

**FOR PUBLICATION**  
**UNITED STATES COURT OF APPEALS**  
**FOR THE NINTH CIRCUIT**

LEAGUE OF WILDERNESS DEFENDERS-  
BLUE MOUNTAINS BIODIVERSITY  
PROJECT, an Oregon non-profit  
corporation,

*Plaintiff-Appellant,*

v.

UNITED STATES FOREST SERVICE;  
JOHN ALLEN, in his official  
capacity as Forest Supervisor,  
Deschutes National Forest; BOV  
EAV, in his official capacity as  
Director of the Pacific Northwest  
Research Station,

*Defendants-Appellees.*

No. 11-35451

D.C. No.  
6:10-cv-06302-HO

OPINION

Appeal from the United States District Court  
for the District of Oregon  
Michael R. Hogan, District Judge, Presiding

Argued and Submitted  
March 7, 2012—Portland, Oregon

Filed July 30, 2012

Before: William A. Fletcher, Raymond C. Fisher, and  
Jay S. Bybee, Circuit Judges.

Opinion by Judge William A. Fletcher

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**COUNSEL**

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**OPINION**

W. FLETCHER, Circuit Judge:

This case involves an Experimental Forest Thinning, Fuels Reduction, and Research Project (“the Project”) in the Deschutes National Forest in the eastern Cascades of central Oregon. The Project allows logging and controlled burning on roughly 2,500 acres of the Pringle Falls Experimental Forest. The purpose of the Project is two-fold: to reduce the risk of wildfire and beetle infestation, and to conduct research on ponderosa pine forest management.

The League of Wilderness Defenders–Blue Mountains Biodiversity Project (“the League”) filed suit against the U.S. Forest Service (“the Service”) and Service officials, alleging that the agency’s environmental impact statement (“EIS”) for the Project fails to comply with the National Environmental Policy Act (“NEPA”). The district court granted summary judgment to the Service, relying in part on the fact that the Project involves research in an experimental forest. We affirm.

### I. Background

#### A. Experimental Forests and the Lookout Mountain Unit

In 1931, the Forest Service established the Pringle Falls Experimental Forest within the Deschutes National Forest as “a center for silviculture, forest management, and insect and disease research in ponderosa pine forests.” The Experimental Forest is located in the eastern Cascades, about twenty-five miles southwest of Bend, Oregon. It is administered by the Service’s Pacific Northwest (“PNW”) Research Station and is one of about eighty experimental forests that the Service manages in the United States and its territories. *See generally* Ariel E. Lugo et al., *Long-Term Research at the USDA Forest Service’s Experimental Forests and Ranges*, 56 *BioScience*

39 (2006) (discussing scientific contributions from long-term research projects in experimental forests).

The Service manages its experimental forests under the Forest and Rangeland Renewable Resources Research Act of 1978 (“Research Act”), 16 U.S.C. §§ 1641-1650. The Research Act recognizes that the federal government “has an important and substantial role in ensuring the continued health, productivity, and sustainability of the forests and rangeland of the United States.” *Id.* § 1641(a)(1). It gives the Secretary of Agriculture broad authority to designate experimental forests and to conduct any research within them that he “deems necessary to obtain, analyze, develop, demonstrate, and disseminate scientific information about protecting, managing, and utilizing forest . . . resources.” *Id.* §§ 1642(a), 1643(a); *see also* 7 C.F.R. § 2.60(a) (delegating the Secretary’s authority to the Service). One of the five major areas of research identified in the Act is “protecting vegetation and other forest and rangeland resources . . . from fires, insects, [and] diseases.” 16 U.S.C. § 1642(a)(3).

The Research Act supplements, rather than limits or repeals, other laws that impose obligations on the Service. *Id.* § 1645(e). These include NEPA, which requires that agencies prepare an EIS for any major federal action “significantly affecting the quality of the human environment,” 42 U.S.C. § 4332(2)(C), as well as the National Forest Management Act, which requires that site-specific actions approved by the Service comply with forest resource management plans, 16 U.S.C. § 1604(i). The relevant management plan here is the 1990 Deschutes Forest Plan, which provides that the goal of the Pringle Falls Experimental Forest is “field research activities.”

The Lookout Mountain Unit (“the Unit”) is located within the Pringle Falls Experimental Forest. When the Service added the roughly 3,500-acre Unit to the Experimental Forest in the 1930s, it noted that the Unit was “especially well-suited

for experiments in thinning and pruning and for studies of growth and site factors.” The Unit contains a large block of closed-canopy forest that “may represent some of the most productive ponderosa pine sites in central Oregon.” The Unit has experienced only minor disturbances since 1845, when a wildfire burned most of the trees. The disturbances include thinning in the 1970s and 80s, as well as several completed and ongoing research projects. Aside from these disturbances, trees in the Unit have “grown exceptionally well.”

In 2005, the Service observed that trees in the Unit had grown to such an extent that their density put them at risk of beetle infestation and wildfire. The Service had previously calculated an upper management zone (“UMZ”) with a prescribed stand density index (“SDI”). A stand is a group of trees of similar size, species, and structure growing together. SDI measures density based on mean tree size and the number of trees within a stand. An SDI higher than the UMZ level means that trees are at imminent risk of beetle infestation. In 2007, the Service determined that stands within the Unit had an SDI between 132 and 224 percent of UMZ. This density resulted in a reduced tree vigor, measured by the percentage of a tree’s canopy occupied by green branches, and a slowed growth rate. The Service expressed concern that widespread infestation or wildfire would destroy some of the older trees in the Unit and compromise ongoing and future research projects.

#### B. Study Plan

In December 2007, Service officials at the PNW Research Station began to design a research project that would reduce the fire and insect risk in the Unit while simultaneously addressing scientific objectives. They prepared a Study Plan entitled “Forest Dynamics After Thinning and Fuel Reduction in Dry Forests.” The Plan identified six specific research questions:

1. What set of fuel reduction treatments best accelerates the development of large trees while over the long-term reintroduce[s] natural disturbance processes that provide greater ecosystem resiliency?
2. What is the long-term influence of climate change interacting with a set of fuel reduction treatments on vegetation dynamics and forest structure?
3. Can single cohort stands be readily converted to multi-cohort stands?
4. Do multi-cohort stands share the same risks of multiple, interacting stresses as single-cohort stands?
5. How does the dominant shrub, giant chinquapin (*Chrysolepis chrysophylla*), respond in the near-term to a set of fuel reduction treatments?
6. How does the residual stand structure resulting from a set of fuel reduction treatments interact locally and in the near-term with wind to cause additional structural changes?

A cohort is a group of trees that grew after a single disturbance and thus are roughly the same age. A multi-cohort stand is a group of trees with two or more age classes.

The Study Plan divided the study area into four blocks. It designated five areas within each block for specified levels of logging and controlled burning. It would leave one area undisturbed as a control group and would thin other areas to various SDIs. The Service would then compare the growth of trees in each area. The Study Plan's working hypothesis for the first research question, put simply, is that "removing more

small trees should allow the residual trees to grow to larger diameters.” The Plan would answer some of the research questions within a few years, while others would take several decades.

The Study Plan underwent two rounds of peer review in 2008: first, by six individuals internally; and second, by seven double-blind external reviewers. The Director of the PNW Research Station approved the Study Plan in March 2009.

### C. NEPA Process

The Service began an environmental review of the Project under NEPA while it was still developing the Study Plan. In April 2008, the Service sent a scoping letter to interested parties describing the proposed action. The Service also published in the Federal Register a notice of intent to prepare an EIS for the Project. *See* 73 Fed. Reg. 19,805 (Apr. 11, 2008). In April 2009, the Service sent another letter to interested parties describing the Project and the alternatives that were being considered for analysis. The Service hosted two field trips to the Unit to discuss the proposed Project with interested groups, the first in August 2008 and the second in July 2009. The League participated in the first field trip.

In September 2009, the Service circulated a draft EIS for the Project and received public comments. The Service also consulted with other federal environmental agencies. In November 2009, the Environmental Protection Agency wrote that it was “supportive of the proposed project, both as a means to address the risk of severe insect epidemic or catastrophic fire, and as an opportunity to study forest dynamics after thinning and fuels reduction in dry forests.” In January 2010, the U.S. Fish and Wildlife Service issued a biological opinion pursuant to the Endangered Species Act concluding that the Project would not likely jeopardize the continued existence of the threatened northern spotted owl.

In March 2010, the Service issued the final EIS for the Project. The EIS examines in detail three alternatives — a no-action alternative and two action alternatives. The two action alternatives are variations of the experiment proposed in the Study Plan. Alternative 2, the preferred alternative, would result in logging approximately 27 to 29 million board feet of timber on 2,554 acres — or about 70 percent of the trees larger than 6 inches in diameter at breast height. It would “thin from below” by cutting the smallest trees in an area until the target SDI for a particular area is reached, thereby retaining the largest trees in that area. In order to reach the desired SDIs, Alternative 2 would remove a total of about one-third of all trees greater than 21 inches in diameter within the logged areas, or an average of about nine such trees per acre. It would also construct about one mile of temporary road and perform maintenance over thirty-five miles of existing roads. Alternative 2 would amend the Deschutes Forest Plan to exempt part of the Project area from geographic Eastside Screens restrictions that, *inter alia*, prohibit logging old growth trees greater than 21 inches in diameter east of the Cascade Mountains. In the EIS, the Service describes the Forest Plan amendments as non-significant because they would affect only a small fraction of the Eastside Screens.

Alternative 3 uses the same research design and has the same target numbers as Alternative 2 for SDIs in the various areas of the Project. However, Alternative 3 would leave undisturbed 372 acres of spotted owl habitat that would be thinned under Alternative 2. This would reduce the total logged area in the Project by about 15 percent. The EIS also briefly describes six additional alternatives that it does not consider in detail because they would not meet the Project’s two purposes of risk reduction and research.

The same day it issued the EIS, the Service published a Record of Decision (“ROD”) selecting Alternative 2 and approving the Project. The ROD explains that Alternative 3 would provide less risk reduction and would render the

research design incomplete without any significant corresponding benefit to the spotted owl. The ROD concludes that Alternative 2 “does the best job of meeting the statutory mission of the Experimental Forest by reducing the risk of losing a large portion of it to fire or insects, and incorporating important research into the design of risk-reduction activities.”

#### D. Procedural Background

In September 2010, the League filed suit against the Service and Service officials, alleging that the EIS does not comply with NEPA. The League sought declaratory and injunctive relief.

In May 2011, the district court granted summary judgment to the Service. The court relied heavily on the fact that the Project involves research within an experimental forest. It wrote that “it would be short sighted for the courts to intervene and dictate that the Forest Service consider alternatives that hamper or eliminate research objectives . . . . While the requirements of NEPA still apply, the necessary range of alternatives and hard look are strongly informed by the research objectives of the Forest itself.” The court concluded that the EIS is adequately supported by scientific data and takes a hard look at the significant impacts of the Project.

The League timely appealed. In June 2011, the League filed an emergency motion in this court for an injunction pending appeal to prevent logging pursuant to the first timber sale under the Project. Interfor Pacific, Inc., which had been awarded the timber sale, joined the Service as amicus in opposing the motion. A divided motions panel denied the emergency injunction. Logging under the Project commenced that month and will continue through 2013.

#### II. Standard of Review

We review *de novo* a district court’s decision on summary judgment that an agency complied with NEPA. *Or. Natural*

*Desert Ass'n v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1109 (9th Cir. 2010). We review an agency's compliance with NEPA under the Administrative Procedure Act. *Id.* We may not set aside an agency action unless it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). A decision is arbitrary and capricious if the Service

relied on factors Congress did not intend it to consider, entirely failed to consider an important aspect of the problem, or offered an explanation that runs counter to the evidence before the agency or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

*Lands Council v. McNair*, 537 F.3d 981, 987 (9th Cir. 2008) (en banc) (internal quotation marks omitted), *overruled on other grounds by Winter v. Natural Res. Def. Council*, 555 U.S. 7 (2008).

### III. Discussion

The League argues that the EIS is deficient in three ways. First, the EIS improperly cabins its analysis by specifying a limited purpose and need for the Project, and by considering only Project alternatives that fit predetermined specifications contained in the Study Plan. Second, it lacks scientific integrity because it overstates the risk of wildfire and beetle infestation. Third, it fails to take a hard look at the Project's impacts on tree mortality and on wildlife species that depend on standing dead trees for nesting habitat. We take each argument in turn.

#### A. Project Purpose and Alternatives Analysis

[1] Congress created NEPA "to protect the environment by requiring that federal agencies carefully weigh environmental considerations and consider potential alternatives to the pro-

posed action before the government launches any major federal action.” *Barnes v. U.S. Dep’t of Transp.*, 655 F.3d 1124, 1131 (9th Cir. 2011) (internal quotation marks omitted). Specifically, an EIS under NEPA must “inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.” 40 C.F.R. § 1502.1; *see also* 42 U.S.C. § 4332(2)(C)(iii) (an EIS shall include “a detailed statement [on] alternatives to the proposed action”). NEPA regulations describe the alternatives analysis as “the heart of the environmental impact statement.” 40 C.F.R. § 1502.14. The analysis “present[s] the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public.” *Id.*

[2] The scope of an alternatives analysis depends on the underlying “purpose and need” specified by the agency for the proposed action. *City of Carmel-By-The-Sea v. U.S. Dep’t of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997); 40 C.F.R. § 1502.13 (“The [EIS] shall briefly specify the underlying *purpose and need* to which the agency is responding in proposing the alternatives including the proposed action.” (emphasis added)). The agency need only evaluate alternatives that are “reasonably related to the purposes of the project.” *Westlands Water Dist. v. U.S. Dep’t of Interior*, 376 F.3d 853, 868 (9th Cir. 2004) (internal quotation marks omitted).

The League challenges the EIS’s statement of purpose and need, as well as the range of alternatives that the Service considered. We review the purpose and need, along with the choice of alternatives, under a “reasonableness standard” or “rule of reason.” *Id.* at 866, 868. We first determine whether the statement of purpose and need was reasonable, and then whether the range of alternatives considered was reasonable in light of that purpose and need. *See id.* at 865, 868.

### 1. Statement of Purpose and Need

[3] “[T]his court has afforded agencies considerable discretion to define the purpose and need of a project.” *Friends of Southeast’s Future v. Morrison*, 153 F.3d 1059, 1066 (9th Cir. 1998). “However, this discretion is not unlimited.” *Westlands*, 376 F.3d at 866. Because they determine the range of reasonable alternatives, an agency cannot define the purpose and need of a project in unreasonably narrow terms. *See Nat’l Parks & Conservation Ass’n v. Bureau of Land Mgmt.*, 606 F.3d 1058, 1070 (9th Cir. 2010). “ ‘[A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency’s power would accomplish the goals of the agency’s action, and the EIS would become a foreordained formality.’ ” *Friends of Southeast*, 153 F.3d at 1066 (quoting *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991)).

The statement of purpose in the Project’s EIS provides:

The primary purpose of the proposed project is to reduce risk to the site by reducing stand densities, and lowering susceptibility to catastrophic loss to insects, disease, and fire. By integrating the need to reduce risk to the site with the research goals of the PNW Research Station, treatments would be implemented in such a way that pertinent research questions regarding long-term sustainability of ponderosa pine and mixed conifer forests in a changing climate can be answered.

The EIS identifies two needs for the Project. First, “[t]here is a need to address the risk of a severe insect epidemic or catastrophic fire.” Second, “[t]here is a need to provide operational scale research opportunities through a series of thinning and fuel reduction treatments applied across the landscape.” The EIS explains that this second need “comes generally from

the establishment record for the Experimental Forest, and specifically from the study plan.” The EIS then lists the six research questions from the Study Plan that the Project is designed to address.

[4] In assessing the reasonableness of a purpose and need specified in an EIS, we must consider the statutory context of the federal action. *See Westlands*, 376 F.3d at 866 (“Where an action is taken pursuant to a specific statute, the statutory objectives of the project serve as a guide by which to determine the reasonableness of objectives outlined in an EIS.”). Here, two statutes inform the Project’s purpose and need. The Organic Act gives the Service authority to “make provisions for the protection against destruction by fire.” 16 U.S.C. § 551. The Research Act gives the Service authority to carry out in experimental forests any research experiments that it “deems necessary.” *Id.* § 1642(a). One of the five major areas of research identified in the Research Act is “protecting vegetation and other forest and rangeland resources . . . from fires, insects, [and] diseases.” *Id.* § 1642(a)(3). The EIS’s dual purpose and need of risk reduction and research opportunities comes directly from these statutory authorities.

The League argues that the EIS states “an unreasonably narrow purpose and need” and incorporates “rigid implementation” of the Study Plan. The League contends that, as a result of the narrowness of the stated purpose and need, only a single alternative — the Study Plan — could satisfy them. However, the statement does not incorporate the specifics of the Plan’s proposed experiment. Rather, the statement refers to the Plan because it contains an extensive discussion of the research objectives and working hypotheses behind the six study questions. *See Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 812-13 (9th Cir. 1999) (per curiam) (statement of purpose and need “appear[ed] too narrow” when read in isolation, but was ultimately reasonable because it “expressly incorporate[d]” broader objectives).

As in *Muckleshoot*, some language in the EIS, when read in isolation, suggests that the statement of purpose and need contemplates implementation of the Study Plan. For example, the EIS asserts that it compares the alternatives “for their ability to implement the study plan.” The EIS also rejects a proposed alternative on the ground that it “would not meet the purpose and need of implementing the study plan.” When read in context, however, these and similar statements were directed to the six research questions and objectives described in the Plan, rather than to any rigid implementation of the specifics of the Plan. Thus, the first sentence excerpted above reads in full that the EIS compares the alternatives “for their ability to implement the study plan *and answer the specific research questions.*” (Emphasis added.) Moreover, the stated purpose and need could not have required “rigid implementation” of the Study Plan, as the League maintains, because Alternative 2, the preferred alternative that the Service ultimately selected, removed forty-nine acres of logging from the Plan’s proposed design in response to conservation groups’ concerns about a sensitive cinder butte in the northeast section of the Project area. Alternative 3 deviated even further from the Plan by removing an additional 372 acres in order to reduce the potential impact on spotted owl habitat.

The League bases its challenge in part on an argument that the Service created the Study Plan “prior to initiating the NEPA process.” NEPA regulations require that an agency “integrate the NEPA process with other planning at the earliest possible time.” 40 C.F.R. § 1501.2. Here, the Service began the NEPA process nearly a year before the Plan was finally approved. As described above, in April 2008 the Service sent a scoping letter to interested parties and published a notice of intent to prepare an EIS in the Federal Register. A few months later, the Service hosted a field trip in the Unit to discuss the proposed Project with interested parties and then modified its proposal as a result of these discussions. In reviewing an EIS’s statement of purpose and need, the “touchstone for our inquiry” is whether the resulting alter-

natives analysis “ ‘fosters informed decision-making and informed public participation.’ ” *Westlands*, 376 F.3d at 868 (quoting *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982)). Based on the record before us, we conclude that the purpose and need in the challenged EIS adequately informed decisions by the Service and participation by the public.

[5] In sum, given the purpose of the Research Act, the Project’s location in an experimental forest, and the “considerable discretion” we afford agencies in this area, *Friends of Southeast*, 153 F.3d at 1066, we agree with the district court that the EIS’s statement of purpose and need is reasonable.

## 2. Range of Alternatives

[6] NEPA regulations require that an EIS “[r]igorously explore and objectively evaluate all reasonable alternatives” to the proposed action, including alternatives “not within the jurisdiction of the lead agency.” 40 C.F.R. § 1502.14(a), (c). “The existence of a viable but unexamined alternative renders an environmental impact statement inadequate.” *Natural Res. Def. Council v. U.S. Forest Serv.*, 421 F.3d 797, 813 (9th Cir. 2005) (internal quotation marks omitted). However, “the EIS need not consider an infinite range of alternatives, only reasonable or feasible ones.” *Westlands*, 376 F.3d at 868 (internal quotation marks omitted). An agency need not consider alternatives that “extend beyond those reasonably related to the purposes of the project.” *Id.* (internal quotation marks omitted). The agency must also “briefly discuss” the reasons why it eliminated any alternatives from detailed study. 40 C.F.R. § 1502.14(a).

The EIS considers in detail a no-action alternative and two action alternatives: Alternative 1 contemplates no action; Alternative 2 would log 27 to 29 million board feet of timber on 2,554 acres; and Alternative 3 would log 23 to 25 million board feet on 2,182 acres. Both action alternatives would divide the Project into approximately 20 units, each of which

would be treated to one of five levels of thinning: (1) no thinning (the control units); (2) thinning to UMZ; (3) thinning to 75 percent of UMZ; (4) thinning to 75 percent of UMZ with creation of small openings; and (5) thinning to 50 percent of UMZ. The EIS also briefly describes six additional alternatives that it excludes from detailed consideration because they would not meet the Project's dual purpose and need.

[7] In another context, an EIS analyzing in detail two action alternatives that differed only in proposed acreage would likely be inadequate. *See, e.g., Muckleshoot*, 177 F.3d at 812-13 (“[T]he Forest Service failed to consider an adequate range of alternatives [where t]he EIS considered only a no action alternative along with two virtually identical alternatives.”). But we agree with the district court that the special circumstances of a research project in an experimental forest “necessarily narrowed consideration of alternatives.” As the district court observed:

The Pringle Falls Experimental [F]orest is, by design, intended to facilitate management, insect, and disease research in ponderosa pine forests east of the Cascades. While the requirements of NEPA still apply, the necessary range of alternatives and hard look are strongly informed by the research objectives of the Forest itself. The Forest Service simply cannot entertain every alternative without regard for elements that are unique to the research forest that accounts for protecting against a major disturbance event that would destroy the ability to carry out ongoing long-term research in the area, or preclude important future research opportunities.

The League argues that the Service failed to consider in detail a reasonable alternative that would have retained, either throughout the Project area or within the Eastside Screens, all trees greater than 21 inches in diameter. The League argues that such an alternative would be consistent with the need to

reduce the risk of wildfire and beetle infestation, as well as with the need to provide operational scale research that addresses the Service's scientific objectives regarding the effects of removing small trees. The EIS explains that the Service briefly considered the League's proffered alternative, but eliminated it from detailed study because modeling indicated that retaining all trees greater than 21 inches in diameter would not achieve the targeted stand densities and thus not fulfill the Project objectives.

[8] In its briefing to us, the Service justifies its rejection of the League's proffered alternative on two grounds. First, the Service contends that the proposed 21-inch-diameter-limit would not achieve the Project's risk-reduction purpose. The EIS's risk-reduction purpose refers to "thinning to the UMZ or below." The EIS notes that retaining all trees greater than 21 inches in diameter would result in densities "above the recommended UMZ." Under our prior case law, agencies need not consider in detail proposed alternatives that fail to meet specifically identified targets or densities. *See, e.g., Carmel*, 123 F.3d at 1155-57 (upholding a statement of purpose and need for a highway project that included a specific level of desired traffic service).

[9] Second, the Service contends that the 21-inch-diameter-limit alternative would not fulfill the research purpose of the Project. The Service maintains that the diameter-limit alternative would not yield statistically valid comparative data among the areas specified for different densities of logging. The EIS explains that "leaving all, or more, of the larger trees than is proposed in the study plan would provide biased results that would be considered questionable." Given the research purpose of the Project and its location in an experimental forest, the EIS does not have to consider in detail an alternative that would not provide the research data that the Service seeks to obtain.

The League also argues that the EIS fails to consider in detail an alternative that would retain all trees greater than 12

inches in diameter. However, the EIS expressly rejects the 12-inch-diameter-limit alternative because it would not achieve the risk-reduction purpose of the Project. The EIS explains that “[t]hinning only the smallest trees would not reduce stand density enough to reduce the risk of insect and disease-caused mortality.” Accordingly, the EIS does not have to consider this alternative in detail.

[10] In sum, the EIS only needs to consider in detail alternatives that would address both of the Project’s stated purposes and needs by meaningfully reducing the risk of beetle infestation and wildfire while attempting to answer the six research questions. *See Ariz. Past & Future Found., Inc. v. Lewis*, 722 F.2d 1423, 1428 (9th Cir. 1983) (“Alternatives that do not accomplish [both] purposes of the project may properly be rejected as imprudent.”). The League has failed to identify a “viable but unexamined alternative” that would satisfy both these goals. *Natural Res. Def. Council*, 421 F.3d at 813. Accordingly, we hold that the range of alternatives considered in the EIS is reasonable.

#### B. Scientific Integrity

[11] NEPA regulations require that an agency ensure the “scientific integrity” of the discussions and analyses in an EIS and explicitly refer to “the scientific and other sources relied upon for conclusions in the [EIS].” 40 C.F.R. § 1502.24. As a reviewing court, we are “most deferential when the agency is making predictions[ ] within its area of special expertise.” *Lands Council*, 537 F.3d at 993 (internal quotation marks omitted). “At the same time, courts must independently review the record in order to satisfy themselves that the agency has made a reasoned decision based on its evaluation of the evidence.” *Earth Island Inst. v. U.S. Forest Serv.*, 442 F.3d 1147, 1160 (9th Cir. 2006) (internal quotation marks omitted), *overruled on other grounds by Winter*, 555 U.S. 7.

The League argues that the EIS overstates the risk of wildfire and beetle infestation in the Unit. In particular, the

League takes issue with the EIS's use of the terms "imminent," "catastrophic," and "stand-replacing." For example, the EIS states that trees in the Unit

have structural characteristics that indicate they are at imminent risk of catastrophic loss to bark beetles and high risk of loss to wildfire. . . . [T]here is a high and increasing probability that ponderosa pine across the Lookout Mountain [U]nit will support a landscape-scale western pine or mountain pine beetle outbreak, or a large stand-replacing event.

The League makes three arguments under the heading of scientific integrity: (1) the EIS overstates the risk of beetle infestation, (2) it overstates the risk of wildfire, and (3) it fails to acknowledge that greater tree mortality would occur under the Project than under the no-action alternative.

[12] First, the League argues that the EIS relies on three scientific reports that do not support its assessment of the risk of beetle infestation. The League's focus on these reports is misplaced. All three reports support the general proposition that excessive density presents a risk of beetle infestation leading to "serious" or "excessive" tree mortality, and that controlled thinning can reduce that risk. The studies do not use the terms "imminent" or "catastrophic," but the EIS does not cite these studies for the specific language that the League challenges on appeal. Other documents cited in the EIS refer to density levels where beetles caused "imminent mortality" and "catastrophic losses" at "epidemic" or "landscape" levels. A Deschutes National Forest report in 1996 established UMZ density levels above which particular stands would be considered "imminently susceptible" to insect attack. The Study Plan, which underwent both internal and external peer review, also concluded that trees within the Unit "currently have structural characteristics which place them at imminent risk of catastrophic loss to bark beetles." We therefore cannot say that the EIS lacks "scientific integrity" or misrepresents the

scientific literature when it asserts that trees within the Unit face such a risk.

The League contends that the Service's UMZ levels lack scientific integrity because, in its view, the density of trees in the Unit has continued to increase well above the UMZ with only "modest natural mortality every 10 years or so." However, the UMZ levels have support in the scientific record and are entitled to deference as a calculation that is within the agency's area of special expertise. *See Lands Council*, 537 F.3d at 993. Moreover, in challenging only the Service's reliance on density to determine susceptibility to infestation, the League overlooks the agency's reliance on additional measurements of tree health within the Unit, such as declining growth rate and low tree vigor. The League cites a district court case involving a successful NEPA challenge to the Service's erroneous reliance on one of the same scientific reports on tree density at issue here. *See Earth Island Inst. v. Morse*, No. 2:08-cv-01897, 2009 WL 2423478, at \*5-8 (E.D. Cal. Aug. 5, 2009). However, in that case, the Service flatly misstated the significance of a particular density target identified in the report. *Id.* at \*7. The League does not point to a similar error here.

The League also contends that the EIS's use of "imminent" and "catastrophic" is inconsistent with the plain meaning of those terms. NEPA regulations require that an EIS "be written in plain language . . . so . . . the public can readily understand [it]." 40 C.F.R. § 1502.8; *see also Pac. Rivers Council v. U.S. Forest Serv.*, \_\_\_ F.3d \_\_\_, 2012 WL 2333558, at \*5 n.8 (9th Cir. June 20, 2012). The League asserts that the agency's use of the terms is hyperbolic and may have been designed to gain unwarranted public support for the Project. Although under the circumstances the EIS probably should have defined the terms in its Glossary, it does disclose in its analysis of the no-action alternative that imminent risk does not mean immediate mortality. The EIS states:

Because the [Unit] trees are at a relatively high susceptibility to insects, there is an increasing probability that the level of pine beetle-caused mortality will become more prevalent even in the short term [less than 10 years]. In the long term, beyond 10 years, increased levels of beetle-caused mortality will occur, and can be expected to reach epidemic levels.

The Study Plan, attached as an appendix to the EIS, also explains that “[w]hile wildfire and insect outbreaks are not a 100% certainty, there is a recognized risk from both fire and insects and this risk increases with time.” Although it is a somewhat close question, we conclude that the EIS’s use of these terms is not arbitrary and capricious or an abuse of discretion.

Second, the League argues that the EIS’s assertion that trees within the Unit face a “high risk of loss to wildfire,” including, possibly, “a large stand-replacing event,” is incorrect. The League points to the Service’s fire models which, “under current fuel and stand conditions,” found a potential for a passive crown fire over only about half of the Project area. A passive crown fire is a surface fire with individual tree torching, and generally represents moderate fire behavior with flame lengths between four and eight feet; an active crown fire consumes the tops of trees and represents high fire behavior, with flame lengths greater than eight feet. However, the League overlooks the EIS’s prediction that, without some logging or prescribed burning over the next twenty years, half the area will develop a potential for active crown fire, and the other half will develop a potential for passive crown fire, thereby leaving the entire Project area susceptible to “moderate or high fire behavior.”

The League argues that the EIS does not present scientific evidence supporting its assertion that there is a “high and increasing probability” that trees in the Unit will face a “large stand-replacing event.” But in its own administrative appeal,

the League quoted forest ecologist Dr. Edwin Royce, who wrote that the experimental forest shows “many locations in need of fuel reduction in order to minimize the probability of the forest being consumed by a future crown fire.” The peer-reviewed Study Plan also concludes that the Unit’s present condition was “conducive to a landscape-scale wildfire.” Given this, the lack of citation to specific scientific evidence supporting the assertion does not warrant reversal. This is not an instance, as in *Earth Island*, 442 F.3d at 1167, where the Forest Service “misunderstood” or “misrepresented” its data about projected tree mortality in an EIS.

Third, the League argues that the EIS lacks scientific integrity because it does not reconcile its goal of reducing the risk of “catastrophic” tree mortality with its preferred alternative that would allow logging of 70 percent of all trees greater than 6 inches in diameter within the Project area. This argument mischaracterizes the Project’s risk-reduction goal and overlooks the function of an experimental forest. The EIS’s stated concern about the risk of catastrophic loss is not simply that a large number of trees might be killed (whether by logging, beetles, or wildfire), but rather that widespread mortality caused by beetles or wildfire would “mean the loss of existing high-value, long-term studies and eliminate most future research opportunities.” In its statement of purpose and need, the EIS explains that “[r]educing risk of loss will protect long-term studies and keep large blocks of homogenous structure to maintain options for future research opportunities.” The EIS also warns of “indiscriminate mortality caused by pine beetles” that would “negatively impact[ ]” the ability to conduct research in the Unit. The EIS’s discussion of fire risk notes that even fires of relatively low intensity could be “devastating” within the Experimental Forest, where ongoing research projects depend on particular trees and plots. Thus, the EIS clearly explains that its risk-reduction goal was not solely to save trees in the Project area, but rather to protect those trees for ongoing and future research. Even though the proposed Project might result in more tree mortality than a

beetle infestation or wildfire, it would do so as part of a controlled research study that would also protect ongoing and future research opportunities.

### C. Hard Look

[13] “Our role in reviewing an EIS is to ensure that the agency has taken a ‘hard look’ at the potential environmental consequences of the proposed action.” *League of Wilderness Defenders Blue Mountains Biodiversity Project v. Allen*, 615 F.3d 1122, 1135 (9th Cir. 2010) (internal quotation marks omitted). Taking a “hard look” includes “considering all foreseeable direct and indirect impacts. Furthermore, a ‘hard look’ should involve a discussion of adverse impacts that does not improperly minimize negative side effects.” *N. Alaska Env'tl. Ctr. v. Kempthorne*, 457 F.3d 969, 975 (9th Cir. 2006) (internal quotation marks and citation omitted). “[G]eneral 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.” *Or. Natural Res. Council Fund v. Brong*, 492 F.3d 1120, 1134 (9th Cir. 2007) (internal quotation marks omitted).

“[W]e employ a rule of reason standard to determine whether the EIS contains a reasonably thorough discussion of the significant aspects of the probable environmental consequences.” *League of Wilderness Defenders*, 615 F.3d at 1130 (internal quotation marks omitted). This standard “requires a pragmatic judgment whether the EIS’s form, content[,] and preparation foster both informed decision-making and informed public participation.” *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 960 (9th Cir. 2005) (internal quotation marks omitted).

[14] The League argues that the EIS fails to take a hard look at the Project’s impacts on overall tree mortality and on wildlife species that depend on standing dead trees. The League’s argument about tree mortality fails for the reasons

discussed above. Most important, the League mischaracterizes the purpose of the Project when it suggests that “reduction in tree mortality is the primary goal.” The League also argues that the EIS fails to quantify the predicted level of mortality caused by wildfire or insects under the no-action alternative. However, the EIS describes the expected mortality in qualitative, rather than quantitative, terms, and explains its reasons for doing so. For example, it states that “[t]he expected level of this mortality [caused by beetle infestation under the no-action alternative] is difficult to predict, given the unique nature of this . . . area. A likely outcome from bark beetle infestation would be larger-than-normal patches of tree mortality and loss of some of the larger-diameter trees in the stand.” We have previously suggested that qualitative analyses are acceptable in an EIS where an agency explains “why objective data cannot be provided.” *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 994 & n.1 (9th Cir. 2004). Here, the EIS discusses the expected tree mortality under the no-action alternative and provides a reasonable “justification regarding why more definitive information could not be provided.” *Brong*, 492 F.3d at 1134 (internal quotation marks omitted).

Second, the League argues that the EIS fails to take a hard look at the Project’s impacts on snag-dependent wildlife. Snags are standing dead trees greater than 10 feet tall and 10 inches in diameter. Several important species of woodpecker, as well as other birds and small mammals, rely on snags for nesting and other habitat.

The EIS analyzes the Project’s impacts on individual snag-dependent species, as well as on snags more generally. Relying on an inventory of the Project area, the EIS estimates that each acre currently contains about seven snags between 10 and 20 inches in diameter and one snag greater than 20 inches in diameter. The EIS notes that this is more snags than in other areas within the watershed, but is still below optimal levels for some species. The EIS states, “The existing low

density of snags[,] coupled with the importance of large diameter snags to many of the [relevant] species, emphasizes the need to retain all existing snags as possible in the planning area, as well as creating conditions that will favor the recruitment of large snags.” The EIS acknowledges that the proposed action would remove some snags for roads and worker safety and might destroy others during prescribed burning. However, it states that “[i]t is not the intention of any of the proposed actions to remove snags.” The EIS assures that during logging operations “[a]ll existing snags would remain except where snags must be felled for roads, log landings, or occupational safety.”

The EIS compares the predicted future impacts on snag-dependent species under the no-action and proposed action alternatives. Under the no-action alternative, the EIS acknowledges that beetle infestation would result in short-term creation of larger snags and that wildfire would “create pulses of dead wood,” after which “there would be [a] gap of dead habitat until the residual stand matures and the snag creation process starts again.” By contrast, the EIS discloses that the action alternatives initially would decrease the rate of snag creation, but predicts that they eventually would result in the creation of larger snags. The EIS has a basis in the record for this qualitative prediction. When the Service tried to quantify future snags under the different alternatives, however, it found that “[t]he effort quickly proved questionable” because it relied on too many variables and assumptions about how certain trees might interact with one another over time. The EIS concludes that the issue “did not seem to warrant” the “considerably larger effort” that a more detailed quantitative analysis would require. Instead, the EIS proposes ongoing monitoring during the Project to assess the assumptions about the effects of prescribed fire on snags.

**[15]** The Service’s analysis of impacts on snag-dependent species constitutes a hard look under our precedent. As with tree mortality, its qualitative prediction about impacts on

snag-dependent species suffices because it explains why precise quantification was unreliable. *See Brong*, 492 F.3d at 1134. In *WildWest Institute v. Bull*, 547 F.3d 1162, 1175 (9th Cir. 2008), we held that a Service EIS took an adequate “hard look” at a logging project’s impact on a snag-dependent woodpecker where it discussed the woodpecker’s habitat needs and acknowledged that some snags would be removed or burned, but noted that the Project would generally retain snags. The EIS in this case does that and more.

#### Conclusion

[16] The Service proposes a forest management research project in an experimental forest specifically set aside for such study. The EIS considers in detail a reasonable range of alternatives that would fulfill both of the Project’s goals by reducing the risk of wildfire and beetle infestation, and by addressing six specified research objectives. The EIS is adequately supported by scientific data and takes a hard look at the significant impacts of the Project.

AFFIRMED.