

FOR PUBLICATION

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

LOS PADRES FORESTWATCH; EARTH ISLAND INSTITUTE; CENTER FOR BIOLOGICAL DIVERSITY, <i>Plaintiffs-Appellants,</i>	No. 20-55859
v.	D.C. No. 2:19-cv-05925- PJW
UNITED STATES FOREST SERVICE; KEVIN ELLIOTT, Supervisor, Los Padres National Forest; UNITED STATES FISH AND WILDLIFE SERVICE, <i>Defendants-Appellees,</i>	OPINION
AMERICAN FOREST RESOURCE COUNCIL; CALIFORNIA FORESTRY ASSOCIATION; ASSOCIATED CALIFORNIA LOGGERS, <i>Intervenor-Defendants-Appellees.</i>	

Appeal from the United States District Court
for the Central District of California
Patrick J. Walsh, Magistrate Judge, Presiding

Argued and Submitted May 12, 2021
Pasadena, California

Filed February 4, 2022

2 LOS PADRES FORESTWATCH V. USFS

Before: Ryan D. Nelson and Kenneth K. Lee, Circuit
Judges, and Sidney H. Stein,* District Judge.

Opinion by Judge Stein;
Dissent by Judge R. Nelson

SUMMARY**

Environmental Law

The panel vacated the district court's summary judgment in favor of the U.S. Forest Service, and the Forest Service's Decision Memo approving the proposed Tecuya Ridge Shaded Fuelbreak Project; and remanded to the Forest Service to provide adequate substantiation for its determination that 21-inch dbh (diameter at breast height) trees are generally small diameter timber within the Project Area.

Tecuya Ridge is located within the Los Padres National Forest, and is home to densely populated forest stands that the Forest Service determined to be at risk of destruction by wildfire. The Tecuya Ridge Project authorized thinning 1,626 acres of forest, including approximately 1,100 acres within a protected area called the Antimony Inventoried Roadless Area ("IRA"). The Roadless Area Conservation Rule was established in 2001 pursuant to a presidential

* The Honorable Sidney H. Stein, United States District Judge for the Southern District of New York, sitting by designation.

** This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

directive to initiate a nationwide plan to protect inventoried and uninventoried roadless areas within national forests. Generally, timber cutting, sale or removal in areas like the Antimony IRA are prohibited by the Roadless Area Conservation Rule. The Rule provides for some exceptions.

The panel held that the Forest Service's conclusion that the Tecuya Ridge Project was consistent with the Roadless Area Conservation Rule was arbitrary and capricious. The panel held that the Forest Service's determination that 21-inch dbh trees were "generally small timber" was arbitrary and capricious. The panel found no record evidence to support this determination. In addition, the Forest Service failed to articulate a satisfactory explanation – in the administrative record, in briefing, and at oral argument – for its determination that the 21-inch dbh trees in the Project area were "generally small" within the meaning of the Roadless Rule. Because the panel could not discern how the Forest Service arrived at the 21-inch dbh number, the panel remanded for the Forest Service to substantiate its conclusion that 21-inch dbh trees are "generally small" within the project area, consistent with the Roadless Rule.

The panel held that the Forest Service's determination that the Project will "maintain or improve" the Antimony Roadless Area's characteristics was not arbitrary and capricious. The Forest Service met its obligations under *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983), to articulate a satisfactory explanation for its action.

The panel held that the Forest Service's decision to "categorically exclude" the Tecuya Ridge Project from review in an environmental assessment or environmental impact statement, pursuant to the National Environmental

Policy Act (“NEPA”), was not arbitrary and capricious. First, the Forest Service’s determination that Categorical Exclusion 6 (“CE-6”) applied to the Project was not arbitrary and capricious. Second, the Forest Service’s determination that no extraordinary circumstances prevented its application of CE-6 to the Project was not arbitrary and capricious. Consistent with 36 C.F.R. § 220.6, the Forest Service analyzed each resource condition – that should be considered in determining whether there were extraordinary circumstances related to the proposed action – and determined that the Project would have “no significant impact” on each. In addition, the Forest Service’s decision to locate the Project in the “wildland zone” instead of the “threat zone” was not arbitrary and capricious because the Forest Service substantiated its decision with evidence in the record.

Judge R. Nelson dissented. He agreed with Sections I.B and II of the majority opinion. He wrote, however, that the majority wrongly held that the Forest Service’s determination that 21-inch dbh trees are “small diameter” was arbitrary or capricious under the Administrative Procedure Act. He would deny the petition for review.

COUNSEL

Justin Augustine (argued), Law Office of Justin Augustine, Oakland, California; Brian Segee, Center for Biological Diversity, Los Angeles, California; for Plaintiffs-Appellants.

Jeffrey S. Beelaert (argued), Bridget K. McNeil, and Sean C. Duffy, Attorneys; Jean E. Williams, Acting Assistant Attorney General; United States Department of Justice, Environment and Natural Resources Division, Washington, D.C.; for Defendants-Appellees.

Lawson E. Fite (argued) and Sara Ghafouri, American Forest Resource Council, Portland, Oregon, for Intervenor-Defendants-Appellees.

OPINION

STEIN, District Judge:

The Tecuya Ridge, part of the San Emigdio Mountain range, rises up from the Los Padres National Forest and overlooks the mountain communities of Lebec, Frazier Park, Lake of the Woods, Pine Mountain Club, and Pinon Pines Estates. The Ridge falls within the Mt. Pinos Place Management Area, an environment forested with old-growth trees, including Singleleaf pinyon-California juniper and Montane conifer. The area provides habitat for the California condor, the California spotted owl, and the northern goshawk and affords a scenic backdrop to the mountain communities nestled within it. But because the Tecuya Ridge is home to densely populated forest stands,¹ the Forest Service has determined that both the forest and the adjacent mountain communities are at risk of destruction by wildfire. To address this risk, the Forest Service proposed the Tecuya Ridge Shaded Fuelbreak Project (the “Project”) in March 2018. The Project aims to create a fuelbreak, a “wide strip or block of land on which the native or pre-existing vegetation has been permanently modified so that fires burning into it can be more readily extinguished,”² running roughly in a jagged line along the Tecuya Ridge.

¹ A “stand” is a “contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.” *Reforestation Glossary*, U.S. Forest Serv., <https://www.fs.fed.us/restoration/reforestation/glossary.shtml>.

² U.S. Dep’t of Agric., U.S. Forest Serv., *Land Management Plan: Part 3 Design Criteria for the Southern California National Forests* 96 (2005).

In April 2019, Los Padres Forest Supervisor Kevin Elliot published a Decision Memo approving the Project. Appellants Los Padres ForestWatch, Center for Biological Diversity, and Earth Island Institute filed a complaint challenging this decision on two grounds: that the Forest Service’s approval of the project violates the National Environmental Policy Act of 1969 (“NEPA”), and that the Project authorizes logging large diameter trees in violation of the Roadless Area Conservation Rule. The parties filed cross-motions for summary judgment. The district court granted Appellee’s motion for summary judgment and denied Appellants’ motion for summary judgment. Appellants filed a timely notice of appeal on August 20, 2020.

Because the Forest Service has failed to explain how its decision to approve the Project complies with the requirements of the Roadless Area Conservation Rule, the Court vacates the district court’s decision and the Forest Service’s Decision Memo approving the Project and remands this case to the Forest Service to substantiate its conclusions.

BACKGROUND

Since 1998, fifteen wildfires have burned through the Tecuya Ridge. The Forest Service believes that the risk of wildfire in that area remains high because the Tecuya Ridge consists of densely packed forest stands. Overcrowded stands are vulnerable to severe wildfire because they are full of tightly packed forest fuels—combustible forest materials—like shrubs, brush, and tree branches.³ “Surface”

³ U.S. Dep’t of Agric., U.S. Forest Serv., *Influence of Forest Structure on Wildfire Behavior and the Severity of Its Effects* 1 (2003).

fuels lie on the forest floor, while “ladder” fuels allow wildfire to climb from the forest floor to the tree canopies.⁴ The Forest Service has determined that surface and ladder fuel loads, dense tree crown cover, continued periods of drought, and the presence of trees ravaged by insects and disease in the Tecuya Ridge pose a risk of a wildfire with the potential to destroy an entire forest stand.

Accordingly, the Forest Service proposed the Tecuya Ridge Shaded Fuelbreak Project in March 2018. The Project Decision Memo explains that the Project aims to create a fuelbreak to “provide safe and effective locations from which to perform fire suppression operations,” to “slow the spread of wildland fire,” to “reduce the potential for the loss of life, property, and natural resources,” and to “increase the forest’s resilience to insects and diseases.”

To accomplish these goals, the Project authorizes thinning 1,626 acres of forest, including approximately 1,100 acres within a protected area called the Antimony Inventoried Roadless Area (“IRA”). “Thinning,” as explained in the Project Decision Memo, means that commercially viable trees will be cut down and mechanically harvested for commercial sale. Smaller trees and shrubs would either be treated by mastication—which means using equipment to grind, chip, or break apart brush and small trees into small pieces, leaving a “mulch” made from wood chips on the forest floor⁵—hand-thinning, or

⁴ *Id.* at 2–3.

⁵ U.S. Dep’t of Agric., *Is Mastication Right For Your Site? Science-Based Decision Trees for Forest Managers*, Rocky Mountain Rsch. Station Sci. You Can Use Bull., Nov. 2020, at 1, *available at* https://www.fs.usda.gov/rmrs/sites/default/files/documents/SYCU_Is_Mastication_Right_for_Your_Site.pdf.

pruning. Any fuels created by these activities would be scattered or piled by hand on the forest floor and burned. The vast majority of the trees targeted for treatment will be commercially logged and sold.

On March 13, 2018, the Forest Service issued a Project Proposal for the Tecuya Ridge Shaded Fuelbreak Project and a letter soliciting public comment on the proposal. Between April 2018 and April 2019, Appellants and other interested parties submitted comments to the Forest Service, raising concerns, among others, that the Project violated 1) NEPA by authorizing the sale of commercial wood products pursuant to a categorical exclusion, and 2) the Roadless Area Conservation Rule by authorizing commercial logging in the Antimony IRA.

In April 2019, Los Padres Forest Supervisor Kevin Elliot published a Decision Memo approving the Project. The Decision Memo explained that the Forest Service had considered the public's concern regarding "impacts to wildlife, the Antimony IRA, and the commercial sale of timber and other wood products" but had determined that the Project would not "imperil species of concern."

Appellants filed a complaint challenging the Forest Service's decision to approve the Project on the grounds that the decision violated the Roadless Area Conservation Rule and NEPA. The district court granted Appellee's motion for summary judgment and denied Appellants' motion for summary judgment on August 20, 2020. This appeal followed.⁶

⁶ Appellants assert they have associational standing to bring this suit. Appellees have not contested this. Nevertheless, Appellants have

STANDARD OF REVIEW

Appellate courts “review a grant of summary judgment de novo.” *Gardner v. U.S. Bureau of Land Mgmt.*, 638 F.3d 1217, 1220 (9th Cir. 2011) (citing *Swanson v. U.S. Forest Serv.*, 87 F.3d 339, 343 (9th Cir. 1996)).

Courts review agency decisions under NEPA and the Roadless Area Conservation Rule under the standards set out in the Administrative Procedure Act (“APA”), and “must set aside agency action found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” *Idaho Sporting Cong., Inc. v. Rittenhouse*, 305 F.3d 957, 964 (9th Cir. 2002) (citing 5 U.S.C. § 706).

ANALYSIS

I. The Forest Service’s Conclusion that the Tecuya Ridge Project Is Consistent with the Roadless Area Conservation Rule Is Arbitrary and Capricious.

The Roadless Area Conservation Rule was established in 2001⁷ pursuant to a presidential directive to “initiate a

associational standing—the right to bring a suit on behalf of their members—because their “members would have standing to sue in their own right, the interests at stake are germane to the organization’s purpose, and neither the claim asserted nor the relief requested requires individual members’ participation in the lawsuit.” *Friends of the Earth, Inc. v. Laidlaw Env’tl Servs. (TOC), Inc.*, 528 U.S. 167, 169 (2000) (citing *Hunt v. Wash. State Apple Advert. Comm’n*, 432 U.S. 333, 343 (1977)).

⁷ The 2001 Roadless Rule has a somewhat complex history. The rule was enjoined before it went into effect, and the Forest Service promulgated an alternative rule, *see* Special Areas; State Petitions for Inventoried Roadless Area Management, 70 Fed. Reg. 25,654–55 (May

nationwide plan to protect inventoried and uninventoried roadless areas” within national forests. *Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1105 (9th Cir. 2002). In promulgating the rule, the Forest Service identified 58.5 million acres of “inventoried roadless areas,” including the Antimony IRA. *See id.*

An “Inventoried Roadless Area” (“IRA”) is an area that “provide[s] large, relatively undisturbed landscapes that are important to biological diversity and the long-term survival of many at risk species.” Special Areas; Roadless Area Conservation, 66 Fed. Reg. 3,244, 3,245 (Jan. 12, 2001); *see also* 36 C.F.R. § 294.11. The Antimony IRA, forested with pinyon pine, other conifers, and sagebrush, spans nearly 40,513 acres across the San Emigdio Mountain range. Twenty-four miles long and three miles wide, it lies both north of and adjacent to the San Andreas Rift Zone. The ridge tops of Antimony provide expansive views of the southern San Joaquin Valley. The Antimony IRA also provides habitat for California condors, which, according to the Final Supplemental Environmental Impact Statement for the Southern California National Forests Land Management Plan Amendment, use the area “extensively for travel and roosting as they soar on uplifted winds along the southern boundary of the San Joaquin Valley.”

The Project authorizes thinning, including commercial thinning, of approximately 1,100 acres of forest within the Antimony IRA. Generally, timber cutting, sale, or removal

13, 2005), which is still codified at 36 C.F.R. § 294. However, the Ninth Circuit affirmed the judgment of a district court setting aside the alternative rule, and reinstating the original 2001 rule, in 2009. *See California ex rel. Lockyer v. U.S. Dep’t of Agric.*, 575 F. 3d 999, 1021 (9th Cir. 2009). The version of the Rule at issue in this case is the original 2001 version.

in areas like the Antimony IRA are prohibited by the Roadless Area Conservation Rule because those activities “have the greatest likelihood of altering and fragmenting landscapes, resulting in immediate, long-term loss of roadless area values and characteristics.” Special Areas; Roadless Area Conservation, 66 Fed. Reg. at 3,244. But the Rule provides for some exceptions. For instance, “[t]imber may be cut, sold, or removed in inventoried roadless areas” if the Responsible Official determines:

- (1) The cutting, sale, or removal of generally small diameter timber is needed for one of the following purposes and will maintain or improve one or more of the roadless area characteristics as defined in § 294.11.
 - (i) To improve threatened, endangered, proposed, or sensitive species habitat; or
 - (ii) To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period[.]

36 C.F.R. § 294.13.

The rule defines “roadless area characteristics” as “[r]esources or features that are often present in and characterize inventoried roadless areas,” including:

- (1) High quality or undisturbed soil, water, and air;
- (2) Sources of public drinking water;
- (3) Diversity of plant and animal communities;
- (4) Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land;
- (5) Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation;
- (6) Reference landscapes;
- (7) Natural appearing landscapes with high scenic quality;
- (8) Traditional cultural properties and sacred sites; and
- (9) Other locally identified unique characteristics.

36 C.F.R. § 294.11.

Thus, “[w]hether the [Forest] Service may harvest timber in an inventoried roadless area is a three-step inquiry.” *All. for the Wild Rockies v. Krueger*, 950 F. Supp. 2d 1196, 1214 (D. Mont. 2013), *aff’d sub nom. All. for the Wild Rockies v. Christensen*, 663 F. App’x 515 (9th Cir. 2016). “First, the timber to be harvested must be ‘generally small diameter.’ Second, the harvest must be needed for one of two listed purposes [as defined in 36 C.F.R. § 294.13]. Third, the harvest must maintain or improve one or more of the roadless area characteristics as defined in § 294.11.” *Id.*

The Forest Service concluded that the Project complies with the Roadless Rule because it seeks to reduce the risk of uncharacteristic wildfire effects, a purpose specifically identified in 36 C.F.R. § 294.13, may be needed for recovery or conservation of threatened, endangered, proposed, or sensitive species, a roadless area characteristic identified in 36 C.F.R. § 294.11, and removes generally smaller trees with a diameter of less than 21 inches at breast height (“dbh”) within the Antimony IRA. Appellants, however, argue that the Forest Service has failed to substantiate its assertion that trees measuring 21-inches dbh are “generally small diameter timber” or explain how the Project will maintain or improve one of the “roadless area characteristics” listed in 36 C.F.R. § 294.11.

The Court disagrees with Appellants on the latter contention and finds that the Forest Service has adequately explained its determination that the Project will maintain or improve one of the roadless area characteristics listed in 36 C.F.R. § 294.11. For instance, the fourth characteristic covers the “[h]abitat for threatened, endangered, proposed, candidate, and sensitive species” and the Forest Service’s Decision Memo finds that “[t]he project would benefit California condors by treating fuels to help prevent large,

high intensity stand replacement wildland fire that could eliminate roosting habitat over a larger area.”

But because the Forest Service has indeed failed to explain its determination that 21-inch dbh trees are “generally small diameter timber” within the meaning of the Roadless Rule, its decision to approve the Project was arbitrary and capricious.

A. The Forest Service’s Determination that 21-inch dbh Trees Are “Generally Small Diameter Timber” Is Arbitrary and Capricious.

“The intent of the [Roadless Area Conservation Rule] is to limit the cutting, sale, or removal of timber to those areas that have become overgrown with smaller diameter trees.” Special Areas; Roadless Area Conservation, 66 Fed. Reg. at 3,257. In promulgating the Rule, the Forest Service specifically chose not to define “what constitutes ‘generally small diameter timber’” because “[s]uch determinations are best made through project specific or land and resource management plan NEPA analyses,” as guided by certain ecological considerations. *Id.*

Risk of fire is one of these considerations. The Forest Service noted that “areas that have become overgrown with shrubs and smaller diameter trees creating a fuel profile that acts as a ‘fire ladder’ to the crowns of the dominant overstory trees may benefit ecologically from thinning treatments that cut and remove such vegetation.” *Id.* The notice of adoption of the final version of the Rule specifically explains that “[t]hinning of small diameter trees, for example, that became established as the result of missed fire return intervals due to fire suppression and the condition of which greatly increases the likelihood of uncharacteristic wildfire effects,” is permissible under the Rule. *Id.*

The Project permits mechanical thinning of trees less than 21-inches dbh inside the Antimony IRA to prevent uncharacteristic wildfire effects. The Forest Service contends that trees less than 21-inches dbh are “generally small diameter timber” consistent with 36 C.F.R. § 294.13. But the Court finds no evidence in the record to support the Forest Service’s determination.

An agency must “articulate a satisfactory explanation for its action including a ‘rational connection between the facts found and the choice made.’” *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)). “Even when an agency explains its decision with ‘less than ideal clarity,’ a reviewing court will not upset the decision on that account ‘if the agency’s path may reasonably be discerned.’” *Alaska Dep’t of Env’tl Conservation v. EPA*, 540 U.S. 461, 497 (2004) (quoting *Bowman Transp., Inc. v. Arkansas-Best Freight Sys., Inc.*, 419 U.S. 281, 286 (1974)). However, an agency’s determination is arbitrary and capricious where it merely provides “generic statements” to support its conclusion in lieu of evidence that it has actually applied its substantive expertise. *Or. Nat. Desert Ass’n v. Rose*, 921 F.3d 1185, 1191 (9th Cir. 2019). The Court “cannot defer to a void.” *Or. Nat. Desert Ass’n v. U.S. Forest Serv.*, 957 F.3d 1024, 1035 (9th Cir. 2020) (internal quotation marks omitted) (quoting *Or. Nat. Desert Ass’n v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1121 (9th Cir. 2010)).

The Forest Service has failed to articulate a satisfactory explanation—in the administrative record, in briefing, and at oral argument—for its determination that the 21-inch dbh trees that inhabit the Project area are “generally small” within the meaning of the Roadless Rule. Problematically,

the Forest Service fails to provide evidence of the average or median dbh of the trees within the Tecuya Ridge Project area at all. It is impossible to tell, from the record, which size classes of trees inhabit the Project area and whether 21-inch dbh trees can properly be considered “small” within those classes. Instead, the Decision Memo approving the Project merely contains a bare assertion—with no supporting analysis—that the 21-inch dbh trees are “smaller trees” consistent with the Roadless Area Conservation Rule.

The Briefing Paper accompanying the Decision Memo, which references the Los Padres Land Management Plan, also fails to provide clarity. The Los Padres Land Management Plan defines large-diameter trees as those of over 24-inches dbh. The Forest Service appears to argue that any tree with a dbh of less than 24 inches can be considered a “generally small diameter tree.” But the Court cannot determine why, in the Forest Service’s view, the difference between a “generally small” tree and a “large-diameter tree” is merely three inches dbh because the Forest Service has failed to provide any information that would help the Court to do so. Indeed, the Land Management Plan’s declaration that 24-inch dbh trees are large-diameter trees leads the Court to conclude that a 21-inch dbh tree is, at best, a medium-sized tree, not a “generally small” tree as contemplated by the Roadless Rule.

Other evidence available in the record tends to confirm that trees of up to 21-inches dbh are not “generally small.” In an Environmental Assessment for another nearby project, the Frazier Mountain Project, the Forest Service noted that “larger diameter” trees were those with a dbh greater than ten inches. Although the Forest Service contends that the Frazier Mountain Project Environmental Assessment is irrelevant here because that project thinned timber stands

primarily overstocked with different tree species—Jeffrey pine—the Court is not convinced. Jeffrey pine, a type of coniferous tree, is a component of mixed-conifer forests and a type of tree found within the Tecuya Project area. Because the Frazier Project area is located in close proximity with the Tecuya Ridge Project area and likely contains a similar stand composition, the Forest Service has failed to justify its determination that “larger diameter” trees in the Frazier Project area have a dbh greater than ten inches while “small diameter” trees in the Tecuya Ridge Project area have a dbh of up to 21 inches.

Even assuming that the stand composition in the Frazier Mountain Project area differs substantially from the stand composition in the Tecuya Ridge Project area, the Forest Service has failed to provide any data comparing the average dbh of trees within the Frazier Mountain Project area with the average dbh of trees in the Tecuya Ridge Project area to support its conclusion that “small” trees in the Tecuya Ridge are much larger than even the “large” trees on Frazier Mountain. If the Forest Service had shown that trees on Frazier Mountain have a generally smaller dbh on average than the mixed conifer and pinyon-juniper trees on the Tecuya Ridge, the Court might have deferred to its determination that trees of up to 21 dbh in mixed conifer and pinyon-juniper dominated stands in the Project area are properly considered “small.” But the Forest Service did not attempt to articulate this explanation or, indeed, provide any information at all on the average dbh of the trees located within the Tecuya Project area.

In attempting to support its determination that the Project Decision Memo complies with the Roadless Rule, the Forest Service notes that the Roadless Rule’s definition of generally small timber is “flexible” and allows Forest Service experts

to determine what timber is “generally small” based on project-specific goals and ecological considerations. It argues that 21-inch dbh trees must be removed within the Project area to “meet the desired conditions of the proposed [Project] to a 90 percent effective level,” and urges the Court defer to its “technical expertise.” But although the Forest Service may indeed apply its technical expertise to determine which “generally small” trees pose an uncharacteristically high risk of fire spread and intensity, *see* Special Areas; Roadless Area Conservation, 66 Fed. Reg. at 3,257, the Forest Service provides no evidence that it has actually performed the technical analysis necessary to identify them.

For instance, the Decision Memo for the Project states that the Forest Service conducted “stand exams” in the project area, “coupled with walk-throughs by Forest professionals and data from other sources,” which “confirm that existing stand density and structure put the area at risk from insects and disease, as well as from wildfire.” But this proclamation pertains solely to the Forest Service’s rationale for the Project—it does not substantiate the Forest Service’s determination that 21-inch dbh trees are “generally small” or why 21-inch dbh trees, specifically, are creating the risk of wildfire the Project seeks to ameliorate. In fact, the Forest Service has never explained what a “stand exam” or “walk-through” entails, and how the data gleaned from those activities helped it to determine that the Project complies with the Roadless Rule. By failing to explain why 21-inch dbh trees are the type of “generally small trees” the Roadless Rule permits the Forest Service to harvest, the Forest Service has failed to show that it has complied with the intent of the Roadless Rule to “limit the cutting, sale, or removal of timber to those areas that have become overgrown with

smaller diameter trees.” Special Areas; Roadless Area Conservation, 66 Fed. Reg. at 3,257.

To be clear, the Court does not require the Forest Service to undertake any particular method of providing a reasoned explanation for its choice to designate trees of up to 21-inches dbh as “generally small.” The United States Supreme Court has continually affirmed that “agencies should be free to fashion their own rules of procedure.” *Vermont Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 544 (1978). “[A] reviewing court may not, after determining that additional evidence is requisite for adequate review, proceed by dictating to the agency the methods, procedures, and time dimension of the needed inquiry.” *Fed. Power Comm’n v. Transcon. Gas Pipe Line Corp.*, 423 U.S. 326, 333 (1976). But where “the decision of the agency ‘is not sustainable on the administrative record made, then the . . . decision must be vacated and the matter remanded . . . for further consideration.” *Id.* at 331 (quoting *Camp v. Pitts*, 411 U.S. 138, 143 (1973)).

The Forest Service’s determination that the Project is consistent with the Roadless Area Conservation Rule is not sustainable on the current administrative record. The Court cannot discern how the Forest Service arrived at the 21-inch dbh number. The Court thus remands this case to the Forest Service to substantiate its conclusion that 21-inch dbh trees are “generally small” within the project area, consistent with the Roadless Rule. *See Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1214 (9th Cir. 1998) (finding the Forest Service’s decision to be arbitrary and capricious where the EA “contain[ed] virtually no references to any material in support of or in opposition to its conclusions”).

B. The Forest Service’s Determination that the Project Will “Maintain or Improve” the Antimony Roadless Area’s Characteristics Is Not Arbitrary and Capricious.

Appellants further allege that the Forest Service violated 36 C.F.R. § 294.13 of the Roadless Rule by failing to provide “any explanation at all” to establish that the logging of 21-inch dbh trees will “maintain or improve one or more of the roadless area characteristics as defined in § 294.11.” But in this case, the Forest Service has met its obligations under *State Farm* to “articulate a satisfactory explanation for its action including ‘a rational connection between the facts found and the choice made.’” *State Farm Mut. Auto. Ins. Co.*, 463 U.S. at 43 (quoting *Burlington Truck Lines*, 371 U.S. at 168).

The Forest Service avers that the Project will maintain or improve habitat conditions for threatened, endangered, proposed, candidate, and sensitive species, a roadless area characteristic defined by 36 C.F.R. § 294.11. That assertion is substantiated in the Decision Memo for the Project, which includes the Forest Service’s determination that “in some situations, cutting or removal of small diameter timber [in the Project area] may be needed for recovery or conservation of threatened, endangered, proposed or sensitive species to improve stand structure or reduce encroachment into meadows or other natural openings.” For instance, the California condor, an endangered species, frequently flies over the Project area and may use the Project area to roost or nest. The Forest Service concluded that the Project “would benefit California condors by treating fuels to help prevent large, high intensity stand replacement wildland fire that could eliminate roosting habitat over a larger area” and might “improve condor foraging habitat by creating a more

open area that facilitates finding and catching prey by birds like condors that are dependent upon sight for locating food.”

The Project area also contains two sensitive botanical species, Hall’s Woolly Sunflower and Flaxleaf Monardella. In its Botany Report for the Project, the Forest Service concluded that the Project would maintain or improve habitat suitability for both of these species because the Project will reduce the “risk of mortality from moderate to high intensity wildfires.” In addition, it concluded that reducing stand density may provide indirect beneficial impacts for these species because the Project will create or maintain open areas which may provide additional suitable habitat. On this record, the Forest Service’s determination that the Project will maintain or improve at least one of the Antimony Roadless Area’s characteristics was not arbitrary and capricious.

II. The Forest Service’s Decision to “Categorically Exclude” the Tecuya Ridge Project from Review in an EA or EIS Was Not Arbitrary and Capricious.

Appellants further contend that the Forest Service’s decision to approve the Project violated NEPA. First, Appellants argue that the Forest Service improperly authorized the Project pursuant to a Categorical Exclusion. Second, Appellants argue that the Forest Service’s decision to categorically exclude the Tecuya Ridge Project from Review in an EA or EIS was arbitrary and capricious because the Forest Service failed to analyze fuelbreak efficacy as an “extraordinary circumstance” that would prevent it from applying a Categorical Exclusion to the Project.

A. The Forest Service’s Determination that CE-6 Applies to the Project Is Not Arbitrary and Capricious.

NEPA, 42 U.S.C. § 4321 *et seq.*, “declares a broad national commitment to protecting and promoting environmental quality.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). It mandates federal agencies to prepare an environmental impact statement (“EIS”) for proposed “[f]ederal actions significantly affecting the quality of the human environment.” 42 U.S.C. § 4332(C). This statutory requirement ensures that federal agencies thoroughly consider “detailed information concerning significant environmental impacts” before approving certain actions and that they make this information “available to [a] larger audience that may also play a role in both the decisionmaking process and the implementation of that decision.” *Robertson*, 490 U.S. at 349.

To effectuate these requirements, Congress established a Council on Environmental Quality (CEQ), which promulgates “binding regulations implementing the procedural provisions of NEPA.” *Id.* at 354; 42 U.S.C. § 4344(4). CEQ regulations allow an agency to first prepare an environmental assessment (“EA”) for a proposed project to determine whether the environmental impact of the project is “significant enough to warrant preparation of an EIS.” *Blackwood*, 161 F.3d at 1212 (citing 40 C.F.R. § 1508.9).

But an agency may avoid preparing either an EA or an EIS altogether by determining that a proposed action fits within certain “categorical exclusions.” 40 C.F.R. § 1508.4. A “Categorical Exclusion” (“CE”) is an action which a federal agency has found “do[es] not individually or

cumulatively have a significant effect on the human environment.” *Id.* Normally, proposed actions that fit within a categorical exclusion do not require an agency to prepare either an environmental impact statement or an environmental assessment. *Id.*

In approving the Tecuya Ridge Project, the Forest Service determined that Categorical Exclusion 6 (CE-6) applied and exempted the Project from review in an EA or EIS. CE-6 applies to “[t]imber stand and/or wildlife habitat improvement activities that do not include the use of herbicides or do not require more than 1 mile of low standard road construction,” which may include activities such as:

- i. Girdling trees to create snags;
- ii. Thinning or brush control to improve growth or to reduce fire hazard including the opening of an existing road to a dense timber stand;
- iii. Prescribed burning to control understory hardwoods in stands of southern pine; and
- iv. Prescribed burning to reduce natural fuel build-up and improve plant vigor.

36 C.F.R. § 220.6(e)(6).

Appellants challenge this action, contending that CE-6 does not apply to the Tecuya Ridge Project because CE-6 permits only precommercial thinning and the Project authorizes commercial thinning. The Forest Service believes that CE-6 applies to the Tecuya Ridge project because the Project does not include the use of herbicides or

require road construction and because thinning is a timber stand improvement activity. The Forest Service interprets CE-6 to allow it to commercially thin trees, as long as the commercial thinning is used to accomplish forest improvement activities.

We do not decide this question here. In the related case *Mountain Communities for Fire Safety, Los Padres ForestWatch, and Earth Island Institute v. Kevin Elliott and the United States Forest Service*, No. 20-55660 (9th Cir. Feb. 4, 2022), this Court agreed with the Forest Service's reading of CE-6. Therefore, the sole remaining question before the Court is whether the Forest Service's decision to apply CE-6 to the Project was arbitrary and capricious because it failed to analyze fuelbreak efficacy as a potential "extraordinary circumstance" that would prevent application of *any* CE to the Project.

B. The Forest Service's Determination that No Extraordinary Circumstances Prevent its Application of CE-6 to the Project Is Not Arbitrary and Capricious.

Even if a proposed project fits within a CE category, the Forest Service cannot opt out of further analysis and documentation in an EA or EIS unless "there are no extraordinary circumstances related to the proposed action." 36 C.F.R. § 220.6(a). An "extraordinary circumstance" is a circumstance "in which a normally excluded action may have a significant environmental effect." 40 C.F.R. § 1508.4. 36 C.F.R. § 220.6(b) provides that:

- (1) Resource conditions 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 are:

- (i) Federally listed threatened or endangered species or designated critical habitat, species proposed for Federal listing or proposed critical habitat, or Forest Service sensitive species;
- (ii) Flood plains, wetlands, or municipal watersheds;
- (iii) Congressionally designated areas, such as wilderness, wilderness study areas, or national recreation areas;
- (iv) Inventoried roadless area or potential wilderness area;
- (v) Research natural areas;
- (vi) American Indians and Alaska Native religious or cultural sites; and
- (vii) Archaeological sites, or historic properties or areas.

36 C.F.R. § 220.6(b).

In addition to these resource conditions, Appellants contend that the Forest Service should have analyzed the Project's impacts to public safety as an additional

“extraordinary circumstance.” Specifically, Appellants contend that the Project’s potential impact to public safety is an “extraordinary circumstance” that prevents the Forest Service from authorizing the Project pursuant to a CE because the Forest Service selected a project location that will not reduce the risk of wildfire to the Mt. Pinos Communities and is not consistent with the Mt. Pinos Community Wildfire Protection Plan.

That plan, developed in 2006 by the Mt. Pinos Communities Fire Safe Council, which includes representatives from the U.S. Forest Service, identifies three zones that comprise the wildland urban interface. The area where man-made structures are located, like homes, is called the “Defense Zone.” The “Threat Zone” is a one-quarter mile buffer around the Defense Zone that “needs specific and intense management and treatments” to “reduce the spread and intensity of fire developing or moving” towards the Defense Zone. The “Wildland Zone” is the area beyond the “Threat Zone.” Approximately ninety-three percent of the Proposed Project lies in the Wildland Zone, while the remaining seven percent of the Project is located in the Threat Zone.

Appellants contend that the Forest Service’s decision to construct a fuelbreak in the Wildland Zone, instead of in the Threat Zone, is arbitrary and capricious. They note that the original, 2006 version of the Community Wildfire Protection Plan did not include any projects located within the Wildland Zone, although the Plan was updated to add the Tecuya Ridge Fuel Break Project, as well as other projects located in the Wildland Zone, in 2009.

Appellants also point to the results of a scientific study⁸ showing that “constructing fuel breaks in remote, backcountry locations will do little to save homes during a wildfire because most firefighters will be needed to protect the wildland-urban interface, and fires will not be stopped by those fuel breaks that are located farther away.” That study concluded that “[f]irefighter access to fuel breaks was the most influential factor in fuel treatment outcome” for the Los Padres Forest.

The Forest Service, however, was not required to examine impacts to public safety or fuelbreak location efficacy in analyzing whether extraordinary circumstances prevented the use of CE-6 for the Project. Consistent with 36 C.F.R. § 220.6, the Forest Service analyzed each resource condition and determined that the Project would have “no significant impact” on each. Although the list of resource conditions located at 36 C.F.R. § 220.6(b) is not intended to be exhaustive, NEPA merely permits, rather than requires, the Forest Service to consider additional factors during its extraordinary circumstances review. *See, e.g.*, NEPA Procedures, 73 Fed. Reg. 43,084, 43,091 (July 24, 2008) (“The list of resource conditions is intended as a starting place and does not preclude consideration of other factors or conditions by the responsible official with the potential for significant environmental effects.”). Courts have therefore rejected the contention that the Forest Service is required to analyze additional factors on top of the specified resource conditions in determining whether extraordinary circumstances prevent the application of a CE. *See All. for the Wild Rockies*, 979 F. Supp. at 1127 (finding that the Fish

⁸ Syphard et al., *Comparing the Role of Fuel Breaks Across Southern California National Forests*, Forest Ecology and Mgmt., Feb. 2011, at 2038–48.

and Wildlife Service did not need to analyze certain factors set out under a different regulation related to bull trout habitat in determining “no extraordinary circumstances” prohibited its application of CE-6 to a proposed project).

Regardless, the Forest Service’s decision to locate the Tecuya Ridge Project in the “Wildland Zone” instead of the “Threat Zone” was not arbitrary and capricious. The Los Padres National Forest Strategic Community Fuelbreak Improvement Project Fire/Fuels Report states that while most existing fuelbreaks are in “high hazard chaparral areas,” a few fuelbreaks, like the one contemplated here, “are in coniferous forest and serve to limit fire spread from or towards communities or timber stands in poor condition.” The Cuddy Valley/Tecuya Stand Improvement Projects Fire/Fuels Report also notes that “[t]o reduce the threat of spotting distance from firebrands (spotting potential), fuels would need to be reduced both near and *at some distance* from the WUI [Wildland Urban Interface].” (emphasis added). The Decision Memo for the Project further explains that the Forest Service chose the project location to strategically “connect to past and future treatment areas on both public and adjacent private lands.” It was therefore reasonable for the Forest Service to conclude that the Project location will “provide a buffer between developed areas and wildlands,” one of the goals of the Mt. Pinos Community Wildfire Protection Plan.

Nor is there evidence that the proposed fuelbreak will be constructed in a “remote backcountry location” that will fail to facilitate firefighter access. The Tecuya Ridge fuelbreak will be located around communities within the wildland-urban intermix, including Pine Mountain Club, Pinon Pines Estates, Lake of the Woods, and Frazier Park. Sixty-six percent of the Project overlaps with the Antimony IRA,

which is linearly shaped and adjacent to major roadways. There are 3.9 miles of Forest system road, 1.1 miles of county roads, and approximately 1.5 miles of Forest permitted roads in the Antimony IRA. Firefighters may access the Antimony IRA via developed roads and trails. Thus, the fuelbreak location does not appear to be too remote for firefighters to approach in the case of wildfire.

Whether the location of the fuelbreak proposed for the Tecuya Ridge Project will serve to protect the Mt. Pinos Communities from wildfire is “a classic example of a factual dispute the resolution of which implicates substantial agency expertise.” *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 376 (1989). Because the Forest Service has substantiated its decision to place the Tecuya Ridge Project within the Wildland Zone with evidence in the record, its decision was not arbitrary and capricious. The Court declines to substitute Appellants’ judgment for that of the agency on this point. See *Morongo Band of Mission Indians v. Fed. Aviation Admin.*, 161 F.3d 569, 573 (9th Cir. 1998).

CONCLUSION

Because the Forest Service’s determination that the Tecuya Ridge Shaded Fuelbreak Project complies with the Roadless Area Conservation Rule is arbitrary and capricious, we **VACATE** the district court’s order granting summary judgment to Appellees and the Forest Service’s Decision Memo approving the Tecuya Ridge Shaded Fuelbreak Project and **REMAND** this case to the Forest Service to provide adequate substantiation for its determination that 21-inch dbh trees are “generally small diameter timber” within the Project Area.

R. NELSON, Circuit Judge, dissenting:

I agree with Sections I.B and II of the majority opinion. As the majority recognizes, the Forest Service “has adequately explained its determination that the Project will maintain or improve one of the roadless area characteristics.” Maj. Op. 14. The majority wrongly holds, however, that the Forest Service’s determination that 21-inch dbh trees are “small diameter” was arbitrary or capricious under the Administrative Procedure Act. I therefore respectfully dissent as I would deny the petition for review.

Under the Roadless Rule, the Forest Service can only approve the commercial thinning of “generally small diameter timber.” Special Areas; Roadless Area Conservation, 66 Fed. Reg. 3244, 3273 (Jan. 12, 2001) (previously codified at 36 C.F.R. § 294.13). The majority assumes that this requires the Forest Service to explain in detail why 21 inches dbh is small diameter. But such a detailed explanation is not required. As long as the Forest Service considers the factors laid out in the relevant federal regulations, the agency need not provide a separate exhaustive explanation of what trees are generally small diameter.

As the majority acknowledges, the regulations do not define what constitutes “generally small diameter timber.” Maj. Op. 16. A single definition for “small diameter timber” makes no sense; such determinations must be project-specific and guided by local ecological considerations in which the Forest Service has expertise. 66 Fed. Reg. at 3257. The regulations require only that the Forest Service use its expertise to determine which trees are small diameter depending on “the great variation in stand characteristics between vegetation types in different areas,” “the

characteristics and interrelationships of plant and animal communities associated with the site and the overall landscape,” and how the “cutting or removal” of trees will “affect the potential for future development of the stand.” *Id.* The Forest Service adequately complied with this administrative directive.

Over the course of preparing the Tecuya Ridge Project Proposal, the Forest Service thoroughly analyzed local plant-animal relationships and the future development of the tree stands in the Project, including how removal “would mimic the role and legacies of natural disturbance regimes.” *See* 66 Fed. Reg. at 3257. It completed a botany report, a fire fuels report, two decision memoranda, and a briefing paper that specifically analyzed whether the Project complied with CE-6 and the Roadless Rule. Silvicultural specialists surveyed and conducted exams and walk-throughs in the Project area. The Forest Service identified forest stands that were overstocked due to their size and density, subject to insect attack due to resource competition, and at imminent risk of creating a “fire ladder” fuel profile. It determined that forest stands over 120 square feet per acre needed to be thinned to at least 80 feet per acre. It calculated the size of trees that should be retained for California condors and northern goshawks. And it decided that—to meet the stated goals that the majority accepts, Maj. Op. 15—only smaller diameter trees up to 21 inches dbh should be cut for safety or operability reasons, especially early seral species including Jeffrey and pinyon pine.

After this comprehensive ecological analysis, the Forest Service concluded that trees under 21 inches dbh “needed to be thinned to meet the desired conditions of the proposed action to a 90 percent effective[ness] level.” As the majority notes, “[e]ven when an agency explains its decision with

‘less than ideal clarity,’ a reviewing court will not upset the decision on that account ‘if the agency’s path may reasonably be discerned.’” *Alaska Dep’t of Env’t Conservation v. EPA*, 540 U.S. 461, 497 (2004) (quoting *Bowman Transp., Inc. v. Ark.–Best Freight Sys., Inc.*, 419 U.S. 281, 286 (1974)). Here, the record allows us to reasonably discern the Forest Service’s “path” in considering the regulatory requirements. *See id.* That is enough to survive our deferential review for arbitrary or capricious agency action. *See Nat’l Family Farm Coal. v. EPA*, 966 F.3d 893, 923 (9th Cir. 2020) (agency decision is arbitrary or capricious “only if the agency relied on factors Congress did not intend it to consider, . . . or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise” (citation omitted)).

The majority reaches the opposite conclusion by improperly comparing the Tecuya Ridge Project here to the Frazier Mountain Project, which it says “likely contains a similar stand composition.” Maj. Op. 18. One of three alternatives presented in that Project deemed trees large diameter at 10 inches dbh. True, the Tecuya Ridge Project and the Frazier Mountain Project are located nearby in the same national forest. But the Los Padres National Forest spans approximately 1.75 million acres, ranges in elevation by over 8,000 feet, and consists of two separate land divisions.¹ As the Forest Service explains, the two projects contain different compositions of tree species. Nothing in the record undermines that finding. Judges are hardly

¹ *Los Padres National Forest*, Nat’l Forest Found., <https://www.nationalforests.org/our-forests/find-a-forest/los-padres> (last visited Oct. 28, 2021); *Los Padres National Forest – Animals and Plants*, U.S. Forest Serv., https://www.fs.usda.gov/detailfull/lpnf/about-forest/?cid=FSM9_034061 (last visited Oct. 28, 2021).

equipped, as the majority does, to second-guess the agency's evaluation of a forest stand's composition.² Especially when the regulations require that the Forest Service's analysis be done on a project-by-project basis, the agency need not explain why small diameter may vary between projects. We cannot rely on the Frazier Mountain Project to provide a workable definition of small diameter trees for the Tecuya Ridge Project. 66 Fed. Reg. at 3257 (determinations best made through "project specific . . . analyses").

We likewise cannot assume, as the majority does, that because the Los Padres Land Management Plan describes large diameter trees as greater than 24 inches dbh, trees up to 21 inches dbh are "at best, . . . medium sized." Maj. Op. 17. The Plan's reference to 24 inches dbh as large diameter only refers to "shade intolerant conifer species." According to the record, shade-intolerant conifers include *ponderosa* pine, which are not listed as within the Project. Nothing in the record suggests that the trees in the Project are shade intolerant. Further, if large diameter trees, sixteen years ago when the Plan was adopted, were "old growth" trees, then today those old growth trees would be even larger. Even if we could rely on the Plan's reference, small diameter trees today would be smaller than or even up to 24 inches dbh. The federal regulations do not suggest that the Forest Service is bound by past data. Instead, they direct the Forest Service to consider the "potential for future development of the stand." 66 Fed. Reg. at 3257. In reality, all trees can be

² For instance, the majority states that the Tecuya Ridge Project is filled with "Singleleaf pinyon-California juniper" trees. Maj. Op. 6. But "singleleaf pinyon" and "California juniper" are two different tree species, and "Single-leaf pinyon-California juniper" in the Los Padres Land Management Plan describes a woodland including trees of those two species.

small or large diameter—as long as the record shows, as it does here, that the Forest Service adequately considered the regulatory factors.

Finally, the majority ignores basic rules of administrative law. The majority correctly notes that we cannot “require the Forest Service to undertake any particular method of providing a reasoned explanation for its choice.” Maj. Op. 20. But then it ignores that principle and finds that the Forest Service failed to provide “the average or median dbh of the trees.” *Id.* at 16–17. Neither the Roadless Rule nor the related regulations require such an analysis. To the contrary, the regulations list very different considerations—namely, local “vegetation types in different areas” and the “future development of the stand”—which seems to exclude the average or mean dbh as a basis for determining small diameter. 66 Fed. Reg. at 3257. Indeed, the majority’s requirement to analyze the average or mean dbh would be particularly detrimental to old growth forest stands because it would allow thinning of larger trees without consideration of the regulatory factors. Regardless, the court may not “impose upon the agency its own notion of which procedures are best.” *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council*, 435 U.S. 519, 549 (1978) (internal quotation marks omitted).

The right question is not “what trees objectively fall into the category of small diameter trees?”—it is “did the Forest Service perform project-specific analyses to support its conclusion that less-than-21-inch dbh trees should be thinned under project-specific circumstances?” The Forest Service did not seek to establish a one-size-fits-all rule that 21 inches dbh was small diameter in all projects. Instead, it determined that the Tecuya Ridge Project included mechanically thinning trees that were less than 21 inches dbh

and that the portion of the Project encompassing the Antimony IRA complies with the Roadless Rule.³ The Forest Service explicitly stated that “[t]his diameter would be needed to be thinned to meet the desired conditions.” This conclusion was neither arbitrary nor capricious under the discretion granted to the Forest Service by federal regulations. I therefore respectfully dissent.

³ About 48 percent of the total 40,153 acres of the Antimony IRA, which overlaps with the Project, is pinyon woodlands, sagebrush, and other conifers. Tree thinning would occur on only 1,075 acres of the Antimony IRA, or less than 3 percent of the IRA.



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Reforestation Glossary

Appropriate Forest Cover - Vegetation composed of plant communities, which would occur naturally on similar sites depending upon the stage of plant succession. Forbs, grasses, and shrubs in their proper ratios are also elements of forest cover.

Current Maintenance Reforestation - All acres in need of reforestation that have been deforested by any natural or human cause, such as, fire, wind, insects, disease, or timber harvest since July 1, 1975. The NFMA requirement that all backlog reforestation be completed by September 30, 1985, was accomplished, therefore, all reforestation is now considered current work.

Advance Regeneration (also called advance reproduction or advance growth) - Seedlings or saplings that develop or are present in the understory.

Age Class (cohort) - One of the intervals into which the age range of trees is divided for classification or use. A distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, such as a 10-year age class, as used in inventory or management.

Artificial Regeneration (Reproduction) - A group or stand of young trees created by direct seeding or by planting seedlings or cuttings.

Cleaning

1. An intermediate, release treatment made in an age class not past the sapling stage to free the favored trees from less desirable individuals of the same age class that overtop them or are likely to do so (see improvement cutting, liberation, and weeding).
2. A release treatment designed to eradicate individual trees infected with diseases, such as dwarf mistletoe.

Clearcut

1. A stand in which essentially all trees have been removed in one operation to produce an even-aged stand. Depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration (see regeneration method (two-aged methods)).
2. A regeneration or harvest method that removes essentially all trees in a stand.

Clearcutting Regeneration Method - The cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class. Regeneration can be from natural seeding, direct seeding, planted seedlings, coppice, or advance reproduction. Cutting may be done in groups or patches (group or patch clearcutting), or in strips (strip clearcutting). The management unit or stand in which regeneration, growth, and yield are regulated consists of the individual clearcut stand. When the primary source or regeneration is advance reproduction, the preferred term is overstory removal.

Clearcutting Regeneration Method with Reserves - A clearcutting regeneration method in which varying numbers of reserve trees are retained to achieve goals other than regeneration. This method produces a two-aged stand in which varying numbers of reserve trees are not harvested. If a minor, live component is left for snag replacement, the method is considered a clearcut method rather than clearcut with reserves.

Coppice Regeneration Method - An even-aged method of regenerating a stand in which the trees in the previous stand are cut and the majority of regeneration is from sprouts or root suckers.

Coppice Regeneration Method with Reserves - A coppice regeneration method in which varying numbers of reserve trees are retained to achieve goals other than regeneration. This method normally creates a two-aged stand. If a minor, live component is left for snag replacement, the method creates an even aged stand.

Even-aged Methods - Regeneration and maintenance of a stand with a single age class.

Even-aged Stand - A stand of trees composed of a predominately single age class in which the range of tree ages is usually less than 20 percent of the intended rotation (see clearcutting, seed-tree, shelterwood, and coppice regeneration).

Even-aged Silvicultural System - A planned sequence of treatments designed to maintain and regenerate a stand with predominately one age class. The range of tree ages is usually less than 20 percent of the rotation (see clearcutting, seed-tree, shelterwood, and coppice regeneration methods).

Forest - An ecosystem characterized by more or less dense and extensive tree cover, often consisting of stands varying in characteristics such as species composition, structure, age class, and associated processes, and commonly including meadows, streams, fish and wildlife.

Forest Regulation - The technical (in contrast to the administrative and business) aspects of controlling stocking, harvest, growth, and yields to meet management objectives including sustained yield.

Group Selection Regeneration Method - A method of regenerating uneven-aged stands in which trees are cut, in small groups, and new age classes are established. The width of groups is commonly approximately twice the height of the mature trees, with small openings providing microenvironments suitable for tolerant regeneration, and the larger openings providing conditions suitable for regeneration that is more intolerant. In the group selection regeneration method, the management unit or stand in which regeneration growth and yield are regulated consists of a landscape containing an aggregation of groups.

Harvest Activity - A reference to a specific type of cut applied under a regeneration method or intermediate treatment. Refer to the TRACS-SILVA Table S1020 for valid codes. (TRACS-SILVA Data Dictionary).

Improvement Cutting - An intermediate treatment made in a stand, pole-sized or larger, primarily to improve composition and quality by removing less desirable trees of any species.

Intermediate Treatment - A collective term for any treatment or tending designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final harvest.

Liberation Cut - A intermediate, release treatment made in a stand not past the sapling stage in order to free the favored trees from competition of older, overtopping trees.

Overstory Removal - The cutting of trees comprising an upper canopy layer in order to release advance regeneration in an understory. Overstory removal is only applicable to the clearcutting regeneration method and only when the primary source of regeneration is advance reproduction.

Patch (Group) Clearcutting - Under an even-aged method, a modification of the clearcutting method where patches (groups) are clearcut in an individual stand boundary in two or more entries. Under a two-aged method, varying numbers of reserve trees are not harvested in the patches (groups), to attain goals other than regeneration.

Preparatory Cut - An optional type of cut that enhances conditions for seed production and establishment applied under the shelterwood regeneration methods.

Regeneration Method - A cutting procedure by which a new age class is created. The major methods are clearcutting, seed-tree, shelterwood, selection, and coppice. Regeneration methods are grouped into four categories: coppice, even-aged, two-aged, and uneven-aged.

Reforestation Treatment - A reference to a specific reforestation activity used to establish reproduction in a stand. Treatments include planting, direct seeding, coppice or root suckers, site preparation for natural reproduction (regeneration), or natural regeneration without site preparation. These treatments typically start at the beginning phases of a regeneration method just subsequent to the harvest, such as: clearcutting, clearcutting with reserves, overstory removal, seed-tree, seed-tree with reserves, shelterwood, shelterwood with reserves, coppice, coppice with reserves, single-tree selection, and group selection.

Release - An intermediate treatment designed to free young trees from undesirable, usually overtopping, competing vegetation.

Reserve Trees - Live trees, pole-sized or larger, retained in either a dispersed or aggregated manner after the regeneration period under the clearcutting with reserves, seed-tree with reserves, shelterwood with reserves, group selection with reserves, or coppice with reserves regeneration methods. Trees are retained for resource purposes other than regeneration.

Salvage Cutting - The removal of dead trees or trees being damaged or dying due to injurious agents other than competition, to recover value that would otherwise be lost.

Sanitation Cutting - The removal of trees to improve stand health by stopping or reducing actual or anticipated spread of insects and disease.

Seed Cut - A type of cut that removes trees except those needed for regeneration and reserve trees. Prepares the seed bed and creates a new age class in an even-aged or two-aged stand under the seed-tree or shelterwood regeneration method. If reserve trees are retained, it is under a two-aged method of seed tree or shelterwood regeneration methods.

Seed-Tree Regeneration Method - An even-aged regeneration method in which a new age class develops from seeds that germinate in fully-exposed micro-environments after removal of the previous stand, except for a small number of trees left to provide seed. All trees are cut except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment. Seed trees are usually removed after regeneration is established unless some are retained to meet other resource objectives (snags replacement). Under a two-aged method (seed tree with reserves), some, or all of the seed trees are retained after regeneration has become established to attain goals other than regeneration. When the Seed Tree method is employed, the sequence of activities can include 1) seed cut (establishment cut) to establish a new age class and, 2) Seed Tree removal cut.

Seed-Tree Removal Cut - A final removal cut that releases established regeneration from competition with seed trees after they are no longer needed for seed under the seed-tree regeneration method. Reserve trees are retained during the removal cut if it is a sequence of the seed-tree with reserves regeneration method.

Seed Tree Regeneration Method with Reserves - A seed-tree regeneration method in which some or all of the seed trees are retained after regeneration has become established to attain goals other than regeneration. This method creates an even-aged stand or a two-aged stand depending on management goals. Reserve trees may also include those trees that are not expected to provide seed for desirable regeneration.

Seed Tree Removal Cut with Reserves - Under the two-aged method, seed tree regeneration method, the final removal of some of the remaining crop trees (seed trees) after regeneration is established. Some seed trees are retained to attain goals other than regeneration.

Shelterwood Regeneration Method - A method of regenerating an even-aged stand in which a new age class develops beneath the moderated microenvironment provided by the residual trees. When the shelterwood regeneration method is employed, the sequence of treatments can include three distinct types of cuttings:

1. an optional **preparatory cut** to enhance conditions for seed production;
2. a shelterwood **seed cut** (establishment cut) to establish a moderated micro-environment, prepare the seed bed, and create a new age class; and
3. a shelterwood **removal cut** to release established regeneration from competition with the overwood.

Cutting may be done uniformly throughout the stand (uniform shelterwood), in groups or patches (group shelterwood), or in strips (strip shelterwood).

Shelterwood Removal Cut - A final removal cut that releases established regeneration from competition with shelter trees after they are no longer needed for shelter under the shelterwood regeneration method.

Shelterwood with Reserves Regeneration Method - A regeneration method in which some or all of the shelter trees are retained to attain goals other than regeneration. This method creates an even-aged stand or a two-aged stand if sufficient trees are reserved.

Shelterwood Removal Cut with Reserves - A final removal cut that releases established regeneration from competition with shelter trees after they are no longer needed for shelter under the shelterwood with reserves regeneration method. Reserve trees are retained during the final removal cut if it is a sequence of the shelterwood with reserves regeneration method (consistent with ST sequence).

Silviculture - The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Silvicultural Prescription - A document written or approved by a certified silviculturist that describes management activities needed to implement silvicultural treatment or treatment sequence. The prescription documents the results of an analysis of present and anticipated site conditions and management direction. It also describes the desired future vegetation conditions in measurable terms (FSM 2478.03). It documents a planned series of treatments designed to change current stand structure and composition to one that meets management goals. The prescription normally considers ecological, economic, and societal objectives and constraints.

Single Tree Selection Regeneration Method - An uneven-aged method where individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration.

Stand - A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the fundamental unit of silviculture reporting and record-keeping. Stand may be analogous to Activity Unit.

Stand Composition - The proportion of each tree species in a stand expressed as a percentage of the total number, basal area, or volume of all tree species in the stand.

Stand Clearcutting - A type of clearcutting where removal of essentially all trees in the previous stand, producing a fully exposed microclimate for the development of a new age class. Under a two-aged method, varying numbers of reserve trees are not harvested to attain goals other than regeneration.

Strip Clearcutting - A type of clearcutting involving strip cutting in two or more entries, separated by a few years, resulting in an even-aged or two-aged stand under the clearcutting regeneration method. Reserve trees may or may not be retained. Under an even-aged method, a modification of the clearcutting method where alternate or

progressive strips are clearcut in an individual stand boundary in two or more entries. Under a two-aged method, varying numbers of reserve trees are not harvested in the strips, to attain goals other than regeneration.

Thinning - An intermediate treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality. Includes crown thinning (thinning from above, high thinning), free thinning, low thinning (thinning from below), mechanical thinning (geometric thinning), and selection thinning (dominant thinning).

Two-Aged Method - Regeneration and maintenance of stands with two age classes. The resulting stand may be two-aged or tend towards and uneven-aged condition as a consequence of both an extended period of regeneration establishment and the retention of reserve trees (green trees) that may represent one or more age classes.

Two-Aged Stand - A growing area with trees of two distinct age classes separated in age by more than plus or minus 20 percent of rotation.

Two-Aged Silvicultural System - A planned sequence of treatments designed to regenerate or maintain a stand with two age classes.

Uneven-aged Methods - Regeneration and maintenance of stands with a multiaged structure by removing some trees in all size classes either singly or in groups or in strips.

Uneven-aged Stand - A stand of trees of three or more distinct age classes, either intimately mixed or in groups.

Uneven-aged Silvicultural System - A planned sequence of treatments designed to regenerate or maintain a stand with three or more age classes Includes single-tree selection, and group selection regeneration methods.

Weeding - A release treatment in stands not past the sapling stage that eliminates or suppresses undesirable vegetation regardless of crown position.

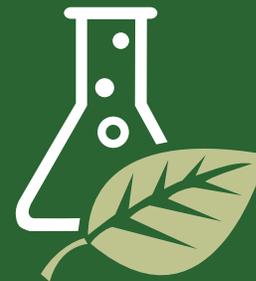
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Rocky Mountain Research Station Science You Can Use Bulletin

NOVEMBER 2020 | Issue 45

Is Mastication Right for Your Site? Science-Based Decision Trees for Forest Managers

Mastication, also known as slash-busting, mulching, or brush-cutting, is used to cut and chop or grind vegetation into smaller particles that are usually left on a site as mulch. By converting fuels into small chunks, standing live and dead fuels are converted into compact surface fuels. In this way, mastication can be used to prepare sites for prescribed fire, or used as a stand-alone treatment in areas where it is difficult to burn—either due to high fuel loads, shortened burn windows, risk of escape, smoke concerns, or the presence of homes and other structures. Land managers also use mastication to remove competition by less preferred species and prepare sites for natural or artificial regeneration.

In a recent review of studies examining mastication as a forest management tool, Terrie Jain, a research forester with the Rocky Mountain Research Station, worked with fellow RMRS colleagues Pamela Sikkink and John Byrne, and Robert Keefe with the Department of Forest, Rangeland,

SUMMARY

Mastication reduces forest vegetation into small chunks by grinding, shredding, or chopping material with specialized equipment. The type of equipment varies from using a front-end loader with a boom-mounted rotary blade to a drum-type head. Forest managers use mastication to remove competition, prepare a site for regeneration, release sapling-sized trees, and convert ladder fuels to surface fuels. This Science You Can Use article describes the potential benefits of mastication as a forest management tool, presented in the form of a set of decision trees that can guide land managers in choosing the right treatment option for a particular site and management objective. Depending on the management objective, if mastication is an option, then a thorough site evaluation includes consideration of slope, nonnative species invasions, vulnerability of soils to erode or compact, and treatment costs. Jain and colleagues also provide a land manager's perspective, with useful insights on the benefits as well as the limitations of mastication as a forest management tool. Operator experience can be one of the most important factors in determining outcomes; so we've included conversations with several veteran machine operators who speak to the challenges of mastication work.



A mastication machine treats surface fuels and provides a fire break surrounding buildings (photo: D. Mitchell, USDA Forest Service, Southern Research Station).



and Fire Sciences at the University of Idaho. [To masticate or not: Useful tips for treating forest, woodland, and shrubland vegetation.](#) Gen. Tech. Rep. RMRS-GTR-381 found that while mastication costs vary widely depending on the types of equipment used, the terrain where they are operating, site conditions, and operator skill, mastication does have important market and non-market benefits. If managers decide that mastication is an option for achieving resource management objectives, then a thorough site evaluation includes consideration of slope, nonnative species invasions, vulnerability of soils to erode or compact, and treatment costs.

“Mastication is increasingly used to treat vegetation, but there was no specific information to guide managers on how and when to use this treatment,” says Jain.

There is a wide range of equipment configurations used for mastication, each with its own advantages and disadvantages. This Science You Can Use Field Guide will only touch on these options in brief (for more detailed descriptions of carrier machines and cutting heads, see Gen. Tech. Rep. RMRS-GTR-381).

The aim here is to describe the potential advantages and disadvantages of mastication as a forest management tool, presented in the form of a set of decision trees that can help guide land managers in choosing the right treatment option for a particular site and management objective.

Jain and colleagues also provide the perspectives of a land manager—who has extensive experience in using mastication as a forest management tool—as well as several veteran machine operators who provide insights on the challenges of providing this service.

The Right Treatment, in the Right Place, at the Right Time

Jain and colleagues suggest that land managers conduct a thorough site evaluation to determine if mastication is an option for a particular land management objective. To aid in the evaluation, the researchers provided a series of decision trees built with a set of detailed questions based on a site evaluation to assist managers in

deciding what treatment method best fits their project.

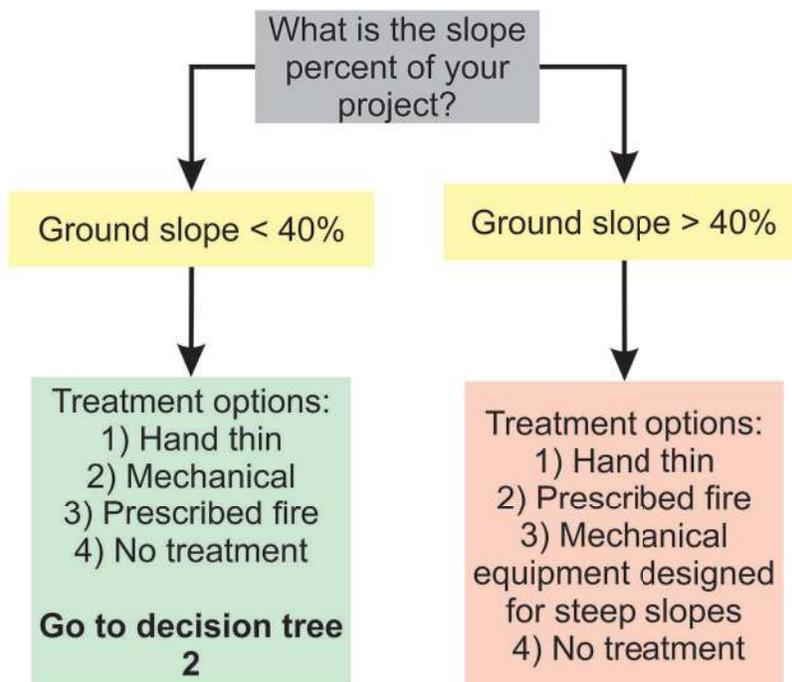
Decision Tree 1 – How Does Slope Percent Influence Treatment Options?

Researchers, managers, and operators agree that slope and terrain factors are some of the most important factors for deciding on whether mastication can be used on a given site. Jain and colleagues found that treatment options for using mechanical equipment are limited to slopes below 40 percent, unless there is the possibility of using machines specifically designed to operate on steep slopes (up to 50 percent).

On slopes greater than 40 percent, managers can consider using

cited in Los Padres ForestWatch v. USFS No. 20-55859 archived on February 1, 2022

Decision Tree 1
The influence of slope when selecting treatment options



prescribed fire or hand slashing and piling. On slopes less than 40 percent, and especially below 35 percent, mechanical treatment becomes a safe and effective option in many situations. The researchers also point out that if the biomass does not create a fire hazard or the regeneration success does not require site preparation, then the site may not need treatment.

Decision Tree 2 – Does the Site Need Post-Harvest Slashing or Have Excessive Advanced Regeneration?

For sites with less than 40 percent slope, the next questions regarding

site treatment relate to the abundance, distribution, and type of noncommercial vegetation on the site.

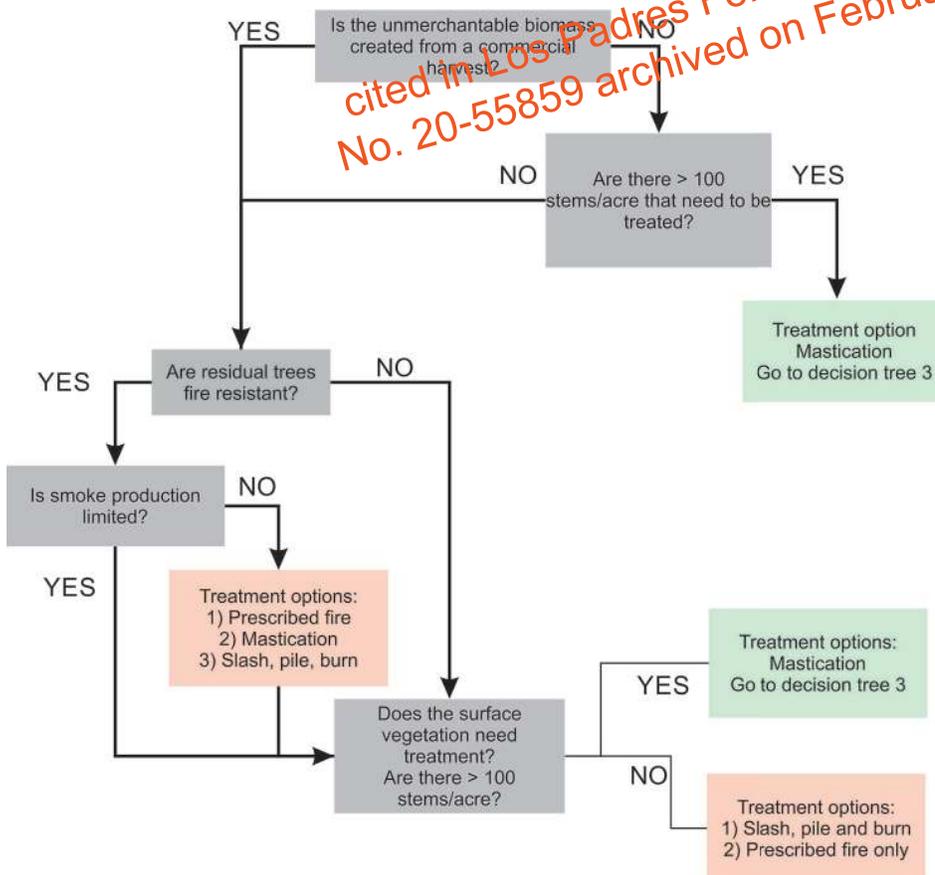
If the site contains logging slash, a shrub-dominated understory, or excessive advanced regeneration (defined as more than 100 stems per acre), then some type of mastication treatment is an option. On sites where the ability to use prescribed fire is limited, managers can use mechanical treatments, such as mastication or grapple piling.

Jain and colleagues found that mastication is most effective on sites where there is substantial advanced regeneration (> 100 stems/acre). However, if only a few trees or shrubs exist, then more practical, cost-effective options are available, such as hand slashing followed by either prescribed fire or grapple piling.

MANAGEMENT IMPLICATIONS

- Depending on the management objective, if mastication is an option, then a thorough site evaluation includes consideration of slope, nonnative species invasions, vulnerability of soils to erosion or compaction, and treatment costs.
- The experience level of an operator can heavily influence project costs and achieving mastication treatment objectives.
- Although research has not shown that mastication negatively affects soils, good management practices, such as implementing mastication on dry soils, driving on slash, and correctly choosing equipment, will help diminish soil scarification and compaction.
- Not all biomass on a site needs treatment or mulching into small pieces. Some trees can remain as down logs. These additional logs provide wildlife habitat and do not contribute to an increase in the fine fuels. Some trees can have tops cut (particularly with a boom-mounted masticator) and be left standing for future snag recruitment.
- The operator has the ability to adjust the piece size by using a vertical shaft that creates larger pieces or by minimizing the amount of time spent chopping each piece, resulting in larger pieces left on the ground.

Decision Tree 2
Treatment options for slopes < 40%



cited in Los Padres ForestWatch v. USFS No. 20-55859 archived on February 1, 2022



Decision Tree 3 – Is the Soil Prone to Compaction?

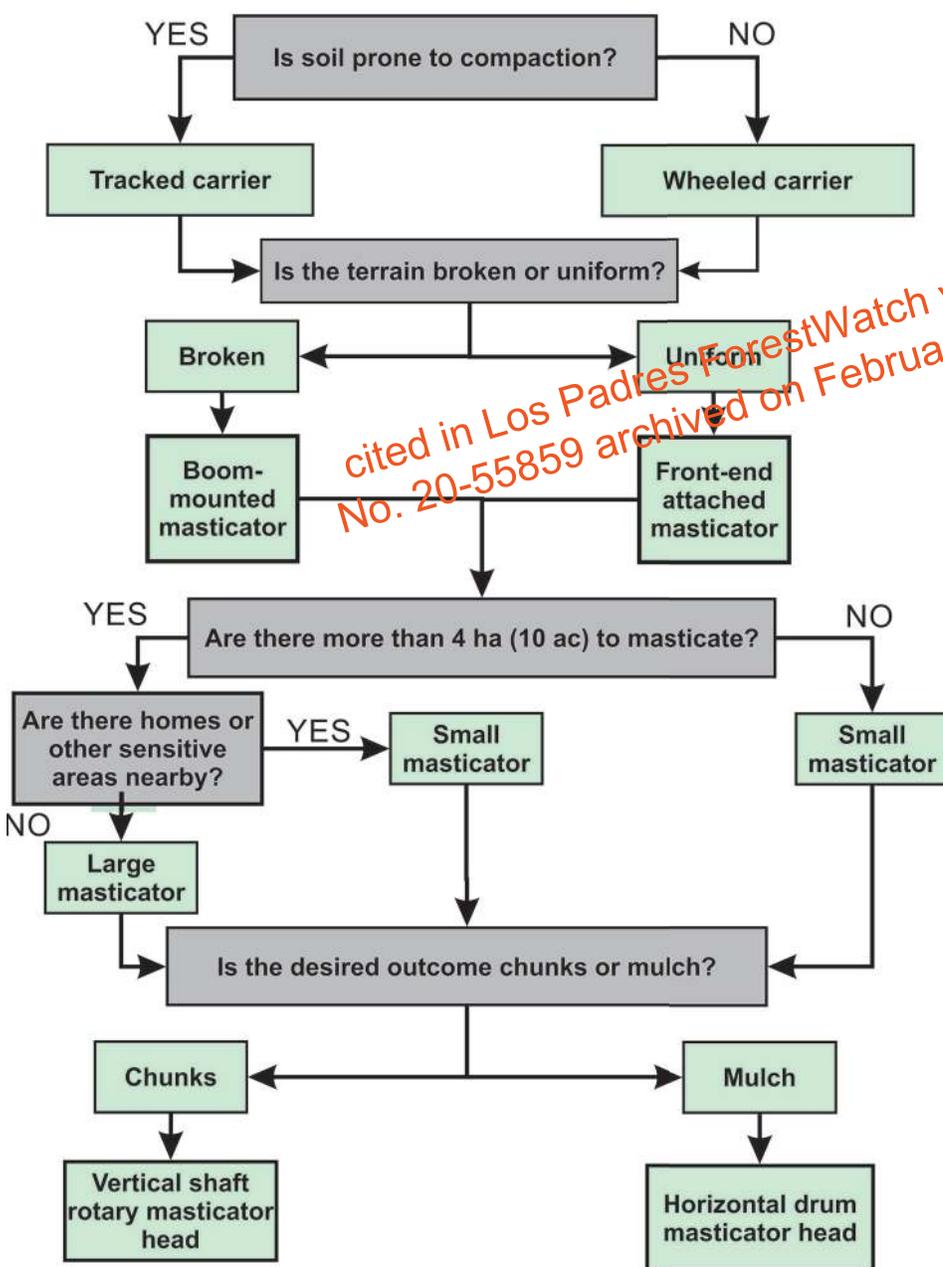
Decision Tree 3 can be used to match the masticator to the site and project objectives once the decision is made that mastication is an appropriate option.

Jain and colleagues found that the impact of machines on soil compaction and disturbance is driven by a number of factors. Here are general findings they

summarized from their literature survey:

- Dry soils lead to less compaction.
- Driving on slash mats can also decrease compaction.
- Wheeled carriers can create ruts, particularly on wet soils.
- Tracked machines generally cause less soil disturbance because the machine weight is spread over a larger area than wheeled carriers.
- Rubber tracks tend to offer the lowest pressure and are the best choice on sensitive soil conditions.
- Equipment with boom-mounted cutting heads can reach over difficult areas or maneuver around tighter spaces; therefore, this equipment avoids driving to every tree, which also diminishes soil disturbance.

**Decision Tree 3
Mastication combinations**



*cited in Los Padres ForestWatch v. USES
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Jain and colleagues suggest that forest managers evaluate compaction potential on their sites using available tools like the Soil Disturbance Field Guide (Napper et al. 2009). The authors also recommend requiring operators to use best practices to reduce soil damage, such as limiting the number of passes, conducting the treatments when soils are dry, and having the machine walk over slash where possible.



Manager and Operator Perspectives: Andrew Saralecos

Andrew Saralecos is a forester for the Nez Perce Tribe in Idaho, who previously held the same position, and was a logging engineer for private industry, and a federal land manager. He has a great deal of experience with mastication as a land management tool, both as a machine operator and contracting land manager. Saralecos shared some of his thoughts on the benefits and limitations of mastication and provides suggestions for land managers thinking of using outside contractors and operators for mastication treatments.

He said the Nez Perce Tribe averages about 2,200 acres of mastication treatments per year, compared to about 450 acres of annual prescribed burning.

We [the Nez Perce Tribe] do a lot of prescribed burning. It's often the right tool at the right time. But if I'm treating logging slash with burning, we have airshed constraints for smoke management, which means very narrow burn windows. However, we also own two masticators and have several more on a standing contract that we can run 11 months out of the year. They can cover a ton of acres and get our desired conditions and objectives done no matter what's going on. It is dependable production I can bank on.

Saralecos said he often uses mastication to prep sites for prescribed burning.

Very seldom do we have continuous fuel loading across the site. Often, there'll be an area that's really brushy and you have 20-foot high ladder fuels of Hawthorne and blackberry bushes and small reproduction. We use mastication to get it knocked down so that we have a good, low fire.

We do see some issues with fire severity if the mulch gets deep and we burn it on the hot side. You can end up impacting the root zone. But our experience has been that it is pretty reasonable and manageable.

Saralecos notes limitations on the types of sites where mastication is effective, particularly in relation to stem size.

From a production standpoint, I don't want to be mulching anything that's over 6 inches DBH [diameter at breast height]. There are machines and operators out there that will say, "Oh yeah, we can mulch this." But you can't do it productively and sustainably in a way that is cost effective. A lot of these machines and a lot of our newer machines, they can run all day long and crank out acres productively in that 5- to 6-inch material. It's possible to take a 10-inch tree at DBH and auger down that last 4 and a half feet to say a 12-inch plus stump, but that's not a great use of their time. And in our case, I have a market for that product, so I'm better off logging it and putting it on a truck. So really from a production standpoint, it comes down to knowing your piece size.

Another issue that arose in Jain and colleagues' research on mastication, as well as in conversations with Andrew Saralecos, is the role of operator skill and experience in mastication outcomes.

In a forest environment, you need to have an operator who's able to understand the specifications for what you're doing. You need them to understand tree species or brush species, a whole range of things, and be able to work independently. Also, they need to realize they aren't working on a prepared site. If you have somebody who's used to running equipment on a construction site or highway project that's flat or relatively flat, now they're dealing with trees and branches and stuff that falls on you and going over stumps and rocks and hillsides. That's not for everybody. Unless you have an operator that's used to working in that kind of terrain, their productivity very rapidly plummets. I can't emphasize enough how low that productivity can drop. You can take a top-shelf operator on flat ground, put them on a slope in the forest and accomplish basically nothing.

Finally, Saralecos has suggestions and considerations for managers to keep in mind when setting up a mastication contract and directing the work.

Figure out what your hundred percent in terms of production is for the day. And then tell the operator to back it off to say 80 percent to 85 percent and maintain that rate. So, at the end of the day you haven't dinged up a bunch of leave trees. You haven't made a mess and you've been very consistently productive. That takes a lot of skill.

What is your tolerance for site disturbance? If you know the operator and you know their capabilities, you might have somebody that'll go in, take care of the job and have zero site disturbance. But if it's going out on more of a low-bid, not a best value contract—you could have someone on the same project look like you rototilled the hillside. The question comes down to what is acceptable.

The other thing I would say that is huge for us is to understand the limitations of the machine and having the proper spacing. People make mistakes by trying to dive into equipment versus relying on the contractor to get them to the desired conditions. So they'll say, "I need to have this machine that has this kind of reach and does these things well," but the reality is that unless they really know their equipment, they've now specified something that might leave others out of the bid pool and their spacing is too tight for the machine they specified. Then they wonder why the project doesn't turn out. The best approach is to say, "Here's my spacing, the end product needs to look like this," and let the contractor do their job.



Other Mastication Considerations

Ecosystem impacts. One of the primary applications of mastication is as a fuels treatment, mostly as a means to convert ladder fuels to surface fuels. Mastication can increase the abundance of fine fuels and, if ignited, these fuels can smolder for long periods; therefore, depending on the quantity of fuels on a site and the depth of the slash that mulching can create, mastication may not always be an appropriate forest treatment.

Recent research has shown that erosion and compaction can be minimized when the machines are driven over masticated residue.

It is difficult to generalize about the impact of mastication treatments on wildlife, as mastication treatment habitat conditions influence wildlife species and not necessarily the treatment itself. Different treatments create different vegetation composition and structure, which can favor some species over others.

Operator skill. An experienced masticator operator can move through a project efficiently and often is more likely to achieve desired site conditions with reduced ecosystem impacts. In their review, Jain and colleagues found that operator experience was the most important factor in project outcomes regardless of the machine—the more experienced the operator, the more cost efficient the project will be.

Table 1. Summary of ecosystem impacts from mastication treatments, based on literature review by Jain and colleagues (see Gen. Tech. Rep. RMRS-GTR-381 for more details).

Ecological response following mastication	Type of response	Response
Vegetation	Revegetation	Varied Time since treatment Vegetation type
	Invasive plant	Vulnerable in grasslands, shrublands and woodlands
Tree	Mortality	Minimal
	With prescribed fire	May increase regeneration
	Reduce competition	Increase seedling survival
Soil	Erosion	Not adversely affected
	Nutrition	Not adversely affected
	Insulation	Increased insulation and created uniform temperatures
	Infiltration	Decreased on pinyon-juniper woodlands Not adversely affected in conifer forests
	Microbial activity	Not adversely affected
	Moisture	Increased moisture on lodgepole pine and dry mixed-conifer soils
Wildlife	Habitat	Depends on the species

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Mastication equipment (clockwise from top):
 1. Tractor with a horizontal cutting head (photo: M. Peterson, Diamond Mowers Inc.).
 2. Skid steer with forestry mulcher attachment (photo: M. Peterson, Diamond Mowers Inc.).
 3. Vertical head masticator (photo: M. Peterson, Diamond Mowers Inc.).
 4. Horizontal shaft cutting heads can have knives or teeth designed to work in different settings, such as on rocky soils (photo: Fecon Inc.).



Manager and Operator Perspectives: Roger Kinyon

Roger Kinyon, the owner of C.K. Excavation in Genesee, Idaho, ran a hydroseeding business for many years and has been doing mastication for 6 years. He uses a FECON 128 purpose-built, forestry mulcher. He works mastication contracts for the Nez Perce Tribe, Coeur d'Alene Tribe, and Northwest Management, a large timber management company in the Pacific Northwest.

Kinyon said that with the replacement of best-value contracting, where bids could be awarded based on experience and past performance, with straight low-bid contract awards, there has been an increase of inexperienced operators moving into the business with equipment that is not suited for forest management work.

Everybody thinks it's a great way to make a living on the weekends. So, they go out and buy a skid steer and a head. They bid these contracts for a hundred dollars per acre. Then they get into it and figure out that with the skid steer they're getting a quarter or half an acre done a day in the heavy stuff where I get about five or six. So, people offering contracts need to check into the type of equipment that people are bidding have or they could end up way over a barrel and have to pay to do it twice because the guy with the low bid just can't do it, their machines just won't do it. Then they have to pay me to come in and fix it.

Kinyon said experience working on forested landscapes is also a key factor in how productive a contractor will be in treating stands to desired conditions.

Masticating in mountain country, in the steep stuff, is a pretty serious situation. I've worked on the North Slope and I've worked a lot of places and done a lot of things, but forest mulching is probably the most dangerous work I've ever done. Because when things go wrong, it goes horribly wrong and then you're just trapped in a machine. So, I've had guys come and cut for a day and say, "This isn't for me, I'm done." Another guy working with me now just loves being in the woods. He loves the thrill of it. But, it's not for everybody.

Site conditions are a big determinant of his ability to complete a contract profitably, Kinyon said. He prefers to have contracts "stair-stepped" with different rates for different stands depending on the size of the trees.

If I'm in 6-inch stuff, the rate is X. I can go through 6-inch stuff and not even hardly slow down. If I move into 8-inch stuff, the contract pays me a little bit more. Once we go over 12 inches, then it jumps a couple hundred dollars an acre because you just spend a lot of time chewing up trees into woodchips, so it just takes that much more time.



“Masticating in mountain country, in the steep stuff, is a pretty serious situation. I’ve worked on the North Slope and I’ve worked a lot of places and done a lot of things, but forest mulching is probably the most dangerous work I’ve ever done. Because when things go wrong, it goes horribly wrong.”

— Roger Kinyon,
mastication contractor,
owner of C.K. Excavation

In addition, minimizing turns and limiting the number of passes may reduce overall site impact, from tree damage to soil impacts.

More complex projects are likely to benefit from more experienced operators. Complex projects might include a high density of residual trees (> 100 trees per acre), the presence of houses or other structures, or the need to work on steep slopes (35 percent to 50 percent).

Experienced operators can create smaller or larger piece sizes (debris left on forest floor) by adjusting the time spent masticating a particular piece.

“What are we going to lose if we don’t go in here? Why don’t we mulch it up, put it back on the land, and use the organic matter. It stores water and it helps slow run-off. There are so many benefits of slash. We still don’t have a market for a lot of our small diameter, nondesirable species. Even ponderosa pine, you can’t sell it for poles, right? So what are your options? Let the beetles eat it or let fire consume it and give it a free ride into the atmosphere, instead of storing that carbon.”

— Chris Heffernan, mastication contractor, North Slope Resource in North Powder, Oregon

Manager and Operator Perspectives: Chris Heffernan

Chris Heffernan, owner of North Slope Resources in North Powder, Oregon, has a long history in forestry as a tree farm owner, forestry contractor, and policymaker. His tree farm has received multiple awards and he was named the Oregon Tree Farmer of the Year. He has also served on the Oregon Board of Forestry. Since 2003, when he worked as a contractor on the Columbia Complex Fire, he has been doing mastication work for private landowners as well as the Confederated Tribes of the Colville Reservation, the Nez Perce Tribe, and the Confederated Tribes of the Umatilla Indian Reservation. He uses a John Deere 2154D purpose-built forestry mulcher with a 54” ProMac cutting head.

It’s a big machine, but because of the big tracks, the compaction and pounds per square inch are minimal, especially when you consider we have a 36-foot reach in all directions. It doesn’t have huge horsepower, but does have huge hydraulic fluid power, which turns the head. It’s like a backhoe, but it’s a track hoe. Instead of a big bucket there, we have a disc that turns 2,000 RPMs, just like a flying saucer out in front of you. You grind from the top to the bottom. If you’ve been around some of them, it’s pretty impressive.

He says the advantage of a tracked swing machine is that it doesn’t have as much impact on the soil as other options.

There are applications where skid-steers, the little ones, are good, but they can’t reach very high. So the top falls off. Then they grind whatever they cut off down to the ground, but then they go back and forth, back and forth, back and forth. Just beat the hell out of the ground to try to get it chewed up. And then they got to go chase that top that fell off. Now we are sitting up there in this monster and she can reach 35 feet high and right up and down. We scatter the material uniformly across the landscape and you don’t beat an operator to death.

Heffernan said he wishes land managers would get over their unease with using mastication.

They’re so afraid of machinery. But what’s going to happen when it burns? What are we going to lose if we don’t go in here? Why don’t we mulch it up, put it back on the land, and use the organic matter. It stores water and it helps slow run-off. There are so many benefits of slash. We still don’t have a market for a lot of our small diameter, nondesirable species. Even ponderosa pine, you can’t sell it for poles, right? So what are your options? Let the beetles eat it or let fire consume it and give it a free ride into the atmosphere, instead of storing that carbon.

Heffernan agrees with Jain and colleagues that terrain is a make-or-break factor for mastication.

Steep terrain and rocks are our biggest enemy when it comes to slash busting. We can do it in a safe manner, but we have to be on 35% slope or less, the vast majority of it.



Heffernan believes that low-bid contracting in which bids are awarded solely based on the lowest price are challenging the ability of many experienced masticators to compete for projects.

Skilled operators can efficiently move the machine and cutting head and minimize the number of passes over a particular area, thus reducing project costs and ecosystem impacts.

Jain and colleagues suggest that a thorough site evaluation can help determine the operator skill needed to conduct the project successfully and efficiently.

Tree size. While the number of stems on a site is an important factor in deciding to use mastication, the head size and horsepower of the machine should be complementary to the tree size targeted for mastication. Vertical shaft masticating heads can typically treat trees effectively up to 6 to 8 inches in diameter when they are boom mounted. Some boom-mounted, horizontal-shaft masticating heads can treat larger trees (up to 30 inches in diameter), but larger trees require a more powerful and larger cutting head and a carrier machine that can deliver the necessary power to the head.

Desired conditions. Managers typically start with desired outcomes in terms of residual stand density and spatial distribution

when deciding on treatment options. These factors can influence the type of equipment used. Drive-to-tree mastication works best on sites with widely spaced trees because it takes less time. However, if a site has tight spacing between trees, a carrier machine with a boom-mounted cutting head has greater flexibility because the operator can move the cutting head into places that might have narrow tree spacing. For precommercial thinning of small trees (less than 2 inches diameter at base height), skid steers with a vertical shaft masticator can be the most cost-effective option, as they can maneuver easily and cut close to residual trees at a 14-foot spacing.

Piece size. The cutting head, how much time the operator spends masticating a particular piece, and the size of targeted biomass influence the post-treatment piece size of the slash left on the forest floor. Depending on the operator's skill level with the machine, both vertical shaft and horizontal cutting heads can create larger or smaller pieces. Operators can also influence the piece size by using slow, methodical passes or multiple passes across an area with the machine. Typically, the more time

the operator spends grinding, the smaller the pieces become; thus, when the operator moves quickly, the piece size increases.

Conclusion

While mastication does not fit every site or management objective, it can be effective in certain situations. The aim of this Science You Can Use article is to present the decision trees developed by Jain and colleagues to help decision-makers and land managers determine if mastication can help achieve their objectives. The decision trees are based on completion of a site evaluation, which includes consideration of factors such as nonnative species invasion, the vulnerability of soils to erode or compact, slope and terrain factors, vegetation characteristics, and treatment costs. If a manager selects mastication as a treatment option, then the manager can work with experienced operators to identify the carrier machine, cutting head, and mounting system best matched to the project goals and objectives.

KEY FINDINGS

- Mastication can increase the abundance of fine fuels and, if ignited, these fuels can smolder for long periods; therefore, mastication may not always be an appropriate forest treatment.
- Soil nutrition is not adversely affected by mastication, and erosion and compaction are minimized when the machines are driven over masticated residue.
- Post-treatment habitat conditions influence wildlife species and not necessarily the treatment itself. Different treatments create different vegetation compositions and structures, which can favor some species over others.

“In a forest environment, you need to have an operator who’s able to understand the specifications for what you’re doing. You need them to understand tree species or brush species, a whole range of things, and be able to work independently.”

—Andrew Saralecos, forester with the Nez Perce Tribe

FURTHER READING

Heinsch, Faith Ann; Sikkink, Pamela G.; Smith, Helen Y.; and Retzlaff, Molly L. 2018. [Characterizing fire behavior from laboratory burns of multi-aged, mixed-conifer masticated fuels in the western United States](#). Res. Paper RMRS-RP-107. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 23 p.

Jain, Terrie B.; Sikkink, Pamela G.; Keefe, Robert; Byrne, John C. 2018. [To masticate or not: Useful tips for treating forest, woodland, and shrubland vegetation](#). Gen. Tech. Rep. RMRS-GTR-381. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 55 p.

Napper, Carolyn; Howes, Steven; Page-Dumroese, Deborah. 2009. [Soil-disturbance field guide](#). 0819 1815-SDTDC. San Dimas, CA: U.S. Department of Agriculture, Forest Service, San Dimas Technology and Development Center. 103 p.

Sikkink, G. Pamela; Jain, Theresa B.; Reardon, James; Heinsch, Faith Ann; Keane, Robert E.; Butler, Bret; Baggett, L. Scott. 2017. [Effect of particle aging on chemical characteristics, smoldering, and fire behavior in mixed-conifer masticated fuel](#). Forest Ecology and Management. 405: 150–165.

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The following individuals were instrumental in the creation of this Bulletin:



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About the Science You Can Use Bulletin

The purpose of SYCU is to provide scientific information to people who make and influence decisions about managing land.

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OUR FORESTS

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Our Forests > Find A Forest > Los Padres National Forest

Los Padres National Forest

Los Padres National Forest encompasses approximately 1.75 million acres of central California's scenic Coast and Transverse Ranges.

The Los Padres National Forest stretches across almost 220 miles from north to south and consists of two separate land divisions. The northern division is within Monterey County and northern San Luis Obispo County and includes the beautiful Big Sur Coast and scenic interior areas. The "main division" of the Forest includes lands within San Luis Obispo, Santa Barbara, Ventura and Kern Counties.

The spectacular Big Sur Coast, an international treasure, is one of the outstanding features of Los Padres National Forest. The Forest manages, through a concessionaire,



The **Jacinto Reyes Scenic Byway** is a 38-mile segment of State Highway 33, known as the Maricopa Highway. The byway travels through some of the most picturesque and diverse terrain in southern California. Spectacular vistas greet you along the entire route, and yet you are also treated to "close encounters" with beautiful cliffs, rock formations, and lush riparian areas.

Los Padres National Forest has many **trails** and roads that are suitable for hikers, bicyclists and equestrian enthusiasts. Mountain bikes are allowed on most forest trails.

The Los Padres National Forest possesses many day use and overnight developed camping **facilities**.

Anglers will find a wide variety of **fishing** opportunities on the 400 miles of year-round and seasonal flowing streams and in the 37 lakes and reservoirs within or near the Forest.



There is also the opportunity to **hunt** on the Forest, and drive **Off-Highway Vehicles** in some areas.



Currently there are forty-four condors in the wild population in Los Padres National Forest. The forest manages two condor sanctuaries, the 1200-acre Sisquoc Condor Sanctuary in Santa Barbara County and the 53,000-acre Sespe Condor Sanctuary in Ventura County.

The Los Padres National Forest has 10 congressionally-designated **Wilderness Areas**, comprising approximately 48% of the Forest. These include the Ventana, Silver Peak, Santa Lucia, Machesna, Garcia, San Rafael, Dick Smith, Sespe, Matilija and Chumash Wildernesses.

Los Padres National Forest has prehistoric and historic Native American sites, including properties related to the practice of Indian and non-Indian religions. The Forest contains some of the most extraordinary native rock art to be found anywhere in the world. Created by the Chumash Indians, these complex and intriguing pictographs are found on numerous rock outcroppings and in caves.

California Forests

Modoc

Rogue River-Siskiyou

Humboldt-Toiyabe

Tahoe

Six Rivers

Sierra

Shasta-Trinity

Sequoia

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Mendocino

Los Padres

Lassen

Lake Tahoe Basin

Klamath

Inyo

Eldorado

Cleveland

Angeles

Stanislaus

Contact cited in Los Padres ForestWatch v. USFS
No. 20-55859 archived on February 1, 2022
805.968.6640

Statistics

STATE(S):

California

NEAREST LARGE URBAN AREA:

San Francisco

NOTES & CONDITIONS

Research campground locations and amenities at the **U.S. National Forest Campground Directory**. The Web site is full of pictures and detailed descriptions to help you plan your next trip.



whitewater rafting, canoeing, kayaking, horseback riding, camping, hiking and fishing trips.

MAPS:

Visit the **National Forest Store** to see what maps are available for this Forest and others you may want to visit.

DONATE

CONTACT US

National Forest Foundation
Bldg 27, Ste 3, Fort Missoula Rd
Missoula, MT 59804

T 406.542.2805

F 406.542.2810

CONNECT



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Site Map

Los Padres National Forest

- [Home](#)
- [Special Places](#)
- [Recreation](#)
- [Alerts & Notices](#)
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- [Maps & Publications](#)
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About the Forest

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- [About the Area](#)

News & Events

Contact Information

Supervisor's Office

Solvang, CA
(805) 448-6487

Mt. Pinos Ranger District

Frazier Park, CA
(661) 805-1057

Ojai Ranger District

Ojai, CA
(661) 805-1057 or (805) 448-6487 or (805) 865-0416

Santa Barbara Ranger District

Santa Barbara, CA
(805) 724-0079

Santa Lucia Ranger District

Santa Maria, CA
(805) 865-0416

Monterey Ranger District

King City and Big Sur, CA
(831) 242-0619

Big Sur Station Multi-Agency Visitor Center

(831) 667-2315
Open daily 9am - 4pm

About the Forest

Los Padres National Forest - Animals and Plants

Animals and Plants



Los Padres contains a wide range of ecosystems, from seacoast and marine habitats to redwood forests, mixed conifer forests, oak woodlands, grasslands, pinyon juniper stands, chaparral and semi-desert areas, which are home to more than 468 fish and wildlife species. There are twenty-three threatened or endangered wildlife species, twenty regionally sensitive wildlife species and thirty-four forest-level sensitive wildlife species in Los Padres. Los Padres provides habitat for and is involved with the reintroduction of California condors, bald eagles, peregrine falcons, tule elk, bighorn sheep and many endangered plants (there are more than thirty species of sensitive plants in Los Padres).

Los Padres National Forest encompasses an area of 1,752,400 acres, or over 2700 square miles, of habitat ranging in elevation from sea level along the Monterey Coast to 8,831 feet atop Mt. Pinos, the highest point within the forest. Most of the forest is composed of steep, rugged coastal mountains containing watersheds which supply nineteen reservoirs. The major mountain ranges within the forest are the Santa Lucia, La Panza, San Rafael, Santa Ynez and Sierra Madre. The climate varies from Mediterranean along the coast and portions of the interior (cool mild winters and hot dry summers) to semi-desert in the eastern badlands. The coastal areas are often tempered by fog and marine air masses resulting in very moderate, year round temperatures. Rainfall averages seven to nine inches in Cuyama area to between 15 and 30 inches throughout the interior. The Monterey District ranges from 20 inches inland up to 80 inches along the Coast Ridge. The vast land area, and the elevational and climatic factors, play a major role in the diversity of habitat types found on Los Padres.

[Learn more about threatened and endangered wildlife species in the Los Padres National Forest](#)

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47555 Highway 1, Big Sur,
CA 93920

Stay Connected



Contact Us

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United States Court of Appeals for the Ninth Circuit

Office of the Clerk
95 Seventh Street
San Francisco, CA 94103

Information Regarding Judgment and Post-Judgment Proceedings

Judgment

- This Court has filed and entered the attached judgment in your case. Fed. R. App. P. 36. Please note the filed date on the attached decision because all of the dates described below run from that date, not from the date you receive this notice.

Mandate (Fed. R. App. P. 41; 9th Cir. R. 41-1 & -2)

- The mandate will issue 7 days after the expiration of the time for filing a petition for rehearing or 7 days from the denial of a petition for rehearing, unless the Court directs otherwise. To file a motion to stay the mandate, file it electronically via the appellate ECF system or, if you are a pro se litigant or an attorney with an exemption from using appellate ECF, file one original motion on paper.

Petition for Panel Rehearing (Fed. R. App. P. 40; 9th Cir. R. 40-1)

Petition for Rehearing En Banc (Fed. R. App. P. 35; 9th Cir. R. 35-1 to -3)

(1) A. Purpose (Panel Rehearing):

- A party should seek panel rehearing only if one or more of the following grounds exist:
 - ▶ A material point of fact or law was overlooked in the decision;
 - ▶ A change in the law occurred after the case was submitted which appears to have been overlooked by the panel; or
 - ▶ An apparent conflict with another decision of the Court was not addressed in the opinion.
- Do not file a petition for panel rehearing merely to reargue the case.

B. Purpose (Rehearing En Banc)

- A party should seek en banc rehearing only if one or more of the following grounds exist:

- ▶ Consideration by the full Court is necessary to secure or maintain uniformity of the Court's decisions; or
- ▶ The proceeding involves a question of exceptional importance; or
- ▶ The opinion directly conflicts with an existing opinion by another court of appeals or the Supreme Court and substantially affects a rule of national application in which there is an overriding need for national uniformity.

(2) Deadlines for Filing:

- A petition for rehearing may be filed within 14 days after entry of judgment. Fed. R. App. P. 40(a)(1).
- If the United States or an agency or officer thereof is a party in a civil case, the time for filing a petition for rehearing is 45 days after entry of judgment. Fed. R. App. P. 40(a)(1).
- If the mandate has issued, the petition for rehearing should be accompanied by a motion to recall the mandate.
- See Advisory Note to 9th Cir. R. 40-1 (petitions must be received on the due date).
- An order to publish a previously unpublished memorandum disposition extends the time to file a petition for rehearing to 14 days after the date of the order of publication or, in all civil cases in which the United States or an agency or officer thereof is a party, 45 days after the date of the order of publication. 9th Cir. R. 40-2.

(3) Statement of Counsel

- A petition should contain an introduction stating that, in counsel's judgment, one or more of the situations described in the "purpose" section above exist. The points to be raised must be stated clearly.

(4) Form & Number of Copies (9th Cir. R. 40-1; Fed. R. App. P. 32(c)(2))

- The petition shall not exceed 15 pages unless it complies with the alternative length limitations of 4,200 words or 390 lines of text.
- The petition must be accompanied by a copy of the panel's decision being challenged.
- A response, when ordered by the Court, shall comply with the same length limitations as the petition.
- If a pro se litigant elects to file a form brief pursuant to Circuit Rule 28-1, a petition for panel rehearing or for rehearing en banc need not comply with Fed. R. App. P. 32.

- The petition or response must be accompanied by a Certificate of Compliance found at Form 11, available on our website at www.ca9.uscourts.gov under *Forms*.
- You may file a petition electronically via the appellate ECF system. No paper copies are required unless the Court orders otherwise. If you are a pro se litigant or an attorney exempted from using the appellate ECF system, file one original petition on paper. No additional paper copies are required unless the Court orders otherwise.

Bill of Costs (Fed. R. App. P. 39, 9th Cir. R. 39-1)

- The Bill of Costs must be filed within 14 days after entry of judgment.
- See Form 10 for additional information, available on our website at www.ca9.uscourts.gov under *Forms*.

Attorneys Fees

- Ninth Circuit Rule 39-1 describes the content and due dates for attorneys fees applications.
- All relevant forms are available on our website at www.ca9.uscourts.gov under *Forms* or by telephoning (415) 355-7806.

Petition for a Writ of Certiorari

- Please refer to the Rules of the United States Supreme Court at www.supremecourt.gov

Counsel Listing in Published Opinions

- Please check counsel listing on the attached decision.
- If there are any errors in a published opinion, please send an email or letter **in writing within 10 days** to:
 - ▶ Thomson Reuters; 610 Opperman Drive; PO Box 64526; Eagan, MN 55123 (Attn: Maria Evangelista (maria.b.evangelista@tr.com));
 - ▶ and electronically file a copy of the letter via the appellate ECF system by using “File Correspondence to Court,” or if you are an attorney exempted from using the appellate ECF system, mail the Court one copy of the letter.

**UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT
Form 10. Bill of Costs**

Instructions for this form: <http://www.ca9.uscourts.gov/forms/form10instructions.pdf>

9th Cir. Case Number(s)

Case Name

The Clerk is requested to award costs to (*party name(s)*):

I swear under penalty of perjury that the copies for which costs are requested were actually and necessarily produced, and that the requested costs were actually expended.

Signature **Date**

(use "s/[typed name]" to sign electronically-filed documents)

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