Lands Council*, 2004, p. 1035). What was unclear from this case, however, was whether the court meant that a model *always* must be verified with on-site data for every project area and every resource.

In *Lands Council* (2004) the court also deemed inadequate the IPNF's analysis under the proxy-on-proxy method for old-growth species. While it reaffirmed the approach as a general tool, the court reiterated that the methodology for habitat analysis

must be reliable. The IPNF's own scientists had stated in a monitoring report that the timber stand management reporting system database (TSMRS) was an unreliable tool for estimating old-growth habitat because of insufficient data on old-growth characteristics such as snag availability and canopy closure (USFS, 1998). The court ruled that the TSMRS therefore could not be used as a basis for the proxy-on-proxy approach for ensuring viability.

The holdings in *Lands Council* (2004) set the stage for something of a firestorm on the issue of judicial review of science in the Ninth Circuit over the next few years. The importance of the decision became apparent in the highly controversial case *Ecology Center v. Austin* (2005) (hereinafter *Ecology Center*) decided by the Ninth Circuit in December of 2005. At issue in *Ecology Center* was the Lolo Post Burn Project, which involved "treatment" of old-growth stands, or commercial thinning and prescribed burning in such stands, and salvage logging in areas burned in the 2000 fires. The USFS argued that such treatment was necessary to improve the vigor of old-growth stands and correct for conditions resulting from years of fire-suppression.

The Ecology Center argued that there was significant scientific uncertainty around the effects of old-growth treatment on old-growth dependent species, and that, although such treatment is meant to improve old-growth habitat, the USFS could not ensure that such treatment would not harm old-growth dependent species. The court sided with the plaintiffs and explained in its decision, "While Ecology Center does not offer proof that the proposed treatment causes the harms it fears, the Service does not offer proof that the proposed treatment benefits—or at least does not harm—old-growth dependent species" (*Ecology Center*, 2005, p. 1063). Citing the precedent set in *Lands Council* (2004), the

court concluded that the USFS' assumptions that old-growth treatment would benefit species "is predicated on an unverified hypothesis" (*Ecology Center*, 2005, p. 1064). The court particularly noted that the Service had no data to support its assumptions, despite the fact that it had had the opportunity to collect such data in areas that it had previously treated. In this case, it seemed the court's decision rested both on the fact that there was no scientific support for the Service's assertions as well as the fact that the USFS had failed to collect monitoring data and learn from previous, similar projects. The Service also failed to openly acknowledge in its EIS the uncertainty of old-growth treatment or to present the proposed project as an opportunity to test its assumptions. Instead, stated the court, "[T]he Service is asking us to grant it the license to continue treating old-growth forests while excusing it from ever having to verify that such treatment is not harmful. Rather, it treats the prediction that treatment will benefit old-growth dependent species as a fact instead of an untested and debated hypothesis" (*Ecology Center*, 2005, p. 1064).

The dissent in this case discussed at length the issue of relying upon unverified hypotheses without observational data. Recall that in *Lands Council* (2004) this issue was raised with regard to the soil quality spreadsheet model. However, in *Ecology Center* (2005) the rule was extended and used to support the court's holding that the USFS must provide some verification of the accuracy of its hypotheses regarding old-growth treatment. In her dissent Judge McKeown argued, "[I]n *Lands Council* we did not purport to create a general rule requiring on-site verification for all scientific hypotheses adopted by the Forest Service regardless of context" (*Ecology Center*, 2005, p. 1076). She pointed out that the USFS did have *some* observational evidence that old-growth treatment does indeed benefit species and also argued that to not treat old-growth

arguably would cause even more harm to old-growth dependent species because of predicted losses due to insect infestations. In other words, based on limited information, the USFS had made a reasoned choice among alternatives that all involved some level of risk.

The holdings in *Ecology Center* (2005) were highly controversial. On the one hand, the case seemed to indicate the USFS no longer could proceed with its management prescriptions without monitoring and learning from its actions. On the other hand, some argued that the court had gone beyond standard APA review and inserted itself too far into the nuances of the science behind agency decisions. The case was appealed to the Supreme Court, which declined to hear it.⁵³ However, as discussed below, the Ninth Circuit ended up overruling the precedent set in this case two and a half years later.

The controversial nature of *Ecology Center* was central in a subsequent decision from 2007 involving the IPNF. In that case, *Lands Council v. McNair* (2007), the same issue regarding the unverified effects of old-growth treatment was raised with regard to the environmental analysis in the Mission Brush EIS from the IPNF. In this case the court issued a preliminary injunction, in which it found a likelihood of success by the plaintiffs. Based on the precedent set in *Ecology Center*, the court again took issue with the fact that the USFS had not proved that its proposed old-growth treatments would indeed improve wildlife habitat. The court wrote in this case, “None of the documents [the USFS] cites...demonstrates the reliability of the Forest Service’s hypothesis that restoration treatment will benefit dependent species” (*Lands Council v. McNair*, 2007, p. 776). Furthermore, the court found it likely that the failure to adequately discuss the

⁵³ *Mineral County v. Ecology Center Inc.*, 127 S. Ct. 931 (2007), *cert. denied*.

uncertainty of the effects of its management prescriptions in its EIS failed to meet the requirements of NEPA.

The body of this decision was relatively unremarkable, but the special concurrences in *Lands Council v. McNair* (2007) were quite interesting. Judge Milan Smith wrote that he joined the majority in this opinion only because he was left with no other choice given the precedent set in *Ecology Center*, which he believed was wrongly decided. In his special concurrence, Smith further argued that the judiciary's intrusion into Forest Service decision-making had created a moving target in terms of judicial review of agency action and had been a prominent factor in the decline of the timber industry in the Pacific Northwest. However, in their concurrence, Judges Ferguson and Reinhardt emphasized that the series of injunctions on USFS activity in the Ninth Circuit was a result not of the court overstepping its role, but of the USFS' repeated illegal conduct and apparent overemphasis on timber harvest rather than environmental stewardship.

The controversy underlying this decision was dealt with the following year in an en banc hearing, granted by the Ninth Circuit at the request of the USFS.⁵⁴ It was in this case that much of the precedent established in *Ecology Center* was overruled and that the court revisited in detail its standards regarding the requirements of the proxy-on-proxy method. None of the judges who ruled in favor of the plaintiffs in *Lands Council v. Powell* (2004), *Ecology Center v. Austin* (2005), or *Lands Council v. McNair* (2007) (except Judge Smith who made it clear he only ruled in favor of the plaintiffs because he

⁵⁴ *The Lands Council v. McNair*, 537 F.3d 981 (2008). An en banc panel is a panel of eleven judges, as opposed to the usual three judge panel, which reconsiders the court's decision in a case. In such a case the court reviews the circumstances of the case, hears oral arguments, and renders a new decision on the case at hand. Such review is generally reserved for issues of special importance.

was bound by precedent) were present on the eleven-judge panel. However, Judge McKeown, who wrote the dissent in *Ecology Center*, was on the panel, and it was Judge Milan Smith, Jr. who delivered the opinion of the court.

The en banc opinion opened by explaining that the court chose to review the case in order “to clarify some of our environmental jurisprudence with respect to our review of the actions of the United States Forest Service” (*Lands Council v. McNair*, 2008, p. 984). The decision vacated and lifted the preliminary injunction that had been issued in *Lands Council v. McNair* in 2007 and went on to address standards of judicial review of science and wildlife analysis in the Ninth Circuit. The court spent a good deal of time addressing and overruling the *Ecology Center* case, something that was notable given that the Supreme Court had declined to hear that case and the Ninth Circuit itself had denied a request for an en banc hearing of that case after it was decided.

Judge Smith made it clear in his opinion that the plaintiffs had done nothing less than ask the court “to act as a panel of scientists that instructs the Forest Service how to validate its hypotheses regarding wildlife viability...and...to explain every possible scientific uncertainty” (*Lands Council v. McNair*, 2008, p. 988). Beginning with a look at *Lands Council v. Powell* (2004), the court acknowledged that *under the circumstances of that case* the USFS needed to verify the prediction of a soil model with on-the-ground observation. However, the court went on to distinguish that case from *Ecology Center*, in which the court applied that rule more broadly to mean that the USFS always had to verify its predictions with on-the-ground analysis. In the en banc decision the court retreated from such a position regarding the necessity of verifying predictions and hypotheses with on-the-ground observation as a general rule and explained that it

overstepped its role in applying that rule generally in both the *Ecology Center* case and the subsequent *Lands Council v. McNair* (2007) case. The court stated that as long as there is some observational basis for application of a model's predictions, it is not necessary that an agency as a rule conduct on-site verification of soils or any other types of models. As for the effects of old-growth treatment on old-growth dependent species, the court acknowledged that the agency had limited evidence that such species at least are not harmed by old-growth treatment but that it is up to the USFS, and not the court, to determine whether such evidence is significant. The decision was a step back towards traditional judicial review under the APA's arbitrary and capricious standard and reaffirmed the role of judicial deference particularly in light of scientific or technical matters.

The opinion also revisited a series of wildlife/USFS cases in the Ninth Circuit, beginning with *Inland Empire*. Specifically, the court stated that although the proxy-on-proxy method remains valid, "[T]he Forest Service nevertheless must both describe the quantity and quality of habitat that is necessary to sustain the viability of the species in question and explain its methodology for measuring this habitat" (*Lands Council v. McNair*, 2008, p. 998). The agency must be clear how it defines suitable habitat and must have reliable and accurate methods for determining available habitat. However, courts will not ask the USFS to do the unreasonable. If the agency has no data on how much habitat is required to support a minimum viable population, a court will almost certainly not require the agency to determine such a number before proceeding with a project. Instead, the agency will only be required to do what it can with the information on hand.

It is difficult to pin down exactly how a court might rule on this last point. Consider, for example, *Inland Empire*, a case in which the agency failed to analyze in detail feeding and nesting requirements for habitat for the flammulated owl. The court noted that such information was not available and that “an analysis that uses all the scientific data currently available is a sound one” (*Inland Empire*, 1996, p. 762). Recall, however, that the USFS’ use of its TSMRS data for old-growth species’ habitat in *Lands Council* was deemed insufficient because the database was outdated and inaccurate in terms of several old-growth characteristics. The distinction here may be inaccurate (outdated and incorrect estimates of canopy cover) versus unavailable data (no known data on habitat acreage needed for feeding habitat for a species). Furthermore, while it is not entirely clear when courts will require agencies to update their databases, such decisions sometimes have hinged on whether the agency’s own scientists have raised questions regarding the reliability of its data sets.⁵⁵ Additionally, although NEPA does not require an agency to generate information, the NFMA requires the agency to ensure species viability and includes monitoring requirements in both the planning regulations and in forest plans.⁵⁶ Under NFMA then, courts can require the agency to update data and comply with its obligations. However, there is no bright line as to when a failure to monitor and update data is acceptable or when it is a problem that a court will require the agency to correct.

⁵⁵ The court’s holdings in *Rittenhouse* (2002) and *Lands Council* (2004) that old-growth datasets were inadequate were based in part on statements made by the agency’s own biologists in monitoring reports.

⁵⁶ The 1982 planning regulations required that plans include monitoring requirements and that forests review conditions of resources at least every five years (36 C.F.R. §219.11 and 219.10 (1982)). The 2008 regulations are similar, requiring that plans describe a monitoring program and that forests provide updated descriptions of conditions every five years (36 C.F.R. §219.6 (2008)).

2.6 Conclusions

In summary, when it comes to the more straightforward aspects of CEA, the Ninth Circuit has established relatively clear standards for how the analysis must be presented in NEPA documents. For example, the agency cannot fail to include other relevant projects in its analysis. Some sort of catalog of past projects must be provided and reasonably foreseeable future projects must also be included in the CEA, as long as the details of those projects are known with any specificity. Adequate empirical support and an explanation of the rationale behind conclusions must be provided in a CEA. The analysis cannot be postponed to some forthcoming NEPA document, nor can it tier to either a non-NEPA document or a programmatic document that does not include analysis specific enough to be relevant for the decision at hand. Data cannot be obviously outdated, particularly if the data play a big role in supporting a CEA. The scale of the analysis must be explicitly stated, and the choice of both temporal and geographic scale of a CEA must be justified with some degree of clear reasoning. In general, claims of professional expertise alone will not survive judicial review.

The case law is less consistent in terms of the aspects of CEA that are more complicated and confusing. For instance, some of the most challenging aspects of implementing the CEA requirement involve the questions of how exactly to capture impacts from many past actions and whether CEA is most appropriately tackled at the programmatic or project level. Indeed, it is in these areas that judicial decisions are not always consistent and vary according to the specific facts of the case. For instance, at present it is not entirely clear to what extent the agency must disclose the effects of individual past projects, as opposed to relying upon a portrait of current conditions as an

indicator of cumulative impacts. I consider this issue in detail in the chapters to come, as discussion of the topic benefits from a closer look at some specific examples of how the IPNF has responded to the issue. Some of the disagreements between the courts and CEQ as to the requirements of CEA in terms of past actions stand as significant impediments to doing CEA. If the agencies are not clear on the requirements, this likely impedes the development of a coherent understanding of the nature of the requirement and effective methods for implementing it.

Requirements for CEA in programmatic NEPA analyses also vary from case to case. For instance, it is unclear as to what extent a CEA, particularly one that addresses private land activities, must be included in forest plan EISs. There is also no bright line rule as to when a reviewing court will deem necessary a programmatic document for reviewing cumulative actions. Finally, the issue of providing a CEA for CatEx categories and projects also is messy and turns on the issue of how and when to provide a look at the cumulative impacts of many smaller or less impactful actions.

As for viability analysis for wildlife species, the proxy-on-proxy method continues to be accepted practice in the Ninth Circuit and by the USFS. In terms of the quality of the science underlying species analyses, the court has occasionally required the agency to update its databases or expand its scale of analysis, particularly when internal agency documents highlight deficiencies in the agency's approach. When evaluating the availability of habitat for indicator species, the Service is required to describe the quantity and quality of habitat required to support a viable population. At the same time it is not required to generate knowledge where it does not exist. These standards are relevant to

understanding much of what is discussed in the next chapter with regard to the way in which the IPNF analyzes cumulative impacts to wildlife species.

Table 2.1a Ninth Circuit CEA Cases by Year

Circuit Court	Year	Case	Decision
Ninth Circuit	1998	<i>Neighbors of Cuddy Mountain v. USFS</i> (137 F.3d 1372) <i>Idaho Sporting Congress v. Thomas</i> (137 F.3d 1146) <i>Blue Mountains Biodiversity Project v. Blackwood</i> (161 F.3d 1208)	CEA in EIS inadequate* CEA in EAs inadequate* CEA in EA inadequate*
	1999	<i>Muckleshoot Indian Tribe v. USFS</i> (177 F.3d 800)	CEA in EIS inadequate*
	2002	<i>Neighbors of Cuddy Mountain v. Alexander</i> (303 F.3d 1059) <i>Native Ecosystems Council v. Dombeck</i> (304 F.3d 886) <i>Idaho Sporting Congress v. Rittenhouse</i> (305 F.3d 957)	CEA in EIS adequate; EIS inadequate for other reasons CEA in EA inadequate* CEA in EIS inadequate*
	2003	<i>Selkirk Conservation Alliance v. Forsgren</i> (336 F.3d 944) <i>Earth Island Institute v. USFS</i> (351 F.3d 1291)	CEA in EIS adequate CEA in EIS inadequate*
	2004	<i>Cold Mountain v. Garber</i> (375 F.3d 994) <i>Lands Council v. Powell</i> (379 F.3d 738, amended at 395 F.3d 1019) <i>High Sierra Hikers Assn. v. Blackwell</i> (381 F.3d 886, amended at 390 F.3d 630)	CEA in EA adequate CEA in EIS inadequate* Lack of CEA/EIS and use of CatEx in violation of NEPA*
	2005	<i>NRDC v. USFS</i> (421 F.3d 797)	CEA in EIS inadequate*
	2006	<i>Environmental Protection Information Center v. USFS</i> (451 F.3d 1005)	CEA in EA adequate
	2007	<i>Oregon Natural Resources Council Fund v. Goodman</i> (505 F.3d 884) <i>Sierra Club v. Bosworth</i> (510 F.3d 1016)	CEA in EIS inadequate* Promulgation of CatEx category without a CEA in violation of NEPA*

* Indicates cases lost on the CEA challenge

Table 2.1b Tenth Circuit CEA Cases by Year

Tenth Circuit	2006	<i>Colorado Wild v. USFS</i> (435 F.3d 1204)	CatEx category and application of category to project not in violation of NEPA
	2006	<i>Utah Environmental Congress v. Bosworth</i> (443 F.3d 732)	Use of CatEx not in violation of NEPA
	2007	<i>Utah Environmental Congress v. Richmond</i> (483 F.3d 1127)	CEA in EIS adequate

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings

Ninth Circuit Cases	CEA-related challenges	Court decision	Further points from the case
<i>Neighbors of Cuddy Mountain v. USFS</i> , 137 F.3d 1372 (1998)	1) Challenge to Grade/Dukes timber sale EIS on the Payette National Forest, Idaho. 2) CEA too general; lacks detailed analysis of effects of this and other proposed sales on old-growth habitat.	CEA in EIS inadequate 1) Discussion of cumulative impacts too general; fails to meet “hard look” standard. CEA must include detailed and quantified information. 2) CEA with specific discussion of other reasonably foreseeable future sales must be included. 3) CEA cannot be postponed until after decision when more data is available; NEPA requires analysis before the action is taken.	1) NEPA requires some detailed or quantified information in a CEA. 2) “General statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided” (p. 1380). 3) USFS’s lack of compliance with NFMA and their forest plan in terms of old-growth protection compounded the CEA issue in this case
<i>Idaho Sporting Congress v. Thomas</i> , 137 F.3d 1146 (1998)	1) Challenge to Miner’s Creek and West Camas Creek timber sale EAs on the Targhee National Forest, Idaho. 2) USFS should have supplemented the EA for the earlier of the two sales to account for cumulative impacts from more recently proposed sale. 3) USFS should have prepared an EIS for both sales to address cumulative impacts.	CEA in EAs inadequate 1) Court rules that an EIS is required for the sales in order to address controversy and uncertainty over possible effects on water quality and fisheries. 2) Cumulative impacts were addressed in the latter of the two EAs. If the court were not requiring an EIS, there would be no need to supplement the earlier EA so that it includes the same information as the latter EA. 3) Court implies that the CEA in the latter EA is inadequate; they say it is “sparse” and inadequacies can be addressed in forthcoming EIS.	

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>Blue Mountains Biodiversity Project v. Blackwood</i>, 161 F.3d 1208 (1998)	1) Challenge to EA for Big Tower salvage timber sale on the Umatilla National Forest, Oregon. 2) EA failed to mention or analyze effects from other proposed sales in the area.	CEA in EA inadequate 1) USFS failed to even mention 3 of the 4 other sales in the EA. All five sales were proposed at the same time as part of a coordinated fire recovery strategy. Court rules these all should have been analyzed in a single EIS (this is a case where the cumulative actions requirement is triggered).	1) The effects analysis for this sale is deemed inadequate and unjustified in its conclusions. The analysis lacks specificity, and the agency's assertions of no significant impacts from this sale are unsupported and inconsistent with statements in other documents, such as the forest plan. In a case where the effects analysis is not sufficient, the CEA also must be inadequate.
<i>Muckleshoot Indian Tribe v. USFS</i>, 177 F.3d 800 (1999)	1) Challenge to EIS for Huckleberry land exchange in Mt. Baker-Snoqualmie National Forest, Washington. 2) Failure to analyze cumulative effects of logging on lands that were part of an earlier exchange, other USFS lands, and lands to be exchanged in the foreseeable future.	CEA in EIS inadequate 1) Agency argues CEA was done in forest plan and also points to another non-NEPA report. The court rules that the agency cannot tier a project-level EIS to a forest plan or any other non-NEPA document. Furthermore, neither the forest plan nor its accompanying EIS provide an analysis of the impacts or cumulative impacts resulting from this land exchange. 2) Agency must consider cumulative impacts in light of logging on previously exchanged lands. 3) Agency fails to analyze cumulative effects of logging on lands proposed for exchanged and only discusses speculative benefits that will result on lands it receives. The analysis is deemed "far too general and one-sided to meet the requirements of NEPA" (p. 811). 4) Future Plum Creek land exchange should have been included in CEA. Its inclusion would not have been speculative, as the land exchange had been announced prior to the completion of the Huckleberry EIS.	1) Court reiterates that a CEA must include at least a catalog of past actions, some detailed information, and a useful analysis of combined effects. 2) The court notes that if they accepted the agency's argument that the CEA had been done at the plan level, the cumulative impacts of land exchanges would escape environmental review.

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>Neighbors of Cuddy Mountain v. Alexander</i>, 303 F.3d 1059 (2002)	1) Another challenge to the EIS for the Grande-Dukes sale. 2) Scale of CEA is too small.	CEA in EIS adequate 1) Court finds that the agency provides substantial analysis and adequate justification for their choice of geographic scale in their CEA.	1) Plaintiffs use NFMA to address a cumulative effects issue; the agency loses on the NFMA challenge, but not on the NEPA/CEA challenge. Plaintiffs argue that the agency has failed to monitor and protect old-growth in violation of its forest plan and NFMA. The plan in this case establishes a forest-wide old-growth standard. Even if the old-growth standard is being met in the project area, the court says that this alone is not sufficient. The cumulative effects of loss of old-growth habitat forest-wide are relevant for compliance with the plan and with NFMA. Therefore, project approval in this case requires consideration of forest-wide effects.
<i>Native Ecosystems Council v. Dombeck</i>, 304 F.3d 886 (2002)	1) Challenge to the Darroch-Eagle timber sale EA on the Gallatin National Forest, Montana. 2) USFS should issue a comprehensive EIS to analyze all road density standard amendments in concert. 3) USFS failed in EA to analyze cumulative impacts of sales and associated amendments to road density standards at forest-wide scale.	CEA in EA inadequate 1) Court holds that the compendium of road density plan amendments are not connected or cumulative actions; a single EIS is not required. 2) EAs must include a CEA or tier to an EIS; other road density standard plan amendments must be considered in this EA as part of CEA. 3) National Forest is the scale for the road density standards in the plan and therefore should be the scale used for the CEA	1) A CEA-type issue was raised under the ESA in the case related to the USFS's biological assessment for grizzly bears. The agency failed to analyze effects of a nearby sheep grazing allotment and provided no justification for why this area was left out of the impacts analysis in the biological assessment. The decision was deemed arbitrary, particularly in light of the fact that other environmental analyses had considered the effects of the grazing allotment on grizzlies.
<i>Idaho Sporting Congress v. Rittenhouse</i>, 305 F.3d 957 (2002)	1) Challenge to two timber sales: Lightning Ridge (EA) and Long Prong (EIS) on the Boise National Forest, Idaho. 2) Scale of analysis for cumulative impacts on old-growth dependent species is too small.	CEA in the EIS inadequate 1) USFS' own monitoring report states that some species require viability analysis at the landscape level. The agency analyzed CEA at a smaller scale and did not justify why it did so. The agency's own documentation makes the CEA in the EIS arbitrary, particularly where the choice lacked any justification.	1) This case also dealt with challenges to USFS practices for monitoring and protecting old-growth species as required by the forest plan and NFMA. The court ruled that the agency's own monitoring report indicated their methodologies were unsound, which invalidated the agency's method of using habitat as a proxy for monitoring indicator species.

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>Selkirk Conservation Alliance v. Forsgren</i>, 336 F.3d 944 (2003)	1) Challenge to EIS for granting an easement to Stimson (a private timber corporation) to access its lands on the Colville National Forest, Washington. 2) Geographic scale of analysis too small (excludes nearby Idaho Panhandle National Forest areas). 3) Failure to analyze effects of future projects in area. 4) Temporal scale of analysis too short (3 years).	CEA in EIS adequate 1) Agency provides a reasoned justification for its choice not to include Idaho Panhandle areas in CEA for grizzly bears. 2) In this case the agency did not need to consider the effects of specific sales in the EIS because this would duplicate their assessment of the adequacy of the Conservation Agreement, which is the basis of and is analyzed in the EIS. 3) The short time frame chosen for the CEA is considered by the court to be a very close issue. It concludes, however, that while the time frame does not appear to be the best choice, there is justification for it and it cannot be deemed arbitrary and capricious.	1) Enforcement of the Conservation Agreement, which governs Stimson's activities on all of its lands in the area, is, in the court's opinion, crucial to the success of this EIS. The court emphasizes, for example, that the scale of the CEA analysis is adequate only if the terms of the Agreement are upheld. Similarly, the time frame of the CEA is sufficient if requirements to update the Agreement based on new information are enforced.
<i>Earth Island Institute v. USFS</i>, 351 F.3d 1291 (2003)	1) Challenge to salvage logging EIS on Eldorado National Forest, California. 2) Agency should have prepared an EIS for projects on both Tahoe and Eldorado National Forests because they were both similar and planned in response to the Star Fire. 3) Scale of analysis too small: Eldorado EIS did not adequately consider cumulative impacts resulting from actions on the Tahoe National Forest, which was also affected by the fire and was planning a nearby sale of a similar nature.	CEA in EIS inadequate 1) The two projects are not necessarily cumulative actions. A single EIS might have made sense but is not required because the projects were not clearly part of a single broader proposal. "Similar" actions <i>may</i> be analyzed in a single EIS, but this is not required. 2) CEA in EIS fails to analyze how actions on the Eldorado will affect a "protected activity center" (PAC) for California Spotted Owls in the Tahoe National Forest. The area under question in the Eldorado was acknowledged as relevant habitat for the Tahoe PAC prior to this EIS. The Eldorado National Forest erroneously concluded that the Tahoe National Forest would delist this PAC; the court holds that the agency should have foreseen that such delisting would not occur and should have analyzed cumulative impacts on the owl.	1) Part of this case revolves around the fact that the Eldorado National Forest erroneously delisted the PAC at issue (which exists on both National Forests) on their own National Forest. It did this based on assumptions that the area should not be inhabited given the post-fire conditions but despite the fact that staff had observed owls still occupying the area.

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>Cold Mountain v. Garber</i>, 375 F.3d 994 (2004)	1) Challenge to EA for bison herding facility on the Gallatin National Forest, Montana. 2) Agency failed to adequately analyze cumulative impacts; should have prepared an EIS.	CEA in EA adequate 1) Court holds that the agency clearly analyzed cumulative effects and justified their decision not to prepare an EIS.	1) Plaintiffs are dissatisfied with decision but fail to highlight a deficiency in the NEPA process.
<i>Lands Council v. Powell</i>, 379 F.3d 738 (2004), amended at 395 F.3d 1019 (2005)	1) Challenge to the Iron Honey timber harvest/watershed management project on the Idaho Panhandle National Forest, Idaho. 2) Lack of specificity and detail in analysis of prior timber harvests in area. 3) Failure to include foreseeable future projects in analysis. 4) Data used for CEA for Westslope Cutthroat Trout is outdated and unreliable rendering the CEA inadequate.	CEA in EIS inadequate 1) EIS fails to provide discussion of the effects from individual past harvests and offers only a vague discussion of overall environmental effects. A cataloging of past projects with detailed information on effects is the minimum necessary for a CEA; it is also crucial for a useful alternatives analysis. 2) Only proposed or scoped future projects must be included in a CEA. Analysis is adequate on the issue of future projects. 3) Trout habitat data is nearly 15 years old and deemed too stale to suffice for a CEA.	1) This case reiterates the Ninth Circuit's requirement that past actions be cataloged as part of a CEA to inform agency decision-making, public comment, and alternatives analysis. 2) The requirement for up-to-date data is also an important and unique aspect of this case in terms of CEA. Habitat data for trout was outdated. 3) The USFS used a watershed model to do CEA. The court rules that the USFS did not adequately disclose shortcomings in this model. 4) The court ruled that an agency must verify its models with on-the-ground testing in a project area. This was in response to a NFMA claim that the USFS' soil quality analysis was insufficient. 5) The court ruled under NFMA that the agency must have reliable habitat data in order for the proxy-on-proxy method of population monitoring to be sufficient. In this case, old-growth habitat data was deemed too outdated and failed to account for habitat characteristics such as canopy closure and snag availability. This violated NFMA's requirements to provide for viable populations. 6) CEQ responded to this case with a memo emphasizing that a cataloging of past actions is not always necessary; monitoring of current conditions can be sufficient for a CEA.

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>High Sierra Hikers Association v. Blackwell</i>, 381 F.3d 886 (2004), amended at 390 F.3d 630 (2004)	1) Plaintiffs contend that the USFS needs to complete an EIS to assess the cumulative impacts of issuing multi-year special use permits to outfitters in two wilderness areas on the Inyo and Sierra National Forests, California 2) Agency had impermissibly categorically excluded one-year renewals of special use permits from NEPA review.	Lack of CEA/EIS and use of CatEx both in violation of NEPA 1) Court rules that an EIS with a CEA is necessary. Agency acknowledges a CEA has not been done and says that it will comply with NEPA when they issue future permit renewals. The court responds that NEPA analysis is required prior to agency actions, and the agency is therefore in violation of the law. 2) CatExs cannot be used for activities in wilderness areas. Again, an EA or EIS is required to assess environmental impacts.	
<i>NRDC v. USFS</i>, 421 F.3d 797 (2005)	1) Plaintiffs challenge the CEA in the EIS for the forest plan for the Tongass National Forest, Alaska. 2) EIS fails to examine CEA with regard to past and reasonably foreseeable future non-federal logging on adjacent lands.	CEA in EIS ruled inadequate 1) Over 5% of the forest is owned by non-federal entities and these areas have been heavily developed. The court rules that the agency must consider the cumulative impacts of this logging and do so in the plan because the CEA could significantly affect how the agency plans to protect other resources. 2) The court makes it clear that a plan level EIS always must include a CEA (citing <i>Resources Ltd. v. Robertson</i> (1993)). In that case the court allowed the agency to defer analysis of the effects of actions on private land until the project level. In this case the court decides that the plan is the appropriate time to analyze activities on private lands. 3) The court cites <i>Lands Council v. Powell</i> (2004) and reiterates that a cataloging of past, present, and reasonably foreseeable actions and an analysis of their environmental effects is required at a minimum for a CEA.	1) The court makes clear that the circumstances in this particular case lead it to the conclusion that the effects non-federal timber harvest in and around the Tongass need to be considered in this programmatic EIS. It says, “A cumulative effects analysis in a programmatic EIS is necessary here for the Forest Service and public to make a rational evaluation of this proposed federal action balancing the competing goals of timber harvest, environmental preservation, and recreational use in the Tongass” (p. 816). 2) The plan is also ruled arbitrary and capricious because of an error on the part of the USFS in interpreting information about the market demand for timber. The USFS relied upon an inflated estimate of market demand, which in turn affected the amount of timber harvest allowed in the plan, which in turn affected how the agency balanced other multiple uses on the forest. This issue led to a number of violations of both NFMA and NEPA in this case.

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>Environmental Protection Information Center v. USFS</i>, 451 F.3d 1005 (2006)	1) Challenge to Knob timber sale EA on the Klamath National Forest, CA. 2) An EIS should have been prepared because of possible significant effects. 3) CEA for water quality flawed. 3) CEA inadequate because of failure to included a reasonably foreseeable future sale.	CEA in EA adequate 1) Court finds that the agency analyzed cumulative impacts to the watershed using a model that analyzed effects on the project and watershed scales and included past, present, and foreseeable future impacts. The plaintiffs do not challenge the validity of the model. The court concludes that the CEA is sufficiently detailed and quantified to meet NEPA requirements. 2) The parameters of the future sale were not developed enough to allow for a useful CEA. The agency did not act arbitrarily in choosing to exclude it. Even if the agency made an error of judgment in excluding the sale from the CEA, it remedied this by providing some discussion of cumulative impacts based on the information available in the comments section of the EA.	
<i>Oregon Natural Resources Council Fund v. Goodman</i>, 505 F.3d 884 (2007)	1) Challenge to EIS for expansion of Mt. Ashland Ski Area, Rogue River National Forest, Oregon. 2) Agency failed to include two future projects in the CEA for the pacific fisher (a wildlife species). 3) Agency erred in its use of a watershed impact model to assess cumulative impacts.	CEA in EIS ruled inadequate 1) Agency failed to provide any specific analysis of potential cumulative impacts on fisher resulting from this and two other scheduled future projects. EIS concludes there will be no significant impacts on the fisher but fails to justify these statements with any supporting information. Furthermore, the agency cannot justify this conclusion with the explanation that a CEA is not necessary because the anticipated effects of the ski area will be small. The agency must put these effects in context in light of the broader landscape—this is precisely what a CEA is for. 2) Agency’s watershed model is sufficiently quantified and detailed to satisfy NEPA’s CEA requirement.	

Table 2.2a Ninth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>Sierra Club v. Bosworth</i>, 510 F.3d 1016 (2007)	1) Challenge to CatEx category 10, the “Fuels Catex”. Agency failed to establish that promulgation of the CatEx category would have no significant cumulative impacts.	Promulgation of CatEx category without a CEA in violation of NEPA 1) CEA not required as part of an EA or EIS for the creation of a CatEx category, but is required nonetheless as part of the process. 2) USFS concedes that no CEA was performed before promulgation of the CatEx category. Court holds that the USFS must ensure that the Fuels CatEx will not have significant cumulative impacts. If this is not possible, then it should not have promulgated the rule. 3) Agency reports indicate potentially significant effects from similar projects on various resources but conclude there will be no significant cumulative impacts. No justification is provided to support this conclusion. The court will not accept general statements about risk (citing <i>Neighbors of Cuddy Mountain v. USFS</i> (1998)) or unsupported conclusions of no significant cumulative impacts.	1) The court says, “The Forest Service does not reveal its methodology or offer any quantified results supporting its conclusory statements that there are no cumulative impacts—it argues only that through the exercise of its expertise it determined that there was no such impact. This is insufficient.” A court will not defer to claims of expertise without evidence in the record providing support for such decisions. 2) The court reiterates that a CEA must be supported with quantified or detailed information and cannot be one-sided, focusing only on positive benefits of an action. A useful analysis of the effects of past projects in combination with proposed and future projects must be included. 3) The agency’s report lists potential mitigation measures, but CatEx actions do not require mitigation, nor are the measures developed enough to be sufficient.
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Table 2.2b Tenth Circuit CEA Cases: Primary Challenges and Holdings

Tenth Circuit Cases	CEA-related challenges	Court decision	Further points from the case
<i>Colorado Wild v. USFS</i> , 435 F.3d 1204 (2006)	1) Facial and applied challenge to CatEx category 13 as applied to Shaw Lake vegetation management project on Rio Grande National Forest, Colorado. 2) Use of category will lead to cumulative impacts.	Use of CatEx not in violation of NEPA 1) Although the plaintiffs make a convincing case as to why the agency's promulgation of this category was flawed, the court rules that the agency's process was adequate. 2) Court relies upon the extraordinary circumstances provision to prevent cumulative impacts from CatExed projects.	1) The court states that scoping prior to CatExed projects will help the agency identify when cumulative effects might be an issue. Scoping, the illegality of segmenting a project, and the extraordinary circumstances requirement, according to the court, serve as safety valves when it comes to cumulative impacts. 2) The court does not explicitly deal with the question of whether the agency adequately analyzed cumulative impacts when it promulgated this CatEx category.
<i>Utah Environmental Congress v. Bosworth</i> , 443 F.3d 732 (2006)	1) Applied challenge to CatEx of Seven Mile Spruce Beetle Management Project on the Fishlake National Forest, Utah. 2) The project should not have been approved under the CatEx because of the lack of a preliminary analysis to determine that the project would not have cumulative effects. 3) Agency failed to analyze cumulative impacts on management indicator species and sensitive species and to delineate an appropriate CEA area beyond the project area. 3) Extraordinary circumstances should have precluded use of CatEx.	Use of CatEx not in violation of NEPA 1) Requirement to perform a CEA would render the use of categorical exclusions useless. The agency already determined that the category would not have significant cumulative effects as part of the creation of the CatEx category, which the plaintiffs do not challenge. 2) An agency only needs to perform a CEA if "extraordinary circumstances" are present that preclude use of a CatEx. The court finds that no significant extraordinary circumstances exist, and therefore the use of the CatEx is justified.	1) The court does not address, as the Ninth Circuit did in <i>Sierra Club v. Bosworth</i> (2007), the issue of whether the promulgation of this CatEx category was in violation in NEPA due to a lack of CEA. 2) The court states that the extraordinary circumstances provision is a safety valve with regard to potential cumulative impacts for CatExed projects.

Table 2.2b Tenth Circuit CEA Cases: Primary Challenges and Holdings (cont'd)

<i>Utah Environmental Congress v. Richmond</i>, 483 F.3d 1127 (2007)	1) Challenge to EIS for Trout Slope West project on the Ashley National Forest, Utah. 2) Agency fails to adequately analyze the nature of cumulative effects and only provides description; agency describes negative effects but does not provide a useful CEA.	CEA in EIS is adequate 1) Court rules that the agency adequately analyzed cumulative effects, providing sufficient information and detail and including analysis of relevant past projects in conjunction with the current project. The plaintiffs, in their opinion, disagree with conclusions of the agency and their subsequent decision, but offer no evidence why the analysis is inaccurate or violates NEPA.	1) As long as an agency complies with the procedural requirements of NEPA, a court will not second-guess its decision.
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CHAPTER THREE: A CASE STUDY OF CUMULATIVE EFFECTS ANALYSIS ON THE IDAHO PANHANDLE NATIONAL FOREST

A central objective of this research is to determine how cumulative effects analysis (CEA) is currently practiced and documented by the U.S. Forest Service (USFS) and to look specifically at how it is done for wildlife. This chapter presents the results of an analysis of National Environmental Policy Act (NEPA) documents from the Idaho Panhandle National Forest (IPNF). The IPNF was chosen as a case study for this research because it presents an ideal opportunity to look at the effects of both litigation and public involvement on CEA and wildlife analysis.

Recall that in the Ninth Circuit, the Forest Service has faced more litigation on this topic than any other federal agency, with the majority of this litigation occurring in Region 1, also known as the Northern Rockies Region (Smith, 2006). After a series of unfavorable decisions in previous years involving CEA challenges and Region 1 forests, a controversial case involving CEA and the IPNF, *Lands Council v. Powell* (2004) was decided. One of the court's primary holdings was that the IPNF had failed to provide a thorough list of relevant past actions in the project area and their effects on resources as part of its CEA. It could be assumed that the IPNF was forced to take a particularly close look at how they conducted CEA in light of the court's ruling. Given the history of litigation against the USFS in the Northern Region and the IPNF in particular, the IPNF was chosen for this analysis with the presumption that the CEA in its NEPA documents would be among the most thorough analyses done by a federal agency or a particular National Forest.

The IPNF has a high degree of wildlife diversity, particularly on the North Zone of the forest where there are a number of endangered or sensitive species, such as the woodland caribou, grizzly bear, grey wolf, Canada lynx, American marten, fisher, flammulated owl, and many others. Environmental groups often challenge the agency's wildlife analyses in project comments, appeals, and litigation. In *Lands Council v. Powell* (2004), in response to plaintiff's complaints about the validity of the agency's analysis for old-growth species, the court ruled that the IPNF's data on old-growth habitat lacked sufficient detail to be used as a basis for wildlife analyses. Complaints regarding wildlife analyses were raised again in *Lands Council v. McNair* (2007), a more recent case involving the Mission Brush project on the IPNF.¹ These cases have drawn considerable attention to how the forest analyzes effects to wildlife species.

For these reasons, the IPNF is an ideal forest to study in order to understand the current state of CEA, particularly in wildlife analyses. Additionally, the constant attention and comments on IPNF projects from a number of environmental groups provide rich insight into what those groups see as the important issues and limitations in how the IPNF handles CEA. Therefore, there is perhaps no better National Forest to study in order to get a sense of the current state of CEA and areas of contention around the nature of that analysis on a forest that is likely at the cutting edge in the agency for conducting CEA on wildlife.

This chapter provides the results from the document analysis portion of this study. Environmental Impact Statements (EISs) from the IPNF were reviewed for 2002-

¹ As discussed in the case law review in Chapter 2, the Ninth Circuit issued a preliminary injunction on the Mission Brush project (*Lands Council v. McNair* (2007)). The injunction was lifted after the decision was revisited by an en banc panel in 2008 (*Lands Council v. McNair* (2008)), and the case now sits before the district court of Idaho awaiting a full hearing.

2003 and 2006-2007. These time frames were chosen in order to understand current CEA practice and compare it to how CEA was done several years earlier, prior to the landmark Iron Honey decision. This allows for a look at how CEA has changed over time and consideration of how the IPNF has changed their analysis in response to that decision. This chapter also answers the question of what processes and sources of information the Forest Service use for doing CEA for wildlife and how that analysis is presented in NEPA documents.

The chapter begins in section 3.1 with an explanation of the methodology used to select and analyze the documents and then provides an overview of findings organized into several sections. In section 3.2 I provide a summary of findings on the nature of the documentation and CEA for the 2006-2007 time period in terms of a number of basic parameters. For example, I answer questions such as where the analysis can be found in the documents, whether it considers non-federal land, and whether it explicitly explains the scale of the CEA. Next, in section 3.3, I examine how the analysis is currently done for wildlife. The final section of this chapter explains how CEA has changed over time by comparing documents from 2002-2003 to those from 2006-2007. Throughout these sections I begin to point to some of the major areas of contention around the IPNF's CEA, although a more in-depth discussion of these issues is reserved for chapter four.

3.1 Methodology

In chapter one I provide an overview of the overall objectives and methodology used in this study. This section explains in more detail how the documents were chosen and analyzed for this phase of the research.

Identifying the Sample of Project Documents

Documents were analyzed from 2006-2007 in order to get a picture of the current state of CEA practice on the IPNF. Documents from 2008 were not analyzed so that the sample would include only projects that had been finalized and for which the appeals timeframe had passed. Projects were identified using the quarterly Schedule of Proposed Actions (SOPA) put out by the USFS. The SOPA lists all ongoing projects by National Forest and district along with the status and purpose of the project.²

I chose to analyze completed projects that listed as a project purpose either “forest products” or “fuels management” in order to capture any projects involving timber harvest. There were several reasons to focus on these types of projects. As explained in chapter one, the majority of USFS litigation historically has challenged logging projects (Keele et al., 2006), and it is this type of project that is traditionally most contentious and viewed as being at odds with conservation interests. Timber projects might be expected to have significant potential impacts to wildlife populations due to the alteration and fragmentation of habitats. Furthermore, the majority of recent CEA case law involving the USFS dealt with timber-related projects. Therefore, I anticipated that timber-related projects in particular would involve CEA that was relevant for wildlife and would include public comment highlighting some of the strengths, weaknesses, and areas of debate over how the CEA is done for wildlife species. Furthermore, focusing on these projects provided for enough similarity across projects that I could develop some familiarity with the proposed actions and the type of

² SOPA reports can be accessed at www.fs.fed.us/SOPA/.

analysis provided for those actions and could compare CEA across projects involving similar activities.

Only projects for which an EIS had been prepared were analyzed. EISs include a more detailed CEA than EAs and therefore allow for a better understanding of the current state of the practice of CEA on the IPNF. Furthermore, EISs are done for projects with potential significant effects, and a project with more significant effects is likely to include a more detailed CEA. A two-year timeframe using these parameters yielded four EISs from various districts on the IPNF for 2006-2007 (the projects are listed in Table 3.1). This provided a large enough sample to compare across projects, but a small enough sample to be practically manageable given the detailed, qualitative analysis undertaken for these documents.

Documents were also analyzed for 2002-2003. This time frame was chosen for several reasons. Primarily, I was interested in considering CEA documentation prior to the Iron Honey litigation in order to determine how the IPNF's CEA had changed in response to that decision. Investigation of this question provided insight into how the judiciary, in response to litigation brought by environmental groups, affects CEA implementation. Looking at this time period also allowed for consideration of whether the nature of CEA has changed more generally over time.

These two years were chosen because they were prior to the Iron Honey decision, included the Iron Honey EIS in the sample, and also included two projects for which the IPNF had prepared supplemental EISs in 2006 in light of the Iron Honey decision (allowing for a look at how the analysis was revised). Also, SOPA reports are available for the IPNF beginning in 2002, making it easier from that year onwards to

identify all ongoing projects on the forest. This time period also yielded four EISs from across the IPNF districts. The table below provides basic information on the projects analyzed herein. The project purposes listed below are taken directly from the SOPA report sections on project purposes. Note that project purposes for the earlier time frame included “timber harvest/sale” and “fuels reduction.”

Table 3.1 Projects analyzed from 2002-2003 and 2006-2007 on the IPNF

Project Name	District	Date Completed	Project Purpose(s)
Myrtle Creek HFRA	Bonnors Ferry	8/07	Fuels management
Hidden Cedar	St. Joe	3/07	Watershed management; road management; forest products
West Gold	Sandpoint	5/06	Fuels management; forest products
Mission Brush	Bonnors Ferry	4/06	Wildlife, fish, rare plants; watershed management; road management; recreation management; fuels management; forest products
West Gold	Sandpoint	11/02	Ecosystem restoration; vegetation and wildlife habitat restoration; fuels reduction; watershed improvement; road management
Hidden Cedar	St. Joe	9/02	Timber sale; road construction; watershed restoration; access management
Iron Honey	Coeur D’Alene	2/02	Watershed improvement; timber harvest; fuels treatment
Little Blacktail	Sandpoint	1/02	Ecosystem restoration; vegetation and wildlife habitat restoration; fuels reduction; watershed improvements; road management

Analyzing the EISs

For each project reviewed, the Record of Decision and EIS summaries were read to develop a basic familiarity with the project. The document analysis then focused on both the nature of the overall documentation of CEA and the nature of the analysis specifically for wildlife. An evaluation form was developed based on several factors (the evaluation sheet can be found in Appendix B). A number of questions comprised a straightforward checklist based on criteria used in previous studies on the documentation of CEA in EAs/EISs (Burris and Canter, 1997a, McCold and Holman, 1995). These questions focused on the nature of the general CEA documentation and included questions such as:

- Where is the CEA found?
- Is it done for each resource?
- Does the scale vary by resource?
- Is there a definition of cumulative impacts?
- Are cumulative impacts summarized in a particular place?
- How are past, present, and reasonably foreseeable future actions accounted for?

This last question was of particular interest not only because it is one of the basic requirements of a CEA but also because of the court's holding in *Lands Council v. Powell* (2004). Recall in that decision that the court stated the IPNF was required to provide a comprehensive list of past actions *and* their environmental effects as part of its CEA. Therefore, I was interested in determining how the IPNF has responded to that requirement in its current NEPA documents.

In looking the nature of the CEA for specific resources, I focused on how it was done for wildlife species in the EISs. I chose to focus on a single resource to narrow the scope of the analysis. Wildlife was chosen because it is an issue that garners constant

attention from the public, has been the subject of numerous court cases, and is an issue that allows me to investigate aspects of the ongoing debate over how the USFS plans for species protection on National Forests. For this part of the analysis, the approach required more than a checklist of questions in order to capture the complexity of how CEA is done for wildlife and to discern some of the general strengths and weaknesses of the analysis. I considered questions such as:

- What species is CEA done for?
- Is the scale of the CEA defined and justified for each species?
- Are non-federal lands considered and how are they incorporated into the CEA?
- How are past, present, and reasonably foreseeable actions dealt with?
- What are the effects variables used in the CEA?
- How are cumulative impacts analyzed and presented?
- Is the presentation clear, logical, and thorough so that it aids in understanding cumulative impacts to wildlife species?

In order to document findings, relevant passages from each document were selected and are discussed herein in order to build a more complete picture of how the CEA is done for wildlife. This aspect of the analysis necessarily involved some subjectivity in terms of what sections were highlighted. Any insights or conclusions are supported with relevant quotes and sections so that the reader can evaluate the validity of any conclusions.

It is important to note that the overall goal was not to rank EISs or provide a complete assessment of the quality or accuracy of the analysis. For example if an EIS reported no significant cumulative effects for a species, it would be difficult for me to assess whether this was accurate. Instead, the goal of this process was to determine general trends in how the IPNF is documenting cumulative effects. The analysis also aimed to identify specifically how CEA is done for wildlife, highlight some of the areas

where the analysis is more or less clear, and examine aspects of the analysis that are the subject of some contention.

Finally, for each project from the 2006-2007 timeframe, public comments and the agency's responses were reviewed and analyzed for relevant content. If a project had been appealed or litigated, the appeal, legal briefs, and agency responses were also analyzed. These steps were taken in order to get a broader understanding of areas of contention around how CEA is done. This also allowed me to identify whether there were commonalities among areas where I as the researcher, members of the public in their comments, or interviewees found strengths and weaknesses in the various documents.

The following sections detail the results of this document review. Sections 3.2 and 3.3 present the results of the document analysis in terms of both the overall approach to CEA and the approach to CEA for wildlife specifically. Section 3.4 considers how CEA changed between the two time frames. Results are presented along with some initial analysis in order to highlight several important areas of contention; however, a closer look at some of the strengths, weaknesses, and criticisms of the CEA is reserved for the next chapter.

3.2 General Aspects of CEA Documentation

As discussed in chapter one, earlier studies found that CEA was not present in all NEPA documents or for all resources (Burris and Canter, 1997a; Cooper and Canter, 1997; McCold and Holman, 1995). Recall that, according to those studies, less than half of EAs even mentioned cumulative impacts and that CEA in EISs was less than

complete. Therefore, as part of this analysis I considered some general questions about the documentation of cumulative effects.

These findings can be summarized briefly. CEA was conducted in 100% of the documents reviewed. It was included for all resources, and the scale of the analysis was stated explicitly and varied by resource. For example, watersheds were used for CEA for water quality, whereas the activity area often was the CEA area for soils. Some justification for the scale of the CEA area was provided for each resource. For wildlife, the CEA area varied by species but in general was the same as the project area. The justification for this was that the project area had been delineated at least in part based on topographic features and was the size of multiple home ranges for the species analyzed. Non-federal lands and past, present, and reasonably foreseeable actions were discussed, albeit to different extents, for all resources where it was deemed relevant in every EIS.

No document provided a comprehensive overview of cumulative impacts in one place. All of the EISs approached CEA resource-by-resource, and the relevant CEA could be found in the “Environmental Consequences” sections for each resource where direct, indirect, and cumulative impacts were presented together. All documents provided a definition of cumulative impacts somewhere in the EIS. The only document to include an index was the Hidden Cedar EIS. “Cumulative effects” was not an item in the index, but it did refer the reader to relevant sections such as that on “Past, present, and reasonably foreseeable future actions.”

Consideration of Past Actions in CEA

One aspect of CEA examined in detail was the way in which past projects were presented and analyzed. In *Lands Council v. Powell* (2004) (referred to hereinafter as *Lands Council* or the Iron Honey decision) the court held that the agency was required to provide a list or “catalog” of relevant past activities in the area and their effects.³ The reasoning for this appeared to be twofold: 1) such a list would facilitate the development of a useful CEA and provide documentation of what projects had been considered as part of the CEA, and 2) documentation of project effects would allow for comparisons among of the proposed alternatives presented in EIS and their possible effects in light of documented effects from past activities. Recall that in that case, the effects of past management were quite significant, with all but two of the 14 watersheds in the project area considered to be either not functioning or functioning at risk, in large part as the result of nearly 40,000 acres of timber harvest since the 1960s.

The requirement from *Lands Council* could be read to be potentially quite challenging. Agencies would have to not only list past actions in an area but also their environmental effects on each resource. In other words, *Lands Council* could be read to mean that the USFS would have to list, for example, all past timber harvests in an area, the types of harvests conducted, the number of acres affected, and the effects of individual projects on each resource, including, but not limited to, soils, water and air quality, and wildlife. The ability to do this would require that a forest have access to monitoring information that would allow it to determine the effects of individual past

³ By a catalog, the court meant a comprehensive list of all past projects and their effects. Webster’s dictionary online (at www.merriam-webster.com/dictionary/) give the word “list” as the first definition of catalog and, as the second, provides the following: “a complete enumeration of items arranged systematically with descriptive details.”

projects. It is important, however, to remember that courts do not require agencies to generate new information in order to comply with NEPA. Therefore, the agency would have to present the information available but also could acknowledge gaps in its understanding of past impacts.

One important question in this research is how the IPNF has responded to this decision. This issue was dealt with somewhat differently in every EIS reviewed from the 2006-2007 period. For example, the Myrtle Creek Final EIS (FEIS) from 2007 did not provide an overview of how the agency chose to respond to this requirement as part of the main document. However, the IPNF did speak to this issue in its “Response to Objections” from members of the public regarding the adequacy of the project’s CEA. The response provided in this section is entitled the “Cumulative Effects Response”, which is, as some interviewees called it, a sort of boilerplate CEA response developed by the IPNF after the Iron Honey decision. This response was found in every EIS reviewed from 2006-2007, and therefore deserves further explanation.

The “Cumulative Effects Response” makes several primary points. It begins by recapping the Iron Honey decision and then discussing the Council on Environmental Quality (CEQ) memo that was released soon thereafter (CEQ, 2005, as discussed in more detail in chapter two of this manuscript). The first important point, according to the IPNF, is that, as the CEQ memo explains, although sometimes a catalog of past projects and their environmental effects might be useful for predicting cumulative impacts, NEPA regulations do not require that agencies exhaustively catalog past projects.

The EISs reviewed for 2006-2007 include a list of past timber harvests and their prescriptions, along with general lists of past, present, and reasonably foreseeable future projects and activities that might be relevant for the CEA for individual resources. For example, the West Gold Final Supplemental EIS includes a list of relevant past, present, and ongoing activities that “may be considered in the cumulative effects analyses” (p. I-8). These are listed in general terms with very little specific information; examples include “firewood gathering”, “hunting”, and “road maintenance activities.” The way in which these activities are actually incorporated in the CEAs varies in the analysis for each resource. I take a closer look at how this issue is dealt with for wildlife in the next section.

The second critical point from the IPNF’s “Cumulative Effects Response” is that CEA generally is supposed to focus on the incremental impact of the present action in combination with the aggregate effects of other actions. To explain this concept, the IPNF cites the CEQ memo, which states, “Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historic details of individual past actions” (CEQ, 2005, p. 2). “Therefore,” explains the IPNF, “while we have listed all past, present and reasonably foreseeable actions individually, their effects may be aggregated when the qualitative benefit of considering cumulative effects analysis of individual past, present and reasonably foreseeable actions is indistinguishable from considering them in aggregate” (West Gold Final Supplemental EIS, pp. III-1, III-2). In other words, the IPNF, based on CEQ’s guidance, concludes that detailing the effects of individual actions often is no

more useful than considering current conditions, in which the aggregate effects of all past actions are embedded.

Finally, a third critical point is made in the “Cumulative Effects Response.” The IPNF explains:

This EIS has provided a description of known past activities and their effects; however due to the marked difference between current land management practices and policies, this analysis did not further aide in assessing whether one form or another of the proposed activities would assist in meeting the project’s purpose and need for action with minimal environmental harm (Myrtle Creek Record of Decision, Appendix A, p. 158).

In other words, according to the IPNF, forestry practices have changed too significantly and rapidly for an analysis of past activities and their effects to be useful in assessing the possible effects of the alternatives presented in current EISs.

The remaining three pages of the “Cumulative Effects Response” detail how road design, timber harvest practices, best management practices (BMPs), and watershed protection strategies have changed over the last several decades. The response concludes:

...[C]hanges in road construction/reconstruction and maintenance practices; implementation of INFISH⁴ direction and watershed BMPs; and the changes that have occurred in Forest Service harvest practices and objectives, an in-depth analysis of the direct and indirect effects of each past action occurring within this project’s analysis area(s) would not help illuminate or inform the analysis about alternatives presented for this project. Where appropriate, information obtained from monitoring the effects of recent similar actions has been used to predict the direct or indirect effects of the proposed action and its alternatives (Myrtle Creek ROD, Appendix A, p. 160).

Despite assurances that such information would not be useful to a CEA, one interesting question is whether the IPNF has adequate monitoring information to understand effects from past projects. Even if such monitoring information would not

⁴ INFISH stands for the Inland Native Fish Strategy, which is a set of standards used by Region 1 for protecting riparian areas.

be useful for an alternatives analysis, why not present it in order to facilitate a CEA? The IPNF's response is that this is not necessary because cumulative impacts are represented in the current environmental condition. However, the IPNF states that a portrait of similar actions and relevant monitoring information will be included when possible.

The approach to cumulative effects of past actions is identical in every EIS, although the location where this information is provided varies from one document to the next. For example, whereas the West Gold provides the boilerplate language in an appendix, the Hidden Cedar SFEIS includes the CEA response at the beginning of Chapter Three: "Affected Environment and Environmental Consequences."⁵ In that EIS the CEA response is followed by a comprehensive list of past, present, and reasonably foreseeable future actions, including federal actions and actions on state and private land. It also provides some details, such as acres harvested, for the USFS timber sales in the project area. The section does not include the effects of any actions on particular resources and is only a comprehensive list of the actions that may be relevant for the resource analyses. The way that these past activities are incorporated into CEA varies for each resource.

The issue of how the IPNF is analyzing past actions is important to consider because it captures how the forest has responded to the Iron Honey decision. The holding in that decision is relevant for all forests under the jurisdiction of the 9th Circuit

⁵ As another example, the Mission Brush SFEIS lists ongoing and future activities in Chapter 1. A list of past harvest activities can be found in Appendix A, including details on acres harvested by various methods. Chapter 3 then includes the boilerplate language, and in Chapter 4 cumulative effects is dealt with slightly differently for every resource.

and has been cited by courts outside of the Circuit as well.⁶ In summary, the IPNF's response is that CEA is supposed to be "forward-looking" (this language is included in some versions of this CEA response) and can capture the effects of past actions by characterizing the existing condition of a resource. Furthermore, according to the IPNF, there is no obvious benefit to be derived from an analysis of the effects of past actions because practices have changed so much over the years. Essentially, the IPNF's CEA response makes the case that the requirements laid out in Iron Honey are not necessarily useful to a CEA or an alternatives analysis.

It is questionable whether the IPNF's approach to past actions meets the requirements of creating a catalog of past projects and their effects as set forth by the Ninth Circuit in the Iron Honey decision; however, the approach *is* in line with the CEQ guidance issued thereafter (CEQ, 2005). Overall, the implications of the Iron Honey decision remain unclear. Recall from chapter two that the applicability of the requirement in legal cases has been held to vary from one set of circumstances to another. It also remains debatable whether CEQ's guidance on the matter will benefit from judicial deference in future cases. Typically courts give CEQ's interpretation of NEPA substantial deference, especially if that interpretation is written into formal regulations.⁷ Notably, the CEQ guidance has been written specifically into the USFS' NEPA implementation regulations, making it more likely that these regulations will be

⁶ For example, the case is cited in two important CEA decisions in the Seventh Circuit: *Habitat Education Center v. Bosworth*, (E. Dist. Wisc. No. 03-C-1023, April 1, 2005) and *Habitat Education Center v. Bosworth* (E. Dist. Wisc. No. 04-C-0254, March 31, 2005).

⁷ CEQ often cites *Andrus v. Sierra Club*, 442 U.S. 347, 358 (1979) when emphasizing this point. It is less clear how deferential courts will be to CEQ's interpretations when they are issued as guidance and not as formal regulations.

afforded deference in the future.⁸ Nonetheless, the challenge of analyzing past actions gets at some of the more complicated and confusing aspects of CEA and is discussed at length in the next chapter.

3.3 The IPNF's Approach to CEA for Wildlife

The IPNF's approach to CEA for wildlife differs slightly for each species, depending on the variables used to evaluate effects for a species (also referred to as the "effects variables") and the information and management strategies available for each species. In order to provide the reader with both a general understanding of how CEA is done and a look at the complexity of the analysis, this section tackles this issue on several scales. It begins with an overview of the commonalities in how the IPNF analyzes direct, indirect, and cumulative effects for wildlife species. Yet, to some extent, the devil is in the details when it comes to understanding how CEA is done for wildlife. Therefore, I provide a closer look at several species, each of which represents a slightly different approach to effects analysis for wildlife.

A look at the analysis for these species gives the reader an overview of the various approaches used for different species while also allowing for more comprehensive understanding of how CEA is done, at least for a few commonly analyzed species. It would be impossible to do justice to the USFS's approach to wildlife analysis, to understand some of the criticisms and concerns about the analysis, or to provide useful, substantive recommendations, without diving in to the nuances and tedious details of viability analysis for wildlife. Once this more in-depth perspective is

⁸ These regulations can be found at 36 C.F.R. §220 and were announced at 73 Fed. Reg. 43084 (July 24, 2008).

established, we can then step back and consider some of the broader questions that are necessarily implicated by this topic, including the overall purpose of cumulative effects analysis and the challenges involved in broad-scale planning for wildlife protection.

The General Approach to Wildlife CEA

The IPNF analyzes effects on threatened and endangered species, regional forester sensitive species (RFSSs), and management indicator species (MISs) that will be affected by a project. For each project the Forest determines which species will be analyzed in detail based on whether habitat for the species is found in the area and whether the project is predicted to have any possible effects on the species. Some species are analyzed as part of a guild with other species and therefore not analyzed in detail on their own.

While the IPNF does some monitoring of species presence, such as inventorying and monitoring of goshawk nest sites, it does not have data on population trends for species on the forest. Long-term conservation assessments based on presence and absence data are underway for some species, such as the pileated woodpecker and northern goshawk, as part of ongoing efforts by the terrestrial wildlife program at the Region 1 office. The Rocky Mountain Research Station is also researching the population status of several species, including marten and fisher. Population estimates from those efforts are not currently in use by the IPNF in their EISs. Estimates of population numbers in areas of the IPNF are available for several species, such as the grizzly bear and woodland caribou, although USFS biologists interviewed for this project disagree as to the accuracy of this data. For all other species, population data of

any kind is not presented in the CEA for wildlife and current estimates of population abundance, distribution, and trends are not available.

Effects to wildlife are analyzed in terms of habitat-based variables. The IPNF's approach is to assess the amount and quality of habitat available for various species and then utilize various management strategies to try to maintain or improve current conditions. In some cases the IPNF estimates whether there is adequate habitat to maintain either existing home ranges or a viable population forest-wide. Because population data is not available, habitat is used as a proxy for estimating species presence and populations in environmental effects analyses. Importantly, this practice depends on at least two key assumptions, which are that: 1) habitat is a useful proxy for population numbers, and 2) the way that vegetation is mapped is an accurate proxy for habitat (Cushman & McKelvey, in press).

Forests designate Management Indicator Species (MISs), which often are supposed to represent a guild of species with similar habitat requirements.⁹ For example, the pileated woodpecker is an MIS on the IPNF and is meant to serve as a sort of bellwether for other species that require some old-growth habitat. This MIS therefore serves as a proxy for other species, and habitat for the MIS is a proxy for actual population numbers. Recall from chapter two that this method of planning for species viability is known as the “proxy-on-proxy” approach and has been upheld by the Ninth Circuit as a valid approach to meeting the wildlife protection requirements incumbent upon the USFS.

⁹ Utilizing one species to represent a group or guild of species is often referred to as a surrogate approach to wildlife conservation planning.

Effects variables for all species, then, are indicators of habitat quality and availability. For example, the effects variables for lynx are impacts to denning habitat and the amount of habitat converted to an unsuitable condition within a 10-year timeframe in a “lynx analysis unit” (LAU). For the black-backed woodpecker changes in distribution and quality of snag habitat are the effects variables. For goshawks and fisher the variables are changes in suitable nesting habitat and suitable denning habitat respectively. Effects on pileated woodpeckers are measured by considering changes to large snag and mature or old-growth habitat.

For most species the IPNF considers the amount of habitat in a “suitable” and “capable” condition. Capable habitat is defined by the IPNF as habitat that has “the inherent potential of a site to produce essential habitat requirements of a species” (Myrtle Creek FEIS, p. B-5). This inherent potential is based on fixed attributes such as elevation or slope. Suitable habitat is habitat that is *currently* meeting species’ habitat requirements. It has both the fixed attributes that make it capable habitat as well as the current mix of variable attributes, such as canopy cover, stand age, or stand density, that make it currently inhabitable by a species (Myrtle Creek FEIS, p. B-5).

The scale of the CEA varies by species. For lynx, the Lynx Conservation Assessment and Strategy (LCAS) sets forth guidelines for managing habitat for lynx (see Reudiger et al., 2006). This document, put out by the Northern Region of the USFS in collaboration with the Bureau of Land Management and U.S. Fish and Wildlife Service, directs the agency to designate lynx analysis units (LAUs), which approximate the size of a home range used by lynx and are used to analyze cumulative effects. Grizzly bears are analyzed using Bear Management Units (BMUs). As the USFS

explains “BMUs are not intended to be the actual home range of known adult female grizzly bears, but are used to analyze cumulative effects. By maintaining sufficient suitable habitat quality in each BMU, then the entire recovery area would remain as viable habitat” (Myrtle Creek FEIS, p. B-13). For most other species the cumulative effects area is the project area boundary. The reason given for this is that the boundary often is the size of multiple home ranges for species, reflects topographic features that govern species movement, and represent the point of diminishing effects. By this, it seems the USFS means that beyond the project boundary, project effects are too small relative to the entire landscape to be meaningfully analyzed. Although this may seem reasonable at first glance, it raises the question of whether and at what point larger-scale and forest-wide assessments of viability and cumulative impacts are undertaken.

A number of conservation strategies guide the way the IPNF analyzes effects on species and designs their management actions. Management for lynx, for example, is guided by the LCAS, which directs that a certain amount of each LAU be maintained in a suitable condition. For goshawks the IPNF utilizes recommendations from Reynolds et al. (1992) that specify that a certain number of potential nesting stands be maintained over a particular number of acres and also give direction on the structural composition of vegetation needed to meet habitat needs for goshawks. Other conservation strategies, such as the Northern Region’s snag protocol, are used to guide the management of habitat for species such as black-backed woodpeckers, which rely almost entirely upon snag habitat. Other strategies and scientific assessments are also utilized for various species and include guidelines such as those found in the IPNF Forest Plan (USFS, 1987) and the Integrated Scientific Assessment for Ecosystem Management in the

Interior Columbia Basin (Quigley et al., 1996). Finally, work by Samson (2006a, 2006b) assessing population viability and minimum habitat thresholds for several avian species is also used in the wildlife CEAs.¹⁰ One of the most heated areas of contention is whether these management strategies and assessments are scientifically credible and valid tools for guiding species management; this matter is discussed in more detail below and in the next chapter.

Private, state, and other non-USFS lands are generally not analyzed in detail in terms of wildlife habitat. Instead, the IPNF assumes that most of these lands are managed for timber extraction and are therefore not providing any mature forest structure over the long-term. In general, it says these lands cannot be relied upon over the long-term to provide any particular type of suitable habitat. Furthermore, the information available about the habitat conditions or the long-term management plans on these lands is of limited availability and would be costly to obtain. The IPNF's approach, then, is to assume that these areas do not provide any habitat for species analyzed. In this way, explains the IPNF, the Forest takes a worst-case scenario approach to the issue of non-federal lands by assuming that the maintenance of sufficient habitat depends entirely upon USFS lands. The one exception to this is for grizzly bear management, in which case federal agencies are required to compensate in some way for habitat loss on non-federal lands in BMUs (see, for example, the explanation in the Myrtle Creek FEIS, p. B-22).

¹⁰ Samson (2006b) also draws conclusions about population viability and minimum habitat thresholds for the American marten and fisher. This work is not used to support the analysis for those species in the IPNF documents reviewed herein.

Past actions and their effects are dealt with by considering the “environmental baseline,” meaning the existing condition, of species’ habitat. In no EIS did the analysis for wildlife include a detailed list of past actions and their effects. In most cases the effects of past actions are discussed generally and the combined effects of past actions are integrated into the description of the current condition of the resource. In many cases, there is no clear reference point with which to compare the current condition; this makes it difficult to understand how habitat availability or population numbers may have changed over time.

CEA for Various Wildlife Species

Between 7-13 different species were analyzed in detail in the EISs reviewed. Some species such as lynx and grizzly bears are managed according to detailed conservation strategies. Others, such as goshawks and fisher are managed using guidelines from scientific assessments developed by the Forest Service. The following sections look more closely at how CEA is done for three species, lynx, fisher, and pileated woodpeckers, in order to provide an overview of three different approaches being used by the IPNF for CEA for wildlife.

Canada Lynx

Lynx (*Lynx canadensis*) are one example of a species for which management guidelines and the approach to CEA are relatively straightforward. For lynx and several other species, the IPNF has developed a habitat capability/suitability model based on its

TSMRS data.¹¹ The TSMRS is essentially a timber stand database that is used in wildlife analysis to estimate habitat availability. IPNF personnel use the database to determine the availability of capable and suitable habitat and then verify the validity of estimates, particularly estimates of suitable habitat, through interpretation of aerial photos and field visits to the project site. These field visits ideally allow the IPNF to verify whether stands are actually suitable habitat and evaluate for the presence of characteristics that are not accounted for in the TSMRS data.¹²

All management for lynx is done within the framework of the Lynx Conservation Assessment and Strategy (LCAS), a conservation strategy that guides management vis-à-vis lynx and sets some cumulative impacts limits (Reudiger et al., 2000). The LCAS was developed by the Northern Region after lynx were listed as threatened under the Endangered Species Act of 1973. In areas of lynx habitat the USFS is to designate Lynx Analysis Units (LAUs), which represent theoretical home ranges for the individual lynx. Within LAUs the USFS is to maintain at least 10% of the habitat in a suitable denning condition, and this habitat is supposed to be well-distributed and in patches greater than 5 acres. The USFS cannot convert more than 15% of lynx habitat to an unsuitable condition within 10 years and cannot reduce suitable habitat at all if more than 30% of

¹¹ TSMRS stands for timber stand management record system or timber stand management reporting system.

¹² This field verification is partly in response to a holding in the *Lands Council v. Powell* (2004) decision. The court held that the TSMRS data was outdated, being over 15 years old at the time. It also stated that the data were inaccurate in terms of canopy closure estimates and that the TSMRS included insufficient data on snag habitat. This, concluded the court, made the use of the TSMRS data unreliable as a foundation for the proxy-on-proxy method of estimating population viability, particularly for old-growth species. This holding was based largely on the IPNF's statements in their 1998 monitoring report. The IPNF's approach to remedying this situation has been to field verify conditions in stands deemed suitable habitat through use of the TSMRS database. IPNF personnel indicated that this process of updating stand-level data through project-site field visits also was occurring before the *Lands Council* decision in 2004 and has continued since.

the LAU is already in an unsuitable condition. These standards serve as cumulative impacts thresholds for habitat alteration both spatially and temporally. Corridors also are to be maintained, and there should be no net increases in over-the-snow routes and snowmobile areas.

The existing condition for lynx in any project area is described as the number of LAUs in the project area and the percentages of habitat in suitable and unsuitable conditions. Effects to lynx are presented in terms of how the various alternatives would impact suitable foraging and denning habitat and would increase the overall amount of unsuitable habitat acreage. Changes to suitable habitat over the last decade are also disclosed. No alternative would be viable if it exceeded the LCAS guidelines, and cumulative effects are deemed insignificant as long as these guidelines are met.

The approach to CEA for lynx focuses on current conditions, changes to those conditions over the last decade, and the requirements of the LCAS. Past, present, and reasonably foreseeable future management activities are considered primarily in general, qualitative terms. For example, the Mission Brush EIS in its CEA for lynx explains:

The road construction associated with [past] sales increased access for trappers and snowmobilers, potentially causing negative impacts to lynx through increased trapping mortality and snow compaction allowing access to lynx habitat for competing predators. However, motorized use of these roads during summer had a relatively minor impact, since lynx are not normally displaced by human presence (Mission Brush, SFEIS, p. 4-59).

After discussing these and other activities in terms of their general contributions to impacts on lynx, the section concludes, “These activities would not have cumulative significant impacts when added to the proposed action, since the effects are already incorporated into the environmental baseline” (p. 4-59). This oblique statement concludes nearly every single CEA for wildlife in the EISs reviewed.

While the information presented on past, present, and future actions is not particularly integrated in terms of impacts on lynx, in this case the conclusion that cumulative impacts are not significant is not without foundation given the LCAS guidelines. The LCAS guidelines set cumulative impact thresholds for management actions over a 10-year timeframe. This approach is meant to prevent further significant cumulative impacts for lynx and the loss of any suitable LAUs. It is important to note, however, that there are no estimates in the EIS of actual lynx population numbers, nor any disclosure of how populations are thought to have declined over time in the area. The approach here to CEA is to prevent further declines to lynx populations by preventing the crossing of what have been established as habitat thresholds within LAUs. This type of strategy based on the use of the LCAS removes some of the burden from individual forests and their project analyses through the provision of clear guidelines for all projects in lynx habitat. A number of biologists and project leaders interviewed on the IPNF explained that the LCAS makes their job easier when it comes to designing project and analyzing effects in areas where lynx may be present. Of course, the efficacy of the strategy is entirely contingent upon the validity of the LCAS approach and its consistency with the prevailing science regarding lynx and its habitat requirements.

The EISs recognize that timber harvest on non-federal lands may adversely affect lynx but state that the LCAS directs the USFS to provide adequate habitat on USFS lands. Therefore, effects on private lands are not considered relevant to the analysis. This approach to private lands is important to consider. While the USFS makes the case that it is taking a worst-case scenario approach by excluding private

lands from its analysis, it is also likely overlooking effects on populations that could result from private land development. As one IPNF employee put it, the worst-case scenario approach probably does not provide an accurate picture of changes to habitat and populations over time.

In summary, because of the presence of a conservation framework with a mechanism for analyzing cumulative impacts, the approach to CEA for lynx is relatively straightforward and unproblematic for project level analyses. Criticisms of how the USFS manages for lynx necessarily implicate issues beyond what is happening on the IPNF. For example, one might criticize the validity of the LCAS or more broadly the use of habitat as a proxy for population estimates. It also would be difficult to know how populations of lynx have changed on the IPNF relative to some point in the past, based on the information in an EIS. These are all potentially valid issues, and some are discussed in more detail in the next chapter. However, within the current legal-administrative framework it is difficult to find any fault with the IPNF's approach to lynx management.

Fisher

Fisher (*Martes pennanti*) are a Regional Forester Sensitive Species, which are species that the Northern Region has identified as having possible threats to viability. Like lynx, fisher are analyzed in terms of acres of suitable and capable habitat in the project area. Unlike lynx they do not benefit from a comprehensive management strategy and cumulative impacts thresholds are unclear. As for the current status of fisher populations, the Mission Brush EIS explains that fisher populations in the

Western U.S. “have remained at low numbers or are absent from their former range” (Mission Brush SFEIS, p. 3-64, citing Heinemeyer and Jones, 1994). The EIS goes on to explain, “Population trend information for fishers in northern Idaho is unavailable, but based on sighting information, fishers are currently rare” (Mission Brush, SFEIS, p. 3-64). Anecdotally, interviewees suggested that fisher populations are at serious risk; the fisher is a species for which viability concerns are likely very real on the IPNF.

The primary effects variables for fisher are changes in acres of suitable denning habitat and road densities. The IPNF utilizes a habitat suitability model based on the TSMRS data for fisher analysis. Suitable habitat is generally considered to be mature and old-growth stands. Fisher habitat is difficult to model, according to the IPNF, because of a lack of information on habitat requirements of fisher and limitations in accounting for various habitat characteristics with the TSMRS data (Mission Brush SFEIS, p. 4-76). Reasons are given for why the TSMRS may overestimate fisher habitat availability and steps that are taken to compensate for this, such as the elimination of previously logged stands from suitable habitat estimates due to the probable lack of large woody debris. Generally, areas modeled as suitable fisher habitat are field verified in some way, although it is unclear how intensive or effective this process is. The Mission Brush EIS, for example, indicates that fisher habitat was verified incidentally during the field verification of lynx habitat.

Existing percentages of mature/old-growth structure are presented along with predicted changes to those percentages by subdrainage. These percentages are compared to guidelines for fisher management in Heinemeyer and Jones (1994), which provides a series of guidelines developed for use by the Northern Region that rate the

quality of a subdrainage as fisher habitat based on the percentages of stands in various vegetation structural stages.¹³ For example, a “high quality” subdrainage is one that has 65-75% of stands in the mature/old-growth class, whereas a moderate quality subdrainage is one with greater than or equal to 40% of stands in the mature/old-growth class. The effects analyses for fisher explain how much habitat is in each structural stage (mature sawtimber, immature sawtimber, pole/sapling, and open/seed) and how much these percentages will change as a result of management actions. Note that this analysis is not based on a well-developed wildlife-habitat relationship model for fisher, but rather estimates effects to fisher based on the use of vegetative structural stages as a coarse proxy for fisher habitat. In other words, habitat requirements for this species are poorly understood, and timber stand data, with limited detail on various habitat attributes, is used to estimate habitat availability. For these reasons, the effects analysis for fisher rests on a shaky foundation.

The IPNF does not set any limits on how much suitable habitat can be converted in an area over a particular length of time, nor does it explain whether there are any thresholds in terms of habitat on the forest as a whole. The general approach to fisher management is to maintain or improve the current condition of subdrainages and to limit effects on fisher through management prescriptions. For example, the Myrtle Creek EIS explains that LCAS and INFISH standards both should benefit fisher. The Mission Brush EIS states that the IPNF’s general approach is to preserve mature and old-growth

¹³ Heinemeyer and Jones (1994) present what they call an interim strategy for fisher management. The paper collects what information is available from the literature and from discussion with experts in order to provide some management guidelines. However, the authors acknowledge, “We presently lack much of the required information necessary to develop an in-depth conservation strategy for fishers across western North America” (Heinemeyer and Jones, 1994, p. 26).

stands, protect riparian areas, and increase the amount of large woody debris across the forest. In the conclusion for effects on fisher the analysis explains, “While [some management strategies] may temporarily reduce fisher habitat at the local scale, habitat should improve for this species with time and should be maintained on a landscape scale” (Mission Brush SFEIS, p. 4-80).

For an example of a specific effects analysis for fisher we can look more closely at the Mission Brush EIS. That analysis explains that the project analysis area is currently a moderate quality subdrainage and that no alternative will convert the subdrainage to a lower quality status. Effects will be minimized through the application of management standards, such as maintaining canopy cover at 50% or greater in selectively harvested areas, following Regional snag protocols, and utilizing BMPs to maintain coarse woody debris on harvested sites.

According to the Mission Brush EIS, the no action alternative would preserve more denning habitat than any of the action alternatives. The EIS explains, “The no action alternative would preserve potential foraging habitat for fisher, and would bring some stands into suitable denning condition more rapidly than treatment would.” It goes on to say:

[H]owever, with this comes the increased risk of stand-replacing wildfire, which would effectively remove most burned-over areas from suitable fisher habitat for many years.[T]hese stands are at higher risk of stand-replacing wildfire than historic, open grown dry-site stands would have been. In summary, while the no action alternative would provide better fisher habitat than the action alternatives in the near future, some of these acres may subsequently be converted to unsuitable conditions through fire (Mission Brush SFEIS, p. 4-77).

The analysis makes the case that although treating a stand may decrease habitat availability, that stand also is at risk of being destroyed by fire. Managers, according to this passage, are essentially faced with choices among a variety of activities that pose

some risks to resources. Notably, an analysis such as this is based on several assumptions. The likelihood of a stand-replacing fire is the subject of debate, as is the question of whether timber harvest in the area would reduce that risk significantly or for any significant length of time, given the probability of such a fire (for more on the broad terms of this debate, see Keiter, 2006). What is notable is that the possibility of such a fire is used as a justification for further treatment without any clear explanation of the likelihood of these relative risks.

All other alternatives in the Mission Brush EIS will eliminate suitable habitat, but reasons are given for why this loss of habitat is either negligible or of minimal consequence. For one, no alternative will reduce the amount of timber in the mature/sawtimber class below 40%, although one alternative reduces the timber in that class from 48.9% to 42.2%. Therefore, no alternative will lead to a less than moderate-quality subdrainage. For alternative two, we are told that suitable habitat that will be altered is mostly in upland areas and is not critical range for fisher. Furthermore, in areas that will be selectively harvested, the IPNF explains, management prescriptions maintaining 50% canopy cover, the use of snag protocols, and grapple piling in thinned units will maintain fisher habitat in a suitable condition even in treated areas. Under this alternative, 225 acres of suitable habitat also would be clearcut (regeneration harvested). The analysis explains, “Regeneration harvest generally eliminates stands from suitable denning condition, although foraging opportunities would remain to some extent” (Mission Brush SFEIS, p. 4-78). Unfortunately, all of these assurances ring somewhat hollow, given that, according to the assessments used by the IPNF, wildlife-habitat relationships for this species are not well-known.

The analysis goes on to state that acres of suitable habitat that are proposed for treatment in the Brush Lake area have high levels of root-rot infestation, making it likely that these stands will be short-lived as suitable denning habitat. Furthermore, these short-lived denning stands lack connectivity corridors to other suitable habitat. In the Mission Creek area of the project, the EIS states:

185 acres of currently suitable fisher habitat are proposed for regeneration harvest. ...Suitable habitat in Units 58, 60, and 125 (~30 acres each) are somewhat isolated, and lack connectivity to other suitable stands. Other suitable habitat within proposed treatment units are on the periphery of capable habitat, and thus would not cause breaks in connectivity corridors if harvested (Mission Brush SFEIS p. 4-78).

Despite assurances of the overall management strategy for fisher populations, it is impossible to know exactly what this kind of information means in terms of fisher populations. Has the forest made a case for why isolated patches of suitable habitat are not as necessary to maintain? It seems that the assumption is that because these patches are “somewhat isolated” and lack connectivity they are less important for this species. However, this assumption is not clearly supported by any discussion of dispersal ranges or patch size requirements and availability in the area for fisher. The message in terms of connectivity corridors is also murky. Why does the elimination of suitable habitat on the periphery of capable habitat lead to the conclusion that connectivity corridors would not be affected? Without stating upfront the basis for these conclusions, it is difficult to know how to interpret this kind of information if we are interested in understanding possible effects on already dwindling fisher populations.

This analysis is combined with information on past activities to provide a picture of cumulative impacts. Again, let us consider the Mission Brush EIS. It explains in the CEA section that past harvest had the potential to eliminate some fisher habitat, although

it does not estimate how much fisher habitat has been lost in the project area. The CEA for past activities concludes:

In combination with past natural and human-caused events, the proposed action would reduce the quantity of suitable fisher denning habitat. However, given the low density of fisher populations, it is unlikely that they are limited by denning habitat. Previous activities would not have cumulatively significant impacts when added to the proposed action, since the effects are already incorporated into the environmental baseline (Mission Brush SFEIS p. 4-79).

While it is apparent that the IPNF is making the case that its management prescriptions are designed to minimize effects on fisher and maintain the quality of the subdrainages in the project area, the quality of this kind of CEA is dubious and raises several questions. For one, if fisher are not considered to be limited by denning habitat, then why is this a useful indicator of effects on fisher? If denning habitat is abundant relative to current fisher population numbers, what factor(s) explains their current status? What if denning habitat is abundant, but population numbers are extremely low, and the habitat in this particular area is supporting some critical portion of the small population that remains? Perhaps the habitat in this area is particularly important; however, with no actual data on the abundance or distribution of the population, it is impossible to know whether this area is critical habitat for fisher.

Furthermore, it is impossible to know what types of effects would lead the IPNF to conclude that there would be significant effects to fisher populations. If denning habitat is not limiting, the implication seems to be that such habitat could be reduced significantly with no effect on fisher populations. If this is the case, it would be helpful to know at what point the IPNF *would* have a significant cumulative effects problem on their hands. Without any thresholds, we simply have to take its word that these minimal

reductions in suitable habitat are insignificant.¹⁴ The assertion, “Previous activities would not have cumulatively significant impacts when added to the proposed action, since the effects are already incorporated into the environmental baseline,” rings somewhat hollow without an attendant explanation. Imagine instead if the analysis stated the following: “Past effects are incorporated into the environmental baseline and proposed actions would not have a cumulatively significant impact *because we are still not reaching threshold x.*” In this case the reader would at least be clear where the red flag would be raised in terms of significant cumulative effects. However, without defining what a viability threshold might be, the reasons for stating cumulative effects are not significant are opaque.

It is impossible to know, without any broad-scale cumulative impacts analysis or viability assessment for this species, when the IPNF would have a cumulatively significant effect on their hands when it comes to fisher. Presumably, as long as no project degrades the quality of any subdrainage in terms of fisher habitat, at least projects are not creating any additional threats to viability aside from those that may already exist. However, without more knowledge about wildlife-habitat relationships for fisher, or about the status of populations, it is difficult to be confident that the IPNF’s guidelines for maintaining fisher habitat are effective.

Beyond this issue of not knowing when thresholds would be crossed, we also are not presented with a clear accounting of what has been lost in terms of fisher habitat or populations in the area. How, for example, would a reader know if over time, say 20

¹⁴ Notably, although it was not used in any of the EISs reviewed, Samson (2006b) did set a sort of habitat threshold for fisher on the IPNF. The validity and reliability of this threshold, however, are highly questionable, according to almost every individual I interviewed, including both agency and outside scientists (this issue is discussed in more detail in the next chapter).

years, the subdrainages in this area had been degraded from high quality status to moderate quality status? This information is central to a CEA, which might not always be only about whether thresholds are being crossed but also about how current conditions compare to conditions at some point in the past. In the case of fisher, this information on habitat loss might be particularly useful, at least as some indication of possible cumulative impacts, given that the current status of populations is not known.

The IPNF provides a proxy for this information but in a somewhat indirect way. If a reader wanted to know whether this drainage used to include more suitable habitat for fisher, rather than having only a picture of the current environmental baseline, she could seek this information in the analysis of forest vegetation. This section of an EIS often paints a picture of how much of a project area is estimated to have been in various structural stages at some point in the past and also will detail how many acres have been harvested according to various harvest prescriptions. A reader could then utilize this information to understand how timber harvest might have reduced fisher habitat in the area. This would be an indirect approach though, in that it would only give a picture of how much forest has been altered in terms of vegetation structural stages. We can assume that these provide only a very rough proxy of suitable habitat for a species like fisher and that habitat itself is only a very rough proxy for population numbers.

As an example of this approach, the CEA in the Mission Brush EIS concludes, “[T]he amount of fisher denning habitat is comparable to the quantity available historically, as evidenced by comparison of the sum of mature/large and old growth forest size classes now versus historically” (Mission Brush SFEIS p. 4-80). A look at the analysis for forest structure in the EIS provides the basis for this statement. It

explains that current estimates of mature forest structure are 36%, which is larger than the estimated historical range of 15-35%, and of old-growth are 12%, which is below the estimated historical range of 15-35%. Detailed information on past harvest also can be found in Appendix A. Therefore, one could piece together a sense of how much fisher habitat has changed in the project area over time, but it would be a rather rough sketch based on timber harvest data and comparisons to historic conditions. Compounding this problem is the fact that these discussions of old-growth availability do not parse out types of old-growth. High elevation old-growth stands, dry-site ponderosa pine stands, and mid-elevation mesic stands are all lumped together in the 12% estimate. The forest does have information on the types of old-growth in each stand, but at least from the EISs it is not easy to get out how current estimates of old-growth availability relate to the needs of old-growth dependent species. It is possible, and likely, according to some USFS scientists, that less than 12% of the type of old-growth required by a species like fisher remains.

As with most other species, private lands are assumed to provide no long-term habitat for this species. The Hidden Cedar EIS in particular deals with the private land issue due to the large percentage of private land (46%) in the project area. In this case, the IPNF explains, it is difficult to put the USFS lands in context in terms of fisher habitat suitability without a large-scale management strategy for the area. Nonetheless, the analysis is done in terms of habitat availability on USFS lands. In this area the drainage is currently in a “low-quality” condition. Because of the presence of private lands in the area, the conclusion is that regardless of conditions on USFS lands, the area will remain in a low-quality condition for species such as fisher.

In general, the CEA for fisher fails to paint a clear picture of how much habitat has been lost over time in the area, and none of the information provided indicates how population status may have changed over time. The IPNF's approach to CEA focuses on the combined effect of the current action in combination with the existing condition. As discussed in the previous section, this approach is not at all inconsistent with CEQ's recent guidance on how to present cumulative impacts, but it fails to provide a clear sense of cumulative impacts over time. The forest also aims to maintain subdrainages at their present quality or trend them towards improved quality of habitat for fisher. Generally, the EISs explain that INFISH, LCAS, and other management guidelines will benefit fisher, and forest-wide there is an effort to trend towards older structural classes, preserve old stands, protect riparian areas, and preserve woody debris. Therefore, effects to fisher should be minimal, according to the IPNF.

If we compare the approach to that for lynx, the primary difference in how these two species are dealt with is the presence of a comprehensive habitat management strategy for lynx. The LCAS sets clear limits about how much denning habitat needs to be maintained in a single lynx analysis unit and how much habitat can be altered from a suitable condition over a 10-year period. By contrast, it is not clear for fisher how much area should remain in a suitable denning condition to support a home range or viable population or how much habitat could be converted in an area without threatening populations.

In summary, a number of things are missing from the fisher analysis. There is no clear management strategy, nor any clear cumulative effects thresholds for fisher that would provide some context for projects that eliminate small portions of habitat. In

terms of CEA, if a reader were interested in how fisher populations have been affected over time or how timber management over the last several decades has affected fisher habitat, this information would be impossible to come by. We could deduce changes in available habitat over time based on rough changes in forest vegetation, but this tool, which uses vegetations structure as a rough proxy for habitat, which itself is a rough proxy for population status, would be our only means for guessing at how populations have been affected. There is, in effect, no real assessment of cumulative effects, either generally or as a result of management actions. Furthermore, the fact that there are no population estimates for fisher and no forest-wide analysis of the status of the species makes it impossible to know if the forest is actually supporting what might be considered a viable population.

Pileated Woodpeckers

Pileated woodpeckers are a Management Indicator Species (MIS) on the IPNF. The species was designated as an MIS because it is a “[p]rimary cavity excavator, old growth indicator because of dependence on large snags,” and is “associated with mature forests” (Hidden Cedar SFEIS, p. 324). Therefore, it is meant to serve as a bellwether for other old-growth species. Pileated woodpeckers do not benefit from an overall management strategy as do lynx, but they were evaluated as part of a region-wide viability assessment (Samson, 2006a), which is used as part of the effects analysis for this species. Other species analyzed in the IPNF’s wildlife analyses also are supported by a region-wide viability assessment. For this reason, I have chosen the pileated

woodpecker as an example of a slightly different approach used for CEA as compared to what we saw for fisher and lynx.

Pileated woodpeckers are managed based on several documents: *Old-Growth Habitat and Associated Wildlife Species in the Northern Rocky Mountains* (USDA, 1990) and Samson's region-wide viability assessment, entitled *A Conservation Assessment of the Northern Goshawk, Black-backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region* (Samson, 2006a). Both of these documents were developed by the USFS to guide the management of a number of old-growth associated and sensitive species in the Northern Region.

Samson's (2006a) work is cited as part of the CEA for this species as well as that for goshawks, flammulated owls, and black-backed woodpeckers in all EISs reviewed. In every EIS that includes a CEA for these avian species, the IPNF states that, according to Samson (2006a), the short-term viability of these species is not in question because: 1) "No scientific evidence exists that the [species] is decreasing in numbers"; 2) "Increases in the extent and connectivity of forested habitat have occurred since European settlement"; 3) "Well-distributed and abundant habitat [for the species] exists on today's landscape"; and 4) "The level of timber harvest [in 2004, 0.0009% of the forested landscape in the Northern Region] is insignificant" (Hidden Cedar SFEIS, p. 327). The author of this study, Fred Samson, was the regional ecologist for Region One until a couple of years ago. A separate document by Samson from 2006 assesses the availability of habitat for each species by forest and sets what is essentially a minimum amount of habitat necessary to support a viable population (Samson, 2006b). It is important to note that his work was not peer-reviewed and is the subject of considerable

debate as to its validity by individuals both inside and outside of the agency. I discuss this issue in more detail in the following chapter.

In order to determine possible project effects on pileated woodpeckers, TSMRS data are used to identify suitable habitat. Based on USFS management guidelines for the species, old-growth and mature stands are mapped, and then hypothetical 1,000-acre home ranges are delineated around suitable nesting stands or groups of stands.

According to the management standards used by the IPNF, at least 100 acres of contiguous suitable nesting habitat should exist in each home range to be sufficient for the species. The areas around suitable nesting stands are evaluated as to whether they provide feeding habitat, which should be comprised of at least 500 acres of mature or immature sawtimber habitat. Effects are then analyzed based on these parameters for each home range, and cumulative effects are assessed by looking at all home ranges across the project area.

To get a better sense of how this plays out, let us consider the Hidden Cedar EIS's analysis for pileated woodpeckers. In the project area six home ranges were delineated, two of which rely on feeding habitat from non-USFS lands. The EIS explains at the outset the effects that are common to all alternatives and states, "No alternative would impact existing old growth or suitable habitat on [USFS lands] to an extent that would affect the availability of suitable pileated woodpecker habitat or populations" (Hidden Cedar SFEIS, p. 326). It then explains that no cumulative effects are associated with the project for the following reasons: 1) the project will have limited effects; 2) suitable habitat and home ranges will be maintained in the analysis area; and, 3) immature timber stands would be maintained to succeed to suitable habitat.

Furthermore, the IPNF cites the work by Samson (2006a), which concludes that the short-term viability of the pileated woodpecker is not threatened in the Northern Region based on the abundance and distribution of habitat for the species across both the IPNF and the Region.

After this analysis is presented in the Hidden Cedar EIS, a closer look is afforded to the effects of each alternative. Several aspects of the analysis are difficult to interpret. For example, direct and indirect effects from the Hidden Cedar EIS for alternatives B and C are explained as follows:

These alternatives would maintain suitable habitat to support pileated woodpeckers in a minimum of three home ranges.... Proposed harvest treatment would impact ~148 of the 178 acres of mature suitable nesting habitat in Home Range A. This could result in insufficient suitable nesting habitat in Home Range A. However, design features (i.e. snag retention levels), prescriptions (i.e. thinning), pileated woodpecker use of areas with 10% forest cover (Samson, 2005), information that indicates that cavity habitat and pileated woodpecker use can be maintained in partially treated stands (Quesnel and Steeger, 2002), and the amount of immature size class maintained reduce the risk of losing sufficient suitable nesting habitat (Hidden Cedar SFEIS, p. 328).

This passage raises several issues. We are told that all but 30 acres of suitable nesting habitat in this home range will be eliminated (recall that each home range is to have at least 100 acres of contiguous nesting habitat). However, this loss of habitat is then dismissed based on uncertainties about what exactly is required to maintain suitable nesting conditions. A variety of factors reduce the risk, by some undisclosed amount, that sufficient nesting habitat will be lost or that the loss of this habitat is important. What is the point, though, of delineating suitable habitat and using this as a standard for identifying home ranges, when the characterization of suitable habitat is so flexible that losses to it can be explained away as potentially insignificant?

In general, the passage raises questions about how the analysis handles uncertainty. Are we meant to understand that the risks to suitable nesting habitat have been deemed insignificant? It is not clear exactly what conclusions have been reached about possible effects to the home range, whether they are important, or whether there is any bottom line in terms of how many home ranges can be depleted of suitable habitat. In this case, the IPNF uses uncertainties about the effects of its practices or in various scientific studies to cast doubt on whether predicted effects to species habitat are actually important. However, without clearer explanations or some estimation of how likely measures are to reduce effects on homeranges and habitat, these sorts of passages can appear to be nothing less than a strategic use of uncertainty in cases where it supports the USFS' proposed actions.

It is also difficult to reconcile the statements in this effects analysis, which indicate the potential loss of a home range, with the statements made up front in this EIS that, "No alternative would impact...suitable habitat on [USFS] lands to an extent that would affect the availability of suitable pileated woodpecker habitat or populations" (Hidden Cedar SFEIS, p. 326). And, recall that the CEA states, "There would be no cumulative effects associated with this project or analysis area that would jeopardize populations of pileated woodpeckers" with one of the reasons given being "the limited effects from this project" (Hidden Cedar SFEIS, p. 327). In light of the effects analysis for alternatives B and C, more explanation is necessary to understand how the conclusion of "no effects" from any alternative is reached, despite the potential elimination of one or more home ranges that are currently in a suitable condition under some alternatives.

The Myrtle Creek EIS's analysis for pileated woodpeckers focuses more on the importance of large-diameter snag habitat for the species and considers the effects of past, present, and reasonably foreseeable future projects. The CEA provides a discussion of the general effects of past actions and some consideration of present and future activities, including activities on non-USFS lands. Other thinning projects, noxious weed treatments, other active timber sales, a land exchange, and activities on private land are all considered in the CEA. Other effects of past activities also have been analyzed as part of consideration of the environmental baseline. The section on past activities includes statements such as:

In general, [timber] sales that involved regeneration logging or overstory removal damaged pileated woodpecker habitat, while sales that involved thinning from below preserved or improved habitat.... As a result, the ultimate legacy of historic logging in the project area is a decrease in *large*-diameter (>20" dbh) snags. However, these activities would not have cumulatively significant impacts when added to the proposed action, since the effects are already incorporated into the environmental baseline (Myrtle Creek FEIS, p. B-38).

This analysis, while it does speak to the effects of past actions, leaves several questions unanswered. The analysis does not explicitly answer whether sufficient snag habitat remains, how many potential home ranges might have been lost in the past due to harvest of mature or old-growth stands, and whether the current number of home ranges forest-wide is sufficient to support a viable population.

The question of how many home ranges are sufficient to support populations comes up again in the Mission Brush EIS. The EIS explains that for two of the alternatives analyzed, mature and immature sawtimber would be reduced below 500 acres making them potentially insufficient in terms of foraging habitat for pileated woodpeckers. The analysis goes on to explain, however, that the woodpeckers might be

able to forage in areas of different theoretical home ranges thus making up for habitat deficits in each home range. This kind of statement again raises the issue of how flexible home range standards are as well as the question of how conclusions are drawn in cases of uncertainty. The analysis goes on to explain that even if these home ranges were no longer suitable for the species, a majority of home ranges (ten of the thirteen in this project area) would be maintained in a suitable condition. Although this analysis paints a clear picture of the current status of habitat in the project area and potential effects to that habitat, we need more context to interpret what exactly these effects may mean in terms of pileated woodpecker populations. It is never made clear how many home ranges are necessary in the project area or forest-wide to maintain viability for the species. The answer to this question apparently lies with Samson's (2006b) analysis, which indicates that ample habitat remains for the species on the IPNF and that therefore no thresholds will be crossed that may threaten species viability. In other words, a considerable amount of habitat or number of home ranges could be converted to an unsuitable condition without threatening the viability of the woodpecker.¹⁵

The West Gold analysis also deals with pileated woodpeckers, but in this case it appears that the project area currently does not include enough suitable habitat to delineate a home range. The analysis acknowledges the specific acreage of capable pileated woodpecker habitat that has been altered by past harvests, providing some indication that a *potential* home range might have been lost in this area due to past actions. However, these harvests are said to have removed "high-risk" stands and

¹⁵ In addition, the IPNF forest plan states that in order to maintain viable populations at least 40% of the maximum potential habitat for species will be preserved. However there is no reference to this in the EISs and no discussion of whether there are estimates of the maximum potential habitat or potential number of homeranges on the forest.

replaced them with tress that are “more disease-resistant and more ecologically compatible with historic vegetation patterns” (West Gold SFEIS, p. III-118). Current actions all are presented as trending the habitat towards conditions more suitable for pileated woodpeckers, thus causing no further effects to woodpecker populations. Present actions combined with the effects of past actions are said to have an overall positive cumulative effect on the species.

The analysis in this case explains the rationale of affecting additional capable habitat. It states that cutting in snag habitat will occur in areas with only minimal mature forest structure and that these areas are expected to suffer from mortality without treatment and/or will be thinned according to snag retention guidelines for large-diameter trees. Regeneration harvests are not predicted to be harmful to potential suitable habitat because they are meant to encourage longer-lived tree species and the persistence of large snag habitat in the long-term. Based on assumptions that the USFS management prescriptions will lead to the desired outcomes and that the habitat requirements of pileated woodpeckers are sufficiently understood, the analysis makes the case that management actions should largely benefit pileated woodpeckers and other old-growth associated species.

In summary, the CEA for pileated woodpeckers utilizes habitat guidelines by hypothetical home range. Home ranges are delineated and analyzed for each project by alternative, and conversion of home ranges to an unsuitable condition is disclosed. Several issues remain unaddressed, however. Because the IPNF has abundant habitat, according to Samson (2006b), projects can convert some home ranges to unsuitable conditions. Current home ranges are delineated based on the presence of currently

suitable nesting habitat. If several projects over time were to eliminate home ranges as suitable habitat, would this be disclosed in the next EIS for the area? For example, would a future sale in the Mission Brush area disclose that some home ranges had been lost due to past projects or would it just paint a picture of current conditions? More broadly, are EISs clearly depicting what has been lost in an area as opposed to just telling the reader that forest-wide the thresholds established by Samson (2006b) have not been crossed? Would this information not be useful, and is it not essential to a CEA? And, in terms of CEA, the efficacy of this entire approach depends on the validity of Samson's work and the proxy-on-proxy method of maintaining species viability. These issues are related to a number of central questions about the IPNF's approach to wildlife CEA and are discussed in more detail in chapter four.

Summary

At this point, the reader should have an overall picture of some of the approaches the IPNF uses to evaluate effects on wildlife species. Other species vary to some extent depending on the various management guidelines used for the species but generally are managed and analyzed in a similar fashion. In general, the IPNF analyzes cumulative effects ostensibly through an analysis of current conditions. For some species, thresholds have been established for forest-wide habitat requirements or management-related changes to habitat conditions. Over the long-term, the IPNF explains that its actions will not degrade current conditions and will trend habitat towards more suitable conditions for wildlife. Limitations to the analysis stem from poorly understood wildlife-habitat relationships, limited data on habitat characteristics in vegetative stand

data, lack of data on population abundance or distribution, and weaknesses in the use of surrogate species to indicate for other species. Furthermore, long term changes or cumulative impacts to habitat availability or population status are both unclear.

Criticisms of the IPNF's approach to wildlife CEA are abundant in the public comments on these EISs. Interviews with environmental advocates as well as USFS personnel shed light on some of the ways wildlife CEA might be improved, but an in-depth treatment of these issues is reserved for the next chapter.

3.4 Changes in CEA from 2002-2003 to 2006-2007

As part of this analysis, EISs from 2002-2003 were also reviewed in order to understand how CEA has changed over time, particularly in response to the *Lands Council v. Powell* decision from 2004. Recall that in that case the Ninth Circuit ruled that the EIS for the Iron Honey project on the IPNF was insufficient in a number of ways, including the quality of the data underlying the CEA and the depth of the CEA itself. The court ruled that in the circumstances of that case a catalog or list of all past, present, and reasonably foreseeable future actions and their effects was required as part of a CEA. The court deemed this a necessary component of CEA, in part because of the utility of such a list in informing the alternatives analysis for the Iron Honey project.

One important issue considered in this section is how the CEA in documents before Iron Honey differ from those completed after that landmark decision. Additionally, this section looks at how CEA specifically for wildlife changed over the time between 2002-2003 and 2006-2007. As with the 2006-2007 period, EISs were analyzed for projects involving timber harvest, which for this time period included

projects with a listed purpose of fuels treatment, fuels reduction, or timber sale/management. For the 2002-2003 time period, four projects were identified for which EISs and records of decision had been issued. A list of these EISs is provided in Table 3.1 at the beginning of this chapter.

Cataloging of Past Actions and Effects

The Iron Honey EIS from 2002 provides a good starting point for looking at the treatment of past actions as part of CEA. In the introduction to the chapter on environmental conditions and consequences, past activities are described generally by decade. For example, the EIS includes statements such as, “More intensive management began in the late 1950’s with the use of clearcutting harvests fragmenting the landscape into smaller patch sizes” (Iron Honey FEIS, p. III-2). The introduction goes on to discuss total acres of areas harvested commercially, with specifics on the total number of acres clearcut, salvaged harvested, or thinned. It also explains that some areas may have been harvested more than once. Maps are included showing the road matrix in the project area. The forest vegetation section also details total acres cut in the past within each watershed. However, there is no catalog of all past harvests listed individually in the document, and there is no specific information about the environmental effects of individual past projects. The section concludes by explaining that effects of past activities on individual resources are discussed where appropriate in the CEA for each resource. However, the primary approach to cumulative effects from past actions is not to consider the effects of specific projects. As with the EISs from 2006-2007, cumulative impacts are accounted for by assessing current conditions.

The Little Blacktail EIS from 2002 takes a similar approach to past actions as the Iron Honey EIS. In the introduction past activities are listed in general terms. For example, it says past activities that may be included in a CEA are timber harvest, planting, firewood gathering, road construction, etc. For foreseeable future actions, the analysis states that urban and residential land use, activities on private forest land, and other factors will be considered where relevant to the resources analyzed. A list of past timber harvests is also included. The way these past actions are dealt with varies by resource.

After the Iron Honey case was decided, Forest Supervisor Ranotta McNair asked her staff to supplement several EISs in light of the court's decision. Both the West Gold and Hidden Cedar EISs had been appealed and were in litigation when the Supervisor pulled them for revision. These EISs are part of the 2006-2007 sample in this research and also were both originally finalized in 2002. These two project EISs therefore provide an excellent opportunity to look specifically at how the CEA in those documents was revised. Both of the supplemental EISs explain in detail how the analysis was supplemented in light of the Iron Honey decision.

The primary change or revision in both documents is the inclusion of the CEA boilerplate language, which was discussed earlier in this chapter. For the West Gold EIS, both the 2002 and 2006 documents include lists of past, present, and future activities, along with lists of past timber harvest and associated details on total acres cut and the cutting method used. In the 2006 document a map of past timber sales has been included along with a separate Appendix D on CEA, where the boilerplate CEA response is located. In that section, the IPNF reiterates that CEQ's guidance on CEA,

issued post-Iron Honey, states, “Generally, agencies can conduct an adequate [CEA] by focusing on the current aggregate effects of past actions without delving into the historic details of individual past actions” (CEQ, 2005, p. 2). The changes to the Hidden Cedar EIS are nearly identical. The boilerplate language is included in the body of the EIS at the beginning of their chapter on environmental effects, along with a comprehensive list of all past, present, and reasonably foreseeable future actions.

In the end, there is very little additional information given in the more recent EISs as to the specific effects of past USFS activities on various resources. The IPNF’s response to the Iron Honey decision is to include more thorough lists of individual activities relevant to a CEA. It also includes the standard cumulative effects response, which explains that it is not required to detail the effects of individual past actions and that management practices have changed too much over the last decades to meaningfully compare past actions with the proposed actions. In essence, the IPNF argues, with the support of CEQ, that the requirements set forth in *Lands Council v. Powell* (2004) are unnecessary and are not essential to conducting a CEA.

CEA for Wildlife

The CEA for wildlife species in the 2002 EISs is somewhat less detailed than that in the 2006-2007 EISs, although the general approach is the same. For example, the wildlife section in the Iron Honey EIS approaches CEA almost identically to the later EISs. Past actions are supposed to be reflected in current conditions, (a.k.a. the environmental baseline), and the specific effects of past actions on populations are only discussed in very general terms. For instance, the cumulative impacts analysis for fisher

makes some general statements that fisher populations have declined over time and are at present at precarious levels, but it does little more than summarize the direct and indirect effects analysis. Some discussion of the effects of trapping on fisher is provided in the beginning of the analysis for this species, which states, “Over trapping, habitat losses from settlement and logging, and the widespread use of poisons as a predator control agent caused population reductions in many areas” (Iron Honey FEIS, p. III-166). However, any more specific analysis of changes over time, or of the specific effects of past USFS activities, is nowhere to be found. It is difficult from this section to get a sense of how populations have been affected over time and how past activities have affected habitat or populations.

A summary of cumulative impacts to wildlife is provided at the end of the wildlife section. This summary discusses general losses of old-growth and interior habitat. Some analysis is provided of how several other proposed sales might affect wildlife, and then a summary of cumulative impacts is provided by alternative. To give an example, the cumulative impacts on wildlife for alternative eight (the proposed alternative) are as follows:

This alternative would increase the young age class from 14% to 23%. Age classes 80 years and older would be reduced by 9%. Large security blocks of interior habitat would be provided under this alternative over the long term. This alternative would result in significant short-term impacts to wildlife. Habitat suitability for wildlife would increase after 50 to 80 years (refer to discussions on goshawk, marten and pileated woodpecker). Snag standards in compliance with recommendations in the Upper Columbia River Basin Draft EIS and companion report by Bull (1997) would be implemented under all alternatives, ensuring viability of snag dependent species. Road densities are reduced which will maintain viable populations of furbearers. Watershed restoration projects that would trend watersheds towards historical conditions would maintain viability for amphibians over the long term (Iron Honey FEIS, p. III-191).

This sort of CEA is no different from what is found in the later EISs and is

unsatisfactory for a number of reasons. The rationale for conclusions simply is not clear. Most of what we are told are percentage changes in available of habitat by successional stage. It is unfortunately difficult to know what that means for populations. There will be significant short-term effects to wildlife, but we are not told if those “significant” effects will threaten viability or how they might affect populations. It must be assumed that although these effects will be significant, viability will not be threatened, because in the effects analysis nowhere does it indicate alternative eight may threaten viability. The analysis also suffers from a sort of optimism based on assertions that prescriptions will help species over the long-term (50-80) years. It is unclear how certain the USFS is that its treatments will lead to the desired conditions or that short-term significant effects will not seriously affect populations. We are also told that because road densities will be reduced, furbearer populations will not be threatened; this implies that road densities are the only significant threat to such populations. All in all, it is nearly impossible to follow the logic in a paragraph such as this. The conclusions may be accurate in the end, but the way they are presented and explained leaves the reader struggling to understand the basis of conclusions and flipping through any number of sections of the EIS wondering if maybe valuable information might be found elsewhere.

Although in general the CEA for wildlife suffers from the same problems in both the older and more recent EISs, some additional information is included in the more recent analyses. A look again at the Hidden Cedar and West Gold EISs provides the clearest insight into how wildlife CEA evolved over time. Very little changed in terms of the CEA for wildlife in the Hidden Cedar EIS. For the species that were analyzed by

Samson (2006a), information is included on that analysis and its conclusions that viability of those species is not threatened. However, the West Gold CEA for wildlife includes more analysis than the documentation from 2002. For instance, when discussing cumulative impacts of all alternatives on pileated woodpeckers, the 2002 EIS only discusses the effects of firewood cutting on snag availability. However, the 2006 EIS includes more information on past road construction and timber harvest. Nonetheless the additional information is quite general. For example, the 2006 EIS states, “Past timber harvest...likely removed forest structure that may have been characterized as capable habitat for pileated woodpeckers. Past regeneration harvests altered about 626 acres of capable pileated woodpecker habitat, converting them into an earlier stage of forest succession....” (West Gold, SFEIS p. III-119). The analysis concludes that the resources are recoverable and that any changes are reflected in existing conditions.

The problem remains in EISs from both time periods that forest-wide analyses of viability for some species are simply not available. For example, in the response to comments in the Iron Honey EIS, the USFS explains that the Ninth Circuit has deemed it acceptable to use habitat monitoring as a proxy for monitoring populations. Nonetheless, it also concedes, “A forest-wide assessment of populations is outside the scope of this project” (Iron Honey FEIS, p. A-24). Because wildlife viability is an issue that must be addressed at a scale larger than the project area, and eventually at the forest-wide scale, it is important to ask at what point will a forest-wide assessment of populations be undertaken. Is that something we look for in 5-year monitoring reports or in the plan revision? One place we see this issue addressed in later EISs is with

Samson's (2006a, 2006b) work, which states that adequate habitat occurs on the IPNF to support the viability of the species analyzed therein.

For some species, however, no forest-wide analysis of viability of any kind is available in either the 2002-2003 or 2006-2007 EISs. Consider the following statements from the 2002 Hidden Cedar EIS concerning fisher:

Forest carnivore conservation/management requires an ecosystem management approach at a scale larger than the Hidden Cedar wildlife analysis area or even the IPNF. There is no existing management strategy. It is therefore difficult to put the habitat in the St. Maries drainage and Hidden Cedar wildlife analysis area into a landscape perspective. However, current literature (including existing draft assessments and strategies) can be used to establish existing conditions, identify opportunities for management, discuss tentative objectives for the Hidden Cedar wildlife analysis area, and establish some sideboards for management objectives (Hidden Cedar FEIS, p. 3-174).

In other words, the current status of fisher populations at a landscape scale is unknown, and there is no comprehensive management strategy for this sensitive species. It is therefore nearly impossible to understand project-level impacts in any broader context or conduct a CEA for populations of this species. What is possible, according to this passage, is to look at existing conditions, identify opportunities for improving those conditions for fisher, and limit effects of management prescriptions on the species. This passage from the Hidden Cedar EIS from 2002 openly acknowledges what is and is not possible in the analysis for fisher, and in fact, this is really what the IPNF does for most species, rather than provide an actual landscape-level analysis of cumulative impacts to species viability.¹⁶

Although the information available is not different in the Hidden Cedar EIS from 2007, the open acknowledgement of uncertainty is toned down in the later version of

¹⁶ One difference is that for some avian species later EISs rely on Samson's (2006a) work, which asserts that viability is not at issue on the IPNF or at the regional scale.

this EIS. The 2007 EIS explains that the goal of a project-level analysis is to maintain functional home ranges within the project area. It also states that it remains difficult to put the habitat in the analysis area into a landscape level perspective and that there continues to be no large-scale management strategy for the species. The final sentence is less tentative and states, “[C]urrent literature can be (and was) used to establish existing conditions, and assess potential effects at the project scale” (Hidden Cedar SFEIS p. 338). Nonetheless, it remains clear that a forest-wide assessment of the viability of this species and a broad-scale approach to cumulative impacts for fisher are still unavailable.

In summary, in terms of wildlife analysis, there is very little difference in how CEA was done across the two time periods, aside from the inclusion of Samson’s work and a bit more detail on potential contributing factors to cumulative impacts.¹⁷ The lack of broad-scale assessments of population status and minimal information on wildlife-habitat relationships undermine the quality of the CEA in both time periods. A long-term understanding of cumulative impacts over time also remains elusive.

3.5 Conclusions from the IPNF Case Study

It is remarkable, given how central CEA was to the Iron Honey decision, how little the IPNF’s treatment of past actions changed in light of that case. The IPNF justifies this based on the CEQ guidance from 2005 and explains their approach in their “Cumulative Effects Response,” included in all of the recent EISs. Essentially, the IPNF

¹⁷ One minor detail is that specific viability standards appear to have changed for some species. For example, in the 2002 Iron Honey EIS, the Region 1 viability standard for goshawks was 1 pair per 10,000 acres. In the later EISs this viability threshold is no longer discussed and appears to have been replaced by Samson’s regional viability analysis for the species.

and CEQ disagree with the court that a catalog of past actions and their effects is important to conducting both a CEA and an informed alternatives analysis. The forest's primary response has been to be sure to include a list of all activities relevant for a CEA and explain why knowing the specific effects of those activities is not critical to a CEA.

Several interviewees from the USFS explained that, in their opinion, in the Iron Honey decision the court overstepped its authority. They felt that the court was valid in stating that the CEA was not adequate but went beyond its appropriate role when it prescribed a specific procedure (the cataloging of past actions and effects) as a remedy to the CEA problem. The IPNF's response has been to explain why the court's approach is not useful and to continue to assess cumulative impacts based on current or environmental baseline conditions. The persistent question is whether their approach to CEA captures important cumulative impacts. The lack of a picture of how past actions have affected resources limits the ability to understand what cumulative impacts to a resource have been, either generally or as a result of management actions. While the court in *Lands Council* (2004) might have gone too far in telling the agency how to address past actions in CEA, the problem remains that the way in which the cumulative impacts of past actions are presented is less than satisfactory. It remains to be seen how the Ninth Circuit will rule in future cases brought against the USFS in terms of the adequacy of their CEA. The CEA was particularly relevant in the case of the Iron Honey project, because much of what was being proposed to restore the area seemed indistinguishable, to the court and the plaintiffs, from past actions that had degraded conditions in the project area in the past. The court might deal with the issue again if a future case brings similar circumstances.

The IPNF's wildlife analysis suffers from a number of serious deficiencies, including the lack of information on population status on a forest-wide scale and limited information on wildlife-habitat relationships. There is only limited use of thresholds to provide a sense of whether viable populations likely exist on the IPNF, and there is no clear information on how population distributions and abundances might have changed over time. In order to gain more insight on these issues I considered secondary literature and public comment on these topics, and also interviewed people both inside and outside of the USFS to get their perspectives. These are incorporated into the analysis that is the subject of the next chapter, where I consider strengths, weaknesses, and criticisms of the IPNF's approach to CEA in general and specifically for wildlife.

CHAPTER FOUR: EMERGENT THEMES, LESSONS LEARNED, AND IMPEDIMENTS TO IMPROVING CEA

Cumulative effects analysis (CEA) is a rich and complex topic for study for the same reason that it has become such an important legal issue in recent years. The requirement is so broad that it encompasses a number of different aspects and controversies in forest management. It is, in essence, a window into some of the most complicated and intractable challenges in both forest planning and in National Environmental Policy Act (NEPA) analysis. One cannot talk about CEA without delving into issues such as how private land actions affect planning on National Forests, the overwhelming data and knowledge gaps and the associated need for increased, strategic monitoring on public lands, or how budgets and institutional biases affect wildlife protection on National Forest lands. When we talk about CEA, we necessarily have to deal with questions about the scale and timing of landscape level analysis and where such analyses fit into the NEPA process. And, in considering problems with CEA, we also are forced to look at the issue of whether the traditional ex ante analysis of projects under NEPA is sufficient and effective.

This chapter builds upon the case law review and case study from the previous chapters to consider some of the most important and pressing issues that arise through the investigation of the challenges with CEA. The analysis herein draws upon the case study, public comments from the EISs reviewed, and approximately 30 interviews that were conducted with U.S. Forest Service (USFS) personnel, environmentalists involved in forest management in the Northern Rockies, and others with expertise on this topic,

including scientists from academia and other NEPA experts.¹ Integrated throughout the analysis are perspectives from scholarly literature, which is used to nest this discussion within a broader dialogue regarding NEPA implementation, forest planning, and biodiversity conservation on public lands.

The chapter begins in section 4.1 with a look at an issue particularly salient to the Idaho Panhandle National Forest (IPNF), given the Iron Honey case and the emphasis in that decision on the analysis of past actions and their effects as part of a CEA. The issue of past actions, or more generally incorporating other actions and their effects into a CEA, is one of the most controversial aspects of CEA, and it deserves a closer look. Part and parcel of this discussion are questions of how an analysis of past actions should fit

¹ The majority of comments discussed from the EISs come from a number of environmental groups who are actively involved in monitoring, commenting on, and participating in forest management on the IPNF. For example, The Lands Council in Spokane, WA comments on the majority of IPNF timber sales. Their forest watch coordinator writes extensive, substantive comments on the IPNF's approach to forest management and analysis of effects on forest composition, old-growth forests, soils, and wildlife species. The Lands Council often coordinates its efforts with the Kootenai Environmental Alliance, which also employs a forest watch coordinator who provides substantive comments on the IPNF's water quality analyses. Often comment letters submitted to the IPNF are on behalf of all of these groups and others, including the WildWest institute in Missoula and the Alliance for the Wild Rockies. Comments from these groups were found along with every EIS reviewed for this project.

It is important to note that many of the criticisms and concerns discussed in this section are from this coalition of environmental organizations. Aside from the Idaho Conservation League, which sometimes takes a distinctive approach, these groups are usually the most vocal in terms of providing substantive criticisms of the IPNF's activities and the effects of activities on natural resources. These groups also have been the primary force behind litigation on the IPNF. For instance, the Lands Council, Kootenai Environmental Alliance, Idaho Sporting Congress, and WildWest Institute brought the case challenging the Iron Honey project (*Lands Council v. Powell*, 2004). The Lands Council and WildWest brought the case challenging the Mission Brush project (*Lands Council v. McNair*, 2007 and ongoing). Numerous other cases discussed herein, such as *Ecology Center v. Austin* (2005), *Inland Empire Public Lands Council v. USFS* (1995), *Idaho Sporting Congress v. Rittenhouse* (2002), and the cases brought by Neighbors of Cuddy Mountain in southern Idaho also involved many of the same environmental groups or attorneys involved in the more recent cases against the USFS in Region 1. I emphasize this only to be clear that much of the critique highlighted in this section comes from a cohort of environmental groups that has been extremely active in challenging USFS practices in this region.

into the long-term process of forest planning and forest plan revision, how to analyze effects from private land activities, and how to determine the appropriate scale of CEA, particularly for wildlife.

Section 4.2 of this chapter focuses on a number of challenges associated with the science behind wildlife CEA. Questions of the adequacy of a habitat-based approach to viability analysis and of the credibility of the USFS' wildlife analyses are explored in detail. CEA also provides a lens through which we can look at some of the most enduring and challenging aspects of NEPA implementation. In Section 4.3, I look at some of the limits of prediction associated with NEPA analysis and the companion issues of how to improve monitoring, mitigation, and flexibility in the NEPA process. These issues were some of the primary themes raised in interviews with USFS personnel and environmental groups alike and are also prominent themes in the scholarly literature. The discussion of these issues draws upon this literature in order to situate the analysis herein within a broader policy discussion on NEPA analysis and the challenges of adaptive management on public lands. The final section of this chapter considers institutional issues that came to the forefront as part of this research. I look at the interplay of institutions such as Congress, the USFS, the judiciary, and public interest groups as these intersect and affect CEA implementation.

4.1 The Challenges of Scope and Scale in CEA

The issue of incorporating past actions is a key part of the current debate as to whether a CEA can be entirely forward-looking or whether it should paint a picture of change over time. Associated with this issue is the conundrum of the appropriate scale of

analysis for a CEA, both temporally and spatially. In terms of wildlife, a critical question is at what point long-term, cumulative impacts are analyzed. Even if such an analysis is not required under NEPA for every project, it is something that must occur for both NEPA and National Forest Management Act (NFMA) compliance at some point in the forest planning process. The section also looks at the issue of actions on private lands and how those are brought into CEA on the IPNF. All of these topics get at the challenge of determining the appropriate scope, scale, and timing of a CEA.

The Environmental Baseline Approach to Past Actions

The issue of how to include an analysis of past actions and their effects was one of the central aspects of the important Iron Honey decision involving the IPNF (*Lands Council v. Powell*, 2004). The case was discussed in detail in chapter two, and in chapter three I looked at how the IPNF has responded to the court's holding that the agency must provide a catalog of past actions and their effects. Rather than do what the court asked for, the IPNF has emphasized that past effects can be effectively analyzed by considering the current condition of a resource. According to the IPNF, CEA is supposed to be forward-looking, meaning that it is meant primarily to inform the decision at hand and to help to determine whether any legal thresholds (such as species viability or soil quality standards) will be crossed. Furthermore, the IPNF argues that management practices have changed so much that it is not useful to an alternatives analysis to compare current activities to past projects.

Despite the fact that the IPNF's approach is consistent with CEQ guidance and that the USFS has issued regulations echoing that guidance, the question of how to

handle past actions is far from settled. The matter remains controversial, is raised repeatedly in comment letters from the public, and has been the subject of ongoing discussions on how to revise or improve NEPA. For example, in 2005 the House Resources Committee, under the leadership of Chair Richard Pombo of California, organized a Task Force on Improving the NEPA.² One of the task force's recommendations is that NEPA be amended to establish that the assessment of current environmental conditions is the appropriate manner in which to analyze the effects of past actions. The report emphasizes that it does not encourage agencies to ignore the effects of past actions, but that the requirement set forth in *Lands Council v. Powell* (2004) is too cumbersome and not useful. According to the report, "[Our] recommendation allows agencies to focus on past actions in the proper context of the proposed action, rather than an exhaustive and improper examination of all past actions" (p. 13). By contrast, in its comments on the Task Force Report, the Environmental Law Institute (ELI) argues, "The cumulative impact issue deserves more attention by agencies and stakeholders that deal with it on a day-to-day- basis before a single approach is locked in place by statute—particularly because agencies' current assessment methods may be the source of difficulty rather than the solution" (ELI, 2006, p. 12).³ ELI explains that rather than codify the Task Force's recommended approach to analyzing past actions, instead, agencies, CEQ, and interested stakeholders should come together to discuss how best to deal with this complicated issue.

² The task force report is no longer available on the House Resource Committee website, but it can be found at: http://www.law.georgetown.edu/gelpi/research_archive/nepa/NEPATaskForce_FinalRecommendations.pdf (last accessed Dec. 28, 2008).

³ ELI's report can be accessed at: http://www.eli.org/pdf/eli_nepa_comments.pdf (last accessed April 10, 2009).

There are several reasons the issue of past actions remains so controversial and important to a discussion of CEA. While the court's holding requiring the USFS to list all past actions and their effects might be unduly cumbersome and might fail to achieve the goal of providing an integrated look at the synergistic effects of past actions, it is unclear what methodology would effectively provide that perspective. A number of USFS personnel argue that in *Iron Honey* the court identified a problem, the lack of CEA regarding past actions, but then took the inappropriate step of prescribing the solution. The question remains, however, as to what other approach might provide the perspective on past actions that the plaintiffs and the court were looking for in that case and in project analyses that have been completed since that decision. It is doubtful that the current emphasis on the environmental baseline actually captures cumulative impacts and suffices for fulfilling NEPA requirements.

At the root of this question is the problem that no one seems to agree on what exactly a CEA is supposed to accomplish. During the interviews, one question I asked interviewees was about the overall intent of CEA: Is it about how management actions have affected the landscape over time? Or, is it about whether cumulatively effects will cross a preset threshold? Or, is it both? One USFS staff member stated that s/he and their staff are constantly debating those questions, but that they try to stick to CEQ's guidance that CEA is "forward-looking" and should focus on whether significant thresholds will be crossed.

The IPNF's environmental watchdogs disagree with the notion that CEA is solely about whether thresholds, such as population viability, are being crossed. For example, in comments on the Mission Brush SFEIS they write, "The discussion about past timber

sales is too cursory for understanding cumulative effects” and go on to explain that the analysis does not explain whether past projects had the same goals, whether those projects accomplished those goals based on monitoring information, or whether past management actions led to the need for the project at hand. In other words, an understanding of past actions and their effects would not only help the public understand what factors led to current conditions, but would also help inform the decision at hand through consideration of the effectiveness of past actions in terms of their management goals. This is essentially the same argument the plaintiffs made in the Iron Honey case.

In a recent appeal on the neighboring Kootenai National Forest, the same appellants write, “There’s no real understanding in the agency as to just how its past management has resulted in the existing conditions or if, in fact, those were the intended conditions based upon repeated rounds of heavy-handed management. There is lack of a comprehensive cumulative effects analysis in the EIS of the past logging and other management activities in the project area” (Young Dodge Appeal, p. 17).⁴ With regard to indicator and sensitive species they write, “The questions a [CEA for species] is supposed to answer are: How much habitat in the project area and on a forestwide, landscape level have all projects modified....? And: How do the remaining, depleted habitat conditions compare to the habitat needs for a well-distributed, viable population of such species....?” (Young Dodge Appeal, p. 57).

Although the Young Dodge appeal is targeted towards a project not on the IPNF, the articulation of the CEA problem in that appeal most closely matches what members

⁴ This appeal by The Lands Council and other environmental groups on the Kootenai National Forest’s Young Dodge project is on file with the author. Information on appeals and litigation can also be accessed at: http://www.fs.fed.us/emc/applit/appeal_decisions.htm.

of environmental groups identified during the interviews as some of their primary concerns with CEA. In fact, what the environmental groups ask for is central to what a CEA should provide: a sense of how conditions have changed over time and how current conditions compare to desired conditions or minimum standards required by law. In current EISs, not only does there appear to be limited learning from past actions, but there is no comprehensive account of how past management actions have affected resources. For instance, at no point in any EIS is there a clear and comprehensive estimate of how populations or habitat availability for a species has changed over time. What is available from sections of the EIS on forest vegetation are estimates of historic patterns of vegetation and an accounting of acres harvested over time, from which one could piece together an estimate of changes in stand structure. This in turn is only a rough proxy for habitat, which is itself a rough proxy for population numbers.

In order to make sense of the debate over what should be incorporated into a CEA, we can begin by taking a closer look at this question of whether the environmental baseline approach satisfies the intent of NEPA's CEA requirement. Throughout this discussion, it is important to keep in mind the purpose of NEPA. Recall that the act has been characterized as having twin aims: to force consideration of environmental values in decision-making and to inform and involve the public.⁵ In order to answer the question of what CEA should involve, it might be useful to distinguish between information that is critical to complying with NEPA, versus information we might like to have generally as a part of forest planning.

⁵ Numerous NEPA cases discuss these "twin aims". See, for example, *Baltimore Gas & Electric Co. v. Natural Resources Defense Council*, 462 U.S. 87, 97 (1983).

Despite the convenience of the approach, it is doubtful that a picture of the existing condition suffices as measure of cumulative impacts of past actions. The approach is analogous to walking up the scene of a crime and declaring that all of the factors leading up that crime are represented in the conditions we see before our eyes. The crime is obviously a result of a variety of actions in the past, all or most of which are represented in some way in the resulting scene. What we see is a result of that legacy, and embedded in the current condition of the crime scene somehow are the cumulative effects of many past events. However, we could not know the causes of the crime based only on what is before our eyes. It would surely be useful to understand what factors led up to the event in order to interpret what we see, understand what happened and why, and possibly figure out how to prevent it from happening again. In terms of understanding causality, a look at the current conditions can only tell us so much.

Aside from the learning opportunities that might be missed by focusing only on current conditions, there is also the question of whether CEA is supposed to be entirely forward-looking or is also supposed to provide a sense of how conditions have changed over time. This issue gets at the heart of one of the most central aspects of the debate around CEA. Several USFS personnel that I interviewed emphasized that CEA is only meant to inform the decision at hand. Therefore, they explained, particularly if a project is only going to have minimal effects on a species, an understanding of how that species has been affected over time might be interesting, but is not important for informing the present decision. Indeed, this argument echoes the most recent guidance from CEQ on the issue of past actions (CEQ, 2005).

However, this argument is untenable for two key reasons. For one, NEPA is also about informing the public about effects, with CEA emphasizing long-term synergistic effects. Even if a species is not at a viability threshold, NEPA's disclosure requirements lend credence to the notion that a CEA, at some level of planning, should include a picture of significant changes to a resource over time. Secondly, it is nonsensical to argue that a broad picture of long-term effects, even if the project at hand will have only minimal effects, is not critical to decision-making. The USFS has a legal obligation to protect species diversity and therefore must have some kind of long-term, landscape level analysis of how species have been affected over time and how the effects of a new project might contribute to cumulative impacts to species. Particularly when no viability threshold of any kind has been established for a species, there is nothing other than a picture of long-term effects that might address whether the agency is meeting its stewardship obligations with regard to biodiversity. Furthermore, diversity and viability standards under NFMA play a critical companion role to the Endangered Species Act, because they may serve as a tool for recognizing species declines before species-wide viability thresholds are crossed. In the U.S. species usually are not listed as threatened or endangered until well after the crossing of what would be considered a minimum viability threshold (Crumpacker, 1998). Therefore, an understanding of effects over time is crucial to getting some sense of effects on species viability.

An exclusive focus on current conditions also runs the risk of feeding into what has been called the "shifting baseline syndrome" whereby "successive generations of wildlife managers use as their baseline the conditions they experienced at the start of their careers, resulting in lower expectations with each new generation" (Tear et al. 2005,

citing Pauly, 1995). In other words, long-term losses might go unnoticed until a threshold is crossed. For these reasons, the question is not whether this sense of cumulative effects over time is critical, but rather, how exactly to get at it, especially for wildlife species.

Eccleston (2006) lends some useful perspective and guidance on this area in terms of the broader challenges with CEA and NEPA implementation. He begins with the premise that many resources have already sustained what might be considered cumulatively significant impacts and provides the following as an example. Consider a campground that has existed for many years and has had a significant effect on the environment. The noise from the campground has displaced several species and water quality in a nearby stream has been degraded. In other words, cumulative significant impacts have already occurred. Now the USFS wants to do a project to improve a trail in the campground, and the incremental effects of this action will be insignificant. However, there *are* significant cumulative effects when you combine the effects of the current project with past effects. In other words, the current project's effects are not significant, but the cumulative impacts are. Is the USFS really required to write a full-blown EIS in this case? This question also arises when we consider any project that contributes to global climate change in any way. A strict reading of the regulations, according to Eccleston (2006), implies that any project that contributes *at all* to significant cumulative impacts requires preparation of an EIS. This reading of the regulations, however, leads to an absurd and untenable result. Indeed, it is for this reason that CEQ seems to emphasize that CEA is supposed to focus on the “incremental impact” of the proposed action (CEQ, 2005).

To fully capture the intent of NEPA, Eccleston (2006) recommends that the “Significant Departure Principle” be employed to deal with this paradox to help NEPA practitioners recognize the situations in which an EIS is required. By this concept, an impact would be significant, therefore triggering the preparation of an EIS, if it constituted a significant departure from the environmental baseline or existing condition. An EIS would not be necessary just because in absolute terms a resource had sustained significant cumulative impacts, if the proposed action only minimally contributed to that baseline condition. Eccleston (2006) goes on to explain, however, that if a small or incremental impact caused a *threshold* (such as a loss of population viability or violation of an air quality or some other management standard) to be crossed, this would be considered a significant effect, triggering the need for an EIS. Furthermore, a significant departure from a baseline condition might be considered a significant cumulative impact, *even if it does not cross a threshold* or if the threshold has already been crossed. What is crucial to recognize then, is that a cumulative impact might be considered significant if it: 1) crosses a threshold, or 2) constitutes a significant departure from a baseline condition. A small incremental impact, however, might only be considered significant if it leads to the crossing of a threshold. However, this does not necessarily mean that the combined effects of past actions are not already significant. Undoubtedly, this entire approach raises issues of whether and how to define thresholds or significant effects/departures compared to the existing condition.

Eccleston (2006) also raises an important criticism of his approach, which is that many small or incremental impacts to a resource might be approved without preparation of an EIS, particularly when thresholds are not crossed. This might lead to a

cumulatively significant impact that is not accounted for anywhere, or not until a clear threshold is crossed. Consider the following scenario, which is particularly relevant for wildlife analysis (although it is a gross simplification of what might constitute a useful management approach for a species). Assume that we originally have 25,000 acres of habitat for a particular species, and we have determined we only need 5,000 acres to maintain a viable population in this particular planning area. We therefore establish the maintenance of 5,000 acres as a minimum threshold for maintaining species viability. Now say we approve a series of small projects that eliminate habitat, and after 20 years we have only 6,000 of the original 25,000 acres of habitat is left. This 6,000 acres of habitat is now our current condition or environmental baseline. Our approach to CEA is “forward-looking” and focuses on the question of whether we are crossing thresholds. In our next EIS we plan to eliminate 500 more acres of habitat. Our CEA in this EIS says the following: “Elimination of 500 more acres of habitat will not be cumulatively significant because past actions have been incorporated into the environmental baseline.” Our logic, although it is not entirely clear from this statement, goes like this. The environmental baseline or current condition, prior to this project, is the presence of 6,000 acres of habitat. We will eliminate 500 more acres of habitat, but we do not consider this cumulatively significant because the only thing we would consider significant would be the crossing of the pre-established threshold of 5,000 acres. Therefore, there are no significant cumulative effects.

There are several important points to consider about this approach. For one, having some kind of threshold is the only indicator in this scenario of whether significant cumulative effects have occurred. In other words, the only way we know when we have

reached a cumulatively significant effect is because the 5,000 acre threshold has been explicitly established. Without this clearly established threshold, we might never know or disclose when we have caused cumulatively significant effects.

Secondly, it also would be useful to know what has been lost. The loss of 19,500 acres of habitat is significant, even when it does not cross our 5,000-acre threshold, and significant cumulative change due to incremental impacts is precisely what the CEA requirement is about. If we only discuss whether we are reaching some minimum habitat threshold, the long-term loss of habitat might never be discussed until thresholds are crossed. Particularly if this habitat loss happened in small, incremental steps and no EIS was ever deemed necessary, it is unclear at what point the significant loss of all these acres would be accounted for and analyzed. Additionally, if we are unsure about the validity of our threshold, how well habitat models represent actual populations, or what a minimum viable population would be, knowing how much habitat has been lost could be a particularly useful piece of information. This scenario closely mimics the CEA approach currently undertaken by the IPNF and other Region 1 forests, and the current approach could easily lead to the failure to account for long-term cumulative losses to wildlife populations and habitat.

I would argue that it is the accumulation of small, incremental changes, none of which alone is significant but which together constitute significant environmental change, that is precisely the thrust of CEA. Therefore, if such analysis is not undertaken at the project level, then a big picture analysis must be undertaken at a programmatic level. If CEA for wildlife is beyond the scope of project level analysis, programmatic analyses of viability are necessary either at the forest or regional level. Notably, the IPNF is utilizing

some such programmatic analyses, such as the Lynx Conservation Assessment and Strategy (LCAS) (Reudiger et al. 2000). Samson's (2006a) work is not nearly as comprehensive as the work for that species, but at least provides some sort of landscape level analysis for project managers to tier to. However, for other species, the USFS seems to be playing what is sometimes referred to as the "shell-game", which was discussed earlier in chapter two (Feller, 1995; Nie, 2006). The idea is that the agency consistently explains that a sought after analysis can or will be found at some other stage of planning, but in the end such analysis is not comprehensively undertaken at any point. Project analyses state the necessary analysis is beyond the scope of the project and needs to be undertaken at a broader scale. However, a broader scale analysis has yet to be completed or is not specific enough to inform project-level effects analyses.

The lack of understanding with regard to this issue is a serious challenge conceptually for conducting CEA, and there is no clear agreement among the courts, the USFS, and members of the public as to whether CEA is just about crossing thresholds or is about resource change over time. CEQ has said that CEA is forward-looking, a notion echoed by many of the USFS staff I interviewed. However, environmental activists in the region unanimously assert that CEA is precisely about knowing what has been lost, specifically as a result of management decisions. I argue that the crossing of thresholds cannot possibly be the sole thrust of CEA and in fact misses the point of CEA, which should involve disclosure of cumulative changes over time. This is the intent of NEPA and follows from the clear language of the CEA regulation. As Eccleston (2006) posits, significant departure from a baseline condition, and not just the crossing of thresholds, constitutes significant environmental change. NEPA documents are supposed to

document significant environmental effects, and it is impossible to argue that significant effects under NEPA only occur when clear and explicit thresholds are crossed. As the federal agencies well know, NEPA can involve disclosure of significant cumulative impacts that do not stop a project from going forward and do not violate any statutory standard or explicit threshold, such as species viability or a forest plan standard.

Furthermore, even if a project will have only minimal impacts on a species, at some point to meet its legal obligations under NFMA, the USFS, at least under its planning rules and plans implemented prior to 2005, must have some kind of forest-wide viability analysis available, and that analysis must provide some kind of useful guidance and context for project-level analyses. NEPA also requires a disclosure of long-term significant effects, if not in a project level analysis, then in some kind of programmatic analysis. Even if a project will not increase risks to a species, some sort of long-term CEA is necessary to comply with both laws, in part to provide a basis for assertions that project level activities are inconsequential. At present, CEQ's interpretation of the regulation sets the standard for analyzing the effects of past actions and deems it appropriate to focus on current conditions. While cataloguing the effects of all past actions is cumbersome (or potentially impossible) and might not be the most effective way to capture cumulative impacts, a look at current conditions alone also does not satisfy the CEA requirement.

In terms of wildlife analysis, looking only at current conditions is especially problematic for several reasons. It is unclear where long-term habitat loss or changes in population numbers are accounted for. And, for species such as fisher, which was discussed in chapter three, no programmatic analysis has been completed and no

thresholds are disclosed in current analyses. Therefore, not only can we not know what has been lost in terms of habitat, but we have no idea about the status of actual populations nor any indication when a red flag would be raised in terms of significant effects to fisher. Other than listing under the Endangered Species Act, it is unclear at what point the USFS might determine that management actions are significantly affecting the species. For other species, project-level activities that may cause some harm to species are supported by regional analyses such as Samson's (2006a) work, which at the least provides some landscape level basis for assertions that losses to habitat at the project level of insignificant. However, such analyses still do not paint a picture of changes to populations or habitat over time at either a regional or forest-level scale.

Past actions and landscape level analysis

If a picture of current conditions does not paint a clear picture of incremental losses over time, at what point are long-term and landscape-scale effects discussed? Is this something we look for in project-level EISs, even if a project's effects are minimal, or is a larger scale analysis best handled elsewhere? Among the interviewees, I found no agreement as to when this analysis is supposed to occur. Several USFS personnel explained that forest plans were where one should look for an analysis of long-term changes to resources. However, seeing as the IPNF has not revised their forest plan in over 20 years, we might want some kind of landscape level picture of CEA to be available in the meantime. Others suggested that long-term changes to populations or habitat availability should be addressed at the regional level or in periodic monitoring reports. Another issue raised was that such analysis would have to occur at the project

level in the future, if the most recent planning regulations stand, because no EISs would accompany forest plan revisions.

The challenge of determining the appropriate scale of analysis for wildlife is a particularly tricky aspect of CEA, especially in project level EISs. Recall that the IPNF generally states that the project area is the appropriate scale of analysis for wildlife species because the project area reflects actual geographic boundaries to some extent and is the size of multiple home ranges for species. However, that does not explain exactly why it is sufficient as the CEA area, and in fact there are several potential problems with the approach. For example, impacts from a road or clear cut at a project site might have effects not only on habitat availability in the project area but on the behavior of species at a scale larger than the project area. Or, imagine for example a project that would eliminate significant habitat for a particular species in the project area. And recall that the 1982 forest planning regulations, which still guide management on the IPNF, require the USFS to maintain viability and well-distributed habitat over the planning area/unit, which has generally been understood to be the National Forest. To put that project's negative effects into context, a CEA would have to consider the project's effects as part of a forest-wide viability assessment. In other words, the analysis would have to ask, can we afford to lose these home ranges or habitat in the project area? Is sufficient habitat available elsewhere? Is that habitat well-distributed? Are populations robust enough to sustain losses in this area?

Members of the environmental groups raise this issue in their comments on the Mission Brush SFEIS and write:

For the proposal to be consistent with the Forest Plan, enough habitat for viable populations of old-growth dependent wildlife species is needed over the landscape. The cumulative effects of carrying out multiple projects

simultaneously across the IPNF makes it imperative that population viability be assessed at least at the forestwide scale. Also, *temporal* considerations of the impacts on wildlife population viability from implementing something with such long duration as a Forest Plan must be considered, but this has never been done by the IPNF” (Mission Brush, SFEIS, p. F-16).

Another public comment states, “According to FS experts, population viability analysis is not plausible or logical, from a scientific standpoint, at the project level such as the scale of a timber sale(s), absent some tiering to a larger-scaled study” (p. F-17 MB SFEIS).

The USFS explains that including a cumulative effects area big enough to truly insure viable populations would be unreasonable to do in project level analysis. In response to the aforementioned comments on the Mission Brush SFEIS, the USFS’ states: “It is unreasonable to ‘include a [CEA] area that would include truly viable populations in project level analyses,’ since for some species this would include a ‘cumulative effects analysis area’ several orders of magnitude larger than the project area itself.... Analyzing at this scale would effectively dilute the impacts of project-level activities—defeating the purpose of [CEA]” (Mission Brush SFEIS, p. F-17).

Undoubtedly, it is difficult to identify the appropriate scale for wildlife CEA in project-level analyses. Given how the IPNF analyzes effects to species, by considering acres of habitat affected as a percentage of the total amount of suitable habitat available, or by analyzing effects to home ranges, an analysis at the forest-wide level *would* make project impacts seem relatively inconsequential in terms of the percentage of total forest-wide available habitat affected. However, the broad assertion that analyzing project effects at a larger scale would dilute project level impacts is not accurate, and, in fact, a larger scale analysis is important and necessary. The real problem is that at present there is no clear way for the IPNF to do a meaningful CEA at a larger scale that also puts project effects into context. However, at some point National Forests must conduct a

forest-wide or some kind of broad-scale analysis of species in order to assess population viability, and ideally such an analysis would provide some kind of useful guidance to project managers that could be used in a project level EIS. What is important to take from this discussion is not a message that the IPNF is in some way particularly complacent or avoidant with regard to this issue. The problem is bigger than that: the USFS, at least in this region, does not currently have the money, data, or tools to do the kind of analysis for most species that is necessary in order to meet legal obligations and to meaningfully understand project level impacts in the context of a broader analysis of viability.

The question of what would be the appropriate scale of analysis for wildlife is the subject of a paper from *Conservation Biology* written by several scientists from the Rocky Mountain Research Station. The paper deals specifically with the challenges of population viability analysis and the appropriate scale of analysis in forest management. The authors write, “The disparity between the scale of a local management action (e.g., a timber sale) and the scale of the ecological response (e.g., species viability) is a fundamental problem in assessing population viability” (Ruggiero et al., 1994, p. 366). They go on to explain: “Disparity between the scale of a proposed management action and the scale at which the corresponding ecological response is evaluated can result in viability analyses that are questionable. This mismatch in scale can easily lead to an erroneous conclusion regarding the impact of management actions if one confuses the inability to measure an effect with the absence of an effect per se” (Ruggiero et al., 1994, p. 366). This is exactly the problem encountered on the IPNF in their CEA for wildlife. The project level analyses often fail to provide a landscape-level context for project-level

effects and explain that broadening the CEA area, which would be necessary to put project effects into some context of population viability, effectively dilutes the effects of a project. It is therefore difficult to detect any significant effects at either the project or the landscape level.

Ruggiero et al. (1994) suggest that an effects analysis area should be analogous to the scale at which meaningful effects to the resource occur. In the case of wildlife species, when possible the analysis area should be roughly equivalent to the boundaries of a wildlife population. Nonetheless, if the population is so wide-ranging that this would lead to a gross mismatch between the scale of the management action and the scale of the analysis, they suggest using a more reasonable scale of analysis, such as a ranger district, which is still considerably larger than a project analysis area. Furthermore, for CEA, even at the project level, they suggest that the analysis area be large enough to consider metapopulations. They write, “[CEA] ought to examine how changes from past, present, and future management actions may alter metapopulation structure and affect the persistence of the population under study” (Ruggiero et al., 1994, p. 369). Again, for wide-ranging species they suggest using some more manageable area, such as a ranger district, for delineating an analysis area. Finally, they stress that linkages between patches of suitable habitat must be considered as part of the analysis for wildlife populations.

As we saw in chapter three, the CEA area for species on the IPNF is almost always the project area and for most species is not done on a scale analogous to the range of a population. Project level effects are not put into some broader context of population viability, as Ruggiero et al. (1994) suggest, except for the species that have benefitted

from some kind of habitat-based viability analysis. It is important to note though, that although they are not available for all species, regional strategies (such as the lynx conservation strategy) and regional assessments of habitat availability by forest (Samson, 2005) do provide at least some broader context for project-level analyses.

Forests such as the IPNF are obviously faced with serious challenges as to how to effectively understand cumulative impacts to wildlife species, but at least there is some good news. General improvements of management practices and standards on the IPNF and the Region and increased use of broad management protocols make it easier for the IPNF to at least limit effects to wildlife at the project level. By minimizing effects through project design, the IPNF creates a situation where CEA is less complex, especially if the analysis focuses on the incremental impact of the project as opposed to broad-scale cumulative effects. IPNF interviewees emphasized that projects are designed from the outset to have limited effects on wildlife species and that by the time various alternatives are developed for in-depth NEPA analysis, those alternatives have already been prescreened by interdisciplinary (ID) team-members and resource specialists to avoid unacceptable negative effects to resources. Another team leader stated that s/he might have a project in mind but would look for a place to implement it ideally where sensitive species would not be an issue. So many areas of the forest are in need of restoration, s/he explained, that it was often possible to choose between various possible project sites and pick an area that would have the least effects on sensitive wildlife species.⁶

⁶ These statements echo an argument that is often made in support of NEPA's efficacy. Many contend that one way NEPA works to further protection of the environment is through a law of anticipated reaction: because project managers know effects will be analyzed and disclosed

A number of other employees from the IPNF pointed towards several ways in which negative effects to species are minimized. The majority of IPNF personnel I spoke with emphasized that the entire direction of forest management in the region has shifted away from resource extraction and towards restoration, something that they said will be the primary emphasis of the forthcoming IPNF forest plan revision. They noted that management practices have changed considerably over time and that currently negative effects are minimized in numerous ways, echoing the IPNF's arguments in its standard "Cumulative Effects Response." In other words, although a landscape level picture of species viability and how it has changed over time is not available, the IPNF argues that the additional effects of new projects will be minimal or inconsequential. Some project analyses present effects to species as a sort of choice among risks, such as loss of habitat due to catastrophic wildfire, versus short-term losses due to management actions meant to reduce the risk of fire. In cases such as this, again, long-term CEA is not available, but project managers can at least assert that the project is not leading to any increased effects on species. However, as was discussed in the previous chapter, often these risks are discussed without any attendant discussion of the scientific support for management strategies or without discussion of the likelihood of competing risks.

IPNF personnel also pointed towards preventative practices such as the implementation of INFISH standards, which are meant to buffer and protect riparian

through the NEPA process, many projects with potential negative environmental effects never get formally proposed at all (Nie, 2006). According to IPNF interviewees, some alternatives or projects are taken off the table before the formal NEPA alternatives analysis even is begun.

areas and aquatic resources.⁷ One interviewee explained that these standards were an improved management approach compared to the use of baseline thresholds. Rather than focusing on a threshold of harm that cannot be crossed, s/he explained, something like INFISH is more prophylactic, emphasizing protection and improvement of the current condition of the resource. However, an environmental advocate expressed concern over the reliance on INFISH. S/he agreed it might prevent further harm but questioned whether the utilization of something like INFISH in current projects does anything to address past harms and cumulative impacts. Prophylactic standards alone do not help us deal with cumulative impacts, but only insure that the current situation will not get worse.

The continual improvement of BMPs, the use of strategies such as INFISH or the LCAS, which are meant to minimize further harm to resources, and the use of other Regional guidelines, such as the Northern Region's snag protocol, are at least positive steps towards limiting further cumulative impacts and are tools for supporting current CEAs. Frameworks and guidelines such as these not only work to minimize overall effects but also provide management strategies that guide project implementation, inform effects analysis, and emphasize habitat protection. Wildlife biologists on the IPNF all stated that these Regional protocols are helpful in guiding effects analysis and project

⁷ INFISH standards give increased protection to aquatic resources and riparian ecosystems and were developed by the USFS to guide management in the Inland Northwest. Guidelines and performance standards are provided for a variety of management activities including timber harvest, recreation, watershed restoration, etc. The idea behind INFISH is that in Riparian Habitat Conservation Areas, riparian-dependent resources are given priority over other activities, which are still allowed, but cannot degrade conditions. INFISH direction was incorporated into the IPNF's forest plan in 1995 as an amendment. The IPNF has on record more detail on INFISH. See: *Inland Native Fish Strategy Environmental Assessment: Decision Notice and Finding of No Significant Impact*. Idaho Panhandle National Forest, Coeur d'Alene, ID. 1995.

implementation and make project level planning and analysis much clearer in terms of what needs to be done.

IPNF staff also felt that Samson's (2006a) work provides a regional analysis that lends support to conclusions in CEAs for the wildlife species analyzed therein. They explained that while biologists still do a CEA for the project area, Samson's (2006a) work provides at least some degree of the kind of landscape-scale perspective needed to understand large-scale cumulative impacts. Regarding the necessity of forest-wide thresholds and larger-scale analyses, several staff pointed out that these were precisely the goals of Samson's work. His assessments do set some forest-wide thresholds and do take a Region-wide look at the viability of some species. However, although some district biologists and project leaders noted that this regional analysis provided credibility to their statements in public documentation, a number of staff questioned the validity of that work. Numerous interviewees felt that it should have been peer-reviewed in some way or done by someone outside of the management arm of the agency. And, interviewees both inside and outside of the agency, particularly those with graduate level academic training in the natural sciences, questioned the validity of Samson's work. In summary, the issue appears to be two-fold: Samson's analysis provides a basis for statements in EISs and is an internal agency assessment that project leaders and agency biologists can rely upon when challenged on their conclusions. Thus, it lends them some credibility with the public and with the courts. However, whether that analysis is actually credible or scientifically valid is a separate issue and one that is discussed in further detail in the next section.

Overall, the Region is slowly moving towards more large-scale assessments and the establishment of thresholds with studies such as Samson's (2006a, 2006b). The Region 1 terrestrial wildlife program is also working towards developing conservation assessments for some species. Other species benefit from species-specific management strategies, although the validity of these approaches is the subject of some debate. For instance, a number of interviewees, some who work with the USFS, indicated that the current goshawk strategy based on Reynolds et al. (1992) is both inapplicable to this ecosystem and also is not being implemented as it should be.⁸ Currently, researchers at the Rocky Mountain Research Station are engaged in a research program to collect population distribution data on the IPNF and build wildlife-habitat relationship models based on large samples of species occurrence and spatial data at multiple scales (Dr. Sam Cushman, *personal communication*). These models are hugely promising as a method for improving CEA for wildlife and are discussed in the final chapter in more detail as a way in which CEA will improve in the future.

A final but important issue to revisit is the fact that forest-wide analysis for species are necessary at some point to comply with NEPA but are also relevant for complying with the National Forest Management Act (NFMA). Environmental groups raise the issue in their project comments that a National Forest's obligations to ensure viability over the course of forest plan implementation require a periodic assessment of viability at the landscape level. The question is, if such an analysis is required as part of the agency's responsibilities under NFMA, where can it be found? If it is not to be found in project-level NEPA analysis, some sort of separate viability assessment would have to

⁸ Environmentalists and USFS personnel raised this issue in interviews; it is also alluded to in the comments accompanying the Mission Brush SFEIS (p. F-18).

be undertaken—presumably this is the goal of Samson’s (2006a) work, in which the USFS asserts that viability is not threatened for several sensitive species.

With regard to forest-wide impacts, in the interviews several environmental activists explained that their whole strategy, which has emphasized the issue of CEA, has been to prepare for the first round of forest plan revisions. They argue that a revised forest plan is supposed to consider the cumulative impacts of implementation of the first forest plan, and therefore must rely upon some kind of long-term assessment of cumulative impacts from management activities on a resource such as wildlife. After all, they explain, NFMA suggests that forest plans are to be revised, not replaced, every 10-15 years. This, according to environmental advocates, is the whole thrust of NFMA—write a plan, implement it, learn from it, and revise the plan based on monitoring information and an understanding of CEA. In other words, they see NFMA as fundamentally an adaptive approach to management of National Forests. However, there is by no means agreement on this topic—numerous personnel with the USFS argue that there is no basis for such an understanding of NFMA and that a revised plan should represent an entirely new and “forward-looking” vision.

This is a fundamental controversy about NFMA: Is planning supposed to involve learning from past management actions or is it about considering current conditions, looking towards desired conditions, and making a plan to get there? Can this latter process be done effectively without adequate learning, monitoring data, and cumulative effects analysis based on past actions? These questions are crucial as the USFS embarks on subsequent rounds of forest planning. Fundamentally, the question mirrors the central debate about CEA as to whether it is meant to paint a picture of how conditions have

changed over time or whether it is meant to focus on the incremental impacts of the decision at hand and whether any effects thresholds might be crossed. The fact is that failing to paint a picture of how management actions have affected resources, or at least how resource conditions have changed over time, misses the basic intention of both CEA under NEPA and forest plan implementation and revision under NFMA. The USFS simply cannot manage and work towards desired conditions effectively without understanding the current conditions of resources and how they compare to conditions in the past, factors that contributed to changes in resource conditions, and the effects of management actions based on high quality monitoring data. The problem is that developing this sort of perspective is daunting. In later sections of this and the next chapter, however, I look at some possible ways forward.

Analysis of non-federal lands

A final issue of interest with regard to past actions that must be addressed in CEA is how to include past or ongoing actions on private lands in the analysis. In the Northern Rockies, vast amounts of National Forest land are checkboarded with parcels of private land, much of which has been aggressively harvested and is slated for development in the future. Notably, on the IPNF in their CEA, private lands are explicitly considered as part of the analysis for various environmental resources.

In the case of the wildlife resource, private lands are not analyzed in detail but generally are assumed not to contribute to habitat for most species. Several interviewees suggested that this was a strength of the IPNF's approach to wildlife analysis because it takes a "worst-case scenario" stance towards private lands. In other words, by assuming

no habitat is available on private lands the USFS is under a greater obligation to provide that habitat on lands under its management. However, other interviewees, both from the IPNF and outside of the agency, questioned whether this approach to CEA for wildlife is ideal because it likely fails to paint an accurate picture of how activities on private lands affect wildlife populations. Without a more complete analysis of the synergistic effects of what is happening on both public and private land, the IPNF cannot accurately capture effects on wildlife populations. Given that the current approach of the IPNF for most species is to monitor habitat and ensure that minimum thresholds are not crossed (in the cases where thresholds have been established), changes in wildlife populations might well be missed if management on non-USFS lands is contributing to some cumulative effect. An exclusive focus on the lack of habitat on private lands also may overlook threats, such as invasive species, for example, from private lands and the possibility that private lands may serve as population sinks for species.

The challenge of obtaining accurate information about private or other non-federal lands is possibly even more salient for other resources. Several interviewees, both with the IPNF and from environmental groups, emphasized this as a serious challenge to CEA for water quality and hydrology. For those resources, the IPNF cannot as easily take a worst-case scenario approach to understanding the effects of non-USFS actions, because those actions may constrain how the USFS designs and implements a project. Because of Idaho state water quality standards or total maximum daily load restrictions under the Clean Water Act, activities on private or state lands must be taken into consideration by the IPNF during project design and implementation. In modeling how their own projects will affect water quality and whether thresholds will be crossed,

information on effects from other lands must be taken into account. Therefore, the USFS must try to capture an accurate picture of how non-USFS activities will affect water quality and incorporate these estimates into their models. IPNF personnel and environmental advocates both emphasized in interviews the importance of doing this and the challenges inherent in gaining the necessary information in order to do it well.

To date, courts have yet to consistently enforce the aspect of the CEA requirement that emphasizes consideration of non-federal lands. Law student Laura Hartt, writes, "In spite of NEPA's mandate to consider the cumulative effects of both federal and nonfederal activities, courts tend to excuse private land use from the analyses" (Hartt, 2002, p. 699). This aspect of CEA could prove enormously useful and powerful but has yet to be enforced and emphasized by the courts and federal agencies. Notably, there are some exceptions. In chapter two, I discussed two cases, *Resources Limited, Inc. v. Robertson* (1993) and *NRDC v. USFS* (2005), in which the Ninth Circuit required the agency to consider private land activities. In the latter case, the Tongass National Forest was required to revise its forest plan and take into account actions on private land. In another case, which involved a challenge to projects on the IPNF and Colville National Forests to respond to bark beetle outbreaks, the district court required the agency to include an analysis of logging projects on adjacent private and state lands.⁹ In this case, the proposed logging on those lands was extensive (one project proposed to log nearly 6 bbf) and would affect important habitat for threatened species; the large size and number of so many non-federal projects may have been what swayed the court in this case (Hartt, 2002). But in numerous other cases, both in the Ninth and other circuits, courts have

⁹ *Kettle Range Conservation Group v. USFS*, 148 F. Supp. 2d 1107 (E.D. Wash 2001).

been more reticent to force analysis of private lands beyond a cursory look by the agency (Hartt, 2002). Nonetheless, as private land divestment and development becomes more common, particularly in the West, consideration of the effects of these activities on public lands will only become more critical.

4.2 Issues with the Science Supporting Wildlife CEA

A major area of controversy over the IPNF's approach to wildlife CEA revolves around the scientific methods and analyses used in support of wildlife analysis by the USFS. For instance, there are serious limitations and controversies associated with the use of habitat-based analysis to assess species viability on National Forests. Environmentalists interviewed for this research and members of the outside scientific community agree that habitat-based analysis alone cannot suffice to meet the USFS' obligations to protect biodiversity on its lands (Adelman et al., 2001; Cushman & McKelvey, in press; Mills, 2007; Noon et al. 2003). Another issue that came up repeatedly in this research was a concern about the lack of validity and reliability of some of the science that the USFS uses to support their analyses. Scientists and other parties both inside and outside of the USFS question the quality of some of these scientific papers or meta-analyses and ask why the USFS does not utilize some form of peer-review to gain additional perspective and lend credibility to the methods it uses to analyze effects on wildlife species. Some observers also have concerns regarding the lack of a conservation biology based approach to land-use planning on National Forests. Environmental groups and many scientists emphasize the need for forest planning that involves more consideration of corridors, linkages, and large patches of habitat in order

to provide for species conservation (Alverson et al. 1994; Crumpacker, 1998; Noss, 2001; Ruggiero et al., 1994). These issues are discussed in the following section, which highlights a number of the problems and challenges associated with current approaches. The next chapter looks more closely at recommendations for improving current practice and considers some promising methods that will improve how species conservation planning takes place on public lands.

Habitat as a Proxy for Assessing Population Viability

One of the most contentious aspects of the way the IPNF analyzes effects on wildlife is the use of habitat as a way to assess species viability as opposed to the use of some kind of population monitoring data. Although according to the law in the Ninth Circuit the USFS does not have to monitor actual population trends, there are valid questions as to whether monitoring habitat alone actually insures the maintenance of viable populations on National Forests. Recall, that on the IPNF, the general approach to species protection and effects analysis is to assess changes to suitable habitat, utilize management protocols that are designed to guide management actions, and maintain the quality of current available homeranges when possible so as not to cause any further declines in population numbers. The primary methodologies used are habitat suitability models and individual home range analyses (see Andelman et al., 2001 and Mills, 2007 for a comprehensive overview of options for assessing population viability). For some species, management strategies, such as the Lynx Conservation and Assessment Strategy (LCAS) or guidelines, such as those from Reynolds et al. (1992) for goshawks, are available. These strategies focus on habitat or homerange analysis as well. For other

species region-wide assessments of viability have been conducted (Samson, 2006a).

Recall that Samson's work (2006a) finds that there are no threats to viability to several avian species based on widespread availability of habitat and the lack of any scientific information indicating species declines. In 2006, Samson also circulated a document he prepared assessing minimum habitat requirements for some species by forest, in essence, establishing a minimum habitat threshold to maintain population viability on individual forests (Samson, 2006b).

Despite these measures, comments from environmental advocacy groups express a fundamental frustration with the lack of population monitoring on forests in the region. In their comments on the Hidden Cedar project, environmental groups complain that Region-wide the USFS "has not monitored population trends in response to management activities as required by Forest Plans and NFMA" (Hidden Cedar SFEIS, Appendix E, p. 19). Public comment on the Mission Brush EIS from the same groups also emphasizes the need for population monitoring data and asserts, "The FS should firmly establish that the species that exist, or historically are believed to have been present in the analysis area, are still part of viable populations" (p. F-16). Comments in the Mission Brush EIS express concern that the IPNF has not determined minimum viable populations for any MIS species or specified the amount and distribution of habitat needed to maintain viable populations.¹⁰ They therefore question whether the IPNF is actually insuring that viable populations exist on the Forest.

¹⁰ The IPNF's forest plan sets a viability standard of maintaining greater than 40% of the maximum potential habitat for species. In no EIS was there an estimate of maximum potential habitat or a discussion of the 40% standard (USFS, 1987).

The IPNF's response to these concerns is that the Forest is not required to directly monitor populations. For example, in the Myrtle Creek EIS, in response to complaints that it has no population trend data for flammulated owls, the IPNF responds:

The District has in the past—and will continue to—survey suitable habitat near activity areas.... However, these surveys merely document presence, rather than abundance. Attempting to estimate population numbers and trends would be prohibitively expensive in that it would require intensive surveys over large areas for a number of years. Instead, the IPNF uses habitat as a proxy for population data of featured species. The Ninth Circuit Court has held that quantitative population data is not required by 36 CFR 219.19, and clearly sanctions the use of habitat analysis for those species for which population data could not be obtained (p. F-35).

Indeed, as discussed in chapter two, the Ninth Circuit has ruled that the USFS can use habitat as a proxy for population viability without measuring actual population numbers, although the USFS' habitat models and data must be reliable. However, despite the fact that the IPNF is not out of compliance with the law by not directly monitoring populations, the question remains as to whether a picture of habitat alone tells us anything reliable about the actual status of populations on a forest. One might argue that it is beyond the USFS's responsibility to do anything more than insure the presence of adequate habitat. USFS staff often explain that it is the agency's job to provide the "hotel space" for populations, but not its responsibility to make sure species are using that space; tracking populations is left to the states, or to the U.S. Fish and Wildlife Service in the case of species listed under the Endangered Species Act. Because of the Ninth Circuit's current position on this matter, the USFS, at least in this region, is able to focus on habitat alone. However, it would be difficult to argue that the presence of suitable habitat alone says much about the status of populations. As University of Montana biologist Scott Mills once pointed out in a conversation, there is abundant passenger pigeon habitat throughout the country, but, of course, not a single bird. Habitat

measurements alone tell us very little about the viability and presence of populations, especially for rare and declining species, and serve as a very weak proxy for ensuring that the USFS is meeting its obligations to protect biodiversity on its lands.

This problem is compounded by questions about the validity and reliability of USFS conservation assessments or forest plan standards, all of which are used in conjunction with habitat evaluations for species viability. Take, for example, the following statements, again from the coalition of several environmental groups' comments on the Hidden Cedar DEIS:

Since there is no scientific basis for assuming that 10% old growth is enough for species viability, and since there is no scientific basis to support the IPNF's use of its MIS as adequately 'indicating' for other species including the Sensitive wolverine, black-backed woodpecker, fisher, flammulated owl, etc., the proof would be in the monitoring. And nothing else shows that FS has completed or is committed to the monitoring that would insure old-growth species' viability (Hidden Cedar SFEIS, Appendix E, p. 19).

In addition to relying upon a habitat-based assessment of population status, the USFS' current approach also depends on the efficacy of management guidelines used for individual species or for structural components such as snag habitat, the utility of MISs to act as surrogates for other species, and standards such as the IPNF forest plan's 10% standard for old-growth. If the validity and reliability of these tools, which form the basis for proxy-on-proxy analysis of wildlife viability, are in question, the entire method of providing for viable populations rests on a particularly shaky foundation. In light of these concerns, the environmental groups make the excellent point that some degree of population monitoring would be a way to insure that habitat modeling is accurate and reliable.

The fact is that the scientific foundation of the proxy-on-proxy method is extremely weak. Using vegetative mapping as a proxy for species presence is, as Noon et

al. (2008) put it, “at least two steps removed from reality” (p. 57). The method of using habitat as a proxy for populations depends on several key assumptions, including the following: 1) habitat is a useful indicator of population status, 2) the way that habitat is designated, for instance based on vegetative community types from TSMRS data, is an accurate proxy for the habitat requirements of species, and 3) the habitat needs of species are well known (Cushman and McKelvey, in press; Noon et al., 2008). Unfortunately, the empirical support in this area is very limited. As Noon et al. (2008) write, “Given the ubiquity of...these assumptions, it is surprising how few formal tests have been conducted. Most of the widely used habitat relationship models, for example, are heuristic rather than quantitative” (p. 57). The models that are in use by land use planning agencies such as the USFS are rarely grounded in strong empirical data, such as large samples of species occurrence coupled with environmental data at multiple scales, which would give an indication of the habitat requirements of species. Because of these serious gaps in the knowledge about wildlife-habitat relationships, in their discussion of coarse-filter, habitat-based approaches to species conservation, Noon et al. (2008) conclude, “[T]he efficacy of these approaches is *entirely unknown*” (p. 57, emphasis added).¹¹

To make matters worse, there is also very little empirical support that the use of indicator species, such as MIS or other surrogates, is effective. The point of using

¹¹ Various scientists distinguish between coarse-filter and fine-filter approaches to species conservation. For example, as Cushman and McKelvey (in press) define it, coarse filter approaches are those in which “a few macro-characteristics, such as some broadly defined ecological community types, ...provide sufficient information to infer the dynamics of the species and processes that act within them.” Some authors consider the monitoring of surrogate species as a fine-filter approach, and Noon et al. (2008) use that terminology to refer to any approach that focuses on populations of individual species.

surrogates is to save time and money—to somehow make the gigantic task of protecting biodiversity manageable by tracking a few representative species. With regard to the approach, however, Cushman and McKelvey (in press), both ecologists from the research arm of the Forest Service, write, “Tests have been few, but when done, the results are seldom encouraging.” They conclude that, based on the limited research that has been done to test the approach, the concept of surrogacy is unlikely to hold true in many cases and the utility of the approach “must be demonstrated rather than assumed” (Cushman and McKelvey, in press). Noon et al. (2008) posit that some kind of surrogate or at least focal species approach will be necessary in public lands conservation planning, simply because the resources are not available to monitor all species directly. However, because there have been so few studies evaluating the efficacy of this approach, any management strategy will have to be coupled with a rigorous monitoring program to evaluate outcomes.

The USFS’ current methodologies for approaching species conservation were discussed in a 2001 report that was commissioned by the Forest Service to look at how to improve biodiversity protection and wildlife viability analysis on National Forest lands (Andelman et al., 2001). In that report, the authors note that habitat suitability modeling allows for some quantitative assessment of the effects of management alternatives. However, they also note that because such models are built upon a number of expert-opinion based parameters, the role professional judgment and degree of scientific uncertainty are often disguised by the quantitative and seemingly objective outputs of models. Furthermore, these models are limited by the lack of detailed information on the habitat requirements of species, inaccurate maps of the landscape, or limitations in the

mapping of specific habitat attributes (Andelman et al., 2001). Similar challenges exist with home-range analysis. The authors explain that one advantage is that home-range analysis “allows evaluation of management alternatives in terms of expected responses in population size” (p. 69). However, it is plagued by the same problems as habitat suitability modeling and fails to capture effects at the landscape and population levels.

In a discussion regarding an early version of the most recent planning rules, which emphasize increased reliance on coarse-filter strategies for wildlife conservation planning, Noon et al. (2003) explain that “coarse-filter” approaches, such as maintaining broad assemblages of vegetative communities, are inadequate for protecting biodiversity. Such strategies, they write, assume that coarse-filter approaches can protect constituent species and that more fine-filter species-level assessments are too difficult or costly to do. They write, “These assumptions are not only counter to current understanding of the role and dynamics of species in sustaining ecosystem processes, they also negate the nature and appropriate role for population viability analyses in land-use planning” (Noon et al., 2003, p. 1218, internal citations omitted). Noon et al. (2003) explain that when planning efforts for species protection focus on broad assemblages of vegetative communities, as opposed to a species-specific approach, commission errors are more frequent than omission errors. In other words, “[C]oarse-filter assessments often overestimate the presence and, presumably, the viability of species on the planning landscape” (Noon et al., 2003, p. 1218). They conclude that what is needed for better wildlife conservation planning on National Forest lands is the use of more fine-filter approaches; the authors also point out that this is precisely what was recommended by the second Committee of Scientists, convened in 1997 to provide guidance for rewriting the USFS’ planning

regulations (see Committee of Scientists, 1999; this history is discussed in more detail in the following chapter).

Given these questions from the scientific community as to whether habitat alone can serve as an indicator of populations status, and the fact that this issue has been raised by environmental groups in litigation and appeals repeatedly, I took up this matter with numerous interviewees from the USFS to get a sense of how they perceive this issue. Biologists indicated that internally in the agency there is constant debate over how to meet the requirement to maintain viability of species. Despite what appears to be the official policy, at least in this Region, that the USFS is only required to maintain habitat, one biologist stated that there is ongoing internal disagreement over the question of whether the agency is supposed to be managing for populations or just habitat. Several interviewees felt that population monitoring was something to be left to the research branch of the USFS or to the U.S. Fish and Wildlife Service. For an anadromous fish species, for example, one interviewee explained that the most that could be expected of the USFS would be to protect and provide habitat on its lands; the challenge and responsibility of assessing and ensuring population viability is a bigger responsibility than the USFS alone can manage. In situations such as this, management guidelines that have been developed as part of a broader assessment of viability and species are helpful in guiding actions on USFS lands.

A number of biologists with the IPNF and at the Regional level expressed concerns over the validity of using habitat alone to estimate species viability. Interviewees repeatedly noted that what is most needed are *clearer wildlife-habitat relationship models* so that at the very least the habitat-based approach is grounded in a

good understanding of the habitat requirements of various species. Interviewees also expressed concern as to whether current vegetation models serve as an accurate tool for assessing habitat availability. When asked about the quality of the TSMRS database, one biologist stated, “I have less trust in it because it was designed to be a timber stand model and not a wildlife database.... It can be frustrating to use that exclusively, so now we try to do more field work—to verify conditions.” Unfortunately, the time and personnel are not often available to do the necessary field work. S/he went on to say that it would be highly useful to have a database that was specifically designed to assess habitat availability—such information would focus on different landscape characteristics relevant for wildlife species. Some environmentalists I spoke with expressed the same concern about the habitat modeling tools such as the TSMRS used for wildlife analysis and considered this a critical institutional limitation of an agency originally designed to focus on timber management. Despite the fact that the agency’s mandate has broadened considerably, institutional factors such as the design and availability of databases can limit their ability to effectively manage for resources such as biodiversity.

As discussed earlier, another primary concern I heard from environmental advocates was that the USFS simply does not have a clear sense of how past actions have affected population numbers of habitat availability, except through the coarse lens of stand composition. Furthermore, they explained that for many species no clear threshold has been established as to when a serious threat to viability might occur. On the IPNF the only thresholds available are for changes to individual homeranges, which do not address overall viability, minimum amounts of habitat necessary for a viable population according to Samson’s work, the 10% old-growth standard from the IPNF’s forest plan,

and the 40% standard from the forest plan, which does not seem to be currently guiding management.

In summary, members of the scientific community have recommended that the USFS employ more fine-filter assessments to meet its obligations to protect biodiversity and species viability. The current planning rules, however, eliminate the viability language and rely largely on a coarse-filter approach to species protection.¹² If relied on exclusively, habitat-based methods for assessing population viability have serious limitations. Without monitoring population trends for at least some species, such as indicator, focal, or at-risk species, it is difficult to know, based off of habitat suitability models, the actual status of populations. Habitat suitability models themselves are limited by knowledge and data gaps, although the extent of these data gaps and the role of expert opinion in filling in the details are often disguised by what appears to be a clear quantitative estimate of habitat availability. In the final chapter of this manuscript, I take a closer look at what the USFS could and should be doing to effectively plan for biodiversity conservation.

Validity and credibility of USFS management guidelines

One of the biggest challenges for the USFS is assessing viability at the landscape or population scale. At present, this has either been handled as part of a large-scale conservation and management assessments, as was done for lynx, has not been done at all, in the case of species like fisher and marten, or has been addressed in recent work on species viability for several avian species (Samson, 2006a). Samson (2006a) found that

¹² 36 C.F.R. §219 (2008).

viability is not currently threatened for the species he analyzed. This work provides something of a safety net for project-level analyses, in which biologists can assert that there presently are no threats to the viability for several sensitive species. An important question, however, is whether this work by Samson (2006a) is reliable. Tear et al. (2005) explain that the data gaps with regard to our understanding of most species are extensive and that establishing minimum thresholds for viability is hugely difficult. They write that for the majority of species and ecosystems, there is not enough information available to determine minimum thresholds. We could assume, based on these statements, that Samson's work may be based on a significant amount of scientific uncertainty and expert judgment in identifying minimum habitat thresholds.

An important issue to consider then is whether work such as Samson (2006a, 2006b), which is being relied upon in part by the IPNF for wildlife CEA, is up to snuff, as one interviewee put it. Environmental advocates and several USFS personnel I spoke with argue that there are serious questions about whether Samson's work is a reliable tool for addressing viability issues. One of the primary complaints about Samson's regional viability assessment is, as an objection letter to the Myrtle Creek project states, "The Samson [2006a] study is not peer-reviewed to validate its purported claims that species such as black-backed woodpeckers and northern goshawks remain viable after a century of major habitat alteration occurring post-European settlement" (Myrtle Creek FEIS, Appendix A, p. 141). The objectors assert that reliance upon Samson is not utilizing best available science and would like to see some review of the science therein to assess whether the approaches used and the conclusions are valid and reliable.

In response to these criticisms, the IPNF points out:

Samson [2006a] is a broad level analysis designed to aid in placing a species in context at the larger population level and addressing NFMA requirements, and was based on numerous peer-reviewed studies. The objectors have cited no published studies (peer-reviewed or otherwise) that directly or specifically dispute the findings in Samson [2006a]. As a result, the USFS considers this paper the “best available science” with regard to Region-and Forest-wide viability analyses of Northern goshawk, black-backed woodpecker, flammulated owl and pileated woodpecker (Myrtle Creek FEIS, Appendix A, p. 141).

The USFS may not be incorrect that Samson’s work is the best assessment of habitat-based viability available. However, the question of whether it deserves the weight afforded to it in project level analyses is another matter. One interviewee explained that there is serious internal debate among biologists about the models relied upon by Samson. Another stated that Samson’s work at best “is a very blunt tool”, in part s/he explained because it relies entirely on assessments of habitat availability and estimates minimum habitat thresholds based on a very generalized dispersal algorithm. In other words, the environmental groups are not alone in questioning Samson’s work. A number of biologists I interviewed with both the administrative and research arms of the agency were skeptical that the work would survive any kind of peer-review from outside scientists.

The obvious next question then, is whether the agency should seek out some kind of peer-review on work such as Samson’s that provides a foundation for wildlife analyses. As one interviewee with the USFS put it, there is no doubt that such work *should* be peer-reviewed if it is going to be assigned so much weight in project-level analyses, but there is nothing in the law that *requires* such action. In other words, in the absence of quality scientific information on, say, the status of a species, the agency can put together some sort of assessment that may have almost no scientific basis or validity,

call it the best available science, and use that “science” to justify what is essentially high-risk behavior in the face of almost complete scientific uncertainty.

This said, before advocating for peer-review of agency science, it is critical to step back for a moment to consider the body of academic literature on this topic. The issue of peer-review in natural resource management is not uncomplicated. A number of authors have explained that peer-review, as it is used in the scientific community to review papers for publication, cannot simply be exported to the context of natural resource or environmental decision-making (Doremus & Tarlock, 2005; Jasanoff, 1990; Shapiro, 2006). Traditionally, peer-review serves to ensure that submitted scientific papers are done according to accepted methods within a field of scientific study and to assess whether the paper will make a valuable contribution to the field. However, peer-review in the natural resource management context can be used as a subtle but effective political tool. As an example of this, consider recent efforts by the Bush Administration to institute a peer-review process to evaluate the scientific basis of federal agency decisions (Michaels, 2006; Shapiro, 2006). The proposed approach would have controlled the type of scientific information reviewed and the membership of review panels and was nothing less than a way to capitalize on the pervasive presence of scientific uncertainty in policy decisions to promote more industry-friendly decisions in the name of “sound-science” (Shapiro, 2006).

A classic example in the natural resource management context is the National Research Council (NRC) review of the U.S. Fish and Wildlife Service’s decision regarding water levels required to support two endangered fish in the Klamath Basin. Rather than directly attack the science behind the Service’s controversial decision,

Secretary of the Interior Gale Norton requested a scientific review by the NRC, which concluded that there was not indisputable scientific support for the Service's decision regarding necessary water levels (Doremus & Tarlock, 2003). However, the NRC did not conclude that the decision was unreasonable or without *any* support given the science, but rather that the decision was precautionary and not based on clear, irrefutable science (Ruhl, 2004; Doremus & Tarlock, 2003). The NRC review had the effect, however, of undermining the Service's position and credibility with the public, even though the committee did not conclude that its actions were contrary to law or were unreasonable given the level of scientific uncertainty involved.

The role of peer-review in natural resource management must be considered carefully because of the potential for the process to be politicized. Most natural resource decisions are made in cases where scientific uncertainty is a significant complicating factor. Inevitably, as a result of the presence of uncertainty, management agencies when making decisions operate in the spaces in between what are science-based and what are political and value-based decisions. Wendy Wagner, an authority on the challenges of decision-making at the science-policy interface, has written that agencies inevitably zigzag between what are scientific and what are science-policy decisions (Wagner, 2003). She writes, "Since the zigzag nature of science and science policy makes it easy to blur the respective roles of science and policy in regulatory decisionmaking, [various] political checks and balances can be lost or at least impeded by the complex interweaving of technical and value decisions" (Wagner, 2003, p. 66). As a result of this zigzagging, important political and value-based decisions may not be made transparently and may not

be overseen by the appropriate political institutions, such as the courts or Congress, for handling such matters.

With these factors in mind, it is worth asking whether some of the management strategies or scientific assessments that are utilized as part of wildlife viability analyses for a number of sensitive species throughout Region 1, should have been peer-reviewed, at the least by someone outside of the management arm of the USFS. Despite the reasons to be careful about when to use peer-review, it would be useful to subject something like Samson's work out for some type of external review. This is precisely the type of situation where peer-review could be used in a way that is analogous to how it has often been used in the scientific community—to evaluate the methods utilized in a scientific paper and to ensure that the methods are consistent with current scientific knowledge and practice. I would not advocate that peer-review be used as a tool to evaluate natural resource management decisions in all or even many cases. But a situation such as this, where peer-review might lend credibility and suggest ways to improve the scientific basis of analyses used to support wildlife viability analysis, would be an ideal situation for some kind of outside review. As Doremus and Tarlock (2005) have argued, peer-review of individual management decisions may not add much value, but review of larger management programs and the scientific basis of decisions by some sort of committee can increase transparency and accountability, spur learning and necessary research, and help to identify areas where data or knowledge gaps could or need to be filled. Particularly in this case, where analyses are being used as the basis for many decisions, and where the issue at hand, wildlife protection, is highly controversial, peer-review would be a useful next step.

This issue is an important topic of discussion inside and outside of the agency. One interviewee on the IPNF said that s/he agreed that a regional assessment is needed to consider something like viability of a wide-ranging species but explained that such an assessment clearly should have been done by someone outside of the USFS rather than someone internal. Another agency biologist stated that s/he had been lobbying for peer-review of work like Samson's by non-federal scientists. S/he explained that some analyses are worked on or reviewed by a group of authors, but they are often still internal to the management side of the agency. Outside review, s/he explained, would lend some credibility to the work. I asked another interviewee at the Regional level, why not send out work like Samson's for some kind of peer-review, even from USFS research? Their response was that such an action is not required by law. While this is true, an agency that suffers from a lack of public trust and is belabored with appeals and litigation has good reason to seek ways to lend credibility to their work and build trust with the public.

In comments on a recent project on the Kootenai National Forest, which neighbors the IPNF, comments from the WildWest cite to an article from a scientist from the agency's research arm to emphasize their point that a number of the conservation strategies and assessments in use by the IPNF would benefit from some kind of independent review. They write:

The DEIS relies upon unpublished references such as those from Forest Service biologists Samson and Johnson to claim that it is utilizing effective conservation strategies that will maintain viable populations of wildlife.... However, none of those methodologies have been subject to independent scientific peer review.... These sources...are not from the independent research arm of the agency (Juel, Young Dodge comments p. 21).

They go on to cite comments by USFS research scientist Ruggiero (2007) who writes, "Independence and objectivity are key ingredients of scientific credibility,

especially in research organizations that are part of a natural resource management agency like the Forest Service. Credibility, in turn, is essential to the utility of scientific information in socio-political processes” (Ruggiero, 2007, p. 1). Ruggiero (2007) goes on to explain that scientific processes should be kept separate from political process and policy choices, which are inevitably made in USFS management. He writes, “Science should not be influenced by managers, and scientists should not establish policy. This logic keeps scientific research ‘independent’ while ensuring that policy makers are free to consider factors other than scientific understanding” (Ruggiero, 2007, p. 2).

The management arm of the USFS is directly influenced by political pressure and makes policy choices every day as it weighs the competing concerns of members of the public and its obligations to manage the land for multiple uses with a limited budget. Scientific assessments from the management arm of the agency are viewed with the suspicion that those assessments might be influenced by political or administrative factors that have little to do with science. Given the potential conflicts of interest involved, it would lend a great deal of credibility to USFS scientific assessments and reports if those reports were peer-reviewed by scientists who do not work with the management arm of the USFS. It is difficult to fathom how the USFS justifies this lack of review, given that they are free to use any scientific assessments as soon as they are available, even while some sort of peer-review is underway. Their failure to do so makes it appear as if the agency is trying shield itself from criticism and utilize assessments that are not grounded in good science. Although it is hard to imagine how to justify a lack of outside review if the agency is committed to resource stewardship, given the political pressures on the agency it is not at all hard to understand why the USFS fails to seek out

peer-review of management strategies for wildlife, a highly controversial management issue, that allow them to continue with business as usual.

The issue of peer-review and reliability also are relevant in terms of the reliability of BMPs, strategies like INFISH, and management protocols like the Northern Region's Snag Protocols. Regional snag retention guidelines are used, for example, in the Mission Brush EIS as part of the effects analysis for fisher and pileated woodpeckers in order to guarantee that sufficient snag habitat would remain under certain alternatives (Mission Brush SFEIS, pp. 2-67 and 2-68). Comments on the West Gold EIS, which also relies in part of the use of the Northern Region Snag protocol, express concerns that the protocol "has not been subject to independent scientific peer review and validation from post-implementation monitoring" (p. J-58). The USFS's response is that the protocol is an optional strategy in use by the forest. However, the issue remains that without outside review of some kind or post-implementation monitoring to verify both that the protocol was implemented and that its assumptions are accurate, it is difficult to know how reliable strategies such as this are for limiting project effects on species. The fact that the protocol is an optional strategy may explain why it has not undergone NEPA review as a formal plan amendment. However, the protocol is used in part to support effects analyses, and therefore its validity as a habitat-protection strategy is a serious issue. The uncertainties associated with these management strategies are again a primary reason why the environmental community argues that project areas be surveyed for species presence post-implementation in order to assess whether those species are using the area as predicted.

One area of the analysis in terms of data quality that seems to have improved in recent years is the field verification of suitability estimates based on TSMRS data. Recall from *Lands Council* (2004) that the court was dissatisfied with TSMRS data because it was outdated and unable to model or account for particular habitat characteristics, such as the amount of coarse woody debris.¹³ Since that decision, wildlife CEAs indicate that some kind of field verification of suitable habitat is being done.¹⁴ However, the issue of whether habitat suitability estimates based on TSMRS data are accurate has not been put to rest. A comment in the Mission Brush SFEIS states, “The SDEIS does not indicate the degree of accuracy of the databases discussed in the SDEIS and relied on for these analysis” (p. F-23). The commenters cite the IPNF’s monitoring report from 2000, which discussed the limitations of habitat models based on TSMRS data. That report states, “The data are, on average, 15 years old.; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material” (USDA 2000, p. 39). This information was part of the reason the TSMRS data was deemed unreliable by the court in *Lands Council*.

In their response to the comments on the Mission Brush EIS, the IPNF writes that the TSMRS data is only a starting point for the analysis and that field reviews and aerial photo interpretation are now used to update and verify the information. The Hidden Cedar EIS also states that the existing conditions and suitable habitat estimates are field reviewed in order to ensure their accuracy. Furthermore, explains the EIS, habitat

¹³ Over the course of several years, prior to the Iron Honey decision, the IPNF invested approximately \$300,000 to update its TSMRS data. Forest silviculturalist Art Zach explained that the purpose of this investment was to update the database in light of possible changes due to natural disturbance and also to update information on the presence of old-growth stands.

¹⁴ Field-verifications of habitat availability predictions also were done for projects before the Iron Honey decision.

suitability analysis and methodologies are based on parameters in the scientific literature, with adjustments made according to the professional judgment of IPNF biologists to add accuracy to the analyses. The question remains, however, of how accurate these estimates are.

The role of conservation biology in forest planning

A final important issue with regard to the approach to wildlife viability analysis involves what some commentators view as an increased need for a conservation biology-based approach to land use planning. The lack of application of principles from conservation biology is an important and long-standing criticism of the USFS' approach to forest planning. One of the most well-known cases with regard to forest planning, *Sierra Club v. Marita* (1995), involved a challenge by plaintiffs that the USFS should have applied principles of conservation biology in their planning process on the Chequamegon-Nicolet National Forest in Wisconsin and provides a useful starting point for understanding this issue.

In the first forest plan for the Chequamegon-Nicolet, in planning for biodiversity protection the Forest Service chose to classify habitat for patches of land based on timber inventories. This process, according to the USFS, met the requirements under NFMA for planning for and protecting biodiversity. The Sierra Club asserted that the fragmented habitat that would result from the Forest Service's approach would not adequately protect biodiversity, and that instead, the USFS should have applied principles of conservation biology, particularly island biogeography, which emphasizes the size of habitat patches and their interconnectedness. In their book *Wild Forests*, a group of conservation

biologists who were involved in the case explain that conservation biology was the better method for protecting old-growth species, which require large habitat patches and would be left unprotected by the USFS's planning methodology (Alverson et al., 1994).

Although the court agreed with plaintiffs that the principles of conservation biology represented sound ecological theory, it found that the USFS is entitled to utilize its preferred scientific methodologies, unless those methodologies have no scientific basis. The court argued that it was not their role under NFMA to assess the quality of the scientific basis of the USFS' decision, except to ensure that it did not violate the arbitrary and capricious standard under the Administrative Procedures Act of 1946. Despite the fact that the USFS did not utilize principles of conservation biology in any alternative in its planning process, and also did not disclose the significant disagreements over the issue in their EIS, the court ruled in favor of the agency. The case has been cited as an example of considerable deference to the agency's choice of scientific methodologies in light of requirements under both NFMA and NEPA (see Schultz, 2008, for more in-depth analysis; see also Clarke, 2006; Kleiss, 2002/2003; King, 1995).

There is little in the way of legal requirements that would force the USFS to take a particular approach to land-use planning. Although forest planning regulations require the agency to "consider" the best available science and NEPA requires the use of "high quality" science, the USFS still has the discretion to choose which methodologies to apply as long as those methodologies have some basis in science.¹⁵ Even if another approach represented the best current scientific thinking, the USFS would not be required to utilize that science. Despite this, some members of the public and of the scientific

¹⁵36 C.F.R. §219.11 (2008); 40 C.F.R. §1500.1 (2008).

community continue to advocate for more of a conservation biology-based approach to land use planning. Supporters of this approach argue that edge effects, patch size, connectivity, and forest fragmentation must be considered on the landscape scale as part of planning for biodiversity protection.

The primary area in which this concern is raised in comments on the IPNF's projects is with regard to old-growth habitat. For example, in comments on the Hidden Cedar draft EIS, representatives of the environmental groups write that the USFS must somehow account for the effects of forest fragmentation, road building, and past logging on old-growth habitat as part of their CEA. They explain, "Cumulative effects on old-growth habitat and on old-growth associated species include increased fragmentation, reduced older forest patch sizes, increased high-contrast edge, reduced availability of interior habitat, and decreased forested connectivity" (Hidden Cedar SFEIS, Appendix E, p. 21). In essence, the commenters suggest that a picture of long-term and cumulative effects to species with regard to several landscape characteristics emphasized by conservation biologists be addressed as part of the CEA. In response, the IPNF notes that its analysis of the effects of private land harvest on old-growth does include a discussion of edge effects. Patch size is also analyzed for some species, such as the pileated woodpecker, for which patch size of habitat is used as part of the home range analysis. It also notes that the current project will not increase edge effects or decrease patch sizes in old-growth habitat.

It is also worth noting that the Hidden Cedar SFEIS analyzes some general habitat characteristics as part of its wildlife analysis. For example, unlike the other EISs reviewed, the Hidden Cedar SFEIS includes a section on "Connectivity" in its wildlife

analysis chapter. That section explains that maintaining connectivity was one factor that influenced the design of the project. The section notes that proposed actions should not affect any likely movement corridors for species. Road construction and the location of harvest units were chosen to minimize effects to saddles, ridges, and riparian areas. The section does explain, however, as part of its CEA, that “harvest on non-NFS land would continue to impact the potential for movement in and through the wildlife analysis area. The magnitude and extent of this impact would vary depending on the harvest method and prescription” (p. 323). The analysis concludes that the current project and foreseeable activities on non-USFS lands should not create any additional impediments to wildlife movement. The IPNF explains, “Given the relatively limited scope of the proposed actions in the alternatives, design features of all alternatives and the conscious desire to minimize impacts through alternative design, it is unlikely that any alternative would have unacceptable, irreversible and irrevocable adverse impacts on connectivity” (p. 324). Although it is admirable that in this EIS the IPNF is trying to address the issue of connectivity, the analysis is not particularly useful for understanding actual effects to species and does little to present a picture of how connectivity has changed over time as a result of multiple actions or long-term management on both USFS and non-USFS lands. In this way, this type of analysis is not unlike the IPNF’s general approach for CEA. The existing condition is used to represent the cumulative effects of past actions.

In their response to comments in the Hidden Cedar SFEIS on the issue of past harvest-related fragmentation, the IPNF says, “Past logging has been considered and is a part of the existing condition and its effects are at the very least implied when displaying the amount of seed/sapling structure and/or the amount of suitable habitat for any given

species” (Appendix E, p. 29). The CEA for the project focuses almost entirely on the incremental effect of the planned action, which should have minimal impacts because of project design. The incremental impact of this project is added to past effects in the sense that it is the added impact to the existing condition. But without some clear reference point to compare to, it is difficult to understand how something like connectivity or fragmentation has changed over time or what this might mean for species viability. In other words, a long-term picture of change to something like connectivity, particularly on a landscape level, remains elusive in this type of analysis.

At the least, however, the IPNF can claim that any additional impacts have been minimized. It is also important to note that in this analysis, the IPNF has gone beyond obvious legal requirements to try to address a broad characteristic of habitat such as connectivity. Such a characteristic is no doubt difficult to analyze, given the varied needs of different species. It also is not difficult to understand why providing a long-term picture of changes to habitat connectivity would be a challenging task. At the least, the IPNF is taking a stab at addressing a few large-scale habitat characteristics, despite the lack of any clear legal obligation to do so.

An interesting question is how conservation biology might play more of a role in future public land planning efforts. Suggestions that lessons from conservation biology be applied to forest planning have been heard from the scientific community for many years. For example, in their article on viability planning on USFS lands, Ruggiero et al. (1994) offer some general rules of thumb for land-use planning: maintain corridors, insure that suitable habitat patches are within the dispersal capabilities of target species, and maintain relatively large patches of habitat, particular for the benefit of interior forest

species. In a similar vein, Crumpacker (1998) writes, “[C]ompelling scientific evidence from conservation biology argues that failure to apply some sort of ecosystem management-type of approach to the remaining natural and seminatural parts of the U.S. landscape will result in the continued loss of natural biodiversity” (p. 66). He advocates for the application of conservation biology principles from Noss and Cooperrider (1994), including the design of “regional reserve networks”, of land-management patterns that consist of core areas from wildlife, surrounded by buffer zones, and connected by corridors. Noss (2001) also has argued that a conservation biology approach to land-use planning will be an important aspect of forest management for protecting biodiversity especially during a time of rapid climate change.

It is clear that, according to the most widely accepted current scientific thinking, the use of principles of conservation biology as part of land-use planning is one key part of an effective strategy for biodiversity protection on public lands (for more on the legal and policy challenges of doing this, see Keiter, 2001/2002). The most obvious place to look for the incorporation of some of these principles in forest management would be in forest or regional plans. An interesting area for future study would be to consider how principles from conservation biology have been incorporated into more recently revised forest plans or into large-scale planning efforts by the USFS, including the recently revised Tongass National Forest plan, the Sierra Nevada Framework, or the Northwest Forest Plan. Land-management planning on this scale would have to be coupled with more fine-filter viability analysis but would be an important way at the forest planning level to address biodiversity protection.

In terms of CEA, it is still unclear when a forest such as the IPNF provides a picture of changes over time to factors such as patch size and connectivity. It is not clear that such an analysis is legally required, but it would provide considerable insight into the changes to habitat for a number of species. This kind of analysis could be particularly important for species that require interior, old-growth habitat and that are especially affected by edge effects (Alverson et al., 1994). Furthermore, current estimates of old-growth on the IPNF are given in terms of percentages of old-growth forest-wide, and not in terms of old-growth forest types or patch sizes. Significant cumulative changes in old-growth habitat types for specific species availability may be masked by general estimates of old-growth habitat availability. A picture of changes to the quality and quantity of habitat availability could shed some light on possible threats to viability, especially for species for which population trends are unknown. At present, as with many other aspects of CEA, the IPNF's approach appears to be to prevent further degradation to habitat characteristics. However, the challenges of presenting a picture of how landscapes have changed over time, in terms of broad-scale habitat connectivity and fragmentation, or planning with these factors in mind, have yet to be met.

4.3 CEA: A Window into the Challenges of NEPA Implementation

Several of the emergent themes and lessons learned from this research relate to some broader issues associated with NEPA and synoptic planning in general. The most prevalent issues are the limitations of predictive analysis and planning and the role of NEPA as a limited venue for resolving conflict around persistent challenges in forest management, including many issues already discussed with regard to how CEA is

practiced. As we have seen, challenges to agency CEAs are a constant critique in current comment letters, appeals, and litigation directed at the IPNF. One reason for this is that CEA is a very broad requirement and serves as a sort of umbrella for some of the most persistent challenges in forest management and environmental analysis. The NEPA process, and discussions about CEA as a part of that process, serve as the most readily available venue for raising these issues. This section revisits the general approach of NEPA and the role of the NEPA process as a venue for conflict resolution in forest management.

It then turns to a consistent critique of NEPA: the limitations of ex ante analysis and prediction, especially when they are not accompanied by consistent monitoring, mitigation, and some form of adaptive management. When asked about the challenges of implementing the CEA requirement, many interviewees discussed the need for increased monitoring and learning in order to effectively analyze long-term effects. These shortcomings in terms of CEA reflect some of the most critical and often-discussed issues regarding the current state of NEPA implementation. In this way, looking at how these issues are relevant to CEA provides an opportunity to look at some of the most important issues germane to a discussion on how to improve NEPA implementation overall.

NEPA as an Imperfect Venue for Conflict Resolution

Through its public involvement mechanisms NEPA provides a venue for conflict resolution in natural resource management. However, the precise role of public participation under NEPA and in forest management in general is not entirely clear. Those familiar with forest policy and history will recall that the NFMA was passed

largely as a result of two high profile conflicts. The first was the controversial nature of forest management on the Bitterroot National Forest and the other involved the issue of clearcutting, which came to a head when a federal appellate court deemed the practice illegal in a case involving the Monongahela National Forest.¹⁶ In both the Monongahela and the Bitterroot controversies, the public wanted more say in forest management and in how the agency's multiple-use mandate was implemented. In a report on the state of forest management prepared by the University of Montana's College of Forestry Dean Arnold Bolle, who was commissioned by Congress to investigate the situation on the Bitterroot, Bolle concluded that multiple-use as a principle was not a reality on the Bitterroot and that more opportunities were needed for public participation in National Forest management (Bolle et al., 1970).

The solution to this problem was NFMA. Although the USFS had been completing forest planning less formally before the passage of NFMA, the Act made forest planning a formal and legally-binding activity. However, some argued that a lack of planning was not the real issue in forest management and that the NFMA planning process was a solution to a non-existent problem (Behan, 1990). Instead, the persistent challenge in forest management seemed to have much more to do with lack of clarity from Congress as to how to prioritize multiple uses on National Forest lands and a lack of opportunities for the public to have a say in forest management. However, aside from the inclusion of increased substantive management standards, the NFMA's main thrust was to emphasize a synoptic planning process for National Forest lands with a less-than-clear role for the public in that process.

¹⁶ *West Virginia Division of Izaak Walton League of America, Inc. v. Butz*, 522 F.2d 945 (4th Cir. 1975).

The NFMA does call for public participation in forest planning, and thus far that has occurred primarily through NEPA compliance during the forest planning process.¹⁷ Unfortunately, NEPA is also an imperfect vehicle for public participation in forest management. Recall from chapter one that there is no single intent or paradigm that alone adequately characterizes NEPA. The act is often portrayed as having the twin aims of 1) leading agencies towards more informed decisions with regard to the environmental effects of actions, and 2) informing and involving the public in those decisions.¹⁸ These two aims are not necessarily compatible, and, in fact, according to law professor Jonathon Poisner, give NEPA a sort of split personality (Poisner, 1996). The first goal is primarily expert-driven, while the second focuses more on the public and its social and value-based preferences.

Also important to note is the act's emphasis on expert-driven planning according to a synoptic planning model, whereby decision-makers identify a goal for an action, alternative means of reaching the goal, and the effectiveness of each alternative, and then choose the most ideal course of action. As Poisner (1996) explains, the first step of the synoptic model, specifying the goal, is problematic with regard to environmental management under a multiple-use mandate. Goal-setting in such a situation is necessarily a social process of balancing various competing values, such as the derivation of utilitarian and economic benefits from natural resources and the protection of environmental values and amenities. Poisner (1996) argues that goal-setting in a democratic society should not be controlled by natural resource specialists, who are not experts in choosing among values or representing the public interest, but by Congress,

¹⁷ See 16 U.S.C. §1604(d) (2000).

¹⁸ See 42 U.S.C. §4331-4332 (2000).

which is the appropriate institution for making value-based choices about societal interests. However, Congress has never done the hard work of explicitly defining goals for multiple-use lands such as National Forests and has left those decisions to the agency.

One way to handle the tough questions that Congress has left unanswered would be to provide for an effective means of involving the public in forest management. However, in the public participation process under NEPA, which has been one of the primary mechanisms for public involvement in forest management, the agency is only required to substantively respond to comments that raise specific issues with the content and quality of the analysis in NEPA documents. Assertions of value-based preferences are noted but do not require a response or any particular action by the agency. There is also no methodology used for tabulating or incorporating public preferences into agency decision-making. The end result is that the public participation aspects of NEPA do not mesh in an obvious way with the synoptic approach of NEPA or NFMA, although there is certainly a role for the public in assuring that the agency has considered all of the relevant information. Still, as Poisner (1996) explains, the result with NEPA is a “confusing hybrid of pluralism and synopticism” that leaves unaddressed the complicated tension between expertise, science, and political preference in public land management. The result of this in forest management is that in many cases participating in scoping and public comment during the NEPA process sometimes seems like the sole, but imperfect, venue for addressing major concerns and potentially resolving conflicts and disagreements.¹⁹

¹⁹ There is also an appeals process in National Forest management. However, the appeals process takes place after participation in management decisions through the NEPA process. Additionally, it is important to recognize that there is nothing that precludes a forest from undertaking an

As a result of this situation there is a considerable amount of frustration regarding the role of the public, both from the point of view of the agency and of members of the public wanting more involvement in the direction of public land management. Members of the public often write highly technical comments in order to force consideration of scientific information that supports their interests. USFS personnel I interviewed stated on the one hand that this is sometimes a beneficial process, bringing to the agency's attention important scientific information. Indeed, this can be one of the most ideal and useful roles the public can play in informing agency analyses. However, another consequence of this situation is that the agency and members of the public often end up arguing over science when the real issues are more value-based than technical. As one interviewee put it, "Everyone can find some science to support their position."

Another result of the nature of public participation under NEPA is that a broader range of people are often discouraged from participating in agency decisions because they do not have the technical expertise to bring a comment that would warrant a response from the agency (Poisner, 1996). Because NEPA analyses are highly complex and technical and the role of public preference is unclear, much of the public is left out of the process, with only a few groups of highly organized participants commenting on most agency decisions. In turn, the agency is left with a limited sense of how the broader public actually views their actions and may lend less weight to the comments of groups who seems to represent only a small subsection of interests. This seems to be the case regarding some of the environmental watch-dogs on the IPNF, who are sometimes portrayed by the agency as a small and radical group of highly vocal interests.

innovative approach to including the public in its planning process. However, the primary, established means for public involvement is generally through the NEPA process.

Agency personnel interviewed for this research also explained that they often see the same comments over and over, regarding significant and highly controversial issues, such as landscape level planning or USFS fire management strategies. Topics such as these almost always are considered to be beyond the scope of a project level analysis, but at the same time it is not clear what other venue members of the public have for addressing such broad-scale concerns about forest management.

To get a sense of some of these larger-scale concerns and how they are relevant for the IPNF, take, for instance, questions from environmental groups in nearly every comment letter asking why the IPNF assumes, as it does in its forest plan, that preserving 10% old-growth is sufficient for species protection? The IPNF consistently responds that addressing this issue is beyond the scope of project level analysis. But it is unclear at what point a forest would address this question except during the plan revision process, which on the IPNF has taken now over 20 years. Wildlife advocates for obvious reasons want to see a more timely evaluation of such as standard and whether it is adequate for protecting old-growth species. Other concerns such as whether the forest should have a forest-wide analysis of species viability or a long-term assessment of changes to habitat over the life of the forest plan, whether there is a need for a conservation biology approach to landscape planning for wildlife protection, or whether the conservation strategy for a particular species is adequate are also broad issues related to CEA that are beyond the scope of project-level analysis. These issues are raised repeatedly in public comment letters and the agency repeatedly references the reader back to the EIS, which presumably has already been read and did not address the question in a way that satisfied

the commenter. The agency also consistently explains that such issues cannot be handled adequately at the project level.

Several other key issues that are central in debates over the nature of forest management and planning also are raised in project-level EISs. For instance, one often-mentioned concern is the lack of a long-term plan for a particular area. In comments on the Mission Brush SFEIS, for example, environmentalists note that the project is proposed as a way to begin restoring forest health in the area but ask how much more logging and prescribed burning will have to occur in the future to meet restoration goals. Or consider the Myrtle Creek project on the IPNF, which includes prescribed burning, thinning, and some timber harvest to restore a heavily burned area. One USFS staff member told me that restoring the area would require multiple projects spread out over many years to come. The FEIS itself, however, does little to explain what would be required long-term to restore the area, how that might be funded and implemented, and whether an alternatives analysis might look different in light of such long-term considerations. Indeed, most project level analyses include almost no picture of a longer-term plan for restoration of an area, what would be required in the long-run to establish desired conditions, and whether such a long-term plan is in place.

This question regarding the need for a long-term plan for a particular area has been raised in other regions and by long-time observers of National Forest management, such as Ray Vaughan of WildLaw in Alabama, an organization actively involved in forest management in the southeastern U.S. Vaughan has suggested that forests create plans by watershed so that project analyses do not stand alone as a snapshot of the ongoing project of restoring a landscape (Oversight Hearing, 2007). In his written

testimony to the House Natural Resources Committee in a 2007 oversight hearing regarding forest management, Vaughan writes, “The Forest Service must stop managing merely by compartment and individual project. Instead, step back and assess at a landscape or watershed level what it is that the forests need and what can be done to meet those needs over a longer timer, at least five years. Fifty years would be better. This is not planning but how to implement plans with a broad vision instead of a microscope” (p. 89). This kind of approach might make for a very different kind of CEA that could have the potential to give a clearer sense of the long-term condition and management plan for a portion of a landscape.

This issue cuts right to the heart of forest planning and how it needs to happen, and comments on this topic are seen in nearly every project-level EIS on the IPNF. However, resolution of this important question requires a much more expansive discussion regarding the nature of forest planning than can possibly be handled by a resource specialist responding to comments on a project-level EIS. The critical question, however, is what venue is available, other than NEPA analyses for raising such issues with the Forest Service? Pushing the agency to deal with this issue by raising it in project-level comments is one of the only places a member of the public might raise a critical concern such as this. In other words, the NEPA process becomes one of the only places where members of the public can address their concerns about broader issues in public lands management. Aside from NEPA analyses, these issues might only be aired during the infrequent forest planning process or in a venue such as the oversight hearing where Vaughan broached the topic.

As a final example of this issue, consider the ongoing debate over whether the USFS can restore forests through the use of mechanical treatments as opposed to allowing natural processes to occur. Environmental groups on the IPNF criticize the forest for using prescribed burning and thinning as a means to address the effects of fire suppression and argue that salvage and thinning operations cannot replace natural fire regimes as a process that affects ecosystem function and structure. They also state that the IPNF has “no empirical evidence to indicate its ‘treatments’ for ‘forest health’ decrease, rather than increase, the incidence of insects and diseases in the forest” and that “[the] ‘forest health’ discussion [is] unscientific and biased toward logging as a ‘solution’” (Mission Brush SFEIS, F-11-12).

The cumulative effects, especially of old-growth treatments, are of serious concern to members of the public concerned with the preservation of old-growth dependent species. One might recall that this issue was central to the *Ecology Center v. Austin* (2005) case, discussed in chapter two, in which plaintiff environmental groups questioned whether the USFS had any evidence that its old-growth treatment processes led to desired conditions for wildlife species. The plaintiffs argued that the whole notion of working towards achieving “historic conditions” was flawed and that process such as thinning and prescribed burning are “qualitatively different from the ‘natural’ or ‘historic’ processes [they are] intended to mimic” (*Ecology Center v. Austin* (2005), p. 1063). In that case, which was later overruled, that the court stated the agency ought to have at least some proof that its treatments benefit species in the way intended.

What is interesting is to consider the broader issues at hand in this case, which include questions as to how the agency ought to manage post-fire landscapes and how

and whether it should prevent future fires in areas where fire has been excluded. Also at issue is the question of how much uncertainty about management practices should be tolerated by the public or in the courts and whether the agency has adequate monitoring data (or any useful monitoring data) regarding the efficacy of forest management practices that have been used for years and continue to be proposed in order to achieve certain conditions.

A significant result of the fact that there are limited venues available for addressing such high-level conflicts in forest policy is that members of the public use NEPA and litigation as tools to challenge agency practices. These, along with the appeals process, which sits somewhere in-between participation in the NEPA process and litigation, are the only consistently available venues for the public to raise concerns over forest management.²⁰ However, neither the NEPA, as traditionally implemented, nor the appeals process creates a venue for dialogue about significant, broad-scale forest management issues. Very little dialogue occurs regarding such issues in the NEPA process, leaving the agency frustrated at receiving and responding to the same comments over and over again and with an inability to address these issues at the project level. Members of the public are also frustrated. Agency responses can seem as if the agency is simply repeating itself in some sort of tired and automatic fashion rather than communicating with the public about valid and serious concerns.

²⁰ This is not always the case, however, and much of this dynamic depends on forest leadership. For example, the IPNF, as discussed more below, is increasingly working to engage environmental groups in planning efforts (note, for example, efforts on the Myrtle Creek and Blue Alder HFRA projects). Interviewees for this research also noted collaborative efforts and increased opportunities for dialogue with the Colville National Forest and the Lolo National Forest regarding restoration objectives and forest plan design.

It also can seem as if the agency is playing the aforementioned “shell game”, promising that certain analyses will occur at some unknown or future level of planning. Indeed, in some cases, such as that of species viability the “shell game” critique may be valid—the agency seems to be avoiding the question of a forest-wide viability analysis at multiple levels of planning. But in the case of questions over processes versus treatments, or the need for watershed level planning, it would be too simplistic to say the agency is playing a shell game when they suggest such questions are beyond the scope of a project level analysis. The truth is, those questions *are* beyond the scope of project level analysis, and the agency is not promising to handle those questions at some future point in time or at some other scale of analysis. The fact is no one seems to know what venue is available for handling such large-scale questions about forest management, particularly in a way that involves the interested public.

The resulting situation and frustration on the part of both the public and the agency is the inevitable result of the fact that NEPA public comment and agency response is often the primary vehicle for any kind of conflict resolution outside of the courts. Perhaps the forest planning process might be a more constructive venue, but there is no reason to expect that forest planning will necessarily occur in a way that is any more satisfactory for members of the public, especially when some of the most pertinent issues involve regional or national-level policies. Presumably, the USFS deals with these questions at the highest levels of management and in a dialogue with other branches of government, such as Congress. But on an ongoing basis, the opportunities for dialogue between the public and the agency can be limited.

An important consequence of this situation is that groups use litigation to stop or slow projects that they do not like. While agencies often accuse environmental groups of using litigation to stall projects, the lack of a strategy for incorporating public preferences into project planning leaves interested members of the public with few other options for pursuing their preferences in public land management. One environmentalist characterized the consistent use of litigation to stall projects as a “war of attrition”—obviously a less-than-ideal way to be involved in public lands management. But while litigation is certainly used to slow down agency projects, it is also important to note that environmental plaintiffs meet with considerable success bringing NEPA complaints. They are more successful at winning NEPA cases than other categories of plaintiffs, and their success rate in federal courts indicates that “federal agency compliance with NEPA still requires significant policing” (Austin et al., 2004). In other words, environmental groups use litigation to stall projects, but they also have valid claims. Their success rate in court belies the fact that they often play an important role in ensuring agencies are in compliance with the law.

These issues are relevant to any discussion about CEA, because some of the concerns as to how the agency does CEA are just the type of issue that cannot be dealt with at the project level. Critiques as to how the IPNF deals with past actions, whether past actions and monitoring information adequately inform current actions, or how the agency analyzes cumulative impacts to species at a forest-wide scale are all the sort of important question that gets raised in project-level comments by members of the public and cannot be handled in any satisfactory way by the agency at that scale of planning. It is for this reason we see so much discussion of CEA in project-level comments, appeals,

and litigation. CEA is a sort of grab-bag requirement—an opportunity for members of the public to somehow get at some of their broader-scale concerns over the entire approach to forest planning. It is likely for this reason too that the courts give such muddled direction on CEA—because the question of when and where large-scale issues are handled in the forest planning process, when plans take 20 years to revise and are outdated by the time they are completed, has not been settled.

Because of the role NEPA plays as a venue for conflict resolution, and the breadth of the CEA requirement, to some extent CEA serves as a surrogate or proxy for larger concerns. Members of the public with concerns about the empirical foundations of wildlife planning or the level of uncertainty in forest service management practices use CEA as a way to take issue with the potential long-term and large-scale repercussions of activities. If there are limited opportunities to deal with conflicts over such issues as roadless area conservation or old-growth protection, then the opportunity to raise challenges during the NEPA process and through concerns over cumulative effects on resources might be the most effective tool for addressing what are essentially much broader concerns over the nature of forest management. This may explain, in part, why CEA is raised so often in court and in public comments—because it is a requirement that allows for discussion of some of the most intractable and broad-scale debates in forest management today.

Monitoring, Mitigation, and Adaptive Management

A slightly different but equally important area of discussion regarding NEPA implementation revolves around the limits of predictive analysis, particularly in the realm

of environmental impact analysis. Earlier assessments of NEPA found that the majority of analyses lacked any quantitative information and that more than 85% of EISs failed at least one test of prediction; in general, the predictive capacity exhibited in NEPA analyses was low (Culhane, 1990; Karkkainen, 2002). In terms of environmental variables, the limits of prediction have been increasingly emphasized in the academic literature (Sarewitz et al., 2000). One legal observer explains that when NEPA was passed, ecologists were beginning to move away from an equilibrium view of ecosystems to more of a non-equilibrium view that emphasizes stochasticity, complexity, and the limited predictability of ecosystem responses (Thrower, 2006). Thrower (2006) concludes, because NEPA was not designed with this paradigm of ecological change in mind, “[T]he future of the EIS as an effective instrument for environmental protection may depend on its ability to incorporate modern ecological concepts of uncertainty and change” (p. 883).

Law professor and NEPA expert Bradley Karkkainen (2002) has argued that NEPA focuses too much on “comprehensiveness and clairvoyance” but provides no mechanisms to determine whether predictions are accurate or whether mitigation measures are effective (p. 902). He writes:

An agency that does not monitor the actual environmental consequences of its activities will have little capacity to develop useful performance benchmarks against which to measure present and proposed activities—for example, by comparing actual results against baseline conditions, performance targets (including those predicted in the EIS), or other projects. Consequently, it will have an underdeveloped capacity to evaluate and learn from its own experience and to improve its performance over time (Karkkainen, 2002, p. 931).

At present, agencies fail to assess whether their predictions are accurate and whether promised mitigation measures actually take place or are effective. Dinah Bear, who formerly served as general counsel for the CEQ, argues that the current lack of post-

decisional monitoring and mitigation has stripped NEPA of its potential utility (Bear, 2003). She writes that it is this failure to monitor and assess "that has made NEPA documents the one-shot deals that they usually are, rather than the living libraries that they could become" (Bear, 2003, p. 945).

The problems with a lack of monitoring are highly relevant to effectively conducting CEA. Without a systematic approach to monitoring, it is difficult for an agency to know how resource conditions have changed over time or what the effects of current and past projects are. This poses a serious impediment to conducting a comprehensive CEA in terms of understanding past effects and their causes, or the potential impacts of the proposed project.

In terms of the wildlife resource, Murphy and Noon (1991) explain, that at its most basic, "Monitoring...is used to test the implicit biological assumptions underlying our management plans." Monitoring will be perhaps the most important challenge and essential component to successfully managing for resources on public lands in the future; however, it is no easy task. Managers need to know what monitoring information is useful and how to apply that information in their development of management plans. Expertise, money, and man-power will be required in order to design systems, collect information, and interpret data usefully (Corbin, 1999).

Despite its potential utility, monitoring, or the lack thereof, has been a persistent challenge in natural resource management. It is difficult to maintain the political and fiscal will to support long-term monitoring efforts, even though such efforts are critical for understanding both baseline conditions of resources and the effects of management actions (Doremus, 2008). Monitoring data are collected infrequently, in part, Doremus

(2008) explains, because, “Monitoring drains scarce agency resources without providing the political benefits of action. It may even threaten to scuttle delicate political compromises if it highlights problems with existing management efforts” (Doremus, 2008, p. 429). She goes on to say, “As a result, post-decision monitoring of management steps is the exception rather than the rule, and opportunities for learning are regularly squandered” (p. 429). Several examples illustrate her point, the most striking of which is that there is no federal agency that uses a systematic approach to monitor whether predictions in NEPA documents are accurate (Doremus, 2008).

For an agency such as the USFS, where past and present resource extraction might have detrimental effects on resources such as soil, water, and wildlife, there probably is a disincentive to monitor. More information could be used against the agency by those who oppose their actions and could reveal that management practices are having or have had detrimental or unintended effects. The fact is that increased information can lead to increased regulation of activities that might degrade natural resources. It is difficult to imagine what incentives the agency does have to monitor, unless those incentives come from the courts or from Congress. Increased information could limit the agency’s ability to manage for resource extraction and in general would limit the agency’s discretion. In order to avoid tying its own hands in any way, an agency like the USFS, which has a multiple-use mandate, is subject to considerable political pressure, and has a history of relying upon its own expert judgment, may prefer to avoid intensive knowledge generation unless it is compelled to do otherwise.

The lack of emphasis on monitoring also may be the result of agencies' desire to "check-off" the NEPA box, as Bear (2003) puts it. Monitoring and adaptive management

by agencies would require re-entering the NEPA process and possibly involve amending EISs and reinvolving the public. Agencies are almost certainly not interested in this added procedural burden and will be unlikely to undertake such action unless explicitly compelled to do so. Acknowledging uncertainty only opens up decisions to increased scrutiny before implementation and when decisions are revisited down the road. If instead decision-makers can make decisions at the outset and face no requirement to reassess them, this likely will be their preferred option.

Courts might be one place to look for increased incentives to monitor. For instance, some observers were delighted by the ruling in *Ecology Center v. Austin* (2005), in which the court seemed to require the agency to provide *some* information in support of its assertions that old-growth treatments would benefit sensitive species, particularly given the fact that the agency had had the opportunity to collect such data in the past. However, that case was overruled, with the court taking a step back towards its traditional approach to judicial review under the APA. By those standards, the agency is entitled to use whatever science is available, even if it is not consistent with the most widely-accepted science or is internally generated, and the agency also is not required to cease management actions because of a lack of data. In *Inland Empire Public Lands Council v. USFS* (1995), for example, the court explained that the agency could proceed with management actions even in light of considerable uncertainty as to how those actions might harm a species. CEQ regulations instruct agencies to acknowledge and make predictions in light of scientific uncertainties, when those uncertainties are central to the

decision being made, but do not require agencies to actively generate information.²¹

Under NEPA, agencies are required only to gather and analyze the information available.

In order to discuss monitoring in specific terms that are useful for this research it is helpful to parse out the different types of monitoring that are relevant in forest management. A Wilderness Society report that provides an overview of monitoring and its role in forest restoration explains that there are two primary types of monitoring: 1) implementation monitoring, which provides an assessment of whether a management action was carried out as planned, and 2) effectiveness monitoring, which determines whether management actions are achieving the desired objectives (DeLuca et al, 2008, citing Block et al., 2001). Both types of monitoring are important to understanding some of the current impediments to effectively doing CEA on the IPNF.

Environmental groups constantly draw attention to the need for increased monitoring on the IPNF, both in terms of implementation and effectiveness monitoring. As mentioned earlier in this chapter, they argue that in order to determine the efficacy of wildlife management strategies, including the use of MIS, old-growth standards, and snag protocols, population responses must be monitored. They also regularly request monitoring information regarding the effectiveness of mitigation measures in terms of soil quality and also request validation monitoring that soil quality guidelines are being met. As we saw with *Ecology Center* (2005), members of the same environmental groups also would like to see increased effectiveness monitoring in terms of the effects of old-growth treatments, thinning, and salvage logging operations. They also raise the issue

²¹ 40 C.F.R. §1502.22(b) (2004). This section replaced the original requirement at §1502.22(b), which required a "worst case analysis" in cases of uncertainty. The regulation still requires an analysis of low-risk but potentially serious harms (see Farber (2003/2004) for more discussion).

that EISs do not disclose how much snag loss or large-diameter tree removal is expected due to safety concerns, compliance with Occupational Safety and Health Administration (OSHA) regulations, or the use of skid trails and other methods of log removal. Implementation monitoring of these factors would provide some indication of how closely projects are implemented as planned.

In terms of understanding cumulative impacts, the lack of monitoring information is cited as one of the primary impediments to effectively understanding the effects of multiple management actions on a landscape scale. In their comments on nearly every EIS analyzed, environmentalists suggest that in order to comply with the court's decision in *Lands Council v. Powell* (2004) the IPNF must disclose not only the details of past actions, but also the goals and assumptions of past projects, and whether those were met based on post-project monitoring data.

What is interesting is that, based on the interviews conducted, USFS personnel and environmental groups see this issue very similarly; in fact, most USFS personnel interviewed share the same concerns as do environmental advocates. In the interviews for this project, I asked USFS personnel what factors would help them do a better job at CEA. Almost every respondent emphasized monitoring as one of the primary areas necessary for improving analysis of cumulative impacts and indicated that post-project monitoring would be extremely helpful to understanding the effects of projects. This would help them do a more complete job with CEA and also would lend some support to predictions in future analyses.

Some biologists explained that not only is post-project effectiveness monitoring necessary, but that post-project implementation monitoring is also crucial. Because

predicted effects to species, for example, depend on a project being implemented as planned, implementation monitoring would be highly relevant for a biologist in knowing whether predicted effects will likely occur. Others emphasized the need for broad inventory monitoring. In other words, in addition to project-related monitoring, monitoring data is needed on baseline conditions and the status of resources.

Most of the personnel I spoke with at the USFS were as aware of the need for monitoring as any outside observer. The problem is that the incentives, funding, and staff are not there to complete it. Over and over again people said “the money just isn’t there” or “there’s really almost no budget for monitoring”. But the issue appears to be more complicated. One interviewee explained that strong leadership and a commitment to monitoring at the district level could improve the current situation despite limited funding. The problem is also more than a straightforward lack of data. Instead, some of the lack of monitoring data, according to interviewees with the USFS, is the result of it being collected in an inconsistent manner or not being coordinated and made available to USFS staff in a useful way. In this way, the problems with monitoring data appear to be one of Doremus’ (2008) “leaks along the pipeline.” The problem goes beyond a lack of data collection and is one of coordination, communication, and refinement of the information that is available. USFS staff stated that they knew of data that was out there but just had not been gathered, analyzed, or communicated to others in a useful way. One staff member said that the district had four years of soil monitoring data but no one to consolidate or interpret it. Others pointed to the fact that forest monitoring occurs every year, but as of the summer of 2007, monitoring reports for the previous three years had not been released for the IPNF.

A sort of companion issue to implementation monitoring is the issue of whether mitigation measures are implemented as planned. NEPA regulations require an agency to discuss in an EIS possible mitigation measures that may be undertaken but do not require that such mitigation measures actually be implemented (Karkkainen, 2002). Some have suggested that NEPA would be strengthened if mitigation measures analyzed as part of an EIS were not optional. For instance, one of the recommendations that arose out of the findings of the 2005 House Natural Resource Committee's Task Force on NEPA was that CEQ issue regulations make proposed mitigation measures binding on agencies.²²

One IPNF interviewee stated that mitigation measures, monitoring, and activities such as road decommissioning are often promised in EISs but are contingent upon securing future funding. When such activities are part of the analysis in an EIS but in fact are never implemented, the predictions and portrayals of future conditions in EISs are inaccurate. That interviewee explained that an unfortunate consequence of this is the loss of trust with the public. Some public comment letters ask that the IPNF be more transparent about the uncertain nature of some of these yet-to-be funded activities. They also request that the IPNF provide an indication as to the priority for implementation of such measures if and when the funding becomes available and additionally want to see some evaluation of how often similar measures promised in the past actually were implemented. Furthermore, just as members of environmental groups express concerns about how safety measures might change implementation as it was designed and presented in an EIS, USFS personnel also suggested that such on-site changes to

²² The task force report is no longer available on the House Resource Committee website, but it can be found at: http://www.law.georgetown.edu/gelpi/research_archive/nepa/NEPATaskForce_FinalRecommendations.pdf (last accessed Dec. 28, 2008).

implementation could significantly affect project implementation compared to project design. Post-project implementation monitoring would be a useful way to have some sense of whether a project went off as planned and whether measures that required future funding ever actually were implemented.

On the IPNF approaches to monitoring are evolving. Annual forest plan monitoring does occur, and monitoring reports are typically issued annually. In fact, a recent USDA report indicated that the IPNF had one of the best-funded monitoring programs of any forest nationwide (Holthausen et al., 2005). One interviewee also explained that while forest plan monitoring is ongoing, the forest is trying to determine how to do more useful and targeted post-project monitoring. There does not appear to be any increased budget for monitoring, so the trick will be to find a way to monitor meaningful indicators by coordinating and using resources more effectively.

An innovative monitoring approach will be used in the Healthy Forests Restoration Act Myrtle Creek project, reviewed as part of this research, which includes a two-tiered approach to implementation that will depend in part on the results of third-party monitoring after the first stage of the project is complete. For instance, the Idaho Conservation League will work with the USFS in that area to determine effects to water quality. Third-party monitoring has the potential to increase the overall monitoring capacity on USFS lands. Some interviewees on the IPNF suggested that ideally there would be a regional approach to monitoring that would be supplemented by monitoring by forests, at the district level, and would include some third-party monitoring, both to increase capacity and to develop trust with members of the public. As one environmentalist pointed out, however, third parties will have to be funded, well-trained,

and well-informed in order to do monitoring well. One of the trickiest issues with monitoring is knowing what parameters to monitor and how to evaluate and analyze results in a meaningful way. Designing effective monitoring strategies with enough statistical power to detect effects and with enough consistency so that data can be aggregated will take thoughtful design and require expert input.

DeLuca et al. (2008) make a number of suggestions as to how more broad-scale monitoring could be tackled that would combine site-specific and larger scale data collection efforts. However, they offer several cautions. For one, they note that historically monitoring has been used to find fault with management actions, creating a disincentive to monitor. Future efforts will need to build in some kind of incentive, perhaps through performance-review, in order to support increased monitoring. They also point to the mandated monitoring that has occurred under the Stewardship Contracting Pilot Program projects in the Northern Rockies. Stewardship contracts are an approach to forest management whereby contractors take profitable timber off of a site in exchange for service and restoration work on the site. Under the pilot program, Congress required and appropriated funding for monitoring. DeLuca et al. (2008) note, however, that for a majority of stewardship contracts they reviewed no monitoring reports were on file. For those projects where monitoring did occur the information was not gathered in a strategic or consistent manner, although a side benefit was the involvement of a diverse set of stakeholders in evaluating forestry projects. Unfortunately, rather than improve on this pilot effort at monitoring, Congress later dropped the requirements for project-level monitoring and instead emphasized programmatic monitoring. Programmatic monitoring is already undertaken by National

Forests, and as we have seen suffers from limited funding and emphasis and needs to be coupled with increased project-level monitoring.

It is useful to step back and consider what sort of monitoring approach would be useful and feasible for the USFS, especially given that monitoring, at least under NEPA, is not mandated and that there does not appear to be any significant increase in the budget or staff available for monitoring. Holthausen et al. (2005) note that the current planning regulations for the USFS include increased flexibility in designing monitoring programs for wildlife species. An ideal monitoring approach for species, they write, would include targeted monitoring of the status and response to management actions of species of interest, cause-and-effect monitoring of the effects of management actions, and context monitoring, or broad-scale monitoring of various ecosystem variables (some of these suggestions are discussed in more detail in the final chapter of this manuscript). In order to undertake an effective approach to monitoring, Holthausen et al. (2005) make several key recommendations: 1) regions should take a larger role in coordinating monitoring efforts; 2) new funding needs to be made available and dedicated to multi-forest efforts; and 3) increased collaboration between the administrative and research arms of the USFS, and between multiple agencies will be necessary. For useful monitoring to take place, a coordinated initiative overseen by a higher level of management, such as the Regional offices, will be necessary. This should allow for an intensive and statistically valid sampling approach that looks at data at multiple scales.

Both Region 1 and the USFS as a whole are moving towards increasing monitoring in general. The Washington D.C. office has directed the Regional offices to

develop region-wide monitoring protocols.²³ Region 1 is in the process of designing these protocols and in fact, is going beyond the Washington office's guidance by attempting to monitor for the effects of climate change.²⁴ A specialist at the Regional office indicated that the region has eight forest plans under revision and that the monitoring approaches are different in nearly every single one. The Regional office is working with forests, however, to coordinate monitoring strategies, something that will be needed for the sake of generating sufficiently useful data that can be analyzed and shared across the region. Regional biologists are also working with the research arm of the USFS to develop a more targeted and prioritized approach to monitoring the status of terrestrial wildlife species (for some discussion of this see Holthausen et al., 2005). Other interviewees at the Regional office indicated that the terrestrial wildlife program is working with individual forests, the states, and the U.S. Fish and Wildlife Service to coordinate on species monitoring.

Beyond the specific needs for monitoring in forest management, there is a general need under NEPA for increased incentives and strategies for monitoring, evaluating the effectiveness of mitigation measures and management actions, and learning from previous activities. One aforementioned strategy would be to make monitoring and mitigation commitments in EISs binding. Karkkainen (2004) has made a number of suggestions, one of which is "simply that we require follow-up monitoring to verify the accuracy of any predictions we can identify at the pre-project analytical stage as resting on uncertain foundations" (p. 350). This would lead to better baseline knowledge, better

²³ See <http://www.fs.fed.us/emc/met/index.shtml> for more information of this monitoring and evaluation framework.

²⁴ Staff at the Region 1 office are willing to make working copies of this document available, but as of February, 2009 there was not yet a public website where the document could be found.

mitigation measures, and more accountability for actual, as opposed to predicted, environmental performance. Some kind of mandated follow-up monitoring sounds like a good idea, but figuring out how to implement the concept will be a challenge. Funding and staff are limited, and follow-up monitoring on every project and every uncertain prediction is unrealistic.

Monitoring also is a central component to adaptive management, which is often put forth as a potential solution to the limitations of predictive analysis (see for example, Karkkainen, 2003; Langston, 2000; Lee, 2003, Sarewitz et al. 2000; Stankey et al. 2003; Stewart et al. 2004).²⁵ In terms of improving wildlife analyses and CEA for various species, increased monitoring and adaptive management could be the keys to better stewardship. Wildlife biologists Murphy and Noon (1991) emphasize the strategy as an essential response to uncertainty, particularly in forest and wildlife management. They write, "Adaptive management can provide a reliable assessment of management programs, provide new ecological information in the process of assessment, and, if warranted, use the new information to modify existing plans." In this way, an adaptive management approach could be key to addressing the challenges of understanding cumulative impacts on wildlife species in terms of both learning from past actions and cautiously planning new actions.

²⁵ The following is provided by Karkkainen (2003) as a working definition of the concept: "[A]daptive management proceeds directly to advance competing hypotheses in an area of scientific uncertainty, and then devises replicable policy experiments to test these various hypotheses, treating pre-experiment conditions as the control" (p. 951). However, others define adaptive management more loosely. For example, Bormann et al. (2007) define it as "a systematic and iterative approach for improving resource management by emphasizing learning from management outcomes" (p. 187). The latter definition emphasizes a structured approach but not necessarily an experimental one.

In terms of the broader issues of NEPA implementation, Karkkainen (2003, 2004) has consistently advocated for incorporating some kind of adaptive management approach into the NEPA process. However, some scientists have argued that adaptive management may be incompatible with NEPA because NEPA requires decisions be made before any action takes place, whereas, in an adaptive management approach, many decisions are made after some experimentation (Prato, 2005). Others have argued that NEPA and adaptive management are essentially two very different paradigmatic responses to decision-making and uncertainty (Karkkainen, 2003). The former takes into account the available information and then makes a decision about the best course of action. Adaptive management, in contrast to making a "best guess" in a one-time evaluation, relies on an iterative and long-term decision-making framework that is guided by the level of uncertainty involved (Karkkainen, 2003). Therefore, NEPA, at least as it is usually applied, may not be very compatible with a more adaptive approach. Dinah Bear argues that there is room for creativity within NEPA and emphatically explains that it does not preclude the use of adaptive management (Bear, 2003). In fact, she says, CEQ encourages an adaptive management approach, but, "NEPA implementation for land management practices will not change until both the executive and legislative branches of government not only endorse the value of post-decisional NEPA but fund its implementation as well."

Over the last decade, CEQ has increasingly emphasized adaptive management. In a 1997 report on the first 25 years of NEPA implementation, CEQ find that many study participants advocate for more monitoring, both to evaluate prediction and to determine the effectiveness of mitigation measures, and for the evaluation and adaptation of projects

(CEQ, 1997b). They emphasize the need to shift towards a new paradigm of environmental management that includes more monitoring and adaptation and write, “[A]n adaptive environmental management approach may be the best means of attaining both NEPA’s goals and an agency’s mission” (CEQ, 1997b, p. 33).

Despite the optimism about adaptive management as a potential way to improve NEPA analysis and natural resource management, there are several critical concerns associated with the coupling of NEPA and adaptive management. In a second CEQ Task Force report from 2003 on “Modernizing NEPA Implementation”, which deals with adaptive management in more detail, the Task Force highlights some of the major challenges associated with the approach (CEQ, 2003). For one, they note that adaptive management could be used as a smokescreen for increasing agency flexibility in light of uncertainty. Agencies could approve activities that may cause harm with they promise that activities will be adapted in light of new information. But without binding commitments to generate that information and adapt activities accordingly, the approach could just be a way to evade responsibility in light of uncertainty (see Doremus, 2001; Karkkainen, 2004).

The Task Force also raises the crucial issue that for adaptive management to work, funding would have to be available to support monitoring and for any additional decisions that would have to be made in light of new information. Questions regarding the timing of judicial review and the triggering of NEPA requirements are also key. If adaptive management were undertaken as a way to improve decision-making, how would NEPA documents be written to include an adaptive management plan, when would supplemental EISs be required, and at what stages in the process would there be

opportunities for public oversight and judicial review? In order to deal with these complicated questions, the Task Force recommends that a pilot study be funded to look at specifically how adaptive management can work in the NEPA context and how CEQ could write regulations to support that process (CEQ, 2003).

Adaptive management has been tried by the USFS in some areas. Elsewhere, I have written in more detail about the success of adaptive management efforts to date under the USFS' Northwest Forest Plan (Schultz, 2008). While adaptive management has occurred to some extent in areas known as adaptive management areas or AMAs, it has not taken place to the extent that was envisioned (Gray, 2000; Noon & Blakesley, 2006; Stankey et al., 2003). In some areas, managers are experimenting with different disturbance regimes, and in a few cases replication and controls have been included (Gray, 2000; Stankey et al. 2003). For example, in the North Coast Range AMA, "[S]everal replicated, stand-level research studies are in place across the region to examine alternative riparian management approaches" (Gray, 2000) However, in other areas it appears that adaptive management has become a "buzzword" for an unstructured trial-and-error learning (Stankey et al., 2003).

Studies of impediments to effectively implementing adaptive management on the AMAs found that a lack of training, leadership, and funding have precluded the effective implementation of adaptive management to date (Stankey et al., 2003; Gray, 2000). There are also a number of institutional and legal disincentives for adaptive management. It does not seem that at present there are many professional incentives for USFS personnel to pursue monitoring or adaptive management. Stankey et al. (2003) conclude that for adaptive management to succeed, something of a sea-change will be necessary

within the USFS, including leadership, training, and organizational change to support experimentation, learning, and risk-taking. However, in their assessment of adaptive management under the Northwest Forest Plan to date, Borrmann et al. (2007) have a slightly more optimistic view. They write that the first cycle of adaptive management has yielded useful information and that learning to effectively implement an adaptive management approach will itself be a learning process.

These issues were some of the most prominently discussed topics in the interviews conducted for this research. Monitoring and adaptive management are relevant to a discussion about CEA because so much of the ability to determine the effects of past actions and how to limit potentially detrimental cumulative impacts from present and future actions depends on monitoring data that incorporates the effects of and learns from past actions. Almost all USFS interviewees emphasized the need for more monitoring information to learn from actions and to improve their capacity to understanding cumulative impacts. Environmental advocates echoed this need for monitoring information but also emphasized the need for more of an adaptive management approach to understand the most effective ways to plan for resource conservation on landscape scales.

This discussion reflects some of the primary challenges not only with CEA but with NEPA implementation overall. Increasing the monitoring capacity and activity of public land agencies is one of the most important steps needed in modernizing and improving NEPA implementation and public lands management. It will be critical for the agency and CEQ to focus on how to support increased monitoring and learning. Mandating monitoring, appropriating money for it, and supporting more adaptive

management strategies will be key. CEQ will have a role to play in providing guidance and possibly regulations regarding the implementation of adaptive management, and agencies will have a role to play in increasing their emphasis on monitoring and creating incentives for managers to monitor, learn, and adapt practices. Pilot projects that include monitoring and adaptive management strategies will serve to help agencies understand how to move forward into what will certainly be a challenging but worthwhile next iteration of public land management. Indeed, the USFS in its announcement of its most recent planning rule emphasized that forest management in the future will need to be more flexible and based on an adaptive management approach; the form this takes remains to be seen.²⁶

4.4 Institutional Impediments to CEA

Throughout this chapter I have alluded to some of the institutional impediments to implementing CEA effectively. For instance, I discussed interviewees' concerns that USFS databases were designed to inventory timber stands and are not ideal as tools for tracking the availability of habitat for wildlife species. A number of other institutional issues arose over the course of this research, primarily through the interviews, as relevant to understanding current CEA implementation. Nearly every USFS staff member I interviewed brought up time and money as factors that limit their ability to do a more complete CEA. Agency staff consistently explained that they are underfunded and understaffed, especially in light of their legal obligations. For instance, more money is sorely needed particularly for monitoring. Staff on the IPNF said they struggle to find the

²⁶ 73 Fed. Reg. 21468 (April 21, 2008).

time to meet all of their responsibilities. At the time of this research, the IPNF had lost their forest-wide biologist and hydrologist due to a lack of funding, and those responsibilities had been shunted to other staff members.²⁷ In general, some positions such as the presence of a NEPA writer/editor, have become a luxury on some Region 1 forests, according to personnel at the Regional office.

Even where positions have not been cut, staff on the IPNF explained that they continually have more work to do because legal requirements are constantly changing, and courts require more analysis and up-to-date information from the field. As one interviewee explained it, the USFS takes a risk-management approach to NEPA documents, and the risk is litigation. In their efforts to bullet-proof EISs, resource specialists have less time in the field, to field-verify and monitor conditions, even though courts have also asked for “more boots on the ground.” While most interviewees felt that litigation in general has led to improved practices by the USFS, and even that increased documentation requirements have led to better analysis in some cases, they also noted that the courts over time have asked for additional information to a point where there may be diminishing returns. Aside from specialists having less time in the field, EISs become more encyclopedic, and some question whether the additional information always improves decision-making and communication with the public.

Aside from increasing the burden on an underfunded agency, this direction from the courts may have another important consequence. Policy observers have noted in the academic literature that courts over time have imposed greater synoptic burdens on agencies, while failing to require agencies to be transparent about the political or value-

²⁷ These were the positions of forest-wide biologist and hydrologist at the supervisor’s office; district level biologists and hydrologists were still on staff.

based motivations behind their decisions (Doremus, 2005; Shapiro, 1988). When it comes to scientific uncertainty, this trend is troubling. Often what is needed is more transparency about why certain choices are made in light of uncertainty, rather than the inclusion of more information that may not actually add anything useful to the analysis. As one staff member on the IPNF put it, rather than admit they do not have the monitoring data to answer some questions clearly, “We fool around and say a lot of stuff without answering the question. We don’t like to admit we just don’t know, as professionals.” The result is that some analyses seem to provide a mass of information but never clearly provide any clear conclusions or straight-forward assessments of the issue at hand. USFS personnel raised a similar issue, asking when enough is enough in terms of information, and when the agency has the opportunity to step back and ask what kind of information is actually useful to making better decisions.

A potentially positive effect of litigation on the IPNF is that it has led to an increased level of collaborative planning, or at least an involvement of environmental groups in pre-project design and analysis. For instance, a collaborative planning approach was taken to the recent Blue Alder project on the Coeur d’Alene district, with individuals from some of the local environmental groups, such as The Lands Council, present for meetings regarding project design. When I asked what prompted this involvement, an IPNF staffer said it was prior successful litigation that had motivated the agency to try to work with environmental groups in more constructive manner. Some observers have drawn attention to the important relationship between collaboration and litigation, which, when successful at stalling or enjoining projects, serves as a motivation for pursuing more collaborative approaches (Nie, 2008). On the IPNF the success of the

approach is still unclear. USFS staff explained that the process for the Blue Alder project took a huge amount of extra time and money, and they were not entirely sure it was useful for resolving disagreements between the agency and environmental groups. Environmentalists I spoke with also were so far disappointed by the outcomes from collaborative efforts on the IPNF, explaining that they did not feel those efforts had had enough of an effect in the end on project design and implementation.

Interestingly, some environmental groups, such as The Lands Council have been involved in collaborative efforts on the nearby Colville National Forest in Washington as well as the Kootenai National Forest in Montana. Until recently, they appealed almost every timber sale on the Colville but have more recently taking a different approach. As one Lands Council staff member put it, litigation and more collaborative approaches go together as a sort of carrot-and-stick strategy for influencing forest management. Staff at The Lands Council felt that efforts on the Colville have been more successful than they have been on the IPNF, in part because environmental and industry groups in that case began meeting on their own before approaching the agency. In other words, on the Colville it appears that a more organic coalition formed, which then approached the agency with proposals and suggestions.

The independence of the coalition along with what they perceive as more receptive leadership on the Colville were both cited as reasons why collaborative planning has so far been more successful on the Colville, at least in the eyes of the environmental groups. It was also suggested that the IPNF has faced more pressure from a more powerful and diverse local timber industry and culture, along with pressure from the Regional office and from powerful Congressional members, such as Larry Craig, who

until recently was a senator from Idaho and was notorious for pushing timber production in Region 1. Importantly, environmentalists noted that although litigation is the tool that motivates the agency to work with them, collaborative efforts have more potential for making some of the gains, such as protection of roadless or wilderness areas, that are important to those groups.

Another institutional challenge that came up repeatedly in the interviews and which was discussed in the section on monitoring, was the issue of data gaps and information supply. USFS interviewees were aware of monitoring data that had been collected, on soils, old-growth habitat, or on project effectiveness, but that was never consolidated or analyzed in a way that was useful for or available to managers.

Interviewees explained that the USFS has put a good deal of time and money into surveying and data collection and has a considerable amount of data. However, the problem is that the data has not always been collected in a consistent or scientific manner or put into some kind of useful final product for managers. Another issue is the challenge of operationalizing information so that it is useful to managers on the project level. For instance, an agency scientist noted that Region 1 is working on a framework for ecological sustainability that looks at connectivity, fragmentation, and landscape patterns, but it remains unclear how that information will be operationalized in a way that is useful for project managers in designing and analyzing site-specific actions. Other interviewees stated that they are constantly bombarded by new science from appellants, and that it would be useful to have staff members, perhaps at the Regional level, who could synthesize that information and help the districts understand its implications.

Biologists at the district level explained that it is nearly impossible for them to stay up-to-date on the literature relevant for wildlife species and also meet their other obligations, such as getting into the field and completing NEPA analyses and specialists reports. When asked if they organized their efforts to save time and share information, biologists indicated that only a minimal amount of coordination has occurred. Until recently, the IPNF went several years without a forest-wide biologist. It seems that without this leadership there was no one to coordinate efforts to stay current on the literature or effectively share information and expertise. In fact, biologists on the IPNF had not met as a team for many years (one person estimated it had been 15 years). It appears that it has been difficult to find the time and leadership to facilitate communication between biologists just on the IPNF, much less across multiple forests or the region as a whole.

Another issue USFS staff raised was the question of whether scientists are consistently supported and adequately trained to do high quality work. Wildlife issues have garnered a significant amount of attention from the public and have been a highly effective tool for stopping agency projects through litigation. As one biologist put it, wildlife has a disproportionate amount of the public interests; as a result, biologists on project teams can have a lot of power and input. Some interviewees indicated that there is a disincentive in the agency for biologists to have too much say or for the agency to hire specialists who are highly trained because they might derail projects. One interviewee estimated that the majority of USFS district biologists have only a bachelor's degree and felt strongly that the agency needs to focus on hiring more graduate-level trained biologists. In fact, s/he noted, Montana Fish, Wildlife, and Parks requires their

biologists to have a graduate degree, while the USFS does not.²⁸ Hiring better-trained biologists would likely improve CEA and the quality of wildlife analysis in general.

In terms of training needs, Region 1 provides a variety of NEPA-related trainings, including a specific multi-day workshop on CEA. Although no one suggested a need for more NEPA training, a number of interviewees emphasized writing skills as a major impediment to how CEA is presented and to the maintenance of consistency from one document to the next. Many interviewees felt there is a need to improve the writing, logic, and integration of information in NEPA documents, and some suggested that training in this area might be helpful.

Many individuals who become project leaders and oversee a significant portion of the NEPA process are relatively new to the agency and have limited experience with NEPA analysis. Interviewees, some of whom were new to NEPA analysis themselves, emphasized the importance of having mentors available to assist new project leaders when needed. The USFS is also now utilizing dedicated NEPA teams: groups of USFS personnel who specialize in NEPA, travel to different forests, and write the NEPA analysis for various projects.²⁹ Although a number of people raised the issue of NEPA burnout and the fact that almost no one comes to the agency with the intention of doing NEPA analyses, one person who works with a dedicated NEPA team said s/he appreciated and enjoyed the ability to focus on NEPA and develop expertise in that area of practice.

²⁸ Montana Fish, Wildlife, and Parks department of human resources confirmed that both fish and wildlife biologists are required to have at least master's level training.

²⁹ See <http://www.fs.fed.us/teams/> for more on the USFS' dedicated NEPA teams (called TEAMS).

In addition, the role of the Regional office in overseeing NEPA analysis is evolving. As one interviewee put it, the Regional office has to strike a balance between oversight and service in an agency that has historically been decentralized. One interviewee referred to ranger districts as individual fiefdoms and explained that the Regional office has to be careful not to intrude too much into management on individual forests. People at the Regional office struggle with how much they should provide oversight and quality control as opposed to more of a service role in answering questions when they arise. Several people at the Regional office explained that over the last couple of years they have begun soliciting one NEPA document a year from each forest for formal review before the decision. Although there was resistance from the forests that this would slow them down, Regional staff explained that they were soon overwhelmed with requests to review NEPA documents. Based on this experience, it seems the Regional office may take more of an oversight role in the future.

Another key point that emerged from this research is that both environmental groups and USFS personnel cited the nature of project funding and the presence of timber targets as impediments to effective management.³⁰ For instance, in a discussion on the

³⁰ The concept of “timber targets” has different meanings in various contexts. In this case, personnel on the IPNF were referring to annual targets that come down to line officers from the USFS Washington Office and Congress. The process is not entirely transparent, in that timber targets are not published as part of any kind of public information for a National Forest. The IPNF’s 1987 forest plan sets the allowable sale quantity (ASQ), which is the maximum amount of timber that can be sold from a National Forest in a year, at 287 million board feet. In some cases people refer to a forest’s ASQ as a timber target, although here I am referring to annual targets that are internally communicated. Williamson (2005) explains that some USFS timber targets are set as part of the planning process undertaken under the Rangeland Renewable Resources Planning Act of 1974 (RPA) and that budgets and intra-agency success of managers are tied to meeting timber targets, giving managers an incentive to prioritize timber production. Nonetheless, the exact process of how annual timber targets are set is murky. Such targets are referred to frequently by USFS staff and sometimes by other academics (see for example discussion in Morton, 1999, and in a 1995 Congressional Research Service report). Several IPNF

possibility of involving outside groups in project planning, one USFS staff member explained that the IPNF is still under considerable pressure from the Regional office and more distantly from the USFS Washington Office and Congress to meet its timber targets. This, s/he explained, limits their ability to slow down and involve a broader set of interests in planning. It also limits the IPNF's ability to take a completely restoration or forest health oriented approach to project planning. S/he explained that timber funding comes down based on timber targets and that the timber budget is by far the largest part of the forest's budget.³¹ If the forest wants to accomplish restoration it often has to couple it with a timber project in order to fund it, because the budget for restoration-only projects is limited. S/he also noted that some areas might need treatment but would provide less timber volume than another area. Therefore, the agency has an incentive to find opportunities for restoration specifically in areas that will yield a higher volume of timber.

Several USFS staff stated that they would prefer their targets came down based on acres treated rather than timber targets. This would allow the agency to take more of an ecosystem management approach and treat the acres that need it most first. As one environmentalist explained, the agency cannot really take an approach that starts with the concept of ecosystem management when its funding mechanisms are still based on timber

staff themselves did not know exactly how timber targets are set and communicated, but explained that targets are hard numbers communicated to line officers. For the IPNF, it seems that current annual targets are around 55 mmbf, with less timber actually coming off of the forest in a year.

³¹ This is aside from the amount of the USFS budget spent on fire, which now accounts for nearly 50% of the USFS' spending. See for example, commentary by Pat Williams, former Congressman from Montana and Director of the Center for Western Progress, detailing the current state of USFS spending on fire fighting, in a *High Country News* article entitled "Don't starve the Forest Service" (July 16, 2008). Online at: <http://www.hcn.org/wotr/17564>.

targets. In a similar vein, the IPNF's new forest plan will focus on restoration goals, but the ability to implement that plan and focus on the acres where restoration will be needed most will be compromised by the fact that the forest will also be under pressure to meet timber targets.

What is interesting is that this is an area where many IPNF managers and environmentalists have some common ground. Environmentalists in the region often ask why timber targets are not openly discussed in project EISs as one of the primary factors that drives site selection and project design. Most environmentalists cite the presence of timber targets as one of the primary reasons they do not trust the agency and its analyses. They explain that because of the presence of timber targets, timber harvest is always the answer to the question of how to reach desired conditions. Environmentalists simply do not trust that timber harvest, when it is proposed, is actually the best method for achieving certain for conditions or that projects are implemented in the areas most in need of restoration. Indeed, it is as if timber targets are the elephant in the room—the agency does not openly acknowledge their role in project design but everyone is aware that forest are under significant pressure to meet the targets, in part because those targets are linked to a forest's budget allocations. As one project manager on the IPNF put it, groups simply do not trust that the agency is not still just “getting the cut out.” S/he explained that there is still plenty of restoration to be done in areas that will yield merchantable timber, but a move towards a target based on acres restored would do a lot to increase the credibility of the agency with members of the public who are skeptical about their actions.

This issue of timber targets is linked to suggestions that the agency plan by watershed, consider what is needed over the long-term in a particular area, and place projects into some sort of broader context of management goals. Statements from Ray Vaughan, whose perspectives on this issue were discussed earlier in this chapter, provide one of the best explanations of the logic behind this position. He explains that planning on a landscape scale would be a kind of planning with a “broad vision rather than a microscope.” Rather than timber quotas, which he suggests have never worked well for the forests or for the agency, he writes:

It would be far better to focus on acres restored, watershed healed, rivers and streams restored, wild places protected, visitor experiences enhanced, conflicts resolved, new workforces created, and the like. Do what the land needs, use the right tools to do the right job, and there will be products and services provided in their own due course. Focus on the work, the land and the people; the rest will take care of itself and be much better than artificial targets (Oversight Hearing, 2007, p. 88-89).

A number of USFS staff also felt the agency should move towards targets based on acres treated, but making this change would require a sea-change in how the agency is funded. At present, Congressional members work with the Washington Office, which works with the Regional office, in a murky negotiation process that results in timber targets and funding allocations for individual forests. IPNF staff said they feel a considerable amount of pressure to meet those targets, both in terms of maintaining their funding as in terms of more general pressure from the higher levels of the agency. Congressional pressure on the USFS to meet targets comes from Congress members with a vested interest in maintaining timber-related industries in their districts and states.

As a final important point with regard to budgets, it will be key to figure out how exactly to fund a high-quality monitoring program. Several staff explained that often budgets are tied to individual projects and not to overarching issues such as a broad-scale

monitoring program. If the agency is serious about moving into a more adaptive management approach to planning, questions will have to be answered as to how large scale monitoring efforts will be funded and whether post-project monitoring funds will be made available.

These types of institutional limitations present a variety of interesting lessons, some of which are daunting. The question of how to restructure the way the agency plans and funds monitoring efforts is a huge challenge that turns on both institutional constraints of the agency and the broader political context of National Forest management. However, other lessons about impediments to effectively conducting CEA would be relatively easy to respond to. Providing NEPA mentors, offering writing assistance and training, and improving the coordination of agency biologists so that they can share information and avoid duplicating each other's efforts are some areas where the agency could remove impediments to the implementation of complex regulatory requirements like CEA.

4.5 Conclusions

Since the late 1990s there has been almost nothing written in the academic literature on the current state of CEA practice and presentation in NEPA documents. One contribution of this research is the provision of an in-depth look at how CEA is currently practiced by the USFS. From that investigation several key areas emerge as some of the most important implications of this research.

With regard to CEA practice, the issue of how to incorporate an analysis of the effects of past actions into CEA remains as one of the most confusing and contentious

aspects of the practice. The current approach to CEA, which focuses on a project-level scale of analysis for wildlife and a picture of current conditions as an indicator of cumulative effects, fails to provide an analysis of how conditions have changed over time and what factors led to those changes. However, at present the law does not clearly require a different approach to CEA.

Under NFMA it is clear that to effectively maintain biodiversity and to comply with the old planning regulations from 1982, some kind of forest-wide analysis of the status of species is necessary. The scientific evidence indicates that a coarse-filter approach to biodiversity conservation will not suffice; however, the new NFMA planning regulations rely even more heavily on a coarse-filter approach, eliminating the viability language and emphasizing ecosystem diversity as a proxy for wildlife diversity. The USFS can choose to augment the ecosystem diversity approach by choosing species of interest or concern to emphasize as a management concern on National Forests. It remains to be seen if this flexibility will be used as a way to improve upon current and past practice with regard to species planning, or will allow for even less accountability and the failure to improve forest-wide or regional wildlife analyses so that they incorporate fine-filter approaches to assessing the status of populations and diversity.

This investigation into CEA implementation reveals several lessons that are reflective of broader issues regarding NEPA implementation. In forest management, the NEPA process is the primary venue for dealing with the public's concerns or questions about the USFS management direction. Because CEA is supposed to provide a broad-scale analysis based on learning from past actions, it becomes a proxy for addressing serious concerns about the USFS' approach to planning, wildlife analysis, old-growth

assessments and treatments, and long-term analysis of the effects of management actions. Because NEPA is one of the only venues for conflict resolution, many of these CEA concerns are seen over and over again at the project level and go unresolved. Limited opportunities for dialogue are available for dealing with questions on this scale regarding the nature of U.S. forest management.

Several impediments emerged as key areas where USFS personnel feel limited in terms of their ability to conduct CEA. One of the most recurrent themes from the interviews is the need for monitoring, including both implementation and cause-effect monitoring. This issue reflects one of the most common challenges raised with regard to NEPA and synoptic planning in general: the need for more post-project monitoring and an adaptive approach to planning that builds upon data collection in order to learn from previous activities. The lack of monitoring on numerous levels, according to USFS personnel, is one of the primary impediments to improved CEA practice on the IPNF. Related to this issue are problems with data supply. Numerous interviewees noted a need for more coordination of data that has been collected, refinement of that data so that it is understandable, and communication of findings to staff in a way that is useful in project level analyses. Biologists in particular also noted a need for more communication among specialists in order to standardize approaches and communicate effectively about new data or research relevant to their work.

Institutional impediments to effective CEA practice are many. The most obvious are the lack of money for monitoring and the fact that staff nearly unanimously noted that the agency is understaffed and underfunded relative to its legal obligations and the amount of public interest in its activities. The nature of project planning and budgeting

also were raised as factors that limit the approach to CEA. Environmentalists argue that providing a picture of the long-term plan for an area would give a better sense of the management intentions of the agency and potential cumulative impacts. Both outside observers and USFS personnel also raise the issue of funding. The continued use of timber targets leads to a lack of trust from members of the public, who note that the agency has strong incentives to pursue timber harvest even when it may not be the most effective management strategy. Many USFS personnel want to see the agency move towards targets based on acres treated, in part to build trust with the public, but also to emphasize a more restoration-oriented mission. A need for more funding that is not tied to project-level activities also would help the agency approach CEA at a scale that would allow for more of a meta-analysis of the effects of many projects and environmental changes.

CHAPTER 5: CONCLUSIONS AND WAYS FORWARD

The primary objectives of this research have been to 1) provide an overview of the administrative and legal history of the CEA regulation and how it has been applied by the federal circuit courts, 2) understand how the USFS performs CEA for wildlife and presents the analysis in its NEPA documents, 3) identify factors that affect implementation of the CEA requirement, and 4) consider how to improve CEA in the future. Several general themes guided the research and were relevant to the findings. These included the challenges of synoptic planning, the difficulties of decision-making in light of data/knowledge gaps and scientific uncertainty, the variety of political factors that affect regulatory implementation, and the challenge of determining how CEA fits into National Forest decision making and planning. This chapter revisits the most salient findings of this research in terms of these objectives and themes and then turns to the question of how to improve both CEA and wildlife analysis as it is done by the USFS. The last section provides recommendations based on the findings of this research.

5.1 Major Research Findings

Lessons from the Case Law Analysis

The case law analysis and regulatory history of the CEA requirement leave little doubt that the regulation is a logical outgrowth of NEPA and a fundamental component of NEPA analysis. Courts have enforced the requirement since the 1970s. The first CEA case decided by a circuit court was *Natural Resource Defense Council v. Callaway* (1975) in which the Second Circuit required the Army Corps of Engineers to analyze the

cumulative impacts of a proposal to dump waste off of the coast of Connecticut in light of other current and foreseeable dumping activities by both state and private parties. The requirement to analyze cumulative impacts of past, present, and reasonably foreseeable (even those that have not been formally proposed) was upheld in numerous court cases in the decades that followed, with courts requiring analysis of, for example, the impacts of multiple projects in the same watershed or multiple activities that might cumulatively affect a species of interest (see *LaFlamme v. FERC* (1988) and *NRDC v. Interior Department* (1988)). Other cases established that some degree of CEA is required at both the plan and project levels of analysis in National Forest management (see *Tenakee Spring v. Clough* (1989), *Resources Ltd. v. Robertson* (1993), and *NRDC v. USFS* (2005)). Courts have also enforced requirements to analyze connected and cumulative actions in a single EIS (see *Thomas v. Peterson* (1985) and *Blue Mountains Biodiversity Project v. Blackwood* (1998)). While these latter two requirements differ from the CEA requirement, they also involve across-project analysis of cumulative impacts.

The late 1990s saw a rise in successful challenges, particularly in the Ninth Circuit, against federal agencies for failure to analyze cumulative impacts. The U.S. Forest Service (USFS) in recent years has lost a number of cases in the Ninth Circuit regarding the sufficiency of its CEA, although the agency has been more successful in the Tenth Circuit. In general, recent cases on CEA have required the agency to better document its rationale for choosing the scope and scale of a CEA and the rationale and empirical basis for conclusions regarding potential cumulative impacts. The courts have also ruled that data used to support a CEA cannot be significantly out-of-date or incomplete, particularly without acknowledgement on the part of the agency as to the

limitations of its data (see *Lands Council v. Powell* (2004)). The USFS also cannot postpone NEPA analysis until after a project has been implemented, nor can it tier analysis either to a non-NEPA document or a programmatic document that is too general to suffice for project-level analyses. Choices that contradict decisions or statements made in other agency analyses or reports also get the agency into trouble in court. Otherwise, as long as the agency provides some documentation and rationale for its choices, beyond relying on unsupported claims of expertise, courts generally have ruled favorably and afforded the agency deference in terms of its chosen approaches and methodologies for doing CEA.

There are several areas, however, in terms of the case law where the requirements of CEA are less clear. These issues reflect in large part the fact that the CEA requirement is huge in scope and difficult to implement. For instance, questions remain as to how much CEA should be done at the plan level or whether the CEA in project level analysis can adequately capture large-scale and long-term effects. For this reason, the courts have ruled differently on this issue depending on the context. For example, in some cases, such as *Resources Ltd. v. Robertson* (1993), courts have allowed the agency to postpone analysis of private land activities until project level analysis. However, in *NRDC v. USFS* (2005) the Ninth Circuit required the Tongass National Forest to include an analysis of state and private land activities in its forest plan EIS, largely because, as the court saw it, that analysis would significantly affect choices about how to allocate uses on federal lands in the forest plan. Thus, it has not been entirely clear what degree of CEA has been required in plan level analyses, although this may be less of an issue in the future as plans will now be categorically excluded from NEPA analysis. Also, courts

have required some degree of analysis of private lands, but the extent to which courts have looked for this has varied from one context to the next. Although it is to be expected that legal decisions will vary depending the facts of the case, legal scholars have argued that consideration of private lands as part of a CEA is one aspect of the requirement that has yet to be enforced fully by the federal courts (Hart, 2002).

The issue of how to include an analysis of past actions is also a facet of the CEA requirement that has yet to be settled. Two of the most recent published court cases on CEA in the Ninth Circuit, *Lands Council v. Powell* (2004) (hereinafter *Lands Council*) and *NRDC v. USFS* (2005), required the agency to catalog or list all past actions relevant to the CEA along with the effects of those actions. The Council on Environmental Quality (CEQ), however, issued guidance that such a cataloging of past actions and effects was not necessary to comply with the CEA requirement (CEQ, 2005). The Idaho Panhandle National Forest (IPNF), which served as the focal forest for this research, was involved in the challenge in *Lands Council* (2004). Subsequent to that decision the IPNF made the case that past actions can be listed, but that providing details on the effects of those individual actions is not useful to a CEA. Instead, and in accordance with the CEQ guidance, the IPNF states that a portrayal of current or existing conditions represents the cumulative impacts of past actions. This issue is one of the most contentious and problematic aspects of CEA, and there is at present no agreement among the courts, the public, CEQ, or even internally among USFS staff as to what exactly the CEA requirement necessitates in terms of an analysis of past actions.

A final unresolved issue in terms of the legal requirements of CEA is where such an analysis fits in with the increased use of categorical exclusions (CatExes) of projects

from NEPA analysis (see GAO, 2006 for details on this trend in terms of vegetative management projects). The Ninth Circuit in *Sierra Club v. Bosworth* (2007) enjoined one of the USFS' CatEx categories for fuels treatments in large part based on the lack of a CEA during the creation of the category. The Tenth Circuit has been more reluctant to rule against the agency in terms of a CEA either for individually CatExed projects or for CatEx categories. However, the case law and general logic behind how CEA is dealt with for CatExed projects, particularly those that fall under some of the current categories for vegetative management by the USFS, leave unanswered the question of exactly how and when cumulative effects will be accounted for. According to the Tenth Circuit, potential effects from CatExed projects will be accounted for through project scoping and the consideration of "extraordinary circumstances" that may lead to cumulative impacts. However, neither of those processes requires the agency to initiate a formal analysis of cumulative impacts. It is not entirely clear how the agency will account for cumulative impacts from multiple CatExed projects, which individually may have effects beyond project area boundaries and cumulatively may have significant effects on resources such as wildlife habitat.

General Findings from the IPNF Case Study

One of the primary findings of this research is that there are serious challenges associated with determining the appropriate scale of analysis for CEA. This is a particularly tricky aspect of the requirement and is a conundrum in terms of environmental effects analysis that has yet to be solved. In the case of forest management, with the USFS categorically excluding both forest plans and numerous

smaller projects from in-depth NEPA analysis, the bulk of CEA will now fall to those projects for which environmental assessments (EAs) or environmental impact statements (EISs) are completed.

Aside from a broad-scale assessment that might accompany a forest plan, there is no obvious place where an analysis of the cumulative impacts of multiple projects, particularly those that are categorically excluded, would occur. Without some kind of programmatic or forest-wide assessment of the status of resources, cumulative losses may be overlooked. As we saw in the preceding chapters, even for projects that are accompanied by an EIS, a number of aspects of CEA might be missed in project-level analyses. Recall that the IPNF's EISs indicate just this in terms of potential effects to wildlife species. The forest acknowledges that to truly assess population viability would require looking at species on the forest or regional scale and that such an analysis is beyond the scope of project level analyses. Given that the assessments that accompany forest plans will occur as infrequently as forest plan revisions occur, and that forest plans themselves will no longer be accompanied by a NEPA analysis such as an EIS, it is unclear where and when this broad scale cumulative impacts analysis will ever take place, particularly for wildlife species.

The USFS has acknowledged this fundamental challenge with regard to CEA, and a discussion of this matter mirrors some of the major controversies in forest management, including questions as to the purposes of forest planning, whether forest plans must build upon lessons learned from previous plan implementation, how to make planning more adaptable and responsive to changing conditions, and how and when to account for cumulative impacts. Speaking to this last point in its most recent record of decision

regarding its new planning regulations, the USFS writes, “Throughout 28 years of land management planning, the Agency has learned that tiering to the cumulative effects analysis in a plan EIS did not provide nearly as much useful information at the project or activity level as the Agency had expected.”¹ This is one of the primary reasons given for why the agency will no longer require an EIS in conjunction with a forest plan. The agency goes on to explain, “Meaningful cumulative effects analyses cannot be conducted until project design and location are known or at least reasonably foreseeable.”²

Therefore, CEA will be shunted to the project scale. Commenters on the rule noted, however, “[W]ithout a plan EIS, cumulative effects and impacts to forest-wide resources would now have to be evaluated in each project decision.”³ To this the USFS responds that it is a misconception that forest-plan EIS provided useful cumulative impacts information; on the contrary, such plan EISs were usually “speculative and quickly out of date.”⁴ For this reason, such impacts will be better handled at the project level.

However, as we have seen, forest-wide analysis at the project level is unrealistic. Specialists must have something to tier to or some broader scale analysis that can inform analysis at the project level. Numerous USFS interviewees explained that the burden of analyzing CEA under the new planning rules will increase at the project level, but no one provided a clear answer of how this burden might be met.

The 2008 rule provides some indication, however, of how the agency plans to handle this problem. The record of decision explains that in order to make forest plans

¹ 73 Fed. Reg. 21468, 21473, Apr. 21, 2008.

² *Id.* at 21473.

³ *Id.* at 21484.

⁴ *Id.* at 21484.

more adaptable, a comprehensive evaluation report (CER) will accompany every forest plan and will be updated at least every five years. The USFS explains,

This evaluation, along with information from annual evaluations and other sources, would be part of the continually updated plan documents or set of documents that would be considered in project analysis. These up-to-date plan documents or set of documents would provide a better context for project cumulative effects disclosures than previously provided by programmatic plan EISs under the 1982 rule; therefore, the Forest Service would make better informed management decisions at the time it decides to propose projects under the plan. However, the comprehensive evaluation report will not have a cumulative effects disclosure like the EISs under the 1982 rule had.... Those cumulative effects will be analyzed and disclosed at the time the projects and activities are proposed....⁵

In other words, the agency is acknowledging that some kind of broader scale analysis is necessary to inform CEA at the project level, and some of this information will be provided in the CER. And yet, no CEA will be done in the CER or for the forest plan, and a forest-wide CEA for any resource will almost certainly still be beyond the scope of project-level analysis. The most optimistic scenario would be that project-level analyses will include a kind of broad-scale CEA, in part based on the CER, unlike that which we have ever seen in a project-level analysis, but the truth there is no reason to expect this. Unfortunately, the approach put forth by the USFS is not obviously different than what is already in place. Five-year monitoring reports and annual monitoring summaries, both of which were required under the 1982 planning rules, are currently meant to inform project-level analyses.⁶ Despite these monitoring reports, project-level analyses fail to address large-scale cumulative impacts, which also are not meaningfully dealt with at the plan level.

⁵ *Id.* at 21483.

⁶ This provision was found at 36 C.F.R. 219.10 (g, h) in the 1982 rules.

The truth is that the new approach is just more of the shell game with regard to CEA as necessary for forest-wide resources, and several factors make the new approach worse than the old one. For one, the standards for maintaining wildlife populations have been weakened, as is discussed in more detail below. Furthermore, while no additional analysis has been added, one level of analysis, the EIS accompanying the forest plan has been lost. At least that EIS would have required some kind of CEA, something we should not expect to see in the CERs. Forest-wide CEA remains as elusive under the new planning rules as it has been in the past. And, the fact is that until the USFS implements a scientifically defensible, frequent, broad-scale, and iterative monitoring strategy, only limited CEA will be possible. Monitoring, along with meaningful definitions of desired conditions that are specific and defined in terms of measurable objectives, will be necessary if there is to be any real analysis of changes to resources over time and consideration of whether the USFS is achieving its management goals.

Also related to the challenge of scale is the matter of how to account for past actions. The analysis in this research of recent IPNF NEPA documents reveals that cumulative impacts are most often presented through a portrayal of the environmental baseline or current conditions. No additional analysis of the specific effects of individual past actions has been added as a result of the *Lands Council* (2004) decision, and in fact the IPNF has argued that this is not necessarily or useful. Unfortunately, the IPNF's approach, which relies on a portrayal of the environmental baseline as an indicator of cumulative impacts, is insufficient for understanding long-term cumulative impacts. A CEA should tell us how resources have changed over time in specific terms and over the course of management cycles such as forest plan implementation. There is no doubt that

it would be difficult to tease out what impacts resulted from management activities. Establishing clear causal relationships would require controls in both space and time with which to compare areas that have been treated and measure effects. Nonetheless, one might imagine that at the least the USFS could say something like, “In the last 20 years, x amount of habitat for this species has been lost due to management activities.” This is precisely what the requirement asks for: a portrayal of cumulative impacts over time as a result of the actions of both public and private entities. However, at present the only portrayal of cumulative impacts available for some resources is a comparison of the environmental baseline (or current conditions) compared to some broad estimate of what conditions may have looked like at some distant point in the past. This gives us no sense of how resource conditions have changed in more specific terms or over the course of forest plan implementation, nor does it provide any indication of how we arrived at current conditions.

For wildlife species the approach is especially problematic. Currently the IPNF analyzes effects to wildlife based on changes to habitat availability. Forest-wide viability analyses are not available for any species, although some regional viability analyses have been done and minimum habitat thresholds have been established for a few species (Samson, 2006a, 2006b). Cumulative impacts to species are said to be embedded in environmental baseline conditions, or conditions at the time of the analysis. No specific information is ever provided by the IPNF as to how much habitat for a species has been lost over say the last 20, 50, or 100 years; one would have to piece together a very rough sense of this based on changes in vegetative communities.

The IPNF has little to no information on the status of populations on the forest and uses habitat as a proxy for estimating whether species may be present. The methods for estimating habitat availability suffer from a number of problems, such as the use of vegetative communities as a proxy for habitat. Compounding this problem is the fact that the species-habitat relationships for many species are not well known. However, even if we accept that these rough estimates of habitat availability are useful as indicators of population status, still at no point in any EIS reviewed for this research was a useful indication of cumulative impacts to habitat availability given.

If we step back for a moment, we can ask, at its most basic, what should a CEA tell us for wildlife? Fundamentally we would want to know how and why population numbers have changed on a forest (or some other meaningful landscape scale) over time. For instance, we might ask what is the current status of resources compared to various points in the past. This might provide some indication of whether a forest is meeting its desired conditions for a species and how the species may have been affected over time by management actions. Because the IPNF currently has limited direct monitoring information on the status of populations, at the very least it would be useful to know how much habitat has been lost. This would serve as some indication of whether populations might be in decline and would be fundamental to complying with the requirement to disclose cumulative impacts, which involve changes in resource conditions over time.

Some kind of threshold is also necessary for providing a sense of whether significant cumulative impacts have occurred. Tear et al. (2005) explain that the data gaps with regard to our understanding of most species are extensive and that establishing minimum thresholds for viability is hugely difficult. They write that for the majority of

species and ecosystems, there is not enough information available to determine minimum thresholds. Given this, it might be most useful to think of thresholds as pre-established trigger points that raise the red-flag of potentially significant effects. Thresholds could also be given as a range of conditions that likely reflect significant threats to resources. Once thresholds are reached, this might then trigger reconsideration of management strategies for particular areas, habitat types, or assemblages or species.

At present none of this information is available. Some sort of threshold for long-term cumulative impacts is provided through estimates of minimum habitat needs for wildlife species by Samson (2006b). However, this work suffers from a serious lack of credibility, according to numerous people I interviewed, both inside and outside of the USFS. More broadly, there is significant debate as to whether habitat is a useful indicator of population status, whether species-habitat relationships are known in enough detail to justify the habitat-based approach, if methods for estimating habitat are accurate, and also whether the analyses used to justify findings of no significant effects to species are reliable. The bottom line is that in the case of the wildlife resource, the agency must move towards providing an accounting of how habitat availability has changed over time, obtaining more information on species-habitat relationships so that its estimates of habitat availability are more accurate, and doing some degree of monitoring in order to better understand the effects of management actions on populations as well as the current status of populations. The scientific bases for analyses also must be valid and credible if the USFS is serious about meeting its stewardship mandates with regard to resources like wildlife and building trust with members of the public who are actively involved in forest management decisions.

Another issue that emerged repeatedly over the course of this research involved the limitations of synoptic planning. Many interviewees suggested that post-project cause-effect and implementation monitoring are both necessary for improving NEPA analysis and management activities in general. Without high-quality monitoring information, understanding and learning from the cumulative impacts of numerous management actions is impossible. The uncertainty of whether mitigation measures discussed in EISs are actually undertaken also is a serious concern.

Beyond this is the problem that the synoptic approach of NEPA sometimes clashes with the act's public participation requirements; the NEPA process ends up serving as a limited venue for discussing some of the most enduring conflicts in forest management. For this reason, CEA is raised repeatedly in public comment letters as a way to get at many contentious broad-scale issues in forest management, such as the efficacy of fuels treatments, the loss of old-growth forests and habitat connectivity, and the scientific uncertainty around the status of populations. Project-level NEPA analyses serve as an imperfect venue for addressing such issues, and USFS staff are frustrated at receiving and responding to the same comments repeatedly. However, it is not always clear where else members of the interested public might more effectively raise such issues.

In summary, there are several significant factors that limit the agency's ability to perform CEA. The lack of post-implementation and broad-scale monitoring is one of the biggest impediments to improving how CEA is done. But, while scientific uncertainty certainly poses serious challenges, there are some manageable data and knowledge gaps that might be effectively addressed through increased or improved leadership.

Coordination of monitoring strategies and information that is already available, as well as improved communication among resource specialists, all could improve CEA and wildlife analysis in general.

Disagreement over the thrust of the requirement, how to handle problems of scale, and how to incorporate analysis of past actions also are serious impediments.

Additionally, limited funding and staff were also cited as impediments to improving monitoring and learning. The nature of funding, which is still largely tied to individual projects and to timber targets, was also cited as an impediment to improving CEA in that it limits the agency's ability to undertake broad-scale monitoring and evaluation. The presence of timber targets undermines trust with the public and creates an incentive to cut timber first and foremost despite the fact that the agency is ostensibly increasingly focused on ecosystem management and restoration. Reconsideration of how the USFS should be funded is more than can be tackled in this analysis, but is an area that might be looked at to improve the way that monitoring is funded and the way in which restoration is approached by the USFS.

5.2 Ways Forward

Throughout this work I have highlighted a number of areas for improvement with regard to NEPA implementation, wildlife planning, monitoring, and other factors. I have made a number of suggestions for improvement of CEA implementation, but two areas in particular merit a bit more discussion than was provided in the previous chapters. There is ample discussion in the academic literature about how to improve the way the USFS and other land management agencies approach wildlife planning and analysis and also

some useful ideas on how to better integrate science into the planning process in a way that is credible and transparent. These suggestions provide some insight into how the USFS could move forward, particularly in terms of how it approaches planning for wildlife conservation.

There are currently limitations to how the USFS does wildlife planning, and members of the scientific community and agency-commissioned task forces have devoted a significant amount of attention to the question of how to improve wildlife planning on National Forest lands. Addressing this challenge is no small task. Noon et al. (2008) write, “Despite the importance of multispecies conservation planning from both a legal and practical perspective, we believe that current scientific understandings and methods provide only limited guidance to land managers. Studying multiple species and the range of spatial and temporal scales that they span has been identified as one of the key challenges in conservation biology” (Noon et al. 2008, p. 51).

A group of population biologists, including Barry Noon, a wildlife biologist with a long history of involvement in National Forest management, devoted a 2003 article in *Bioscience* to the question of how best to conduct conservation planning and biodiversity protection on Forest Service lands. They suggest that a combination of coarse-filter (landscape level assessment of broad assemblages of habitat types and vegetative communities), fine-filter (assessments of the status of individual species), and population viability analysis (species-specific models based on demographic data) be used together for effective biodiversity conservation on National Forests. They conclude that none of these approaches alone will serve to adequately protect biodiversity on public lands but could be effective if used in combination. Particularly, they recommend that formal

population viability analysis (PVA) be undertaken for species in decline or at high risk or for focal species, which they define as species with high functional significance in an ecosystem.

As Noon et al. (2003) note, their recommendations echo those of the second Committee of Scientists, which was convened in 1997 to make recommendations for revision of the USFS planning regulations. Those recommendations suggest maintaining the viability requirement for wildlife species and utilizing fine-filter approaches for focal and indicator species as well as species-at-risk, such as those listed under the Endangered Species Act (Committee of Scientists, 1999). In other words, Noon et al. (2003) and the Committee of Scientists both recommend that an *increased* level of fine-filter and species-specific analysis be undertaken by National Forests in order to protect biodiversity.

Increased use of fine-filter approaches and PVA would augment the USFS' current approaches to species planning. As we have seen, some assessments of species viability based on habitat availability are conducted for individual species but the efficacy of those approaches is essentially unknown without some kind of direct population measurements. To date in National Forest management, formal PVA for forest species is a rarity. A 2001 panel of scientists in a review of several of the most high profile broad-scale assessments in forest planning, including the Sierra Nevada Forest Plan, Northwest Forest Plan, Tongass Forest Plan, and others, found that demographic analysis was rare and had only been employed for one species (the northern spotted owl) (Andelman et al. 2001). One other species, an orchid, was analyzed using metapopulation analysis (Andelman et al., 2001). Although scientists have recommended some incorporation of

PVA into forest planning, so far this level of analysis is uncommon, and the IPNF is not unusual by any means in its lack of analysis of population trends for wildlife species.

Demographic models of population viability could give us more information on the actual status of populations but are information intensive. Because of the scientific uncertainty that necessarily is involved with PVA, Tear et al. (2005) suggest that in the context of alternatives analysis, “PVA is more appropriately used...for comparing the relative effects of differing management actions on population growth and persistence than for determining a specific minimum population size or extinction probability” (p. 840, internal citations omitted).

However, despite the challenges of conducting PVA for various species, it is apparent that much of the scientific community recommends that in order to meet its obligations to protect biodiversity, the USFS undertake more fine-filter analysis and develop PVA models for some species. These recommendations were reflected in the 2000 planning rule, based on the Committee of Scientist’s recommendations, but that rule was quickly suspended.⁷ The 2000 rule was replaced with a series of planning rules that culminated in the 2008 rule that currently guides forest planning. In that rule, the viability requirement has been removed and more emphasis has been placed on the use of coarse-filter approaches to maintaining diversity. In the 2008 rule, the USFS explains, “Ecosystem diversity is the primary means by which a plan contributes to sustaining ecological systems.”⁸ In other words, the coarse-filter approach to species conservation, which focuses on maintaining broad habitat types and conditions, is the primary methodology that will be used to protect biodiversity. The rule goes on to say that if the

⁷ The 2000 rule was published at 65 Fed. Reg. 67514 (November 9, 2000).

⁸ 36 C.F.R. §219.10(b)(1) (2008).

responsible official deems it necessary, s/he can also make additional provisions for protection threatened and endangered species, species-of-interest, and species-of-concern.⁹

The USFS' move in this direction towards focusing on ecosystem diversity as an adequate approach for protecting wildlife is contrary to recommendations from the scientific community, the Committee of Scientists, and an additional expert panel on biodiversity conservation that was convened at the request of the USFS (see Andelman et al. 2000) as to what is needed to strengthen protection for wildlife species on National Forest lands. Of great concern is the fact that the new planning rules include no detail as to what level of ecosystem diversity will be deemed sufficient. In terms of wildlife conservation, Noon et al. (2008) write that, as a result of the new rules, the USFS no longer has to apply any fine-filter analysis for species or do any direct monitoring of species and their responses to management actions. What is perhaps most alarming is that the efficacy of the new biodiversity conservation approach has not been established. Noon et al. (2008) explain:

While maintaining a diversity of vegetation types is far easier to implement and monitor than is the maintenance of viable populations of multiple species, there

⁹ 36 C.F.R. §219.10(b)(2) (2008). To get a sense of this approach, consider the Draft Comprehensive Evaluation Report (CER) for the Kootenai/Idaho Panhandle Zone forest plan revision, which lists terrestrial mollusks and the American Peregrine Falcon as its species of concern. For these species some direct monitoring and protection of occupied sites will take place. Species of interest include many of the previous management indicator or regional forester sensitive species. Management for these species is not obviously different from the broad direction to manage for ecosystem diversity. For example, fisher are listed as part of the "aquatic/riparian group," and the CER explains for this group, "Habitat components for each of these species will be maintained or restored through the Proposed Land Management Plan components for watershed and aquatics. Plan components for ecosystem diversity will provide for the upland portion of fisher habitat requirements" (Draft CER at p. 2-87). The draft CER is available online at: <http://www.fs.fed.us/kipz/documents/plmp/index.php> (last accessed April 1, 2009). USFS personnel involved in forest plan revision indicated that the forthcoming CER will have more detailed information as to what kind of analysis will be required for species of interest.

is little guidance concerning how vegetation diversity alone can be used to infer the conservation status of unmeasured species. The reality is that the composition and configuration of vegetation types and successional states needed to sustain multiple species over the long term is unknown (Noon et al. 2008, p. 74, internal citations omitted).

The approach is further weakened by the limited amount of detail with regard to habitat characteristics available through reliance upon broad-scale forest vegetation data such as Forest Inventory and Analysis (FIA) data (Noon et al. 2008). Given these multi-layered problems with coarse-filter analysis, there is reason to be concerned about the future of wildlife conservation on USFS lands. Particularly for threatened, endangered, keystone, endemic, or other indicator species, Groves et al. (2000) write, “Because of their rarity, habitat specificity, or area needs, the majority of species in these categories are unlikely to be conserved by a focus on either community or ecosystem or abiotic targets” (p. 503).

Without direct monitoring of the species there is almost nothing that provides the USFS with empirical evidence of the status of populations, the accuracy of coarse-filter approaches for estimating population status, or the effects of management actions on populations. As one USFS staff member put it, the way the USFS currently approaches wildlife conservation is essentially through a “data-free analysis,” and the proposed approach under the 2008 rule will be even less rigorous than what is done now. It may be a little much to say the approach is based on no data whatsoever, but the empirical foundations of how the IPNF currently manages for wildlife are weak. Beyond general information on vegetative stands and estimates of how those stands may constitute habitat for species, there is limited quantitative evidence of species presence, species-habitat relationships for most species, the accuracy of vegetation data for approximating habitat, or the long-term cumulative impacts of management actions on species. By removing the

viability requirement and requirements to monitor the status of management indicator species, the USFS will now be required to be even less rigorous in its approach to species conservation. This is not to say necessarily that the USFS' methods will not improve, but it is clear that the legal requirements for species conservation have been weakened.

What could the agency be doing to better understand impacts to species?

One promising avenue is the potential to use genetic sampling to estimate species abundances, movement patterns, and distribution (Cushman et al., 2006; Noon et al. 2008). Non-invasive sampling and even the use of older samples from previous research could be used to understand a number of factors regarding changes in species distribution and abundance. This approach is still being developed but in the future will provide a much more cost-effective way to understand that status of populations, in part because representative and large samples are relatively less important for the methodology to be effective (Noon et al., 2008). Researchers at the Rocky Mountain Research Station indicated in interviews for this research that monitoring through genetic sampling is one of the most promising ways that wildlife monitoring will improve in the future.¹⁰

However, while genetic monitoring may be able to provide some indication of abundance and distribution of species, it also will not replace monitoring methods that are designed to determine how populations respond to management actions or other factors in the short term.

Another factor that is discussed frequently is the fact that not all species can be monitored directly and therefore some will have to be prioritized. Nearly all the

¹⁰ This topic also was the subject of a recent *New York Times* article by Jim Robbins entitled "Tools That Leave Wildlife Unbothered Widen Research Horizons" (March 9, 2009). The article discusses the uses of genetic monitoring and its advantage over traditional capture-mark-recapture methods for estimating wildlife population abundances.

scientific literature on wildlife planning offers suggestions as to how to choose priority species for monitoring. Most suggest the direct monitoring of species-at-risk, such as those that are listed as threatened or endangered, as well as species that are expected to respond to management actions or those that play a significant functional role in an ecosystem (referred to by some as focal or keystone species); much more detailed recommendations can be found throughout the literature on how to appropriately prioritize species for monitoring (Andelman et al., 2001; Committee of Scientists, 1999; Holthausen et al., 2005; Noon et al., 2003; Noon et al., 2008).

Prioritizing wildlife conservation areas and habitat is also an option for improving how they agency goes about planning for wildlife conservation. As noted previously, coarse-filter approaches will have to be coupled with fine-filter approaches, and one way to improve coarse-filter strategies will be to identify areas to target for wildlife conservation. Measuring and protecting habitat alone is not likely an effective way to go about species conservation, but identifying priority habitats for conservation is one piece of the complicated puzzle of landscape level planning to protect biodiversity. The Nature Conservancy has taken some unique approaches to prioritizing habitat, often by considering priority watersheds for biodiversity conservation. Groves et al. (2002) describe a step-by-step process where biotic, abiotic, and socioeconomic factors, along with patterns of land use ownership, are identified for a landscape; then, a variety of algorithms can be run to identify conservation priority areas. Planners can input minimum size requirements or stipulations that prioritize public lands or connectivity if desired. Groves et al. (2002) provide an example of a process to prioritize conservation areas along watersheds (6th code hydrological unit codes) for the Middle Rockies-Blue

Mountains Ecoregion and suggest that these methodologies might help planners identify areas to emphasize for conservation.

A similar process has been undertaken by Alaska Audubon and the Nature Conservancy for the Coastal Forests and Mountains Ecoregion, which is made up largely of the Tongass National Forest. The process has provided an inventory, analysis, and assessment of conservation value for the region and was designed to support decision-making by the National Forest by helping to identify conservation priority watersheds. The Conservation Assessment for the ecoregion emphasizes the importance of planning and conservation on the watershed scale, which the authors explain will prevent fragmentation, the removal of key habitat components, and increased use by humans that threatens ecological values. The authors of the Conservation Assessment note that ecological research has indicated that, at least in that region, watersheds are the most appropriate scale for planning, conservation action, and evaluating cumulative impacts. They explain, “[B]ecause watersheds define an appropriate ecological unit where human impacts tend to accumulate and can be measured and because of their value for key ecological processes and the global rarity of intact watersheds, identifying and representing a range of intact watersheds should be included as part of any credible, systematic, science-based conservation analysis.”¹¹

While it may seem that advocating for some prioritization of habitat by watersheds contradicts the notion that coarse-filter approaches are relatively untested as a means to protect biodiversity, it is key to recognize that both coarse- and fine-filter approaches have their utility. As Groves et al. (2000) acknowledge, planning on this

¹¹ From Chapter 10, p. 4 of the Conservation Assessment, which can be found at: http://home.gci.net/~tnc/HTML/Consv_assessment.html.

scale in part rests on “assumptions that remain inadequately tested (e.g., surrogate measures for biodiversity) and methods that are not yet fully developed...” (p. 510). However, given ongoing losses to biodiversity, they write, “[T]he urgency of the conservation mission demands that conservation plans based on the best available scientific information and methods be implemented now, while explicitly acknowledging their limitations and working toward their improvement” (Groves et al., p. 510).

The key to incorporating such approaches will be monitoring. As Noon et al. (2008) write, with regard to several landscape level planning efforts, “[T]here is too little empirical support at the temporal and spatial scales required for comprehensive conservation planning to support the use of any of these conceptual tools without close monitoring of the desired outcomes” (p. 62). Essentially what is needed is an adaptive management strategy, with monitoring, implementation of various conservation or land-use approaches, and repeated periodic monitoring to verify conditions and adapt activities accordingly. Two Rocky Mountain Research Station Scientists offer suggestions for precisely how to improve monitoring strategies so that they serve as a solid foundation for adaptive management and understanding the effects of planning and management activities. Cushman and McKelvey (in press) begin with the basic premise that “[c]ost effective, timely, representative, and broad-scale monitoring of multiple resources is the foundation upon which adaptive management depends.” The key to their monitoring strategy is that it include large-sample, multi-scale, and georeferenced data on multiple ecosystem attributes. Rather than averaging across the vast spatial and temporal complexity present in landscapes, that complexity must be incorporated into monitoring data for understanding ecosystems. Furthermore, they write, “Given the spatial, temporal

and contextual nature of ecological systems, frequent remeasurement across large spatial sampling networks is fundamentally important.” One of their key recommendations is also the direct monitoring of resources, given the uncertainties associated with the use of proxies or surrogates. They also emphasize the need for large samples that provide statistically powerful inferences regarding conditions, and data collection at least every five years.

If we applied this vision to monitoring for species, that monitoring would be based on multiple points of detection, coupled with ecological data from multiple scales, in order to build a more solid understanding of species-habitat relationships. This kind of data could then provide a basis for understanding potential cumulative impacts to species based on changes to habitat, but predictions would have to be verified with iterative, long-term direct monitoring of populations themselves in order to evaluate and improve models. The key here is the need to utilize monitoring in order to test proposed relationships between coarse-filter ecosystem attributes and population responses. As Cushman and McKelvey (in press) explain, if we only ever monitor proxies, such as vegetation structure and type as a measure of habitat availability, our assumptions about species-habitat relationships will remain perpetually untested and uncertain.

Although the approach sounds like it might be prohibitively expensive, Cushman and McKelvey (in press) envision a network of sampling plots and the use of biotic and abiotic data that is already available to create more useful and multi-layered databases. The challenge is also to make ongoing monitoring efforts, and the associated money that is already being spent, more useful. Cushman and McKelvey (in press) write, “[M]ost ecological monitoring to guide natural resources management is severely limited by

failure to adequately consider spatial sampling design, often failure to even establish spatially referenced sampling networks, and inconsistencies across space and through time on what variables are measured, at what scale, and with what methods.” Therefore, some improvements could be made by improving and coordinating current monitoring efforts.

Unfortunately there is no reason to think that an increased budget or organizational emphasis will be directed at improving monitoring. However, there is little doubt that developing a comprehensive, long-term, and iterative monitoring program is what is necessary if the agency is serious about pursuing adaptive management and, in general, better-informed management with regard to desired conditions. Noon et al. (2008) suggest that at the least the improved resolution and availability of remote sensing data will make coarse-filter approaches more useful over time. Incorporation of fine-filter approaches and direct monitoring will likely come along more slowly, and in the meantime it will be key to undertake strategic efforts to prioritize a small cadre of species for monitoring.

Also important will be ensuring adequate communication between scientists and managers. At present there is often a serious gap between the research and management arms of the USFS and in public lands management in general (Noon et al., 2008). Scientific advancements and information may not always be available or readily understandable to practitioners, and more communication between these communities has the potential to improve management strategies. This recommendation could couple nicely with the need for increased credibility of the approaches and tools used by the

management side of the USFS. The need to facilitate more involvement from the scientific community is one area where USFS practice could and should improve.

Some of the Committee of Scientists' recommendations dealt with the need for increased communication and credibility with regard to scientific information used for planning (Committee of Scientists, 1999). In the response to comments for the final rule issued in 2000, the USFS explained that the scientific information used for planning should be subject to peer-review where appropriate and that other scientific checks should be used in order "to ensure that the best science is available to decision makers, is properly analyzed and interpreted, and can be applied with scientific credibility."¹² Under the 2000 rule, broad scientific analyses such as Samson's work would have likely been subject to some peer review. The rule also called specifically for "science consistency checks" and "science advisory boards" to ensure that the relevant scientific information is used in planning and decision-making, that uncertainty is acknowledged, and that scientific disagreements are acknowledged and documented.¹³ Scientific advisory boards were also to be convened at the national and regional levels, overseen by the Deputy Chief of the research arm of the agency, and would have advised the Chief of the Forest Service on issues of national scope.

These regulations would have provided for more of a collaborative relationship between the research arm of the USFS and management and in general would have ensured more of a solid scientific foundation for planning and decision-making. Given the problems identified in this research regarding the validity of some of the assessments used by the USFS and general issues of the scientific credibility of its approaches,

¹² 65 Fed. Reg. 67514 (Nov. 9, 2000) at 67553.

¹³ These provisions were included in the 2000 rule at 36 C.F.R. §§219.24-219.25.

increased use of peer-review and science consistency checks would be a positive step forward. Scientific advisory boards at national and regional levels would also provide a forum for increased discussion within the agency on controversial management questions. This would provide an additional venue within the agency for discussion broad-scale issues that often are central to conflicts over forest management but are too large in scope to deal with at the local or regional level.

Despite the fact that these regulations no longer stand, the use of science consistency checks is something the agency could be doing anyway. In fact, a similar process was undertaken by the Tongass National Forest during its forest plan revision process. In that case managers from the Alaska Region and researchers from the Pacific Northwest Research Station teamed up during the forest plan revision, and both played a strong role in the process. The scientists gathered and synthesized the available data and identified key gaps in the knowledge base for the plan. Those gaps were then addressed through a 5-year research program, funded jointly by the regional office and the research station. That effort resulted in scientific information that was used to inform the next cycle of planning, and some of the research was published in peer-reviewed journals as well (Everest, 2005).¹⁴ Everest (2005) explains that the scientists has a separate role from that of the planners and were charged with developing “credible, value-neutral, scientific information without reference to management decisions” (p. 21). They also assessed the levels of risk associated with different management approaches and conducted consistency checks to evaluate whether “all relevant information was used to reach

¹⁴ The *Landscape and Urban Planning* (Vol. 72) issue in which this article was published contains several other pieces describing the process used on the Tongass to incorporate science into planning.

management decisions, if the information was understood and correctly interpreted, and if managers had acknowledged and documented the risks inherent in the decisions they had made” (Everest, 2005, p. 21). Everest (2005) concludes that the science audits on the Tongass were positive for research and management in that they led to an increased role for scientists and better management decisions. The positive results of the approach were also a primary reason that the notion of science consistency checks were written into the planning regulations issued several years later.

The Tongass science audits serve as an example of how collaboration between USFS research and management could lead to improved scientific bases for decision-making and increased credibility of the science underlying management decisions. It would be exciting to see the Northern Region and the Rocky Mountain Research Station engage in a similar type of collaboration, whether it was to guide forest planning or to support the development of tools, such as management standards or scientific evaluations, used to support decision-making, or to help develop a broad-scale monitoring strategy for the region. This is not to imply that there is no collaboration at present; however, increasing the frequency, transparency, and formality of collaboration with USFS research and other scientists could be a positive step forward for the agency.

5.3 Recommendations

The topic of CEA is broad and encompasses a wide variety of different issues in forest management. The challenges of conducting CEA mirror some of the most pressing issues in U.S. forest management, including design and implementation of a monitoring program to support adaptive management and understand cumulative impacts,

development of scientifically sound and credible analyses to support project implementation, and landscape level planning and analyses for biodiversity conservation. Throughout this manuscript recommendations and options for improvement have been included in the analysis, and I revisit some of those here. Several recommendations can be distilled from this research as the most important avenues for improving CEA practice:

1. Despite CEQ's guidance and the convenience of using the environmental baseline as an indicator of cumulative impacts, the current approach to understanding cumulative impacts from past actions is unsatisfactory. CEQ and the USFS both must reconsider how to handle this challenge and how to improve implementation of this aspect of the CEA requirement in the future. The environmental baseline does not adequately capture how resource conditions have changed over time and does not provide any sense of what the causes of those changes may have been. Changes that have been the result of small, incremental actions, significant changes to resource conditions, *and* the crossing of thresholds all need to be captured in CEA.
2. Measurable objectives and meaningful descriptions of desired conditions must be established so that cumulative impacts to resources can be put into some context. Some kind of threshold, trigger point, or target objective must be identified in order to guide a cumulative impacts analysis. Without a clearly defined desired condition or threshold, it is easier to dismiss impacts as non-significant.

Thresholds for wildlife could reflect a goal, such as maintaining viability, or aim for a more ambitious target, such as maintaining or improving current status of populations. Tear et al. (2005) state that effective conservation of biodiversity will require the setting of measurable conservation objectives and provide guidelines and useful examples of how this can be done.

3. The USFS must emphasize the development of a comprehensive monitoring program that can be used to understand cumulative impacts. Implementation and effectiveness monitoring will both be necessary. A consistent, iterative, and broad-scale monitoring strategy will provide the foundation for adaptive management, which itself rests upon an agency's ability to understand impacts to resources and the factors that are likely causing those impacts. In terms of wildlife species, increased monitoring is necessary in order to understand population status, conduct broad-scale assessments, and better understand species/habitat relationships.
4. The scientific foundations of forest management could be improved by ensuring that scientific information and methods are made available and understandable to managers. Collaboration between USFS research and management should be increasingly utilized to provide peer-review of programmatic scientific analyses and input on programmatic processes such as forest planning. The approaches from the 2000 regulations are possible ways forward. Those recommendations called for increased use of science advisory boards overseen by USFS research,

- peer-review of agency documents when appropriate, open acknowledge of uncertainty in planning, and the use of science consistency checks for processes such as forest planning.
5. The agency could improve the coordination, communication, and dissemination of existing information. Consistent coordination of monitoring efforts, refinement of monitoring data, and communication of the implications and potential uses of data and scientific studies are necessary to maximize the efficacy of efforts that are already taking place. Increased coordination and communication among resource specialists could help to ensure that analyses are conducted in a consistent manner and that specialists are not needlessly duplicating each other's work. The regional offices could play a role in coordinating communication about important new scientific findings, practical methodologies for conducting analysis, and species-specific information to guide management strategies.
 6. Effects from private land activities on resources such as wildlife need to be more meaningfully analyzed. Anecdotally, several scientists with the USFS indicated that a more accurate picture of impacts from private land is possible and that cumulative impacts analyses completed for consultation with the U.S. Fish and Wildlife Service, as required by the Endangered Species Act of 1973, include more detail than what is included in project analyses. In other words, there is room for improvement in terms of how private lands are analyzed in project-level analyses, and a more complete picture of the effects of private land activities

could be provided. Improving the analysis of private land issues in project and plan level analyses will only become more crucial in the West, as population and private land development both increase. This also is an area where the courts could embrace a more probing analysis than what has been required in the past.

7. To improve wildlife analyses, the USFS should continue to work on developing priority lists of species for monitoring and priority wildlife habitat areas, while recognizing that the use of wildlife surrogates and coarse-filter approaches are essentially untested hypotheses. In light of this, direct monitoring of populations will be necessary to some extent. Ideally, rather than move in the direction currently taken in the 2008 rules, the USFS should implement more of a fine-filter analysis in line with the recommendations of numerous ecologists and the agency's own Committee of Scientists convened in 1997 to inform the revision of forest planning regulations. Furthermore, the agency must assess effects to wildlife populations at a scale that is appropriate for that resource. Analyses that consider effects to species at larger landscape and population scales must be undertaken. These assessments also must provide useful guidance for project-level analyses in order to facilitate a meaningful analysis of project-level effects within the broader context.

Several other avenues for improving CEA also should be considered as possible options for moving forward. Environmental advocates and a number of USFS staff recommend that the agency move away from timber targets and use targets based on acres-treated instead. This would increase trust with the public and would assist the

agency in focusing on its restoration priorities. Others have suggested that the agency begin to contemplate altering its planning and budgeting approaches to move towards watershed planning, rather than project-by-project planning. Scientists have argued that in some cases watershed-level planning is more effective for addressing cumulative impacts and for protecting resources. Environmentalists have suggested that watershed-level planning would be more appropriate given the agency's current emphasis on land stewardship and restoration and would provide a clearer picture of the long-term changes and management strategy for an area, which might reduce conflict over long-term planning and effects. Watershed-level planning would have to be coupled with the forest planning process, and it is an interesting possibility to consider for future planning efforts.

If the USFS is serious about implementing an adaptive management strategy, it should consider convening an adaptive management task force to concertedly address questions of how to embark upon what is essentially a new and novel planning paradigm. The task force would have to address questions of monitoring strategies, how to couple adaptive management with requirements for accountability and judicial review, how to write meaningful objectives and decision points into plans so that adaptive management does not become a buzzword for unstructured planning, and how to facilitate the approach institutionally. This task force would ideally involve interagency communication, particularly with CEQ, which has identified a need for an adaptive management task force to look at how the approach would work with the NEPA process. Potentially, a set of pilot projects could be implemented, and future efforts could learn from those pilot projects and from adaptive management efforts that have been

undertaken by other land management agencies. If the USFS is serious that it wants to embrace adaptive management, as it says in its new planning regulations, the challenges of the approach suggest that a thoughtful and concerted effort will be necessary to move in this direction.

These recommendations and options for moving forward reflect the lessons learned from this research based on the legal review, case study, and interviews with numerous knowledgeable individuals who deal with these issues daily. Addressing these issues could improve how CEA is done, especially for wildlife, and also could improve National Forest management and planning in general. A major finding of this research is that the challenges of CEA essentially mirror some of the major challenges of forest management. In order to effectively manage National Forests, the USFS needs to implement planning and monitoring on scales that are more consistent with the relevant scales of analysis for various resources. If effects are more visible or meaningful at watershed or forest-wide scales, then somehow the USFS must find ways to analyze effects on those scales and make those analyses useful for project level planning. These steps also are necessary to effectively understand cumulative impacts. More effective monitoring of resources themselves, coupled with increased knowledge coordination, will serve to improve cumulative effects analyses and also will be necessary if the USFS is to understand the effects of its actions and improve its strategies in light of that understanding. Similarly, strengthening the scientific foundations of its work will improve CEA and will serve to improve the quality of management as well as credibility with public with regard to National Forest management.

Appendix A: Interview Guides

Interview Guide for USFS personnel

How they do/present CEA

1. How has the way you do CEA changed over the last ten years or so?
2. How do you do a CEA for wildlife species?
3. What are some of the strengths/weaknesses of the scientific basis for CEA? How do you respond to criticisms that some analyses are not peer-reviewed or reliable?
4. At what point in the planning process do you begin to analyze CEA? Have you seen cases where it has affected the development or implementation of a project?

Factors that affect how CEA is done

1. How have litigation/public attention affected how CEA is done?
2. How have litigation and public involvement affected the quality of the analysis?
3. With regard to past actions, how are you now analyzing cumulative effects? Does a description of the environmental baseline capture cumulative impacts? Is there a difference between cumulative impacts and reaching a threshold?
4. What are some other factors that affect how you/your forest does a CEA (support, training, guidelines, leadership)?
5. What are some factors that prevent you from doing a better job (data, budgets, time, threat of litigation)?

What is a good CEA and how might it improve in the future

1. Where do you see the agency currently succeeding in their implementation of the requirement? Where could the agency be doing better?
2. How would you characterize the criticisms from the public with regard to the way the forest does CEA?
3. How do you see the process evolving in the future? (Will it be a more important aspect of environmental impact analysis in this region? Will there be more tools and data for doing it? Will it change in light of the new planning regulations? Will it be done more at the project or plan level?)
4. How would CEA ideally be done in the future? What would a good/complete CEA look like? At what level of planning would it take place?

Interview Guide for Non-Profit Personnel/Other Interested Parties

Perspectives on how the agency does CEA/Problems with the analysis

1. Why is the CEA requirement an important issue for your organization? Has it become a more important aspect of EIA in this region?
2. Has the way the agency does CEA changed much over the last 10 years or so? What role did public attention litigation play in affecting how the agency does CEA?
3. In cases where you've raised complaints about CEA in the past, how would you characterize the primary deficiencies in the analysis?
4. What did you hope to gain in terms of how the agency plans or analyzes cumulative impacts? Were those gains realized?
6. How have litigation and public involvement affected the quality of the analysis?
5. Where do you see the agency currently succeeding and failing in their implementation of the requirement?
6. What are some of the current strengths/weaknesses of the science used as part of CEA?
7. Can you discuss how the agency deals with the issue of past actions and any strengths/weaknesses of the approach?
8. What factors do you think affect the agency's ability to do an adequate CEA (time, money, data)?
9. Have you seen any cases where a CEA affected project implementation?

What is a good CEA and how might it improve in the future

1. How do you see the process evolving in the future? Are the tools or data available changing in any way? Will it change in light of the new planning regulations? Will it be done more at the project or plan level?
2. What would a good CEA look like? How would CEA ideally be done in the future? At what level of planning would it take place?

Appendix B: EIS Evaluation Form

CEA Evaluation and Checklist

Project Name:

Location:

Project Summary:

Documentation

Are cumulative impacts listed in the index, table of contents, and/or executive summary?

Where are they found?

Are they done for each resource?

Does the scale of analysis vary by resource?

Are past, present, and reasonably foreseeable future actions discussed for each resource?

Is there a summary of cumulative impacts?

Is there a definition of cumulative impacts?

Are cumulative impacts mentioned in scoping section?

Is there a separate CEA section?

Are procedures and guidelines for conducting a CEA explained?

Wildlife Analysis

What species is it done for?

Is the scale defined? Does it vary by species?

Is the temporal/geographic scale justified?

Are past, present, and reasonably foreseeable actions included in the analysis? How?
Are they listed?

Are actions of non-federal lands considered?

What other kinds of documents and information support the CEA?

What kind of data is used to support the CEA?

What are the effects variables?

How are cumulative impacts presented?

Is there evidence for findings? Is the rationale for findings explained?

Is there analysis as opposed to description of activities?

Are transboundary or global issues addressed?

If cumulative impacts are found to be non-significant for a resource, is this mentioned and explained?

Is there anything notable about the scientific foundation of the CEA or the treatment uncertainty?

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