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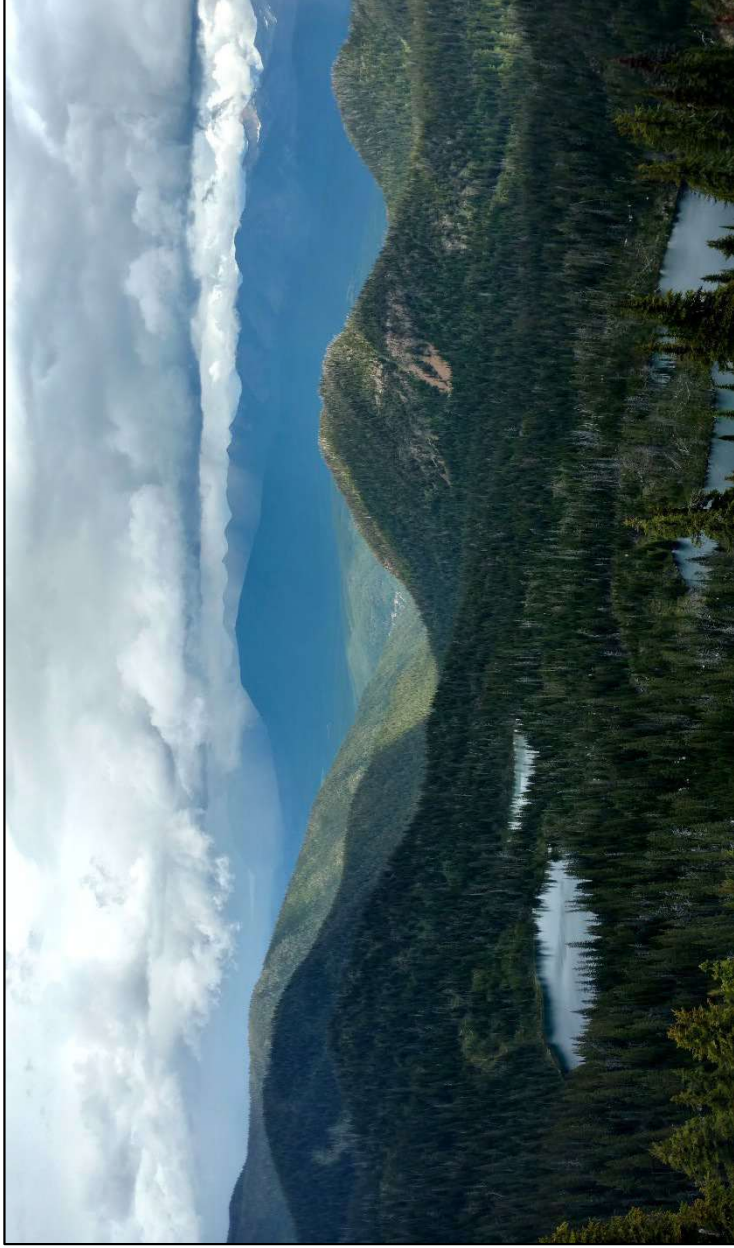
Nationwide

Project #68605

August 2026

2001 Roadless Area Conservation Rule Rescission

Draft Environmental Impact Statement



View of Doris Lakes from Doris Mountain, Flathead National Forest, Montana. USDA Forest Service photo.

2001 ROADLESS AREA CONSERVATION RULE RESCISSION Draft Environmental Impact Statement

Nationwide – National Forest System Inventoried Roadless Areas
Managed Under the 2001 Roadless Rule

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Introduction

The U.S. Department of Agriculture proposes to rescind the 2001 Roadless Area Conservation Rule (2001 Roadless Rule) (66 FR 3244, 36 CFR Subpart B (2001)), which prohibits road construction, road reconstruction, and timber harvesting in inventoried roadless areas, with limited exceptions. Rescinding the 2001 Roadless Rule is intended to return decision-making for these activities to local officials, in conjunction with forest-level land management planning. The 2001 Roadless Rule applies to approximately 44.7 million acres of National Forest System lands, including in Alaska. The 2001 Roadless Rule is not in effect in Colorado or Idaho because those states have state-specific roadless rules.

Accompanying the proposed rule, which is published in the Federal Register, the Forest Service has prepared this draft environmental impact statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant laws and regulations. The draft EIS applies USDA's interim final NEPA regulations of July 3, 2025, and all references to 7 CFR 1b within this document refer to the interim rule¹. This draft EIS discloses the environmental impacts that would result from the proposed rule and alternatives. All documents, including the proposed rule and other supporting information, may be found on the [project website](#).

This draft EIS is also being published to facilitate comments on the alternatives and environmental impacts in accordance with USDA regulations (7 CFR 1b.7(n)). USDA invites written electronic comments on the proposed rule and draft EIS (see Additional Opportunity to Comment).

Background

Roadless Rule History

Throughout its history, the Forest Service has managed undeveloped areas to conserve their unique characteristics. After passage of the Wilderness Act of 1964 (Pub. L. 88-577), management of these areas, commonly known as “roadless areas,” became the focus of national attention when the Forest Service initiated a review to determine their suitability for inclusion in the National Wilderness Preservation System, known as the Roadless Area Review and Evaluation (RARE) I (1973) and RARE II (1977) (USDA FS 1978 and USDA FS 1979). In the decades following the inventory, roadless area management continued to be controversial in land management planning and project proposals to harvest timber, build roads, or otherwise develop these areas. In 1999, President Clinton directed the Forest Service to undertake a public process to “provide appropriate long-term protection for most or all of these currently inventoried ‘roadless’ areas...,” initiating the rule-making process. In 2001, the Forest Service issued the Roadless Area Conservation Rule (36 CFR Part 294, Subpart B (2001) (66 FR 3272) (2001 Roadless Rule)) establishing a national-level rule to maintain the values of inventoried roadless areas, limit their development, and address the history of controversy.

¹The July 3, 2025, USDA interim final NEPA regulations are available at: <https://www.federalregister.gov/documents/2025/07/03/2025-12326/national-environmental-policy-act>

The 2001 Roadless Rule prohibited road construction, road reconstruction, and timber harvesting on inventoried roadless areas (IRAs) on 58.5 million acres, or 31 percent, of National Forest System lands (defined in 36 CFR 294.11 (2001)) identified in the set of maps contained in the 2001 Final EIS). The 2001 Roadless Rule provides for certain limited exceptions, including public health and safety, reserved or outstanding rights, existing or renewed mineral leases, to prevent resource damage or address safety hazards, and stewardship² purposes (36 CFR 294.12 and 294.13 (2001)).

Despite the intention to resolve the controversy with respect to the management of IRAs, the Roadless Rule has been the subject of nine lawsuits in Federal district courts in Idaho, Utah, North Dakota, Wyoming, Alaska, and the District of Columbia. In the years following the issuance, the rule was both enjoined and reinstated multiple times. Before the Roadless Rule's effective date, a Federal district court in Idaho granted an injunction blocking implementation, which was lifted a year later by the Ninth Circuit. In 2003, and again in 2008, the Federal District Court of Wyoming issued a nationwide injunction finding the rule was substantively and procedurally flawed. On appeal in 2011, the 10th Circuit vacated the district court decision, reinstating the 2001 Roadless Rule nationwide.

During the years of legal challenges, in 2005, under the George W. Bush Administration, USDA replaced the 2001 Roadless Rule with a State Petitions Rule (70 FR 25,654 (May 13, 2005)), which allowed governors to submit petitions to the Secretary of Agriculture to request adoption of special rules for inventoried roadless area management in their respective states. In 2006, the Federal District Court of Northern California set aside the 2005 State Petitions Rule and reinstated the 2001 Roadless Rule, in response to legal challenges by a group of states and environmental organizations. The U.S. Court of Appeals for the Ninth Circuit affirmed this decision in *California ex rel. Lockyer v. U.S. Department of Agriculture*, 575 F.3d 999 (9th Cir. 2009). Numerous states filed petitions for state-specific rules or have sought specific roadless policies through legal challenges, including Alaska, California, Colorado, Idaho, Maine, New Mexico, Utah, Virginia, North Carolina, South Carolina, Oregon, Washington, and Wyoming. Ultimately, Idaho and Colorado Roadless Rules (36 CFR 294 Subparts C and D) addressed road building and timber harvest, along with other uses important in these States.³ These state-specific rules replaced the 2001 Roadless Rule for National Forest System lands in those states and remain in effect today.

Roadless area conservation has also been of interest in Congress. Over the years, considerable congressional interest resulted in the introduction of competing legislative bills designed to either facilitate or prohibit various multiple use management proposals in inventoried roadless areas. These legislative proposals perfectly illustrate the diverse and opposing views regarding roadless

² The 2000 FEIS for the 2001 Roadless Rule refers to exceptions for cutting and removal of generally small diameter trees as 'timber harvest for stewardship purposes;' this term is also used here to refer to the exceptions in 36 CFR 294.13(b)(2001). See Appendix 2 – Rule Language by Alternative for the full text of the 2001 Roadless Rule.

³ These proceeded as general petitions under the Administrative Procedure Act and not under the 2005 State Petitions Rule.

area conservation and included attempts to legislate an outcome, but none of these bills have been enacted into law.

Additional information, including a historical archive, is available at the [Forest Service Roadless Area website](#).

Tongass National Forest

The application of the 2001 Roadless Rule to Alaska’s Tongass National Forest has also been subject to ongoing litigation, policy reversals, and rulemaking petitions. The Forest Service manages approximately 22 million acres of Federal lands in Alaska, which are distributed across two national forests – the Tongass and Chugach National Forests, including over 14 million acres of inventoried roadless areas (9.3 million acres on the Tongass National Forest alone). Since the 2001 Roadless Rule, the management of roadless areas on the Tongass National Forest has been subject to multiple legal and policy shifts. The litigation history and rulemaking history are set forth in detail in prior notices (for example, 84 FR 55522 and 85 FR 68688), as well as the Congressional Research Service Report: “The Alaska Roadless Rule: Eliminating Inventoried Roadless Areas (IRAs) in the Tongass National Forest.” (R46505 February 3, 2021). The history contained in these notices and reports will not be repeated here. In response to a petition from the State of Alaska and after extensive engagement with the public, Alaska Native Tribes, Alaska Native Corporations, and others, in 2020, the USDA issued the final rule entitled “Special Areas; Roadless Area Conservation; National Forest System Lands in Alaska,” (2020 Alaska Roadless Rule) (85 FR 68688). It fully exempted the Tongass from the 2001 Roadless Rule. However, in 2021, the Department initiated a new rulemaking process to reconsider the 2020 Alaska Roadless Rule, and the exemption rule was subsequently repealed in 2023. Now, Executive Order 14153: Unleashing Alaska’s Extraordinary Resource Potential, directs that the Secretary of Agriculture “shall reinstate” the 2020 Alaska Roadless Rule, exempting the Tongass National Forest from the 2001 Roadless Rule.

Consistent with past rulemaking, USDA puts additional focus on the Tongass National Forest throughout this EIS. The analysis in this EIS relies on and incorporates by reference the 2020 Final Environmental Impact Statement (2020 FEIS) for the Alaska Roadless Rule, analysis supporting the 2023 rulemaking, and associated records, as outlined in 7 CFR 1b.9 on efficient and effective environmental reviews (see Environmental Impacts within the Tongass National Forest and Appendix 4 – Review of the Final Environmental Impact Statement for the 2020 Alaska). These supporting documents are available on the [project website](#).

Inventoried Roadless Areas

Today, roadless areas total approximately 58.2 million⁴ acres, or about 30 percent of all National Forest System lands. The 2001 Roadless Rule applies to approximately 44.7 million acres of National Forest System lands, including about 9.3 million acres within the Tongass National Forest. The 44.7 million acres exclude approximately 9 million acres of Idaho Roadless Areas

⁴ While the original rule listed 58.5 million acres, mapping modernization and technical corrections reduced that to 58.2 million acres.

and 4 million acres of Colorado Roadless Areas, which are managed under state-specific roadless rules. Current areas are reflected in national maps at the [Forest Service Roadless Area website](#).⁵

⁵ To view the national maps in an interactive map viewer select '[Map Service](#)' for inventoried roadless areas designated by the 2001 Roadless Rule', then select [ArcGIS Online Map Viewer](#).

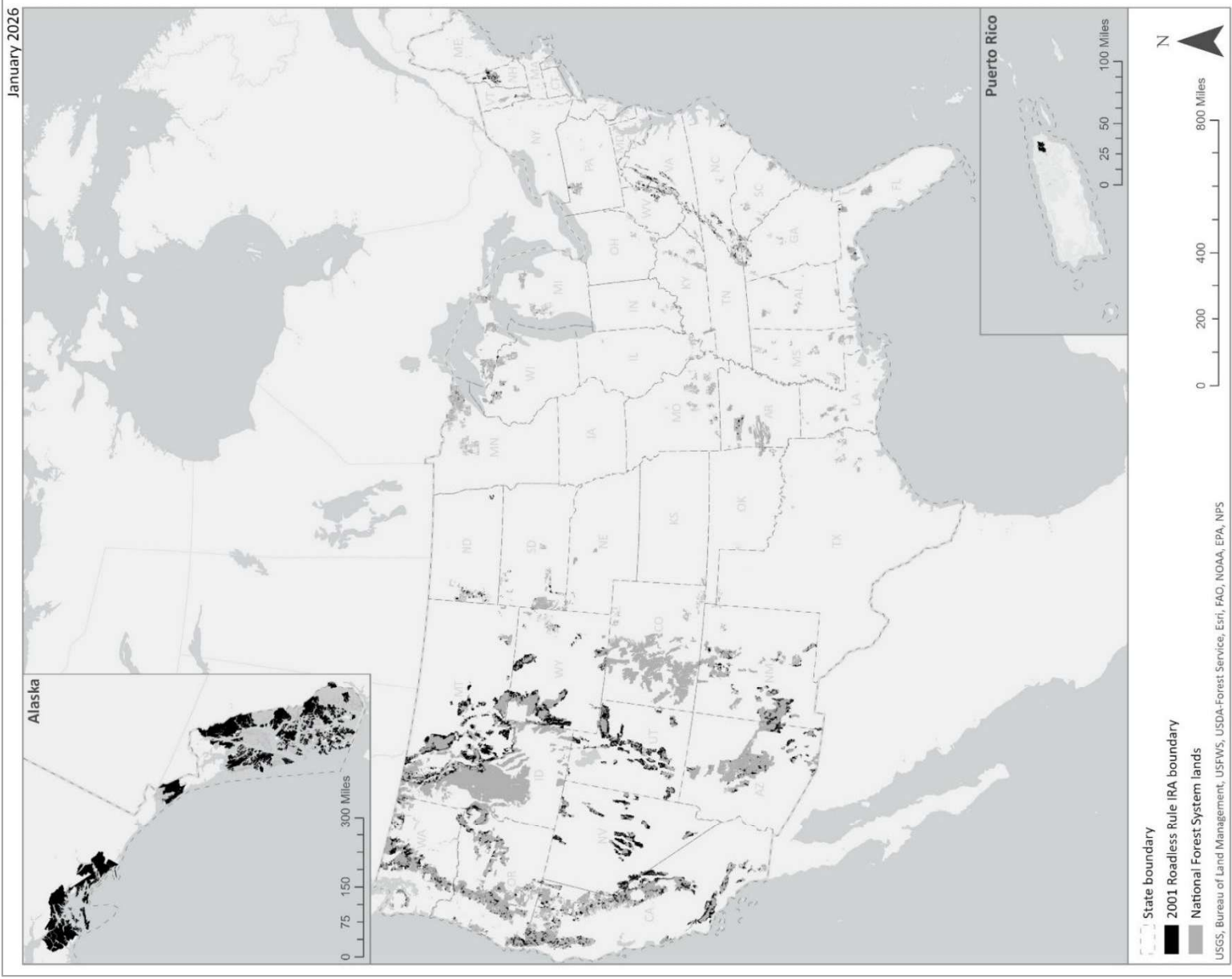


Figure 1. National Forest System lands and 2001 Roadless Rule Inventoried Roadless Areas

More than 95 percent of IRAs managed under the 2001 Roadless Rule (outside of Colorado and Idaho) are in ten Western states (from largest inventoried roadless area acreage to smallest):

Alaska, Montana, California, Utah, Wyoming, Nevada, Washington, Oregon, New Mexico, and Arizona (see Volume II Maps). In the West, IRAs were typically 5,000 acres or greater. Some roadless areas are less than 5,000 acres—either because they are adjacent to Congressionally designated wilderness or in the eastern US (east of the 100th meridian). While they are referred to as “roadless”, because of the decades between inventory and designation, there are thousands of miles of existing roads within lands subject to the 2001 Roadless Rule, including National Forest System roads as well as roads of other ownerships (see National Forest System Roads section). Additionally, decommissioned roads and unauthorized routes that are not part of the official system or records may exist.

The 2001 Roadless Rule identified the following features that often characterize or are present within inventoried roadless areas: (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 nonmotorized 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 CFR 294.11 (2001); 66 FR 3272).

2001 Roadless Area Conservation Rule Implementation

The 2001 Roadless Rule provided that the responsible official may grant certain limited exceptions to the road construction prohibitions, including public health and safety, reserved or outstanding rights, existing or renewed mineral leases, and realignment of roads to prevent resource damage or address safety hazards (36 CFR 294.12(b) (2001)). It also provides exceptions to the timber harvest prohibitions for generally small diameter tree cutting to improve habitat for threatened, endangered, or sensitive species or to maintain or restore ecosystem characteristics and where it maintains or enhances one or more of the roadless characteristics, or when the activity is incidental to activities not otherwise prohibited (36 CFR 294.13(b) (2001)) (see also Table 1 in Proposed Action and Alternatives). The rule states that use of the timber harvest exceptions would be expected to be infrequent. Amid legal challenges to the 2001 Roadless Rule and to provide for consistent application, exceptions for specific activities in IRAs were reviewed and authorized by the Secretary and Forest Service Chief until 2012. In 2012, certain exceptions were delegated to the applicable regional forester. In 2018 all exceptions were delegated to the regional foresters, and some exceptions for public health and safety or small diameter tree cutting⁶ may be further delegated to responsible officials. Approval of exceptions generally requires review documentation, including maps and justification. The activities are subject to the National Environmental Policy Act (NEPA), as applicable.

Regional forester approval of exceptions under the 2001 Roadless Rule has been limited, and the majority have been for timber harvest for stewardship purposes. There is no national-level tracking of the review, approval, or implementation of 2001 Roadless Rule exceptions, though the Washington Office has recommended that Responsible Officials document reviews and

⁶ Regional foresters and deputy regional foresters must retain sole authority for exceptions under §294.12(b)(3)-(7) and §294.13(b)(4) (2001).

approvals. For the purpose of this analysis, existing information was compiled from Regional level tracking of review and approvals between 2018 and 2025. This information shows about 188 documented proposals, about 10 percent involved road related activities and 96 percent involved tree cutting (some involved both road and tree cutting activities). This information does not include responsible official reviews or approvals below the regional forester level⁷, so it does not include all exceptions that were granted. In addition, the information does not include if the final decisions were made for these proposed activities or if they have been implemented.

The best available information on activities that have been implemented within IRAs over the last decade comes from the Forest Service Activity Tracking System. This data shows an average of 500 acres per year of timber harvest and a total of 1.8 million acres of hazardous fuels reduction within IRAs managed under the 2001 Roadless Rule. More than half of the hazardous fuels reduction was from wildfire use, which is reported when acres burned by wildfire are determined to meet land management planning objectives in the post-fire assessment. An additional 25 percent of the hazardous fuels reduction was from prescribed burning activities for reducing fuel hazards and as resource management treatments. Best available records of permanent road construction indicate that approximately 60 miles of roads were built within inventoried roadless areas after 2013. See National Forest Transportation System, Vegetation and Forest Management, and Fire and Fuels Management sections for more detail about past and ongoing activities.

Overall, use of the available exceptions has been limited in scope and inconsistent. This is due in part to rigorous project-level analysis requirements and associated reviews and approvals needed to demonstrate consistency with Roadless Rule requirements, as well the rule's intent for infrequent use.

Relationship of the 2001 Roadless Rule to Land Management Planning

Administration of each national forest and grassland is guided by a land management plan, along with numerous land management laws, regulations, policies, and agency directives. A land management plan provides a framework for future site-specific project analysis and decision making. Land management plans are developed, amended, and revised under the National Forest Management Act and the land management planning regulations (2012 Planning Rule at 36 CFR Part 219). Plans must provide for or contribute to ecological integrity and social and economic sustainability; conform to existing laws and regulations; and are tailored to the unique local conditions of the national forest or grassland. They are generally available for review on the website for each national forest or grassland.

The 2001 Roadless Rule did not amend, revise, or compel amendment or revision of any land management plans (36 CFR 294.14(b) (2001); 66 FR 3273); however, the Roadless Rule supersedes individual land management plans where a provision of the rule is more restrictive than a plan. Similarly, for some areas, the plans may contain plan components that are more restrictive than the 2001 Roadless Rule. Under the 2012 Planning Rule, inventoried roadless

⁷ Similarly, the Agency does not track when requests for exceptions were abandoned or not approved.

areas are treated as a type of designated area,⁸ with the option to also identify these areas as unique geographic areas or management areas in the plans. These 2012 Rule plans may also include additional plan components for inventoried roadless areas if they are compatible with the restrictions of the applicable roadless rule. Within all land management plans (under 2012 or 1982 rule), inventoried roadless areas currently overlap other management areas or geographic areas, such as core habitats, research natural areas, alpine areas, or areas managed for backcountry recreation where there are expected to be low levels of development, including timber harvest and road construction.

There is a great variation in how existing land management plans address inventoried roadless areas and the 2001 Roadless Rule. The majority of the current land management plans across the National Forest System (108 out of 126) were developed or revised under the 1982 Planning Regulations. A total of 77 of these plans were developed or revised after the 2001 Roadless Rule was issued; however, 45 of those were revised between 2001 to 2011 when the status of the Roadless Rule was uncertain due to litigation. Therefore, these plans are less likely to have incorporated IRAs into their management areas or provided specific direction for these areas. Newer plans, especially the 19 revised under the 2012 Planning Rule and directives, are more likely to identify IRAs as a type of designated areas and may have additional plan components for these areas. The content of current land management plans has been evaluated and relevant management direction summarized for analysis purposes in this EIS (see Potentially Affected Environment and Appendix 1 – IRA Acreage Summarized by Region, State, and Forest).

Agencies and Persons Consulted

On June 23, 2025, U.S. Department of Agriculture [Secretary Brooke L. Rollins publicly announced](#) the intent to rescind the 2001 Roadless Rule. The Forest Service began notifications to Tribes in July 2025. On August 29, 2025, the agency announced a public comment period to provide the opportunity for Federal and State agencies, local governments, businesses, organizations, and individuals to provide comments (90 FR 42179).

⁸ 36 CFR 219.7(d) Management areas or geographic areas. Every plan must have management areas or geographic areas or both. The plan may identify designated or recommended designated areas as management areas or geographic areas.

36 CFR 219.9 Designated area. An area or feature identified and managed to maintain its unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas. Examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves.

Geographic area. A spatially contiguous land area identified within the planning area. A geographic area may overlap with a management area.

Management area. A land area identified within the planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous

Consultation with Federally Recognized Tribes and Alaska Native Corporations

On July 22, 2025, the Forest Service notified Tribes and Alaska Native Corporations of the opportunity to consult on the proposed rulemaking to rescind the 2001 Roadless Rule, with a summary analysis of proposed changes and an invitation to a Tribal forum engagement session. This information was also emailed to regional foresters on July 25, 2025. The Office of Tribal Relations held a Tribal forum engagement session on August 5, 2025.

The Forest Service received 64 requests for consultation, 29 consultations have been held, and an additional 5 scheduled. Tribal consultations were held either in person or virtually with local or regional Forest Service line officers serving as consulting officials. Some tribes submitted letters in lieu of, or in addition to, consultations. Consultations will be ongoing throughout the rulemaking process and a final Tribal Impact Summary Statement will be included with the final rule. In addition to government-to-government consultations, many comment letters were received from Tribes during the public comment period on the notice of intent published on August 29, 2025. The comment letters received from Tribes or Tribal organizations during the comment period (via hardcopy or the via regulations.gov comment portal) were included in the public comment summary (Appendix – Notice of Intent Comment Summary) and considered in the development of the draft EIS and proposed rule. See also Proposed Action and Alternatives and Tribal Rights and Interests.

Notice of Intent

On August 29, 2025, the Department published a NOI in the *Federal Register* to inform interested parties that it would prepare an EIS, initiating a 21-day comment period (90 FR 42179). The NOI requested public comments on alternatives or effects and on relevant information, studies, or analyses with respect to the proposal (7 CFR 1.7(b)). Comments received in response to the NOI were used to inform the range of alternatives and environmental impact analyses. Over 220,000 comment letters were received during the NOI comment period. These comments came from Federally Recognized Tribes, Alaska Native Corporations, and Tribal members; members of Congress and other elected officials; Federal, State, and local governments; and businesses, organizations, and individuals. Counting all signatures submitted with the petitions as individual submissions, the letters represent over 625,000 submissions. The comments are posted electronically at [Regulations.gov](https://www.regulations.gov).

More than 90 percent of the letters received contained brief sentiments or opinions on the proposed action. Of the comment letters received, approximately 99 percent were generally opposed to the proposed rule rescission, while approximately 1 percent were generally in support. Those containing substantive comments related to the NEPA process, potential alternatives, and/or specific issues to be addressed in the EIS are summarized in Appendix 3 – Notice of Intent Comment Summary. Major comment themes include environmental review and compliance, purpose and need, alternatives, infrastructure and transportation, cultural and Tribal resources, biodiversity, water quality, geology and soils, minerals and mining, climate change, carbon, air quality, public health and safety, recreation and access, socioeconomic effects, and impacts on specific locations such as the Tongass National Forest.

After considering comments received in response to the notice of intent, the Department responded by: clarifying the proposed action; analyzing an additional alternative in detail; using the information to inform analysis (including consideration of various literature and references cited); and making corrections or updating content to read more clearly and be more readily understood. Other comments were considered but no change was made because the concern, recommendation, or suggested alternative was already accounted for, outside the scope of the rulemaking and purpose and need, and/or outside the authority of the Department or agency.

Additional Opportunity to Comment

An additional opportunity to comment is available following publication of the proposed rule in the federal register. Comments should be sent via one of the following methods:

- Electronically (preferred): Through the Federal eRulemaking Portal, <https://www.regulations.gov>, identified by docket number FS-2025-0001 or RIN 0596-AD66; or
- Mail: Hardcopy letters must be submitted to the Director, Ecosystem Management Coordination, 201 14th Street SW, Mailstop 1108, Washington, DC 20250-1124.

See the [project website](https://www.regulations.gov), Federal Register Notice of the Proposed Rule and/or www.regulations.gov for instructions on how to submit your comments. Substantive comments received will be published electronically.

Schedule

A Final Rule and Final Environmental Impact Statement are anticipated to be completed in 2027.

Purpose and Need for Action

The Department is proposing this rule rescission to reduce regulatory burden and return land management decision-making for inventoried roadless areas to local Forest Service officials. In 2001, the Roadless Area Conservation Rule established a single, nationwide set of prohibitions intended to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management. Today, the Department believes increased management flexibility in the administration of these lands is needed to better meet the multiple-use mission and provide benefits to the American people. This approach prioritizes decision-making by local Forest Service officials informed by Tribes, State, and local communities. As explained below, there is a need to increase local management flexibility and, where necessary, allow for active management to respond to changing and localized conditions, such as increasing wildfire risk, the spread of insect and disease infestations, and the need for community protection in the wildland-urban interface.

Under the current Administration, the Department has refocused policies, programs, and resources on increasing rural economic opportunity, decreasing Federal regulation, and streamlining Federal Government services. Specifically, this deregulatory action advances the policy objectives of [Executive Order 14192](#), *Unleashing Prosperity Through Deregulation*, to

alleviate unnecessary regulatory burdens. In [Executive Order 14225](#), *Immediate Expansion of American Timber Production*, the President declared that “the United States has an abundance of timber resources that are more than adequate to meet our domestic timber production needs, but heavy-handed Federal policies have prevented full utilization of these resources.” In [Executive Order 14154](#), *Unleashing American Energy*, the President likewise declared that “it is in the national interest to unleash America’s affordable and reliable energy and natural resources.” In [Executive Order 14153](#), *Unleashing Alaska’s Extraordinary Resource Potential*, the President declared that “it is the policy of the United States to fully avail itself of Alaska’s vast lands and resources” and “maximize the development and production of the natural resources located on both Federal and State lands within Alaska.” Consistent with this policy, Executive Order 14153 directed the Secretary of Agriculture to reinstate the 2001 Alaska Roadless Rule that exempted the Tongass National Forest in Alaska from the 2001 Roadless Rule. This proposed rescission does not mandate timber cutting or road construction but would relieve regulatory burden relative to management of National Forest System lands.

Rationale for the Proposed Rule

As resource conditions and national policy have evolved, the Department has determined that a single, national blanket approach to the management of inventoried roadless areas taken in the 2001 Roadless Rule constrains responsible officials from exercising the timely, place-based discretion needed to meet the Forest Service’s multiple-use mission. In addition, evolving national priorities and changed conditions have required more active management approaches. The 2001 Roadless Rule limited the Forest Service’s ability to conduct vegetation management within inventoried roadless areas and has contributed to the lack of active management of the national forests, which has contributed to challenges in addressing forest health concerns. The 2001 Roadless Rule prohibited cutting, sale, or removal of timber—except when one of a limited set of exceptions applied. Per the Rule’s text, the use of these exceptions was “expected to be infrequent” (36 CFR 294.13(b) (2001)). In addition, while exceptions were available, their use was limited and inconsistent due to associated reviews and approvals to demonstrate consistency with the 2001 Roadless Rule. Furthermore, the limited number of roads within inventoried roadless areas and the inability to reconstruct or build new roads to provide the needed access further limit management flexibility. Taken together, the prohibitions have removed important management tools for key areas where there are needs or opportunities to address overgrown and fuel-loaded national forests.

This proposed rescission is intended to return primary authority for determining the appropriate management of inventoried roadless areas at the local level to the land management planning process mandated by the National Forest Management Act of 1976 (16 U.S.C. 1600 et seq.). The National Forest Management Act requires that plans shall assure multiple use and sustained yield of National Forest System products and services and include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness (16 U.S.C. 1604(e)(1)). The National Forest Management Act establishes the requirement for the Forest Service to develop land management plans, including direction in 16 U.S.C. 1604(a) and (b) for interdisciplinary planning and consideration of landscape-level conditions. These statutory requirements are implemented through the Agency’s land management planning framework, which require

consideration of the plan area in the context of the broader landscape and requires that each plan reflects the unit's expected distinct roles and contributions to the local area, region, and Nation. The land management planning framework ensures each land management plan addresses similar conservation objectives as the 2001 Roadless Rule was intended to address, such as ecological integrity (including air, soil, and water), sources of public drinking water, diversity of plant and animal communities (including federally listed threatened and endangered species), sustainable recreation, scenic character, and protection of cultural and historic resources. At the same time, this planning approach allows for place-based, collaborative decision-making that is responsive to specific on-the-ground resource conditions, rather than a “one-size-fits-all” national mandate. While national-level considerations are important, land management planning efforts by local decisionmakers at the national forest or regional scale are best positioned to make decisions about inventoried roadless areas because they understand the unique ecological, economic, and social needs of their communities.

In 2001, USDA and the Forest Service asserted that a national prohibition was the best means to reduce conflict and potential for incremental impacts to the ecological and social values of these areas. Since then, conditions across National Forest System lands have changed substantially, especially in the Western United States where many inventoried roadless areas are located, with increasing drought, extreme temperatures, wildfire frequency and severity, and insect and disease outbreaks. Alongside these landscape changes, the Agency's land management planning framework has become more adaptive, science-based, efficient, and effective. These changes, combined with evolving Department priorities for active forest management and deregulation, diminish the basis for a national prohibition. The proposed rule would return land management decision-making for inventoried roadless areas to local Forest Service officials—giving them the flexibility to address conservation and resource issues informed by input from stakeholders, communities, and state, local, and tribal governments. Local decision making would remain subject to the substantive requirements of the Endangered Species Act, National Forest Management Act, and other related laws and regulations.

The Secretary of Agriculture has broad authority under statutes such as the Organic Administration Act of 1897 and the Multiple-Use Sustained-Yield Act of 1960 to manage the National Forest System for a variety of uses. Just as the establishment of the 2001 Roadless Rule was discretionary, this proposed rule is an exercise of discretion to determine the most appropriate process for balancing competing values and uses in inventoried roadless areas within that legal framework.

Proposed Action and Alternatives

The alternatives presented in detail below represent a reasonable range of rulemaking alternatives that are technically and economically feasible and consistent with the stated purpose and need. For each alternative, the resulting status for the Tongass National Forest is highlighted. In the final decision-making, the Secretary would determine whether to address the Tongass the same as every other national forest (alternative 1 and 2), or to treat the Tongass differently than the National rule (alternatives 3).

Appendix 2 – Rule Language by Alternative provides the regulatory language that would be associated with each alternative.

Alternative 1 – No Action, 2001 Roadless Area Conservation Rule

- Continues current management, pursuant to the 2001 Roadless Area Conservation Rule
- Prohibits road construction, reconstruction, and timber harvest in inventoried roadless areas
- Provides limited exceptions for public health and safety, reserved or outstanding rights, existing or renewed mineral leases, and realignment to prevent resource damage or address safety hazards, and stewardship purposes (see 36 CFR 294.12 and 294.13 (2001), Table 1)
- Applies to inventoried roadless areas totaling 44.7 million acres; including 9.3 million acres of the Tongass National Forest

Alternative 1, the no-action alternative, illustrates the consequences of taking no action to contrast the impacts of the proposed action and alternatives with the current condition and expected future condition if the proposed action or alternative were not implemented (7 CFR 1b.7(h)(3)(iv)). It establishes a benchmark, or environmental baseline, against which the effects of the other alternatives are compared. This alternative reflects the continuation of current management, pursuant to the 2001 Roadless Rule (36 CFR Part 294, Subpart B (2001); 66 FR 3272) (see Appendix 2 – Rule Language by Alternative). Discussion of the consequences of taking no action or implementing any of the action alternatives are discussed in the Environmental Impacts section.

Alternative 1 applies to 44.7 million acres of IRAs, as identified in the current national roadless area maps (see Inventoried Roadless Areas). This alternative does not mean that no activities would occur within IRAs; rather it means the projects and activities currently occurring or allowed to occur would continue (see Common to All Alternatives). This alternative would continue nation-wide prohibitions on road construction, reconstruction, and timber harvest with limited exceptions. Exceptions (Table 1), as listed in 36 CFR 294.12(b) and 294.13(b) (2001), may be authorized following review and approval by the appropriate responsible official (as described in 2001 Roadless Area Conservation Rule Implementation).

Modification of IRA boundaries would require rulemaking, though technical corrections may be approved by the Chief (see Inventoried Roadless Areas).

Under alternative 1, the 9.3 million acres of inventoried roadless area within the Tongass National Forest would remain subject to the 2001 Roadless Rule. This is the same action analyzed in alternative 1 of the 2020 Alaska Roadless Rule FEIS and selected in the 2023 Final Rule Repealing the Alaska Roadless Rule.

Table 1. 2001 Roadless Rule exceptions (alternative 1) (36 CFR 294.12(b) and 294.13(b) (2001))

Road construction, reconstruction, including temporary road construction, is prohibited in inventoried roadless areas, except when:	Timber harvest would be prohibited, though timber may be cut, sold, or removed in inventoried roadless areas if the following exceptions apply.
1) A road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause the loss of life or property;	Exceptions would be expected to be infrequent.
2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;	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.
3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;	a. To improve threatened, endangered, proposed, or sensitive species habitat; or
4) Road realignment is needed to prevent irreparable resource damage that arises from the design, location, use, or deterioration of a classified road and that cannot be mitigated by road maintenance. Road realignment may occur under this paragraph only if the road is deemed essential for public or private access, natural resource management, or public health and safety;	b. 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;
5) Road reconstruction is needed to implement a road safety improvement project on a classified road determined to be hazardous on the basis of accident experience or accident potential on that road;	2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited by this subpart;
6) The Secretary of Agriculture determines that a Federal Aid Highway project, authorized pursuant to Title 23 of the United States Code, is in the public interest or is consistent with the purposes for which the land was reserved or acquired and no other reasonable and prudent alternative exists; or	3) The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use, as provided for in 36 CFR part 223; or
7) A road is needed in conjunction with the continuation, extension, or renewal of a mineral lease on lands that are under lease by the Secretary of the Interior as of January 12, 2001, or for a new lease issued immediately upon expiration of an existing lease. Such road construction or reconstruction must be conducted in a manner that minimizes effects on surface resources, prevents unnecessary or unreasonable surface disturbance, and complies with all applicable lease requirements, land and resource management plan direction, regulations, and laws. Roads constructed or reconstructed pursuant to this paragraph must be obliterated when no longer needed for the purposes of the lease or upon termination or expiration of the lease, whichever is sooner.	4) Roadless characteristics have been substantially altered in a portion of an inventoried roadless area due to the construction of a classified road and subsequent timber harvest. Both the road construction and subsequent timber harvest must have occurred after the area was designated an inventoried roadless area and prior to January 12, 2001. Timber may be cut, sold, or removed only in the substantially altered portion of the inventoried roadless area.

Alternative 2 – 2001 Roadless Rule Rescission (Repeal)/No Rule

- Rescinds the 2001 Roadless Rule in its entirety
- Eliminates nation-wide prohibitions on road construction and timber harvest, continues management by applicable land management plan
- Removes IRA designation from 44.7 million acres, including 9.3 million on the Tongass National Forest
- Does not change Idaho and Colorado state-specific Roadless Rules

The 2001 Roadless Rule prohibiting activities in inventoried roadless areas would be rescinded as drafted in the Notice of Proposed Rulemaking and Appendix 2 – Rule Language by Alternative. Alternative 2 would eliminate the national prohibitions on road construction, reconstruction, and timber harvest set forth in the 2001 Roadless Rule and would remove the national “inventoried roadless area” designation from the 44.7 acres million acres of National Forest System lands currently designated as inventoried roadless areas under the 2001 Roadless Rule.

Management of lands formerly managed as inventoried roadless areas would be governed by applicable land management plan direction for each unit of the National Forest System alongside other relevant laws and regulations. Under alternative 2, the governing land management plan could still include restrictions on road construction, road reconstruction, and timber harvesting in roadless areas within the management unit, as well as management direction that influences when, where and how these activities may be carried out. These may include direction to meet other management objectives or legal requirements, protect sensitive areas, to provide for primitive recreation opportunities, lands recommended for wilderness, or to provide wildlife habitat. Alternative 2 would not alter existing land management plan direction nor would it compel amendment or revision of any land management plan (see Common to All Alternatives, Potentially Affected Environment).

Alternative 2 would not authorize any specific ground-disturbing projects (see Common to All Alternatives, Potentially Affected Environment).

Under alternative 2, the 9.3 million acres of inventoried roadless area within the Tongass National Forest would be included in the 44.7 million acres no longer managed according to the 2001 Roadless Rule. This is the same action as was analyzed in alternative 6 (the full exemption alternative) of the 2020 Alaska Roadless Rule FEIS and selected as the 2020 Alaska Roadless Rule – it would have the same results as reinstating the 2020 Alaska Roadless Rule.

Alternative 3 – Modified Roadless Rule/IRA Boundaries

- Removes roadless rule prohibitions and designation on 31.7 million acres, including:
 - ♦ 4.5 million acres of non-NFS lands and congressionally designated areas
 - ♦ 17.9 million acres that are within ½ mile on either side of existing roads and/or within wildland-urban interface, outside of the Tongass National Forest, and

- ◆ 9.3 million acres of inventoried roadless area within the Tongass National Forest.
- Continues current management on 13 million acres, pursuant to the 2001 Roadless Area Conservation Rule;
 - ◆ Prohibits road construction, reconstruction, and timber harvest
 - ◆ Provides limited exceptions for public health and safety, reserved or outstanding rights, existing or renewed mineral leases, and realignment to prevent resource damage or address safety hazards, and stewardship purposes (see 36 CFR 294.12 and 294.13 (2001)) (same as no action).
- Provides provisions to modify boundaries based on locally led modification proposals

Under alternative 3, the 2001 Roadless Rule would be modified (see Appendix 2 – Rule Language by Alternative). This alternative responds to a wide range of recommendations that suggest removing or modifying inventoried roadless area designations or prohibitions where they have restricted the Forest Service’s ability to maintain key benefits or meet community concerns, especially with respect to forest health, reducing fire risks, and protecting infrastructure and communities. At the same time, it responds to commenters’ concerns of maintaining the roadless rule prohibitions and the associated ecological, social, and economic benefits in core or ‘high value’ areas, including benefits to habitat for big game, fisheries, wildlife connectivity, recreation or opportunities for solitude, and tourism economies. Comments suggested that a modified Rule could meet the purpose and need and provide more flexibility for local decision-makers to propose actions that would protect the wildland urban interface from fire, reduce insect and disease risks, and increase acreages available for potential timber harvest, while also maintaining the benefits of large unroaded areas.

This alternative addresses the issue commenters raised about roaded inventoried roadless areas, sometimes referred to by commenters as ‘inaccurate mapping.’ These roaded areas were included as inventoried roadless areas under the 2001 Roadless Rule because of mapping errors in RARE II and road construction between the time RARE II was completed and the 2001 rule. In addition, some road construction occurred between 2001 and 2010 while the rule was enjoined, or pursuant to the 2001 Roadless Rule’s exceptions. By removing roaded areas, this alternative would provide local decision-makers flexibility to propose road construction and timber harvest to facilitate more active management in areas accessed from existing roads. This alternative similarly responds to comments which recommended providing more flexibility for local decision makers to propose actions that could reduce fire risks to communities, by removing designation of inventoried roadless area in the wildland-urban interface (WUI), the area between undeveloped land and human development, such as homes or other buildings.

Alternative 3 would modify the definition of inventoried roadless areas, referring to an updated map of inventoried roadless boundaries (see Volume II Maps). Under the modified boundaries, similar to alternative 2, 31.7 million acres of existing IRAs would be removed from roadless designation and, therefore, no longer subject to national prohibitions. The revised mapping includes several steps:

- Removing about ½ million acres of non-National Forest System lands from the national inventoried roadless area maps⁹. The Roadless Rule applies only to National Forest System lands (see also Potentially Affected Environment).
- Removing about 4 million acres of Congressionally designated areas, which have more restrictive and more permanent mandates than the Roadless Rule (see also Potentially Affected Environment).
- Removing 17.9 million acres which include 5.1 million acres within the wildland-urban interface and 6.3 million acres of roaded roadless and 4.7 million acres that are both within the wildland-urban interface and within 0.5 miles of existing roads. The remaining acreage was removed as the small, isolated areas did not meet previous mapping criteria.
 - ♦ Roaded inventoried roadless areas were defined as the area within 0.5 miles (either side) of existing roads.¹⁰
 - ♦ WUI based on the Healthy Forests Restoration Act’s (HFRA) definition, which includes the areas identified in an existing Community Wildfire Protection Plans or, where a Plan is not in effect, the extent of at-risk communities and up to a 1.5-mi buffer around the communities and areas around evacuation routes for at-risk communities.¹¹ The mapping process resulted in some small fragments of former IRAs remaining. Under this alternative, USDA would apply past criteria for designating IRAs and the western US (west of the 100th meridian) and Alaska, only retaining areas that are greater than 5,000 acres or share a border with Wilderness or recommended Wilderness. East of the 100th meridian inventoried roadless areas of any size were retained.

Across all Forest Service Regions, the percentage of 2001 Roadless Rule IRA acres that would have prohibitions removed under alternative 3 vary from 60 percent in the Northern Region to 97 percent in Southern Region.

⁹ There are 44.7 million acres of IRAs managed under 2001 Roadless Rule. Review of the geospatial data found that 44.3 million acres of these are on National Forest System lands, meaning about 0.4 million acres of lands have had land ownership change since the 2001 Roadless Rule or there may be vertical integration problems (mapping errors) between the inventoried roadless data and official land ownership boundary data.

¹⁰ Existing roads for this analysis include National Forest System roads and other authorized public roads (see National Forest System Roads)

¹¹ WILDLAND-URBAN INTERFACE.—“The term “wildland urban interface” means—(A) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or (B) in the case of any area for which a community wildfire protection plan is not in effect—(i) an area extending 1/2-mile from the boundary of an at-risk community; (ii) an area within 1 1/2 miles of the boundary of an at-risk community, including any land that—(I) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (II) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or (III) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and (iii) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide a safer evacuation from the at-risk community”. (Healthy Forests Restoration Action of 2003; 16 U.S.C. 6511 (16))

The inventoried roadless area designation and the following rule prohibitions would continue to apply to the remaining approximately 13 million acres (all outside of the Tongass) (see Volume II Maps):

- Prohibit road construction, reconstruction, and timber harvest, with limited exceptions (same as alternative 1).
- Provides limited exceptions for public health and safety, reserved or outstanding rights, existing or renewed mineral leases, and realignment to prevent resource damage or address safety hazards, and stewardship purposes (see 36 CFR 294.12 and 294.13 (2001)) (same as alternative 1).

This alternative also includes provisions to make modifications and administrative corrections to inventoried roadless area boundaries, responding to comments about issues with inaccurate national mapping. The following procedures are included in this alternative allow site-specific boundary modifications or corrections:

- a. Modifications to boundaries. Responsible officials, working with local government, Tribes, and interested parties, may propose boundary modification to the Chief. Modifications and additions approved by the Chief will be reflected in the set of maps maintained at the national headquarters office of the Forest Service. Modifications of inventoried roadless area boundaries may be made to correspond with geographic features, land management plan management areas, or for other reasons. A boundary modification is not required to perform work done under an exception pursuant to §§ 294.12(b) or 294.13(b). Public notice with a minimum 30-day comment period will be provided for any proposed boundary modifications.
- b. Administrative corrections to boundaries. The Chief of the Forest Service may issue administrative corrections. Administrative corrections to the maps of any inventoried roadless area are adjustments to correct clerical errors, to conform with new statutory or regulatory requirements, or to correspond with changes based on improvements in mapping technology.

Modifications and corrections will be reflected in the set of maps maintained at the national headquarters office of the Forest Service.

Under alternative 3, the 9.3 million acres of inventoried roadless area within the Tongass National Forest would no longer be managed in accordance with the 2001 Roadless Rule. This is the same action as was analyzed in alternative 6 (the full exemption alternative) of the 2020 Alaska Roadless Rule FEIS and selected as the 2020 Alaska Roadless Rule – it would have the same results as reinstating the 2020 Alaska Roadless Rule and is the same as alternative 2.

Common to All Alternatives

No changes are proposed to state-specific roadless conservation rules for Idaho and Colorado (36 CFR Subparts C and D), administration of those areas would continue as follows:

- Idaho Roadless Rule (36 CFR 294, Subpart C) applies to approximately 9 million acres of Idaho Roadless Areas in the national forests within the State of Idaho. Five

management themes that provide that assign various permissions and prohibitions regarding road building, timber cutting, sale or removal, and discretionary mineral activities. (<https://www.fs.usda.gov/r04/planning/roadless-area-idaho-rule>)

- Colorado Roadless Rule (36 CFR 294, Subpart D) applies to approximately 4 million acres of Colorado Roadless Areas. This rule includes an updated inventory of roadless areas; upper tier protection on 1.2 million acres is more restrictive; prohibits tree cutting, sale, or removal, road construction and reconstruction, and the use of linear construction zones, with some exceptions; including exceptions that address state-specific situations at the time of the rule’s promulgation (<https://www.fs.usda.gov/r02/natural-resources/forest-management/colorado-roadless-rule>)

Any State, Tribe, or other interested entity seeking to establish roadless management provisions tailored to specific geographic or resource conditions may submit a petition for rulemaking under the Administrative Procedure Act (5 U.S.C. 553(e)) and USDA regulations at 7 CFR 1.28. If such petitions are submitted, the Department would consider them consistent with applicable law and policy. If such state-specific roadless rulemaking is proposed and developed in the future, the effects would be attributed to and analyzed as part of the decision-making for that rulemaking. Federally recognized Tribes may separately submit requests for related roadless management provisions under government-to-government consultation. Records of such consultation will be retained and may be referenced in future rulemaking. This process ensures that requests for new or modified roadless management approaches are evaluated transparently and in accordance with established rulemaking procedures.

No alternatives would compel the amendment or revision of any land management plan.

While the rulemaking would not require such changes, plans may be amended in any manner whatsoever and are revised periodically (16 U.S.C. 1604(f)). Local responsible officials (forest supervisors and regional foresters) would continue to have discretion to ***amend or revise a*** land management plan as deemed necessary. A determination to amend or revise a land management plan is based on a variety of factors.

- *Plan revisions. A plan revision creates a new plan for the entire plan area, whether the plan revision differs from the prior plan to a small or large extent. A plan must be revised at least every 15 years. But the responsible official has the discretion to determine at any time that conditions on a plan area have changed significantly such that a plan must be revised (16 U.S.C. 1604(f)(5)) (36 CFR 219.7(a)).*
- *Plan amendment. A plan may be amended at any time. Plan amendments may be broad or narrow, depending on the need for change, and should be used to keep plans current and help units adapt to new information or changing conditions. The responsible official has the discretion to determine whether and how to amend the plan and to determine the scope and scale of any amendment. Except as provided by paragraph (c) of this section, a plan amendment is required to add, modify, or remove one or more plan components, or to change how or where one or more plan components apply to all or part of the plan area (including management areas or geographic areas) (36 CFR 219.13 (a)).*

- *Administrative changes. An administrative change is any change to a plan that is not a plan amendment or plan revision. Administrative changes include corrections of clerical errors to any part of the plan, conformance of the plan to new statutory or regulatory requirements, or changes to other content in the plan (36 CFR 219.13(c)).*

Any future administrative changes, amendments, or revisions to land management plans would comply with NFMA and planning regulations (36 CFR 219 or the planning directives at FSM 1920 and FSH 1909.12). No alternatives would modify the planning regulations at 36 CFR 219 or the planning directives at FSM 1920 and FSH 1909.12. (See also ‘Relationship of the 2001 Roadless Rule to Land Management Planning’). The regulations require plans be based on science and meet basic substantive requirements, including providing or contributing to: ecological integrity; air, soil, water and riparian protection; social and economic sustainability; timber; multiple uses and ecosystem services; sustainable recreation, recreation settings, access, and scenery; protection of cultural, and historic resources and management of areas of tribal importance; providing the ecological conditions necessary to contribute to the recovery of threatened and endangered species to maintain viable populations of species of conservation concern; protection and recommendations for designated areas (wilderness, wild and scenic rivers, research natural areas, and others); and contributing to economic sustainability (36 CFR 219.8 through 219.11). They also require public involvement. To the degree that a land management plan could change in the future, the effects of such a change would be attributed to and analyzed as part of the decision-making for that action.

No alternatives would compel or authorize site-specific ground disturbing activities. Future projects in inventoried roadless areas will be proposed, reviewed, and approved by local Forest Service officials. All future site-specific project decisions, including those to authorize road construction, reconstruction, and timber harvesting, must be consistent with land management plans. Future project decisions must comply with applicable Federal and State laws, such as the National Environmental Policy Act, Clean Water Act, the Clean Air Act, Endangered Species Act, National Historic Preservation Act, and the Wilderness Act, as well as provisions for government-to-government consultation with Tribes and Alaska Native Corporations.

The reasonable exercise of reserved or outstanding rights for access, occupancy, and use of National Forest System lands within inventoried roadless areas would not be affected. The rights include those that exist by law or by treaty. They include, but are not limited to, the right to provide reasonable access across National Forest System lands to private property, mining claims for locatable minerals under the 1872 Mining Law, land uses protected by Native American treaty rights, and uses under the Alaska National Interest Lands Conservation Act.

All alternatives would allow for the ***continuation, transfer, or renewal of existing land-use authorizations*** for activities in roadless areas. “Authorizations” refer to land uses allowed under a special use permit, contract, or similar legal instrument. Numerous types of lands and recreation-related authorizations are issued for occupancy and use of National Forest System lands.

Other Forest Activities that are *not otherwise prohibited* are permissible in inventoried roadless areas under all alternatives, if not restricted by land management plans or other law, regulations, and policies. These activities include, but are not limited to, the following:

- Maintaining existing roads;
- Constructing or maintaining motorized and non-motorized trails;
- Engaging in hunting, fishing, hiking, camping, and other recreational uses;
- Using a motorized vehicle, such as an off-highway vehicle, on a trail open to motorized use;
- Riding a bike on a trail open to mechanized use;
- Implementing prescribed burning; and
- Grazing livestock.

Comparison of Alternatives

Table 2 compares the scope and scale of each alternative.

Table 2. Comparison of alternatives

Rule requirements and applicability	Alternative 1 – No action, 2001 Roadless Rule	Alternative 2 – Roadless Rule Rescission	Alternative 3 – Modified IRA Boundaries
National-level Prohibitions	Road construction, reconstruction, and timber harvest, with limited exceptions (36 CFR 294.12 and 294.13 (2001))	None	Same as alternative 1
Inventoried roadless areas (acres) subject to nation-wide prohibitions	44.7 million acres, including Tongass	0 acres	13 million acres
Inventoried roadless areas (acres) removed from IRA designation, no longer subject to nationwide prohibitions	Not applicable	44.7 million acres	31.7 million acres
Tongass National Forest Inventoried Roadless areas	9.3 million acres	0 acres	0 acres
Inventoried roadless area boundary modification	Requires rulemaking: Chief approves technical corrections.	Not applicable	Locally led modifications and additions, approved by the Chief, with public notice and comment. Chief may approve administrative corrections.
Potentially affected inventoried roadless areas (IRAs)	Not applicable	40.1 million acres	27.2 million acres

Under alternatives 2 and 3, for areas removed from IRA designation, where national prohibitions no longer apply, it is reasonably foreseeable that road construction or timber harvest activities could increase in the future. Across the resources evaluated in the DEIS, the potential effects of increases in road construction and timber harvest activities are described in a general, programmatic, and qualitative way (see Table 3). However, the site-specific locations and amounts of activities that could occur in the future are uncertain. To compare alternatives and the potential intensity of effects, the DEIS estimates where activities may be more or less likely to occur in the future based on the direction in current forest and grassland land management plans and the technical and economic feasibility for timber harvest. Estimates of activities and effects are more predictable in the shorter-term.

Alternative 2 and 3 would give more flexibility for local land managers to tailor active forest management to address local land conditions and needs, though benefits would likely be modest and localized. For alternative 2, about 4.8 million acres (16 percent of forested areas in the potentially affected IRAs) are in areas where current land management plans allow timber harvest and are more likely to be operable. Slightly less for alternative 3 (4.3 million acres). Depending on the alternative, these areas could potentially contribute a 4 to 10 percent increase in total sawtimber harvest towards the nationwide increase across NFS lands, providing a resulting opportunity for an increase in revenue for the timber industry, which could benefit local communities. In addition, substantial acreage within potentially affected IRAs has a relatively high likelihood of burning under high-intensity conditions that are difficult to manage or that could expose communities, infrastructure, or drinking-water sources. Alternatives 2 and 3 would provide additional opportunities to expand hazardous fuel treatments, especially those integrated with timber management, in priority firehatched, community wildfire risk reduction zones, and other high-risk areas. Under alternative 3 these hazardous fuel treatments would be more concentrated in the wildland-urban interface and roaded areas. The management flexibility or opportunities could provide resulting benefits, aligned with land management plan desired conditions, such as improving habitat or reducing wildfire risk to resources.

In general, impacts from road construction and timber harvest activities could include: increased fire frequency (human-caused), reduction in primitive or semi-primitive recreational settings; sedimentation and impacts to water quality; landscape fragmentation; adverse impacts to threatened, endangered, or sensitive wildlife and plants; loss of scenic character; impacts to tribally important resources; or economic losses related to recreation or non-commodity values of roadless areas. While these activities and effects could increase under alternatives 2 or 3, the amount (intensity) of these effects depends on the specifics of future decisions (for example, future travel management decisions about if constructed roads would be open to the public). Most effects would occur under both alternatives but affect less area or be slightly reduced under alternative 3. Across all alternatives, potential adverse effects could be reduced or mitigated by existing land management plans and individual project design. They could be further mitigated through future land management planning decisions, consistent with the 2012 Planning Rule.

Table 3. Comparison of effects

Resource/Topic	Comparison of Effects
National Forest System Roads	There are currently about 9,500 miles of roads within the potentially affected IRAs (9,400 miles of NFS roads, 100 miles of private roads) representing about 2.5 percent of the NFS transportation system. Exceptions for road construction have been limited and approximately 60 miles of roads were built within IRAs since 2013. Under alternative 1, NFS transportation changes would be unlikely. Under alternatives 2 and 3, roads would be constructed or reconstructed only where there is a need and funding source –timber harvest or other active vegetation management activity would likely generate the greatest need. Temporary roads would be more commonly used within ½ mile of existing roads under all alternatives. Current land management plans would allow or generally allow road construction on about half of the potentially affected environments (18 million acres (45.5 percent) for alternative 2 and 14 million acres (53 percent) for alternative 3). NFS road mileage, deferred maintenance and management cost increases are likely under alternatives 2 and 3; however, increases would be less under alternative 3. There could be a need to shift resources or funding to account for additional permanent mileage added to the NFS system.
Access to Non-National Forest System Lands, including mineral and energy exploration and development	Across all alternatives, land use authorizations and mineral and energy exploration and development occur within IRAs (though to a lesser degree than other NFS lands) and would continue where there are existing rights or permits/leases/authorizations. The alternatives differ relative to how new or expanded land use authorizations and authorizations for leasable minerals (primarily oil and gas and coal) would address road construction or timber harvest activities. Differences would be dependent on external requests for new or expanded for access or uses within the potentially affected IRAs. Under alternative 1, new or expanded authorizations for oil and gas or coal exploration and development would include surface use restrictions, including limiting road construction, consistent with the Roadless Rule prohibitions. This would also apply under alternative 3 in areas that remain IRAs (13 million acres). Under alternative 2, requests for new land use authorizations or leasable minerals could increase in areas no longer subject to the Roadless Rule. New authorizations and expanded authorizations may include road construction and reconstruction, where it's consistent with other legal requirements, such as land management plan components, and is consistent with resource protection considerations. This would also apply to alternative 3 in areas that are no longer designated IRAs (27 million acres).
Vegetation and Forest Management	Forested and non-forested communities within IRAs are shaped by natural forces like wildfire, drought, insects, and disease. Under alternative 1, only small amounts of timber cutting would occur where approved through exceptions, and vegetation trends would continue to be driven mostly by natural disturbances. Under Alternatives 2 and 3, increased timber harvest within potentially affected IRAs is reasonably foreseeable and would be most likely in forested areas that are potentially operable and where current land management plans allow it. Alternative 2 would expand active forest management opportunities the most, with about 4.8 million acres where timber harvest could be considered operable and allowed by current land management plans. Alternative 3 would provide the same opportunity, though slightly less area (4.3 million acres). Increased active management that is reasonably foreseeable in alternatives 2 and 3, could provide opportunities to promote increased timber production, forest health, and resilience to insects and disease, consistent with land management plans.

Resource/Topic	Comparison of Effects
Fire and Fuels Management	Currently, the number, frequency, and density of wildfire ignitions are lower in designated wilderness and potentially affected IRAs compared to other NFS lands. Under alternatives 2 and 3, if there is an increase in public road access, there could be increase the number and frequency of wildfires as human-ignitions are more likely near roads. However, public access could be limited to minimize fire hazard in high-risk areas. Substantial acreage within potentially affected IRAs has a relatively high likelihood of burning under high-intensity conditions that are difficult to manage or that could expose communities, infrastructure, or drinking-water sources. Under alternative 1, hazardous fuels treatments can occur within inventoried roadless areas, though may require an exception, and opportunities for mechanical thinning and fire control would be limited. Alternatives 2 and 3 would provide additional opportunities for hazardous fuel treatments in priority fireheds and other high-risk areas. Also, under alternatives 2 and 3, certain strategically placed roads may confer fire control benefits. Opportunities under alternative 3 would be more concentrated in the WUI and roaded roadless, nearer to the communities they are intended to protect.
Non-Native Invasive Plant Species	Forest Service data indicates less than one percent of the affected environment has mapped invasive plant populations. There would be limited activity-driven change in alternative 1. Where activities increase under alternatives 2 and 3, they could potentially increase the extent or the number of invasive plant species, especially if they create ground disturbance. Where hazardous fuels activities reduce risk of large openings from wildfire, it could reduce the risk of establishment of invasives. Given future project design and other management requirements to mitigate invasives species introduction and spread, the invasives are not expected to greatly increase.
Soil, Water, and Air	Soil and water conditions in the potentially affected IRAs are satisfactory, with some regional variation depending on indicator. Under alternatives 2 and 3, where road construction and timber harvest occur, these activities could contribute to reducing forest soil productivity and water quality, with most impacts decreasing as vegetation is reestablished following management activity. The most common effects of road construction and timber harvest activities on soil, water, and air resources are loss of vegetation, soil erosion and compaction, loss of soil productivity, increased potential for landslides, reduced transpiration (use of water by plants), increased water runoff, reduced water quality, and periodically reduced air quality. These would have variable effects on soil and water resources across Forest Service Regions and individual National Forests, depending on the existing condition or sensitivity to disturbance. Impacts would be reduced using mandatory National best management practices and local land management plan compliance. Fewer areas would be potentially disturbed under Alternative 3 and areas with the least existing disturbance would continue to have Roadless Rule prohibitions. Most of the affected environment is currently in attainment with air quality requirements, except for some areas of the Pacific Southwest Region. Alternatives 2 and 3 would have minimal immediate effects on air resources. The largest potential effect would likely be changes in wildfire emissions, particularly in the West, which have the largest potential effect on air resources at the national scale.

Resource/Topic	Comparison of Effects
Biodiversity	Under all alternatives, road construction, road reconstruction, and timber harvest could potentially have effects on biodiversity by increasing habitat fragmentation, loss of connectivity, negative edge effects, and human disturbance. Beneficial effects could include enhanced access for habitat management or improvement. Impacts to biodiversity would likely be the least under alternative 1 and would likely be more frequent and broader in scale, especially in the long term, under alternative 2 and 3, though alternative 3 would have a lesser effect than alternative 2. Under all alternatives, biodiversity of plant and animal communities on NFS Lands, including inventoried roadless areas, would continue to be planned for and managed according to the requirements of law, regulation, and policy. All land management plans, through NFMA and planning regulations, are required to maintain the diversity of plant and animal communities and support the persistence of native species in the plan area.
ESA-Listed Species and Regional Forester Sensitive Species	All future activities in potentially affected IRAs, regardless of the alternative selected, would require compliance with the ESA prior to implementation. As is typical, future project designs in these areas would avoid and minimize adverse effects to ESA-listed resources. All future activities in potentially affected IRAs, regardless of the alternative selected, would require identification of sensitive species and project-level analysis of effects on viability of sensitive species in a Biological Evaluation, for administrative units with land management plans under the 1982 Planning Rule. Based on preliminary draft biological assessment, “may affect, and is likely to adversely affect” 327 ESA-listed species and 71 critical habitats; effects would be similar or reduced in alternative 3. No alternative would cause a trend toward federal listing or a loss of viability for Regional Forester Sensitive Species.
Recreation and Scenery	Alternative 1 maintains primitive, undeveloped settings with the most opportunities for quiet, remote and self-reliant recreation and least flexibility for new developed recreation. These areas provide dispersed recreation and help reduce pressure on designated wilderness. Alternative 2 has the greatest potential impact on recreation settings and scenery. Short-term timber harvest and road construction effects could include noise, visible infrastructure, and temporary closures. Long-term, recreation settings could shift toward more developed conditions with future activities more likely in the semi-primitive and roaded areas. Under alternative 2, developed and road-based recreation could expand into inventoried roadless areas. Though, most new roads would likely be temporary and closed to public motor vehicle use, some new permanent roads could support backcountry recreation with low-development facilities such as trailheads and primitive campsites. This expansion could increase road-based recreation and accessibility improvements but reduce opportunities for quiet, remote and self-reliant recreation and increase user conflicts. Alternative 2 also has the highest potential for effects on National Recreation Trails and National Scenic and Historic Trails (NSHTs). Future potential management activities may have some short- and long-term scenery effects under both alternative 2 and 3. Management activities would strive to achieve long-term sustainable desired scenic character within the scenic integrity objectives identified in the land management planning process and any scenery-related direction outlined in other statutory and regulatory requirements. Alternative 2 has the greatest potential for negative effects to scenery. Alternative 3 has similar effects to Alternative 2 but affects fewer acres.
Cultural and Historic Resources	Under all alternatives, timber harvest and road construction and reconstruction could potentially have long-term negative impacts on cultural resources including historic properties. Future timber and road projects would require review under Section 106 of the National Historic Preservation Act including early consultation with Tribes, State Historic Preservation Officers, and other consulting parties to identify and evaluate historic properties and assess effects on them and, if needed, resolve adverse effects. Impacts to cultural resources would likely be the least under alternative 1. The potential impacts would likely be more frequent and broader in scale under alternative 2, with fewer under alternative 3.

Resource/Topic	Comparison of Effects
Tribal Rights and Interests	Generally, Tribes are concerned about current and future adverse effects on resources including all physical resources such as access routes, air, groundwater and surface water, plant and animal life, and landscapes, as well as less tangible attributes such as sense of place; sense of historical, spiritual, religious, and Tribal identity; opportunities for solitude; and opportunities to continue traditional cultural practices and ceremonies. There would be the greatest potential for adverse effects under alternative 2 and slightly reduced potential under alternative 3. Future projects and land management planning require early and regular consultation with Tribes to identify potential impacts to Tribally important areas and resources and to ensure the agency meets its Tribal trust responsibilities and that projects do not conflict with reserved rights in treaties and other laws.
Social and Economic Environment	Social and economic effects of the alternatives provide an understanding of the full realm and variety of influences on people's quality of life. Alternative 2 enhances the quality of life for people that value timber harvest and potential mineral and energy development and the economic contributions that these provide to the community. Both action alternatives would similarly enhance the quality of life for people living in communities near the IRAs, as there are increased opportunities for wildfire risk mitigation. Alternative 2 would have the greatest negative effects to the quality of life for people that hold intrinsic value for the existence of roadless areas, the ecosystem services and recreation benefit they provide.
Effects on the Tongass National Forest	The effects associated with the potentially affected IRAs within the Tongass National Forest are fully disclosed in the 2020 FEIS for the Alaska Roadless Rule and associated record. These findings are incorporated by reference.

Alternatives Considered but Eliminated from Detailed Study

Public comments received in response to the Notice of Intent provided recommendations or suggestions for alternatives. The alternatives recommended have been organized into groups or categories of similar recommendations. See also Appendix 3 – Notice of Intent Comment Summary for more detail on recommendations.

Alternatives analyzed in detail must be technically and economically feasible and meet the purpose and need (NEPA section 102 (2) (c)(iii)), 7 CFR 1b.7(h)). Roadless rules are narrowly focused prohibitions and exceptions established by the Secretary concerning whether road construction/reconstruction and timber harvest may be allowed within certain designated inventoried roadless areas. The alternatives evaluated in detail in this DEIS focus on the geographic locations (boundaries) in roadless rulemaking. Some of the recommended alternatives would not have substantially different effects or are sufficiently duplicative of the alternatives considered in detail.

Some of the alternatives recommended are outside the scope of the proposed rulemaking. These include, but are not limited to, recommending legislative solutions (such as codifying the existing Rule or providing permanent protection through designation as wilderness), alternatives to rulemaking, or changes to land management plan rules and processes (such as recommended wilderness process). General guidance considering other discretionary or non-discretionary aspects of management are better addressed through land management planning or site-specific project level planning.

Alternatives With a Different Geographic Scope of the Rule

Recommendations included additional suggestions to re-inventory roadless areas to add or remove additional areas, provide for local review of boundaries, address errors with historic roadless area mapping, remove roadless areas that are already ‘roaded’ or substantially altered, or develop an approach that allows for changes to roadless area designations, but maintains a consistent amount of roadless over time.

An alternative that increases the acreages covered by the rule would not be responsive to the deregulatory executive orders or to the fire and forest health-related concerns associated with maintaining existing prohibitions and exceptions, nor would it meet the purpose and need to restore decision making to local responsible officials. It is not the intent that management of areas currently un-inventoried be subject to a national prohibition.

Alternative 3, which is being considered and analyzed in detail, includes modifying the IRA boundaries to address comments suggesting reduced prohibitions or increased flexibility for “roaded inventoried roadless” areas and within the wildland urban interface. It also provides a provision to correct or modify boundaries. Alongside alternative 3, an alternative that uses a different wildland-urban interface boundary to delineate new geographic boundaries of inventoried roadless areas was considered. A sensitivity analysis associated with HFRA WUI boundaries and the census-based wildland-urban interface approach (Radeloff et. al. 2023) to delineating the wildland urban interface, along with applying the 0.5-mile buffer from existing roads, showed that the differences in the two wildland urban interface delineations while buffering the 0.5 mile from existing roads revealed about a 12 percent difference of remaining inventoried roadless acreages. The Healthy Forest Restoration Act definition of wildland-urban interface was included in the development for alternative 3 and considered in detail, as it aligns more closely with the purpose and need relative to local decision-making.

Additional recommendations suggested different approaches to modifying boundaries, including treating restoration areas, priority watersheds for treatment, insect and disease areas, or wildfire crisis strategy landscapes differently. The effects of these different approaches would not be substantially different than alternative 3. Management opportunities relevant to these suggestions are currently limited by the Rule’s prohibitions and their proximity to roads, and alternative 3 was specifically developed to address management opportunities near existing roads and within the WUI. As shown in the analysis (see Vegetation and Forest Management and Fire and Fuels Management) alternative 3 would provide for slightly less management flexibility overall when compared to alternative 2 but does provide for more management opportunity in key areas (for example, priority fireheds) than the no action alternative. In addition, alternative 3 would continue the existing Rule’s exceptions and provides for locally led boundary modifications which could enable local units to propose adjustments where the nationally derived boundaries do not align with local data or conditions.

Alternatives That Would Modify the Rule Prohibitions or Exceptions

Recommendations suggested that the prohibitions and exceptions in the rule be modified to provide more restrictions on activities or reduced exceptions. Other recommendations suggested the rule could be modified, similar to the Idaho and Colorado Rules, to include additional

flexibility in the exceptions or different ‘tiers’ of roadless management, especially to meet needs related to the wildland-urban interface or for management within already roaded areas. Alternative 3 is being considered and analyzed in detail. It takes a different approach to address recommendations to modifying where existing rule prohibitions and exceptions apply, especially related to wildland-urban interface and roaded inventoried roadless areas.

An alternative that considered maintaining existing inventoried roadless boundaries and prohibitions on permanent road construction while allowing temporary road construction and timber harvest was considered but eliminated from detailed study as not being responsive to the purpose and need as it would continue to restrict local decision-making discretion. In addition, maintaining national roadless boundaries would require project-level analysis considerations of roadless values which have been, and would continue to be an administrative and legal burden for the agency.

Adding restrictions to existing rule prohibitions would not meet the purpose and need to restore decision making to local responsible officials, nor would it serve to address the increasing fire and forest health related concerns associated with maintaining the existing prohibitions and exceptions.

State-Specific Rulemaking

Several comments recommended taking a state-specific rule-making approach, similar to those used in Idaho and Colorado Roadless Rules. Any State, Tribe, or other interested entity seeking to establish roadless management provisions tailored to specific geographic or resource conditions may submit a petition for rulemaking under the Administrative Procedure Act (5 U.S.C. 553(e)) and USDA regulations at 7 CFR 1.28) (see also Common to All Alternatives). The options for state petitions exist regardless of the national roadless rule – Idaho, Colorado, and Alaska state-specific rules were all developed through these procedures in time periods where the 2001 Roadless Rule was not in effect and when it was in effect. Some comments suggested retaining the 2001 Roadless Rule while allowing for potential state-specific rulemaking – this is not considered in detail separately, as this would have the same effect as Alternative 1. Others suggested rescinding the Rule and instead providing for State-specific Rulemaking (akin to the 2005 State Petitions Rule), this was not considered in detail as this would have the same effects as alternative 2. The impacts of future state-specific rules are unknown and not predictable. If state-specific roadless rules are proposed in the future, the effects would be analyzed as part of that decision-making process.

Under all alternatives, during national forest or grassland land management planning, local Responsible Officials must engage States and local governments in the planning process and, where appropriate, shall encourage them to request cooperating agency status (36 CFR 219.4(a)).

Tribal-Specific Rulemaking

Tribal letters and consultations suggested this rulemaking prioritize Tribal conservation priorities and interests, for example including a mechanism to allow Tribes to request specific management approaches for specific IRAs or to manage specific characteristics of IRAs important to Tribal interests. Other recommendations included a non-rescission alternative that directs or

incentivizes cooperative agreements between the Forest Service and Tribes for the management of IRAs and incorporating Indigenous knowledge as a source of best available science.

General or broad discretionary or non-discretionary aspects of national forest and grassland management, such as co-stewardship with Tribes, are better addressed through local land management planning or site-specific project level planning than through National Rulemaking. During the land management planning process, Tribal consultation is required (36 CFR 219.4(a)(2)) and, where appropriate, the responsible official shall encourage federally recognized Tribes to seek cooperating agency status (36 CFR 219.4(a)(1)(v)). The Responsible Official could consider information about Indigenous Knowledge, land ethics, cultural issues, and sacred and culturally significant sites (36 CFR 219.4(3)). In addition, the Forest Service can enter into cooperative agreements or contracts with Tribes to facilitate cooperative forest management, through mechanisms such as the Good Neighbor Authority and the Tribal Forest Protection Act (TFPA) (see Tribal Rights and Interests).

Tongass-Specific Alternatives

Four additional alternatives for managing roadless area conservation specific to the Tongass National Forest were considered in detail in the 2020 Alaska Roadless Rule FEIS (see Appendix 4 – Review of the Final Environmental Impact Statement for the 2020 Alaska Roadless Rule and Chapter 2 of the 2020 Alaska Rule FEIS for a description of each of these alternatives). Taken together, the six alternatives considered for the Tongass in 2020 represented the spectrum of management regimes identified to the Forest Service through interdisciplinary review, public comments, public meetings, Tribal and Alaska Native corporation consultations, and cooperating agency input. They were found to be an appropriate range of alternatives for the 2020 and 2023 Alaska Rulemaking (2020 Alaska Roadless Rule, 85 FR 68689-68690; 2023 Final Rule 88 FR 5254), which selected alternative 6 and alternative 1, respectively. Alternatives 2 through 5 of the 2020 FEIS were re-considered for this rule-making. However, these alternatives do not meet the purpose and need for the current proposed rulemaking, as they would not comply with the policy direction in Executive Order 14153.

See also several additional alternatives considered but eliminated from study in the 2020 Alaska Roadless Rule FEIS (page 2-17), including management or co-management of the Tongass with Tribes, congressional changes to the 2001 Roadless Rule, and use of 2003 and 2008 inventories.

Potentially Affected Environment

This section briefly describes the status of inventoried roadless areas that may be affected. See also Inventoried Roadless Areas above. Potentially affected environments are also included in the environmental impacts section. See Appendix 1 – IRA Acreage Summarized by Region and Volume II Maps.

There are 44.7 million acres of IRAs subject to the 2001 Roadless Rule¹². Review of the geospatial data found that 44.3 million acres of these are on National Forest System lands, meaning about 0.4 million acres of lands have had land ownership change since the 2001 Roadless Rule or there may be vertical integration problems (mapping errors) between the inventoried roadless data and official land ownership boundary data¹³.

Over 4 million acres are within Congressionally-designated wilderness¹⁴, wilderness study areas¹⁵, and wild segments of wild and scenic rivers¹⁶. These statutory designations have more restrictive and more permanent mandates than the 2001 Roadless Rule. Therefore, changes in management activities in these areas under any alternative are highly unlikely and not reasonably foreseeable and these 4 million acres are not included in the potentially affected environment (see Wilderness and Other Designated Areas).

As described in the Relationship of the 2001 Roadless Rule to Land Management Planning section, the rule and land management plans provide overlapping layers of direction within IRAs that any activities must comply with. Current land management-plans often include plan direction and components that identify where timber management and road construction may or may not be allowed. Example management areas where timber management or road construction may be limited include recommended wilderness, research natural areas, or backcountry management areas. Figure 2 shows the primary management emphasis of management and geographic areas which overlap with the potentially affected IRAs. Some plans include plan components with direction specific to IRAs.

¹² Current areas are reflected on national maps at the Forest Service Roadless Area website: <https://www.fs.usda.gov/managing-land/planning/roadless>

¹³ Vertical integration is a term used in the Geographic Information System (GIS) community to describe the process of a linking datasets from different sources. This includes the process of aligning the 2001 IRA boundary lines with National Forest System (NFS) boundary lines. NFS boundaries include, but are not limited to NFS property boundaries, national forest/national grassland boundaries, and special designated area boundaries (such as wilderness). Misalignments occur over time due to new surveys, improved technologies, and datum shifts (USDA Forest Service 2024– Memo Procedure for Aligning and Making Technical Corrections). Very slight misalignment of the coverages can result in polygon slivers between the coverages, which can produce acreage differences initially. These differences can amount to tens or hundreds of acres or more, especially because of the large area under analysis.

¹⁴ Congress has included approximately 1.3 million acres (or 2.8 percent) of inventoried roadless areas managed under the 2001 Roadless Rule in the National Wilderness Preservation System.

¹⁵ 2.8 million acres are Congressionally-designated wilderness study areas. Agency policy requires that “[a]ny area recommended for wilderness or wilderness study designation is not available for any use or activity that may reduce the wilderness potential of an area” (FSM 1923.03(3)).

¹⁶ 85,000 acres are Wild segments of designated Wild and Scenic Rivers. Agency policy states that “[g]enerally, a wild river is accessible only by trail” (FSM 2354.42g) and that we must “[e]nsure trees are not sold, cut, or otherwise harvested in a designated wild river area except under emergency conditions, such as for insect or disease control, fire, natural catastrophe, disaster, public safety, or under specified conditions on valid mining claims” (FSM 2354.42d).

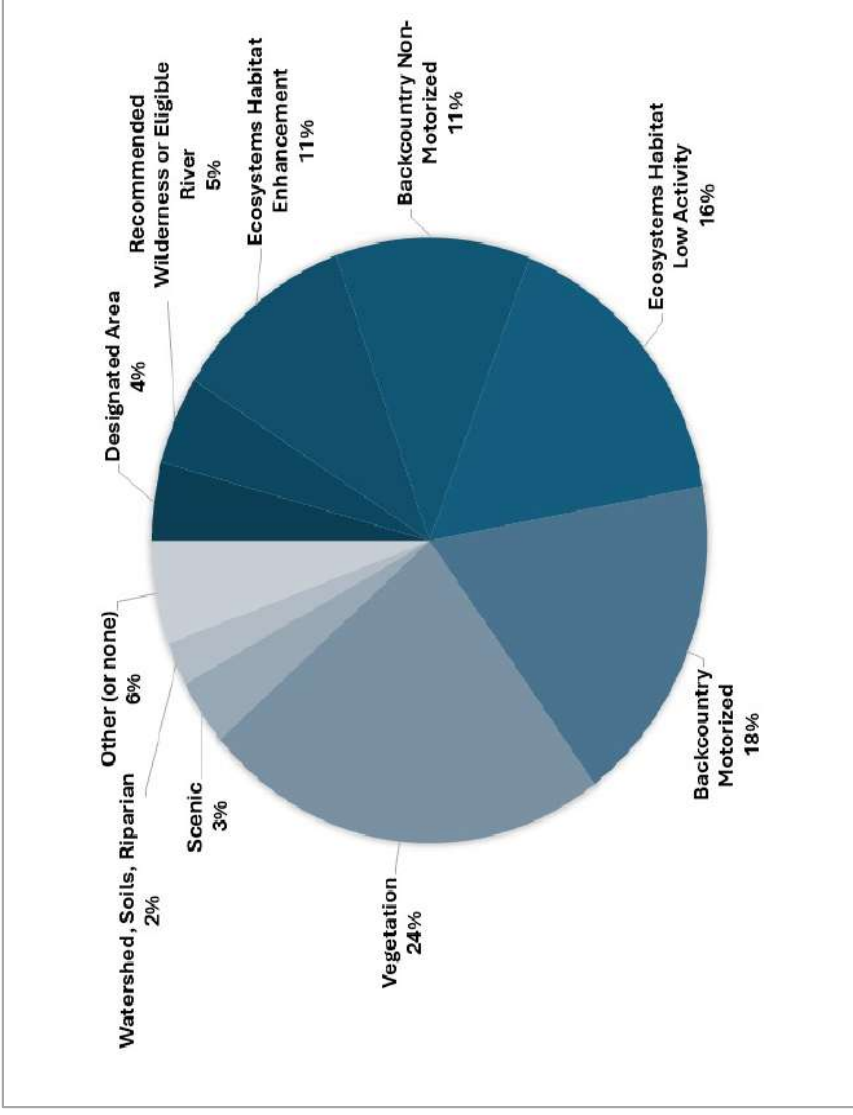


Figure 2. Proportion of land management plan emphasis categories across a flattened layer of all management, geographic, and designated areas within the potentially affected environment

A national review of plan components in management areas overlapping the potentially affected environment was completed to identify where plans do or do not further restrict timber harvest and road construction activities. There is much variation between individual land management plans and Regions reflecting differences in local conditions, age of the plans, and changes in planning policies over time (see Appendix 1 – IRA Acreage Summarized by Region for more detail and examples). Overall, within potentially affected IRAs, land management plan components:

- Further restrict (do not allow or generally do not allow) road construction on 21.8 million acres (54.5 percent of the potentially affected IRAs), and
- Further restrict (do not allow or generally do not allow) timber harvest on 26.7 million acres (66.5 percent of the potentially affected IRAs).

Note that this information is intended for programmatic analysis purposes for this EIS, actual implementation of any activities would be subject to local interpretation of the land management plans based on unique local conditions.

Within the Tongass National Forest 9.3 million acres of inventoried roadless area managed under the 2001 Roadless Rule, or about 56 percent of the Forest. Approximately 9.2 million acres of

these are included in the affected environment (on National Forest System lands and outside of wilderness, wilderness study area and wild river segments).

The potentially affected environment does not include any lands in Colorado or Idaho because roadless areas in those states, managed under state-specific roadless rules. There would be no changes to those rules and no effects within these states.

Scope of the Analysis

The Environmental Impacts section provides the scientific and analytic basis to compare the alternatives. The scope of the impacts covered in this draft EIS are informed by the preliminary issues listed in the Notice of Intent, substantive information received on the notice (see Agencies and Persons Consulted and Appendix 3 – Notice of Intent Comment Summary), the history of roadless rulemaking analyses and its implementation, and the interdisciplinary team’s review. Effects that could have potential for significant impacts are discussed in proportion to their reasonably foreseeable significance (as defined in 7 CFR 1b.2(f)(3)(ii) and (iii)). This analysis is a programmatic review (42 U.S.C. § 4336e (11)), analyzing a policy or program and its environmental effects. The environmental impact analysis provides a programmatic or high-level review of the potentially significant effects that may result from proposed rulemaking and alternatives, considering the policy and legal framework that guides National Forest System land management.

The draft EIS presents the reasonably foreseeable impacts of the rulemaking alternatives and potential adverse effects that cannot be avoided, including from the no-action alternative. An irreversible or irretrievable commitment of resources will not be made by the rulemaking because none of the rulemaking alternatives propose specific actions that would cause irreversible or irretrievable commitments of resources¹⁷.

In general, it is reasonably foreseeable that activities with potential for beneficial or adverse environmental effects could occur within or near inventoried roadless areas under all alternatives, and that more road construction and timber harvest activities are reasonably foreseeable under alternatives 2 and 3. However, the rulemaking would not compel, require, or authorize any site-specific activities. Therefore, site-specific locations and amounts of activities that could occur in the future under the alternatives are uncertain. Any future decisions on these activities are greatly influenced by factors beyond the proposed rulemaking such as local decision-making through

¹⁷ Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of a mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road. The 2001 Roadless Rule FEIS stated that the rule prohibitions could reduce road-caused irretrievable commitments to watersheds, soils, critical habitat, and dispersed recreation activities compared to no action (not issuing the rule) (USDA FS 2000a). Although road construction and/or timber harvest could potentially increase within some roadless areas under alternatives 2 and 3, commitment of resources would be based on site-specific proposals, which are currently unknown, and would be addressed in subsequent land management plan or project environmental analyses.

land management plans and projects, informed by the local community, local industry capacity, agency budget allocations and resources, and other regulations and policies.

Potential adverse effects described in this draft EIS could be reduced or mitigated at the project level through compliance with existing land management plan direction, implementing best management practices, or employing project-specific design criteria; or through future land management planning. Site-specific effects can be meaningfully measured and evaluated at the project and activity stage and are evaluated during the National Environmental Policy Act (NEPA) process, as appropriate. Common requirements or practices that reduce impacts are noted throughout the Environmental Impacts discussion.

To aid in comparing alternatives, the analysis in the EIS focuses on the difference where (what locations) reasonably foreseeable activities, particularly road construction and timber harvest, are more or less likely to occur within inventoried roadless areas under the alternatives, and the resulting difference in ecological and social effects. Estimates of areas where activities are more likely to occur, were prepared for effects analysis purposes (see National Forest System Roads, Vegetation and Forest Management and other sections) – they do not reflect proposed or planned activity areas and activities would not occur in all of these areas.

The following describes how the agency drew a reasonable and manageable line in consideration of the reasonably foreseeable environmental effects of the proposed action and action alternatives, and those that may extend outside the geographical territory of the proposal or might materialize later in time¹⁸. The geographic extent of the environmental effects analysis focuses on activities with a close causal relationship to the rulemaking alternatives. The locations, geographic extent, and duration of ecological or social impacts depend on the resource or impact being measured, the activity type or intensity (such as road type or traffic level), and topography and will be generally described in the following sections. Changes to regulations remain in place until additional rulemaking or Congressional action. Short- and long-term reasonably foreseeable environmental impacts of the rulemaking alternatives are considered. The analyses also discuss short and long-term effects that may result from potential future activities, if/when they occur.

The short-term potential for road construction and timber harvest or related activities and associated effects is more predictable and reasonably foreseeable. Within the potentially affected environment the following areas are more likely to have activities or impacts, in the short-term (5 years):

- areas where activities are allowed under existing land management plans (see Potentially Affected Environment);
- areas that are more feasible or economical for equipment and workers to access (more operable) (see Vegetation and Forest Management); and,
- areas with a greater management priority or ‘need’ (for example, high risk firesheds and areas affected by insect and disease or other disturbances);

¹⁸ 7 CFR 1b.11(a)(12)

- areas with high product potential/economic viability for timber production to support management objectives.

In the longer term (up to 20 years and beyond), the extent of activities is more uncertain. Still, it is reasonable to expect a greater proportion of the potentially effected environment could be impacted by activities over time. Factors affecting long term change include natural events such as storms and wildfires, local decision-making through projects and land management plan amendments and revisions, national policy changes, state-level rulemaking proposals, technological changes, industry and economic changes, etc. Areas that are least likely for development in the short term (currently restricted, less developed, etc.) could be impacted by change, in the longer term. However, given the long causal chain and distance from the action proposed, predicting the specific amounts is too speculative.

There are also other ongoing or reasonably foreseeable actions with relevance to impacts of the proposed action and alternatives. Forest Service policy decisions and local plan and project decisions would determine how much and where actions would occur.

Table 4. Ongoing and reasonably foreseeable actions

Action/Decision/Situation	Responsibility/ Control	Relevance
36 CFR 228A (locatable minerals) proposed rule (91 FR 8316)	USDA Forest Service (National)	Proposed revisions to increase efficiency, including review and approval. Proposed revisions define clear criteria for when a plan of operations would be required, requiring site-specific environmental analysis and agency approval.
National active management strategy; regional strategies	USDA Forest Service (National)	Increasing timber volume targets (25 percent over 5 years), post fire recovery emphasis
One Big Beautiful Bill Act of July 2025 (Sec. 50301)	Statue/Congressional Action	Directs the Forest Service to annually, beginning in FY2026 and through FY2034, sell a quantity of timber on National Forest System land that is at least 250 million board feet greater than the quantity that was sold in the previous fiscal year, subject to land management plan limits. The Forest Service must annually enter into 40 20-year or longer contracts for the sale of national forest materials for FY2025-FY2034.
Travel management policy (36 CFR 212) proposed changes	USDA Forest Service (National)	The Travel Management Rule governs transportation and public motor vehicle access on National Forest System Lands. In 2026, the rule is scheduled for amendment.

Action/Decision/Situation	Responsibility/ Control	Relevance
Ongoing land management plan revisions include the Black Hills, Bridger-Teton, Gila, Manti-La Sal, Lincoln, Lolo, Tongass National Forests; the Blue Mountains Forest Plans Revision (Malheur, Umatilla, and Wallowa-Whitman National Forests); and the Cimarron and Comanche National Grasslands. In addition, the Northwest Forest Plan Amendment is ongoing.	USDA Forest Service (Forest/Unit-level)	These revisions and amendments are underway and, once approved, could result in changed management direction for these Forests, consistent with the requirements of NFMA and the 2012 Planning Rule.

In the long term, there could be other changes or actions outside of USDA or Forest Service control (such as future Congressional action, regulatory or de-regulatory proposals in other Federal agencies, changes to State-level requirements) which could modify effects in the long term (for example through added or removed requirements or controls on future projects). Beyond those listed in the table above, these potential changes are uncertain or too far removed in time to consider in the effects analysis.

Environmental Impacts

National Forest System Roads

Background

National Forest Transportation System

The Forest Service maintains and administers approximately 368,000 miles of roads on National Forest System lands, referred to collectively as National Forest System roads (NFS roads). The objective of the NFS transportation system is to provide the minimal mileage road system needed for safe and efficient travel, and for administration, utilization and protection of NFS lands.¹⁹ The roads under Forest Service jurisdiction are necessary for administering, managing, protecting, and using national forests. They are commonly called “system roads” and they are maintained and managed by national forests, including collecting and inventorying physical road characteristics within data preserved in the Forest Service Natural Resource Manager (NRM) database²⁰.

¹⁹ The National Forest Roads and Trails Act of October 13, 1964, as amended (16 U.S.C. 1608). Authorizes construction and maintenance of adequate system of roads and trails for the national forests carried forward on an economical and environmentally sound basis. The Travel Management Rule (Title 36, Code of Federal Regulations, Part 212 (36 CFR Part 212)). Establishes requirements for the administration of the Forest transportation system.

²⁰ Official Forest Service records as found in the Natural Resource Management (NRM) database were used to provide information on NFS roads (open, closed, administrative use only, etc.). Database records are dynamic; the roads data of September 2025 is used for analyses. Data, methods and results of analyses related to roads are provided in the project file. The Forest Service does not have a national database of temporary road information and any temporary road data is tracked at the local level during project implementation.

The FEIS for the 2001 Roadless Rule includes NFS road system history (page 3-21). Information includes annual mileage increases to the NFS roads system from the 1940s to its peak of 386,000 miles in 2000 (USDA Forest Service 2000b). More recent data shows that in the last 23 years, there has since been a decline in the system of 18,000 miles, as illustrated in Figure 3. Figure 4 shows the distribution of NFS road miles by vehicle use. Approximately 65,000 miles, or close to 18 percent, are managed to accommodate standard passenger cars; 200,000 miles, or 54 percent, of NFS roads, are managed to accommodate high-clearance vehicles; and the remaining 103,000 miles, or 28 percent, are currently in storage, temporarily restricting roads from standard vehicle use but preserving them for future operation.

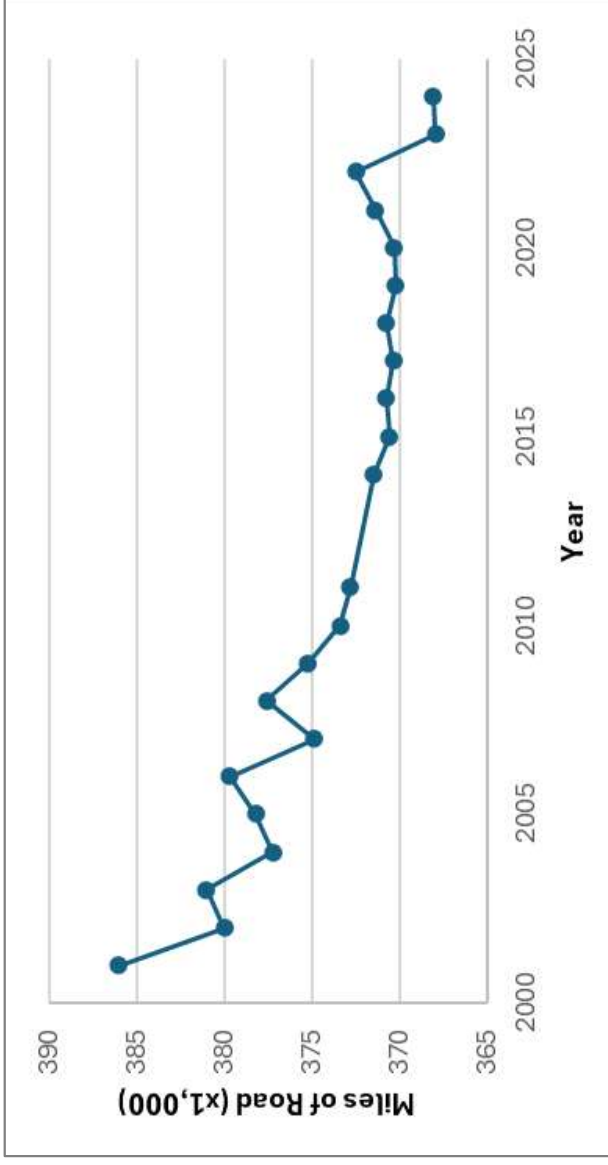


Figure 3. NFS road system mileage has declined by 18,000 miles over the last 23 years.

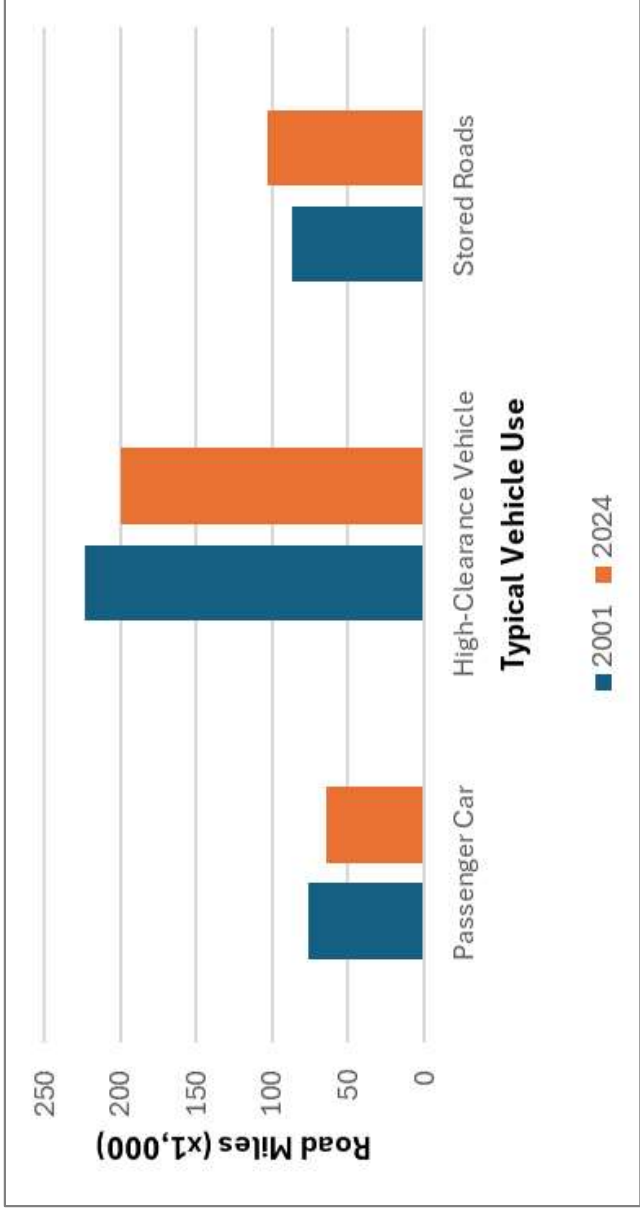


Figure 4. Miles of NFS Road by typical vehicle use. A total of 65,000 miles of National Forest System roads are managed to accommodate passenger car use.

The downward trend in National Forest System road system mileage was spurred by increased emphasis on transportation system management, consideration for ecosystem protection and wildlife habitat connectivity, funding available for decommissioning unneeded roads, and recognition of declining funding for maintaining the road system. Two major transportation system management policies were implemented in the last two decades for planning purposes to meet road users’ needs while at the same time being fiscally responsible.

One policy was the Roads Analysis Policy implemented in August 1999. The objective was to produce a road system that was safe and responsive to public needs and desires, was affordable and efficiently managed, had minimal negative ecological effects on the land, and would be in balance with available funding for needed management actions. Further information on the Roads Analysis Policy is available in the FEIS for the 2001 Roadless Rule, pages 3-28 and 3-29 (USDA Forest Service 2000a).

The Forest Service further refined transportation management strategies with the implementation of the Travel Management Rule (36 CFR Part 212) (TMR) in 2005. The goal of the rule was the identification of an environmentally and financially sustainable transportation system while meeting public needs. Under the TMR, each National Forest System unit was required to identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands. In determining the minimum road system, the units were required to incorporate a science-based roads analysis at the appropriate scale to identify NFS roads that were no longer needed to meet forest resource management objectives.

Today, the NFS road system serves a wide variety of forest users and administrative purposes, joining with county, state, and national highways to connect rural communities and urban centers with NFS lands, resources and activities. Access for administrative purposes includes fire

management, law enforcement, natural resource management such as timber and watershed, and facilities management. Permitted operations such as ranching, special-use recreation events, utility and telecommunications, and energy exploration and mining rely on NFS roads. Additionally, NFS roads are used for recreation purposes and access including hiking, sightseeing, fishing, hunting, camping, and off-highway vehicle use. Finally, NFS roads may connect landowners with their private property and provide access to administrative and developed recreation sites.

While not part of the NFS road system, temporary roads are also developed and used on NFS lands. Temporary roads are authorized under contracts and permits, such as timber sale contracts, special use permits, oil and gas exploration permits, or facility construction contracts; or they may be constructed by the Forest Service for administrative access. These roads are needed for a short time to meet a one-time access need, usually for one year and not more than ten years. The Forest and Rangeland Renewable Resources Planning Act of 1974 (as amended) generally requires temporary roads to be closed and revegetated within ten years after use.

Road System Classification and Definitions

National Forest System roads are managed and maintained to provide differing levels of service based on intended purpose, management area direction, and type and extent of resource activities. The roads are classified by five different maintenance levels: 1, 2, 3, 4, and 5. Maintenance level 1 roads are roads that have been placed in storage between intermittent use restricting the road from standard vehicle use while still allowing for certain activities such as pedestrian access and motorized trail access if such use is designated. Maintenance level 2 roads are maintained for high-clearance vehicles. Maintenance level 3, 4, and 5 roads are maintained for passage by standard passenger cars during the normal season of use. Typical NFS roads include native surface roads maintained for high-clearance vehicles and slower travel, and gravel and paved surface roads allowing for somewhat higher speeds and travel by standard passenger cars. *Guidelines for Road Maintenance Levels* found at <https://www.fs.usda.gov/t-d/pubs/pdf/11771811.pdf> (FSH 7709.59) provides the following definitions for NFS road maintenance levels:

- Maintenance level 1. These are roads that have been placed in storage between intermittent uses. The period of storage must exceed one year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level.
- Maintenance level 2. Assigned to roads open for use by high clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are not provided with the exception that some signing, such as W-18-1 “No Traffic Signs”, may be posted at intersections. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level.

- Maintenance level 3. Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. The Manual on Uniform Traffic Control Devices (MUTCD) is applicable. Warning signs and traffic control devices are provided to alert motorists of situations that may violate expectations. Roads in this maintenance level are typically low speed with single lanes and turnouts.
- Maintenance level 4. Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. Manual on Uniform Traffic Control Devices is applicable.
- Maintenance level 5. Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated. Manual on Uniform Traffic Control Devices is applicable.

Roads on National Forest System lands are also identified and defined by jurisdiction and type. Current policy found in Forest Service Manual 7700 uses the following terms:

- *Forest Road*- road wholly or partly within or adjacent to and serving the NFS that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (36 CFR 212.1).
- *National Forest System Road (NFS road)*-A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority (36 CFR 212). (An NFS road is identified in Forest Service NRM database as being under FS jurisdiction, having a status of 'existing' and is part of the NFS roads system.)
- *Public Road*-A road under the jurisdiction of and maintained by a public road authority and open to public travel (23 U.S.C. 101(a)).²¹
- *Temporary Road*-road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a system road and that is not included in a forest transportation atlas.
- *Decommissioned Road*-road no longer needed wherein actions have been performed resulting in restoration of unneeded road to a more natural state.
- *Unauthorized Road*-road that is not a Forest road or a temporary road and is not included in a Forest transportation atlas (such as user-created routes and off-road vehicle tracks not designated and managed as a trail).

²¹ NFS roads may be open to public use or identified as administrative use only. An administrative NFS road is any NFS road that is not a public road. NFS roads open to the public are identified on a unit's motor vehicle use map.

Road Maintenance

The Forest Service is responsible for maintaining NFS roads resulting from traffic associated with administration of NFS lands, noncommercial uses and activities, incidental noncommercial use related to ownership or occupancy of isolated parcels of private land served by an NFS road, commercial road use that is not subject to cost recovery, and incidental public use (Forest Service Manual 7730).

NFS roads are maintained to accommodate standard passenger cars and high-clearance vehicles such as sport-utility vehicles, pickups, and jeeps. Some NFS roads are stored for future use. These roads are typically single-use roads (for example, timber sale access) that are generally closed after their initial use, kept closed between uses and may receive basic custodial maintenance to prevent damage to adjacent resources and perpetuate the road for future resource management needs. Across all lands, NFS roads maintained for passenger cars include approximately 9,500 miles of paved roads, 36,500 miles of gravel roads, and 19,000 miles of native material (dirt) roads. As illustrated in Figure 4 and Table 5, less than 10 percent of paved roads and less than 30 percent of gravel roads are in good condition.²²

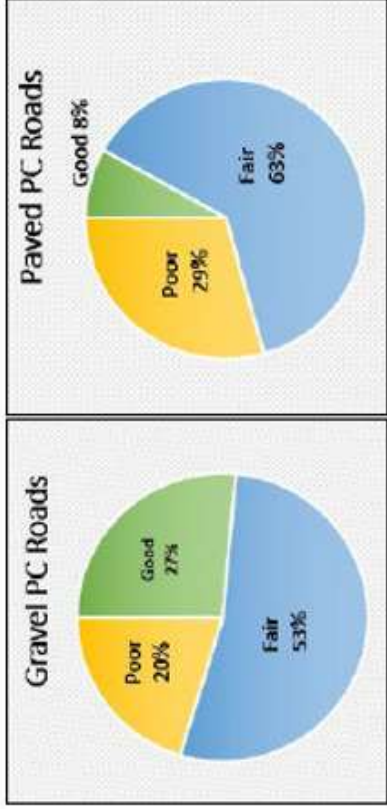


Figure 5. Less than 20 percent of NFS paved/gravel surfaced passenger car (PC) roads are in good condition.

Table 5. Miles of passenger car roads by surface type on NFS lands

Surface Type – Passenger Car Roads	Miles
Paved	9,594
Gravel	36,504
Native Material	18,709

Road maintenance activities vary by road surface and anticipated traffic characteristics. All roads, except those stored, have some level of signage maintenance, hazard removal, and vegetation management to maintain sight distance. Typical maintenance for native surface (dirt) roads includes bulldozer or grader work to maintain grades and drainage, and maintenance of drainage ditches to prevent erosion and environmental damage. Gravel road maintenance

²² Information from the 2024 Roads Program Fact Sheet summarizing various transportation program facts and data as tracked by the USDA Forest Service engineering program. Good, fair, and poor ratings based on four pavement performance measures: roughness, cracking, rutting, and faulting as defined and described in 23 CFR, Part 490.

typically includes grading to maintain crown and shoulder slopes, spot surface replacement to repair sections with new gravel, and maintenance of drainage ditches, culverts and other drainage structures. Asphalt roads similarly include shoulder and drainage structure maintenance and additionally include pothole patching and pavement resurfacing. Road maintenance also includes repair and preservation of major drainage structures such as bridges.

Road maintenance is performed in accordance with best management practices to reduce the concentration of subsurface and surface water runoff, minimize road surface erosion, filter ditch water before entering streams, and decrease risk of culvert failures during peak runoff events. Maintenance may include culvert installation, replacement of existing culverts, installation of drainage dips and surface water deflectors, placement of riprap to armor drainage structures, aggregate surface replacement, aggregate placement to reinforce wet surface areas, ditch construction and cleaning where needed, and surface blading to restore drainage efficiency of the road surface.

Road Decommissioning

Road decommissioning is part of NFS road system management. It includes applying various treatments to restore unneeded roads to a more natural state, mitigate environmental damage, and restore hydrologic function. Treatments may include one or more of the following:

- Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation;
- Blocking the entrance to a road or installing water bars;
- Removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed;
- Completely eliminating the roadbed by restoring natural contours and slopes; and
- Other methods designed to meet the specific conditions associated with the unneeded road.

Road maintenance and decommissioning costs can vary greatly based on treatment, location, material needs, terrain, and drainage. Based on current agency data, typical costs for annual road maintenance can range from \$5,000 to \$50,000 per mile. A review of route decommissioning projects from various Forest Service regions for fiscal years 2022 to 2024 indicated decommissioning costs from as low as \$2,000 per mile for minor treatments such as blocking entrances or installing water bars to an excess of \$50,000 per mile for more complex treatments such as removing culverts and restoring drainages.

Road Construction or Reconstruction

Construction or reconstruction of NFS roads may be required to provide needed access for implementing land management plans goals and objectives. Construction and reconstruction are typically paid for by the use that most benefits from the access. Examples include timber harvest by timber purchasers, mining operations by mining claimants, and special use permit access by permittees. However, some roads are built using congressionally appropriated dollars such as roads for recreation, administrative access, and ecosystem restoration. The Forest Service is responsible for planning, design, and construction oversight and often retains long-term

jurisdiction, including maintenance and operational responsibilities, for roads constructed on NFS lands.

An informal Forest Service survey related to average cost for new construction indicates that NFS road construction cost in the lower 48 states varies between \$80,000 to \$100,000 per mile for native surface (dirt) roads. Adding gravel surfacing is an additional \$300,000 to \$500,000 per lane mile, and approximately \$1,000,000 to \$2,000,000 per lane mile for asphalt paved roads. In Forest Service Region 10, Alaska, road costs are much higher, typically four to five times that of the lower 48 states. These costs do not include significant drainage structures such as bridges, retaining walls, or other substantial slope stabilization measures.

Road System Management Costs and Funding

Each new mile of road competes for limited road maintenance funding. Road investment planning for capital improvement and maintenance is implemented through a multi-faceted approach at the national and local levels. At the national level, funds are set aside for higher-cost projects and project proposals are submitted for consideration and selected based on agency priorities through the agency's National Asset Management Program. At the local level, annual funding is allocated and distributed to units based on factors such as national visitor use monitoring figures, National Forest System land area managed, and forest product outputs. Road maintenance plans and future investment plans are prepared at the local level based on their individual needs.

A fiscal year 2023 Service-wide Asset Summary for the Forest Service estimated current replacement value for NFS roads and bridges at \$39 billion²³. Using the industry standard 4 percent of current replacement value to estimate annual funding needs to maintain the existing NFS road network in a state of good repair, maintenance funding needed is calculated out to an estimated \$1.6 billion annually. This figure includes reoccurring maintenance and cyclic replacement and repair of major assets such as bridges, drainage structures, pavements, and gravel surfacing. Per a budget review of annual funding, the Forest Service received approximately \$270 million in fiscal year 2023, or less than 20 percent of the estimated funding needed to maintain its existing road infrastructure.

Approximately 31,000 miles of passenger car and high-clearance roads were maintained, improved or reconstructed in fiscal year 2024. This equates to approximately 8 percent of the entire NFS road system or approximately 12 percent of open road mileage (mileage not identified as maintenance level 1 or "in storage") (gPAS²⁴).

Funding received for NFS roads includes annual appropriations, special program funding, collections from commercial users, and highway funds. For example, in fiscal year 2024, transportation projects were partially funded from Great American Outdoors Act (GAOA, 2021-2025), Legacy Road and Trail Remediation Program as part of the Infrastructure Investment and

²³ Information from a 2023 Service-wide Asset Summary report as generated from the Forest Service's database of record, Natural Resource Management (NRM).

²⁴ Information from the Forest Service's source for performance data, the Geo-Enabled Performance Accountability System.

Jobs Act (IIJA, 2021–2026), and Federal Lands Transportation Program. Annual appropriations to the Forest Service for roads capital improvement and maintenance funding in fiscal year 2024 was \$73 million. The other programs mentioned above provided the remaining \$197 million for 2024; however, this funding is outside of typical annual appropriations and not guaranteed. For example, GAOA expired at the end of fiscal year 2025 and IIJA is set to expire on September 30, 2026.

Annual appropriations for construction, improvement and maintenance of the road system have drastically declined in the last 20 years. Annual appropriation funding reached a peak of \$234 million in 2004 and dropped to \$73 million 2024. The overall trend of decline in appropriated funding over the last 20-years is illustrated in Figure 6.

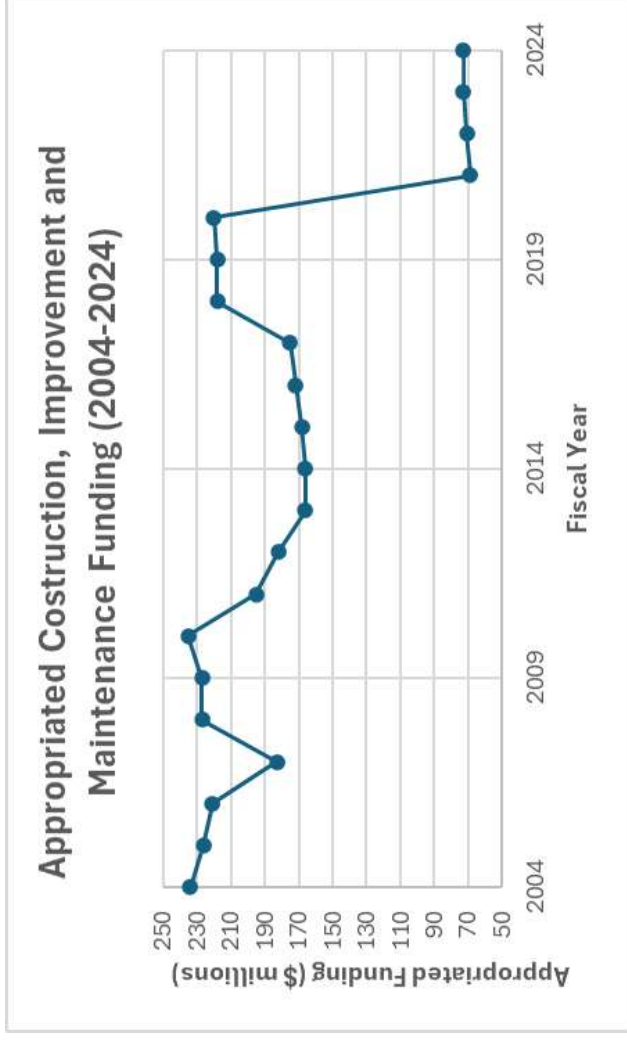


Figure 6. Appropriated funding for NFS road system has declined by almost 70 percent over the last twenty years.

The difference in funding available for roads and that needed to maintain the roads system has resulted in a deferred maintenance backlog.²⁵ In 2024, the Forest Service estimated a deferred maintenance backlog of \$6.9 billion for roads and bridges. This estimate is based on passenger car roads only (maintenance levels 3 - 5). In 2001, the deferred maintenance backlog was estimated at \$8.4 billion for all maintenance levels of roads. The 2024 estimate does not include maintenance level 1 or 2 roads as there is no current tracking mechanism for these lower maintenance level roads. (In 2001, resources were available to survey 100 percent of NFS roads to determine deferred maintenance. Currently, the Forest Service uses a random sample method for determining deferred maintenance at a national scale and it includes only passenger car roads.) The growth in deferred maintenance over the last ten years is illustrated in Figure 7.

²⁵ Deferred maintenance is the practice of delaying or postponing necessary repairs, upkeep, or replacements for infrastructure to save costs or because of a lack of resources.

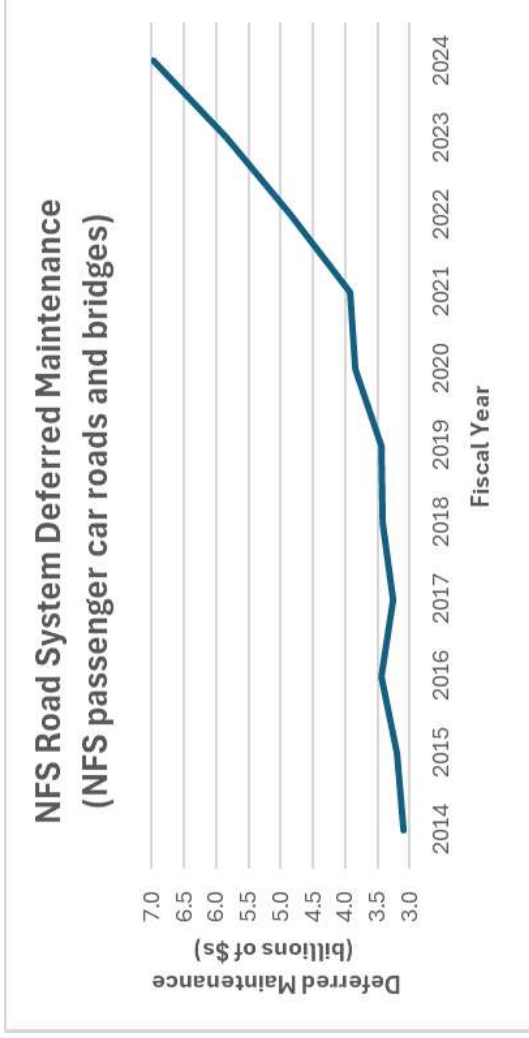


Figure 7. NFS Road System Deferred Maintenance

Common to All Alternatives

The objective of the NFS transportation system is to provide the minimal mileage road system needed for safe and efficient travel, and for administration, utilization and protection of NFS lands. Road construction and reconstruction would be designed for the level appropriate for intended use. Any new roads would be designed and maintained in a way that would minimize negative effects on water quality, soil stability, and wildlife habitat. Trails open to motor vehicles are managed for recreation access, including full size vehicles, and are addressed in the recreation section.

The decision to construct a new, permanent road that would become part of the NFS road system would be made as part of transportation planning associated with planned resource management activities and use of NFS lands. Proposals for new roads related to development and the associated environmental effects would be considered through project-level planning.

If future decisions authorize it, modifications to the transportation network would follow law, regulation and policy found at 16 USC 1608, FSM/FSH 7700, relevant State and Federal statutes such as the Clean Water Act, NEPA, and Endangered Species Act, and national forest land management plans. Implementation of these policies can minimize, but not eliminate, some adverse environmental effects.

Potential road system management activities could include construction, reconstruction, maintenance, and decommissioning of NFS roads as well as temporary roads. Road construction and reconstruction could include preliminary site investigations, actual building, and any activities incidental to the construction or reconstruction of a road. Road maintenance would include upkeep of the entire road facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization. Road decommissioning would include activities that result in the stabilization and restoration of unneeded, temporary or unauthorized roads to a more natural state.

Timber harvest activities would likely generate the highest need for permanent and temporary roads on the landscape. Other activities typically requiring road construction include private or special uses, existing rights, minerals and energy exploration, fuels reduction, pre-commercial thinning, watershed restoration, habitat improvement, and recreation development.

Some timber activities would not require any new roads. For example, it's assumed timber related activities within 0.5 miles of existing roads where terrain slopes are 40 percent or less, would less likely require the development of new, permanent roads. Conversely, where timber activities are occurring beyond 0.5 miles of existing roads, some construction of new temporary and permanent roads would be more likely.²⁶

Financing for construction of roads could be accomplished by appropriated funds, requirements on purchasers of national forest timber and other products, by cooperative financing with other public agencies, and with private agencies or persons.

The Forest Service has a significant road maintenance backlog; however, it is assumed that some new road construction and additional maintenance would result from any action alternative. It is further assumed that revenue generated by timber sales or other resource extraction activities would be used for some road-related system management but not be sufficient to cover the costs of constructing and maintaining all new roads related to a project.

Potentially Affected Environment

National Forest Transportation System

The 2001 Roadless Rule EIS identified approximately 9,660 miles of existing roads within all inventoried roadless areas at that time (including Idaho and Colorado roadless areas).²⁷ According to Forest Service roads datasets, there are currently approximately 9,500 miles of roads within the potentially affected IRAs (which do not include Idaho and Colorado roadless areas). This information is approximate as precision is limited by spatial analysis methods and use of multiple datasets. The approximately 9,500 miles of roads include approximately 9,400 miles of NFS roads and approximately 100 miles of private roads. Available information in Forest Service database records indicate that approximately 60 miles of roads were built within inventoried roadless areas after 2013. The mileage does not include any temporary, unauthorized, or decommissioned roads that may exist or had previously existed on the ground but are not part

²⁶ A recent review of timber related projects in Forest Service Northern Region (1) revealed that approximately 25 percent of roads constructed in connection with timber contracts or other permits/leases were considered temporary and would be decommissioned within 10 years of contract, permit, or lease termination (16 USC 1608). For example, the Sawmill-Petty Project on the Lolo National Forest in Montana estimated road construction needs of approximately 19 miles of permanent road and 9 miles of temporary road to treat just under 17,000 acres. Another project, the Cyclone Bill Project on the Flathead National Forest estimated road construction needs of approximately 12 miles of permanent road and 2.5 miles of temporary road to treat approximately 12,000 acres.

²⁷ The 2001 Roadless Rule EIS existing road mileage is provided for reference, however, the change in mileage reflected between 2001 and current data is not necessarily indicative of actual change in road miles on-the-ground within roadless area boundaries. Differences from 2001 to current road mileage information may be the result of construction of roads based on exceptions, more thorough inventorying of existing roads over the last 20 years, and spatial analysis method anomalies because of roads that straddle inventoried roadless area boundaries.

of the Forest Service roads database. Road mileage for NFS roads within the potentially affected inventoried roadless areas equates to approximately 2.5 percent of the total NFS road system.

Table 6 and Table 7 indicate distribution of NFS road miles within the affected environment by surface type and vehicle use, respectively.

Table 6. NFS road miles by surface type within the affected environment

Surface Type	Road Miles
Asphalt	100
Aggregate	1,200
Native Material	8,100

Table 7. NFS road miles by typical vehicle use within the affected environment

Typical Vehicle Use	Road Miles
In Storage (not open)	2,300
High-Clearance Vehicle	6,100
Passenger Car	1,000

There are no prohibitions or limitations on road maintenance for existing roads within inventoried roadless areas and these activities are ongoing and would continue. Land management plans include some restrictions or limitations on road construction. Table 8 provides information on acreage where land management plans prohibit road construction. Land management plan direction allows or generally allows road construction across 44.5 percent of the potentially affected environment (see also Appendix 1 – IRA Acreage Summarized by Region).

Table 8. Acres and proportion of the Potentially Affected Environments where Road construction is allowed based on current land management plans

Area affected	Road construction is not allowed	Road construction is generally not allowed	Road construction is generally allowed	Road construction is allowed	Total acres
Alternative 2 potentially affected environment	8,632,800 (21.5%)	13,208,600 (33.0%)	12,485,150 (31.2%)	5,736,100 (14.3%)	40,062,000
Alternative 3 potentially affected environment	5,951,300 (22%)	6,956,300 (26%)	9,690,800 (36%)	4,529,500 (17%)	27,128,000

Deferred Maintenance

Deferred maintenance is tracked and reported each year for passenger car roads (maintenance levels 3, 4 and 5 only) and bridges (see Road System Management Costs and Funding). Deferred

maintenance is calculated on a national scale using a random road sample so there is no means to determine deferred maintenance for only roads within the potentially affected environment.

Transportation System Management Costs

Each mile of NFS road within inventoried roadless areas competes for limited road maintenance funding as part of the overall NFS road system. Annual allocations for road construction, reconstruction and maintenance are distributed nationally utilizing a formula. The formula does not consider any factor related to land area or designation managed by each region.

Road maintenance activities and maintenance costs within IRAs is typical of that for the road system outside of IRAs as discussed previously.

Road construction costs vary greatly based on terrain, level of service required for intended use, and remoteness. Costs for construction of permanent roads within IRAs are more likely to be much greater than typical road construction because of steep and difficult terrain, extensive earthwork, geotechnical challenges, costly infrastructure such as bridges or tunnels, and accessibility due to isolated locale. Consequently, it is not feasible to provide a typical cost per mile for road construction within the inventoried roadless areas. In general terms, however, Federal Highways Administration describes mountainous terrain as terrain frequently sloping over 33 percent and recognizes the construction of roads in mountainous terrain as being of “unique difficulty and expense.” Further, some data sources indicate construction costs in mountainous terrain can be 3 to 10 times more per mile than flat terrain.²⁸

Effects of Alternative 1 – No Action

National Forest Transportation System

Continued management pursuant to the 2001 Roadless Rule would prohibit road construction or reconstruction with limited exceptions. New permanent road construction resulting in a transportation network change unlikely. Road construction or reconstruction would be based on exceptions. For example, since 2018, agency records show regional foresters reviewed and approved 20 exceptions under the 2001 Roadless Rule for proposed roads related activity (see 2001 Roadless Area Conservation Rule Implementation). The excepted road activities in these records included road construction for resource protection, road realignment, road safety, road construction pursuant to reserved or outstanding rights, and one exception for road construction in connection with a Secretary of Agriculture determination related to a Federal Highway re-route.

The extent of road construction and reconstruction that occurred in the last 10 years pursuant to the rule’s exceptions is not a reliable predictor of future road construction or reconstruction. An increase in NFS transportation system network miles under alternative 1 would be less likely

²⁸ Scale of cost inferred from information provided by Federal Highway Administration’s Status of the Nation’s Highways, Bridges, and Transit Condition & Performance 23rd Edition (2019) and video file of mountainous road design process example in Colorado (2024).

than under alternatives 2 and 3. Additional access needs and associated roads would be limited to those that fit within the rule's exceptions.

Deferred Maintenance

Ongoing maintenance activities on roads within IRAs would continue, where consistent with land management plan direction. New permanent road construction resulting in increased deferred maintenance, if similar to the past ten years (approximately 60 miles of road constructed), would be inconsequential at the national scale. Therefore, an identifiable change in annual deferred maintenance reported is less likely under alternative 1 than under alternatives 2 and 3.

Transportation System Management Costs

New road construction or reconstruction using exceptions could be authorized, which could result in additional needs for maintenance and possible redistribution of limited maintenance funding. This could impact the existing network both inside and outside of IRAs. A major impact on overall transportation system management costs is less likely under alternative 1 than other alternatives considering new road construction would be by exception only and extremely small compared to the broader road network.

Effects of Alternative 2 – Proposed Action

National Forest Transportation System

Elimination of the national prohibitions set forth in the 2001 Roadless Rule for road construction and reconstruction within inventoried roadless areas could result in new road construction and an increase of NFS transportation system mileage overall²⁹. Temporary road construction would be more likely on lands within 0.5 miles of existing roads (11.3 million acres or 28.3 percent of the affected environment). Permanent road construction within 0.5 miles of existing roads would be less likely, hence, less likely to result in increase in NFS road system mileage. Activities could be proposed further than 0.5 miles from an existing road, wherein access to the area by new permanent roads would be more likely. In the short term, any new permanent road construction would be limited to areas where it is currently allowed by land management plans (18.2 million acres or 45.5 percent of the affected environment).

Deferred Maintenance

New permanent roads would increase future maintenance needs. Similar to alternatives 1 and 3, ongoing maintenance activities on existing roads would likely remain unchanged unless there is a modification at land management direction levels. Under alternative 2, there is more likely to

²⁹ New road construction would be accordance with 16 U.S.C. 1608 which states "Unless the necessity for a permanent road is set forth in the forest development road system plan, any road constructed on land of the National Forest System in connection with a timber contract or other permit or lease shall be designed with the goal of reestablishing vegetative cover on the roadway and areas where the vegetative cover has been disturbed by the construction of the road, within ten years after the termination of the contract, permit, or lease either through artificial or natural means. Such action shall be taken unless it is later determined that the road is needed for use as a part of the National Forest Transportation System."

be a measurable increase in overall reported NFS road system deferred maintenance for the NFS road system than under alternatives 1 and 3.

Transportation System Management Costs

New permanent road construction or reconstruction would be more likely under alternative 2 and would require additional maintenance planning and possible redistribution of limited maintenance funding. This could impact the existing road system both inside and outside of inventoried roadless areas. It's more likely that there would be an impact to overall transportation system management costs and maintenance fund redistribution considering new road construction and increased maintenance needs under alternative 2 than under alternatives 1 and 3. Budget and resource constraints could limit potential of new permanent road construction.

Effects of Alternative 3 – Modified Rule

National Forest Transportation System

Like alternative 2, removing 2001 Roadless Rule prohibitions on lands within 0.5 miles of existing roads would more likely result in temporary road construction for access; however, permanent road construction would be less likely within 0.5 miles of existing roads and would not likely result in substantial growth in transportation network mileage overall.

Permanent road construction would be more likely in the wildland-urban interface areas that extend further out than 0.5 miles of existing roads. Like alternative 2, as more activities are proposed further than 0.5 miles from existing roads, access to the area by new roads becomes more likely. In the short term, new permanent road construction would be limited to areas where it is currently allowed by land management plans (14.2 million acres or 52 percent of the alternative 3 potentially affected environment).

On the 13 million acres where current management would continue under the 2001 Roadless Area Conservation Rule, effects would be similar to alternative 1. Road construction or reconstruction would be authorized only when authorized by exceptions. Potential for new permanent road construction in this area would be less likely.

Deferred Maintenance

Permanent road construction could occur in the potentially affected IRAs where the roadless rule prohibitions would be removed under this alternative. New permanent roads would increase maintenance needs. Similar to alternative 2, an increase in deferred maintenance for the NFS road network is more likely, but because road construction would remain prohibited in a portion of the affected environment, there would be less increase than alternative 2.

Transportation System Management Costs

Removing Roadless Rule prohibitions on lands within 0.5 miles of existing roads would less likely result in permanent road construction or increase in mileage of the NFS road system. Additional access needs by permanent road for the 13 million acres remaining under the Roadless Rule would require an exception. It's less likely that there would be an increase to overall transportation system management costs related to new road construction. Like

alternative 2, new permanent roads would require maintenance planning and possible redistribution of limited maintenance funding; however, new permanent road construction would be less likely for alternative 3. It's less likely that there would be an impact to overall transportation system management costs due to new road construction and increased maintenance needs.

Conclusion

Under alternatives 2 and 3, roads would be constructed or reconstructed only where there is a need and funding source –timber harvest or other active vegetation management activity would generate the greatest need. Temporary roads would be more commonly used within ½ mile of existing roads under all alternatives. Current land management plans would allow or generally allow road construction on about half of the potentially affected environments (18 million acres (45.5 percent) for alternative 2 and 14 million acres (53 percent) for alternative 3).

Across all alternatives, permanent road construction and reconstruction is less likely in the short-term due to land management plan requirements. In the long term, permanent and temporary road construction would be more likely under alternatives 2 and 3; however, it would be less likely under alternative 3 than alternative 2.

National Forest System road mileage, deferred maintenance and management cost increases are more likely under alternatives 2 and 3; however, increases would be less likely under alternative 3 than alternative 2. In the long-term, under alternatives 2 and 3 there could be some need to shift resources and funding from one region to another to account for more permanent mileage added to the NFS road system in a particular region.

Table 9. Road construction and transportation system management comparison

Transportation System Management	Alternative 1	Alternative 2	Alternative 3
Permanent Road Construction	Less likely	More likely	Less likely within 0.5 miles of existing roads More likely beyond 0.5 miles of existing roads Much less likely where current IRA management remains
Temporary Road Construction	Less likely	More likely	More likely within 0.5 miles of existing roads Much less likely where current IRA management remains
NFS Road Mileage Increase	Less likely	More likely	More likely but less than alternative 2
Deferred Maintenance Increase	Less likely	More likely	More likely but less than alternative 2
NFS Road System Management Cost Increase	Less likely	More likely	More likely but less than alternative 2

Access to Non-National Forest System Lands and Special Use Authorizations

Background

The Forest Service authorizes activities on, or occupancy of National Forest System land for a wide range of improvements considered special uses, including water transmission/storage, utilities, research, military training, communication uses, agriculture, pipelines, recreation events, ski areas, road access and much more. Between recreation and lands special uses, there are more than 200 different types of special uses that may be authorized. Special use authorizations are uses allowed under a special use permit, or similar legal instrument. The Forest Service processes approximately 4,000 new authorizations each year across the entire country, including renewals and reissuances of existing uses.

Special use authorizations are typically reactive in nature to respond to public and customer needs. An authorization is issued only after being evaluated and having passed through screening criteria (36 CFR 251.54), including compliance with the applicable land management plan, and environmental analysis processes. Special use authorizations are the legal instrument that the agency issues to allow for the use and occupancy of NFS lands and that enable the holder to operate in otherwise prohibited activities and/or areas. Special use authorization terms range widely based on the use type, applicable legal authorities, and practical need with the term ranging anywhere from 1 day in length (such as recreation events like a bike race) to being an authorization with no stated expiration date (such as an easement for a county road). Utilities, roads for private access, and other infrastructure, are commonly issued for longer terms, such as 5-30 years, and renewed or re-issued to continue the use until no longer needed, provided the use complies with the authorization. The Special Uses Database System (SUDS) is the official Forest Service record system for creating, billing and administering authorized special uses.

All the alternatives allow for the continuation, re-issuance, or renewal of existing special use authorizations for activities in roadless areas.

Authorizations to Access Lands of Other Ownership

Landownership within NFS boundaries includes parcels of land owned by states, private individuals, and other Federal and non-Federal entities known as inholdings. The most common special uses authorized generally, but not always, rely on road access to accommodate construction, operation, and maintenance on these inholdings. As such, most existing and anticipated future special uses are either located or reasonably likely to be located where roads currently exist.

Roads constructed to access private lands within or adjacent to NFS lands, are typically the responsibility of the benefiting landowner who secures an authorization. However, when it is in the interest of the Forest Service, the agency may accept or share responsibility for operation and maintenance. Members of the public may use open, unrestricted NFS roads without a special use authorization (36 CFR 251.50(d)). If a party proposes road maintenance or commercial hauling, an authorization is typically required (36 CFR 251.110(d)).

Alaska National Interest Lands Conservation Act (ANILCA), Section 1323 ensures access to non-Federal land in-holdings. Under ANILCA and 36 CFR part 251.110, subpart D, the authorized officer must provide access adequate for the landowner's reasonable use and enjoyment. Access need not be the most direct or convenient and may be non-motorized or via alternate routes, including across other ownerships. Alternative routes and modes of access may be considered. If a landowner has an adequate alternative route or mode of access, including access across other land ownerships, the Forest Service is not obligated to authorize roaded access. Reasonable access is determined on a case-by-case basis and may not require year-round motorized access via a road. The Forest Service recognizes valid ANILCA access as a statutory right.

Reserved or Outstanding Rights for Access, Occupancy, and Use

The 2001 Roadless Rule prohibition on road construction and reconstruction in IRAs did not affect already existing access, occupancy, and use rights. The rights include those that exist by law, treaty, or by other authority. They include, but are not limited to, the right to provide reasonable access across NFS lands to private property, mining claims for locatable minerals under the 1872 Mining Law, and land uses protected by Native American treaty rights. These rights include, but are not limited to, rights of access provided in the Alaska National Interest Lands Conservation Act (ANILCA) (Public Law 96-487) and recognized highway rights-of-way granted over NFS lands under Revised Statute 2477 (Public Law 94-579). The most common type of access pursued in conjunction with these two prominent statutes is motorized road access.

Rights-of-Way

R.S. 2477 provides a means by which rights-of-way were granted for public highways constructed across public domain lands in the late 1800s to early 1900s. A R.S. 2477 highway must have been constructed across public domain lands before the date of the national forest reservation. R.S. 2477 did not require the issuance of any formal authorization to exercise and perfect a right-of-way. The Federal Lands Policy Management Act repealed R.S. 2477 in 1976. However, rights-of-way that predate the establishment of the national forest are still in effect, unless they have been subsequently relinquished. The Forest Service recognizes valid R.S. 2477 right-of-way as outstanding rights.

The Forest Service cooperates with the Department of Transportation's Federal Highway Administration (FHWA) to grant Counties and States rights-of-ways for highway projects on the Federal aid system or under chapter 2 of the Federal Highway Act (23 U.S.C. 317). Examples include adding a passing lane to an existing highway, assigning road jurisdiction to the State or County for an existing road that requires maintenance, or even the new construction of a highway.

Potentially Affected Environment

Land use authorizations and rights-of-way existing prior to the 2001 Roadless Rule are ongoing. The Special Uses Database System does not have specific tracking or reporting capabilities to identify the number or location of uses in IRA compared to other NFS lands. Inventoried roadless areas typically have fewer existing roads, improvements, and development, therefore

special uses are not a major consideration, relative to other National Forest System lands. Agency records show regional foresters have reviewed and approved few exceptions related to special use authorizations that authorized road construction or reconstruction or tree cutting in IRAs between 2018-2025, including both lands and recreation special uses (see 2001 Roadless Area Conservation Rule Implementation). The uses included military training, installation of telecommunications, pipeline and powerline work and related vegetation management, facility maintenance and removal of water storage/transmission, communication site, road access, and ski area facilities. In context of the national special uses program, these exceptions account for less than 1 percent of the national special uses' annual workload.

Effects of Alternative 1 – No Action

Special use authorizations that existed prior to the 2001 Roadless Rule would continue until their term ends. The 2001 Roadless Rule contains exceptions to the road construction and tree cutting prohibitions for reasonable exercise of reserved or outstanding rights for access, occupancy, and use of NFS lands. These would continue and new requests would be authorized, consistent with relevant statutes. Public roads and highways that would have required additional or new rights-of-ways from the FFWHA within IRAs, would continue to require an exception to proceed, though they are very rare.

Most new proposals involving road construction or timber harvest (tree cutting) that are not based on a reserved or outstanding right or provided in statute or treaty within IRAs would typically be rejected in the screening process due to the conflicting nature of the use and land designation. However, other new uses in IRAs that do not require road construction, road reconstruction, or timber harvest (tree cutting) are evaluated on their own merits and case specifics and authorized consistent to other special uses outside of IRAs.

Effects of Alternative 2 – Proposed Action

Similar to alternative 1, pre-existing uses and those related to reserved or outstanding rights for access, occupancy, and use of NFS lands would continue. It is reasonably foreseeable that there would be an increase in new proposals for uses that benefit the public or provide access to non-Federal lands within or adjacent to IRAs, as well as requests for expansion of existing uses (for example, additional access routes or improved road quality, as well as frequency of use). Under the proposed action, new special use proposals would be evaluated on their own merits and no longer be rejected outright due to prohibitions for road construction or reconstruction.

Requests for and approval of road construction-related authorizations are most likely to occur in areas that are 'operable' and where current land management plans allow these activities (see National Forest System Roads and Vegetation and Forest Management sections). Alternative 2 would enable the FFWHA and Forest Service to more swiftly accommodate public access needs involving road construction or reconstruction on highways within the potentially affected IRAs.

There is little difference in effect between alternatives with respect to how the Forest Service would respond to an ANILCA access requests, but, under alternatives 2 and 3, it would be less cumbersome to evaluate, grant and administer access that include new road construction that are not categorically prohibited in roadless areas. Under all alternatives, the reasonable exercise of

reserved or outstanding rights for access, occupancy, and use of NFS lands within roadless areas would not be affected. There is little to no effect between alternatives with respect to how the Forest Service would respond to an R.S. 2477 claim.

Effects of Alternative 3 – Modified Rule

These effects would be similar to alternative 1 in areas that continue to be managed under Rule prohibitions and similar to alternative 2 in areas where the roadless designation and prohibitions no longer apply. Requests would be most likely to occur in areas where the prohibitions no longer apply, that are operable, and where current land management plans allow these activities (see National Forest System Roads and Vegetation and Forest Management sections).

Mineral Exploration and Development

Background

On National Forest System lands, minerals are classified according to the law under which they are managed. Minerals are classified as locatable, leasable, and mineral material (common variety or salable). This distinction is important because each classification is subject to different authorities and requirements for exploration and development, and in some cases the Forest Service cannot prohibit exploration and development. Exploration and development of any domestic mineral or energy resources is a function of fluctuating commodity prices, environmental and permitting costs associated with domestic mineral or energy resource development, accessibility to domestic mineral or energy resources, and level of public support for mineral and energy resource development on Federal lands. At present, the administration's priorities are to remove barriers to development of domestic mineral and energy resources as identified in Executive Order 14154 Unleashing American Energy, Executive Order 14156 Declaring a National Energy Emergency, Executive Order 14241 Immediate Measures to Increase American Mineral Production, and Executive Order 14261 Reinvigorating America's Beautiful Clean Coal Industry and Amending Executive Order 14241.

Locatable Minerals

Most valuable mineral deposits on lands open to mineral entry are considered locatable unless otherwise determined to be leasable or a mineral material. Locatable minerals include gold, silver, copper, lead, zinc, barite, gypsum, and certain varieties of limestone, which are subject to appropriation under the General Mining Law of 1872 (17 Stat. 91, as amended). Most of the critical minerals (USGS 2025) are locatable under the mining laws. The Mining Law of 1872 provides United States citizens a right to prospect, explore and develop these minerals on public domain lands. It applies to National Forest System lands by virtue of the Organic Administration Act (16 U.S.C. §§ 482). It also provides for access suitable for conducting these activities. Depending on the stage of exploration or development, reasonable access can range from unimproved temporary roads for prospecting or drilling to more permanent improved roads for full mine development and transportation of ore. The Forest Service cannot prohibit reasonably necessary activities required for the exploration, prospecting, or development of valuable mineral deposits. However, the Forest Service has the authority and the obligation to regulate locatable

mineral operations in order to prevent or minimize damage to surface resources (36 CFR Part 228, Subpart A).

Leasable Minerals

Leasable minerals are those that can be explored for and developed under one of the several mineral-leasing Acts. They include energy mineral resources such as oil, gas, oil shale, coal, gilsonite, and geothermal. They also include non-energy minerals, such as phosphate, and minerals important for their sodium, potassium, or sulfur content. Moreover, for lands acquired or administered under the Weeks Act (Public Law 61–435) (mostly in the Eastern United States) and the Bankhead-Jones Act (Public Law 75–210), they include deposits of otherwise locatable minerals like gold, copper, lead, barite, and gypsum.

Exploration and development of leasable mineral resources are discretionary activities. This means that leasing may or may not be allowed by the Bureau of Land Management, the agency that has the authority to dispose of leasable mineral resources on National Forest System lands. Most leasable mineral resources, however, may only be leased if the Forest Service provides consent. The Bureau of Land Management and Forest Service evaluate the effects of any future lease exploration and/or development in project specific environmental review documents and ensure compliance with other relevant law, regulation, and policy prior to leasing.

Once issued, the holder of a lease or permit has a contractual agreement with the government that allows reasonable access for exploration and development of the leased commodity. After a lease is issued, it can be modified and adjusted for economic or technical reasons. Often, during mine development areas of mineral will be identified that are not included in the original lease. To promote recovery or prevent environmental damage, these areas may be added to the existing leases. As an example, it may be more environmentally sound to locate ancillary facilities, such as topsoil and overburden stockpiles, in areas outside the boundaries of the issued lease. This would require a modification of the lease and possibly expanding the lease boundary.

Coal and oil and gas exploration and development are the most likely leasable minerals within inventoried roadless areas in the affected environment.

Oil and Gas Leasing and Development

Approval for leasing, exploration, or development of oil and gas on National Forest System lands is governed by the Mineral Leasing Act of 1920, the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The Bureau of Land Management issues Federal oil and gas leases on National Forest System lands and approves drilling through the application permit to drill (APDs). The Forest Service provides consent to the Bureau of Land Management to lease on National Forest System lands (a forest-wide programmatic analysis is typically completed). The Forest Service approves the site-specific surface use plan of operations (SUPO), applying additional site-specific protections that do not conflict with lease terms. The Forest Service monitors surface disturbing activities, enforces surface use requirements, and ensures reclamation (36 CFR 228 Subpart E).

Coal Leasing and Development

Approval for leasing, exploration, or development of coal on National Forest System lands is governed by the Mineral Leasing Act of 1920, the Federal Coal Leasing Amendments Act of 1976, codified in 43 CFR 3400. Coal leasing is proponent driven and leasing is typically completed on a site-specific basis. Coal markets are dictated by demand, typically for thermal coal used in electrical power generation. When the Bureau of Land Management receives a coal lease application located on National Forest System lands, the Bureau of Land Management requests Forest Service consent to issue a Federal coal lease and under what conditions it may do so. The Forest Service completes appropriate environmental review prior to making the consent determination with conditions of its consent to protect surface resources, site specific coal lease stipulations. Once a lease is issued, the lessee or operator will be required to submit a Federal mine plan or amendment to an existing mine plan to the Office of Surface Mining Reclamation and Enforcement and/or the state agency with primacy over coal mine permitting in that state. The Forest Service will cooperate on permit reviews and may recommend additional conditions to protect surface resources that do not conflict with the contractual rights of the lessee identified in the coal lease per 30 CFR Part 700.

Exploration for coal occurs on Federal lands with the issuance of a coal exploration license obtained from the Bureau of Land Management on lands where coal has not already been leased. On-lease exploration can occur on lands currently under a Federal coal lease. For either situation, road construction may be necessary for the drilling of bore holes for sampling and coring in the exploration for coal. However, this activity is subject to site specific environmental review, where restrictions to the surface may apply and could also preclude road construction on lands not suitable for that activity.

Potentially Affected Environment

Exploration, mining, and mineral processes under the mineral disposal authorities occur within IRAs and are not themselves prohibited activities. A lack of existing roads, as they were defined in the criteria for identifying the 2001 inventoried roadless areas, does not necessarily imply that these areas have little or no prospective value for containing mineral or energy deposits. Road construction, reconstruction, as well as incidental tree cutting have continued within inventoried roadless areas, subject to the exceptions in the 2001 Roadless Rule. Roads constructed for mineral or energy prospecting activities are typically temporary in nature and, therefore, not National Forest System roads.

Locatable Minerals

Valuable deposits of locatable mineral resources may occur in IRAs, principally west of the 100th meridian. The Forest Service does not track the number of proposals in relation to IRAs, so does not have data to indicate the relative amount of proposed plans of operations that are within or outside IRAs. Where reasonable access involving temporary or permanent road construction or tree cutting is reasonably necessary to support exploration, mining or other locatable mineral operations, these activities are reviewed relative to the 2001 Roadless Rule exception for existing right of access as provided for in the General Mining Law (36 CFR 294.12(b)(3); 36 CFR 294.13(b)(2)). Agency records show that since 2018 regional foresters

reviewed and approved 19 exceptions related to locatable mineral projects; the majority of which were exploration operations which required cutting or removing timber rather than road construction (2001 Roadless Area Conservation Rule Implementation).

Leasable Minerals

Oil and gas and coal resources occur within the potentially affected IRAs. Table 10 shows by region the number of existing Federal oil and gas leases authorized and in production within the potentially affected environment (Minerals & Lands Record System). At present, there are 271 leases with a surface area of approximately 538,300 acres within the IRAs nationwide, excluding Colorado and Idaho, in authorized and producing status.

Table 10. Existing Federal oil and gas leases within potentially affected IRAs (Minerals and Land Record System data filtered)

Forest Service Region	Oil and gas leased acres within potentially affected IRAs	Number of oil and gas leases within the potentially affected IRAs
Northern (1)	38,400	96
Rocky Mountain (2)	5,500	28
Southwestern (3)	12,800	41
Intermountain (4)	22,500	46
Pacific Southwest (5)	900	10
Pacific Northwest (6)	0	0
Southern (8)	46,600	28
Eastern (9)	411,600	22
Alaska (10)	0	0
Approximate Total	538,300	271

According to the Minerals Lands Records System, there are 14 authorized Federal coal leases within the potentially affected IRAs, totaling 13,050 acres of land. All of these leases are within the Intermountain Region (Region 4) on the Manti-La Sal National Forest in Utah. Underground methods of extraction are authorized on these leases with limited surface disturbance for exploration, powerlines, vent shafts and pipelines. The federal coal leases are also adjacent to private and state coal tracts that are developed or will be developed during mine development.

Effects of Alternative 1 – No Action

Locatable

Under alternative 1, the 2001 Roadless Rule, road construction and reconstruction or timber cutting for locatable mineral exploration and development would continue to be considered a right of access as provided by the General Mining Law, excepted from the prohibition on road construction or reconstruction, and tree-cutting (36 CFR 294.12(b)(3); 36 CFR 294.13(b)(2)). Therefore, in the long term, it is foreseeable that future exploration, mining, and mineral processing activities would continue to occur in IRAs where valuable deposits exist.

The Forest Service receives an average of 198 plans of operations each year across all NFS lands, ranging from individual operators with small equipment up to large operating mines (USDA FS 2019). The relative amount of these proposals that are within IRAs are not tracked, but a portion of them are assumed to be. Not all plans of operations propose road construction or reconstruction or tree cutting. This same rate of mineral exploration and development is reasonably foreseeable for future decades because we have little information that would lead to higher or lower expectations of development. The Forest Service hears anecdotally and in public comment that there is a perception that the 2001 Roadless Rule prohibitions have affected locatable mineral development, but the reasonable access to locatable minerals, including construction or reconstruction of roads or timber cutting where warranted, is a right of access provided by the General Mining Law, and the Forest Service has continued to approve the construction and reconstruction of roads after the 2001 Roadless Rule was implemented. In fact, of the 11 large-scale mines producing at least one commodity in 2024, six are operating partially or wholly within IRAs (USDA FS 2025c).

All future proposals for locatable mineral exploration or development within inventoried roadless areas would be subject to the planning and design requirements governing locatable minerals in 36 CFR 228, Subpart A³⁰. If proposed operations meet the threshold to require a plan of operations, and an analysis of environmental effects would be conducted under NEPA. This plan of operations would be binding on the operator.

Leasable Minerals

Under this alternative, management of leasable mineral resources in IRAs would not change the way they are currently managed. Leases issued prior to the 2001 Roadless Rule have valid existing rights and therefore are not subject to the road construction prohibitions in the rule. These leases would continue to be managed under existing laws and regulations governing coal under this alternative without consideration of the 2001 Roadless Rule.

For new or modification of leases Forest Service and Bureau of Land Management, would continue to follow the detailed review process, including environmental impact statements and assessments under the overarching law (see Background). Consistent with the 2001 Roadless Rule prohibitions, a no surface occupancy would be applied to new leases within IRAS, limiting where the lessee could construct roads. The 2001 Roadless Rule would continue to restrict road building associated with new leasable mineral exploration, both on-lease and off-lease exploration, subject to valid existing rights. However, this would not completely preclude exploration from occurring on preexisting roads. The prohibitions could also potentially limit the expansion of existing leases and operations where further identification of leasable mineral reserves or surface developments requiring roads may be needed in the future.

³⁰ On February 20, 2026, the Forest Service published a proposed rule in the Federal Register (91 FR 8316) to revise the locatable minerals regulation at 36 CFR Part 228, Subpart A. The proposed revisions improve the efficiency and transparency of Forest Service regulation of operations conducted on National Forest System lands under the mining laws, while continuing to minimize, to the fullest extent practicable, adverse impacts on surface resources.

New or modified leases would continue to be managed under existing laws and regulations governing oil and gas and coal under this alternative but would need to consider the 2001 Roadless Rule in leasing decisions.

Effects of Alternative 2 – Proposed Action

Locatable

Under these alternatives, the effects on locatable mineral exploration and development are generally the same as those under alternative 1. Road construction, reconstruction, and tree cutting for locatable mineral exploration and development is a right of access as provided by the General Mining Law. However, the Forest Service hears anecdotally and through public comment that locatable mineral development has been impeded. To the extent that the perception of limitations from the roadless rule has prevented operators from proposing to conduct operations, that perception would be removed.

Leasable

New, modified or renewed leases would continue to be managed under existing laws and regulations governing oil and gas and coal under this alternative.

Existing leases would continue under alternative 2. For new leases or modifications of leases, under alternative 2 construction or reconstruction of roads that are reasonable and necessary for development of existing energy or mineral leases, for access to new or existing energy or mineral leases, and for access to associated product conveyance lines could be allowed as necessary in accordance with the terms of the lease, where they are consistent with land management plans or other requirements. In accordance with the terms of the lease, approval of operations involving road construction within potentially affected IRAs would be more likely to be authorized without the no surface occupancy lease stipulation, than alternative 1.

When existing leases expire, renewals would not need to consider the prohibitions associated with the 2001 Roadless Rule. In addition, the IRA boundary would not apply or be considered in any analyses for the modification of existing leases. However, in a site-specific leasing analysis a no surface occupancy stipulation may still be applied to protect surface resources. For example, to prevent excessive erosion on steep slopes, a no surface occupancy may still be applied to the Federal lease.

Effects of Alternative 3 – Modified Rule

Locatable

The effects would be the same as alternative 2.

Leasable

Within areas that continue to be managed under the Roadless Rule prohibitions, effects would be similar to alternative 1. New or modified leases would be stipulated with a no surface occupancy stipulation, limiting where the lessee could build roads within the lease boundary. The IRA would continue to restrict road construction associated with new leasable mineral exploration,

both on-lease and off-lease exploration, subject to valid existing rights. When existing leases within the retained IRAs (see Table 11) expire, any renewals would have to consider the road building restrictions with respect to the IRA, if a lease was issued prior to the 2001 Roadless Rule. The effect would be the same as the effect in alternative 1.

In areas where the IRA designation and prohibition no longer apply, effects would be similar to alternative 2. Construction or reconstruction of roads that are reasonable and necessary for development of existing energy or mineral leases, for access to new or existing energy or mineral leases, and for access to associated product conveyance lines could be allowed as necessary in accordance with the terms of the lease, where they are consistent with land management plans or other requirements. In accordance with the terms of the lease, approval of operations involving road building within areas previously designated as IRA would be more likely without the no surface occupancy lease stipulation.

Table 11. Existing Federal oil and gas leases within alternative 3 potentially affected IRAs (Minerals and Land Record System data filtered)

Region	O&G leased acres within alternative 3 affected environment (MLRS data filtered)	Number of O&G leases within the alternative 3 affected environment
1	37,200	96
2	5,500	28
3	12,800	41
4	22,100	46
5	700	10
6	0	0
8	46,600	28
9	252,600	22
10	0	0
Total	377,500	271

According to the Minerals Lands Records System, of the 14 total authorized Federal coal leases in IRAs, all are in Utah, located on the Manti-La Sal National Forest and within the alternative 3 affected environment, totaling 12,727 acres of land. Underground methods of extraction are authorized on these leases with limited surface disturbance for exploration, powerlines, vent shafts and pipelines. The Federal coal leases are also adjacent to private and State coal tracts that are developed or will be developed during the life of the mine and are subject to valid existing rights. The effect would be the same as the effect in alternative 1, unless subject to valid existing right.

Conclusion

Across all alternatives, mineral and energy development would continue where there are existing rights or permits/leases. The alternatives differ relative to new or expanded authorizations for leasable minerals (primarily oil and gas and coal). Under alternative 1, across all 40 million acres of potentially affected IRAs, new or expanded authorizations for oil and gas or coal exploration and development would be subject to review and include surface use restrictions, including

limiting road construction, consistent with the roadless rule prohibitions. This would also apply under alternative 3 in areas that remain IRAs (13 million acres). Under alternative 2, new authorizations and expanded authorizations could include road construction and reconstruction, depending on other legal requirements, such as land management plan components, and resource protection considerations. This would also apply to alternative 3 in areas that are no longer designated IRAs.

Vegetation and Forest Management

Background

This section examines forested and non-forested vegetation within areas managed under the 2001 Roadless Rule, describing the diversity of plant communities, with attention to forest health, carbon, and timber management. It provides background on national trends and emerging issues that shape conditions across the National Forest System and outlines opportunities for forest management. The discussion is intended to frame how these factors interact with land management direction and set the context for comparing effects under the three proposed alternatives.

Potentially Affected Environment

The potentially affected environment spans approximately 40 million acres with a wide range of vegetation types and conditions (see Table 12). About half of the potentially affected IRAs are forested lands, as defined by the National Landcover Dataset (USGS 2024). These forests are predominantly classified as evergreen forest, with smaller proportions of deciduous forest and mixed forest, reflecting the ecological diversity within roadless areas. Non-forest vegetation ecosystems include extensive shrub/scrub and dwarf scrub cover, grassland; herbaceous, and sedge communities; as well as wetland systems, including woody and emergent herbaceous wetlands. These land cover classes, derived from the National Land Cover Database, provide a foundational understanding of the ecological composition and potential resource sensitivities relevant to evaluating the alternatives. Since the 2001 Roadless Rule, inventoried roadless areas have been managed according to the rule, with the goal of sustaining the public benefits including clean water, biodiversity, recreational opportunities, wildlife habitat, and forest health provided by these areas.

Table 12. Acres per national land cover database classes within the potentially affected environment

National landcover dataset landcover class	Approximate acres	Percent
Forest	20,928,700	52.3
Evergreen Forest	17,767,400	44.4
Deciduous Forest	1,680,300	4.2
Mixed Forest	1,481,000	3.7
Non-forest vegetation	14,900,100	37.2
Woody and Emergent Herbaceous Wetlands	743,300	1.9
Grassland/Herbaceous, Sedge	2,090,300	5.2
Shrub/Scrub, Dwarf Scrub	12,056,600	30.1
Cultivated Crops, Pasture/Hay	9,900	0
Barren Land (Rock/Sand/Clay), Perennial Ice/snow	4,013,300	10
Open Water	156,700	0.4
Developed (Low-High Intensity, Open Space)	50,800	0.1
Total	40,049,537	100

Note: Total acres figure may differ slightly from total acres in the potentially affected environment as pixels of each class were summed and converted to acres.

Forest Vegetation

About 145 of the 193 million acres, or three-quarters, of the National Forest System lands are forested. Within the potentially affected IRAs, about 21 million acres (52 percent) are forested. Most of the forested area within the potentially affected IRAs (96 percent) is in the western states. The Alaska Region includes 5.79 million acres and the Intermountain Region 5.76 million acres, which make up 46 percent of all forested lands. The Pacific Northwest and Pacific Southwest Regions include 20 percent of the IRA forests (2.9 and 2.1 million acres respectively). The Rocky Mountain and Southwestern Regions include 11 percent of the forests (1.74 and 1.19 million acres respectively). The Southern and Eastern Regions include 4 percent of the IRA forests (each with about a half million acres).

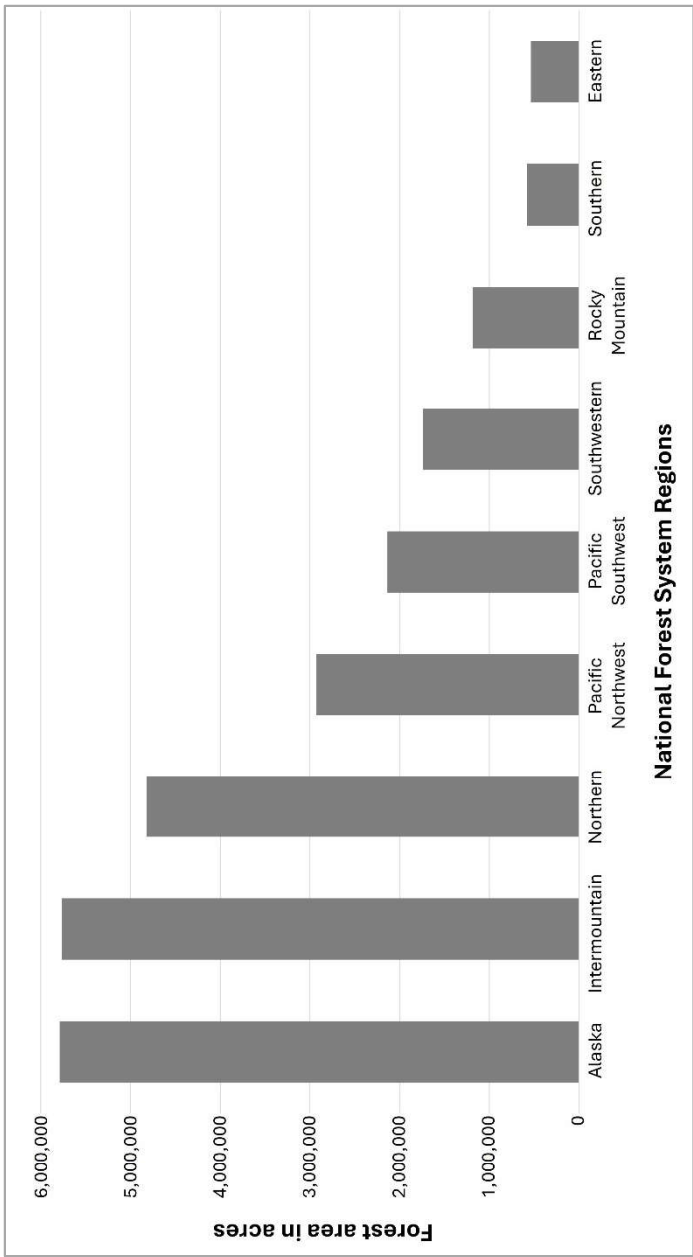


Figure 8. Forested acres within the potentially affected IRAs by Forest Service region, based on Forest Inventory and Analysis data

Forest composition, stand age, and structure are important characteristics governing the potential ecosystem services forests deliver and frame their role in providing services to surrounding communities. Composition, structure, and relative abundance of forest types guide local land management planning and decisions to optimize benefits for the public. Forest Inventory and Analysis data on forest composition within the affected environment identifies 26 different forest type groups and their dominant species (Table 13). The predominant forest types within the potentially affected IRAs are the conifer forests of the coastal and Cascade Mountain Ranges of Northern California, Oregon, and Washington; the Rocky Mountains from New Mexico to Montana; and the Alexander Archipelago of Southeast Alaska.

Table 13. Area and percentage of forest type groups within inventoried roadless area environment as estimated by the Forest Service Forest Inventory and Analysis data

Forest type group	Acres	Percent
Conifers	21,394,200	83.9
Fir/spruce/mountain hemlock	6,991,200	27.4
Pinyon/juniper	3,702,700	14.5
Douglas-fir	3,031,000	11.9
Hemlock/Sitka spruce	2,846,000	11.2
Lodgepole pine	2,703,000	10.6
Other western softwood	655,400	2.6
California mixed conifer	605,400	2.4
Ponderosa pine	571,200	2.2
Spruce/fir	177,000	0.7

Forest type group	Acres	Percent
Western larch	156,000	0.6
Western white pine	36,600	0.1
Loblolly/shortleaf pine	33,800	0.1
White/red/jack pine	24,100	0.1
Longleaf/slash pine	16,100	0.1
Other eastern softwoods	700	0.003
Hardwoods	4,092,700	16.1
Woodland hardwoods	1,164,800	4.6
Aspen/birch	995,900	3.9
Western oak	536,600	2.1
Oak/hickory	524,100	2.1
Maple/beechn/birch	221,700	0.9
Tanoak/laurel	164,200	0.6
Other hardwoods	111,700	0.4
Elm/ash/cottonwood	83,400	0.3
Oak/pine	74,500	0.3
Alder/maple	40,900	0.2
Oak/gum/cypress	18,900	0.1
Total	25,486,900¹	100

1. Note the total forested acres from Forest Service Forest Inventory and Analysis differs from the forested acres national land cover database classes (Table 12) due to different methodologies in these data sources.

Five conifer groups make up over 75 percent of the forest cover within the affected environment. The most extensive forest type is the fir/spruce/mountain hemlock group of higher elevation forests occurring from northern New Mexico to Alaska and covering nearly 7 million acres. The second most abundant forest type is the pinyon/juniper group covering 3.7 million acres in the Intermountain and Southwestern Regions. Pinyon-juniper forests are typically not harvested for sawtimber but include fuelwood and other potential forest products. Three additional groups each make up 10-11 percent of the total forest cover of the affected environment, including the Douglas-fir group (3 million acres) abundant in the Northern and Pacific Northwest Regions, the Hemlock/Sitka spruce group (2.8 million acres) common in the Alaska Region, and the Lodgepole pine group (2.7 million acres) common in the Northern and Rocky Mountain Regions. Mixed hardwood forests cover 16 percent of the affected environment. They feature oak, hickory, maple, and beech, and are common in the Appalachians and Midwest. Aspen/birch forests and woodland hardwoods are common in the Intermountain Region. In addition to the most abundant forest types within the potentially affected IRAs, relatively unique forest types of lesser extent include the longleaf/slash pine group and the oak/gum/cypress group as identified through Forest Inventory and Analysis data (see Figure 9).

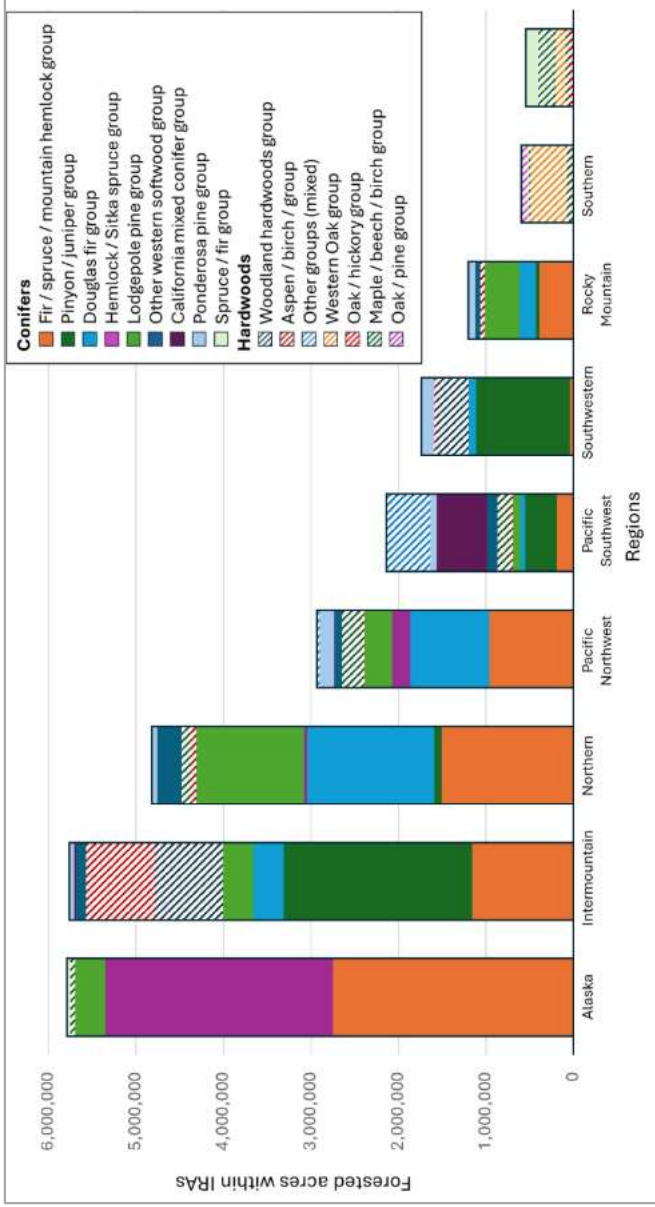


Figure 9. Number of acres of forest land and forest type within the inventoried roadless areas affected environment by NFS region, based on Forest Inventory Assessment data

Forests across the potentially affected IRAs include a variety of young, mature, and old growth stands which each provide unique benefits. Across all forest types within the affected environment outside of Alaska,³¹ approximately 16-17 percent of the forested areas and Puerto Rico, are old growth, 48-52 percent are mature, and 32-35 percent are young forest.³² Old growth stands encompass the later stages of stand development that typically differ from earlier stages by tree size, accumulation of large dead woody material, number of canopy layers, species composition, and ecosystem function (USDA FS 1989). They are characterized by multi-layered stands that serve as long-term carbon storage and unique habitat (Woodall et al. 2023). Across all forest types within the affected environment outside of Alaska, approximately 16-17 percent of the forested areas and Puerto Rico, are old growth, 48-52 percent are mature, and 32-35 percent are young forest. Mature forests vary widely and exhibit structural characteristics that are lacking in earlier stages of forest development and may contain some but not all the structural attributes in old-growth forests. Mature forests provide benefits such as biodiversity conservation, wildlife habitat, watershed protection, carbon storage, and opportunities for recreation, timber production, and cultural use. Young forests generally result from disturbance, management, or natural succession and provide benefits for wildlife by increasing habitat diversity and stand initiation for future timber production.

While some of the forested areas have existing roads (see National Forest System Roads section) or had a history of forest management prior to the 2001 Roadless Rule, many of these forests

³¹ See Environmental Impacts Within the Tongass National Forest for discussion of old growth within the Tongass National Forest.

³² Based on the working definitions developed for “Mature and Old Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management” (Brandt et. al. 2023).

remain largely undisturbed from extensive management activities. Forests are subject to a variety of disturbances that affect their structure, composition, and the delivery of natural benefits, ranging from timber production to carbon sequestration to recreational opportunities (Costanza et al. 2023). These disturbances are frequently categorized as biotic (insects and disease) or abiotic (severe weather, drought, fire). Some areas of the affected environment are at risk of wildfire, drought, and insect and disease epidemics (see also sections that follow). In addition, environmental drivers within and adjacent to IRAs have changed in recent decades, with increasing drought (Zhuang et al. 2024), more extreme temperatures (Alizadeh et al. 2020), and associated changes in wildfire behavior (Balch et al. 2024) and insect and disease infestations.

Carbon sequestration, storage, and emissions are important functions of forests, including in the inventoried roadless areas. Climate, soil productivity, management actions, fire and other natural disturbance processes interact to govern carbon storage. Generally, forests in the United States are a carbon sink and CO₂ uptake in the contiguous United States offsets between 12 to 19 percent of total carbon dioxide emissions each year (Janowiak et al. 2017, Ryan et al. 2010). Aboveground biomass in U.S. forests has increased in recent decades, primarily due to increases in biomass per unit area as opposed to increased forest land area (Oswalt et al. 2019). Regional variation in carbon flux in forest land is largely controlled by climate and disturbance. In 2021, forested lands within the national forest system sequestered 43.5 million metric tons (MMT) CO₂, which follows national trends of increasing forest biomass in recent decades, however forests in the drier and more fire prone Intermountain, Rocky Mountain, Northern, and Southwestern Forest Service regions had net carbon loss (31.5 MMT CO₂) while the remaining regions had a net carbon increase, sequestering 63.5 MMT CO₂ (Domke et al. 2023). Stored carbon within forests, including in the inventoried roadless areas, can fluctuate due to forest growth, management, fire, and mortality due to insects and disease. Birdsey et al. (2025) estimate the IRAs contain about 5 percent of the stored forest carbon in the coterminous United States (0.9B Mg C). Carbon loss from insects, disease, and high severity fires can be significant, long lasting, and expected in any of the alternatives. Under all alternatives, the inventoried roadless areas will continue to be managed primarily as forests and continue to sequester and store carbon.

Insect and Disease

Commonly observed mortality-causing insects in U.S. forests are native bark beetles of conifers, including fir engraver, spruce beetle, mountain pine beetle, eastern larch beetle, and exotic insects, including balsam woolly adelgid, spongy moth, and emerald ash borer. Tree diseases such as root rots, oak decline, sub-alpine fir decline, and yellow cedar decline also cause tree mortality (based on USDA Forest Service Forest Health Protection data).

Quantifying the effects of insects and diseases on forests, including the amount within potentially affected IRAs, can be challenging due to limitations of data sources (Fitts et al. 2022; Potter et al. 2020). Forest Health Protection detection survey data provides annual snapshots of landscape-scale insect and disease impacts on forests. These data are collected predominately via aerial surveys, whose spatial accuracy can be influenced by the scale of the pest event, landscape complexity, and survey conditions; mortality observations collected via aerial detection surveys are more than 70 percent accurate (Coleman et al. 2018, Bright et al. 2020). Between 2000 and

2023, Forest Health Protection detection surveys documented insect and disease-driven tree mortality on 0.8 to 8.4 million acres of all U.S. forests per year (Coleman et al. 2018; USDA 2020, 2022a, 2022b 2023a, 2023b 2024a), including NFS, State, private, and Tribal forests. Some of this annual mortality is observed within IRAs, but due to the nature of the surveys it's not possible to characterize the mortality observed on IRAs on a national scale.

The presence and severity of insects and disease are influenced by local conditions, which vary across the Nation, including climatic conditions (such as temperature or drought), stand conditions (density, basal area, tree size, and number of canopy layers), landscape context (proximity to outbreak) and pest-host dynamics (mechanism of attack, host defense) (Weed et al. 2013; Costanza et al. 2023; Forest Health Protection 2025; Audley et al. 2020). The National Insect and Disease Risk Map leverages these predictors to model the risk of tree mortality due to insects and diseases over a 15-year period.

According to the 2024 National Insect and Disease Risk Map (Forest Health Protection 2025), approximately 32 million acres, or 22 percent, of all National Forest System forests in the lower 48 states are at risk of tree mortality due to major forest insects and diseases during the 2024-2038 period. The proportion of forests at risk varies regionally and by management designation. National Forests System forested lands outside of designated areas (wilderness, wild and scenic, and inventoried roadless areas) generally have more active management and are compared to forests in the potentially affected areas, which remain largely undisturbed from extensive management activities. The percent of NFS forests outside of designated areas at risk ranges from 8.9 percent to 12.4 percent in the eastern United States and from 17.5 percent to 50.4 percent in the western United States (Table 14). Insect and disease risk is generally higher in western regions; in western forests, the percent of forests at risk is similar or lower in potentially affected IRAs when compared to NFS forests outside of designated areas.

Table 14. Percent of NFS forested acres at risk of tree mortality due to major forest insects and diseases, by land classification, according to the 2024 National Insect and Disease Risk Map

Region	Percent at risk of tree mortality – NFS ownerships outside of designated areas ¹	Percent at risk of tree mortality – inventoried roadless areas in the potentially affected environment	Percent at risk of tree mortality – inventoried roadless areas in the alternative 3 potentially affected environment
1 – Northern	50.4	34.2	40.1
2 – Rocky Mountain	23.1	27.9	27.7
3 – Southwestern	17.5	13.5	14.5
4 – Intermountain	17.5	23.3	22.5
5 – Pacific Southwest	18.9	15.2	9.6
6 – Pacific Northwest	34.7	23.5	18.9
8 – Southern	12.4	19.4	30.4
9 – Eastern	8.9	12.7	22.9
10 – Alaska	Not available	Not available	Not available

¹ Excludes wilderness, wild and scenic, and inventoried roadless areas.

The areas of potentially affected IRAs that have the greatest amount of insect and disease risk occur within the Northern, Rocky Mountain, Intermountain, and Pacific Northwest regions. In western North America, the mountain pine beetle is the primary tree killing insect. It typically occurs at endemic levels causing low-level scattered tree mortality of less than 2 percent per year, but local biotic and abiotic conditions can trigger mountain pine beetle epidemics that result in widespread tree mortality (USDA FS 2000c). Epidemics have increased in magnitude in recent years (Raffa et al. 2008) and have impacted over 25 million acres in the western United States from 2000-2020 (Audley et al. 2020), including a widespread mortality event in the Central Rockies that impacted millions of acres where stand and weather conditions were favorable to mountain pine beetle (Chapman et al. 2012).

Non-Forested Vegetation

Non-forested vegetation varies greatly across the potentially inventoried roadless areas. Alpine meadows and tundra zones, found in the Sierra Nevada and Alaska and other areas, host treeless, high-elevation plant communities of grasses, sedges, and wildflowers. Shrublands and chaparral ecosystems, dominated by drought-tolerant species like sagebrush and manzanita, are widespread in California, the Southwest, and the Intermountain West. Native grasslands and prairies, rich in bunchgrasses and herbaceous plants, stretch across the Great Plains and interior basins. Riparian zones and wetlands, which line streams and rivers, support vegetation such as sedges, and aquatic plants. Approximately 37 percent of the potentially affected environment are non-forested vegetation types (14.9 million acres). For this analysis, non-forested vegetation is defined as plant communities containing a preponderance of herbaceous (grass, grass-like, and forb) or shrub species. These communities will be identified as woody and emergent herbaceous wetlands, grassland/herbaceous and sedges, shrub/scrub/and dwarf scrub, and cultivated crops, pasture/hay (see Table 12). Non-forested vegetation consists of native species and communities, but, in some places, introduction of non-native grasses and forbs has occurred for revegetation or restoration purposes. Plant communities with desirable non-native herbaceous or shrubby species will be considered in the context of non-forested vegetation.

Timber and Forest Management

The potentially affected environment is a varied landscape – differences in physical terrain and distance from roads affect potential operability for forest management. Forest management activities in inventoried roadless areas are currently limited to infrequent cutting, sale, or removal of small diameter trees for certain exceptions; and further restricted due to the prohibition on road construction, reconstruction, and temporary road construction which limits access (36 CFR 294.12 and 294.13 (2001)). Since 2018, agency records indicate that regional foresters reviewed and approved 168 exceptions that involved some level of forest management and an additional 14 with tree cutting in association with a roads-related activity (see 2001 Roadless Area Conservation Rule Implementation). The majority were related to maintaining and restoring ecosystem characteristics, including hazardous fuels reduction. Many were for incidental timber removal to an otherwise not prohibited activity, including minerals activities. To a lesser extent, exceptions approved tree cutting for improving threatened, endangered, or sensitive species habitat and for personal use. Approval of tree cutting exceptions can be delegated to responsible officials below the regional forester level and has been in some regions,

so it is likely additional exceptions were granted. In addition, the agency has not tracked if the regionally approved exceptions were eventually implemented.

To understand the timber and non-commercial activities that have been implemented in inventoried roadless areas, the best available information is the Forest Service Activity Tracking System database. Based on that data, from 2014-2024, timber harvest within the potentially affected IRAs was completed on approximately 500 acres per year, on average, with volume harvest levels inconsequential to overall nationwide levels. Non-commercial treatments were conducted on average on about 1,700 acres per year nationwide including hazard tree removal, precommercial thinning, planting, pruning, wildlife habitat treatments, and incidental removal.

Common to All Alternatives (Analysis Assumptions)

The sale of timber is authorized under the United States Constitution's Property Clause (article 4, section 3, clause 2) and governed under the Organic Administration Act, Multiple Use Sustained Yield Act (16 U.S.C. 528, as amended), which directs the national forests to manage multiple uses including timber, and ensure sustainable harvest levels of timber; and the National Forest Management Act (16 U.S.C. 1600, as amended), which requires land management plans for national forests and grasslands. Land management plans must ensure:

- Timber harvest is only allowed in areas that will not be irreversibly damaged, where cutting units can be visually blended into the terrain, where streams, wetlands, riparian areas, and water bodies are protected.
- Timber harvest does not exceed sustained yield and is not designated solely to maximize outputs.
- Harvested areas must be regenerated within 5 years.

Any project activity, including timber harvest, must be consistent with land management plans. The 2012 Planning Rule provides further direction for forest management activities including timber harvest and non-commercial treatments. These plans include plan components (desired conditions, goals, objectives, standards, and guidelines) and identify areas suitable and not suitable for timber production to maintain sustained yield levels, identify maximum harvest levels on suitable lands (allowable sale quantity or sustained yield limit), and allow, prohibit, or limit timber harvest to protect resources, and ensure forests are regenerated within 5 years.

Forest management activities include timber harvest³³ and non-commercial treatments³⁴ and are completed for multiple resource objectives, including but not limited to timber production, fuels

³³Timber Harvest – Forest management activities that include the removal of sawtimber. Timber sales are often used as a least-cost method (revenue is returned to the Federal Treasury to offset the costs of preparing and carrying out the timber harvest while portions of receipts are used for post-sale activities) of managing vegetation to meet multiple resource objectives (Forest Service Manual 2400, Forest Service Handbook 2409.14).

³⁴Non-commercial forest management – Forest management activities that do not include the removal of sawtimber, non-commercial uses of timber, or any forest products removed for personal or incidental use. These activities may be completed with mechanized systems or by hand. Non-commercial forest management are higher cost options for managing vegetation to meet multiple resource objectives than timber harvest (Forest Service Manual 2460, Forest Service Handbook 2409.18).

reduction, public health and safety, forest health improvement, watershed improvement, and wildlife habitat improvement. A range of silvicultural prescriptions are utilized to meet direction within individual land management plans including both even-aged and uneven-aged systems (See Table 15 for most common silviculture prescriptions used by region). Timber sales and other removals of forest products support agency strategic objectives to foster resilient, adaptive ecosystems, mitigate wildfire risk, and strengthen communities (USDA FS 2015). On average per region, NFS harvests less than 1 percent of operable areas annually (Forest Service Cut and Sold Reports 2014-2024).

Table 15. Common silvicultural prescriptions and harvest levels by region in 2020 through 2024

Region	Common Harvest Prescriptions
1 – Northern	Commercial Thin, Clearcut, Seed Cut
2 – Rocky Mountain	Commercial Thin, Removal Cut, Clearcut
3 – Southwestern	Commercial Thin, Selection Cut
4 – Intermountain	Sanitation, Commercial Thin, Clearcut
5 – Pacific Southwest	Commercial Thin, Sanitation, Clearcut
6 – Pacific Northwest	Commercial Thin, Sanitation, Selection Cut
8 – Southern	Commercial Thin, Clearcut, Seed Cut
9 – Eastern	Commercial Thin, Clearcut
10 - Alaska	Clearcut, Selection Cut

Forest management would be implemented within the potentially affected environment at some level across all alternatives. Site-specific activities would be authorized and implemented in accordance with laws, regulations, relevant agency policy and land management plans. Implementation of project level forest management activities would be through contracts, agreements, or permits (timber sale, stewardship or service, agreements, or any other implementation vehicle), following all required measures, including land management plan requirements, best management practices, site-specific project design features, and mitigation measures. Silviculture prescriptions used for forest management would likely correspond with prescriptions currently implemented outside of roadless areas (Table 12) because vegetation types are similar. It is likely that future projects proposing forest management activities would be planned crossing boundaries of potentially affected IRAs, aligned with landscape features or land management plan boundaries.

Timber harvest is set to increase nationally due to urgent challenges to meet domestic lumber demand, reduce wildfire risk, and revitalize rural economies (National Active Forest Management Strategy 2025³⁵). Recent policy and legislation require an increase in timber production. Executive Order 14225 Immediate Expansion of American Timber Production, directs the Forest Service to expand timber production, streamline regulations, and modernize forest management to support national well-being. The One Big Beautiful Bill Act (Section 50301)³⁶ directs the Forest Service to sell at least 250 million board feet more each year for the next 10 years, subject to land management plan limits. Accordingly, the National Active Management Strategy lays out the goal of an increase in timber production nationally by 25 percent, focusing on sustaining healthy forests and watersheds by completing treatments in the right places and locations and in partnership with States, Tribes, and industry for more efficient product delivery.

It is expected that some level of timber would be harvested from the analysis area under all alternatives (though very limited under alternative 1). Assuming overall timber harvest levels increase on National Forest System lands (as indicated by the goals/requirements above), it is expected that some portion of that increase may occur within the potentially affected environment, and under the action alternatives, there could be more opportunities within the analysis area due to the agency's emphasis on increased timber harvest. Future actual timber harvest levels in the potentially affected environment would be dependent on factors including land management plans, operability, local decision-making and objectives, local industries, agency budgets, and timber product values.

Under all alternatives, incidental tree cutting would continue to occur when it is incidental to an otherwise permitted purpose; such as, removal of hazard trees adjacent to roads or trails for public health and safety reasons; fire line construction for wildland fire suppression or control of prescribed fire; survey and maintenance of property boundaries; mining operations, maintenance of power or water lines, trail maintenance or construction; and removal for personal or administrative use would continue to occur. Personal use includes activities such as cutting Christmas trees and firewood. Administrative use includes activities such as construction of fences, footbridges, and maintenance of facilities.

³⁵ The [National Active Forest Management Strategy](#) lays out the goal of an increase in timber production nationally by 25 percent, focusing on sustaining healthy forests and watersheds by completing treatments in the right places and locations and in partnership with States, Tribes, and industry for more efficient product delivery. The agency will maximize use of all tools and authorities that have previously not been used to the extent possible, as well as implementing new tools that can be used to facilitate active forest management, including current and future emergency authorities.

³⁶ The One Big Beautiful Bill Act (Section 50301) directs the Forest Service annually, beginning in Fiscal Year 2026 and through Fiscal Year 2034 to sell a quantity of timber on National Forest System lands that is at least 250 million board feet greater than the quantity that was sold in the previous fiscal year, subject to land management plan limits. The Forest Service must annually enter into forty 20-year or longer contracts for the sale of national forest materials for Fiscal Year 2025-Fiscal Year 2034.

Effects of Alternative 1 – No Action

Timber and Forest Management

Alternative 1 would allow for the least discretion for local land managers to tailor forest management, as appropriate to local land conditions. Forest management activity would remain infrequent, due to the 2001 Roadless Rule's prohibition on timber harvest. Incidental harvest of small diameter timber could occur, where approved by regional foresters through exceptions (36 CFR 294.13(b)(2001)). The level of assumed forest management activity would continue at approximately the same as the recent levels of 500 acres a year of timber harvest and 1,700 acres a year for non-commercial treatments (see Potentially Affected Environment). Even though overall agency timber harvest may increase nationally, in accordance with current agency direction, timber harvest from IRAs under no action would not increase in either the short or long term. Any timber harvest would be an extremely small portion of the agency's overall timber production. Incidental and permitted tree cutting would occur at historic levels.

Implications for Forest Vegetation, Forest Health, and Carbon

No action would continue trends in vegetation succession governed by natural processes, including disturbances, and management associated with fuels reduction or other permitted management actions. Natural processes and trends differ across the IRAs, but generally include forest biomass accumulation, succession, disturbance and tree mortality related to wildfire, drought, windfall, insects and disease. In the long term, the effects of changing natural processes would likely increase disturbance and tree mortality due to wildfire and pests. Fuels management activity that does not involve road construction or tree cutting (such as prescribed fire, or wildfire use) would continue to be allowed and may offset some increased wildfire risk. Additionally, although they are expected to be infrequent, approved tree cutting exceptions may complement natural processes affecting vegetation structure, composition, and forest health to improve habitat or maintain or restore ecosystem composition and structure.

Under the no action alternative, trends in insect and disease activity would continue; these vary across forest type and are influenced by abiotic and biotic conditions. Infrequent activities permitted under the existing exceptions may support localized management action to mitigate insect and disease caused mortality or damage at minor levels. It is expected that risk of insect and disease activity across National Forest System lands would continue to be highest in western conifer forests where fire, drought, and bark beetles can cause widespread tree mortality.

Under alternative 1 carbon dynamics would be predominantly governed by natural processes versus management actions. These trends may include increasing carbon storage overall with regional variation depending on climate, soils, and disturbance by wildfire, insects and disease. In some regions/areas, carbon loss may increase due to increasing incidence of drought, pests, and wildfires (Seidle et al. 2017, Balch et al. 2024).

Non-Forested Vegetation

Under alternative 1, not much change is expected in non-forested vegetation in the short term. In the long term, meadows and hardwood stands would be subject to conifer encroachment which reduces their individual size and distribution across the landscape. These reductions would

continue unless some type of mechanical treatment action or natural disturbance such as wildfire occurred. Non-forested vegetation structure, such as shrub density, would continue to move away from management objectives making it susceptible to future natural disturbances, such as insect infestations or large wildfires.

Effects of Alternative 2 – Proposed Action

Forest Management

This alternative would give the most flexibility for local land managers to tailor forest management, as appropriate to local land conditions and consistent with local land management plans. The area where timber harvest would be allowed could increase due to the removal of the 2001 Roadless Area Conservation Rule prohibitions; however, timber harvest could only occur in areas where it's allowed under the direction of land management plans, agency policy, and areas where mechanized equipment can safely operate (see below). There would be no nationwide prohibitions and therefore, no required process for exceptions.

The proposed rulemaking does not compel or authorize site specific timber harvest – any harvest that occurs would be the result of future site-specific decisions and local market conditions and the specific locations or amounts of activity are not feasible to predict. Increased timber harvest and non-commercial forest management activities are reasonably foreseeable to occur in the potentially affected IRAs. However, these activities would not be equally reasonably foreseeable across all portions of inventoried roadless areas. The likelihood of timber harvest occurring in any given area is analyzed based on operability categories combined with current land management plan direction (see [Potential Timber Harvest Opportunity](#) below). Timber harvest would be more likely to occur in the likely operable and operable but complex areas where costs of implementing treatments is lowest through traditional timber sales, where current land management plans allow it, and where natural resource objectives align such as, but not limited to, fuels reduction in moderate and high-risk areas and addressing insect and disease epidemics.

Non-commercial forest management activities could occur in the same operability categories when equipment is used (for example, non-commercial product removal, thinning with equipment, mechanical site prep) and further used into expanded areas when treatments are implemented by hand (such as hand activities including thinning, pruning, planting, etc.). These treatments would also need to be consistent with current land management plans. Under alternative 2, non-commercial forest management completed by hand (without mechanized/logging equipment) could be feasible in any operability category but may be limited by land management plans, capacity, and funding. Incidental and permitted tree cutting activities would continue to occur and may occur at increased levels if public access increases with opened reconstructed roads or newly opened constructed roads. Generally, these activities would occur more in likely operable areas than likely operable but complex or likely not operable areas.

Potential Timber Harvest Opportunity

To aid in comparison of alternatives, potential timber harvest operability was estimated based on the capability of mechanized treatment or activities, the existing road system, forest productivity,

and slopes and is displayed by region.³⁷ A nationwide geospatial analysis was used to estimate potential operability, or the capability of mechanized treatment or activities, in each area based on slope, distance from roads, site productivity, and statutory restrictions. All forested areas of potentially affected IRAs were grouped into the following three categories:

- **Likely Operable:** These are areas where ground-based systems (mechanized tree cutting, including feller bunchers or harvesters, log skidding, and/or log forwarding) could feasibly be used. They are potentially forest areas that are less than 0.5 miles from a road, on slopes less than 40 percent, are productive for restocking (greater than 20 cubic feet per acre per year), and have no statutory restrictions from timber harvest.
- **Likely operable, but complex:** These are areas that require more complex or costly harvesting systems (for example, high-cost permanent or temporary road construction, 0.5 to 1 mile skidding or forwarding, and/or complex steep slope harvesting systems including cable and/or tether). They are potentially forested areas that are less than 0.5 miles from a road and on slopes between 40 percent and 70 percent or between 0.5 miles and 1 mile from a road and on slopes less than 70 percent. These areas have the same productivity for restocking as likely operable areas and have no statutory restrictions from timber harvest. Some national forests may have the ability to operate in these areas, while other national forests may not have the ability to harvest timber in these areas due to local economics of these systems. However, they could incur additional costs or accept lower rate timber sales to utilize these systems.
- **Likely not operable:** There are areas on steep slopes or far from existing transportation systems where potential forest management would require supplemental funding (for example, high-cost permanent or temporary road construction over 1 mile, skidding or forwarding over 1 mile, and/or complex steep slope harvesting systems including cable, tether, and/or helicopter logging). Complex harvesting systems in these areas would have to be available and local timber markets would have to be stronger for these areas to be managed, or large amounts of funding would have to become available where local timber markets do not exist. Non-commercial treatments would also be high cost due to more difficult access. These are areas that are neither likely operable nor operable but complex (further than 0.5 miles from a road, greater than 70 percent slope, etc.)

In addition, current land management plan components, including areas suitable for timber production, were evaluated to determine if timber harvest is allowed, generally allowed, generally not allowed, or not allowed (Appendix 1 – IRA Acreage Summarized by Region). Plan components that restrict or limit timber harvest may be included in land management plans for a variety of purposes, including, but not limited to, recreation, scenery, watershed, wildlife habitat, and special area designation (such as recommended wilderness area) purposes (see Potentially Affected Environment).

³⁷ Idaho is excluded from the Northern and Intermountain Regions, Colorado is excluded from the Rocky Mountain Region, The El Yunque National Forest is excluded from the Southern Region, and the Alaska Region includes both the Chugach and Tongass National Forests.

While the physical conditions (slopes, productivity of the land) do not change, over time, accessibility of these areas and land management plans could change. In the long term, permanent road construction over 0.5 miles from existing roads could occur and could increase forest management opportunities and change operability categories. Similarly, it is possible that land management plan amendments and revisions could change plan components that apply to these areas over time. Some forest plan limitations could be removed if forest plans were revised or amended to allow for increased forest management activities. In other cases, existing plan components that limit certain activities in these areas may remain in place. All plan amendments and revisions would comply with the planning rule requirements relative to timber which include plan components, sustainability of ecosystems, multiple use, areas suitable and not suitable for timber production, sustained yield in areas suitable for timber production which would be within forest or grassland authority, inherent capability, and fiscal capacity of the unit (36 C.F.R. 219.1(g)).

In the short and long term, it would be more likely that local land managers would propose projects with commercial and non-commercial activities in the likely operable areas where timber harvest is consistent with land management plans. It is likely that alternative 2 would result in an increase in treatment area (acres) and volume harvested in these areas. If local harvest capabilities are available and it is economical, it is possible that alternative 2 could result in an increase in treatment area and volume harvested in the operable, but complex areas in both the short and long term. Non-commercial hand treatments would be more feasible in these areas than in the not operable areas, but also at higher costs than the likely operable areas due to steep terrain or more difficult accessibility.

Any forest management activity, including timber harvest, in areas that are likely not operable would present the lowest likelihood compared to the other two operability categories where consistent with land management plans. In the short term, it is not reasonably foreseeable to see large increases in forest management activities in these not likely operable areas due to high costs and complexities unless permanent or temporary road construction, skidding, or forwarding over 1 mile would be feasible within stronger local timber markets. In the long term, there could be a slight level of increased harvest if technology or market conditions improve, or future land management plan changes drove these increases.

To aid in comparison of alternatives, based on the assumptions above, estimates of potential treatment acres and volumes, by operability, were derived from Forest Service data, using models developed. Acreage and sawtimber volume estimates were derived from Forest Service Cut and Sold Reports (2014-2024), Timber Information Manager, Forest Inventory and Analysis data, and Forest Service Activity Tracking System. These estimates are for analysis and comparison purposes only to illustrate the differences between alternatives because it is not possible to fully predict actual areas where harvest would be proposed in projects and annual harvest levels given varying land management plan direction, local decision-making authority and local market conditions.

Potential Timber Harvest Areas

Timber harvest is reasonably foreseeable within likely operable and likely operable, but complex areas consistent with land management plans. Overall, 4.8 million acres (16 percent of forested areas in the potentially affected IRAs) are likely operable or likely operable but complex in areas where timber harvest is allowed or generally allowed under current land management plans, though there are differences between regions. The Intermountain Region (Region 4) presents the most potential area for timber harvest with 1.5 million acres, followed by the Northern Region (Region 1) at approximately 841,000 acres, and the Pacific Southwest Region (Region 5) at approximately 608,000 acres. Much less area would have potential timber harvest opportunity in the Southwestern Region (Region 3) at approximately 200,000 acres and the Southern Region (Region 8) at approximately 148,000 acres (Figure 10). Some of the variation between regions shown is due to regional variation in land management plan components which differ based on local conditions, the age of the plan, and also the policy under which the plans were developed (see Appendix 1 – IRA Acreage Summarized by Region). In the long term, land management plan amendments and revisions could increase the area where timber harvest would be allowed.

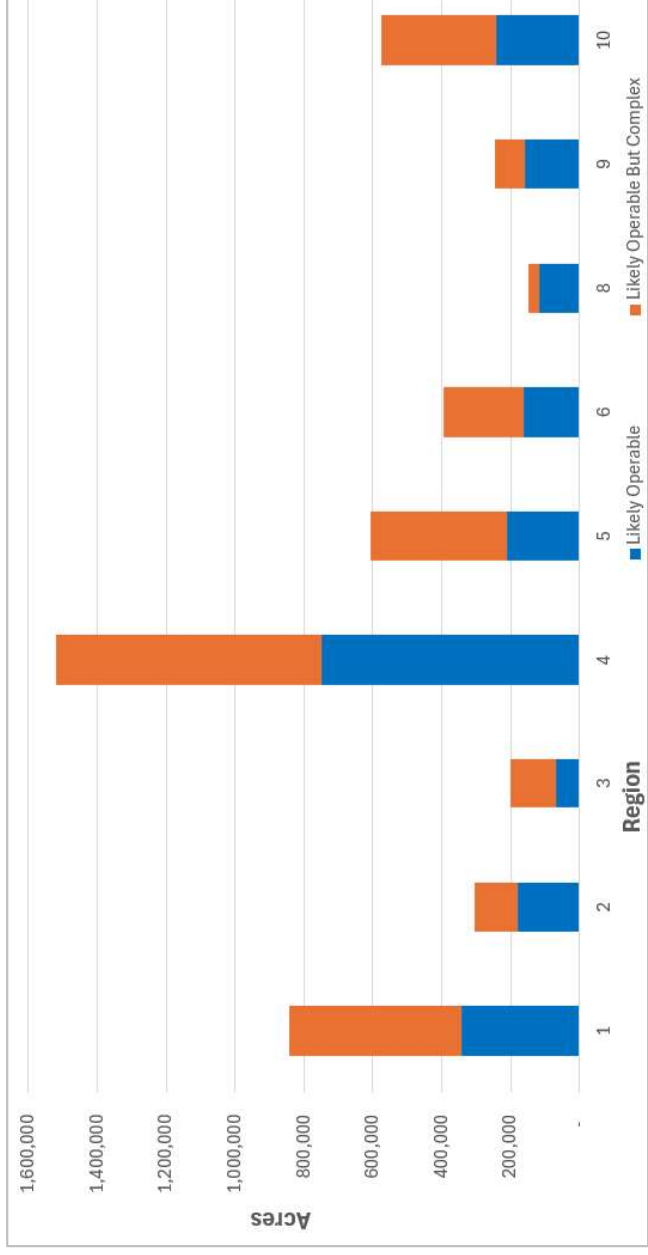


Figure 10. Alternative 2 land management plan operability – likely operable and likely operable, but complex areas applying current land management plan direction (acres)

Potential annual harvest levels

Under alternative 2, it is reasonably foreseeable that an increasing proportion of timber volume sold (sawtimber) would come from within the potentially affected area. The estimated potential volume available for timber harvest by region is based on volume by species sold that exist within areas of potential timber harvest (above) compared to the average annual harvest rates and amounts of those species types on neighboring forest lands. All quantifiable operability data is presented as a range of hundred cubic feet (ccf) volume representing minimum and maximum

potential annual harvest levels. Volume is presented in broad ranges and is best interpreted at broad scales due to the limited statistical reliability of Forest Inventory and Analysis data.

Applying current land management plan direction, national annual increases in sawtimber harvest in likely operable areas could be approximately 106,000 to 254,000 ccf per year and 147,000 to 303,000 ccf per year within likely operable but complex areas, a total of 253,000 to 557,000 ccf. If all of this annual harvest occurred, it could represent a potential 5 to 10 percent increase in total sawtimber harvest on National Forest System lands compared to current harvest levels (which are 5.5 million ccf per year nationally). The Intermountain Region followed by the Rocky Mountain Region and the Northern Region have the greatest potential timber volume output while the Southwestern, Southern, and Alaska Regions present the least (see Figure 11). In the long-term land management plan amendments and revisions could increase the area where timber harvest would be allowed and potentially increase the potential timber harvest volumes.

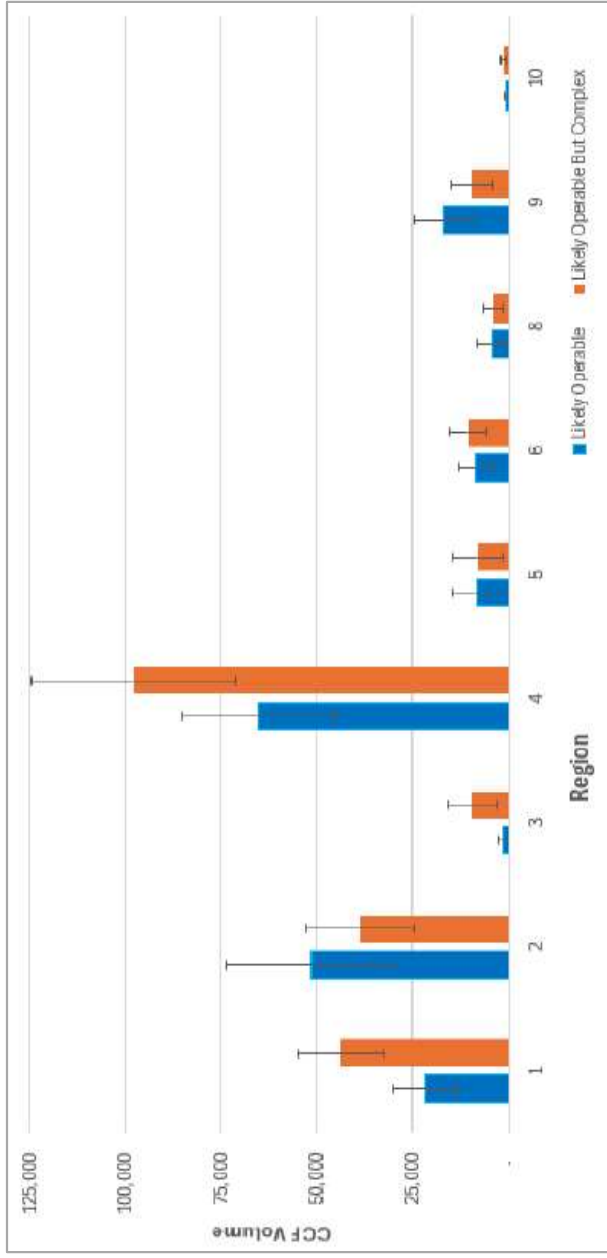


Figure 11. Alternative 2 potential merchantable sawtimber volume (ccf) opportunity per year with current national forest harvest levels applying land management plan direction

Implications for Forest Vegetation, Health, and Carbon

Under alternative 2, additional active forest management, including some level of road construction or reconstruction, could occur and would be more or less likely in certain areas as described above. Where site-specific vegetation management occurs, it would be designed to move vegetation conditions toward desired conditions and objectives identified in land management plans, consistent with the 2012 planning rule requirements for ecosystem integrity (36 CFR 219.8(a)) or, for older plans, prior planning requirements or ecosystem diversity under the 1982 Planning Rule (36 CFR 219.27(a)(1982)). Changes to vegetation structure, function, age class, and/or composition would be more likely in the operable areas and where land management plans allow timber harvest or road construction. Active forest management effects would generally be short term while road construction and associated infrastructure requiring

permanent removal would result in long-term loss of forest canopy, but these levels would be small compared to the overall forested landscape.

More common forest types within inventoried roadless areas include the fir/spruce/hemlock, Douglas-fir, and aspen/birch groups (see Table 13). For common forest types, long-term effects would be mitigated by the relative abundance of the tree species and forest types across the landscape and appropriate reforestation management actions. Less common forest types within the affected environment include many of the eastern hardwood forest types, the longleaf/slash pine group, and the oak/gum/cypress group forest types (see Table 13). Less common forest types within inventoried roadless areas would likely be less affected by road construction or timber harvest because management activities would likely be avoided or they would be designed to improve these forest types.

Within areas that are potentially operable, and where forest plans generally allow for timber harvest, approximately 11-16 percent is old-growth forest, 54-63 percent is mature forest, and 26-31 percent is young forest. Potentially operable areas where land management plan allowances generally allow timber harvest exclude forest types with little to no merchantable sawtimber. However, not all remaining areas have potential for commercial timber harvest. For example, approximately 50 percent of the old-growth forest in potentially operable areas where plan allowances generally allow timber harvest are composed of non-commercial forest types such as aspen/birch, pinyon/juniper, and fir/spruce/mountain hemlock.

Alternative 2 would increase the opportunity to conduct management activities that mitigate insect and disease risks within the potentially affected IRAs, particularly on operable and operable but complex areas. Depending on the region, between 10-40 percent of acres within the operable and operable but complex categories are at risk for insect and disease related mortality (the low end of this range is found in Pacific Southwest Region IRAs that are operable but complex, whereas the upper end of this range is found in Northern Region IRAs, where 40 percent of operable but complex lands are at risk) (Table 16). Forest management activities that include practices that reduce risk to forest insect and disease or reduce impact of abiotic stressors in those local environments could reduce insect or disease caused tree mortality. Changes in risk cannot be estimated nationally and would be determined by local conditions, management activities, and pest conditions on the surrounding landscape.

Table 16. Percent of forested acres at risk of tree mortality due to major insects and diseases, within the NFS forests outside designated areas, within IRAs in the alternative 2 potentially affected environment, and by operability class, according to the 2024 National Insect and Disease Risk Map

Region	Percent at risk of tree mortality – NFS ownerships outside of designated areas ¹	Percent at risk of tree mortality – inventoried roadless areas in the potentially affected environment	Percent at risk of tree mortality – operable acres at risk	Percent at risk of tree mortality – operable but complex acres at risk
1 – Northern	50.4%	37.3%	34.2%	40.1%
2 – Rocky Mountain	23.1%	27.7%	27.9%	27.7%
3 – South western	17.5%	9.5%	13.5 %	14.5%

Region	Percent at risk of tree mortality – NFS ownerships outside of designated areas ¹	Percent at risk of tree mortality – inventoried roadless areas in the potentially affected environment	Percent at risk of tree mortality – operable acres at risk	Percent at risk of tree mortality – operable but complex acres at risk
4 – Intermountain	17.57%	18.6%	23.3 %	22.5 %
5 – Pacific Southwest	18.9%	10.1%	15.2 %	9.6 %
6 – Pacific Northwest	34.7%	18.0%	23.5%	18.9 %
8 – Southern	12.4%	25.9%	19.4 %	30.4 %
9 – Eastern	8.9%	22.2%	12.7 %	22.9 %
10 - Alaska	Not available	Not available	Not available	Not available

¹ Excludes wilderness, wild and scenic, and inventoried roadless areas.

Under alternative 2, where future road construction, timber harvest, or non-commercial forest management remove vegetation, there would be a loss of stored carbon. Areas affected by permanent tree removal activities, such as permanent road construction, would lose capacity for carbon sequestration. Given forest management objectives, these areas would be small compared to the overall carbon within the forested landscape within roadless areas. Effects of timber harvest on carbon storage would be proportional to the level of harvest intensity. Affected areas following harvest treatments would retain capacity for carbon sequestration, and by including required reforestation efforts, can be expected to maintain stored carbon levels over the long term. Depending on stand age and the intensity of harvest, areas where timber was harvested may take several decades to return to similar levels of live biomass (Woodall et al. 2023). Carbon storage in wood products could offset some carbon loss through harvest. Active management, as guided by land management plans, could increase productivity and carbon sequestration in the long term through selective logging, thinning to allow for continued growth of large trees, timber salvage and carbon storage in wood products, and reforestation in the areas where forest management activities occur (Bettinger et al. 2016, Wadsworth 1997).

Non-Forested Vegetation

Alternative 2 would create potential opportunities for project vegetation treatments that could increase herbaceous and shrub production over alternative 1 because project activities would create canopy openings, altering the composition of the plant communities in the short term. As the canopy cover is removed, these treatments could allow more sunlight to reach the ground and temporarily increase production of grasses and browse for wildlife use. Large areas would be opened up to sunlight, and a variety of plants would generally appear, including forbs, grasses, trees, and shrubs. Depending on the scope, extent, and timing of the future active management, effects could also include long-term impacts such as invasive plant establishment and/or spread, a disruption in water relationships as would occur through diverting of surface or subsurface flow from road construction, or increased erosion potential through ground disturbance, and habitat fragmentation. If new roads are constructed or reconstructed in potentially affected IRAs, and if vegetation management or other project activities occur in those areas, best management

practices would be implemented and much of the impact would be prevented through project design and consistency with land management plans.

Effects of Alternative 3 – Modified Rule

Timber and Forest Management

This alternative would, to a lesser extent than alternative 2, allow local land managers to tailor forest management, as appropriate, to local land conditions within roaded areas that are currently inventoried roadless areas and the wildland-urban interface. Boundary adjustments would increase areas where timber could be harvested in areas outside of roaded roadless areas and the wildland-urban interface. Similar to alternative 2, commercial timber harvest is reasonably foreseeable to increase, though the area where this is likely to occur is smaller (see below) and the total potential harvest volumes are less than alternative 2.

Alternative 3 also does not compel or authorize timber harvest – any harvest that occurs would be the result of future site-specific decisions and local market conditions and the specific locations or amounts of activity are not feasible to predict. Increased timber harvest and non-commercial forest management activities are reasonably foreseeable to occur in the alternative 3 analysis area. However, these activities would not be equally reasonably foreseeable across all portions of the alternative 3 potentially affected IRAs. The likelihood of timber harvest occurring in any given area is analyzed based on operability categories combined with current land management plan direction (see Potential Forest Management Opportunity below). Timber harvest would be more likely to occur (more reasonably foreseeable) in the likely operable and likely operable but complex areas where the cost of implementing treatments is lowest through traditional timber sales, where current land management plans allow it, and where natural resource objectives align. Natural resource objectives include, but are not limited to, fuels reduction in moderate and high risk areas and addressing insect and disease epidemics.

Similar to alternative 2, non-commercial treatment and incidental and permitted tree cutting activities is reasonably foreseeable and could occur at increased levels in likely operable areas than likely operable but complex or likely not operable areas compared to the existing condition. The level of this use would be less than the proposed action because roads could not be constructed outside of roaded roadless or wildland-urban interface areas. Non-commercial forest management completed by hand (without mechanized/logging equipment) could be feasible in any operability category but may be limited by land management plans, capacity, and funding. Within the wildland-urban interface and roaded roadless areas, activities could proceed without the 2001 Roadless Rule's exception process. Outside these areas, the activities would remain subject to the exception process. Incidental and permitted tree cutting activities would continue to occur and may occur at increased levels if public access is increased with opened reconstructed roads or newly opened constructed roads.

Potential Forest Management Opportunity

Alternative 3 was analyzed using the same considerations as alternative 2 including operability categories and land management plan direction.

Potential Timber Harvest Areas

Likely operable areas would vary by region in alternative 3. Timber harvest is reasonably foreseeable within likely operable and likely operable but complex areas coupled in areas where it is allowed or generally allowed by land management plans. Overall, about 4.3 million acres (21 percent of the forested portions of the potentially affected IRAs for alternative 3) is within likely operable areas or likely operable but complex areas where timber harvest is allowed or generally allowed by current land management plans, though there are differences between regions. The Intermountain Region presents the most area potentially available for timber harvest with approximately 1.2 million acres, followed by the Northern Region with approximately 700,000 acres and the Alaska Region with approximately 575,000 acres. The Southwestern and Southern Regions would have the least area that could be potentially available.

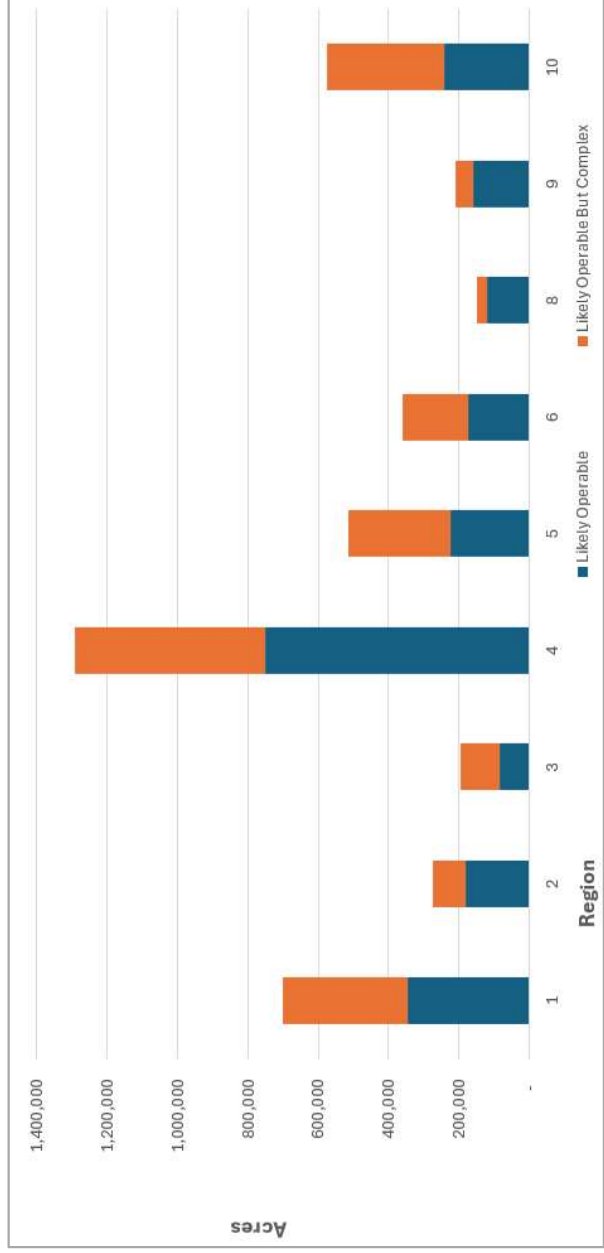


Figure 12. Alternative 3 operability – acres of likely operable and likely operable, but complex areas applying land management plan direction

Potential annual harvest levels within roadless areas

Under alternative 3, it is reasonably foreseeable that an increased proportion of timber volume sold would come from the potentially affected environment. We estimated the potential volume available for timber harvest based on operable areas and average annual harvest rates and amounts on National Forest System lands. All quantifiable operability data is displayed in acres and hundred cubic feet (ccf) volume. Volume is presented in broad ranges and is best interpreted at broad scales due to the limited statistical reliability of Forest Inventory and Analysis data. Applying land management plan direction to national annual increases in sawtimber harvest in likely operable areas could be approximately 112,000 to 264,000 ccf per year and 106,000 to 237,000 ccf per year within likely operable but complex areas, a total of 219,000 to 501,000 ccf per year. It could represent a potential 4-9 percent annual increase in total sawtimber harvest on National Forest System lands. In the long term, land management plan amendments and revisions could increase the area where timber harvest would be allowed as well as increase potential timber harvest levels.

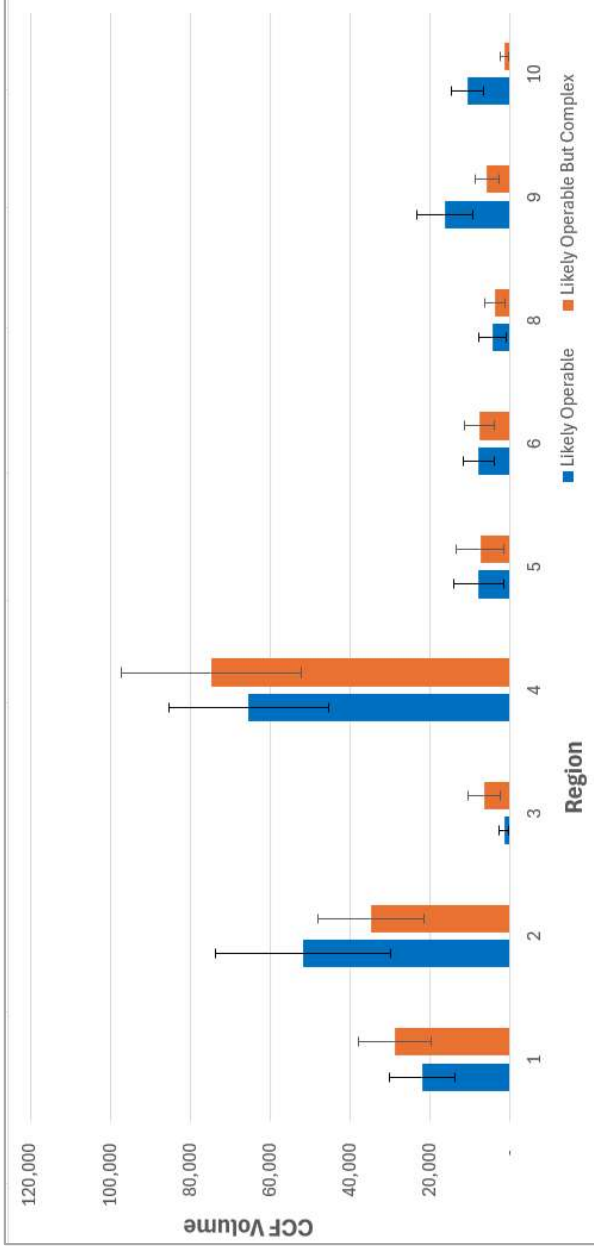


Figure 13. Alternative 3 potential merchantable sawtimber volume opportunity (ccf) per year with current national forest harvest levels applying land management plan direction

Implications for Forest Vegetation, Health, and Carbon

Under alternative 3, potential forest management activities would be more likely to be concentrated in areas near existing roads and within wildland-urban interface zones. These areas are generally easier to access. Operable ground within these areas are more likely to experience forest management activities which could include shifts in forest cover types aligned with land management plan desired conditions. Over the short term, this could result in a reduction in canopy cover, improvement of growing conditions of residual stands, and a shift toward younger age classes in stands treated with regeneration harvest. Over the longer term, how forest vegetation could be managed would continue to be dictated by land management plans or changed should land management plan amendment or revisions be undertaken. In contrast to alternative 2, alternative 3 would limit these changes to a smaller subset of the IRA footprint, leaving areas outside the wildland-urban interface or more than 0.5 miles from roads restricted from forest management.

Under alternative 3, carbon dynamics would be similar to alternative 2. Alternative 3 would increase the opportunity to conduct management activities that mitigate insect and disease risks within the potentially affected IRAs, particularly on operable and operable but complex areas. Depending on the region, between 9-43 percent of acres within the operable and operable but complex categories are at risk for insect and disease related mortality (the low end of this range is found in Pacific Southwest Region IRAs that are operable but complex, whereas the upper end of this range is found in Northern Region IRAs, where 43 percent of operable but complex lands are at risk) (Table 17). Forest management activities that include practices that reduce risk to forest insect and disease or reduce impact of abiotic stressors in those local environments could reduce insect or disease caused tree mortality. Changes in risk cannot be estimated nationally and would be determined by local conditions, management activities, and pest conditions on the surrounding landscape.

Table 17. Percent of forested acres at risk of tree mortality due to major insects and diseases, within the NFS forests outside designated areas, within IRAs in the alternative 3 potentially affected environment, and by operability class, according to the 2024 National Insect and Disease Risk Map

Region	Percent at risk of tree mortality - NFS Ownerships outside of designated areas ¹	Percent at risk of tree mortality - inventoried roadless areas in the alternative 3 potentially affected environment	Percent at risk of tree mortality - Operable	Percent at risk of tree mortality - Operable
1 – Northern	50.4%	39.9%	34.5%	43.1%
2 – Rocky Mountain	23.1%	27.7%	28.1%	27.9%
3 – Southwestern	17.5%	10.8%	13.4%	17.8%
4 – Intermountain	17.57%	17.4%	23.0%	21.9%
5 – Pacific Southwest	18.9%	10.4%	15.6%	8.8%
6 – Pacific Northwest	34.7%	21.4%	24.0%	20.5%
8 – Southern	12.4%	26.4%	19.4%	31.1%
9 – Eastern	8.9%	15.8%	10.9%	19.2%
10 - Alaska	Not available	Not available	Not available	Not available

¹Excludes wilderness, wild and scenic, and inventoried roadless areas.

Non-forested Vegetation

Similar to alternative 2, alternative 3 could create opportunities for project vegetation treatments that would increase herbaceous and shrub production although long-term impacts such as invasive plant establishment and/or spread and a disruption in water relationships could also occur through diverting of surface or subsurface flow from road construction, or increased erosion potential through ground disturbance, and habitat fragmentation. The area of operability and the miles of new roads anticipated to be constructed are not expected to be substantially different under alternatives 2 and 3. As a result, these alternatives are not expected to differ significantly in regard to their contributions to effects of non-forested vegetation. If new roads are constructed or reconstructed in roadless areas, and if vegetation management or other project activities occur in those areas, best management practices would be implemented and much of the impact would be prevented through project design and consistency with land management plans.

Conclusion – Vegetation and Management

Inventoried roadless areas are shaped by natural forces like wildfire, drought, insects, and disease, with limited management under the 2001 Roadless Rule. Under alternative 1, only small amounts of timber harvest would occur, and vegetation trends would continue to be driven mostly by natural disturbances. Alternative 2 would expand active forest management opportunities the most, with about 4.8 million acres (16 percent of forested areas within potentially affected IRAs) where timber harvest could occur on operable areas and is allowed by current land management plans. If all potential annual timber harvest occurred, it could represent a potential 5 to 10 percent increase in total sawtimber harvest on National Forest System lands

compared to current harvest levels. This option also provides the greatest ability to promote forest health by reducing insect and disease risks, especially in western conifer forests. Alternative 3 offers a more moderate increase than alternative 2, with about 4.3 million acres available under current plans. Potential harvest levels would be lower, but it would still promote forest health through targeted management in operable areas, though at a smaller scale than alternative 2. Across all alternatives, natural disturbances remain a force shaping vegetation, but increased active management, as proposed in alternatives 2 and 3, could promote increased timber production, forest health, and resilience to insects and disease.

Fire and Fuels Management

Background

In the right place at the right time, wildland fire can create many environmental benefits, such as reducing fuel loads, improving wildlife habitat, and increasing ecological resilience to future disturbances. In the wrong place at the wrong time, wildfires can threaten lives, homes, infrastructure, and important natural and cultural resources. Adaptive management principles involve continual assessment of how proposed management alternatives will affect wildfire hazards and the potential for risk mitigation. This analysis assumes consistency with The Federal Wildland Fire Management Policy, as outlined in the Interagency Standards for Fire and Fire Aviation Operations, and the location-specific land management plan objectives. The overarching goal remains to balance fire suppression with the strategic use of fire, resource management, and national adaptation to fire presence.

Forest Service objectives for fire management include minimizing the risk to people, communities, and natural and cultural resources by assessing the likelihood of occurrence, severity of potential impacts, and the possible advantages of actions to reduce risk. Wildfire risk is a measure of the probability and consequences of uncertain future fire events. The Forest Service uses a risk management framework to make decisions and investments focused on protecting people and the built environment, conserving natural and cultural resources, and restoring and maintaining ecosystem health and services. This system considers risk as a function of wildfire hazard (likelihood and intensity) and the vulnerability (exposure and susceptibility) of resources and assets. Risk mitigation focuses on actions, including fuel treatments and fire response, that reduce the likelihood of negative consequences from wildfire.

Fuel treatments can change the likelihood and intensity (hazard) of wildfire by altering the amount, type, and/or configuration of live and dead vegetation available to burn. Treating hazardous fuels on NFS land, especially within the wildland-urban interface (areas adjacent to communities) and municipal watersheds (sources of public drinking water), is a key priority under several national initiatives, including the National Fire Plan, the Healthy Forests Restoration Act (HFRA), the Healthy Forests Initiative, the National Cohesive Wildland Fire Management Strategy, and Congressional budget directives. Local land management plans set specific management objectives and the allowable management activities for different units of the landscape, including for fuels and fire response.

Hazardous fuels reduction work generally falls into three categories:

- Landscape fuel treatments designed to alter fire behavior and intensity principally to strengthen ecological resilience and protect natural resources,
- Point protection zones of defensible space to reduce potential for loss around fire-sensitive assets (such as housing or infrastructure), and
- Linear fuel breaks designed to improve the safety, efficiency, and effectiveness of fire firefighting efforts at strategic locations.

The agency uses a variety of treatment types to reduce landscape-specific wildfire risks and support fire control activities, including commercial and non-commercial forest thinning, biomass removal, and prescribed fire (broadcast or pile burning). Prescribed fire is an effective risk mitigation tool, but it requires extensive planning and approval, as well as timely repeated application. Integrated thinning and prescribed burning treatments are often most effective for achieving restoration and hazard-reduction outcomes (Stephens et al. 2009, Hood et al. 2022).

When a wildfire occurs, the Forest Service follows the Federal Wildland Fire Management Policy and similar agency program directives to determine appropriate management response considering applicable land management plan objectives, protection concerns, and firefighting safety, efficiency, and effectiveness. Typically, land management plans emphasize ecological values within IRAs, which are often promoted by fire, and there are few key issues within IRAs beyond drinking water source watersheds. Thus, naturally ignited fires (unplanned ignitions) are sometimes managed for resource objectives, including wildfire risk reduction and the restoration of forests negatively impacted by decades of aggressive fire suppression that built up fuels (North et al. 2021). However, a range of stakeholders are concerned about the prospect of notable, high-severity fires within drinking water source watersheds and large cross-boundary fires that impact adjacent communities. They argue that increased roads and hazardous fuels reduction treatments have the potential to reduce these effects by improving firefighting safety, efficiency, and effectiveness in IRAs, thereby increasing initial attack success and opportunities for large fire containment.

Due to the broad nature of the proposed rule change and uncertainties about the type, magnitude, intensity, and location of foreseeable activities, potential changes in wildfire risk and mitigation opportunities are evaluated relative to one another. These uncertainties include seasonal climate variability, which can affect fire behavior and frequency; funding constraints that may limit the scope and implementation of fire management efforts; and operational challenges, such as access restrictions in remote areas. By acknowledging these factors, planners can better anticipate potential challenges and develop more effective strategies for wildfire risk evaluation.

Potentially Affected Environment

Wildfire Occurrence

Wildfire occurrence refers to an instance of a wildfire event (a specific incident) or a collection of cases. Past research and new analyses presented here indicate that more fires, both in absolute numbers and density, originate on other NFS lands compared to IRAs and wilderness areas

(Healey 2020; Johnston et al. 2021, see more detail below). Still, the percentage of burned area is highest in wilderness, followed by other NFS lands and IRAs. In other words, while there are fewer fires per land area (lower densities) in roadless and wilderness areas, the fires that do burn tend to reach larger sizes. The impacts to vegetation in terms of fire severity are broadly similar across the NFS-wide land designations, with only slightly greater proportions of roadless areas burning at moderate and high severity at the national scale.

Roadless and wilderness areas also experience a higher proportion of lightning-caused ignitions than other NFS lands, reflecting both reduced human access and biophysical conditions that support natural ignitions. The proportion of human-caused fires in IRAs and wilderness is less than half that on other NFS lands, which may be due in part to public access limitations. The incidence of human-caused fires generally increases with proximity to roads.

The tables and figures that follow summarize wildfire counts (human vs. natural), area burned, and severity information from recent decades using official agency incident records (InFORM) and satellite observations of burned areas and fire severity. These data are summarized across three land designations - wilderness, IRAs, and other NFS lands - to characterize baseline wildfire hazard in IRAs and consider how it might change if managed more like other Forest Service lands.

The InFORM Fire Occurrence Data Record (FODR)³⁸ was used to examine characteristics of wildfires that start on NFS lands by land management designation, including ignition density, cause, size, and total area burned, which may include area burned beyond NFS lands. The interagency, satellite-based Monitoring Trends in Burn Severity (MTBS)³⁹ dataset was used to characterize the total area burned on NFS lands by large wildfires and their severity (as reflected in vegetation effects). Both datasets were used because each has its benefits and drawbacks⁴⁰. Differences in area burned estimates by land designation between these two datasets are to be expected. To ensure comparability across datasets and in accordance with current management conditions, primary comparisons of fire activity across land designations focus on 2014–2024, representing the most recent full decade of Roadless Rule implementation.

³⁸ The FODR provides a near-complete census of wildfire activity on Federal lands, with the most reliable data available from 1992 onward (Short 2014). These summaries do not include fires that start on adjacent ownerships and later burn onto NFS lands. This distinction is important because cross-boundary fires originating off NFS lands cause a disproportionate share of community destruction (Downing et al. 2022).

³⁹ MTBS considers fires large enough to map using satellite imagery if they exceed 1,000 acres in the western US or 500 acres in the East. These summaries include wildfires that have burned NFS lands, regardless of their origin.

⁴⁰ The FODR includes data for fires of all sizes and provides reported points of origin and fire ignition causes. The most consistent and reliable subsets of the data are considered to date back to 1992 (Short 2014). The MTBS dataset includes mapped perimeters and severity information for large fires from 1984 to 2024 but lacks ignition location and cause information. The FODR data were used to present summaries of fire ignitions (counts, densities, average fire size) by cause, while the MTBS data set was used to characterize fire severity. Both datasets were used to estimate area burned, but the FODR summaries are based on the land designations where fires (of all sizes) originated. In contrast, the MTBS summaries are based on intersections of large fire perimeters with land designation maps.

The total number of wildfires originating on NFS lands from 2014 to 2024 is lowest within wilderness, followed by potentially affected IRAs, and highest on other NFS lands (Table 18). However, when converted to a density estimate (number of fires per million acres per year) to account for differences in each land base, the IRA estimates are essentially equivalent to those from of wilderness (12 fires per million acres per year) and represent less than one-third (29 percent) of the ignition density on other NFS lands (42 fires per million acres per year).

Table 18. Fire occurrence statistics for NFS land categories of other, potentially affected IRAs, and wilderness using fire occurrence records with a point of origin on NFS lands for years 2014-2024 from the Interagency Fire Occurrence Reporting Module (InFORM) Fire Occurrence Data Record (FODR)

Fire Occurrence Metric	Other NFS Lands	Potentially Affected IRAs	Wilderness
Total land area (acres)	88,828,539	40,062,119	29,278,987
Number of fires	40,811	5,305	3,960
Ignition density (fires/million acres/year)	41.8	12.0	12.3
Area burned (acres)	12,230,160	3,480,203	4,223,903
Area burned (percent of land area)	13.8%	8.7%	14.4%
Mean fire size (acres)	302	659	1,071

Despite some inherent discrepancies, both sources of data (FODR and MTBS) indicate that, from 2014-2024, approximately 3.5 million acres (9 percent) burned within or originated from the potentially affected IRAs (Table 18 and Table 19), compared with 14 percent of the total area in wilderness and 11-14 percent on other NFS lands, depending on the source. Of the burned area within the potentially affected IRAs, about 27 percent burned at moderate severity and 20 percent burned at high severity – like the proportions of the other land classes (Table 19).

Table 19. Fire occurrence statistics for NFS land categories of other, potentially affected IRAs, and wilderness using MTBS annual burn severity mosaics for wildfires and wildland fire use incident types for years 2014-2024 (2024 is incomplete)

Fire Occurrence Metric	Other NFS lands	Potentially Affected IRAs	Wilderness
MTBS area burned (acres)	9,519,917	3,477,517	4,051,922
MTBS area burned (percent of land area)	10.7%	8.7%	13.8%
MTBS - Underburned to Low Burn Severity (percent of area burned)	15.4	14.7	18.0
MTBS - Low burn severity (percent of area burned)	41.6	37.5	40.7
MTBS - Moderate burn severity (percent of area burned)	23.3	27.0	23.5
MTBS - High Burn Severity (percent of area burned)	19.0	20.1	17.0

Fire occurrence data were also used to examine trends over a longer time period, back to 1992 (FODR) and 1984 (MTBS). Area burned has trended upward over time for all NFS lands and within the potentially affected IRAs, causing a rise in total area burned at moderate and high severity in recent decades (Figure 14). In some dry conifer forests, the increased area burned at high intensity and severity due to decades of fire suppression (exclusion) efforts is a problematic

departure from historical conditions (Parks et al. 2023, McClure et al. 2024). Many of these low-elevation, dry pine forests exist near communities in the western U.S. High severity fires in pine forests that were historically burned by frequent low- to moderate- severity fires, may result in conversions to non-forested conditions and increased sedimentation and water quality impacts to municipal watersheds (Hohner et al. 2019, Coop et al. 2020).

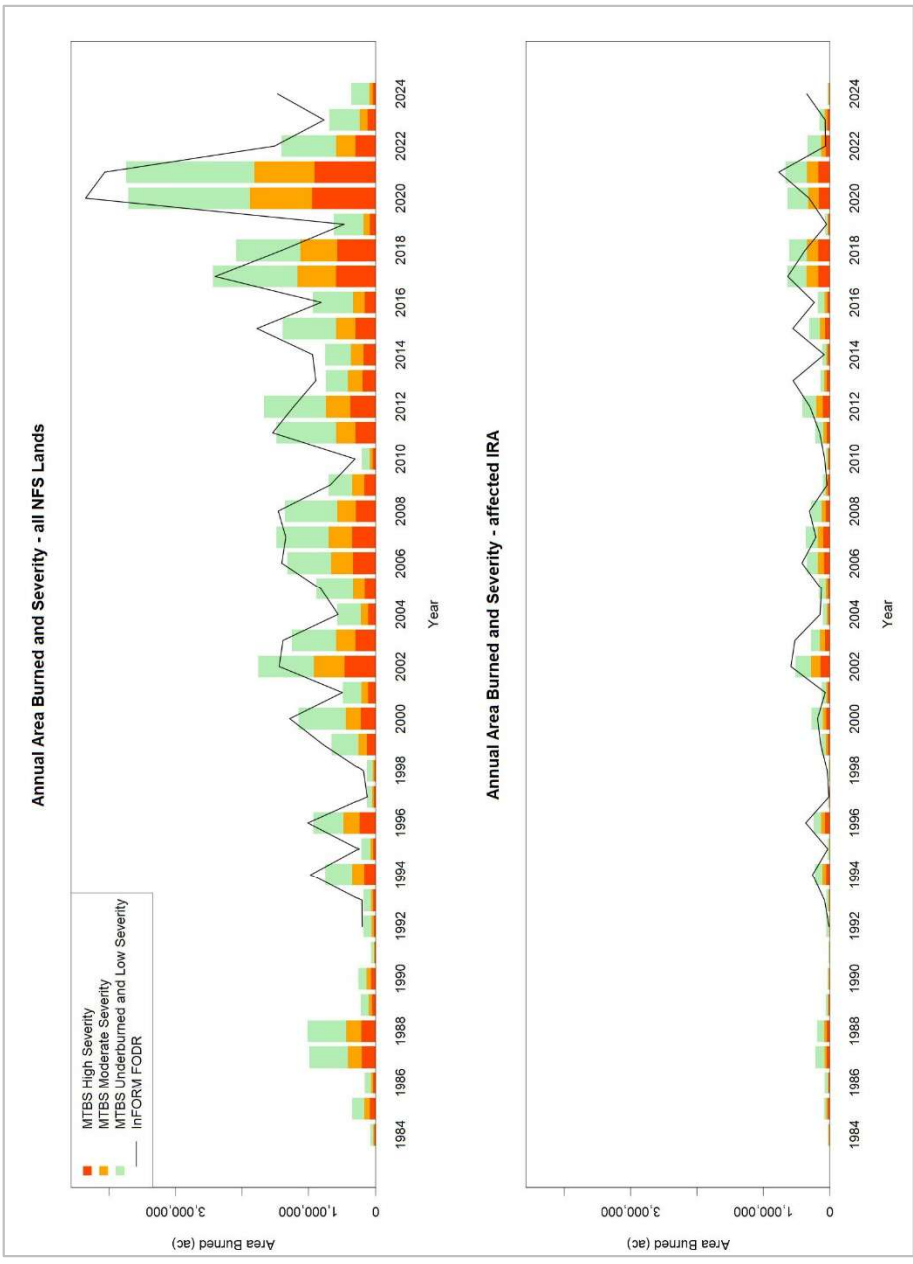


Figure 14. Trends in area burned and severity for all NFS lands (top) and the potentially affected IRAs (bottom). Data from the InFORM FODR shows the total area burned by fires that start on NFS lands from 1992-2024. Data from MTBS shows the area burned by severity on NFS lands for years 2014-2024 (2024 is incomplete)

Between 1984 and 2024, wildfire burned 20.5 percent of potentially affected IRAs (or 29.9 percent of potentially affected IRAs outside of Alaska). Of these, 4.2 percent (1.7 million acres) were high severity wildfire and 5.2 percent (2.1 million acres) were moderate severity wildfire.

Table 20. Fire severity statistics for potentially affected IRAs using MTBS annual burn severity mosaics for wildfires and wildland fire use incident types for years 1984-2024 (2024 is incomplete)

NFS Region	Total potentially affected IRAs (acres)	Acres (and percent total IRA) of wildfire	Acres (and percent total IRA) of high severity wildfire	Acres (and percent total IRA) of moderate severity wildfire
Northern	5,950,570	1,213,513 (20.4%)	296,004 (5.0%)	394,675 (6.6%)
Rocky Mountain	1,733,272	171,527 (9.9%)	41,154 (2.4%)	34,863 (2.0%)

NFS Region	Total potentially affected IRAs (acres)	Acres (and percent total IRA) of wildfire	Acres (and percent total IRA) of high severity wildfire	Acres (and percent total IRA) of moderate severity wildfire
Southwestern	2,528,766	1,134,979 (44.9%)	210,555 (8.3%)	82,460 (3.3%)
Intermountain	8,481,385	1,227,748 (14.5%)	373,731 (4.4%)	226,245 (2.7%)
Pacific Southwest	3,627,646	2,547,695 (70.2%)	747,569 (20.6%)	524,567 (14.5%)
Pacific Northwest	3,729,978	1,752,794 (47.0%)	404,846 (10.9%)	409,310 (11.0%)
Southern	839,340	150,992 (18.0%)	23,500 (2.8%)	4,217 (0.5%)
Eastern	605,813	12,293 (2.0%)	230 (0%)	21 (0%)
Alaska	12,565,348	13,353 (0.1%)	3,839 (0%)	559 (0%)
Total	40,062,119	8,224,894 (20.5%)	2,101,427 (5.2%)	1,676,917 (4.2%)

These findings are similar to those of other recent studies that quantified fire occurrence within and outside Forest Service Roadless Areas. Healey (2020) found that a similar proportion of area burned on NFS lands, within and outside of IRAs, using MTBS data from 1984-2016.

Additionally, Healey (2020) found that fire severity within the forested portion of IRAs was only slightly different than for other NFS lands, with the largest difference being proportionally more area burned at high severity area in IRAs (5 percent within IRAs, 3.2 percent outside of IRAs). Johnston et al. (2021) investigated the influence of roaded and roadless land use designations on fire ignitions, fire extent, and fire severity on NFS lands in the western U.S. In this study, “roadless” included both IRAs and wilderness. Using point-based agency fire occurrence records from 1992-2017 (like the FODR), they found that most fires (74 percent of total) started in roaded areas, but fires in “roadless” settings were more likely to exceed 300 acres (4 percent in roadless versus 1.4 percent in roaded areas). Johnston et al. (2021) also quantified Forest Service area burned by large fires (originating on any ownership) within the same categories, using MTBS data from 1984-2017, and found that a greater proportion of “roadless” area burned (30 percent) compared to the roaded setting (18 percent). Their analysis of burn severity for large fires from 1984-2017 found no significant difference across land designations when accounting for biophysical differences (for example, elevation, terrain, vegetation type, wetness).

As indicated below, ignition density is approximately four times greater on other NFS lands compared to the potentially affected IRAs and wilderness. Most of this difference is due to the greater density of human-caused ignitions within other NFS lands (Table 21). Among fires with causes determined, 77 percent and 74 percent were reported as naturally ignited in wilderness areas and potentially affected IRAs, respectively. In contrast, the majority (57 percent) of fires with cause determinations on other NFS lands were reported as human caused. Other NFS lands typically have more land management activities, infrastructure (such as powerlines), and public recreation that can lead to human caused ignitions. The new analysis presented in this DEIS indicates that other NFS lands also have about twice the density of natural ignitions than IRAs or wilderness, potentially due to biophysical differences or higher detection rates. The number of “actionable” and reportable wildfires may also be generally greater in areas outside of roadless or wilderness areas. Fires within the potentially affected environment are more often caused by natural (lightning) ignitions, and some may extinguish without being detected or requiring a management (suppression) response. Consistent with other research findings, these analyses

indicate that human caused ignitions increase in abundance with proximity to roads, supporting the notion that roads facilitate human access, which can in turn result in more human caused fires (Narayananaraj and Wimberly 2012, Parisien et al., 2016, Balch et al., 2017, Chen and Jin, 2022).

Table 21. Ignition density by fire cause classification for NFS land categories of other, potentially affected IRAs, and wilderness using fire occurrence records with a point of origin on Forest Service ownership for years 2014-2024 from the Interagency Fire Occurrence Reporting Module (InFORM) Fire Occurrence Data Record (FODR)

Fire Occurrence Metric	Other NFS lands	Potentially affected IRAs	Wilderness
Ignition density (fires/1M-ac/yr) human	22.4	3.0	2.7
Ignition density (fires/1M-ac/yr) natural	16.8	8.5	9.1
Ignition density (fires/1M-ac/yr) undetermined	2.5	0.5	0.5

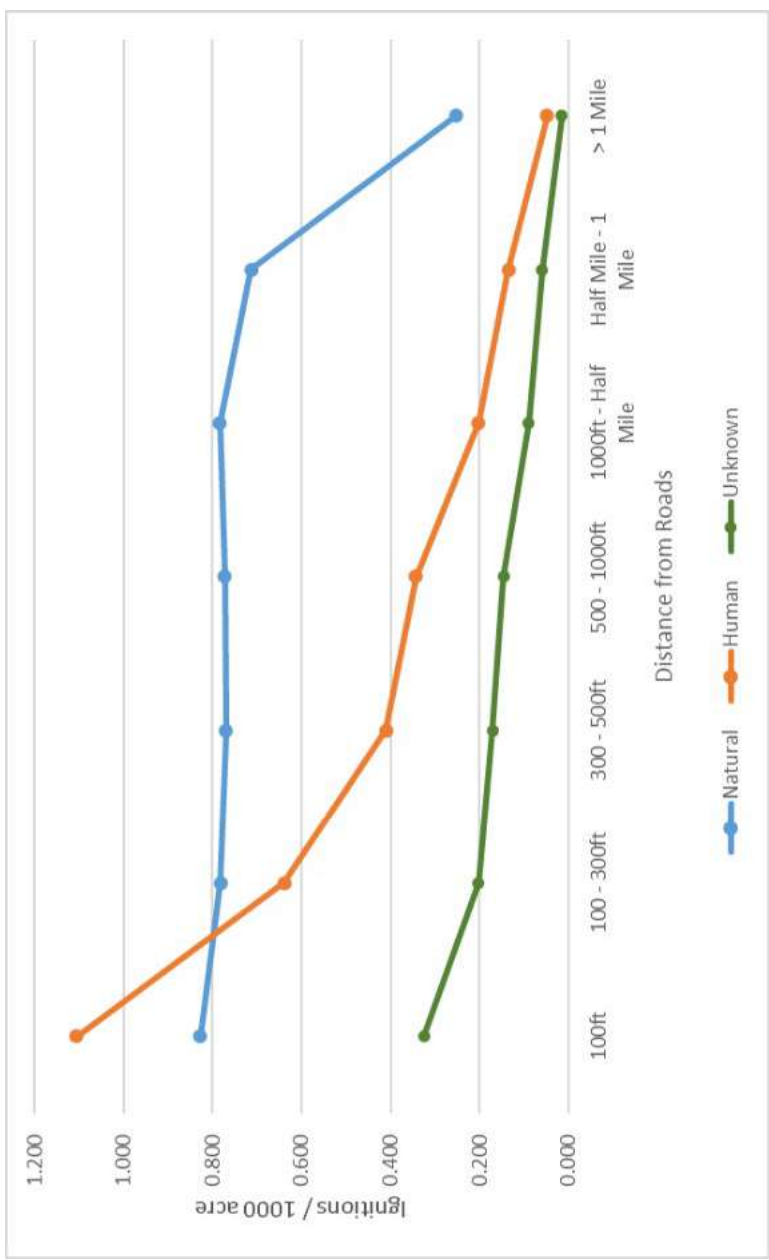


Figure 15. Density of reported ignitions by distance to roads and cause within the potentially affected IRAs

Wildfire Risk

Wildfire risk is a function of the likelihood of wildfire and the potential consequences to highly valued resources and assets (HVRAs). The Forest Service uses a nationally consistent wildfire risk assessment framework to evaluate risk across landscapes and to inform planning, prioritization, and investments. This framework merges wildfire hazard (likelihood and intensity), exposure (the spatial coincidence of wildfire and HVRAs), and susceptibility (the degree to which HVRAs are harmed or benefit from fire). Together, these components provide a quantitative and qualitative understanding of wildfire risk and opportunities for mitigation.

The potentially affected IRAs span a wide range of vegetation types, climate regimes, and fire regimes. As a result, wildfire risk varies substantially across the IRA network. Some IRAs occur in ecological systems where fire is infrequent but severe when it happens; others occur in fire-adapted landscapes where frequent, low- to moderate-severity fire traditionally sustained ecosystem structure and function. Understanding this variation is fundamental to examining how the proposed alternatives may influence wildfire risk.

Nationally, wildfire hazards are commonly characterized using the Wildfire Hazard Potential (WHP) index, which integrates burn probability and potential fire intensity. WHP provides a relative measure of wildfire hazard across the United States. Areas with high or very high WHP are disproportionately located in the western United States, particularly in fire-adapted conifer forests, where decades of fire exclusion have increased the likelihood of high-severity fire.

Exposure of HVRAs within IRAs varies by region and by the type of resource or asset considered. Many IRAs overlap with watersheds that supply drinking water to downstream communities. Others contain habitats for threatened, endangered, or sensitive species that may be vulnerable to high-severity fire. In some cases, fire can provide ecological benefits by reducing fuel loads, promoting regeneration, or maintaining habitat structure. In other instances, high-severity fire can result in long-term loss of forest cover, increased sedimentation, and degradation of aquatic habitat.

Susceptibility reflects the degree to which HVRAs are harmed or benefit from wildfire. For example, municipal watersheds are generally highly susceptible to negative impacts from high-severity fire, including increased erosion and sedimentation. In contrast, some fire-adapted ecosystems benefit from low- to moderate-severity fire, which can reduce fuel loads and promote ecological resilience. The susceptibility of HVRAs within IRAs, therefore, depends on both the environmental context and the potential fire behavior.

The Forest Service's national risk assessment identifies priority landscapes for hazardous fuels reduction and wildfire risk mitigation. These areas represent opportunities to reduce wildfire risk through strategically placed fuel treatments and improved fire response. However, the extent to which such treatments can be implemented within IRAs depends on management direction, access, and operational feasibility. Key operational barriers to these implementations include restricted access due to road infrastructure limitations, which can impede the timely deployment of firefighting resources and equipment. The high cost of conducting treatments in remote or difficult-to-access areas further limits feasibility. Additionally, environmental reviews and regulatory compliance can delay or restrict treatment activities. These constraints highlight the need for realistic planning that accounts for these operational challenges while optimizing risk mitigation strategies.

To evaluate wildfire risk within the potentially affected IRAs, this analysis summarizes Wildfire Hazard Potential, HVRA exposure, and susceptibility across the IRA network (Table 22 and more details provided in the sections that follow). Across potentially affected IRAs outside of Alaska, 42 percent of lands are classified as high or very high Wildfire Hazard Potential, indicating a high potential for intense wildfire under severe weather conditions. Approximately 26 percent overlap with high-priority fire sheds identified in the Wildfire Crisis Strategy (WCS).

These firesheds are areas where wildfire poses the most significant risk to communities, infrastructure, and natural resources. Within these firesheds, opportunities for risk mitigation may be substantial. In addition, approximately 15 percent of the potentially affected IRAs overlap with Community Wildfire Risk Reduction Zones (CWRZ), which represent areas where wildfire poses elevated risk to communities. These overlaps highlight the importance of considering how IRA management may influence wildfire risk to adjacent neighborhoods.

Table 22. Area of overlap between potentially affected IRAs and key national wildfire hazard and risk indicators

Region	Area with high or very high wildfire hazard potential (WHP) (acres)	Area (percent) within high priority firesheds (acres)	Area (percent) within community wildfire risk reduction zones (CWRZ) (acres)	Area (percent) within HFRA WUI (acres)
Northern	2,624,476 (44.1%)	982,893 (16.5%)	1,091,492 (18.3%)	1,922,932 (32.3%)
Rocky Mountain	554,945 (32.0%)	160,694 (9.3%)	333,711 (19.3%)	1,004,272 (57.9%)
Southwestern	1,368,771 (54.1%)	812,569 (32.1%)	520,750 (20.6%)	858,665 (34.0%)
Intermountain	2,649,444 (31.3%)	1,042,159 (12.3%)	1,267,982 (15.0%)	3,084,578 (36.4%)
Pacific Southwest	2,176,277 (59.9%)	2,189,754 (60.2%)	1,061,363 (29.2%)	1,074,784 (29.6%)
Pacific Northwest	2,014,316 (54.0%)	1,606,220 (43.1%)	591,494 (15.9%)	802,128 (21.5%)
Southern	58,782 (7.1%)	432,160 (52.3%)	519,711 (62.9%)	781,349 (94.5%)
Eastern	32,553 (5.4%)	9,970 (1.6%)	299,728 (49.5%)	208,961 (34.5%)
Alaska	Not Available	0 (0.0%)	233,282 (1.9%)	47,602 (0.4%)
Total	11,479,564 (28.7%)	7,236,418 (18.1%)	5,919,512 (14.8%)	9,785,271 (24.4%)
Total (excluding AK)	11,479,564 (41.8%)	7,236,418 (26.3%)	5,686,230 (20.7%)	9,737,669 (35.4%)

The susceptibility of HVRAs within IRAs varies by region and by resource type. For example, IRAs in the Pacific Northwest and Northern Rockies often contain habitat for species sensitive to high-severity fire, such as the northern spotted owl and bull trout. In contrast, IRAs in the Southwest and southern Rockies often occur in fire-adapted ponderosa pine and mixed-conifer forests where low- to moderate-severity fire can provide ecological benefits.

Overall, wildfire risk within the potentially affected IRAs is influenced by wildfire hazards, HVRA exposure, and susceptibility. The proposed alternatives may influence wildfire risk by affecting the ability to implement fuel treatments, manage wildfire for resource objectives, and respond to unplanned ignitions. Evaluating these potential changes requires understanding the baseline risk conditions and the opportunities for risk mitigation within IRAs.

Wildfire Hazard Potential

The Forest Service Wildfire Hazard Potential (WHP) map products⁴¹ provide nationally consistent information about the likelihood that vegetation will burn under high intensity

⁴¹ <https://research.fs.usda.gov/firelab/products/dataandtools/wildfire-hazard-potential>

conditions that are difficult to control (Dillon et al. 2014; Dillon 2023). Across potentially affected IRAs outside of Alaska, 42 percent of lands are classified as high or very high Wildfire Hazard Potential, indicating a high potential for intense wildfire under severe weather conditions. Regional values range from 5 percent in the Eastern Region to 60 percent in the Pacific Southwest. WHP is a measure of hazard, not full risk, because it does not incorporate the presence of communities, infrastructure, or other highly valued resources and assets. High and very high WHP ratings generally correspond to conditions where suppression operations are more challenging due to expected flame lengths, fireline intensity, and resistance to control. In IRAs, these challenges may be compounded by limited road access, steep terrain, and a greater reliance on indirect tactics or aerial resources. Landscapes with both elevated WHP and restricted access can therefore present higher suppression difficulty, influencing potential fire growth and the likelihood of impacts to nearby communities or infrastructure where those values occur (for example, Thompson et al. 2016; Calkin et al. 2015). Because WHP alone does not characterize exposure to people or critical resources, this analysis incorporates additional national datasets that delineate Community Wildfire Risk Reduction Zones (CWRRZs) and high-priority firesheds, which are the primary indicators used by the Forest Service to understand and prioritize wildfire risk reduction (USDA FS 2022a; USDA FS 2022b).

Community Wildfire Risk Reduction Zone

A CWRRZ is a spatially defined area where mitigation activities are focused on reducing wildfire exposure to communities. These zones integrate wildfire likelihood with the location of populated areas to identify where ignitions are most likely to affect people and structures (USDA Forest Service 2022a). CWRRZs map where buildings exist and apply a 1.5-mile buffer around building clusters, producing a more spatially refined representation of communities and adjacent wildlands that most strongly influence their wildfire risk. CWRRZs are categorized into minimal exposure, indirect exposure, direct exposure, and the transmission zone. Within the potentially affected environment 5.9 million acres (14.8 percent) overlap CWRRZs (Table 23). Nearly all CWRRZ within the potentially affected environment occurs within the transition zone (within the 1.5-mile buffer surrounding building clusters).

Priority Firesheds

Firesheds represent areas where wildfire ignitions are likely to spread to communities and expose buildings or other highly valued resources and assets (USDA Forest Service 2022b). The Forest Service's Fireshed Registry tracks past, current, and planned investments in forest and fuel management in relation to historical and predicted fire activity. Firesheds identified as high risk for building and drinking-water-source exposure are prioritized for hazardous fuels reduction (USDA Forest Service 2022b). Across the conterminous United States, over 7 million acres (26 percent) of potentially affected IRAs intersect with current high-priority firesheds (Table 22). Alaska currently has no mapped high-priority firesheds on NFS lands. This evidence demonstrates that, although less than one-quarter of IRA acreage is closely associated with community protection priorities, there are specific landscapes where IRAs may contribute to elevated wildfire risk for nearby communities.

Wildland-Urban Interface

The Healthy Forests Restoration Act (HFRA) definition of the Wildland–Urban Interface (WUI), includes: at-risk community boundaries; a 1.5-mile buffer around at-risk communities unless modified by a Community Wildfire Protection Plan (CWPP); and areas surrounding evacuation routes for at-risk communities (see Alternative 3 – Modified Roadless Rule/IRA Boundaries). The HFRA WUI is used by the Forest Service to identify areas where hazardous fuels reduction may provide the greatest benefit in reducing wildfire exposure to people and structures (USDA Forest Service 2022). When combined with other national risk-based datasets—such as Community Wildfire Risk Reduction Zones (CWRRZs) and high-priority fire sheds—the HFRA WUI helps clarify where IRAs may intersect with broader community protection priorities. Within potentially affected IRAs 9.8 million acres (24 percent) overlap HFRA WUI.

Wildfire Risk Mitigation Opportunities

Wildfire risk mitigation refers to activities designed to reduce the likelihood of wildfire occurrence and lessen the potential for losses to highly valued resources and assets. Aspects of risk mitigation include reducing hazardous fuels on the landscape—through mechanical treatments and prescribed burning—and strategically investing in control features, such as roads or other linear fuel breaks, to help manage fires when they do occur and to support prescribed fire activities.

Hazardous Fuel Reduction

The 2001 Roadless Rule EIS stated that “the majority of fuel management work is expected to occur outside inventoried roadless areas” (USDA FS 2000). However, recent assessments, including the wildfire risk analyses presented here, indicate that substantial acreage within potentially affected IRAs has a relatively high likelihood of burning under high-intensity conditions that are difficult to manage or that could expose communities, infrastructure, or drinking-water sources. These areas may therefore represent priority opportunities for hazardous fuel reduction. Despite concerns about recent increases in large-fire frequency, size, and impacts to communities, many forested landscapes across the western United States remain in a deficit of fire relative to pre-settlement conditions (Parks et al. 2015, Parks et al. 2025).

The 2001 Roadless Rule does not prohibit and has not entirely prevented hazardous fuels reduction in IRAs. For example, there are no prohibitions on the use of prescribed fire. The 2001 Roadless Rule also provides exceptions for activities, including cutting and removing small diameter timber, to reduce wildfire risk. Table 23 describes the general opportunities across NFS land designations. Forest Service management activity reporting (Forest Activity Tracking System, or FACTS database) indicates that hazardous fuels reduction has been completed on about 5 percent of the potentially affected IRA area over the most recent decade (fiscal years 2014-2024).

Table 23. General characterization/comparison of opportunities for commonly claimed hazardous fuel reduction activities on NFS lands by designation

Land Designation	Mechanical Treatments	Prescribed Fire	Wildland Fire Use/ Unplanned Ignitions
Inventoried Roadless Areas (IRAs)	Limited due to restrictions on road construction, steep terrain, and high operational costs. Exceptions exist for cutting/removal of timber when needed to reduce wildfire risk, but access constraints reduce feasibility.	Moderate but constrained. Not prohibited, but limited by lack of control-line access, terrain, smoke management, and narrow burn windows. Implementation rates remain low relative to hazard levels.	Moderate to high opportunity when conditions allow. Naturally ignited fires can be managed for resource benefit, reducing fuels at landscape scales. Opportunities depend on ignition timing, risk environment, and resource availability.
Wilderness Areas	Very limited. Mechanical treatments generally prohibited under the Wilderness Act except in rare circumstances tied to imminent threats to life or property.	Moderate but highly constrained. Allowed when consistent with wilderness character and safety requirements, but access and operational limitations reduce feasibility.	High opportunity when risk is acceptable. Managed wildfire is often the primary fuels-modification tool due to natural ignition patterns and limited suppression infrastructure.
Other NFS Lands (Roaded/General Forest)	High opportunity. Road access, operable terrain, and fewer policy constraints allow for a broad range of mechanical treatments, including thinning and mastication.	High opportunity. Greater access, more flexible control-line options, and more favorable logistics support higher implementation rates.	Moderate opportunity. Managed wildfire may be used but is often constrained by proximity to communities, infrastructure, and values at risk.

Managing Unplanned Wildfire and Prescribed Burning

Of the reported accomplishments within the IRA, 55 percent involve managing unplanned ignitions to achieve land management plan objectives. When a wildfire is allowed to burn for resource benefit, the acres burned are recorded as a treatment accomplishment if post-fire assessments indicate the fire effects are consistent with the desired land management plan objectives identified for that location. The next most common activities are prescribed burning treatments (25 percent), including broadcast burning, jackpot burning, and under burning for fuel reduction or resource management. The frequent use of unplanned wildfires in activity reporting highlights its key role in ecosystem restoration and wildfire risk reduction.

These patterns highlight a fundamental trade-off in wildfire management. Immediate suppression can reduce short-term risks to communities, infrastructure, and other highly valued resources and assets. However, aggressive suppression across many decades has contributed to fuel accumulation and increased the likelihood that future fires, particularly those that escape initial attack, will burn under more extreme conditions and be more difficult to control – a dynamic often referred to as the wildfire paradox (Arno and Brown 1991; Calkin et al. 2015; Kreider et al. 2024). Allowing some naturally ignited fires (unplanned ignitions) to burn under conditions that align with land management objectives can help reduce fuels, restore ecological processes, and moderate long-term risk, but doing so requires confidence that fire behavior will remain within acceptable limits.

The difficulty is in determining when and where unplanned ignitions can safely provide ecological and risk-reduction benefits without exceeding control or threatening critical values. Fires in remote, unroaded areas can present opportunities to achieve resource objectives, particularly when spatial fire management planning, such as the use of Potential Operational Delineations (PODs) or similar tools, has identified likely fire pathways, potential control features, and areas where fire can be managed with lower risk (O'Connor and Calkin 2019; Thompson et al. 2022). These planning frameworks help clarify the operational environment and support decision-making that balances the immediate benefits of suppression with the long-term benefits of restoring fire as an ecological process.

Mechanical Treatments

Mechanical treatments within potentially affected IRAs have been more limited, focused on mechanical rearrangement (11 percent of reported activities) or mechanical removal (6 percent). Mechanical rearrangement includes movement or breaking down of woody fuels to reduce fuel bed depth or to speed up decomposition (such as piling, chipping, compacting). Mechanical removal occurs through a variety of means, including yarding and removal of woody fuels, burning of piled material, or even targeted grazing. Responsible Officials must grant exceptions for some of these activities (such as activities involving timber cutting), but others (targeted grazing, burning of piled material for example) are not prohibited (see 2001 Roadless Area Conservation Rule Implementation).

The analysis presented here suggests that hazardous fuels reduction treatment occurred on about 5 percent of the potentially affected inventoried roadless areas over the most recent decade. Previous research using similar agency data concluded that the 2001 Roadless Rule did not meaningfully constrain hazardous fuel treatment activities when considering the number and area of treatments as a share of total forested land (Healey 2020). But the limited total area treated within IRAs using mechanical methods is aligned with the general sentiment in planning studies that roadless designation is a barrier to mechanical treatment (North et al. 2015; Ager et al. 2021, Woolsey et al. 2024). There are also likely other inherent limitations for mechanical activities related to some combination of operability, lack of access for equipment, cost constraints, or consideration of public sentiment related to these activities in IRAs (for example, to avoid potential litigation).

Fire Control

Roads have potential to influence fire control opportunities through several mechanisms, featuring reduced decreased ground transportation response times to recently discovered ignitions, the types of resources that may be deployed, enhanced firefighter safety, and potential use as fire breaks during initial or extended attack (Thompson et al. 2021). Data from the FODR for fires occurring between 2014-2024 indicate that initial attack success rates⁴² are high (more than 90 percent) for all land designations. Still, initial attack success rates were highest within the other NFS land class versus IRAs and wilderness (Table 24). There is a trend of decreasing initial attack success from other NFS lands to inventoried roadless areas to wilderness. Mean

⁴² Initial attack was considered successful if the final fire size was less than 300 acres, and the success rate was calculated from the population of fires with sizes attributed, which is most but not all wildfires.

time to containment of escaped fires (greater than or equal to 300 acres) increases considerably from other NFS to roadless to wilderness. However, this analysis does not account for fire management objectives and strategies (opportunities that may include less-than-full-suppression tactics). Management strategies other than complete suppression are more likely to be employed in IRAs and wilderness areas because land management plans emphasize ecological objectives and because critical resources and assets that can be harmed by fires are relatively limited (Daniels et al. 2024).

Table 24. Fire occurrence statistics for NFS land categories of other, potentially affected IRAs, and wilderness using fire occurrence records with a point of origin on Forest Service ownership for years 2014-2024 from the Interagency Fire Occurrence Reporting Module (InFORM) Fire Occurrence Data Record (FODR). Initial attack success rates were calculated for the subset of fires with valid Incident Size attributes (not NA and >0) considering fires $\geq$ 300-ac as escaped. Time to containment was calculated for the subset of escaped fires with valid discovery and containment date times.

Fire occurrence metric	Other NFS	Potentially affected IRAs	Wilderness
Initial Attack Success Rate	97.2%	94.4%	92.3%
Mean days to containment for escaped fires	27.4	46.6	57.9

Ground transport is the most widely used and cost-effective way for firefighters to access fires. The fire suppression effort needed to achieve containment typically scales with fire size and perimeter length (Fried and Fried 1996), which incentivizes rapid initial response to fires that threaten critical resources and assets. Protection priorities and lengthy travel times to reach fires in IRAs could be one factor influencing the lower observed initial attack success rate as compared to other NFS lands (Table 24). Fires that occur far from roads usually require firefighters to either hike long distances, which increases response time and firefighter fatigue, or to use air transport for access, which can be costly and introduces different safety risks (Belval et al. 2025). One study on fireline construction productivity found that hand crews spent 18 percent of their time driving and hiking (Broyles 2011). It is reasonable to assume that the proportion of time spent on travel versus suppression activities is higher in IRAs than other NFS lands, thereby decreasing the overall efficiency of fire control, whether in an initial or extended attack.

The presence of roads and their maintenance levels influence the types of firefighting resources that can be feasibly deployed to suppress a fire. Fires in locations far from roads generally limit the response options to hand crews or specialized aviation resources like helitack and smokejumper crews, and their efficiency and effectiveness may be limited by what materials and equipment they can bring with them or be provisioned with (such as water, fuel, pumps, food, and camping gear). Roads facilitate use of additional firefighting resources such as wildland fire engines, water tenders, bulldozers, material and equipment transport vehicles, and forestry equipment (such as fellers, skidders, masticators, and chippers). The road design and maintenance requirements for these resources vary, but they are best supported by roads with smooth surfaces, low grades, and wide corners, which generally correspond to permanent Forest Service roads with maintenance levels 3-5. Temporary roads and roads with lower maintenance levels may sometimes accommodate these firefighting resources depending on site specific factors and the ability to make emergency improvements.

Table 25. Alignment of large wildfire perimeters with Forest Service roads during the Roadless Rule implementation period (2014-2023), indicating the prevalence of road use for large fire containment

Forest Service Region	Total large fire perimeter (miles)	Perimeter aligned with roads (miles)	Perimeter aligned with roads (percent)
Northern	3,319	541	16.3
Rocky Mountain	574	152	26.5
Southwestern	7,250	2,602	35.9
In termountain	2,138	319	14.9
Pacific Southwest	7,837	2,313	29.5
Pacific Northwest	7,142	2,302	32.2
Southern	1,287	592	46.0
Eastern	271	111	41.0
Alaska	41	0	0.0
Total	29,861	8,932	29.9

Roads contribute to several aspects of firefighter safety described in the Lookouts, Communications, Escape Routes, and Safety Zones (LCES) framework, the 10 Standard Firefighting Orders, and the 18 Watch-Out Situations (Gleason 1991; NWC 2025a). Roadbeds are typically devoid of fuels, and roadside vegetation is often managed to reduce hazards and improve sightlines. These conditions can enhance visibility for observing fire behavior, locating personnel, and communicating through visual signals. Roads can also serve as pre-existing escape routes, reducing the need to construct new ones and allowing firefighters to focus on other operational tasks.

Although roads can provide opportunities for containment, incident management teams do not automatically select every available road for suppression operations. Roads may be avoided when they are poorly aligned with expected fire spread, located in hazardous terrain, or positioned in areas where fire behavior is likely to overwhelm containment efforts. Some roads lack safe access or egress, have limited turnouts, or require extensive preparation before they can function as control features. In other cases, using a road may expose firefighters to unacceptable risks due to steep slopes, narrow canyons, or limited visibility. Strategic decisions also consider resource availability, operational priorities, and the potential for more effective containment opportunities elsewhere. As a result, only a subset of roads interacting with a wildfire are actively used in suppression, and containment outcomes reflect both the physical characteristics of the road and the tactical choices made by fire managers.

Roads are most frequently used as containment features when indirect tactics are safer, more efficient, or more effective than direct tactics, although few studies quantify their occurrence rate. One study in the Southwest found that 27.5 percent of large fire perimeters in recent decades aligned with roads (Yocom et al. 2019). This analysis was extended and updated for NFS lands (excluding Colorado and Idaho) using the most recent complete decade of large fire extents from Monitoring Trends in Burn Severity (2014–2023) and the current National Forest

System Roads (as described in National Forest System Roads)⁴³. Nationally, 23.5 percent of NFS road length that interacted with wildfires was associated with successful containment. Success rates varied by operational maintenance level: the highest rates occurred on level 3–5 roads (40.9–51 percent), moderate rates on level 2 roads (20.8 percent), and the lowest rates on level 0–1 roads (12.7–13.4 percent). Regional patterns also differed, with the highest containment success in Regions 8 and 9 (59.3–66.6 percent) and lower success rates across the Western Regions (14.6–39.7 percent).

Although there is limited research specifically evaluating the use of level 3–5 Forest Service roads for wildfire containment, several studies highlight the operational value of higher-standard roads in suppression efforts. Higher-maintenance roads generally provide safer access, more reliable egress, and better opportunities for anchoring indirect line construction or burnout operations (Thompson et al. 2021; Campbell et al. 2024). These roads are more likely to meet width, surface, and visibility requirements that support safe firefighter movement and equipment deployment. They also tend to be better aligned with terrain features that facilitate containment, such as ridgelines or flatter ground. They are more likely to be part of connected networks that offer multiple egress routes, an important consideration under the LCES framework. Although empirical studies quantifying containment success by road class are sparse, operational guidance and case-study analyses consistently emphasize that higher-standard roads are among the most reliable and frequently used containment features when indirect tactics are selected. The elevated containment success rates observed for level 3–5 roads in this analysis are consistent with these operational expectations.

Table 26. Length of Forest Service roads by maintenance level that encountered large wildfires during the Roadless Rule implementation period (2014-2023) and their containment outcomes, indicating the effectiveness of roads for large fire containment

Operational maintenance level	Total road length encountered (miles)	Successful containment length (miles)	Successful containment rate (percent)
0 - NOT MAINTAINED	28	4	12.7
1 - BASIC CUSTODIAL CARE (CLOSED)	9,588	1,284	13.4
2 - HIGH CLEARANCE VEHICLES	24,085	5,013	20.8
3 - SUITABLE FOR PASSENGER CARS	5,101	2,131	41.8
4 - MODERATE DEGREE OF USER COMFORT	1,132	463	40.9
5 - HIGH DEGREE OF USER COMFORT	684	349	51.0
NA - NOT APPLICABLE	1,657	691	41.7
Total	42,276	9,935	23.5

⁴³ Roads were included if they intersected NFS lands and were located within 100 meters of a large fire perimeter. For each fire, road segments were classified as “successful” if they intersected a 100-meter buffer around the final perimeter, and as “unsuccessful” if they fell within the remaining fire interior.

Table 27. Length of Forest Service roads by region that encountered large wildfires during the Roadless Rule implementation period (2014-2023) and their containment outcomes, indicating the effectiveness of roads for large fire containment

Forest Service region	Total road length encountered (miles)	Successful containment length (miles)	Successful containment rate (percent)
1	2,087	616	29.5
2	766	165	21.5
3	7,472	2,966	39.7
4	1,054	319	30.2
5	17,598	2,573	14.6
6	12,276	2,624	21.4
8	886	590	66.6
9	137	81	59.3
Total	42,276	9,935	23.5

Effects of Alternative 1 – No Action

The occurrence and severity of wildfires would likely remain similar to recent decades, with variation expected related to localized changes in environmental conditions and population levels. The area burned by wildfire is likely to remain relatively high in IRAs and wilderness, which could be beneficial in certain areas of high ecological resilience. While some hazardous fuels activities could continue, alternative 1 would allow for the least discretion for local land managers to modify dangerous fuels. Activities such as prescribed burning, or those not requiring mechanical thinning and road construction would likely continue at similar to recent rates (see Hazardous Fuel Reduction). Activities requiring tree cutting would require exceptions under the 2001 Roadless Rule exceptions, which allow for activities to reduce the risk of uncharacteristic wildfire effects (36 CFR 284.13(b)). The use of these exceptions would continue to be infrequent. The pace and scale of hazardous fuel treatments would likely be limited to that of recent decades, due to ongoing challenges to implementation, including litigation in some cases. Road construction or reconstruction would also continue to be an exception only when “a road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause the loss of life or property” (36 CFR 293.12(b)).

Overall, the prohibition on road construction would likely limit opportunities for mechanical thinning and fire control. Reliance on prescribed fire would continue, but its use is constrained by access, smoke, and public tolerance. Long-term effectiveness of fuel treatments requires maintenance; single entries lose effectiveness over decades. The 2001 Roadless Rule prohibitions and the existing condition of IRAs limit both access and the ability to sustain treatment cycles.

There would be no changes to how the Forest Service can respond to fires within IRAs. Incident-specific risk analyses that consider land management objectives, protection concerns, and firefighting safety, efficiency, and effectiveness will continue to inform response strategies. Challenges related to initial attack and large-fire containment in unroaded areas would persist. In

portions with limited existing road access, initial attack success rates would continue to be slightly lower than on other NFS lands. Without roads to support large-scale fire containment, firefighters would continue to be challenged to identify safe, effective, and efficient places to contain fires before they spread to more accessible parts of the landscape, continuing the trend of larger and longer-duration fires in IRA.

Effects of Alternative 2 – Proposed Action

Under alternative 2, additional active forest management, including some level of road construction, would likely occur with the extent varying by location (see National Forest Transportation System and Vegetation and Forest Management sections). With increased road construction, especially open-access roads, and other human activity, there could be increased hazard from human-caused ignitions. However, alternative 2 would provide increased opportunities for wildfire risk mitigation, especially within higher risk firesheds.

Wildfire Occurrence and Risk

Factors such as road type, pattern, and placement on the landscape may affect fire occurrence and the opportunities to mitigate wildfire risks with hazardous fuels reduction and fire response. As discussed in Wildfire Occurrence, past fire occurrence information on NFS lands, inventoried roadless areas, and wilderness can be used to evaluate the potential effects of new road construction. Road density is linked to human-caused wildfires, and as the density of roads increases so does the probability, number, and frequency of wildfire ignitions (Cardille et al. 2001). However, not all roads constructed under alternative 2 would be open for public access. Therefore, increased human ignitions do not necessarily follow from increased road construction. While human ignitions are a typical driver of wildfire occurrence, they can be targeted in wildfire prevention programs, including public education efforts and road-access restrictions (Devenport & Edgeley, 2025).

Wildfire Risk Mitigation Opportunities

Alternative 2 would provide the most local management flexibility for wildfire risk mitigation. This flexibility is essential for identifying, prioritizing, implementing, and maintaining treatments that address key drivers of wildfire risk, as well as for adapting strategies to changing conditions. Implementation of the National Active Forest Management Strategy goals would likely expand the area of timber harvest and hazardous fuels reduction treatments in potentially affected IRAs and shift some proportion of active management toward landscapes with the greatest potential to reduce wildfire risk to communities, infrastructure, and drinking-water-source watersheds.

Hazardous Fuels Reduction

Alternative 2 could present opportunities to implement activities that reduce wildfire risk in the potentially affected IRAs, compared to alternative 1. Expanded operational access via roadbuilding in high-priority areas may be used for increased active fuels management. Additional activities, including prescribed burning and wildfires with hazardous fuel reduction benefits, could also be influenced. Broadening the land base available for mechanical treatment allows for flexibility to develop treatment plans that optimize across the multiple dimensions of

effective landscape-scale fuel treatment design and restore fire as a key ecosystem process (Woolsey et. al. 2024).

Over 7 million acres (nearly 26 percent) of all inventoried roadless areas outside of Alaska intersect with high priority firehatched areas (there are no high priority firehatched areas in Alaska). Our assessment of the high priority firehatched area within IRAs was further refined based on timber operability, which approximates the land available to combined timber and fuels projects. Approximately 3.6 million acres (52 percent) of the high priority firehatched areas in the potentially affected IRAs are in the likely operable or operable-but-complex condition, meaning that mechanical fuels reduction activity could be feasible. About 16 percent fall within the likely operable category, likely providing the greatest opportunities for integration between hazardous fuels reduction and economical timber harvest (see Table 28), as consistent with land management plans. Local project-specific design would determine which part of these areas would be strategic for treatment.

The Pacific Southwest and Pacific Northwest Regions contain the greatest extent of high-priority firehatched overlap with IRAs, followed by the Northern Rockies, Intermountain, and Southern Regions (Table 28).

Table 28. Acres of high priority firehatched areas and operability for timber harvest, by Forest Service Region (not the operable areas contain only forested lands, so do not sum to the total firehatched acres).

Region	High priority firehatched area intersecting the potentially affected IRAs (ac)	Likely operable (acres)	Likely operable but complex (acres)	Likely inoperable (acres)
Northern	982,834	137,455	391,889	402,418
Rocky Mountain	160,694	47,261	51,550	53,651
Southwestern	812,566	58,794	124,543	507,006
Intermountain	1,049,213	122,555	191,470	549,921
Pacific Southwestern	2,182,708	339,082	892,234	776,492
Pacific Northwestern	1,606,208	313,961	688,055	515,941
Southern	432,159	164,960	211,645	55,089
Eastern	9,970	5,057	3,854	1,027
Alaska	0	0	0	0
Total	7,236,352	1,189,125	2,555,240	2,861,545
Total percent	100.0	16.4	35.3	39.5

Fire Control

Alternative 2 would allow both temporary and permanent road construction where not otherwise restricted by land management plans. However, the prevalence of temporary, spur road construction within the operable areas around existing roads is likely, assuming that timber projects are the primary motivation and funding source for new roads (see National Forest System Roads section). New permanent road construction, strategically planned to support fuels and fire objectives, is less likely to be widespread within potentially affected IRAs, given the costs of road construction costs, maintenance funding limitations, constraints on placement of roads, and current land management plan restrictions. In high-risk landscapes, protection

concerns could be great enough to motivate new permanent roads for fuels and fire suppression purposes. In such cases, they would likely be strategically placed along the edges or through the core of IRA to mitigate wildfire transmission to adjacent communities or to suppress fires at smaller sizes to reduce impacts to resources and assets within IRAs.

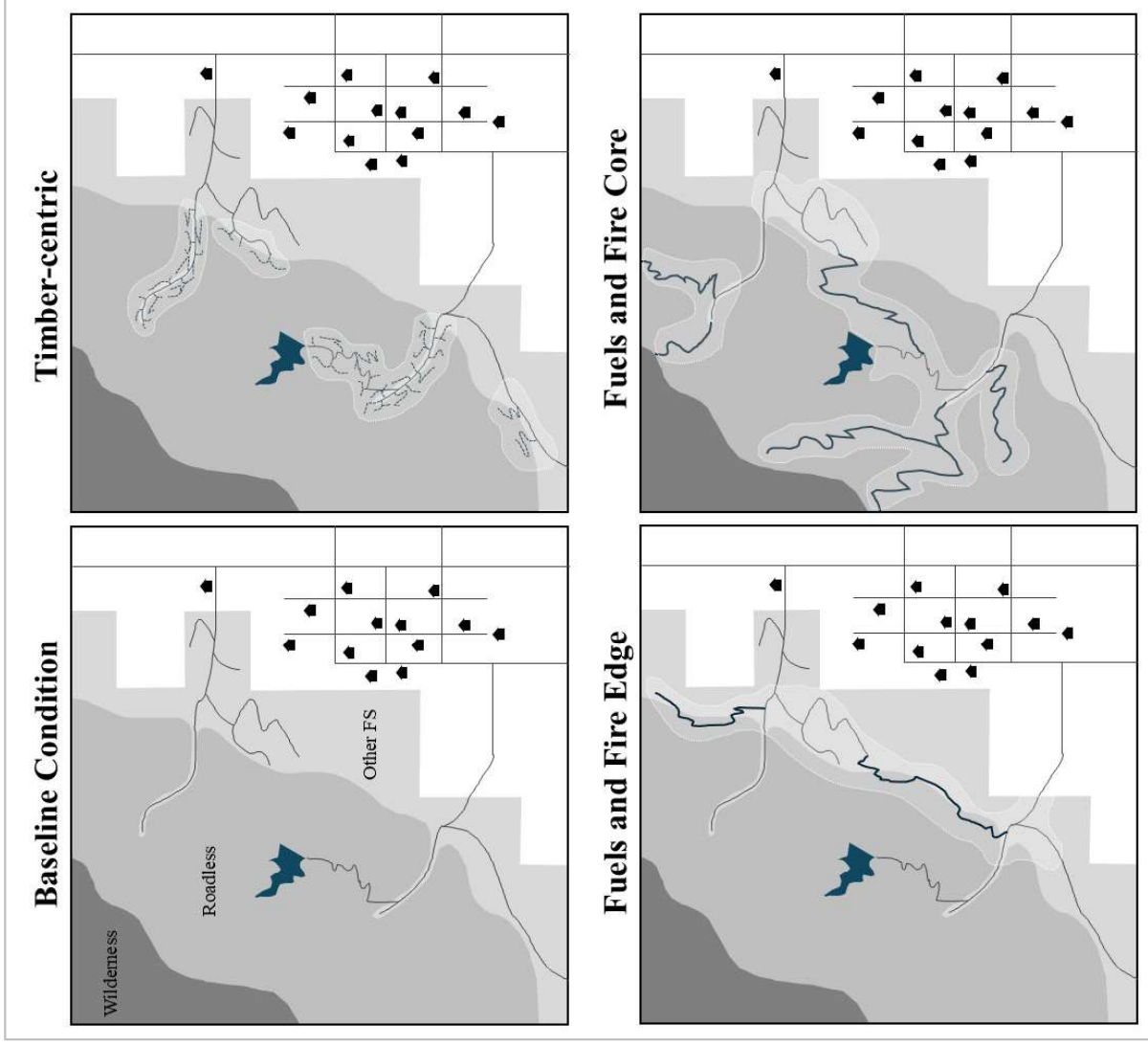


Figure 16. Hypothetical depiction of potential road scenarios under different primary objectives of commercial timber harvest and wildfire risk reduction. Timber-centric investments are likely to result in additional temporary, spur roads within the operable areas around existing roads. Roads constructed for strategic wildfire risk reduction may be prioritized differently within operable areas based on their potential to provide effective fire control opportunities near the WUI (Fuels and Fire Edge) or hazardous fuel reduction opportunities further within the core of IRAs (Fuels and Fire Core).

With increased road access, initial attack success rates would be expected to increase. Additional roads would provide safer, more effective, and more efficient containment opportunities,

potentially reducing fire sizes and durations. The magnitude of these beneficial effects would depend on site-specific decisions regarding the amount and layout of the expanded road network, its strategic placement for fire control, and its maintenance level. Benefits would increase if road access were paired with hazardous fuel treatments.

Effects of Alternative 3 – Modified Rule

The effects of alternative 3 would be similar to those of alternative 2 - the types of wildfire risk reduction opportunities (hazardous fuels reduction and fire response) are not expected to differ meaningfully between alternatives 2 and 3 in the areas where prohibitions are removed.

Alternative 3 would provide less flexibility than alternative 2 to target wildfire risk in large patches retained as IRAs. Hazardous fuel reduction treatments would continue to be similar to alternative 1 for areas that remain subject to the rule prohibitions.

Under alternative 3 opportunities for mechanical hazardous fuels reduction and fire response would be concentrated in the WUI and roaded roadless, nearer to the communities they are intended to protect. Alternative 3 has a similar proportion of area mapped as high or very high WHP at 42.7 percent, excluding Alaska (Table 29). Compared to the potentially affected IRAs, alternative 3 has a greater proportion of potentially affected area overlapping high priority freshets, CWRZs, and HFRA WUI (Table 29) – especially when excluding Alaska.

Table 29. Area of overlap between the alternative 3 potentially affected IRAs and key national indicators of wildfire hazard; wildfire risk to communities, infrastructure, and drinking water as represented by high priority freshets; and wildland-urban interface

Region	Area with high or very high wildfire hazard potential (WHP) (acres) (Percent of potentially affected IRAs)	Area (percent) within high priority freshets (acres)	Area (percent) within community wildfire risk reduction zones (CWRZ) (acres) (Percent of potentially affected IRAs)	HFRA WUI (acres and percent)
Northern	1,689,552 (47.7%)	610,216 (17.2%)	1,022,088 (28.9%)	1,922,932 (54.3%)
Rocky Mountain	418,493 (31.8%)	127,238 (9.7%)	313,390 (23.8%)	1,004,272 (76.4%)
Southwestern	923,494 (56.0%)	601,524 (36.4%)	442,667 (26.8%)	858,665 (52.0%)
In termountain	1,799,376 (33.5%)	918,872 (17.1%)	1,146,649 (21.3%)	3,084,578 (57.4%)
Pacific Southwest	1,389,103 (59.0%)	1,397,939 (59.4%)	829,636 (35.3%)	1,074,784 (45.7%)
Pacific Northwest	1,285,960 (55.6%)	938,680 (40.6%)	486,989 (21.0%)	802,128 (34.7%)
Southern	49,185 (6.1%)	425,338 (52.8%)	519,539 (64.5%)	781,349 (96.9%)
Eastern	32,518 (8.3%)	5,536 (1.4%)	213,289 (54.3%)	208,961 (53.2%)
Alaska	Not Available	(0.0%)	178,781 (1.9%)	47,602 (0.5%)
Total	7,587,681 (28.0%)	5,025,343 (18.5%)	5,153,030 (19.0%)	9,785,271 (36.1%)

Region	Area with high or very high wildfire hazard potential (WHP) (acres) (Percent of potentially affected IRAs)	Area (percent) within high priority fire sheds (acres)	Area (percent) within community wildfire risk reduction zones (CWRRZ) (acres) (Percent of potentially affected IRAs)	HFRA WUI (acres and percent)
Total (excl. AK)	7,587,681 (42.7%)	5,025,343 (28.3%)	4,974,249 (28.0%)	9,737,669 (54.9%)

Alternative 3 has the same concern about new roads increasing ignitions, and these ignitions would be closer to communities, where they could potentially cause more damage. However, the net impact of new roads on fire occurrence is likely small or insignificant, given the potential for improved response times and increased initial attack success. Alternative 3 would provide less flexibility than alternative 2 to target wildfire risk in remaining IRAs. The increased fire control opportunities under alternative 3 would be concentrated closer to community protection areas than under alternative 2.

Conclusion

Currently the number, frequency, and density of wildfire ignitions are lower in designated wilderness and potentially affected IRAs compared to other NFS lands. Under alternatives 2 and 3, if there is an increase in public road access, the number and frequency of wildfires could rise. However, public access to roads constructed or improved under alternatives 2 and 3 can be limited to minimize fire hazard in high-risk areas.

Under alternative 1, hazardous fuels treatments can occur within inventoried roadless areas if they do not include road construction or tree cutting, or if exceptions are granted by the Responsible Official. Agency management records show that a lack of roads has not prevented fire prevention or protection measures, especially wildland fire use and prescribed fire. However, road restrictions limit opportunities for mechanical thinning and fire control.

Alternatives 2 and 3 would provide additional opportunities for hazardous fuel treatments in priority fire sheds and other high-risk areas, when compared with alternative 1. Substantial acreage within potentially affected IRAs has a relatively high likelihood of burning under high-intensity conditions that are difficult to manage or that could expose communities, infrastructure, or drinking-water sources. Between 15-29% of the alternative 2 affected environment has at least one indicator of wildfire risk that would elevate it as a priority for mitigation. These areas may therefore represent priority opportunities for hazardous fuel reduction. The alternative 3 affected environment is similar to alternative 2 in terms of wildfire hazard potential, but has proportionately more high priority fire shed, community wildfire risk reduction zone, and WUI overlap. Under alternatives 2 and 3, certain strategically placed roads may confer fire control benefits not currently attainable under the no-action alternative. Opportunities under alternative 3 would be more concentrated in the WUI and roaded roadless, nearer to the communities they are intended to protect.

The Forest Service would use tools already in existence to help prioritize where site-specific treatments occur and to make hazardous fuels program investments with emphasis on existing

Forest priorities, integration with the timber/vegetation management program, and an outcome-based assessment framework.

Non-Native Invasive Plant Species

Introduction

Executive Order 13751 defines an “invasive species” as a non-native organism whose introduction causes or is likely to cause economic or environmental harm or harm to human health, animal, or plant health. This executive order directs all Federal agencies to address invasive species concerns and refrain from actions likely to increase invasive species problems. Invasive plants can negatively affect habitat by competing with native plants for resources such as water and light, establishing and changing the community composition, eliminating or reducing native plants, or changing the vegetation structure. The changes in community composition or vegetation structure can reduce native plant populations as well as negatively affect habitat for wildlife and fish.

Policy and guidance for managing invasive plants are provided by the Forest Service Manuals and Handbooks and Forest Service policy, including the Invasive Species Management Policy (Forest Service Manual [FSM] 2900) and the National Strategic Framework for Invasive Species Management (USDA Forest Service 2013), and individual land management plans and invasive plant management plans. FSM 2900 and Forest-wide standards and guidelines include direction to review proposed projects to determine the risk of introduction or spread of invasive plants and implement appropriate mitigation measures. They also include direction to control existing invasions and rehabilitate habitats impacted by invasive species.

Potentially Affected Environment

Invasive plants are ranked and identified as being invasive or noxious in the state in which they occur. Invasive plants can spread rapidly and reproduce in high numbers, which enables them to effectively crowd out native plant populations. Some can pose serious threats to the composition, structure, and function of native plant communities and ecosystems. Ground-disturbing activities from machinery can transport seeds and reproductive plant parts of invasive plants and can create openings for existing or new populations to expand. Large, severe fires can also create openings and invasive plants may have competitive advantages over native plants that allow them to spread into recently disturbed sites. Forest Service policy and guidance provides direction to address invasive plant species establishment and spread by implementing land management plan standards and guidelines as well as measures in project planning and design such as equipment cleaning, herbicide treatments, and monitoring. Within the potentially affected IRAs, multiple invasive plant species were mapped⁴⁴ and cover approximately 309,000 acres (270,787 for alternative 3), less than 1 percent of the potentially affected environment area. It is likely that there are populations that have been undetected and have not been mapped. It should also be

⁴⁴ The Natural Resource Manager within the Forest Service Threatened, Endangered, and Sensitive Plant–Invasive Species (TESP-IS) database was used to derive GIS polygon layers used in the analysis. Only existing mapped invasive plant occurrences within the inventoried roadless area were analyzed and obtained from the TESP-IS. These polygons represent mapped estimates of invasive plant infestations.

noted that of the 438 invasive plant species recorded in the affected environment area, their status and conservation rankings differ from state to state because each jurisdiction uses its own management priorities and evaluation methods.

Effects of Alternative 1 – No Action

Implementation of the no-action alternative would result in no direct increase of existing and new invasive plants in inventoried roadless areas in the short term because no new activities would occur. However, existing vectors and corridors for invasive plant spread, such as livestock, wildlife, motorized vehicles, roads, and trails would continue to contribute to a gradual steady encroachment of newly established invasive plant populations over the long term, particularly if resources are not available or there is lack of access to conduct ongoing detection and treatment of new populations. Where populations of invasives currently exist, population expansion by way of existing vectors and corridors would likely continue at current rates, depending on species, site characteristics, and other variables. The costs of treating existing invasive plants could also slightly increase due to potential population expansion. Under the no-action alternative, there would be fewer opportunities for active management in inventoried areas where fuels treatments and other management is needed. Wildfires and other disturbances create conditions that are conducive to invasive plant establishment, such as large areas of burned ground. Other factors that contribute to the introduction and establishment of invasive plants include transport of seeds and reproductive plant fragments on vehicles traveling on existing open roads, spread of existing roadside invasive plants, and potential wildfires that are likely to continue under this alternative.

Effects of Alternative 2 – Proposed Action

In addition to the ongoing impacts of invasives (as described in alternative 1), under alternative 2, road construction and timber harvest activities, and other development, are likely to increase in some areas. Where these activities occur, they have the potential to introduce and spread invasive plant species due to ground disturbance. Effects from invasive plants may be minimal where the intensity of ground disturbance is low or where there are no existing invasive plant infestations. In the short term, ground-disturbing activities within the affected environment area could potentially lead to the introduction of invasive species where these species do not currently exist, especially where these activities are more likely to occur (see above). In the long term, increased disturbance could increase the spread risk of existing invasive plant populations. In addition, Forest Service policy and land management plan direction for invasive plants, best management practices, and future project design features reduce the likelihood of increasing or spreading invasive plant infestations (such as by treatment or removal). Alongside these measures, there would also likely be an increased cost associated with detecting and treating new invasive plant populations.

Effects of Alternative 3 – Modified Rule

Alternative 3 has fewer acres in the potentially affected area than alternative 2 and fewer acres of invasive plants (270,787 acres) within the affected area, though still less than 1 percent of the area is affected. The potential for the introduction and spread of invasive plant species due to ground disturbance associated with timber harvest, road construction, and other development or

management activities would be similar to alternative 2. It is assumed that the majority of proposed projects in the affected area would be forest management activities. The areas of likely operability for these activities are not expected to be significantly different under alternatives 2 and 3. As a result, the alternatives are not expected to differ significantly in regard to their contributions to the introduction and spread of invasive species.

Conclusion

The no-action alternative would result in no direct increase in existing and new invasive plant species in the affected area because no project actions would occur. Conversely, alternatives 2 and 3 may provide opportunities for activities that could potentially increase the extent or the number of invasive plant species in the affected environment area. Invasive plant establishment or spread would most likely be in areas that would create ground disturbance. However, alternative 2 and 3 would also provide opportunities to reduce fuel loads in the affected environment area, therefore reducing the potential for wildfire that could create large openings for the establishment of invasive plant species. With compliance of applicable laws and implementation of the forest plan's standard and guidelines for invasives species in addition to future project design features and management requirements to mitigate invasives species introduction and spread, the effects from activities resulting in the implementation of alternatives 2 and 3 are not expected to greatly increase.

Soil, Water, and Air Resources

Soil productivity, erosion, water quality, water yield and timing, and air quality can vary widely, even in undisturbed situations. Road construction, timber harvest, prescribed burning, and similar activities, can affect these values, and their variability. Sometimes the effects are within natural ranges; sometimes they are not. The most common effects of road construction and timber harvest activities on soil, water, and air resources are loss of vegetation, soil erosion and compaction, loss of soil productivity, increased potential for landslides, reduced transpiration (use of water by plants), increased water runoff, reduced water quality, and periodically reduced air quality.

Roads have long been recognized as a substantial human-caused source of soil and water disturbances in forested environments. Most impacts occur during initial road construction and then gradually decrease as roadside vegetation is reestablished and disturbed soil surfaces stabilize. Effects such as landslides persist when a road permanently undercuts unstable soils or landforms, or when roads are continually disturbed by road maintenance. Periodic maintenance activities can cause some of the impacts to reoccur. Areas of particular concern are the road surface and associated drainage structures such as ditches and water crossings (bridges, culverts, and fords). Poorly maintained roads can result in greater impacts as surface water is diverted, culverts plug, and other road design characteristics are compromised. Lack of maintenance commonly has detrimental effects on water quality. Insufficient maintenance funding is a key reason for the lack of adequate road maintenance (USDA Forest Service 2001). Temporary road construction has most of the same effects as permanent road construction, but generally for a shorter term and for a more limited physical extent. Long-term effects can occur if temporary roads receive extended use and are not decommissioned.

The National Forest Management Act requires land management plans to have assurances that soil, slope, or other watershed conditions will not be irreversibly damaged (16 USC 1604(g)(3)(E)). This is reflected in both the 2012 planning regulations at 36 CFR 219.8(a)(2) and the previous 1982 planning regulations (now replaced) that were at 36 CFR 219.23.

Soils

Background

Soil Compaction, Displacement, and Site Productivity

Timber harvests and road construction can negatively impact soil and affect long-term productivity due to heavy machinery use and timber harvest operations which can 1) compress the soil (compaction), 2) displace or mix the surface organic matter with the mineral soil, or 3) expose low-productivity subsoil. These soil disturbances have the potential to affect site productivity. The degree and extent of soil disturbance are often site-specific and the distribution across a site depends on the type of logging system (such as ground-based operations, skyline or helicopter harvest systems) and silvicultural prescription (Crawford et al. 2021).

Soil disturbance most commonly occurs as compaction resulting from ground-based harvesting and slash disposal equipment. All soils are highly susceptible to compaction except for a few unique, strongly cemented soils. Soil compaction is defined as the “densification of an unsaturated soil body by the reduction of its air-filled porosity, generally resulting from the application of compressive forces (pressure)” (Hillel 2008: 265). Forest soils are prone to compaction due to their loose, friable structure and high porosity. The most common cause of soil compaction is human activities, such as timber harvesting, that increase the amount of traffic (such as off-road vehicles, harvest equipment; Cambi et al. 2015). The degree of soil compaction is related to soil texture (Page-Dumroese et al. 2009), soil moisture (Froehlich and McNabb 1983), harvesting system (Adams and Froehlich 1981), amount of slash on the soil surface (Han et al. 2006; McMahon and Evanson 1994), and the number of machine passes (Han et al. 2006; McDonald and Seixas 1997).

Concerns about the effects of compaction extend to reductions in vegetation and root growth, nutrient cycling, and microbial functions (Bodelier et al. 1996; Cambi et al. 2015; Frey et al. 2009; Startsev and McNabb 2000). Harvest equipment traffic leads to an increased bulk density, a measure of soil compaction (Han et al. 2006). The extent of impact on skid trails can be variable with bulk density increases in the skid tracks (if present), throughout the skid trail width (up to 5 meters in width), and up to 2 meters outside the trail (Solgi et al. 2020). In addition to changing soil physical properties, increased compaction can lead to substantial alterations of soil biological and chemical properties (Cambi et al. 2015), such as reduced gas exchange and water infiltration, reduced root and tree growth, lowered decomposition, altered nutrient cycling, and a general decline in health of the microbial community. These properties are critical for maintaining vegetation growth, and range from short- to long-term effects, depending on the degree of soil compaction.

Soil displacement and erosion, rutting and puddling, and platy structure are some other common forms of soil disturbance. Once soils reach saturation, soil displacement is often more detrimental than compaction (Crawford et al. 2021). Soil displacement is the movement of soil from one place to another by harvest equipment and is sometimes confused with soil erosion which refers to the physical wearing away of the Earth's surface by wind, water, or other natural geologic forces. Displacement occurs when equipment turns on soft soil or when equipment moves topsoil from one location to another. Displacement can negatively affect numerous site and soil characteristics by altering short- or long-term soil quality or site productivity. For example, organic horizons improve site productivity because they act as a mulch, drive nutrient cycling, and are home to many macro- and microorganisms (Martin 1988), but they can easily be displaced during harvest operations. Perhaps the most important attribute of surface organic horizons and organic matter within the soil profile in seasonally dry forest soils is that they hold a great deal of water; 1 to 6 percent organic matter can hold 5 to 25 percent available water (Hudson 1994).

The effects of soil compaction and displacement have the potential to affect site productivity⁴⁵. The effects of soil disturbance on site productivity or hydrologic function are related to the degree, extent, distribution, and duration of impact (Craig and Howes 2007). Forest soil surface horizons are more fertile than deeper soil horizons, and a compacted or displaced surface can lead to reduced plant growth. Severe compaction in the surface mineral soil can negatively impact forest regeneration and root development when the soil penetration resistance exceeds 2.5 Megapascal, which is commonly reached in skid trails (Cambi et al. 2015; Williamson and Neilsen 2000). Seedling roots have difficulty penetrating compacted mineral soil, leading to seedling death or growth deformities (Greacen and Sands 1980). Seedling survival declines when emerging root radicles from seeds cannot penetrate dense soil caused by soil compaction (Froehlich et al. 1986). If seedlings do establish on compacted soils, they may have lower growth rates due to the alteration of soil physical properties that influence root penetration, aeration, moisture, and nutrient uptake (Brais 2001; Conlin and van den Driessche 1996; Demir et al. 2010; Froehlich et al. 1986; Gomez et al. 2002; Pinard et al. 2000; Smith 2003; Williamson and Neilsen 2000). The greatest losses during seedling establishment occur when the surface structure is destroyed by puddling (smeared mineral soil particles that reduce infiltration; Binkley and Fisher 2013).

Soil Loss and Sedimentation

Erosion is defined as the detachment and removal of soil particles from the soil surface by running water or wind (Hillel 2008). It can be exacerbated by displacement because of the piling of loose soil on the soil surface. On slopes, removal of overstory trees can lead to erosion where ground cover or surface organic horizons are removed due to traffic. Soil disturbance and erosion can further be increased if stumps are pulled for bioenergy or to reduce a threat of disease (Page-Dumroese et al. 1999). Over time all roots decompose and this loss of root structure within the

⁴⁵ Site productivity is the capacity of a site to grow biomass such as trees.

soil profile can exacerbate soil erosion, particularly shallow landslides on steep slopes (Amman et al. 2009).

Sediment within timber harvest units is most strongly related to road construction and associated facilities (skid roads and trails, log landings, etc.) that are needed to remove logs (Anderson et al. 1976). Skid roads and trails, log landings, and similar disturbances within the sale area are the main cause of soil erosion and can contribute up to 90 percent of the sediment generated by timber sale activity (Patric 1976; Swift 1988). Historically, poorly managed timber harvest activities have been a major source of sediment from a timber sale area (Martin and Hombeck 1994). However, implementation of Best Management Practices may significantly reduce sedimentation. Generally, monitoring has shown compliance rates for implementing best management practices to be between 85 percent and 98 percent,⁴⁶ with compliance rates increasing over time as awareness and training programs take effect (Edwards 2000). Although best management practices do not completely eliminate water quality impacts, they do reduce impacts to acceptable levels. “Best management practices may not be completely effective, but they do provide a level of protection that the states and the Environmental Protection Agency judged sufficient to meet the goals of the Clean Water Act” (Cristan et al. 2018). All Forest Service permanent and temporary roads needed for timber sales are designed and constructed using water, soil, and air best management practices⁴⁷ that meet or exceed those required by individual States under Environmental Protection Agency (EPA) direction. Current road design and management criteria incorporate the latest knowledge and experience, resulting in fewer effects such as surface erosion, landslides, sedimentation, and dust emissions, on water, soil, and air resources. Proper design and construction of new roads and maintenance of existing and new roads can limit but not eliminate these effects (USDA Forest Service 2000b).

Landslides and Debris Flows

Forest harvesting and road construction may significantly increase the frequency and severity of debris flows by altering the landscape's hydrology and soil stability. Harvesting and roads disturb the natural cycle of soil reinforcement and drainage, making slopes more susceptible to failure, especially in mountainous regions with heavy rainfall (Goetz et al. 2015).

Effects of forest harvesting activities increase the likelihood of debris flows through reduced soil reinforcement and altered hydrology. The decay of tree root networks can dramatically increase the risk of shallow landslides, which can then evolve into debris flows. Tree roots act as a natural binding agent, reinforcing soil and increasing its shear strength. After logging, roots decay over a period of 5 to 20 years, causing a critical drop in soil strength. This makes slopes more vulnerable to landslides, with the highest risk occurring 5 to 10 years after harvesting. The removal of forest canopy and undergrowth reduces the amount of rainfall intercepted and transpired by plants. This increases the amount of water reaching the forest floor, elevating soil moisture levels and raising pore water pressure within the soil. Saturated soils are more prone to failure, particularly on steep slopes. Logging and mechanical harvesting can compact soils and

⁴⁶ Results vary between States and ownerships, with Federal lands and large forest industry entities showing highest compliance.

⁴⁷ National Best Management Practices for Water Quality Management on National Forest System Lands, 2012

create pathways like skid trails and landings. This decreases the soil's infiltration capacity, causing more rainwater to run off the surface rather than soak into the ground. This increased runoff can contribute to triggering debris flows. Landslides that occur in harvested areas can deliver large amounts of sediment directly into stream channels. This added material can accumulate and later be mobilized by rainfall, initiating in-channel debris flows.

Forest roads may be more of a trigger for landslides and debris flows than logging alone, particularly when improperly located in unsuitable terrain. Roads destabilize slopes and alter drainage networks in several ways. Road construction involves creating artificial cuts and fills that can alter the natural slope profile. Road fills are highly prone to failure because they are composed of loose, uncompacted material placed on the original, often steep, hillslope. Steepened road cuts can also fail, especially if subsurface water flow is concentrated behind them. Roads act as effective drainage systems, redirecting and concentrating surface and subsurface water flow. Road surfaces are highly compacted, which prevents infiltration and forces water to run off the surface. Poorly designed culverts or drainage ditches can become overwhelmed during intense rainstorms. When blocked by sediment and woody debris, water can overtop the road and lead to erosion and roadbed failure. Roads create a "hydrologically connected" network that quickly routes water and sediment into stream channels, bypassing natural infiltration processes. This leads to flashy and increased streamflows, which can initiate in-channel debris flows. Many landslides are triggered at road sites, and research has shown that landslides and debris flows are 6 to 9 times more likely adjacent to forest roads (Goetz et al. 2015).

Potentially Affected Environment

In general, soil conditions within the potentially affected environment are satisfactory. Potentially affected inventoried roadless areas have few large-scale disturbances related to management activities.

Soil Compaction, Displacement, and Site Productivity

Data collected as part of the Watershed Condition Classification⁴⁸ indicates that soil conditions in HUC⁴⁹-12 watersheds (watersheds) which contain the potentially affected inventoried roadless areas across the Eastern, Southern, Southwestern, and Intermountain regions have soil conditions that are ranked as 43 percent, 28 percent, 31 percent and 13 percent as "Poor" which indicates

⁴⁸ Watershed Condition Classification (WCC) system: The WCC system is a national forest-based, reconnaissance level evaluation of watershed condition that can be aggregated for a national assessment of watershed conditions. The WCC system offers a systematic, flexible means of classifying watersheds based on a core set of national watershed condition indicators. The system relies on professional judgment, GIS data, and available national databases, and on written rule sets and criteria for indicators that describe three watershed condition classes (functioning properly, functioning at risk, and impaired function). The WCC system is a first approximation of watershed conditions, and WCC information is employed to establish priorities, evaluate program performance, and communicate watershed restoration successes to interested stakeholders and Congress (FS-978, 2011). For more information, see: https://www.fs.usda.gov/naturalresources/watershed/condition_framework.shtml

⁴⁹ HUC is short for hydrologic unit code. A hierarchical, numeric code that uniquely identifies hydrologic units. There are six levels of Hydrologic Unit Code classification: 2-digit (region), 4-digit (subregion), 6-digit (accounting unit), 8-digit (catchment unit), 10-digit (watershed), and 12-digit (subwatershed). EnviroAtlas national maps summarize data by 12-digit HUC (subwatershed level).

“significant alteration to reference soil condition is evident” (Table 30). The least altered soil conditions are currently found across watersheds in the Northern, Rocky Mountain, Pacific Southwest, and Pacific Northwest regions, where more than 75 percent of soils rank as being “Good” condition with “minor or no alteration of soil condition”.

Soil conditions are least favorable for activities across the Southern, Eastern, Southwestern, and Intermountain Regions based on the Watershed Condition Classification Soil Indicator rating for watersheds containing potentially affected inventoried roadless areas. This indicator addresses alteration of natural soil condition, including productivity, erosion, and chemical contamination.

Table 30. Soil conditions based on the Watershed Condition Classification Soil Indicator rating for watersheds containing potentially affected inventoried roadless areas. This indicator addresses alteration of natural soil condition, including productivity, erosion, and chemical contamination

Region	Good	Fair	Poor
Northern	79%	15%	6%
Rocky Mountain	77%	21%	2%
Southwestern	27%	42%	31%
Intermountain	35%	52%	13%
Pacific Southwest	78%	16%	6%
Pacific Northwest	75%	23%	2%
Southern	14%	44%	43%
Eastern	7%	66%	28%

Soil Loss and Sedimentation

Soil loss and erosion from forest harvest operations is typically highest from native surface or gravel roads. The GRAIP Road and Trail Erosion⁵⁰ metric is a spatial modeling approach to estimate sediment delivery to waterbodies from road and trail surfaces within a watershed. Within watersheds that contain potentially affected inventoried roadless areas, the best conditions are found in the Eastern and Pacific Northwest regions where more than 50 percent of the watersheds are rated “Good” which corresponds to a low sediment delivery to waterbodies (Table 31). All other Regions have more than 50 percent of watersheds classified as “Fair or Poor” with the highest percentages found in the Southwestern, Southern, Pacific Southwestern, and Intermountain regions.

The Southwest and Intermountain regions are characterized by arid or semi-arid climate with high intensity monsoon rainfall that leads to high erosion rates. The Pacific Southwest region is a Mediterranean climate that experiences high intensity and prolonged duration storm events

⁵⁰ Geomorphic Roads Analysis and Inventory Package (GRAIP): Uses Digital Elevation Maps (DEMs), existing road GIS layers with surfacing type information, and field calibration datasets to determine subwatershed scale road sediment production and delivery. Specifically, we use two metrics derived in GRAIP: Slope Stability (C_{min}) and Erosion Base Rate from Roads (Luce et al. 2025). Sediment production from roads is calculated, and delivery is based on the flow distance from the road to the stream and the calibrated probability of delivery at that distance. Slope stability ratings are based on the infinite-slope Factor of Safety equation (such as O’Loughlin 1974, Gray and Megahan 1981, Hammond et al. 1992, Pack et al. 1998), which describes the force balance of soil on a hillside. For more information, see: <https://research.fs.usda.gov/rmrs/projects/graip>

during winter months; while the Southern region is more temperate, it experiences very high intensity and often long duration rainstorms from tropical disturbances and convective storms.

Table 31. GRAIP derived Road and Trail Erosion Indicator rating for watersheds containing potentially affected inventoried roadless areas. This indicator addresses the propensity for existing road and trail networks to deliver sediment to a water body based on local climate, topography, and soils.

Region	Good	Fair	Poor
Northern	47%	50%	3%
Rocky Mountain	48%	50%	2%
Southwestern	15%	77%	8%
Intermountain	32%	66%	2%
Pacific Southwest	28%	64%	8%
Pacific Northwest	64%	34%	2%
Southern	18%	73%	9%
Eastern	78%	21%	1%

Landslides and Debris Flows

Hillslope stability was modeled in GRAIP and results suggest that the highest risk for landslide potential within potentially affected inventoried roadless areas is found in the Pacific Northwest and Pacific Southwest regions where 69 percent and 56 percent of watersheds containing potentially affected inventoried roadless areas are rated as having “Poor” Slope Stability (Table 32). This is likely a factor of steep topography and intense precipitation events during winter storms along the Coast, Cascade, and Sierra Nevada ranges.

Table 32. GRAIP derived Slope Stability Indicator rating for watersheds containing potentially affected inventoried roadless areas. This indicator addresses the potential for slope failure associated with road construction.

Region	Good	Fair	Poor
Northern	36%	17%	46%
Rocky Mountain	64%	19%	17%
Southwestern	58%	25%	18%
Intermountain	52%	34%	14%
Pacific Southwest	26%	18%	56%
Pacific Northwest	15%	17%	69%
Southern	31%	30%	39%
Eastern	66%	19%	14%

Effects of Alternative 1 – No Action

Alternative 1 would have little potential for altering current soil and water conditions in the potentially affected IRAs because of the general prohibitions on road construction, reconstruction, and tree cutting activities. Few forest roads or major facilities are expected to be constructed in the potentially affected inventoried roadless areas. Thus, there would be little to no additional permanent loss of the productive capacity of the land. Likewise, the limited miles of new roads constructed or reconstructed relying on exceptions, would be scattered among

many different potentially affected inventoried roadless areas so the likelihood would be low that projected road construction would occur on highly sensitive soils and result in a substantial increase in soil erosion. There would also be little additional risk of significant increase of landslides or debris flows because the likelihood would be low that projected road construction would occur on highly unstable slopes and result in a substantial increase in landslides or debris flows.

Effects of Alternative 2 – Proposed Action

Under alternative 2, additional road construction, reconstruction, temporary roads, timber harvest, and other activities are reasonably foreseeable within the potentially affected IRAs. Impacts to soil resources are more likely where activities are more likely to occur (see National Forest System Roads, Vegetation and Forest Management, and Fire and Fuels Management sections) and where more sensitive conditions exist within the affected environment. Those impacts would be reduced using mandatory National best management practices and local land management plan compliance.

Soil Compaction, Displacement, and Site Productivity

Roadbuilding is a dedicated land use, and any additional permanent roads would remove the impacted area from forest production. Even temporary roads, which are required to be revegetated after use, and skid trails are likely to reduce productivity for several decades. Timber harvest and some non-commercial fuel treatments typically involve tracked or wheeled vehicles to cut and remove trees from the harvest area which may displace and compact soils under certain environmental conditions and if multiple passes are made over the same piece of ground. The potentially affected inventoried roadless areas within these watersheds are relatively undisturbed compared to other lands. The IRAs in the Intermountain, Southwestern, Southern, and Eastern regions are at higher risk for impairment due to additional activities because more of these areas are currently classified as ‘fair’ to ‘poor’ existing soil conditions (Table 30). Additional road building and harvesting in IRAs could increase soil disturbance and reduce productivity across the affected environment. However, operational restrictions would limit the potential for future soil disturbance within potentially affected roadless areas. For example, only 12 percent of the potentially affected inventoried roadless areas in the Intermountain region are classified as “likely operable” (see Vegetation and Forest Management and Appendix 1 – IRA Acreage Summarized by Region). Similarly, only 6 percent of potentially affected inventoried roadless areas in the Southwestern region are classified as “likely operable.”

Soil Loss and Sedimentation

Under alternative 2, future road building and timber harvest could disproportionately contribute additional sediment delivery where erosion rates are greatest. The GRAIP Roads and Trails Erosion model indicates that erosion rates from roads and trails rates are greatest in the Southwest, Southeast, Pacific Southwest, and Intermountain regions (Table 31). If additional road building occurs in areas with erosive soils and high intensity and/or high duration precipitation events, it could lead to additional sediment delivery to surface waters. Within the regions’ most sensitive to soil loss and erosion, only 6 percent of the Southwestern region, 12 percent of the Intermountain region, and 15 percent of the Pacific Southwestern region are

classified as “likely operable”. However, 40 percent of the potentially affected inventoried roadless area in the Southeastern region is “likely operable”.

Landslides and Debris Flows

Vegetation removal and road construction may lead to landslides and debris flows where long steep hillslopes and intense precipitation coincide. Roads can facilitate landslides and debris flows by undercutting hillslope stability, adding mass to the slope, and channeling water downslope of the road surface. The GRAIP Slope Stability model indicates that mass wasting events are most likely in the Pacific Northwest and Pacific Southwest regions where long steep slopes and high intensity precipitation events, and saturated soils co-occur, particularly in winter months when atmospheric rivers frequently bring abundant moisture (Table 32). If additional road building activities occur in these unstable areas, it would likely lead to additional mass wasting events. There is also significant risk in the Southern and Northern Regions (Table 3). Although mass wasting events are less common in more arid regions and regions with lower relief, landslides and debris flows are still possible with additional road construction in potentially affected inventoried roadless areas.

As with other soil metrics not all of the potentially affected environment is likely operable. Only 15 percent of the potentially affected inventoried roadless areas in the Pacific Southwest and 21 percent of potentially affected areas in the Pacific Northwest are considered likely operable with another 16 percent in the Rocky Mountain and 40 percent in the Southern regions. Across the Roadless Affected Environment, land management plan components generally allow timber harvest across 13.4 million acres (33.4 percent of NFS land within the Roadless Affected Environment). Plans do not allow timber harvest on 36 percent and generally do not allow timber harvest on another 26.8 percent (with some exceptions). Across the Roadless Affected Environment, land management plan components generally allow road construction across 18.2 million acres (45.5 percent of NFS land within the Roadless Affected Environment).

Effects of Alternative 3 – Modified Rule

Soil conditions within roadless areas identified under alternative 3 do not differ greatly from those identified under alternative 2. Therefore, the distribution of areas of concern is consistent with alternative 2, but the affected area in alternative 3 is smaller than the affected area in alternative 2. Areas with the least amount of existing disturbance (further than ½ mile from existing roads) would continue to have roadless prohibitions with effects similar to alternative 1.

Water Resources

Background

Water Quality

The Environmental Protection Agency (EPA) delegates the responsibility to implement the Clean Water Act to the States and Tribes. The Forest Service works closely with States and Tribes to assure Agency management practices comply with their requirements. Per agreements with many States, the Forest Service is the designated water-quality management agency for NFS lands. These agreements include specific procedures to apply if water quality problems are discovered.

Section 303(d) of the Clean Water Act requires States to evaluate water quality in light of State water-quality standards, report those stream segments that are impaired, and require development of a total maximum daily load of pollutants. Many States have identified impaired stream segments on NFS lands, and they are working with the Forest Service to determine how to reduce pollutant impacts and meet total maximum daily load requirements. On NFS lands, many of the recognized impairments are from sediment, temperature, nutrients, and similar pollutants (U.S. EPA 1997).

Since 2012, the Forest Service has used National Core Best Management Practices to aid in meeting CWA requirements. The National Best Management Practices Program was developed to improve agency performance and accountability in managing water quality consistent with the Federal Clean Water Act (CWA) and State water quality programs. Current Forest Service policy directs compliance with required CWA permits and State regulations and requires the use of best management practices to control nonpoint source pollution to meet applicable water quality standards and other CWA requirements.

Roading and timber harvest may indirectly affect water quality by increasing the release of certain nutrients from the decomposition of timber harvest byproducts (leaves, branches, and other organic matter) and reduced nutrient uptake from harvested trees. Nutrients, such as nitrogen, phosphorous, potassium, and calcium may increase in stream water following timber management activities. Nitrogen generally shows the most abrupt changes. Tree cutting has less effect than subsequent site preparation activities that are used to expedite regeneration (Hornbeck and Leak 1992). Elevated nutrient levels in streamflow usually return to normal in 1 to 4 years (Chamberlin et al. 1991).

Road construction and timber harvest may cause water temperature to change where groundwater is intercepted and brought to the surface, where the stream channel shape is wider or shallower, or where loss of tree cover in riparian areas reduces shading (Hornbeck and Leak 1992). Temperatures may rise sharply in exposed areas and some of those elevated temperatures may then return to normal levels as water re-enters shaded areas downstream or receives cool inflow from other streams or groundwater (Pierce et al. 1993). Smaller or shallower streams are generally more susceptible to temperature fluctuations than larger or deeper streams (Chamberlin et al. 1991).

Water Yield and Runoff Timing

Roads affect the quantity and timing of stream flow by intercepting, concentrating, and diverting runoff (Furniss et al. 1991; Sedell et al. 2000). They can indirectly affect annual flow volume because they replace trees that use water. Water otherwise used by trees would run off or enter into the soil.

Water Yield

The relative effects of individual timber harvesting and roading activities on flooding decreases as watershed size increases. The extra flow generated in smaller watersheds becomes less evident as it joins flows from other watersheds and continues downstream (Anderson et al. 1976; Stone et al. 1979; Hewlett and Doss 1984; Thomas and Megahan 1998; Ziemer 1998). Similarly,

numerous harvest units and roads in multiple sub-watersheds of a larger watershed generally do not yield proportional increases in floods. Additional water from smaller units enters the main stream at different times. This action desynchronizes the flows, moderating net flow increases. Effects of land uses, such as timber harvest and roading, are more evident during small and moderate storm events but are less important in large storm events (Bosch and Hewlett 1982). Large runoff events are generally the result of large volume or extended periods of precipitation or snowmelt runoff that exceed the capacity of the soil to hold additional water. This is true regardless of land use practices. Timber harvests can cause an increase in total annual water yield, whereas roads are unlikely to have a similar effect, mainly because harvests tend to cover more area than roads (Sedell et al. 2000).

Changes in total annual water yield would most likely be detected where there is abundant moisture to begin with, and where the soil has less ability to absorb additional water such as in the coastal forests of California, Oregon, and Washington (Harr 1983; Kattelmann et al. 1983; Ziemer 1987). Studies in Eastern forests indicate that at least 20 percent to 25 percent of the basal area in a given watershed must be removed to produce detectable increases in annual flow (Hornbeck et al. 1993). Changes in total annual water yield are generally less detectable in the drier climates of the Intermountain West and Southwest where additional water is quickly used by the remaining plants or is lost through evaporation (Sedell et al. 2000). Harvest levels on NFS lands in the Southern and Eastern regions are generally too small to generate measurable change (Hornbeck et al. 1993). Water-yield returning to normal levels is in direct proportion to how quickly the site revegetates. Regrowth in the East and in humid parts of the West is rapid, and flows return to normal levels in 6 to 10 years after harvest. Slower growth in drier parts of the country may extend the recovery period to at least twice as long (Douglas and Swank 1972; Sedell et al. 2000).

Runoff Timing

Timing of water runoff (how quickly a watershed generates runoff and the time it takes for that water to work its way downstream) can change as roads and related drainage structures intercept, collect, and divert water. This accelerates water delivery to the stream, more water becomes storm runoff, which increases the potential for runoff peaks to occur earlier, be of greater magnitude, and recede more quickly than in unroaded watersheds (Wemple et al. 1996).

Vegetation cover removal through timber harvest can also change flow timing. In conifer forests where the majority of precipitation is in the form of snowfall, such as in the Intermountain West, openings in the forest canopy can capture more snow and deliver it earlier during spring runoff (Leaf 1975; Troendle and King 1985; Troendle and King 1987). In rain-dominated Western conifer forests, flows from harvested areas are greater toward the end of the summer dry period than are flows from uncut forests, but the flow difference is minimal once soils are re-saturated by fall rains (Ziemer 1998). Harvesting hardwood forests and areas that receive the majority of precipitation from rainfall delivers more water in the late summer or early fall. This pattern can supplement low flows during these times and can be beneficial to fish and other aquatic organisms during water-stress periods (Anderson et al. 1976; Kochenderfer and Hornbeck 1999; Elliot and Vose 2011). Changes in water timing are most likely to occur in areas with large amounts of timber harvest and roading because these activities have the highest potential to alter

natural hydrologic processes. Areas with greater variability in seasonal precipitation and runoff, such as the arid and semi-arid portions of the West, would be more sensitive to changes in flow timing than areas with more even rates of precipitation and runoff such as the humid portions of California, Oregon, and Washington, and the Eastern United States. Changes in the magnitude of flood peaks and seasonal low flows are more evident in drier climates (Sedell et al. 2000). The USDA publication, “Forest Service Roads: A Synthesis of Scientific Information,” (2000) summarizes most of the effects of roading and timber harvests on hydrologic regimes.

Collectively, these studies suggest that the effect of roads on basin stream flow is generally smaller than the effect of forest cutting, primarily because the area occupied by roads is much smaller than that occupied by harvest operations. Generally, hydrologic recovery after road building takes much longer than after forest harvest because roads modify physical hydrologic pathways but harvesting principally affects evapotranspiration processes.

Municipal Water Use

Forests are an important source of clean drinking water for over 150 million people in the United States (Caldwell et al. 2014; Liu et al. 2021). The 749 million acres of forested lands provide more than half of the national water yield from lands in the lower 48 States (Liu et al. 2021; Sun et al. 2016). Approximately 74 percent of total drinking water withdrawals originate from surface water sources, such as streams, ponds, and reservoirs, and national forests provide about 15 percent of the Nation’s runoff (Dieter et al. 2018; Liu et al. 2021). Population and water demands are projected to increase in the western U.S., including communities adjacent to IRAs (Sedell et al. 2000; Theobald 2005). At the same time temperatures are increasing, snowpack is declining and melting sooner, and drought and summer water deficits are more frequent and longer (Barnett et al. 2008; Mohammed and Tarboton 2008; Miller et al. 2021). Streamflow reductions ranging from 10 to 45 percent are likely for the western states over the next half century (Barnett and Pierce 2009; Miller et al. 2021). A 10 percent drop in streamflow is considered calamitous by municipal water districts. More frequent and intense flood events are also likely in places (Raff et al. 2009), despite drying conditions. Costs for flood control, repair and reconstruction, and insurance rates will also increase (GAO 2007). Because inventoried roadless areas represent roughly a third of national forestland, by inference they contribute significantly to the overall runoff volume and value estimated in billions of dollars annually (DellaSala et al. 2011). The Forest Service is required to manage National Forest watersheds that supply municipal water under multiple use prescriptions in land management plans (36 CFR part 219).

Potentially Affected Environment

Water Quality

There are watersheds which contain potentially affected inventoried roadless areas and 303d impaired waters within the affected environment. Water bodies on the 303d list are considered “Impaired” and require the development of a Total Maximum Daily Load (TMDL). A TMDL includes a calculation of the maximum amount of a pollutant that can be present in a waterbody and still meet water quality standards. Derived Road and Trail Erosion Indicator is a rating for watersheds containing potentially affected inventoried roadless areas. This indicator addresses

the propensity for existing road and trail networks to deliver sediment to a water body based on local climate, topography, and soils. Nearly 40 percent of these watersheds with 303d listed streams are found in the Pacific Northwest region with another 13 percent in the Northern and Southern region, and 10 percent or less in all other regions (Table 33).

Within the potentially affected inventoried roadless areas, water quality parameters assessed in the Watershed Condition Classification are rated highest in the Rocky Mountain region, where more than 90 percent of watersheds containing IRAs are rated as having “Good” water quality. Followed by the Southwestern, Intermountain, Pacific Northwest, Pacific Southwest, and Northern Rockies, which all have more than 60 percent of watersheds rated as having “Good” water quality. The lowest rankings occur in the Southern and Eastern regions where long legacies of industrialization and agriculture have impacted water quality. Although water quality conditions are generally considered better in the western US, it should be noted that in the Pacific Northwestern region, nearly 40 percent of watersheds containing IRAs also have 303d listed streams.

Table 33. Watershed Condition Classification Water Quality Indicator rating and the percentage of streams on the EPA 303d list for watersheds containing inventoried roadless areas. This indicator addresses the expressed alteration of physical, chemical, and biological components of water quality.

Region	Good	Fair	Poor	Streams listed on 303d list
Northern	63%	16%	22%	13%
Rocky Mountain	91%	7%	2%	0%
Southwestern	72%	18%	10%	6%
Intermountain	66%	23%	11%	9%
Pacific Southwest	63%	23%	13%	9%
Pacific Northwest	66%	23%	11%	40%
Southern	48%	32%	20%	12%
Eastern	26%	31%	43%	10%

Water yields and run-off

Water yields and hydrographs within the watersheds containing potentially affected inventoried roadless areas are generally in “Good” condition (Table 34). The Southwestern and Intermountain regions have a disproportionately high number of watersheds where water yields and hydrographs have been altered within the affected environment. Only 51 percent of watersheds considered in the Intermountain region are rated as “Good” and only 43 percent of watersheds considered in the Southwestern are rated as “Good.” The Southwestern and Intermountain are two of the most arid regions, and many streams have been altered for water delivery and are utilized for irrigation.

Table 34. Watershed Condition Classification Water Quantity Indicator rating for watersheds containing potentially affected inventoried roadless areas. This indicator addresses changes to the natural flow regime with respect to the magnitude, duration, or timing of the natural streamflow hydrograph.

Region	Good	Fair	Poor
Northern	72%	21%	7%
Rocky Mountain	72%	14%	14%
Southwestern	51%	36%	12%
Intermountain	43%	43%	13%
Pacific Southwest	68%	19%	13%
Pacific Northwest	77%	10%	13%
Southern	73%	23%	4%
Eastern	76%	18%	6%

Municipal Watersheds

According to the more recent data in the Forest to Faucets 2.0 Assessment⁵¹, there are more than 7,000 municipal water intakes within watersheds containing potentially affected inventoried roadless areas (Table 35). The largest number of intakes occur in the Pacific Northwest and Intermountain Regions, but the largest populations served by these water supplies occur in the Pacific Southwest Region where nearly 5 million people receive drinking water from municipal intakes within watersheds containing potentially affected inventoried roadless areas. This is largely driven by the proximity of major population centers to water supplies in California. In other regions water from the potentially affected inventoried roadless areas flows downstream and collects in major rivers before being utilized by municipalities. This is particularly evident in the Northern, Rocky Mountain, and Intermountain Regions where population centers are further from sources. Approximately 24 million people utilize water which originates within potentially affected inventoried roadless areas (Table 35) outside of Alaska⁵².

Table 35. Water use data derived from the Forest to Faucets 2.0 Assessment including the number of municipal water intakes and the population served by those intakes within watersheds containing potentially affected IRAs (outside of Alaska)

Region	Number of Municipal Water Intakes	Population Served by Intakes	Maximum Downstream Population Served by Watersheds
Northern	1,287	100,400	4,480,200

⁵¹ Forests to Faucets 2.0: Utilizes the EPA's SDWIS dataset (U.S. Environmental Protection Agency 2018) to identify drinking water intake locations and the population served by those intakes. Forest to Faucets uses basic information from SDWIS, including the latitude and longitude of the water system intake, the population served by the water system, and the source watertype (surface water, ground water, etc.). The population served by each water intake was calculated by summing the population within a water system and dividing it by the total number of intakes within that water system. For more information, see: https://www.fs.usda.gov/ecosystemservices/FS_Efforts/forests2faucets.shtml or <https://storymaps.arcgis.com/collections/4e450a6c7ed24f0cbae4abc1c07843b7?item=1>.

⁵² These data were not available for Alaska. On the Tongass municipal watersheds are designated on the Forest Plan Land Use Designation Map - these include the municipal watersheds for Ketchikan, Petersburg, Sitka, Juneau, Wrangell, Kake, Klawock, Craig, and Hydaburg (USDA Forest Service 2020).

Region	Number of Municipal Water Intakes	Population Served by Intakes	Maximum Downstream Population Served by Watersheds
Rocky Mountain	325	74,700	4,479,000
Southwestern	739	43,800	1,826,600
Intermountain	1,466	1,118,900	4,344,500
Pacific Southwest	1,034	4,762,400	2,264,400
Pacific Northwest	1,522	388,800	616,100
Southern	378	614,600	2,911,200
Eastern	286	63,500	3,819,600

Effects of Alternative 1 – No Action

Water Quality

Potentially affected inventoried roadless areas typically have good water quality due to limited disturbance. Less than 12 percent of watersheds with potentially affected inventoried roadless areas have “impaired” streams on the 303d list. Activities that could be allowed to occur under the exceptions of the 2001 Roadless Rule are unlikely to contribute to further impairment of streams currently listed on the 303(d) list or degrade water quality in a significant way as widespread road building and timber harvest are generally prohibited.

Water Yield and Runoff Timing

Water yields and runoff patterns within potentially affected inventoried roadless areas are generally unaltered from natural conditions. The extent and magnitude of road construction or vegetation removals under alternative 1 would not be expected to cause a major change in water yield from the potentially affected inventoried roadless areas. The aerial extent of the tree cutting in the roadless areas would not be great enough to exceed 20 percent basal area within any watershed. (Research indicates 20 to 30 percent of a watershed needs to be disturbed to generate a measurable increase in water yield); Douglas and Swank 1972, Hornbeck et al. 1993).

Municipal Water Use

Alternative 1, in general, has little risk of potential adverse effects and provides the greatest protection of water quality.

Effects of Alternative 2 – Proposed Action

Water Quality

Road construction and native surface forest roads are the largest source of sediment related to timber harvest operations, and sediment delivered to surface waters is a major source of water quality degradation. Additional road construction and timber harvest is reasonably foreseeable in potentially affected inventoried roadless areas and has the potential to impact water quality through increased sediment delivery. However, using Best Management Practices during road maintenance and construction can reduce these impacts to levels congruent with the Clean Water Act. The Eastern and Southern Regions are the most susceptible to additional impacts due to

long histories of land use, agriculture, and industrial pollution surface waters in (Table 33). The Eastern and Southern Regions also tend to have the largest percentage of potentially affected inventoried roadless areas considered likely operable with greater than 40 percent across both regions. Although water quality in the western United States is generally considered better due to larger protected areas, more than 20 percent of watersheds containing potentially affected inventoried roadless areas in the Northern Rockies region are rated as having “Poor” water quality, and 40 percent of surface waters in the Pacific Northwest are listed as “impaired” (Table 34). Within these regions, only 16 percent and 21 percent of potentially affected roadless areas are classified as “Likely operable” within the Northern and Pacific Northwest Regions (Potential Forest Management Opportunity, Figure 10).

Water Yield and Runoff Timing

The presence of roads can alter the timing and magnitude of peak flows because they can “short circuit” the natural water flow paths in a watershed through ditches and culverts, delivering water more quickly to the watershed outlet. Timber harvests and road construction have the potential to alter water yields and runoff timing if implemented over large areas, and regions with more arid climates are most likely to see altered runoff after timber harvests. Although harvested areas may accumulate more snowpack during winter, the snowpack tends to melt earlier in spring which potentially limits water yields later in the season. Water yields and runoff timing are already significantly altered in the Southwestern and Intermountain region due to water diversions for irrigation and municipal water use. Additional road construction and timber harvests in these regions could further alter water yields and runoff. Similar effects are possible in more arid portions of the Northern, Rocky Mountain, Pacific Northwest, and Pacific Southwest Regions. In all but the Rocky Mountain and Pacific Northwest regions the percentage of potentially affected inventoried roadless areas considered likely operable is less than 20 percent.

Municipal Water Use

If additional road construction or timber harvest result in a decrease in water quality, and or reduce the efficacy of water treatment. The Pacific Southwest Region is particularly vulnerable because nearly 5 million people draw water directly from watersheds containing inventoried roadless areas (Table 35). The Intermountain Region is also affected in that over 1 million people receive water directly from watersheds containing inventoried roadless areas (Table 35). This does not infer that other regions are not vulnerable to the effects of increased road and timber harvests. More than 4 million people receive water from inventoried roadless areas in the Northern Rockies, Rocky Mountain, and Intermountain Regions, another 2-3 million people receive water roadless areas in the Southwestern, Eastern, and Southern Regions; however, these users tend to be further downstream. Overall, the largest percentage of potentially affected inventoried roadless areas deemed “likely operable” occurs in the Eastern and Southern regions where the topography is less steep compared to the western US and harvest operations and road construction are more feasible in inventoried roadless areas. Most forest plans acknowledge the need for protections for municipal watersheds with plan components that have an overall management objective to maintain and improve watershed status.

Effects of Alternative 3 – Modified Rule

For the areas that remain with Roadless Rule designation and prohibitions, the effects would be similar to alternative 1.

For those areas where the 2001 Roadless Rule would no longer be in place, effects to water quality, water yield and runoff timing, and municipal water use would be similar to alternative 2, however, the distribution of effects would be in a smaller area.

Water Quality

Analyses of water quality within potentially affected roadless areas identified under alternative 3 do not differ from those identified under alternative 2. Therefore, the distribution of areas of concern are consistent with alternative 2, but the affected area in alternative 3 is less than the affected area in alternative 2.

Water Yield and Runoff Timing

Analyses of water yields and runoff timing within potentially affected roadless areas identified under alternative 3 do not differ from those identified under alternative 2. Therefore, the distribution of areas of concern are consistent with alternative 2, but the affected area in alternative 3 is less than the affected area in alternative 2.

Water Use

Under alternative 3 there are more than 5,000 municipal water intakes within watersheds containing potentially affected roadless areas, outside of Alaska. The largest number of intakes occur in the Intermountain and Northern Rocky Mountain regions, but the largest populations served by these water supplies occur in the Pacific Southwest Region where nearly 4 million people receive drinking water from municipal intakes within watersheds containing the potentially affected roadless areas identified under alternative 3 (Table 36). This is largely driven by the proximity of major population centers to water supplies in California. In other Regions water from the affected environment flows downstream and collects in major rivers before being utilized by municipalities. This is particularly evident in the Northern, Rocky Mountain, and Intermountain Regions where population centers are further from sources.

Table 36. Water use data derived from the Forest to Faucets 2.0 Assessment including the number of municipal water intakes and the population served by those intakes within watersheds containing potentially affected roadless areas in alternative 3. The table also provides the maximum downstream population served by the watersheds containing potentially affected roadless areas in alternative 3 (not including Alaska).

Region	Number of Municipal Water Intakes	Population Served by Intakes	Maximum Downstream Population Served by Watersheds
Northern	1,074	94,040	4,480,247
Rocky Mountain	271	24,554	4,471,505
Southwest	642	38,897	1,826,559
Intermountain	1,261	1,083,304	3,711,472
Pacific Southwest	878	3,940,388	2,264,387
Pacific Northwest	999	344,739	616,132
Southern	342	473,388	2,911,189

Region	Number of Municipal Water Intakes	Population Served by Intakes	Maximum Downstream Population Served by Watersheds
Eastern	238	63,328	3,819,602

Air

Background

Air quality related values are defined as resources that may be negatively affected by air pollutants, including visibility, soil and water quality, and vegetation. Through the Clean Air Act⁵³(CAA) the EPA identifies geographic areas of the country that do not meet the primary ambient air quality standards as being in “nonattainment” for that air quality standard. Individual states are responsible for compliance with the NAAQS and those containing non-attainment areas are required to develop State Implementation Plans (SIPs) that outline emission control strategies and other activities to demonstrate how they will address non-attainment. Primary NAAQS and EPA standards for the air pollutants included in this analysis are summarized in .⁵⁴

Table 37. Primary NAAQS standards relevant to nonattainment and maintenance areas overlapping inventoried roadless areas. <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

Pollutant	Level	Averaging	Form
Nitrogen Dioxide (NO ₂)	53 ppb	1 year	Annual mean
Ozone (O ₃)	70 ppb	8 hours	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particulate Matter 2.5 micrometers (PM _{2.5})	9.0 µg/m ³	1 year	Annual mean averaged over 3 years
	35 µg/m ³	24 hours	98th percentile averaged over 3 years
Particulate Matter 10 micrometers (PM ₁₀)	150 µg/m ³	24 hours	Not to be exceeded more than once per year on average over 3 years

⁵³ The Clean Air Act, as amended (42 U.S.C. 7401 et seq.), significantly broadened the authority and responsibility of the Forest Service by:

- Complying with all Federal, State, or local air control rules, regulations, and directives.
- Requiring compliance with substantive and procedural requirements imposed by a Federal, State, interstate, or local administrative authority or court.
- Requiring consultation with each State having delegated authority on all matters concerning the prevention of significant deterioration of air quality, visibility, air quality maintenance plan requirements, and nonattainment requirements.
- Giving Federal land managers an affirmative responsibility to:
 - Protect the air quality related values on any lands managed by them within a class I area.
 - Consider, in consultation with the Administrator of the Environmental Protection Agency, whether a proposed major emitting facility will have an adverse impact on air quality related values.

⁵⁴ The U.S. Environmental Protection Agency Green Book was used to evaluate the current state of air quality in potentially affected roadless areas. The EPA Green Book: The Green Book (<https://www.epa.gov/green-book>) provides information about a National Ambient Air Quality Standards (NAAQS) designations, classifications and nonattainment status. Information is current as of the Green Book posted date and is available in reports, maps and data downloads.

Prevention of Significant Deterioration is a state-permitting process that requires emission limitations for certain new or modified sources of air pollution, mandated by the Clean Air Act. Under this program, attainment areas are categorized as either Class I, Class II, or Class III based on their levels of air quality protection. Class I allows very little deterioration of air quality. The Clean Air Act established Class I areas in each national park over 6,000 acres and each national wilderness larger than 5,000 acres that existed when the 1977 Amendments were passed. The CAA also established the Regional Haze Rule (EPA 2011) to remedy existing, and prevent future, impairment to atmospheric visibility caused by pollution in selected Class I areas (42 USC 7491). This rule requires states to develop plans to reduce emissions that affect Class I areas in order to achieve natural visibility conditions.

Potentially affected environment

Current maps of air quality nonattainment and maintenance for O₃, PM_{2.5}, PM₁₀, and NO₂ were analyzed to identify areas that overlap with the potentially affected IRAs (Table 38). Nonattainment areas have not met the NAAQS and require a SIP to address air quality. Maintenance areas have a history of nonattainment but now meet the NAAQS under a maintenance plan. Affected inventoried roadless areas overlapping non-attainment and maintenance are areas where new emissions may be most important with respect to effects on air quality. State and local managers and experts would be best positioned to conduct the analyses needed to inform specific emission scenarios and potential air quality outcomes at the appropriate scale. Within non-attainment areas, General Conformity of new projects would apply. General Conformity is the pollution prevention and control program that requires a federal agency to assure any activity the agency proposes will conform to the purpose of applicable implementation plans and will not interfere with a State or Tribe's ability to attain and maintain the NAAQS for air quality, as required under the CAA section 176(c). A substantial portion of inventoried roadless areas are near or adjacent to wilderness areas so air quality in wilderness areas could be affected (see Recreation and Scenery).

Less than 5 percent of inventoried roadless area overlaps Primary NAAQS nonattainment or maintenance for O₃, PM or NO₂ in all regions other than the Pacific Southwest, consistent with generally good air quality across national forests and Class I areas nationally. The Pacific Southwest Region, however, contains much larger areas of inventoried roadless area overlapping nonattainment and maintenance: 40 percent of roadless area for ozone (nonattainment), 19 percent for hourly and annual PM_{2.5} (nonattainment), 27 percent for annual PM₁₀ (nonattainment), and 7 percent for NO₂ (maintenance). Overlap does not imply that nonattainment or maintenance in these areas is the result of emissions on National Forest System lands. Rather, these are areas where new emissions on National Forest System lands may contribute to an existing air quality issue.

Table 38. Areas of national forests on which potentially affected environment overlaps with non-attainment and maintenance areas for air quality

	Region	Area (acres) of nonattainment/maintenance overlapping potentially affected environment	Percentage of inventoried roadless area within region
Ozone	Southwestern	75,417	3

	Region	Area (acres) of nonattainment/maintenance overlapping potentially affected environment	Percentage of inventoried roadless area within region
	Intermountain	177,735	2.1
	Pacific Southwest	1,473,942	40.6
	Southern	596	0.1
PM _{2.5} Hourly	Pacific Southwest	697,720	19.2
	Intermountain	172,603	2
PM _{2.5} Annual	Pacific Southwest	700,539	19.3
PM ₁₀ Annual	Northern	2,106	<0.1
	Rocky Mountain	4	<0.1
	Southwestern	355	<0.1
	Intermountain	428,292	5.1
	Pacific Southwest	989,116	27.2
	Alaska	2,104	<0.1
NO ₂	Pacific Southwest	243,219	6.7

Effects of Alternative 1 – No action

The vast majority of inventoried roadless areas are currently in attainment for Primary NAAQS. Maintaining current activity levels within inventoried roadless areas means that air emissions in these areas would not be expected to change significantly and that future trends in air quality will be the result of changes in emission sources outside inventoried roadless areas. In this analysis, the Pacific Southwest Region differs from other Regions in the extent to which current inventoried roadless areas overlap with non-attainment and maintenance for ozone, particulate matter, and nitrogen oxides. Improvements in air quality in these areas will be subject to effectiveness of State Implementation Plans and other emission reduction measures.

Effects of Alternative 2 – Proposed Action and Alternative 3 – Modified Rule

Smoke

Fire (wildfire, prescribed burning, slash burning) are sources of ozone precursors, particulate matter, carbon dioxide, carbon monoxide and other trace gases. Fuel removal in newly accessible areas may reduce wildfire intensity but may also lead to more frequent prescribed burning. These emissions could impact nearby communities, especially in valleys and basins with poor dispersion. Most states have a smoke management program to minimize impacts to air quality, which may be part of a State Implementation Plan. Additionally, FSM 5140 policy requires coordination of prescribed fire program activities with Regional air quality specialists and Federal, State, Tribal, air pollution control district or county regulatory authorities to ensure compliance with air regulations and use of Basic Smoke Management Practices (USDA 2011) to minimize impacts to downwind communities.

Greater access to current inventoried roadless areas could affect fire and subsequent emissions in several ways. Use of prescribed fire could increase, potentially impacting nearby communities seasonally for relatively short periods of time. As noted previously, prescribed fires are carefully

planned and managed under state and local smoke management programs and use of Basic Smoke Management Practices (USDA 2011) to minimize impacts to downwind populations. Expanded use of prescribed fire reduces wildfire risk, thereby increasing air quality resilience longer-term. Greater access leads to a higher potential for fire ignitions from recreational activities (campfires, vehicles) and forest management (vehicles, equipment). Expanded treatment of fuels (mechanical, prescribed fire, pile burning) would increase the frequency of short-term managed smoke events but reduce risk to wildfire over the longer-term. Greater access also allows for faster response to wildfires, resulting in smaller burned areas and shorter duration smoke events. The net effect of the alternatives would be more frequent short-duration smoke events from prescribed fire and fuels treatment but greater air-quality resilience due to reduced risk of catastrophic wildfire.

Potential expansion of the road system under the alternatives, and therefore access for fuel treatment, human wildfire ignition, and firefighting, will likely follow the operability designations for currently inventoried roadless areas. The total acreage of areas where the road system may be most likely to expand (likely operable) is nearly the same between alternatives. Thus, the potential for changes in fire emissions, both positive and negative, may be similar between the alternatives. Overall, resulting changes in wildfire will likely drive changes in total emissions from fire and subsequent air quality impacts over the long-term. A more detailed analysis of the potential net result is not possible at this time.

Road Construction and Use

Elimination of the national prohibitions in the 2001 Roadless Rule would allow for road construction and reconstruction within potentially affected inventoried roadless areas. This would likely increase permanent road miles, especially further than 0.5 miles from existing roads, resulting in more miles traveled on Forest Service roads (see National Forest System Roads). Road construction and maintenance results in emissions of particulate matter (dust) from ground disturbance and application of construction materials such as crushed rock, sand, and gravel. Construction equipment and associated vehicle traffic are sources of ozone precursors, particulate matter, carbon dioxide, carbon monoxide, sulfur dioxide and other trace gases. Post-construction travel is also a source of these pollutants including emissions of dust on unpaved roads. Dust emissions from construction activities and travel of vehicles and heavy equipment on unpaved roads are episodic and do not typically involve long distances. Dust emissions are related to traffic volume and speed, vehicle characteristics, properties of the road surface (such as silt and moisture content), and frequency and amount of precipitation. Trackout of dust and dirt on vehicles onto paved roads is an additional source of PM emissions. Mitigation measures exist for control of emissions from the unpaved road surface and trackout. Disturbed natural soils are, in general, prone to wind-blown dust emission, the impacts of which will be highly dependent on meteorological conditions, direction and distance from non-attainment areas.

Increases in miles traveled will result in increased emissions. It is difficult to assess potential differences in effects between the alternatives at the national scale. Assuming new road construction and reconstruction is most likely to occur in “likely operable” areas (reference Timber operability), potential changes in emissions between the alternatives may be similar.

Tree Cutting and Removal

Increases in timber harvest could result in increased emissions from tree cutting and removal activities. Gas- and diesel-powered equipment used to cut and remove trees are also sources of ozone precursors, particulate matter, carbon dioxide, carbon monoxide, sulfur dioxide and other trace gases. Slash pile burning and prescribed fire are short-duration sources of these pollutants, as well. Tree cutting and removal also disturb natural soils, which may become a source of windblown dust.

Given the similarities in “likely operable” acreage noted above, it is reasonably foreseeable that emissions from tree cutting and removal between the alternatives would be similar.

Mineral Development

Under alternatives 2 and 3 across potentially affected inventoried roadless areas, any new or expanded authorizations for oil and gas or coal exploration and development would be subject to review and include surface use restrictions, including limiting road construction, consistent with the roadless rule prohibitions (see Locatable and Leasable Minerals Section). It is reasonably foreseeable that new mineral development is mostly likely to occur near existing roads and within the “likely operable” areas. Development of locatable (such as gold, silver, lead, gypsum), leasable (oil, gas, coal) and material (sand, stone, gravel) minerals would result in emissions associated with drilling, production, processing, storage, and transport of products. These emissions would include ozone precursors, particulate matter, carbon dioxide, carbon monoxide, sulfur dioxide and other trace gases. The sources of these emissions could include drilling equipment, venting and flaring of gas, storage tanks, pipe fittings and valves, pumps, dehydrators, compression engines, and heavy equipment and vehicles associated with extraction and transport activities. Particulate matter in the form of dust would also be emitted as a result of vehicle travel and ground-disturbing activities. Drilling, blasting, loading and hauling of mining products and waste are also sources of ozone precursors, particulate matter, carbon dioxide, carbon monoxide, sulfur dioxide and other trace gases. Oil and gas extraction, as well as mining, is also a source of methane, a greenhouse gas, and some hazardous air pollutants.

The potential for increased emissions from new mineral development would be greater for alternatives 2 and 3, compared to no action, but likely similar between the two alternatives.

Table 39. Relative potential for air emissions differs among categories and alternatives. + represents lowest potential for emissions and ++++ represents the highest potential for emissions.

Activity	Alternative 1	Alternative2	Alternative 3
Road construction and use	+	++	++
Tree cutting and removal	+	++	++
Prescribed fire	+	++	++
Wildland fire	++++	+++	+++
Mineral development	+	++	++

Conclusion – Soil, Water, and Air Resources

Alternative 2 and 3 would have variable effects on soil and water resources across Forest Service Regions and individual national forests depending on the direction in existing land management

plans. Many of these plans already have protections in place for potentially affected IRAs. However, it is reasonably foreseeable that additional road construction and timber harvest eventually could occur, and these activities could contribute to reducing forest soil productivity and water quality. Impacts are more likely in the ‘operable’ areas and where existing land management plans allow them. Any specific activities that are eventually implemented would be decided by local and regional managers based on local conditions and priorities. Any future site-specific projects or changes to land management plans would need to follow all Federal, State and local laws and agency policy and regulations, including but not limited to the Multiple Use, Sustained-Yield Act, National Forest Management Act, National Environmental Policy Act, and the Clean Water Act. Plan components ensure that management not lead to permanent impairment of the productivity of the land (16 U.S.C. 1604 Sec. 2(g)(3)(C)).

Alternatives 2 and 3 would have minimal immediate effects on air resources. However, it is reasonably foreseeable that new activities that could affect emission of air pollutants could eventually occur. It is likely that changes in wildfire emissions resulting from the proposed alternatives will have the largest potential effect on air resources at the national scale, compared to emissions associated with prescribed fire, mineral development, road use and construction, and timber harvest and removal. The relative importance of changes in prescribed versus wildfire will vary Regionally. Any future site-specific projects or changes to Land Management Plans would need to follow all Federal State and Local laws and agency policy and regulations, including but not limited to requirements of the Clean Air Act. When relevant or required, project level analyses would determine potential changes in emissions more quantitatively to assess effects on air resources, taking into account local conditions that reflect contributions from influential sources outside inventoried roadless areas. This analysis revealed that the Pacific Southwest differs substantially from other Regions in the extent that current inventoried roadless areas overlap with current NAAQS non-attainment and maintenance areas for ozone, PM and nitrogen oxides. These represent areas where air resource objectives may be more sensitive to future changes.

Biodiversity

Plant and Animal Communities

Background

Biodiversity measures the variety of organisms and life forms in a specific area and is a key attribute of healthy ecosystems. Declining biodiversity is strongly linked to the human actions that have modified ecosystems leading to declines in habitat quality, quantity, and connectivity in marine, freshwater, and terrestrial settings (USDA 2023).

The following sections provide a detailed discussion of the reasonably foreseeable short- and long-term effects of the alternatives on biodiversity of plant and animal communities:

- Terrestrial Animal Species and Habitats
- Aquatic Animal Species and Habitats

- Terrestrial and Aquatic Plant Species and Habitats

In this analysis, reasonably foreseeable effects to biodiversity were evaluated by considering the kinds of species potentially affected, identifying the important characteristics of inventoried roadless areas that foster biodiversity, and evaluating the potential adverse and beneficial effects of road construction and timber harvest on those characteristics. These effects are discussed for plant and animal communities including terrestrial animal habitats and species, aquatic animal habitats and species, and terrestrial and aquatic plant species. These are broad groups for discussion and are intended to encompass all species within these groups that might occur on NFS lands, including but not limited to species of concern (such as species listed under the Endangered Species Act, Regional Forester’s Sensitive Species⁵⁵, Species of Conservation Concern⁵⁶), migratory birds, game species, and pollinators. The potential effects of the alternatives were addressed by considering land use; regional distribution and abundance of inventoried roadless areas; relationship of species to habitats present in potentially affected inventoried roadless areas; fragmentation and connectivity; laws, regulations, and policies that affect biodiversity; operability; and invasion of non-native species.

Assumptions Common to All Alternatives

In all alternatives, biodiversity of plant and animal communities on NFS Lands, including inventoried roadless areas, would continue to be planned for and managed according to the requirements of law, regulation, and policy. All current Forest Service land management plans, through the National Forest Management Act (NFMA) and planning regulations (1982 Planning Rule or 2012 Planning Rule), are required to maintain the diversity of plant and animal communities and support the persistence of native species in the plan area (39 CFR 219.9, 2012 Planning Rule; Sec. 219.19, 1982 Planning Rule). Specifically, under the 2012 Planning Rule, biodiversity is maintained in the plan area by providing the ecological conditions necessary to support the persistence of most native species. These ecological conditions may include standards or guidelines related to habitat features, condition, or connectivity. Additionally, all land management plans, through NFMA and planning regulations, are also required to maintain and contribute to the recovery of threatened and endangered species and conserve proposed species in the plan area (39 CFR 219.9, 2012 Planning Rule; Sec. 219.19, 1982 Planning Rule).

⁵⁵ Regional Forester Sensitive Species (RFSS; sensitive species)—Policy developed under the 1982 Planning Rule at Forest Service Manual (FSM) 2670 requires identification of sensitive species and project-level analysis of effects on viability of sensitive species in a Biological Evaluation (BE). Although a BE was prepared for the proposed rule, under all alternatives project-level BEs will still be required for administrative units with land management plans under the 1982 Planning Rule.

⁵⁶ ***Species of Conservation Concern (SCC)***—The 2012 Planning Rule at 36 CFR 219 adopted a complementary ecosystem and species-specific approach to provide for the diversity of plant and animal communities and the long-term persistence of native species. This approach requires the identification of SCC and development of plan components to maintain or contribute to maintaining a viable population of each SCC. For all land management plans that have been or are being revised under the 2012 Planning Rule, the appropriate regional forester identified SCC. An SCC is a species—other than federally recognized threatened, endangered, proposed, or candidate species—that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species’ capability to persist over the long-term in the plan area (36 CFR 219.9(c)).

It is assumed that under all alternatives, future land management plan revisions or amendments would comply with NFMA and planning regulations to meet these requirements to the extent feasible within Forest Service authority and consistent with the inherent capability of the plan area (36 CFR 219.9 and FSH 1909.12). Future projects in current inventoried roadless areas will require compliance with environmental laws and regulations, including the Endangered Species Act, Migratory Bird Treaty Act, and Bald and Golden Eagle Protection Act. As is typical, future project designs would avoid and minimize adverse effects to ESA-listed resources to the greatest extent feasible.

Potentially Affected Environment

Biodiversity

Biodiversity conservation depends on preventing habitat loss and degradation, limiting competition and predation by non-native species, and preventing pollution and overexploitation (Wilcove et al. 2000, as cited in USDA FS 2000a). The 2001 Roadless Rule FEIS, Volume 1, contains a comprehensive review of biodiversity in national forests and grasslands, as well as its roadless area context (USDA FS 2001). Biodiversity in the potentially affected environment occurs in many types of landcover, from evergreen and deciduous forest to non-forest vegetation types such as shrub/scrub, grasslands, alpine meadows, and wetlands, as well as areas of barren land and open water (for example, see in the Vegetation and Forest Management section). Both the amount and configuration of these cover types, and key features within them like older forest patches, riparian areas, snags, and downed wood, provide habitat for numerous terrestrial and aquatic animal and plant species. In turn, the biodiversity found within the potentially affected environment supports highly valued ecosystem services such as hunting and fishing, wildlife viewing, and activities such as outdoor recreation in large blocks of contiguous older forest. In accordance with the requirements of statute, The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) evaluate the risk of extinction of species and have designated many plant and animal species as threatened, endangered, or proposed for listing (“threatened, endangered, or proposed”).

Patterns of biodiversity vary across landscapes in accord with the spatial patterns of vegetation and ecosystem processes over short and long time scales. Five coniferous forest group types comprise about 75 percent of the forest cover in the potentially affected environment, occur primarily in the western U.S. including Alaska, and support a host of threatened, endangered, and proposed species, as well as numerous species of regional conservation concern, and many other valued fish and game species. Additional forest types such as mixed hardwoods, longleaf/slash pines, and oak/gum/cypress forests, do not cover as wide an area within the potentially affected environment (see Vegetation and Forest Management), but also serve key functions, supporting high levels of biodiversity in the Appalachians, the Midwest, and the southeastern U.S., along with related ecosystem services. Across the U.S., the approximately 37 percent of the potentially affected environment in non-forest vegetation cover also supports a host of threatened, endangered, and proposed native plant and animal species including species only found in these areas (endemics), as well as migratory game and non-game species.

Habitat

The potentially affected environment provides habitat for a host both common and rare animal and plant species, both terrestrial and aquatic. Numerous threatened and endangered species call these areas home. The most recent USFWS and NMFS data indicate that the potentially affected environment of inventoried roadless areas provides habitat for more than 300 threatened, endangered, and proposed species. Additionally, the potentially affected environment provides habitat for thousands of Regional Forester Sensitive Species (RFSS) and Species of Conservation Concern (SCC).

Within the potentially affected environment there are 79 final or proposed critical habitats designated under the Endangered Species Act for species managed by USFWS and 19 critical habitats designated for species evolutionarily significant units or distinct population segments managed by NMFS. The potentially affected environment also includes areas designated by NMFS as Essential Fish Habitat under the Magnuson-Stevens Act.

See the ESA-Listed Species and Regional Forester Sensitive Species section of this document for more information on those species

Fragmentation

The spatial and temporal attributes of the potentially affected environment affect biodiversity and the persistence and abundance of threatened, endangered, and proposed species there (Wilson et al. 2015). A synthesis of fragmentation experiments spanning five continents and 35 years demonstrates that habitat fragmentation reduces biodiversity by 13 to 75 percent (Haddad et al. 2015). Effects tend to be greatest in the smallest and most isolated fragments, increasing over time (Haddad et al. 2015). Decreased habitat patch sizes, increased patch isolation, and increased edge area can affect ecosystem processes that result in generalizable changes at population, community, and ecosystem levels, such as decreased residency within and movement among habitat patches, reduced species richness, decreased nutrient retention, and shifts in microclimate. Thus, shifts in spatial attributes of habitat over time, and the nature and timing of those shifts relative to the life history requirements of a species (Wan 2025), may have profound effects on its abundance and persistence.

The effects of fragmentation do vary depending on the species being considered. Forest-dependent birds, for example, are generally more sensitive to habitat fragmentation than birds adapted to more open habitats (Timmers et al. 2022). Males and females of the same species may also have different spatial requirements. Northern long-eared bats, for instance, roost and forage in the forest interior, but female roosting and foraging areas may be roughly six and three times larger, respectively, than those for males (Broders et al. 2006). Aquatic species sensitive to sedimentation or increased temperatures may be adversely affected by activities that fragment landscapes, such as those increasing runoff to aquatic ecosystems, reducing the delivery or persistence of large dead wood to streams, or decreasing the amount of closed canopy forest in riparian areas.

Connectivity, the degree to which a landscape facilitates or impedes the movement of organisms and the flow of natural processes, is crucial for maintaining biodiversity and allowing species to access essential resources and new or discontinuous habitats in dynamic landscapes.

Connectivity is not an inherent property of the landscape, but a function of the physical landscape structure (“structural connectivity”) and the specific behavioral responses and movement capabilities of a particular species (“functional connectivity”). Connectivity, therefore, is relevant at the scale at which a given species interacts with its landscape. For example, wide-ranging mammals such as the federally threatened grizzly bear, have suffered habitat loss and the extirpation or fragmentation of their populations, and require connected landscapes across broad geographic extents, to facilitate movements of individuals and promote the conservation and recovery of the species (Sells et al. 2023).

It is widely understood that increases in forest edge can have detrimental and beneficial effects on threatened, endangered, and proposed species. For example, both northern spotted owls and California spotted owls nest sites tend to be located away from forest edges (Phillips et al. 2010), but edges and heterogeneity have been shown to be important for foraging and overall fitness for the California spotted owl (Zulla et al. 2022, Zulla et al. 2023, Kuntze et al. 2023, Jones et al. 2024) Some bat and bird species use forest edges extensively for foraging, while other related species do not (for example, Brand and George 2001; Morris et al. 2010, Blakey et al. 2019). Some species such as the California spotted owl use habitat containing a large proportion of mature conifer forest at the home range scale, but at finer scales may use other vegetation classes interspersed with mature conifer for foraging (Williams et al. 2011). Similarly, the amount of connected mature forests in the home ranges of Canada lynx increase the proclivity of females to produce kittens (Kosterman et al. 2018, Holbrook et al. 2019). While lynx select mature forests at broad spatial scales, they use a mosaic of forest-structure classes, avoiding open initiating stands and preferring young (20-30 year) stands of advanced regenerating forests (Holbrook et al. 2017). Thus, relationships between forest patch sizes, configuration, and connectivity among patches are complex and species-specific. One generally detrimental effect of forest edges involves non-native invasive species. Non-native invasive species may outcompete and adversely affect the persistence of native species. Invasive species may have increased opportunity to establish and increase their ranges in increasingly fragmented landscapes, especially those with roads for ingress. Non-native plants, for example, are twice as common within 500 feet of a road (Healey 2020).

The potentially affected environment consists of inventoried roadless areas of various sizes, shapes, and configurations. Patches of different kinds of vegetation also have different characteristic shapes and sizes, and they vary in how they are laid out across a landscape in terms of what different types of vegetation are nearby, and how far apart patches of the same kind of vegetation are from one another. This variety results from where roads exist, where the inventoried roadless area boundaries are, and what are the biophysical features of the given landscapes. For detailed information about spatial characteristics of the affected environment, please see Appendix 5 – Biodiversity Analysis Supplemental Information, where you can find tabular results for fragmentation analyses for both land cover patches and forest vegetation patches in roadless areas.

In general, in the northeastern U.S., contiguous inventoried roadless areas tend to be the largest. In the southeast they tend to be the smallest. The western (Intermountain, Northern, and Pacific Southwestern Region) inventoried roadless area patches tend to be closer to each other than those

in the eastern U.S. These larger western inventoried roadless area patches also have more linear edge per unit area, which might also be described as more irregular, “wiggly” edges, for patches of a given size. The Eastern and Southern Regions (8 and 9) tend to have more fragmented, intricately shaped landscapes.

For vegetation types, differences in sizes, shapes, and the distribution of patches of a given vegetation type across a landscape result from differences in land use history, road occurrence, limited land management activities, vegetation ecology, and the spatial pattern and frequency of disturbances there. A range of sizes and shapes, and spatial distribution of patches would be expected to occur across the various forest vegetation types, at local to regional scales, as well as among Forest Service regions.

The spatial components of inventoried roadless area lands, just described, have been fairly static, affected only by the introduction of new roads or land allocation changes approved under exceptions. However, forest vegetation patch sizes, along with other spatial characteristics key to some species such as snag occurrence and longevity, may also vary over short to long time periods given the wide variety of forest vegetation types, their life history traits, and the frequency and magnitude of disturbances such as fires, insect outbreaks, and windthrow and ice storm events. The pace and pattern of these dynamic landscape vegetation attributes may dramatically affect the spatial distribution and abundance of native species.

Effects to species resulting from changes to the amount and configuration of landscape features also vary among species given their habitat requirements, life history, and population characteristics. In forested ecosystems, habitat specialists may require specific forest vegetation types, and some species, such as cavity-nesting birds and snag-dependent species, or those relying on downed dead wood, may even require specific features within those types. Habitat generalists, on the other hand, may be less sensitive to the spatial components of landscape vegetation. Sensitivity to fragmentation may be influenced by habitat type and the degree of specialization of the species, as well as life history traits such as fecundity, body mass, dispersal ability, and lifespan (Keinath et al. 2017; Suarez-Castro et al. 2025). Further fragmentation of forest types may have more negative impacts in forest types and for associated wildlife where that forest type is already rare, disconnected, and/or fragmented, depending on the needs of the individual wildlife species. In other words, where patches of forest vegetation are more intact and wildlife populations that are sensitive to fragmentation are more robust, fragmentation might have fewer negative impacts.

Understanding how various forest vegetation types are spatially distributed and shaped in a landscape can help us to assess potential habitat for wildlife. Across regions, as well as within an individual region, forest type groups have some generalizable differences in their sizes, shapes, and spacing. These probably come from differences in ecological processes across these complex landscapes, as well as from the characteristic temporal and spatial patterns of land use history and the history of disturbance, including fire sizes and severities there (please see the Fire and Fuels Management section for further description of fire sizes and severities in inventoried roadless areas). Indeed, patch sizes across regions seem fairly consistent with which forest types prevail in those areas and related history: patches of Douglas-fir in the Pacific Northwest, Northern, and Rocky Mountain Regions (Regions 6, 1, and 2), California mixed conifer in the

Pacific Southwest Region (5), maple/beech/birch in the Southern and Eastern Regions (8 and 9), and loblolly/shortleaf and longleaf/slash pine in the Southern Region tend to be larger. Patches of tanoak/laurel in the Pacific Southwest and Pacific Northwest Regions (5 and 6), oak/pine in the Southern and Eastern Regions, and aspen/birch in the Rocky Mountain and Southwestern Regions (2 and 3) tend to be smaller on average than other vegetation types. In the Southwestern Region (3), ponderosa pine patches are highly fragmented, as are aspen/birch in the Intermountain Region (4), loblolly/shortleaf pine in parts of the Southern Region (8), and maple/beech/birch in the Eastern Region (9) around the Great Lakes. Distance to the nearest patch of the same type for many forest vegetation types does not currently seem to depend on the size of the patches: both large and small patches of various types have high distances to the nearest patch of the same vegetation type.

Effects of Alternative 1 – No Action

Under alternative 1, continued management pursuant to the 2001 Roadless Rule would prohibit road construction, road reconstruction, and timber harvest within inventoried roadless areas, with limited activities occurring based on exceptions, similar to historic levels. Trends in the affected environment would be expected to continue under alternative 1. Refer to the effects analyses for alternative 1 in the National Forest System Roads; Vegetation and Forest Management; Fire and Fuels Management; Non-Native Invasive Plant Species; and Water Resources sections. Since 2018, records indicate that regional foresters reviewed and approved 168 exceptions approved tree cutting (2001 Roadless Area Conservation Rule Implementation). The majority were related to maintaining and restoring ecosystem characteristics. Eight exceptions approved tree cutting for the explicit purpose of “improving threatened, endangered, or sensitive species habitat,” although some of the exceptions outside of this category may have served multiple purposes, such as providing benefits to species habitat and additional exceptions may have been by responsible officials below the regional forester level.

With fewer disturbances caused by roads and associated activities, stream channel characteristics, such as channel and floodplain configuration, substrate embeddedness, riparian condition, amount and distribution of woody debris, stream flows, and temperature regime, are less likely to be altered (Furniss et al. 1991 as cited in USDA FS 2000). Illegal introduction and harvest of fish species would be less likely to occur under alternative 1 due to limited existing motorized public access in recreation settings within the affected environment and negligible changes to current non-motorized recreation settings anticipated (USDA FS 2000). With relatively few roads and low exposure to the disturbances associated with them, inventoried roadless areas are less likely to experience problems with non-native invasive species and are more likely to be able to maintain intact native plant communities (USDA FS 2000). Although exceptions may occur that allow road construction, road reconstruction, and timber harvest in inventoried roadless areas, potential adverse effects to terrestrial and aquatic species and habitats from fragmentation, loss of connectivity, edge effects, and human disturbance are much less likely under alternative 1 than under alternatives 2 or 3. These potential effects to species across taxa groups are discussed in more detail under alternative 2. Beyond these potential adverse effects being less likely under alternative 1, the potential beneficial effect of alternative 1 to species and habitats would be that large contiguous tracts of land are more likely to be

maintained because the potential for roads and timber harvest are less likely to occur under this alternative than alternative 2 or alternative 3.

Ongoing natural processes in inventoried roadless areas would differ across a wide range of forest types, but generally would include continued forest biomass accumulation, succession, disturbance and tree mortality related to wildfire, drought, windfall, insects and disease (Vegetation and Forest Management section). Further, while the 2001 Roadless Rule specifically includes exceptions to improve threatened, endangered, proposed, or sensitive species habitat or to maintain or restore the characteristics of ecosystem composition and structure, exceptions overall are intended to be infrequent, and these activities would be much less likely to occur under alternative 1 than alternative 2 or alternative 3. Therefore, potential adverse effects to terrestrial and aquatic species and habitats under alternative 1 could include very limited to no additional access created for some species and habitat management; loss or degradation of habitats due to vegetation encroachment, high severity wildfire, insect and disease impacts; or reduced ability for habitat enhancement through stand manipulation.

Areas of non-forest vegetation account for 37.2 percent of the total potentially affected environment, with 30.1 percent of the potentially affected environment being shrub/scrub/dwarf scrub (Table 11). Vegetation succession and woody encroachment in non-forested areas of the potentially affected environment could have adverse effects on some terrestrial animal species that depend on open or semi-open habitats for safety from predators while foraging or reproducing; species that require diverse herbaceous forage; or species that forage exclusively on plants sensitive to shading and competition. For example, greater sage-grouse (of the bi-state distinct population segment) exhibit strong site fidelity, limiting the degree to which they can adapt when their habitat changes due to pinyon-juniper encroachment, urbanization and infrastructure development, fire-invasive species cycles, or local increases in predation (Coates et al. 2024, USFWS 2020). Additionally, vegetation succession and woody encroachment could lead to over-shading and competition of some groundcover and midstory plant species that require a degree of open canopy, resulting in reduced growth and productivity of those plants. In some cases, it has been observed that herbaceous plant species richness and diversity decline in grasslands and savannas as woody species increase (Van Auken 2009, Ratajczak et al. 2012). Under alternative 1, prohibition on road construction and reconstruction could make accessing and managing these habitats in inventoried roadless areas less likely than under alternative 2 or alternative 3. As discussed in the Vegetation and Forest Management section, under alternative 1, change in non-forested vegetation would not be expected in the short term. In the long term, meadows and hardwood stands would be subject to conifer encroachment which reduces their individual size and distribution across the landscape. Non-forested vegetation structure, such as shrub density, would continue to move away from objectives making it susceptible to future natural disturbances, such as insect infestations or large wildfires. Although expected to be infrequent, approved tree cutting exceptions may complement natural processes affecting vegetation structure and composition to improve habitat or maintain or restore ecosystem composition and structure. Additionally, fuels management activity that does not involve road construction or tree cutting (such as prescribed fire, or wildfire use) would continue to be allowed and may offset some of the potential effects of vegetation succession and woody encroachment; however, for prescribe fire, current IRA constraints limit both access and the

ability to sustain treatment cycles (see the Vegetation and Forest Management and Fire and Fuels Management sections).

Many species evolved under the influence of recurrent fire, including stand replacing events, and their long-term persistence relies heavily on the maintenance of important habitat components by these disturbance events. However, high severity wildfires in old growth forests, or other forested ecosystems which are not adapted to high severity fire, could have adverse effects on some terrestrial animal species that depend on mature, structurally complex forests, dense canopy cover, or specific resources found in unburned habitats. For example, a major threat to mature forest specialist species such as the California and Mexican spotted owl, and Sierra Nevada Fisher is an increased risk of wildfires that kill a majority of the canopy layer, which could result in direct mortality or local loss of suitable mature and structurally complex forest habitat (Jones et al. 2016, Steel et al. 2023, Jones et al. 2025, USFWS 2023a). High severity wildfires could have an adverse effect on specialist species without suitable habitat to shift to nearby, species that lack mobility to quickly shift their occupied area, or species with low population numbers that can't recover from a sudden loss of a portion of their population (Jager et al. 2021, van Mantgem et al. 2015). Even among mobile animals such as birds, growing size of high severity patches can lead to reduced species richness within patch interiors (Steel et al. 2022). For plant species, high severity wildfires could result in direct mortality of plant species lacking fire-adapted traits. For plants that survive high severity fires, there could be increased competition with fast-spreading non-native invasive species that become established quicker in the post-fire environment. Overall, the threat of high severity wildfires to forested habitat availability is the risk of large-scale tree regeneration failure and persistent type-conversion (Stevens et al. 2017; Coop et al. 2020). For example, high severity fires in pine forests that were historically burned frequently, but by low to moderate severity fires, may result in conversions to non-forested conditions. In forested riparian areas, the loss of trees and other overhanging vegetation along waterbodies due to high severity wildfires could result in a loss of cover habitat for aquatic animal species, reduced bank stability, and increased sedimentation.

Aggressive suppression across many decades has contributed to fuel accumulation and increased the likelihood that future fires, particularly those that escape initial attack, will burn under more extreme conditions and be more difficult to control (Arno and Brown 1991; Calkin et al. 2015; Kreider et al. 2024). Area burned has trended up through time for all NFS lands and potentially affected IRAs, leading to more total area burned at moderate and high severity in recent decades (Figure 14). The mean fire size within inventoried roadless areas from 2014 to 2024 was greater than other NFS lands but less than Wilderness areas (Table 18), and percent of area burned that was high severity within inventoried roadless areas during that same period was greater than other NFS lands and Wilderness areas (Table 19). Within inventoried roadless areas opportunities for mechanical treatments, prescribed fire, and wildland fire use are more limited compared to other NFS lands due in part to greater restrictions on road construction, access constraints, terrain, high operational costs, narrow burn windows for prescribed fire, and ignition timing of wildfire (Fire and Fuels Management). While wildfires could occur under all alternatives, under alternative 1 the prohibition on road construction and reconstruction could make accessing areas to perform fuels management activities in inventoried roadless areas less likely than under alternative 2 or alternative 3. Under alternative 1, fuels management activities can occur within

inventoried roadless areas if they do not include road construction or tree cutting, or if they are reviewed and approved by the regional forester under an exception. Agency management records show that a lack of roads has not prevented fire prevention or protection measures; however, road restrictions limit opportunities for mechanical thinning and fire control (see the Fire and Fuels Management section). High severity wildfires could result in mortality of dispersal limited species, displacement of species due to habitat loss or competition, or loss of old growth and other forested habitats in both the short term and long term; however, as hazardous fuel loads continue to accumulate in these forested areas the risk to some species and habitats from high severity fires would increase.

Insect and disease outbreaks can affect species and habitats by directly harming native species, disrupting ecosystems, and altering the physical landscape. For example, outbreaks of bark beetles can kill trees over large areas which can reduce biodiversity and alter habitat structure (USDA FS 2025). Under alternative 1, trends in insect and disease activity would continue; these vary across forest type and are influenced by abiotic and biotic conditions. While the risk of insects and disease is similar in potentially affected IRAs relative to all NFS lands, under alternative 1 prohibition on road construction and reconstruction can make accessing and managing insect and disease outbreaks in inventoried roadless areas less likely under this alternative than alternative 2 or alternative 3 (see the Vegetation and Forest Management section for more detailed discussion on insects and disease). However, infrequent activities permitted under the existing exceptions may support localized management action to mitigate insect and disease caused mortality or damage at minor levels. In the short-term insects and disease outbreaks may stress populations or kill individuals of a species, but in the long term, if not managed, these outbreaks could lead to widespread tree mortality and habitat loss for some species.

Reduced ability for habitat restoration and enhancement for some species through stand manipulation in inventoried roadless areas may be a potential adverse effect of alternative 1, because under the prohibitions and exceptions, tree cutting, of generally small diameter timber, is expected to be infrequent and must be approved by a regional forester (36 CFR 294.13(b)). For example, waiting for natural succession to reach the late-seral stage is not ideal when managing for at-risk species like the cerulean warbler in some regions; forest management can be used to provide the necessary structural diversity in a short period of time (Nareff et al. 2019). Under alternative 1, activities related to improving habitat for ESA-listed and sensitive species would continue to be limited to approved exceptions and would be more likely to occur primarily in areas where road access already exists. Although permitted activities or approved tree cutting exceptions under alternative 1 can be implemented to complement natural processes affecting vegetation structure, composition, and forest health to improve habitat or maintain or restore ecosystem composition and structure, these activities could be less likely under alternative 1 than under alternative 2 or alternative 3 where the prohibitions on road construction and timber harvest would be rescinded.

Current status of and trends in biodiversity are likely to continue under alternative 1 in the short-term because no increase in timber harvest within the IRAs is expected and new road construction would be based on existing exceptions. The level of assumed forest management

activity would continue at approximately the same as the recent levels. In the long term, the potential adverse effects to biodiversity from lack of management would be more likely than in the short-term under alternative 1, and could lead to habitat alteration or loss, species displacement, or direct mortality to plant and animal species. However, these potential adverse effects are applicable to specific conditions which may be less certain to occur relative to the potential adverse effects from a potential increase in road construction, road reconstruction, and timber harvest under alternatives 2 and 3.

Effects of Alternative 2 – Proposed Action

Although alternative 2 does not compel or authorize site-specific activities in potentially affected inventoried roadless areas, an increase in site-specific road construction, road reconstruction, and timber harvest is reasonably foreseeable. Road construction, road reconstruction, and timber harvest could increase due to the removal of the prohibitions. However, these activities would only occur in areas where allowed under the direction of land management plans, NEPA, agency policy, and areas where mechanized equipment can safely operate. In the long term, biodiversity is more likely to be affected by road construction, road reconstruction, and timber harvest which could occur in more areas of the affected environment if land management plans are revised or amended, though timber activities would still be unlikely in the “not operable” forested areas (see the alternative 2 summary tables in Appendix 1 – IRA Acreage Summarized by Region). Refer to Vegetation and Forest Management and National Forest System Roades sections for a full discussion on potential road construction, road reconstruction, and timber harvest activities.

Future proposals for road construction, road reconstruction, and timber harvest, where allowed by current land management plans and where operable, would be considered on a case-by-case basis at the project level (see Common to All Alternatives). The potential effects to biodiversity which could occur in the short term and long term are discussed in more detail below for terrestrial animal species and habitats, aquatic species and habitats, and terrestrial and aquatic plant species and habitats. Overall, potential impacts to species and habitats from these effects would be expected to vary depending on the timing, location, and scale of activities. The discussion in this section captures the principal effects that have been associated with roads and timber harvest, but these are potential effects, and not every activity associated with roads and timber harvest would necessarily exhibit each of these effects.

Terrestrial Animal Species and Habitats

Potential Adverse Effects from Road Construction or Road Reconstruction

Inventoried roadless areas may function to provide some terrestrial animal species with refugia from potential adverse human-related activities that are prevalent in roaded areas. Almost all roads present some level of benefits and risks. These effects can vary greatly in degree and can shift over time (USDA FS 2000, Findlay and Bourdages 2000). Some effects are immediately apparent, but others may require external events, such as a large storm, to become visible. Other effects may be subtle, such as pathogens noticed only when they become widespread in the landscape, or with increased road use as recreation styles and motor vehicles change (USDA Forest Service 2000h, as cited in USDA FS 2000). Some of the potential adverse effects described below may already be mitigated through land management plans, particularly

standards and guidelines determined during the land management planning process to provide the ecological conditions necessary to maintain or restore ecological integrity and diversity. Therefore, in the short-term these potential adverse effects to terrestrial species and habitats are less likely, but in the long-term these effects could be more likely to occur if there is an increase in road-related activities in the affected environment. In both the short term and long term, in compliance with land management plan requirements and through project-specific planning, future activities would be designed to avoid or minimize adverse impacts from road construction or reconstruction to biodiversity and in some cases could incorporate design features beneficial to terrestrial animal species and habitats, however, complete avoidance of adverse effects may not be possible.

Some of the potential adverse effects of road construction and road reconstruction activities on terrestrial animal species and habitats are summarized below with examples.

- Habitat loss and degradation
 - ♦ Smaller habitat patch size and loss of interior forest habitat have adverse effects on numerous species dependent on such habitat including some neotropical migratory bird species such as the cerulean warbler, hooded warbler, and wood thrush (Southern Appalachian Man and the Biosphere 1996a as cited in USDA FS 2000).
- Habitat fragmentation and edge effects
 - ♦ Numerous species inhabiting landscapes affected by the rescission of the 2001 Roadless Rule could be negatively affected by habitat fragmentation and the creation of additional edge habitat along roads if new roads are constructed (Haddad et al. 2015). Bird richness tends to decline with road presence in habitats with dense tree cover (Kroeger et al. 2022). At a population level, more mobile species and those with larger home ranges tend to respond more negatively to road presence (Rytwinski and Fahrig 2012). Populations of species with high reproductive rates and high flight altitudes, on the other hand tend to be less vulnerable to roads (Kociolek et al. 2015).
 - ♦ Roads and forest cover can affect the behavior, health, and survival of recreationally harvested species like elk. Elk avoid areas near roads and select for habitat away from roads (Rowland et al. 2004, Rowland et al. 2000, Rowland et al. 2018). Ideal summer elk habitat, as described by one study conducted in northern Idaho, consists of unroaded land with at least 40 percent canopy cover and forage. The same study noted that in areas with roads, elk select areas with greater canopy cover (Unsworth et al. 1998). A study comparing time periods before and during a period of road restriction on Bureau of Land Management lands found that during the road restriction period daily elk movement rates decreased, potentially conferring energetic benefits (Cole 1997). The same study also found that survival rates increased during the road closure period and decreased again when road closure gates were removed.

- ◆ Occupancy of endangered marbled murrelet habitat declined with greater fragmentation, with greater negative effects further from marine resources and closer to the species' range edge (Valente et al. 2023).
- Introduction and spread of invasive species
 - ◆ Road construction, routine roadside mowing, and the use of roads have been shown to facilitate the spread of non-native invasive plant species such as yellow starthistle, scotch broom, knapweed, small broomrape, gorse, and cheatgrass (Mortensen et al. 2009, Gelbard and Belnap 2003, Seipel et al. 2012). Areas infested with invasive species, such as knapweed and leafy spurge, can have low grass productivity affecting the quality and amount of forage available to many animal species (Stannard 2004, USDA 2017a, USDA 2017b, Ortega et al. 2006). Invasive species can also have extensive impacts on native plant abundance (Pearson et al. 2016a). Once established, many of these non-native species are extremely difficult or impossible to eradicate. Depending on the chemical used and the application methods, the use of herbicides in eradication or control efforts can have unintended adverse effects to populations of other terrestrial and aquatic species (Crone et al. 2009, USDA 2017a, Pearson et al. 2016b, Ortega and Pearson 2011).
- Encroachment of generalist, competitor species into novel ecosystems
 - ◆ Roads and other linear features can cause woodland caribou, their competitors (moose, deer, and elk), and their shared predators to change their space use (Dickie et al. 2023) with negative implications for caribou demographic rates (Serrouya et al. 2017). Competitor ungulates and predators can use roads to access parts of caribou range that were previously inaccessible to them, leading to increased predation on caribou populations and depressed population growth (Wittmer et al. 2007).
- Recreational disturbance
 - ◆ Wolverines appear to be sensitive to both motorized and non-motorized human recreation (Heinemeyer et al. 2019, Barrueto et al. 2022, Kortello et al. 2019). In some instances, these interactions may be caused by roads, as one study found that wolverine distribution is negatively correlated with forest roads used by winter snowmachines (Kortello et al. 2019). Females may be especially sensitive to recreational disturbance (Heinemeyer et al. 2019).
 - ◆ Human recreation activities, especially winter activities such as backcountry skiing, cat-skiing, and snowmobiling, make use of existing roads and require ongoing road maintenance. These roads create more opportunities for more human disturbance in areas that were previously less accessible (84 FR 52598) which affects woodland caribou stress levels (Freeman 2008) and habitat use (in snowmobile areas, Seip et al. 2007).
 - ◆ Sound disturbance from recreation causes behavior changes (increased fleeing and vigilance) and decline in presence of elk and other wildlife around areas with hiker and biker noise (Zeller et al. 2024). Long-term exposure can increase stress and avoidance of impacted areas (Piñeiro et al. 2012; Heinemeyer et al. 2019).

- ♦ While bald eagles may have active nests near roads, especially when the roads pre-date the eagles' successful nesting activity in the area, they are less disturbed by a constant level of use than by intermittent, occasional, or irregular use of those roads (USFWS 2007). Generally, activities should be kept as far away from nest trees as possible (USFWS 2007).
- Increased human wildlife conflict
 - ♦ According to the grizzly bear recovery plan, “the presence of open roads in grizzly habitat often leads to increased bear/human contact and conflict, and can ultimately end in grizzly mortality”. The recovery plan adds “accidental shooting... and habituation through direct human contact and/or food reward all increase with the use of even secondary, unpaved roads by humans” (USFWS 1993).
 - ♦ A study in Canada found that some moose are attracted to roadsides where vegetation has higher concentrations of sodium (as a result of de-icing in winter) during periods of sodium deficiency, and therefore road construction could increase human-moose interactions (Laurian et al. 2010). Increased chances for interaction could lead to increased conflict because moose have been known to stand their ground or charge when they feel threatened or cornered by humans, particularly during breeding season and when protecting young (CPW 2025, Utah DWR 2025).
- Barriers to movement and dispersal
 - ♦ Multiple studies found that roads often restrict the movements of small mammals and can function as barriers to population dispersal (McGregor et al. 2007, Brehme et al. 2013 Galantinho et al. 2022). These studies identify road design and vegetation management of the roadside as important factors contributing to roads acting as barriers for small mammals.
 - ♦ Terrestrial migrations may be disrupted by roads. For example, the addition of roads associated with oil extraction in Wyoming may have altered the migration routes and increased the movement speed of mule deer (Sawyer et al. 2013).
- Increased disturbance from human interactions leading to physiological stress for some species and lowered success in reproduction and rearing of young
 - ♦ An experimental study found that nestling tree swallows exposed to traffic noise had higher levels of stress response hormones and lower body condition (Injaian et al. 2018).
 - ♦ Experimental application of road noise in a roadless area of southern Idaho showed over a quarter decline in bird abundance (McClure et al. 2013), 31 percent of species avoided “phantom roads” where noise was applied, and decreased body condition for those birds that remained (Ware et al. 2015), with especially negative impacts on hatch-year birds influencing community age structure (McClure et al. 2017).
 - ♦ A review of research on the effects of noise (including road noise) on wildlife showed largely negative impacts, including reduced abundance, altered vocal, vigilance and foraging behavior, and impacts on individual fitness and community

structure. These effects were especially prevalent among taxa such as songbirds that rely on vocal communication (Shannon et al. 2015).

- ◆ Many reptile species are sensitive to harassment or human presence during particular seasons, which could lead to reduced productivity, increases in energy expenditures, or displacements in population distribution or habitat use (Bennett 1991 and Mader 1984 as cited in USDA FS 2000; Beale et al. 2016)
- ◆ Bats are vulnerable to disturbances and displacement caused by human activities in caves and mines, and on rock faces (Taylor et al. 2020, USFWS 2023b). Human entry or other disturbance to hibernating bats can result in an increase in total energy expenditure at a time when food and water resources are scarce or unavailable (USFWS 2022a).
- Direct mortality
 - ◆ In a meta-analysis of studies across 22 countries comprising 69 mammalian species, road mortality was the greatest source of mortality for approximately one-third of populations for which data were provided ($N = 16$ out of 57 populations). Large individual losses on roads can directly reduce the effective population size and/or increase mortality rates above recruitment rates, therefore making populations vulnerable to environmental and demographic stochasticity, as shown for many species (Moore et al. 2023).
 - ◆ While highways are regularly implicated in wildlife mortality, wildlife can also be killed by vehicles on lower-trafficked roads. For example, between 2010 and 2015, 22 of 54 lynx road mortalities in Maine occurred on low traffic, low speed, dirt forestry roads and 2 of 9 mortalities in Minnesota occurred on unpaved forest roads (USFWS 2017).
 - ◆ Amphibians may be especially vulnerable to roadkill because their life histories often involve migration between wetlands and uplands, and individuals are inconspicuous and sometimes slow moving (Fahrig and Rytwinski 2009). Roads can be demographic barriers that cause habitat and population fragmentation (Joly and Morand 1997 as cited in USDA FS 2000; Lesbarrères et al. 2006).
 - ◆ Reptiles, such as snakes, seek roads for temperature regulation and are vulnerable to mortality from motorized vehicles (Fahrig and Rytwinski 2009, Andrews et al. 2015).
 - ◆ Some research has shown that roads can cause mortality of low-flying species and disrupt bat travel, especially major roads with high associated noise (Bennett and Zurcher 2012, Fensome and Mathews 2016).
 - ◆ Roads and road traffic are major sources of insect mortality, act as barriers to small or flightless species, and are sources of pollution that negatively impact insects (Munoz et al. 2014).

- Loss of genetic diversity and genetic connectivity within and between populations
 - ♦ Early genetics work found that roads often, but not always, decrease genetic diversity (Holderegger and Di Giulio 2010). A recent analysis of over 1,400 mammal populations in North America found that the impact of roads on genetic diversity varied widely across genera (Habrigh et al. 2021) and was moderated by some life history traits. For example, the genetic diversity of species with large home-ranges was more negatively affected by road density than species with small home-ranges (Habrigh et al. 2021).
 - ♦ In the endangered southern Sierra Nevada fisher population roads were found to have a negative influence on genetic connectivity for females in the south-central region of the population where even the most heavily used roads are primarily two-lane mountain roads running through otherwise contiguous forested habitat (Tucker et al. 2017).
- Changes in behavior
 - Roads with high traffic can alter grizzly bear habitat use, driving them to be largely nocturnal and to select for private lands with lower traffic levels (Northrup et al. 2012). Habitat use for both grizzly and black bears in northwest Montana was lower near roads and trails (Kasworm and Manley 1990). Negative impacts of roads can be moderated through managed access of motorized access (Proctor et al. 2020).
- Decline in species abundance
 - ♦ Road disturbance is linked to a decrease in caribou abundance in occupied caribou habitat and the surrounding areas. Research suggests that for every 1 percent increase in roads (buffered by 50 meters) in the areas surrounding occupied caribou habitat, there would be a 42 percent decline in southern mountain caribou abundance (Lochhead et al. 2022).
 - ♦ Reptile and amphibian population can decline due to roads and traffic. One review article spanning multiple countries found that populations of frogs, toads, salamanders, turtles, snakes and lizards are negatively affected by roads (Rytwinski and Fahrig 2015).
 - ♦ A global meta-analysis indicated that the negative effect of roads (and other types of infrastructure) on bird abundance can extend up to one kilometer away, with much variation among species (Benitez-Lopez et al. 2010). Multiple studies generally see decreased species richness or community integrity with increasing density of roads (Glennon and Porter 2005), though there tends to be a lag effect after roads are developed (Findlay and Bourdages 2000).
 - ♦ Grizzly bear densities decline with increased road density in British Columbia and Alberta, Canada, but reducing vehicle access would likely reduce impacts (Lamb et al. 2017, Boulanger and Stenhouse 2014).

Potential Adverse Effects of Timber Harvest

There are potential risks of adverse effects on terrestrial animal species and habitats associated with harvesting timber. Adverse effects of timber harvest can vary, depending on the amount, type and location of timber harvest, overall watershed condition, status of species within the affected area, and the mitigation measures applied. Some of the potential adverse effects described below may already be mitigated through land management plans, particularly standards and guidelines determined during the land management planning process to provide the ecological conditions necessary to maintain or restore ecological integrity and diversity. Therefore, in the short-term these potential adverse effects to terrestrial species and habitats are less likely, but in the long-term these effects could be more likely to occur if there is an increase in timber harvest in the affected environment. In both the short term and long term, in compliance with land management plan requirements and through project-specific planning, future activities would be designed to avoid or minimize adverse impacts from timber harvest to biodiversity and in some cases could incorporate design features beneficial to terrestrial animal species and habitats, however, complete avoidance of adverse effects may not be possible.

Some of the potential adverse effects of timber harvest on terrestrial animal species and habitats are summarized below (USDA FS 2000) with examples.

- Declines in abundance for some species
 - ♦ A noticeable decline in marten habitat in Sagehen Experimental Forest (California) occurred between 1983 and 1990. During that period, 39 percent of the forested habitat in the Sagehen Experimental Forest experienced some form of timber harvest, including 11 percent harvested with clear-cut or shelterwood methods and 28 percent harvested with salvage sales. As a result, researchers estimated that the percent cover of high-quality marten habitat in the Sagehen Experimental Forest declined from approximately 27 percent in 1978 to 15 percent by 1990. A number of other studies suggest that martens tend to disappear from an area after the percent of total forest cover is reduced below 45–75 percent (Hargis et al. 1999, Potvin et al. 2000, Fuller 2006, Webb and Boyce 2009).
 - ♦ Ash (1997), and Petranka et al. (1993) found that clearcut timber harvest eliminated some species of salamanders from the harvest area (as cited in USDA FS 2000). Mossman et al. (2019) studied the response of two salamander species in New England forests and found that both species populations were lowest immediately after timber harvest but that the long-term mechanism of effects from harvest on each species varied. For example, the red-backed salamander abundances were strongly tied to stand age and abundance of coarse woody debris, while the abundance of eastern newts were tied primarily to wood debris and vegetation characteristics and not directly related to stand age.
- Habitat loss, fragmentation, and negative edge effects
 - ♦ “Intensive” forest harvesting such as “large scale clearcuts” can be detrimental to lynx by eliminating habitat associated with prey and lynx denning (65 FR 16053). While lynx occasionally use even recently harvested landscapes (Squires et al. 2010;

Holbrook et al. 2018), they do not prefer them. In winter, lynx in the Northern Rockies avoid clearcuts (Squires et al., 2010). Similarly, lynx in this region increasingly avoided forests 5 years or less post-disturbance as it became more available in home ranges (Holbrook et al. 2017). Work in Maine shows similar results with lynx avoiding recent clearcuts in winter (Fuller et al. 2007). Regardless of silvicultural treatment, lynx may avoid recently harvested landscapes. Work in the Northern Rockies showed that lynx avoided areas subjected to group selection cuts, liberation cuts, improvement cuts, pre-commercial thinning, regeneration cuts with natural regeneration, and regeneration cuts with planting up to approximately 10 years post-action (Holbrook et al., 2018). Lynx use of these silvicultural treatments increased with time in a manner dependent on treatment type and composition of the surrounding landscape (Holbrook et al., 2018).

- ◆ The northern spotted owl, a late successional forest species, continues to be threatened by habitat loss due to lag effects of past habitat loss, continued timber harvest, wildfire, and non-native barred owls (85 FR 81144). Timber harvest continues to be a stressor even though loss of habitat due to timber harvest has been greatly reduced on Federal lands over the past two decades (USFWS 2011). Previous studies found that negative effects from timber harvest were most likely associated with instances of higher-intensity thinning, timber harvest close to the nest area, and when the affected owl site had low amounts of alternative habitat available (USFWS 2011).
- Loss of snags and downed logs
 - ◆ Loss of large trees, snags and logs in areas adjacent to roads through commercial harvest or firewood cutting could have adverse effects on cavity-dependent birds and mammals (Hannet al. 1997 as cited in USDA FS 2000). However, potential impacts to species dependent on these features would be expected to vary depending on the timing, location, and scale of removal.
- Lowered success in reproduction and rearing of young
 - ◆ Although forest edges, such as those created by timber harvest, may benefit some species, they also provide access to interior forest patches for opportunistic species, such as the brown-headed cowbird, a brood parasite that lays its eggs in the nests of other bird species, and which may adversely affect some bird populations (Cox et al. 2012). One study on the Swainson's warbler, a neotropical migrant, in the St. Francis National Forest and White River National Wildlife Refuge found that the probability of brood parasitism was greater near forest edges and that number of Swainson's warblers fledged was lower in parasitized nests (Benson et al. 2010).
- Increased physiological stress for some species
 - ◆ A study on ovenbirds in Canada found that logging disturbs nestling ovenbirds resulting in elevated baseline corticosterone levels and a shift of offspring sex ratio towards males (Leshyk et al. 2012).
- Introduction and spread of non-native invasive species

- ◆ Ground disturbing activities from machinery can transport seeds and plant parts of invasive plants and can create openings for existing or new populations to expand.
- Altered trophic dynamics (for example, shifts in composition of prey base)
 - ◆ Northern flying squirrels (Holloway and Smith 2011) and red tree voles (Forsman et al. 2016), prey species of the northern spotted owl, occurred at lower densities in some timber harvest areas than in unmanaged forests. Another study in Canada also found that red squirrels and northern flying squirrels occurred at lower densities in partially harvested stands of mature Douglas-fir relative to unharvested stands, while yellow-pine chipmunks increased with logging intensity (Herbers and Klenner 2010).
- Direct mortality; impacts to ground dwelling species (loss of burrows, soil compaction)
 - ◆ Some native bee species nest in the ground and mechanical equipment associated with timber harvest could destroy their nests or result in direct mortality to bees if present. For example, the federally listed rusty patched bumble bee typically nests in abandoned rodent nests or similar cavities in well-drained soils and may inhabit forests or forest edges (USFWS 2021). The current recovery plan for this species identifies undisturbed nesting habitat as a key component to their survival and successful recruitment (USFWS 2021)
- Disruption of dispersal and species migration
 - ◆ Many amphibian species have been found in lower densities in some timber harvest areas when compared to mature, unmanaged forests (deMaynadier and Hunter, Jr. 1998, Petranka et al. 1993, Ash 1997, and deMaynadier and Hunter, Jr. 1999 as cited in USDA FS 2000). One study found that seven out of nine pond-breeding amphibians consistently experienced negative effects from clearcut timber harvest, which exposed the forest floor to more sunlight and wind; although effects in partial-harvest treatments were mixed, with some positive effects observed potentially due to enhanced productivity of the herbaceous and shrub layers (Semlitsch et al. 2009). Clearcuts can result in changes to microclimate and a loss of leaf litter used as cover, potentially disrupting the movement of some amphibian species (Semlitsch et al. 2009).

Potential Beneficial Effects of Road Construction, Road Reconstruction, and Timber Harvest

Some of the potential beneficial effects of road construction and timber harvest on terrestrial animal species and habitats could include:

- Enhanced access for some plant and wildlife management activities
- Easier access for habitat restoration and enhancement for some species through stand manipulation
- Creation of edge habitat and early successional habitat used by some species
- Increasing abundance, for some species
- Facilitation of movement, migration, and dispersal, for some species

Some examples of potential beneficial effects on terrestrial animal species and habitats include the following:

- Timber harvest can be used to benefit species like the red-cockaded woodpecker, Florida scrub jay, and Kirtland's warbler by creating and maintaining appropriate open forest or early seral conditions (Rudolph et al. 2004, 89 FR 85294, USFWS 2019a, USFWS 2019b).
- The response of California spotted owls and Mexican spotted owls to fuels treatments depends on the silviculture type, method, and scale of treatment; but long-term benefits to reduce the risk of severe large-scale wildlife could outweigh short-term negative impacts (88 FR 11600, USFWS 2012). Some studies in California found that strategic fuels management, depending on the methods, can both mitigate severe wildfire behavior and provide habitat structure beneficial to some species such as spotted owls and fisher (McGinn et al. 2025, Steel et al. 2023, Jones et al. 2025).
- Roads and associated infrastructure can provide important roosting habitat for bats. Gray bats roost under bridges when caves are unavailable (Etchison & Weber 2020, Sasse 2019). Similarly, tricolored bats roost in road-associated culverts in places where caves and mines are rare (USFWS 2022).
- Road corridors function as travel routes for a number of bat species including those in the *Myotis* genus. Gray bats use roads as travel corridors during flight, so rural road development may aid bat movement to foraging areas (Jackson et al. 2023). However, as noted under the potential adverse effects above, other research has associated mortality and travel disruption with low-flying bats using roads as travel corridors (Bennett and Zurcher 2012, Fensome and Mathews 2016).
- Species adapted to open forest canopy, such as hoary bats and silver-haired bats, show increased activity in clearcuts and harvested areas while forest-interior bat species show more variable responses (Patriquin and Barclay 2003; Owen et al. 2004). The endangered northern long-eared bat and Indiana bat selected previously thinned areas and patch cuts (less than 4-ha) but avoided large clearcuts (greater than 4-ha; Divoll et al. 2022). Loeb and Waldrop (2008) also showed increased bat activity for some species following forest thinning treatments.
- Roads can provide access for invasive species monitoring and removal. For example, a combined monitoring and barred owl removal experiment relied on road accessible monitoring (generally less than 200 m from minor roads) to locate invasive barred owls and lethally remove them to understand the conservation benefits for spotted owls and ecological integrity (Hofstadter et al. 2022).
- Silvicultural practices that bring small gaps that effectively mimic natural disturbance processes can be neutral to forest birds and even enhance habitat (Forsman et al. 2010). Similarly, the National Fire and Fire Surrogate project showed general increase in small mammals following fuel reduction treatments (such as prescribed fire, thinning, mastication), but variable responses among species and taxa (Converse et al. 2006). In forests with relative homogeneity such as second-growth forest stands in eastern North

- America, moderate levels of canopy reduction can increase understory vegetation and subsequently foraging and nesting opportunities for certain birds (Akresh et al. 2023).
- Silvicultural practices such as thinning and burning that emulate historical disturbance regimes can also support the diversity and abundance of bees that require early successional resources including flowering understory plants (Chase et al. 2023). These positive impacts are conditional on season, soil conditions, and management type. For example, the combination of prescribed fire and mechanical treatments can increase bee abundance and occurrence of rare species, while the combination of herbicide application and plantings can negatively impact rare species (Cunningham-Minnick et al. 2024). Post-harvest bee diversity was high in a Douglas-fir stands but declined with stand age (Rivers and Betts 2021).
 - Stand manipulation can be used to improve habitat for species like the cerulean warbler when used to create opening in the canopy while retaining large trees preferred by this species (Nareff et al. 2019). Further, managing breeding habitat for cerulean warblers can simultaneously improve habitat for game species such as wild turkey, ruffed grouse, and white-tailed deer that need complex forest structure with mast-producing trees, interspersed with fields and young forests to satisfy year-round habitat needs (Nareff et al. 2019).

A road- or timber harvest-related beneficial effect for one species, may, in fact, represent an adverse effect for another. Because alternative 2 would allow the full range of timber harvest to occur (in alignment with land management plans), some local negative impacts to these resources and to biodiversity could occur. For example, although forest edges, such as those created by road construction and timber harvest, may benefit some species, such as deer and bobwhite quail, they also provide access to interior forest patches for opportunistic or predator species (Norse et al. 1986, as cited in USDA FS 2000). These benefits would be weighed at the local project level against the risks of implementing these treatments during project-level environmental review and when assessing projects for consistency with land management plan requirements. All land management plans are required under the 2012 Planning Rule to maintain or restore ecological integrity (36 CFR 219.8(a)), and older plans under the 1982 Planning Rule to provide for or contribute to ecosystem diversity (36 CFR 219.27(a)(1982)). To meet these requirements, land management plans include plan components to provide the ecological conditions necessary to support diversity of communities and the persistence of most native species in the plan area. Therefore, future timber or road-related activities implemented consistently with land management plans, as required, would be designed to avoid or minimize adverse impacts to biodiversity and in some cases could incorporate design features beneficial to terrestrial species and habitats.

Beneficial effects to terrestrial species from timber harvest activities are often due to creating or maintaining some specific habitat condition. Timber harvest creates forest age-class diversity and mosaic habitats used by some species (USDA FS 2000, Nareff et al. 2019, Forsman et al. 2010). Some species require early seral or open-forest habitats that can be created and maintained by restorative timber harvest. Timber harvest activities may also reduce the risk of uncharacteristic

large stand-replacing insect and disease outbreaks and severe wildfires. These disturbance events can present both benefits and risks to some species, at least at a local level.

Aquatic Animal Species and Habitats

Refer to the Water Resources section for a full discussion of the potential effects of alternative 2 on water resources. This section focuses on how potential effects to water resources under alternative 2 could impact aquatic animal species and habitats. In compliance with land management plan requirements and through project-specific planning, future activities would be designed to avoid or minimize adverse impacts from road construction or reconstruction to the biodiversity of aquatic animal species and habitats, however, complete elimination of adverse effects may not be possible.

Potential Adverse Effects from Road Construction and Road Reconstruction

Road construction, reconstruction, maintenance, use, and even the presence of roads in a watershed can have numerous adverse effects to aquatic habitats and the species they support. Road design and application of best management practices have been effective in some instances at moderating or avoiding many adverse effects (USDA FS 2000). The discussion in this section captures the principal effects that have been associated with roads, but these are potential effects, and not every road would necessarily exhibit each of these effects. Some of the potential adverse effects described below may already be mitigated through land management plans, particularly standards and guidelines determined during the land management planning process to provide the ecological conditions necessary to maintain or restore ecological integrity and diversity. Therefore, in the short-term these potential adverse effects to aquatic species and habitats are less likely, but in the long-term these effects could be more likely to occur if there is an increase in road-related activities in the affected environment. In both the short term and long term, in compliance with land management plan requirements and through project-specific planning, future activities would be designed to avoid or minimize adverse impacts from road construction or reconstruction to biodiversity and in some cases could incorporate design features beneficial to aquatic animal species and habitats, however, complete avoidance of effects may not be possible.

Adverse effects from roads on water resources could include (Furniss et al. 1991, Trombulak and Frissell 2000, and USDA Forest Service 2000h, as cited in USDA FS 2000, USDA 2023):

- Increasing habitat fragmentation and loss of connectivity.
- Increasing sediment loads in streams.
- Altering watershed hydrology, stream flows, water temperature regimes, and stream channel morphology.
- Degrading water quality.

These physical alterations to water resources can potentially result in a variety of adverse effects to aquatic species and habitats including:

- Increased vulnerability of subpopulations to catastrophic events and loss of genetic fitness, related to loss of habitat connectivity.

- Loss of spawning and rearing habitat, deep pools, protective cover, and resting habitat.
- Increased reproductive failure and mortality of eggs and young.
- Increased susceptibility to disease, predation, over harvest, and poaching.
- Shifts in macroinvertebrate communities to those tolerating diminished water quality.
- Competition from non-native species.
- Increasing barriers to passage, gradient, and temperatures.

Some examples of adverse effects from roads on aquatic animal species and habitats include the following:

- The primary threats to big sandy crayfish are land-disturbing activities that increase erosion and sedimentation leading to smothering of rocky substrates and suitable cavities this species requires for cover. Loss of cover and refugia can lead to reduced carrying capacity and density of subpopulations, increased predation risk, reduced foraging success, and increased competition with non-native crayfish. Within the range of the big sandy crayfish, sources of sedimentation have been identified as active surface coal mining, commercial forestry, unpaved roads, gas and oil development, road construction, and stream modifications associated with channel instability (USFWS 2025b).
- A controlled experimental study in northern California found that increasing concentrations of deposited fine sediment in streams decreased growth and survival of juvenile steelhead trout, increased steelhead activity and injury rates, and shifted invertebrate communities to be dominated by burrowing species not suitable as forage for steelhead (Suttle et al. 2004).
- Some studies suggest that spawning bull trout abundance is negatively correlated with road density in the northwest United States (Rieman et al. 1997, Baxter et al. 1999). The USFWS 2024 Species Status Assessment for bull trout notes forest management practices as one of the threats to bull trout stream habitats. The USFWS states that “forest management activities, including timber harvest and road construction, can affect bull trout stream habitats by altering recruitment of large woody debris, erosion and sedimentation rates, runoff patterns, the magnitude of peak and low flows, water temperature, and annual water yield” (USFWS 2024). However, the magnitude and potential synergistic effect of forest management activities with other threats would vary across recovery units, core areas, and among local populations.

Potential Adverse Effects of Timber Harvest

The effects of activities associated with timber harvesting (such as tree felling, yarding, landings, site preparation by burning or scarification, fuels reduction, brush removal and whip felling, and forest regeneration) are often difficult to separate from the effects of roads and road construction. The road systems developed to harvest timber are often a significant factor affecting aquatic habitats, as discussed above. Some of the potential adverse effects described below may already be mitigated through land management plans, particularly standards and guidelines determined during the land management planning process to provide the ecological conditions necessary to

maintain or restore ecological integrity and diversity. Therefore, in the short-term these potential adverse effects to aquatic species and habitats are less likely, but in the long-term these effects could be more likely to occur if there is an increase in timber harvest in the affected environment. In both the short term and long term, in compliance with land management plan requirements and through project-specific planning, future activities would be designed to avoid or minimize adverse impacts from timber harvest to biodiversity and in some cases could incorporate design features beneficial to aquatic animal species and habitats, however, complete avoidance of adverse effects may not be possible.

Some of the potential adverse effects to aquatic habitat from timber harvest could include the following (Chamberlin et al. 1991, Hicks et al. 1991, and Beschta et al. 1987 as cited in USDA FS 2000):

- Increasing erosion and sedimentation from timber harvest, which can promote excessive substrate movement and negatively impact fish species such as the bull trout by causing egg and juvenile mortality and reduced suitable habitat (USFWS 2024). Sedimentation can also negatively impact aquatic plant species and habitat complexity by reducing sunlight penetration due to increased water turbidity and via smothering by deposited sediment.
- Removal of riparian vegetation, which can increase stream temperatures beyond what is suitable for cold-water species. For example, warmer temperatures can reduce egg survival, rearing densities, and growth of coho salmon (Carter 2005).
- Habitat loss and fragmentation; for example, the Van Dyke’s salamander, an aquatic and terrestrial species with 65 percent of known populations on federal lands, is primarily threatened by timber management practices, road construction, and climate change (NatureServe 2025). One of the most significant threats noted for this species is timber harvest (particularly clear cutting) which can damage microhabitat and alter moisture regimes (NatureServe 2025).

Potential Beneficial Effects of Road Construction, Road Reconstruction, and Timber Harvest

Some of the potential beneficial effects of road construction, road reconstruction, and timber harvest on aquatic animal species and habitats could include:

- Enhanced access for some plant and wildlife management activities.
- Easier access for habitat restoration and enhancement for some species.
- Facilitation of movement and dispersal for some aquatic species through road reconstruction or realignment.
- Improved aquatic habitat quality through road reconstruction or realignment.

Some examples of potential beneficial effects include the following:

- Roads in need of repair deteriorate and discharge sediment into streams that could contaminate water, block stream flow, and harm aquatic fish species. Road reconstruction could improve water quality, restore aquatic organism passages, and maintain forest

access through the implementation of the Forest Service Best Management Practices for Water Quality Management on National Forest System Lands (USDA 2012).

- Increased or improved access to reduce hazardous fuels in forested riparian areas which could cause wildfires resulting in the loss of trees and other overhanging vegetation along waterbodies. Vegetation in forested riparian areas provides cover habitat for aquatic animal species and improves bank stability.

Terrestrial and Aquatic Plant Species and Habitats

Potential Adverse Effects from Road Construction, Road Reconstruction, and Timber Harvest

Potential effects to plants from road construction, road reconstruction, and timber harvest would vary by ecosystem type, road design, and traffic volume. Some of the potential adverse effects described below may already be mitigated through land management plans, particularly standards and guidelines determined during the land management planning process to provide the ecological conditions necessary to maintain or restore ecological integrity and diversity.

Therefore, in the short-term these potential adverse effects to plant species and habitats are less likely, but in the long-term these effects could be more likely to occur if there is an increase in road-related activities and timber harvest in the affected environment. In both the short term and long term, in compliance with land management plan requirements and through project-specific planning, future activities would be designed to avoid or minimize adverse impacts from road construction, road reconstruction, or timber harvest to biodiversity and in some cases could incorporate design features beneficial to plant species and habitats, however, complete avoidance of adverse effects may not be possible.

Some of the potential adverse effects to plant species and habitats from road construction, road reconstruction, and timber harvest could include:

- Increased level of habitat disturbance from human activity.
- Habitat fragmentation.
- Introduction of non-native invasive plant species.
- Collection or trampling of individual rare plants.

Some examples of these potential adverse effects on terrestrial and aquatic plant species include:

- Isolation or severely restricted subpopulation size due to habitat fragmentation could lead to lack of genetic interchange that can lower a plant species ability to adapt or respond to changing environmental conditions (USDA FS 2000).
- Road construction, routine roadside mowing, and the use of roads have been shown to facilitate the spread of multiple non-native invasive plant species such as yellow starthistle, scotch broom, knapweed, small broomrape, gorse, and cheatgrass (USDA FS 2000). Invasion of non-native species can alter habitat composition and act as competition for native plant species.

- Road construction can create abrupt habitat edges that modify light, temperature, moisture, and wind conditions, fragmenting suitable habitat for plant species sensitive or intolerant to edge effects and altered microclimate (Hulting et al. 2024).
- Road construction can involve vegetation clearing and earthwork that directly destroys plant species and alters habitat structure in the project vicinity. Further, disturbance to topsoil during road construction or timber harvest activities could reduce seedbanks and directly harm fungi or disrupt mycorrhizal networks. Mycorrhizal networks are a beneficial relationship between fungi and trees, where underground fungi in contact with tree roots help those trees access nutrients and water for growth in some forested ecosystems (Smith et al. 2014).

Discussions on the potential adverse effects of road construction and timber harvest to habitats in the Terrestrial Animal Species and Habitats and Aquatic Animal Species and Habitats sections above are also relevant to plant species.

Potential Beneficial Effects of Road Construction, Road Reconstruction, and Timber Harvest

Some of the potential beneficial effects of road construction and timber harvest on terrestrial and aquatic plant species could include:

- Enhanced access for some plant and wildlife management activities.
- Easier access for habitat restoration and enhancement for some species through stand manipulation.
- Creation of edge habitat and early successional habitat used by some species.

Some examples of potential beneficial effects include the following:

- Easier access to manage vegetation succession and woody encroachment in non-forested habitats to improve habitat for plants sensitive to shading and competition.
- Improved access to manage fuel loads to reduce the likelihood of stand-replacing wildfires and mortality to trees in old growth forests and other forested ecosystems which are not adapted to fire.
- The Arizona sneezeweed, a Regional Forester's Sensitive Species, inhabits roadsides and clearings in ponderosa forests (NatureServe 2025). Other examples of RFSS that may inhabit roadsides or open edge habitats include the broad-tooth monkeyflower, butterfly milkweed, closed gentian, Cooke's phacelia, and Cooper's milkvetch (NatureServe 2025). Road construction could result an increase of edge habitat suitable to these species; conversely road maintenance where these species already occur could pose a threat these species in some cases.

Discussions on the potential beneficial effects of road construction and timber harvest on habitats in the Terrestrial Animal Species and Habitats and Aquatic Animal Species and Habitats sections above are also relevant to plant species.

Effects of Alternative 3 – Modified Rule

Road construction, road reconstruction, and timber harvest could increase due to the removal of the prohibitions from a portion of inventoried roadless areas. Within the affected environment, timber harvest and related road construction are more likely in operable areas and where allowed by current land management plan direction (see the Alternative 3 summary in Alternative 2 – Proposed Rule).

In the areas where 2001 Roadless Rule prohibitions would no longer apply under alternative 3, the potential adverse and beneficial effects to species and habitats from road construction, road reconstruction, and timber harvest are similar to what is described under alternative 2, but generally to a lesser extent as the potentially affected environment would be reduced to 17.9 million acres outside of the Tongass National Forest (versus about 30 million acres under alternative 2). More specifically, the likelihood of potential adverse effects due to road construction, road reconstruction, and timber harvest including landscape fragmentation and loss of connectivity, habitat degradation, increased levels of human activities, and non-native invasive species introductions as described under alternative 2 would be reduced under alternative 3. Where prohibitions would remain in approximately 13 million acres of inventoried roadless areas under alternative 3, the potential adverse and beneficial effects to species and habitats from retaining the 2001 Roadless Rule are similar to current conditions and what is described under alternative 1, but to a lesser extent.

Under alternative 3, most adverse effects are possible but less likely relative to alternative 1 and alternative 2. The most notable difference in likelihood of effects between alternative 3 and alternative 2 is that the potential for fragmentation of large contiguous tracts of undisturbed areas currently within inventoried roadless areas would be less likely to occur, because prohibitions in current inventoried roadless areas would only be rescinded in relatively close proximity to existing roads and within WUI areas. The size of a protected area has been positively related to biodiversity (MacArthur and Wilson 1967 as cited in USDA FS 2000a; Gray et al. 2016). Large unfragmented areas generally contain more species, more species with large home ranges, and more species sensitive to human activity. These areas can provide refuge for species sensitive to disturbance because there is sufficient space for the species to move away from the area of disturbance to reduce stress or to shift to suitable interior habitat away from edge effects as the environment changes. Species richness and native biodiversity are more likely to be conserved in areas large enough to offer a shifting mosaic of habitat patches in various stages of recovery from disturbance (Noss and Cooperider 1994 as cited in USDA FS 2000a). However, under alternative 3 the total size of some of these large contiguous areas could still be reduced overall under alternative 3 if they overlap with the areas where prohibitions would be rescinded. Further, exceptions may still occur that allow for activities related to roads and timber in these core inventoried roadless areas which could lead to additional fragmentation, but that could also be the case under alternative 1 where the 2001 Roadless Rule would be fully retained.

Overall, alternative 3 would be less likely to have adverse effects to animal and plant species sensitive to disturbance, fragmentation, and loss of connectivity than alternative 2. In particular, the potential effects to species with large home ranges or large patch size requirements such as

game species, fisheries, large carnivorous mammals, and migratory birds would be expected to be less under alternative 3 than alternative 2.

Conclusion

All Alternatives

Under alternatives 1, 2, and 3 any road construction, road reconstruction, and timber harvest could potentially have long-term adverse effects on biodiversity by increasing habitat fragmentation, loss of connectivity, negative edge effects, and human disturbance. These impacts would likely be more frequent and broader in scale under alternative 2. Impacts under alternative 3 would likely have a lesser effect on biodiversity than alternative 2, because the prohibitions on these activities would continue in some areas. Impacts to biodiversity would likely be the least under alternative 1, because current prohibitions allow limited exceptions for these activities.

Under all alternatives, biodiversity of plant and animal communities on NFS Lands, including inventoried roadless areas, would continue to be planned for and managed according to the requirements of law, regulation, and policy. All current Forest Service land management plans, through NFMA and planning regulations (1982 Planning Rule or 2012 Planning Rule), are required to maintain the diversity of plant and animal communities and support the persistence of native species in the plan area (39 CFR 219.9, 2012 Planning Rule; Sec. 219.19, 1982 Planning Rule). Site-specific road construction or forest management activities would be implemented in compliance with laws, regulations, and relevant agency policy which provide for a sustained yield, multiple use, and protection, and protection, improvement, and enhancement of the environment.

Alternative 1 – No Action

Under alternative 1 the potential beneficial effect to biodiversity is a greater likelihood, relative to alternative 2 or alternative 3, that large tracts of contiguous land within inventoried roadless areas would be maintained and remain relatively undisturbed by human activities. However, under alternative 1 the continued prohibitions on road construction, road reconstruction, and timber harvest could potentially have adverse effects on species and habitats due to very limited to no additional access created for species and habitat management activities related to woody encroachment, vegetation succession, fuels reduction, and insects and disease outbreaks. Ability to manage these areas could be less likely under alternative 1 than alternative 2 or alternative 3. Further, habitat restoration and enhancement in inventoried roadless areas could be less likely under alternative 1 than the action alternatives due to limited or no access to remote areas along with stand manipulation being limited to small diameter trees.

In the short term the current status of and trends in biodiversity are likely to continue under alternative 1 because no increase in timber harvest within the IRAs is expected. Forest management activity would remain infrequent and include incidental harvest of small diameter timber, where approved by regional foresters through exceptions (36 CFR 294.13(2001)). The level of assumed forest management activity would continue at approximately the same as the recent levels. New road construction would be based on existing exceptions. Agency management records show that a lack of roads has not prevented fire prevention or protection measures, especially wildland fire use and prescribed fire; however, road restrictions would

continue limit opportunities for mechanical thinning and fire control. In the long term, the potential adverse effects to biodiversity from limited management (with the exception of continued fire-suppression) would be more likely and could lead to habitat alteration or loss, species displacement, or direct mortality to plant and animal species. However, these potential adverse effects are applicable to specific conditions which may be less certain to occur relative to the potential adverse effects from an increase in road construction, road reconstruction, and timber harvest under alternatives 2 and 3.

Alternative 2 – Proposed Action and Alternative 3 – Modified Rule

Under the action alternatives the potential beneficial effects to biodiversity include enhanced access for species and habitat management, easier access for habitat restoration and enhancement for some species through stand manipulation, creation of edge habitat and early successional habitat used by some species, and easier access for hunting and wildlife viewing activities. Under these alternatives the potential adverse impacts to biodiversity from increasing road construction, road reconstruction, and timber harvest in potentially affected inventoried roadless areas generally include habitat loss and degradation, habitat fragmentation and loss of connectivity, barriers to movements, dispersal, and migration, human disturbance and interactions. The effects could have negative impacts on both terrestrial and aquatic habitats, and species across all taxa groups, including migratory species and game species.

In the short term, biodiversity is less likely to be impacted. Although the area where road construction, road reconstruction, and timber harvest would increase, these activities would be likely only where existing land management plans allow. Further, timber harvest would be most likely to occur where it is allowed by land management plans and where “operable”. Non-commercial timber activities would be most likely where “operable/operable but complex”. In the long term, biodiversity is more likely to be impacted by road construction, road reconstruction, and timber harvest which could occur in more areas of the affected environment over time if land management plans are revised or amended, though timber activities would still be unlikely to occur in the “not operable” areas. Refer to the Vegetation and Forest Management and National Forest System Roads sections for full discussion on conclusions, expectations, and assumptions related to these activities.

Some of these activities can be designed to avoid or minimize impacts to species and habitats, and in other cases, complete avoidance may be impractical. Through compliance with applicable laws, regulations, and policy, it is assumed that under all alternatives, future land management plan revisions or amendments would meet the species diversity requirements of NFMA and planning regulations to the extent feasible within Forest Service authority and consistent with the inherent capability of the plan area (36 CFR 219.9 and FSH 1909.12). Further, future land management plan revisions or amendments would require plan-level NEPA and plan-level ESA consultation. Project activities under current or future land management plans would need to be consistent with their land management plan and perform site-specific consultation as appropriate.

ESA-Listed Species and Regional Forester Sensitive Species

Section 7(a)(2) of the Endangered Species Act (ESA) requires Federal agencies to ensure any actions they authorize, fund, or carry out do not jeopardize listed species or adversely modify

designated critical habitats. The proposed rule is a Federal action and must comply with the ESA. Draft biological assessments have been prepared to assess federally listed species and designated critical habitat under the Endangered Species Act.

In addition, under the current Forest Service direction for management for sensitive plants and animals, contained in FSM 2670, a Biological Evaluation is required by the Agency to analyze and document any potential effects of a proposed project, activity, or program to threatened and endangered species, species proposed for listing, and sensitive species. A Biological Evaluation has been prepared to assess reasonably foreseeable effects to Regional Forester Sensitive Species.

The analysis and findings presented in the draft biological assessments and biological evaluation are incorporated into this DEIS by reference and summarized in the sections that follow. These draft analyses are available with the supporting documents on the project website.

This Draft EIS presents preliminary findings. Based on these findings, we anticipate initiating consultation under Section 7(a)(2) of the ESA and that the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) will issue a Biological Opinion. Future actions in inventoried roadless areas are subject to ESA consultation if it is determined these projects “may affect” ESA-listed resources.

Because no alternatives would compel the amendment or revision of any land management plan, analysis of species of conservation concern at this stage is not required. It is assumed that under all alternatives, future land management plan revisions or amendments shall meet the requirement for evaluating SCC under the 2012 Planning Rule (36 CFR 219.9(b)), 36 CFR 219.13(b)(6), and FSH 1909.12). Similarly, Management Indicator Species⁵⁷, an element of the 1982 Planning Rule, are identified and analyzed during land management planning, and monitored during plan implementation (36 CFR 219.19(a)(1982), FSM 2620.5, FSM 2634.1). It is assumed that under all alternatives, land management plans still operating under the 1982 Planning Rule were developed and shall be implemented consistently with the planning rule requirements for maintaining and improving habitat for Management Indicator Species (36 CFR 219.19(a)(1982)). All future activities must be consistent with land management plans.

The Magnuson–Stevens Fishery Conservation and Management Act (MSA) mandates that agencies initiate consultation with the National Marine Fisheries Service for any activities that could affect essential fish habitat (EFH). This consultation is completed for site-specific projects with ground-disturbing activity. Because no alternatives would compel or authorize site-specific ground disturbing activities, analysis of EFH at this stage is not required. It is assumed that under all alternatives any action that would be taken that could affect EFH would undergo project-level consultation.

⁵⁷ Management Indicator Species: “plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent” (FSM 2620.5)

Potentially Affected Environment

Under the 2001 Roadless Rule, management actions that do not require the construction of new roads are still allowed, including activities such as timber harvest for clearly defined, limited purposes, development of valid claims of locatable minerals, grazing of livestock, and off-highway vehicle use where specifically permitted. Forest health treatments for the purpose of improving threatened, endangered, proposed, or sensitive species habitat or maintaining or restoring the characteristics of ecosystem composition and structure, such as reducing the risk of uncharacteristic wildfire effects, are allowed where access can be gained through existing roads or by equipment not requiring roads.

Inventoried roadless areas under the 2001 Roadless Rule serve as the baseline action area, though wilderness, wilderness study areas, and wild portions of wild and scenic rivers were removed from the analysis because these designations provide protections beyond those afforded by the 2001 Roadless Rule. The resulting potentially affected environment overlaps the range of more than 300 threatened, endangered, and proposed species; 79 final or proposed critical habitats managed by USFWS; and 19 critical habitats for species evolutionarily significant units or distinct population segments managed by NMFS and listed under the ESA. These analyses are detailed in the USFWS and NMFS Biological Assessments.

Over 3,500 species (plants, wildlife, and fungi) are listed as Regional Forester Sensitive Species on Forest Service-managed lands. Each Region of the Forest Service compiles its own list of sensitive species and periodically updates them. This analysis uses the most recent approved list from each region. For the purposes of sensitive species, the word “species” can refer to a species, a subspecies, a botanical variety, or a distinct population or population segment. These analyses are provided in the Biological Evaluation.

ESA-Listed Species and Designated Critical Habitat

Interagency cooperation pursuant to section 7(a)(2) of the Endangered Species Act is ongoing and will be completed prior to a final decision. Based on the preliminary findings of the draft biological assessments, the Forest Service expects a majority of ESA-listed species in the affected environment could potentially be exposed to road construction and timber activities under the proposed rule; however, the magnitude, intensity, and timing of activities is not precisely known at this time.

The pertinent subject matter experts reviewed the proposed rule and documented determinations for threatened, endangered, and/or proposed (TEP) and/or critical habitat in a biological assessment. To facilitate analyzing effects to a large number of species, each ESA-listed species was assigned to one of the following taxonomic groups: mammals, birds, reptiles, amphibians, plants, insects and arachnids, bivalves, crustaceans, or fish.

The potential exposure of ESA-listed species to activities following rescission of the 2001 Roadless Rule is not well understood because rescinding the rule does not compel any future activities in areas previously identified as inventoried roadless areas. However, because the 2001 Roadless Rule specifically prohibited road construction, road reconstruction, and timber harvest those are the activities that are being analyzed in the Biological Assessments. Exposure was

determined by comparing species occurrence data with inventoried roadless area operability and categorized as high, moderate, and low likelihood of exposure. Exposure estimates were performed in a manner to err on the side of likely exposure. Existing protections afforded by land management plans and other documents/decisions were also reviewed to determine how they may affect the determinations for each species, particularly if effects to the species were determined to be highly impactful. The response of species was derived from published scientific literature and previous consultations. Together, exposure and response were used to make the determinations: No effect (NE), Not likely to adversely affect (NLAA), and likely to adversely affect (LAA). Where information is lacking the Forest Service erred on the side of making the more impactful determination.

Given the lack of information regarding future projects in previously inventoried roadless areas, most of the 300+ ESA-listed species would likely have some level of expected exposure. Similarly, the overlap of designated critical habitat with the operability analysis will inform the likely exposure of critical habitat to future activities associated with rescission of the 2001 Roadless Rule.

Under alternative 2 (the proposed rule), preliminary findings resulted in a “may affect, likely to adversely affect” determination for 327 species and 71 designated critical habitats, as listed in the Appendix 5 – Biodiversity Analysis Supplemental Information and in the USFWS and NMFS Biological Assessments. Additionally, the Biological Assessments contain the full evaluations for the ESA-listed species and designated critical habitat, and also lists the species with “no effect” or “may affect, not likely to adversely affect” determinations.

Regional Forester’s Sensitive Species

The Forest Service policy for sensitive species is to conserve sensitive species so that they do not become ESA-listed species and their habitats remain well distributed throughout their geographic range on NFS lands (FSM 2670.22). The pertinent subject matter experts reviewed the proposed rule and documented determinations for sensitive species in a biological evaluation.

The potential exposure of sensitive species to activities following rescission of the 2001 Roadless Rule is not well understood because rescinding the rule does not compel any future activities in areas previously identified as inventoried roadless areas. However, because the 2001 Roadless Rule specifically prohibited road construction, road reconstruction, and timber harvest those are the activities that are being analyzed in the Biological Evaluation. Exposure was determined by comparing species occurrence data with inventoried roadless area operability and categorized as high, moderate, and low likelihood of exposure. Exposure estimates were performed in a manner to err on the side of likely exposure. Existing protections afforded by land management plans were also considered to determine how they may affect the determinations for each species. Given the lack of information regarding future projects in previously inventoried roadless areas, most of the sensitive species will likely have some level of expected exposure. The habitat use of species was derived by comparing occurrences to the National Land Cover Dataset, and when occurrence data was not available by reviewing NatureServe species accounts or other published scientific literature. Threats to sensitive species related to road construction, road reconstruction, and timber harvest were summarized from NatureServe species accounts or

other published scientific literature, if available. Where information is lacking the Forest Service erred on the side of making the more impactful determination.

Under alternative 2 (the proposed rule), preliminary findings resulted a “may effect individuals or habitat” (but will not result in a loss of species viability or a trend toward federal listing) determination for 3,490 sensitive species as summarized in the table below (note that some species occur in more than one region and may be counted more than once in the table). The Biological Evaluation contains the full sensitive species evaluation and lists the species with “no effect” determinations. No determinations of a loss of species viability or trend toward federal listing were made.

Table 40. Number of “May Effect Individuals or Habitat” Determinations for Sensitive Species by Region

Taxa Group	Northern Region	Rocky Mountain Region	Southwest Region	Intermountain Region	Pacific Southwest Region	Pacific Northwest Region	Southern Region	Eastern Region
Wildlife	36	82	168	33	102	219	233	379
Vascular Plants	168	70	162	196	457	588	234	542
Lichens, Fungi, & Bryophytes	20	1	0	5	22	120	44	41
Total	224	153	330	234	581	927	511	962

Conclusion

Under all alternatives, activities on NFS lands must comply with laws, regulations, and policies. All projects on NFS lands must be consistent with land management plans. All future activities in potentially affected IRAs, regardless of the alternative selected, would require compliance with the ESA prior to implementation. As is typical, future project designs in these areas would avoid and minimize adverse effects to ESA-listed resources. All future activities in potentially affected IRAs, regardless of the alternative selected, would require identification of sensitive species and project-level analysis of effects on viability of sensitive species in a Biological Evaluation, for administrative units with land management plans under the 1982 Planning Rule.

ESA-listed species and critical habitats, Regional Forester’s Sensitive Species, and Essential Fish Habitat were analyzed under Alternative 2. There were 327 ESA-listed species and 71 designated critical habitats for which a determination of “may affect, likely to adversely affect” (LAA) was reached for the proposed rule, as described further in the NMFS and USFWS Biological Assessments. For sensitive species, there were 3,490 species for which it was determined that the impact of Alternative 2 would be “may effect individuals or habitat”, as described further in the Biological Evaluation. Use of this determination indicates that Alternative 2 would not cause a trend towards federal listing under ESA, nor cause a loss of viability in each planning unit.

Under alternative 3, effects determinations to Regional Forester’s Sensitive Species potentially within the affected environment would be expected to be similar or reduced under alternative 3 relative to alternative 2, depending on the species’ range, with the total number of “May Effect Individuals or Habitat” determinations likely to decrease. Effects to ESA-listed species and

critical habitats would be expected to be similar or reduced under alternative 3 relative to alternative 2, depending on the species' range and critical habitat locations, with the total number of "may affect, likely to adversely affect" determinations likely to decrease.

Recreation and Scenery

Background

Federally managed recreation resources provide unique and important recreation opportunities (White et al. 2023). About 13 to 16 percent of individuals over age 6 in the United States engage in each of the most popular nature-based recreation activities: day hiking, camping, and fishing (White et al. 2023). Federally managed recreation resources provide unique and important recreation opportunities (White et al. 2023), and 39 percent of outdoor recreation participants reported recreating on national forest land at least once a year (Outdoor Foundation 2023). Among the six Federal agencies providing recreation opportunities, the USDA Forest Service receives the third-highest number of recreation visits each year, behind the National Park Service and the U.S. Army Corps of Engineers (Hanson et al. 2025). Thirty-nine percent of outdoor recreation participants reported recreating on national forest land at least once a year (Outdoor Foundation 2023). The agency's National Visitor Use Monitoring program does not track separately the number of recreation visits to IRAs. However, the national forests that include current inventoried roadless areas receive about 125 million visits annually or 76 percent of the 164 million visits each year to all NFS lands.

Recreation on National Forest System lands encompasses more than just the activities themselves. Outdoor recreation is generally described in terms of several integrated aspects – recreation opportunities, access, use, and settings. Specifically, the 2012 Planning Rule defines sustainable recreation as, "The set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations" and requires that each Land Management Plan "provide for sustainable recreation; including recreation settings, opportunities, and access; and scenic character" (36 CFR 219.10(b)(1)(i)).

Effects related to recreation and scenery include: (1) recreation opportunities and settings, (2) scenery, (3) developed facility and road-based recreation, (4) trail-based and dispersed recreation, (5) special uses and outfitters and guides, and (6) wilderness and other designated areas.

Recreation Opportunities and Setting

A recreation setting is the social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. These characteristics represent how recreation resources are considered and managed within an overall spectrum of settings – ranging from little to no development with emphasis on resource protection, to developed settings focusing on user comfort. For example, camping in a remote undeveloped area for self-reliance or, in contrast, reserving a site within a popular campground for social interaction and comfort facilities like toilets and tables.

The basis for describing the affected environment for recreation opportunities and settings is the Recreation Opportunity Spectrum (ROS) which consists of six setting classes: Primitive (P), Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM), Roadless Natural (RN), Rural (R), and Urban (U) (USDA Forest Service 2024b, USDA Forest Service 1982). The 2012 Planning Rule requires land management plans to use ROS to define and categorize existing recreation settings, as well as include desired conditions for sustainable recreation using mapped desired ROS classes. Beyond the 2012 Planning Rule, the National Forest Management Act of 1976 requires that land management plans coordinate all multiple uses, including outdoor recreation. For a specific example, timber harvest activities intended to regenerate stands must be designed to protect recreation opportunities.

Accessibility considerations tied to statutory and regulatory requirements and universal design⁵⁸ principles are applied to address usability, safety, and availability of programs and facilities across recreation settings and facility types at the planning and implementation levels. Site-specific accessibility reviews, determinations, and documentation occur during project-level planning and design.

Potentially Affected Environment

Existing ROS settings were mapped across all alternatives. This mapping exercise was conducted specifically to provide a comprehensive data layer of existing ROS settings based on current roads and trails data. These mapped existing ROS settings represent a snapshot of current ROS settings and do not convey desired conditions found in land management plans that guide units as to what ROS settings should be maintained or achieved over the life of a land management plan. The first step in mapping ROS is to categorize travel routes (roads and trails). As would be expected of roadless areas, consistent with the roadless characteristics defined in the 2001 Roadless Rule, the majority (90 percent) of the potentially affected IRAs are either primitive, semi-primitive non-motorized, or semi-primitive motorized recreation settings. Of that, 33 percent primitive and 49 percent semi-primitive non-motorized.

Given the nationwide scale of the analysis, mapping existing ROS settings across all National Forest System lands is not intended to be exact.⁵⁹ The purpose is to provide as accurate as possible representation of existing recreation settings across the affected environment that are consistent with existing travel data (roads and trails) to aid in analyzing potential effects. The output reflects the existing condition of primitive, semi-primitive non-motorized, semi-primitive motorized, and roadless natural settings. Mapping rural and urban settings relies on site-specific data and local knowledge at a further refined scale. For the sake of this analysis, the roadless natural setting was not parsed into either rural or urban settings. This approach is consistent with

⁵⁸ Universal Design: The design of products and environments to be usable by all people, to the greatest extent possible, without need for a adaptation or specialized design. <https://www.section508.gov/develop/universal-design/>

⁵⁹ Finer-scale inaccuracies may exist due to data discrepancies or inadvertent errors in light of an all National Forest System lands scale. The national existing ROS product used for this analysis was not verified with local knowledge and informed professional judgement. As with other resources, recreation settings at the land management plan and project level are considered based on local unit specific ROS mapping and pertinent plan direction within each land management plan.

the scale of analysis and employs a simplified, conservative approach with the affected environment leaning more toward the less developed end of the recreation opportunity spectrum.

Effects of Alternative 1 – No Action

The characteristics of the existing recreation settings are consistent with overall characteristics of roadless areas and would be maintained due to the restrictions or limitations that would continue within the affected environment area under the 2001 Roadless Rule. The 2001 Roadless Rule allows road construction in limited situations. The amount of change from such new permanent or temporary road construction or reconstruction is anticipated to have a negligible change on the current non-motorized settings. In those limited areas where permanent roads are constructed or reconstructed, the setting could change from non-motorized to motorized if the road is designated as available for public motorized access on motor vehicle use maps.

Effects of Alternative 2 – Proposed Action

Under alternative 2, road construction and reconstruction are reasonably foreseeable. Where and when these activities occur, they could have short duration effects on recreation use and settings from increased on-site infrastructure and noise during site specific project implementation. Generally, timber harvest would not alter ROS settings after project implementation in the long term. Road construction has more potential to impact ROS settings in the long term. If newly constructed or reconstructed roads are designated for public use on motor vehicle use maps, existing ROS settings could change to a more developed setting class. It is assumed that any potential effects to ROS settings or designated public motorized access would be consistent with recreation-related land management plan direction and analyzed following the procedural requirements of the National Environmental Policy Act (see Common to All Alternatives).

Road construction and timber harvest and associated effects are more likely to occur where existing land management plans allow it and where the areas are ‘operable’ for mechanical vegetation treatments (see National Forest System Roads and Vegetation and Forest Management sections).

Table 41. ROS setting class of the potentially affected inventoried roadless areas under alternative 2

ROS setting class	ROS acres within potentially affected IRAs (alternative 2)	Percent of potentially affected IRAs (alternative 2) in each ROS setting	ROS acres within “Likely Operable” areas	Acres within “Likely Operable, but Complex” areas
Primitive	13,332,000	33%	82,100	481,400
Semi-Primitive Non-Motorized	19,474,000	49%	2,225,600	6,686,700
Semi-Primitive Motorized	3,111,000	8%	996,400	499,700
Roaded Natural	3,125,000	8%	1,628,400	318,400

Potential changes under alternative 2 are more likely to affect those portions of the affected environment currently in roaded natural, semi-primitive motorized, and semi-primitive non-

motorized. The likely operable and likely operable but complex portions of the affected environment (collectively referred to in this section as “operable area”) are primarily comprised of semi-primitive non-motorized ROS settings (nearly 9 million acres, or about 70 percent of the operable areas). The semi-primitive motorized and roaded natural settings of the operable area comprise 48 percent and 62 percent, respectively, of those two motorized settings within the affected environment as a whole. However, the combined motorized setting acreage within the operable area (3.4 million acres) represents 5.5 million acres less than just the semi-primitive non-motorized setting acreage within the operable area. Primitive ROS settings comprise a much smaller share (4 percent) of the operable area compared to the potentially affected environment as a whole.

Given that operability is based on the ability to reach and operate within a location proximate to roads and infrastructure, these ROS setting breakdowns within the operable area are reasonable. It is much less probable that primitive recreation settings would be impacted by road construction than any of the other three ROS settings. An average of about 52 percent of semi-primitive non-motorized, semi-primitive motorized, and roaded natural ROS settings within the alternative 2 affected area are more likely to be impacted. However, under alternative 2 there would be more opportunities for implementing management approaches in these three ROS settings which could stabilize or improve the biophysical characteristics of the settings and/or user experience.

Effects of Alternative 3 – Modified Rule

The 13 million acres that would remain inventoried roadless areas would not see changes in their ROS settings, as described for alternative 1. The effects of road construction and timber harvest would generally be the same as alternative 2, however, the potentially affected inventoried roadless areas are smaller, so fewer acres of all recreation settings could be impacted overall. Most notably, about 12 million fewer non-motorized acres could be potentially impacted (about 5 million less primitive and almost 7 million less semi-primitive non-motorized acres).

Table 42. ROS setting class of the potentially affected inventoried roadless areas under alternative 3

ROS setting class	ROS acres within potentially affected environment (alternative 3)	Percent of affected environment (alternative 3) of each ROS Setting	ROS acres within “Likely Operable” areas	Acres within “Likely Operable, but Complex” areas
Primitive	8,051,000	30%	65,900	267,500
Semi-Primitive Non-Motorized	12,749,000	47%	2,225,700	4,769,200
Semi-Primitive Motorized	2,652,000	10%	96,300	373,300
Roaded Natural	3,038,000	11%	1,628,200	292,000

About 4 percent of primitive ROS settings within the potentially affected environment fall within operable areas, while about 55 percent of semi-primitive non-motorized, 52 percent of semi-

primitive motorized, and 63 percent of roaded natural settings fall within either operability type. Of the two non-motorized ROS setting classes within the operable area of alternative 3 (7.3 million acres), about 31 percent falls within likely operable and about 69 percent within likely operable, but complex. However, a total of about 21 million acres makes up the two non-motorized ROS setting classes within alternative 3 versus about 33 million acres within alternative 2. Of the two motorized recreation ROS setting classes within the operable area of alternative 3 (3.3 million acres), about 80 percent falls within likely operable and about 20 percent within likely operable, but complex. This represents both a similar total motorized ROS setting acreage and operability as alternative 2 (about 76 percent within likely operable and about 24 percent within likely operable, but complex).

Similar to alternative 2, these ROS setting breakdowns are expected and similar across the two alternatives for three of the four settings – semi-primitive non-motorized, semi-primitive motorized, and roaded natural. About 5.3 million fewer primitive acres are potentially impacted in alternative 3 (8 million acres) than alternative 2 (13.3 million acres). Both action alternatives potentially impact about 4 percent of the total primitive settings under each scenario.

Scenery

Scenery, the general appearance or features of a place or landscape, contributes to recreation settings and influences visitors' recreation experiences and tourism. Scenic conditions vary by location and depend on natural features like geology, vegetation, landforms, water features, and human developments. Scenery contributes to a community's sense of place and quality of life. People value scenery because it is integral to community character and recreation experiences. Research shows that high-quality scenery, especially scenery with natural-appearing landscapes, enhances people's lives and benefits society (USDA 1995). Scenery and natural settings provide the backdrop for homes and communities, and inspire people to visit, recreate in, and live near national forests and grasslands. More people are choosing to live and recreate in scenic environments, as evidenced by population increases in areas known for their recreational and natural amenities (English, Froemke, and Hawkos 2014; Johnson and Stewart 2007). High-quality scenery and access to recreational opportunities provide social and economic benefits locally, regionally, and nationally.

Observing scenic views for pleasure is the second most common activity associated with recreational visits to national forests, and it is the third most common primary activity, according to National Visitor Use Monitoring (USDA 2024). People visiting national forests expect to see “a naturally appearing character” on NFS lands (USDA 1974). The Forest Service manages scenery for the benefit of present and future generations because scenery has benefits, outcomes, and ecosystem services related to communities, recreation settings, and tourism (economic benefits). Forest Service scenery management identifies scenic character and scenic integrity as key indicators of scenic quality. Scenic character is a combination of the physical, biological, and cultural images that give an area its scenic identity and contribute to its sense of place. Scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity. Scenic integrity, specifically allocated scenic integrity objectives in unit land management plans, are the minimum degree to which desired scenic character attributes are to remain intact (USDA 1995, USDA 2025). Scenery management follows guidelines from the

Forest Service Manual 2380 and land management plans, which use standards called Visual Quality Objectives (VQO)⁶⁰ or Scenic Integrity Objectives (SIO) to decide how much a landscape can be changed. These systems help staff analyze and share how projects might affect the scenery, using methods from the Visual Management System and the updated Scenery Management System⁶¹. There are four nationally defined scenic integrity objectives (SIOs) that can serve as desired conditions (very high (unaltered), high (appears unaltered), moderate (slightly altered), and low (appears altered)). A landscape where management activities are consistent with desired scenic character is rated as very high or high scenic integrity. Those landscapes where scenic character appears altered have lower scenic integrity. National forests and grasslands staff apply SIOs to any management activity that has the potential to affect the landscape's scenic character and design projects to meet land management plan direction (SIOs) in the long term.

Multiple legislative acts have scenery related requirements. In statutes scenery may be referred to as aesthetic values, esthetic resources, environmental design arts, visual resources, scenic values, or other related terms. Scenery as a part of recreation is a multiple use of NFS lands (Multiple-Use Sustained-Yield Act of 1960). National Environmental Policy Act (NEPA) and National Forest Management Act (NFMA) require all Federal land management agencies to consider scenic resources during land management planning, resource planning, and project design, implementation, and monitoring. Scenery is often a nature and purpose (meaning a basic, inherent feature) for which designating legislation and management plans establish and identify designated areas (such as scenic byways, nationally designated trails, wild and scenic rivers, national monuments, and more). Scenery is also embedded in the 2012 Planning Rule) and policy (Forest Service Manual 1920, 2310, and 2380 and Forest Service Handbook 1909.12).

Most noticeable changes to scenic conditions across landscapes occur through natural processes such as wildfires, insect and disease, hurricanes or flooding. These natural disturbances shape the vegetation and landform features of the landscape, affecting how landscapes change over time and, consequently, how scenery changes over time. Therefore, Forest Service scenery management considers the dynamic nature of landscapes so that ecological processes and disturbance patterns are part of a landscapes' scenic character and consistent with high or very high levels of scenic integrity.

⁶⁰ For older unit land management plans that use the visual management system the land management plan allocated visual quality objectives and other current Plan direction would be used to manage scenery and determine plan compliance of any site-specific projects. Visual quality objective definitions differ from the scenic integrity objective definitions provided in this analysis and can be found in a unit's land management plan. To describe and compare consequences, this analysis uses SMS terminology (scenic integrity objectives) for all alternatives.

⁶¹ The Scenery Management System (SMS) guides how scenery is managed for current and future generations. SMS helps the Forest Service record scenery conditions and set goals for how landscapes should look (SIOs). These goals are mapped and described as the "desired scenic character," which is the look the landscape should keep or develop over time. Staff use SIOs to make sure any project fits the landscape's scenic goals. SIOs range from "Very High" (almost untouched) to "Very Low" (heavily altered, only used to describe current conditions, not as a target). Each level shows how much change is acceptable, from landscapes that look natural to those with visible management activities but still blend with the surroundings.

Management actions, such as timber harvest, fuels management, minerals and energy development, range, recreation facilities, transportation infrastructure (roads and trails), and special uses also affect the scenic integrity of a landscape to varying degrees. Management impacts to scenery are often mitigated through design criteria identified during project level analysis under NEPA to comply with land management plan components and NFMA.

Potentially Affected Environment

The 2001 Roadless Rule identified “natural appearing landscapes with high scenic quality” as a roadless characteristic that is often present in and characterizes IRAs. The existing scenic integrity of landscapes in the potentially affected IRAs is generally high or very high, which indicates a low level of landscape modification due to a lack of high intensity management activities. However, altered landscapes with lower levels of existing scenic integrity may exist in some areas due to activities such as mining, grazing, and special uses. Because these areas have been managed under 2001 Roadless Rule prohibitions resulting in very limited road construction and commercial timber harvest (36 CFR 294.11), it is assumed that since 2001, management activities in these areas have maintained and enhanced high/very high scenic integrity and desired scenic character focused on natural appearing landscapes with high scenic quality. Exceptions to 2001 Roadless Rule prohibitions have been limited (see 2001 Roadless Area Conservation Rule Implementation) and it is assumed that associated management activities have been designed to maintain roadless characteristics and to meet land management plan scenery desired conditions in the long term.

Effects of Alternative 1 – No Action

All resource management activities in inventoried roadless areas strive to achieve long-term sustainable desired scenic character within the scenic integrity objectives identified in the land management planning process.

Under this alternative and the current 2001 Roadless Rule, the scenic quality would remain substantially unaltered by future management activities. Inventoried roadless areas would continue to be managed for roadless characteristics including natural appearing landscapes with high scenic quality. Scenic character maintained and enhanced under this alternative would primarily be naturally evolving, substantially unaltered, and natural appearing and consistent with high to very high scenic integrity objectives.

Individual land management plans also have allocated scenic integrity objectives that likely align with maintaining scenic quality in IRAs (though may be less restrictive, especially for plans that have not been revised under the 2012 Planning Rule).

Activities currently occurring or permitted to occur would continue and have scenic effects based on proposed locations at the project level. Scenery management techniques and principles would be used to mitigate any future site-specific land altering activity or introduced elements on the land, to achieve and maintain desired scenic integrity objectives and desired scenic character identified in land management plans in the long term. Tree cutting within the provisions (generally small-diameter material for specific purposes) would have localized effects to scenic integrity for a few years. However, the amount and types of tree cutting allowed in inventoried

roadless areas would often result in positive effects to scenery over time, such as a more natural-appearing mosaic of vegetation; variety in species, composition, age classes, and structure of vegetation; and a landscape that is more resilient to uncharacteristic disturbances. Over time, scenic integrity could be maintained or enhanced.

The 2001 Roadless Rule allows road construction in limited situations. It is anticipated that the amount of change from such new permanent or temporary road construction or reconstruction would have a negligible change on the current high and very high scenic integrity in most inventoried roadless areas. In those limited areas where permanent roads are constructed or reconstructed, the scenic integrity could change from high-to-moderate or low. Alternative 1 also has universal design implications and would maintain visual coherence and predictability according to allocated scenic integrity objectives in affected areas, which reinforces orientation and perceptual clarity for all visitors.

Effects of Alternative 2 – Proposed Action

Under alternative 2, there are potential impacts to scenery as a result of increased timber harvest and road construction and reconstruction management activities, depending on the intensity and location of treatments. Future site-specific design criteria would be identified in project level analysis based on the desired scenic character within the scenic integrity objectives and other plan components (desired conditions, objectives, standards or guidelines) to ensure consistency with the land management plan. Areas currently managed for high or very high scenic integrity consistent with “natural appearing landscapes with high scenic quality” of inventoried roadless areas may have scenic integrity objectives ranging from high to moderate to low in land management plans.

Management activities affect scenic resources by altering the appearance of the natural landscape and can create beneficial, neutral, or adverse changes to the scenic character in both the short and long term. When management activities blend with the line, form, color, and texture of the desired scenic character, the scenery effects are considered neutral or beneficial. When management activities strongly contrast with the line, form, color, and texture of the desired scenic character, the scenery effects are considered adverse or negative (figure 19). Management activities are usually noticeable for a few years after project completion and defined for scenery as contrasts or deviations to the surrounding landscape’s desired scenic character. This analysis focuses on the potential effects of increased timber harvest including hazardous fuels reduction treatments and road related construction and reconstruction management activities because these types of activities may impact landscape attributes and have the potential to thereby impact scenic resources. The goal of site-specific scenery design criteria identified in project level analysis is to reduce the contrast management activities create so that they blend with the desired scenic character and thereby have neutral or beneficial effects for scenery over time and meet the scenery management direction found in a unit’s land management plan.

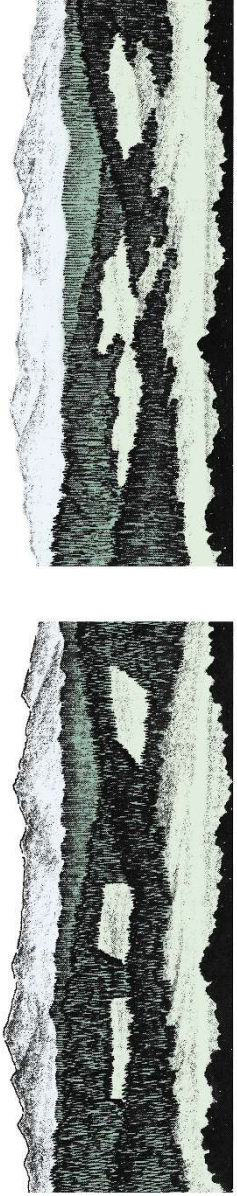


Figure 17. These images show the difference in form and line from geometric shapes that dominate the scenic character (left) to shaping units to look more natural and irregular, reducing impacts to scenic character (right). These images are from “Forest Landscape Management, Volume 2, Number 5—Timber.”

Timber Harvest and Hazardous Fuels Reduction

Timber harvest and hazardous fuels reduction would temporarily impact scenic resources. A landscape’s desired scenic character is closely related to the appearance of a landscape in which species composition and stand structure are within natural range of variation. Conditions within an ecosystem’s natural range of variation generally create scenery desired conditions that maintain a natural-appearing scenic character and an environment in which scenery attributes are sustainable and resilient to uncharacteristic disturbance in the long term. Therefore, management activities that would move the vegetation toward the desired scenic character and include scenery design criteria to meet the land management plan scenic integrity objectives are beneficial to scenery resources in the long term. These beneficial effects are often realized over a long period of time but lead to the lasting sustainability of valued scenery attributes.

Activities including tree removal, depending on the intensity of the treatment, can have varying consequences on scenery. Scenery effects of timber harvest are often the most noticeable for a few years after implementation until the growth of new grasses, shrubs, and remaining trees begin to soften the effects of removal operations. These effects are especially noticeable when the viewer has an up-close view of the harvest site usually in the foreground viewing distance which is up to ½-mile from the viewer. Viewers may have a longer duration view of these effects when traveling at slower speeds along travelways such as using a non-motorized trail or using a developed recreation site, campground or scenic overlook. Viewer’s traveling at faster speeds on travelways such as using motorized trails or driving along roads, have shorter duration views of these effects for a few years. When viewed from further distances (middleground and background which are 1/2 mile to 4 miles or beyond the viewer), changes to the forested texture from thinning or introduced shapes, forms, or edges of treatment units, may be noticeable for several years or more especially along vegetated hillsides or mountain slopes. When site specific scenery design criteria are used to blend the form, shape, texture and edge of timber harvest management activities with the scenic character, the management activities are less noticeable in both short- and long-term timeframes based on the specific activities proposed and those define short- and long-term timeframes based on the site-specific conditions such as the goals and ecological conditions of the project area and desired conditions to be achieved.



Figure 18. These images show scenery effects when the viewer has an up-close view of a selective timber harvest. Immediately after harvest scenery effects of slash, stumps, and removed trees are noticeable (left). As time passes, vegetation growth softens these effects and the harvest becomes less noticeable, reducing impacts to scenic character (right). (USDA Forest Service photos by Corey Morgan)

The scenery effects of tree removal can vary depending on the prescription and intensity of the treatment and amount of trees removed. Removal operations and activities which create young forest or openings (regeneration prescriptions) tend to be more noticeable in the landscape directly affecting scenery and views from high concern level travel routes and use areas. Generally, the effects of these types of prescriptions change the forested structure and texture, creating a more open landscape. If many trees are removed, the tree removal may be quite noticeable due to the textural change in the forest canopy and introduced shape and form of treatment units. These effects may be reduced if some trees are left in clumps and groups, or younger, smaller-diameter trees are present in the stand and protected during removal operations (figure 19).

Stumps, slash, and edge effects of freshly logged areas or units, depending on the intensity of the treatment, can result in a forest that appears moderately altered for a few years (figure 20). The initial contrast between harvested and unharvested areas is often quite noticeable. Shaping and blending treatment unit edges, using naturally occurring unit boundaries and terrain breaks, and applying other common scenery design criteria reduces the effects to scenery and promotes a natural-appearing landscape over time. When viewed from the foreground and middleground distances, the transition zone of unit edges used in common scenery design criteria would reduce noticeable edges between treated and non-treated areas. Tying proposed unit boundaries into existing meadows and openings and using variable density (feathering) along the edges can also reduce noticeable edge effects between treated and untreated areas (figure 21).



Figure 19. These images show the difference between not feathering (left) and feathering (right) timber unit edges to blend with surrounding openings (U.S. Department of Agriculture 1974). These illustrations are adapted from “National Forest Landscape Management, Volume 1—General Concepts.”

Hazardous fuels reduction activities could change the character of the landscape where activities occur for a few years like effects described for timber harvest. Over time, with scenery design criteria applied, these activities may provide for some preferred scenic settings, such as visual access into a forested stand, retaining large trees, greater vegetative diversity, and herbaceous ground cover (Gobster 1994) (figure 22). The removal of some trees, dependent on scale and intensity of treatment, may improve scenic character over time and make scenic attributes more resilient to natural disturbance such as insect and disease outbreaks. Vegetation conditions allowing fires to move through the landscape at the appropriate scale, frequency, and intensity without doing major damage and recovering relatively quickly from fire is beneficial for long-term scenic quality and scenic character resilience. Healthy and resilient forest environments that recover relatively quickly would maintain or improve scenic character which maintains sense of place attachment and opportunities to connect with nature.



Before



After



Before



After

Figure 20. These images show a coniferous forest with ponderosa pine and lodgepole pine. Before examples show pre-thinning and existing scenic character with a wall of small conifer trees with little to no spacing between the trees (left). After examples show after thinning and desired scenic character with large trees, green grass, and an “open” forested stand (right).

Effects described for timber activities are more likely to occur where allowed and generally allowed by current land management plan direction and could expand to more areas over time as plans change. In alternative 2, the effects of these potential management activities would be most likely in the operable areas identified in alternative 2.

Roads Related Activities

Potential road construction can impact scenic resources by creating evident contrasts in color and texture and changing landforms for cut and fill slopes. New road construction is often noticeable by exposing light-colored soils on the new road surface and any cut and fill slopes and by potentially creating a break in the tree canopy. Effects of road construction may be dominant in foreground, middleground, and even background distance zones depending on location and design. Roads also serve as the viewer platform, offering opportunities and access to view scenery. The somewhat modified setting of a viewer platform (road or trail) is accepted as a necessary component allowing travelers to experience the greater landscape (USDA 1995, page D-1). Project specific design criteria can reduce effects, so road construction meets scenic integrity objectives.

Construction of temporary roads can affect scenery by exposing light-colored soils and creating noticeable color contrasts which may be seen in foreground and middleground views. Generally temporary roads, once rehabilitated, revegetate quickly and would visually recover within a few years once rehabilitation activities are complete.

Decommissioning roads is typically beneficial to scenery resources by recontouring slopes to mimic natural landforms and rehabilitating and revegetating exposed soils typically noticeable on cut and fill slopes created during road construction. Road maintenance is beneficial for scenic resource viewing by providing access and a platform for viewing scenery from motorized vehicles.

Effects of Alternative 3 – Modified Rule

In affected environment locations where alternative 3 removes roadless rule prohibitions, the effects would be the same as those described for alternative 2. However, the potential geographic scope where these effects could occur would be less than the geographic scope of alternative 2. In alternative 3, the effects of management activities described would be most likely in operable areas identified in alternative 3. This alternative also includes provisions to make needed modifications to the applicability of prohibitions within inventoried roadless boundaries. Where boundaries are modified that remove prohibitions, the effects would be the same as those described above.

In affected environment locations that continue current management, pursuant to the 2001 Roadless Rule in remaining IRAs (prohibit road construction, reconstruction, and timber harvest with limited exceptions defined in the 2001 Roadless Rule), the effects would be same as those described for alternative 1. In these areas under this alternative, scenic character maintained and enhanced would primarily be naturally evolving, substantially unaltered, and natural appearing and consistent with high to very high scenic integrity objectives.

Developed Facility and Road-Based Recreation

Affected Environment

Developed recreation sites on National Forest System lands serve as concentrated areas for public use, offering amenities such as restrooms, potable water, picnic tables, designated parking, and other facilities for user comfort. These sites are designed to accommodate a wide range of recreational activities while minimizing environmental impacts through managed infrastructure and visitor guidance. Developed sites⁶² host a broad range of visitors, including people with disabilities, families, and others who benefit from accessible infrastructure and safe, reliable facilities, and they play a critical role in reducing dispersed impacts on sensitive ecosystems. By centralizing use and providing clear signage, administrative presence, and emergency access and egress, developed recreation areas help protect natural resources while enhancing visitor experience.

⁶² FSH 2309.19, Chapter 50, Section 50.5, Exhibit 01

The Recreation Site Development Scale outlines a graduated system for classifying recreation sites based on the degree of human modification and facility development. The development scales range from 0 (Undeveloped), where sites retain a natural character with minimal or no constructed features, to 5 (Highly Developed), where extensive infrastructure such as paved roads, utilities, and large visitor facilities dominate. Each level reflects increasing investment in access, amenities, and visitor capacity, while correspondingly reducing naturalness and the sense of a largely unaltered environment. This framework provides a consistent way to evaluate recreation settings, anticipate environmental impacts, and guide management decisions. The scales typically correlate with the ROS, where lower levels align with primitive or semi-primitive classes and higher levels correspond to roaded natural, rural, or urban classes.

There are 10,755 developed recreation sites (development scale 3-5) and assets located on National Forest System lands nationally. These provide the infrastructure necessary for the access and enjoyment of a wide variety of recreation activities. Developed recreation sites include, but are not limited to, campgrounds, recreation rentals, mountain resorts, and trailheads. The estimated cost of deferred maintenance for these sites is approximately \$1.28 billion. There are approximately 500 developed recreation sites within the potentially affected IRAs. Most (70 percent) of these are campgrounds, but they also include lookouts/cabins, and trailheads. Over the last ten years, nationally, the Forest Service has constructed an average of 4 new developed recreation sites each year. Additionally, there are 20,061 development scale 0-2 recreation sites on NFS lands nationally that provide limited amenities and typically focus on resource protection over visitor comfort. The estimated cost of deferred maintenance for these sites is approximately \$58 million⁶³. Over the last ten years, nationally, the Forest Service has constructed an average of 6 new development scale 0-2 recreation sites each year.

Developed recreation sites require regular maintenance to keep them safe, clean, and in good condition. New developments, replacement/relocation of existing infrastructure, and some existing developed sites will need to be updated and modernized for usability and accessibility, or to meet visitor demand.

As a whole, people use federal lands and roads to access areas and sites that will provide some form of leisure opportunities such as recreation, hunting, wood cutting, and sight-seeing. In general, higher standard roads provide access to more developed recreation sites, such as campgrounds and resorts, and serve as primary routes for large segments of the visiting public. Access to less developed recreation sites and primitive areas, such as inventoried roadless areas and wilderness entry points, is often made via lower-standard roads or trailheads on the peripheries of unroaded areas. These roads also provide access for individuals using Other Power-Driven Mobility Devices (OPDMDs) on routes that are designated for motor vehicle use. For inventoried roadless areas, those trailheads can provide motorized trail access into the inventoried roadless area. Lower standard roads typically lead to more dispersed types of

⁶³ Official Forest Service records, as found in the Natural Resource Management (NRM) database were used to provide information on NFS recreation sites. Database The total amount of deferred maintenance backlog for these sites is approximately \$1.28 billion. records are dynamic; therefore, a snapshot of the recreation site data is used for analyses.

recreation such as primitive camping, fishing, hiking, caving, collecting forest products, and motorized trail recreation, also provide opportunity for driving for pleasure and viewing nature.

There are approximately 368,000 miles of road across the National Forest System. Not all road miles are designated for public motor vehicle use and, in many cases, off highway vehicles are limited to roads with lower development levels while higher development level roads are open to passenger cars. Approximately 65,000 miles, or close to 18 percent, are maintained for standard passenger cars; 200,000 miles, or 54 percent, of NFS roads, are maintained for high-clearance vehicles; and the remaining 103,000 miles, or 28 percent, are currently in storage (see Roads section) The Travel Management Rule at 36 CFR 212.51 establishes the process for designating roads, trails, and areas by vehicle class. Wheelchairs and mobility devices as defined in 36 CFR 212.1 and FSM 2353.05, including those that are battery-powered, may be used anywhere on NFS lands where foot travel is permitted. OPDMDs are managed according to vehicle class and may be used on roads, trails, and areas where that class of vehicle is designated for use as displayed on a Motor Vehicle Use Map.

Effects of Alternative 1 – No Action

With the exception of existing facilities and roads that pre-date the 2001 Roadless Rule, developed facilities and road-based recreation would remain concentrated in areas outside inventoried roadless areas. Future development, modernization, and increased visitor capacity would be focused in non-roadless areas, where higher-standard roads support amenities designed to serve a broad range of users through application of accessibility standards and universal design principles. As recreation demand continues to grow, these areas are expected to face increasing pressure to sustain infrastructure and services, amplifying the need to prioritize ongoing operation and maintenance. Deferred maintenance costs are expected to rise as aging facilities and roads require more intensive upkeep, especially in high-use areas. While trailheads provide limited access into inventoried roadless areas, the inability to build new roads or upgrade existing ones due to multiple factors including terrain, cost, and roadless designation restricts the potential for new developed sites in those areas.

Concentrating use within existing developed areas promotes consistency in layout, amenities, and surface and design conditions, which support usability and orientation for a wide range of visitors. However, limited expansion capacity may constrain opportunities to apply universal design principles that enhance accessible recreation experiences.

Effects of Alternative 2 – Proposed Action

Under this alternative, developed and road-based recreation opportunities could expand into potentially affected IRAs, especially where road construction is allowed by land management plans. New construction of developed recreation sites would likely remain limited, as the recreation setting is more suitable for lower development facilities. It is likely that most new roads within 0.5 miles of existing roads would be temporary construction and not designated as open for public motor vehicle use (see Roads analysis). Permanent roads that are constructed would support a range of uses, with associated facilities likely designed to serve backcountry recreation needs such as low development scale trailheads, primitive campsites, or staging areas, rather than large-scale infrastructure like new campgrounds.

Existing developed recreation sites outside roadless areas would continue to operate and be maintained. As demand for recreation grows, these sites would experience increasing pressure to sustain services and amenities, especially where accessibility improvements or modifications are needed to meet applicable standards. Deferred maintenance costs would continue to accumulate, particularly in high-use areas where aging facilities and roads require more intensive upkeep to meet visitor expectations and safety requirements.

Increased flexibility for development under this alternative could provide opportunities to apply current accessibility standards and integrate universal design principles that improve usability, safety, and availability for all visitors into existing or new developed sites. Implementation would depend on project-level prioritization of accessible recreation opportunity development, site-specific conditions, and feasibility during planning and design.

Effects of Alternative 3 – Modified Rule

Developed and road-based recreation would remain largely concentrated outside inventoried roadless areas, similar to alternative 1, but with more flexibility than the 2001 Roadless Rule because under alternative 3 there would be less designated IRAs. Areas that are removed from the inventoried roadless area designation (WUI and roaded roadless areas), could potentially support limited development, such as trailheads or primitive campsites, where terrain and resource conditions permit.

While new large-scale infrastructure development is likely to remain restricted, this alternative allows for modest expansion of developed recreation opportunities compared to alternative 1, but less than alternative 2. Similar to alternative 2, most new roads would be temporary, with limited public motor vehicle access.

Existing developed sites would continue to face pressure from growing recreation demand, requiring sustained investment in operations and maintenance. Deferred maintenance costs would remain a concern, especially in high-use areas.

Trail-Based and Dispersed Recreation

More than 164,000 miles of National Forest System trails and 7,500 trail bridges provide access for trail-based recreation across 193 million acres of National Forest System lands. Of these trails, approximately 19.5 percent (32,109 miles) are within designated wilderness areas, 39 percent (69,389 miles) are designated open to motorized use, and 41 percent (67,819 miles) are restricted to nonmotorized use outside of wilderness. Each trail in the system is assigned one or more managed use types: hiker/pedestrian, pack and saddle, bicycle, motorcycle, all-terrain vehicle, four-wheel drive vehicle, vehicles exceeding 50 Inches in width, cross-country ski, snowshoe, snowmobile, motorized watercraft, and nonmotorized watercraft. The trail system has increased by an average of 540 miles per year each of the past three years, largely due to road to trail conversions.

The trail system includes National Scenic and Historic Trails, which are congressionally designated per the National Trails System Act of 1968 (P.L. 90-543). NSHTs are long-distance, continuous trails that provide for maximum outdoor recreation potential and for the conservation

and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas. The Forest Service is the lead administering agency for five National Scenic Trails and one National Historic Trail, totaling 9,972 miles. The agency also manages portions of 11 other National Scenic and Historic Trails. These trails are to be managed to preserve the nature and purposes for which they were established and in accordance with their Comprehensive Plan. These trails are predominantly managed as non-motorized and with high scenic integrity objectives. Additionally, the National Trails System Act of 1968 authorized the Secretary of Agriculture to designate National Recreation Trails. Today, the Forest Service administers 538 National Recreation Trails.

National Forest System lands are a popular destination for those seeking dispersed recreation experiences. Dispersed recreation activities occur outside of developed recreation areas, including in wilderness areas, along roads and trails, and general forest and water areas not managed as developed sites (campgrounds, picnic areas, or visitor centers). Activities can be motorized or non-motorized and include, but are not limited to, hunting, fishing, boating, hiking, cross-country skiing, horseback riding, mountain biking, off-highway vehicle riding, snowmobiling, and dispersed camping. Dispersed areas generally have few or no facilities such as toilets, tables, or garbage bins. People who enjoy dispersed recreation activities opt for areas allowing dispersed use over developed sites because they prefer less human disturbance and on-site controls, and/or want to avoid paying a fee to recreate on public lands. Dispersed recreation occurs within all ROS settings; however, any infrastructure installed in these settings emphasizes resource protection over user comfort.

Affected Environment

Within potentially affected IRAs, there are 21,808 miles of trails, including 1,127 miles of national scenic and historic trails, and 981 miles of national recreation trails. The majority of these trail miles are managed for non-motorized use, such as hiking, biking, equestrian use, or skiing/snowshoeing. The potentially affected area includes about 5,200 miles of motorized trails (581 miles of which are snow trails) and 16,208 miles of non-motorized trails (274 miles of which are snow trails). Trails within affected roadless areas are accessed by roadside pull outs and trailheads. The vast majority of trailheads are located either on the periphery of roadless areas or at farther distances from the roadless area in places accessed via higher standard roads.

Wheelchairs and mobility devices as defined in 36 CFR 212.1 and FSM 2353.05, including those that are battery-powered, may be used anywhere on NFS lands where foot travel is permitted. OPDMDs are managed according to vehicle class and may be used on roads, trails, and areas where that class of vehicle is designated for use as displayed on a Motor Vehicle Use Map.

Dispersed recreation activities are typified in Forest Service inventoried roadless areas, where minimal infrastructure, limited human disturbance, and a focus on resource protection over user comfort align with the preferences of visitors seeking quiet, challenge, and low-impact outdoor experiences.

Effects of Alternative 1 – No Action

The no-action alternative would sustain the availability of primarily unroaded settings that provide quiet, remoteness and self-reliance. These settings provide nature-based activities such as hiking, backpacking, horseback riding, mountain biking, hunting, fishing, wildlife viewing, dispersed camping, and off-highway vehicle (OHV) use on designated routes. While minor shifts and displacement in recreation patterns may result from ongoing activities or those approved by exceptions under the 2001 Roadless Rule, the overall availability of inventoried roadless areas for dispersed recreation would remain high.

The lower-development and primitive settings of the no-action alternative would provide more unroaded recreation opportunities compared to the action alternatives.

Effects of Alternative 2 – Proposed Action

Under this alternative, there will be some reduction in areas that provide quiet, remote settings as compared to alternative 1. New road development is reasonably foreseeable. Where these roads are permanent and open to public access, this could provide increased public access to dispersed recreation opportunities due to more roads, but may result in reduced availability of recreation opportunities in quiet, remote settings. This alternative would provide fewer quiet, remote settings than alternatives 1 or 3. As a result, users seeking a more natural setting are more likely to experience decreased availability of their preferred recreation setting or be displaced to other areas. Consequently, existing recreation uses in these areas could experience more use conflicts than Alternative 1 and 3. Alternatively, motorized recreation opportunities may increase more than alternatives 1 or 3 due to a potential increase in road miles. This alternative could provide increased opportunities for dispersed camping, hunting, and climbing access, and could potentially lead to additional trailhead development for increased trail access where new roads are developed. Site specific designs would reduce adverse impacts to comply with land management plans.

Alternative 2 is not expected to directly change the total number of motorized or non-motorized trail miles, however, the national trend of adding approximately 540 miles annually⁶⁴ suggests additional trail mileage may occur over time, subject to capacity and funding and some temporary roads may be developed as trails once management activities are concluded. An increase in trail miles could potentially increase trail-based recreation opportunities, particularly for individuals with mobility disabilities.

Active management activities may temporarily affect access to dispersed recreation areas and trails due to equipment use and safety closures. Visual and noise impacts may also affect the quality of the recreation experience. These impacts are expected to be short term. This alternative would provide more short-term impacts to trail based and dispersed recreation visitors than alternatives 1 and 3.

Alternative 2 has the highest potential for active management activities and is most likely to result in negative effects to 920 miles of National Recreation Trail and 1,075 miles of National

⁶⁴ Data derived from the Forest Service Enterprise Data Warehouse annual updates and averaged over time.

Scenic and Historic Trails within potentially affected IRAs. Active management could result in temporary closures to public access, short-term visual and noise impacts resulting from active management activities, and long-term visual and noise impacts from additional miles of permanent roads crossing or near NSHTs. These activities and impacts would be more likely to occur in areas that are potentially operable for timber harvest. Of the NSHTs within the Alternative 2 analysis area, 268 miles are in areas considered operable and 316 miles are in areas that identified as operable but complex for active management activities.

Increased flexibility for trail and dispersed recreation management under this alternative could allow for application of current accessibility standards and universal design principles in new or reconstructed trailheads or trails, access routes, and constructed features, improving usability and safety for a wide range of visitors where conditions permit. Expanded road and trail networks may also create additional opportunities for use of Other Power-Driven Mobility Devices (OPDMDs) where consistent with resource protection and visitor safety. However, temporary closures, shifting recreation settings, or changes in allowable uses could reduce predictability and limit accessible recreation opportunities until project-level design and designation decisions are implemented.

Overall, this alternative may increase opportunities for road-based recreation and increase availability of accessible infrastructure and amenities compared to alternatives 1 and 3.

Effects of Alternative 3 – Modified Rule

Under alternative 3, there would be some reduction in areas that provide quiet, remote settings as compared to the no-action alternative, but this alternative would preserve more of those settings than alternative 2. Active management activities could result in increased permanent road development in some areas. This could provide increased public access to dispersed recreation opportunities due to more roads but may result in reduced availability of recreation opportunities in quiet, remote settings. Consequently, existing uses in the area could experience an increase in use conflicts over alternative 1 but less than Alternative 2. This alternative would provide for more quiet, remote settings than alternative 2. As a result, users seeking a more natural setting may experience decreased availability of their preferred recreation setting or be displaced to other areas compared to alternative 1. This alternative may provide more recreation opportunities than alternative 1 for motorized recreation due to an expected increase in road miles. Compared to alternative 1, this alternative would provide increased opportunities for dispersed camping, hunting, and climbing access, and could potentially lead to additional trailhead development for increased trail access.

This alternative would provide more short-term impacts to trail based and dispersed recreation visitors than alternative 1 but less than alternative 2.

Because this alternative would retain some roadless designations, it has lower potential to result in negative effects to NSHTs than alternative 2. There is a total of 680 miles of NHST's affected by alternative 3, 28 miles of which are designated open to motorized use. Active management could result in temporary closures to public access, short-term visual and noise impacts resulting from active management activities, and long-term visual and noise impacts from additional miles of permanent roads crossing or near NSHTs. These activities and impacts would be more likely

to occur in areas that are potentially operable for timber harvest. Of the NSHTs within the analysis area, 268 miles are considered operable and 122 miles are operable but complex for active management activities.

Overall, this alternative may increase opportunities for road-based recreation and increase availability of accessible infrastructure and amenities compared to alternative 1 and less than alternative 2.

Recreation Special Uses

Frequently, visitors to national forests turn to others to facilitate their recreation experience. Recreation special use authorizations, such as permits, are employed by Forest Service managers to allow others to provide desired recreation services. The agency has over 24,000 active Recreation Special Use (Rec SU) permits that vary in complexity and size, from which the agency collected approximately \$150 million in fee revenue in fiscal year 2024. Recreation special use permits are issued to a variety of entities including governmental, for profit, and nonprofit. Permit holders are authorized to operate in specific locations, which can be as broad as an entire forest or as narrow as a specific campground. The types of uses include fixed footprint uses with developed sites and facilities such as ski areas, campgrounds, organizational camps, marinas, recreation residences, and resorts. Ski areas sometimes have large areas within their permit boundary that are unroaded and provide for similar recreational opportunities within their footprint. Permits can also be used for dispersed uses without developed sites and facilities such as outfitting and guiding services recreation events, and noncommercial group uses. Outfitters and guides for activities such as sightseeing, hunting, fishing, and rafting often provide recreation opportunities authorized by special use permits in semi-primitive areas, outside of wilderness which has less restrictions. These areas often falls within inventoried roadless areas. Recreation special use permitholders must ensure equal access to publicly available facilities, services, programs, and activities, such as websites, rentals, ski lessons, and restaurants, for individuals with disabilities.

Affected Environment

Fixed Footprint Recreation Special Uses with developed sites and facilities such as ski areas, campgrounds, organizational camps, marinas, recreation residences, and resorts

Ski Areas are identified in this analysis because they are a unique commercial use and occupancy of Forest Service lands. Downhill skiing, primarily done at permitted ski resorts, is the second most popular recreation activity on Forest Service lands (USDA Forest Service 2023c). Demand exceeds mountain resort capacity in many locations and the corresponding Recreation Opportunity Spectrum classification in the applicable land management plan tends to be “rural,” or “urban.” Other fixed footprint recreation special uses such as campgrounds, resorts, marinas and recreation residences have generally much smaller footprints, less potential for overlap with inventoried roadless areas and less frequent expansions into inventoried roadless areas. So, for the purpose of this analysis, ski areas will serve as the proxy for other fixed footprint recreation special uses which may be affected by changes in inventoried roadless areas but to a lesser extent.

Often some of the fixed footprint developed sites such as ski areas and resorts are overlapping or adjacent to inventoried roadless. There are approximately 70 developed sites, other than ski areas such as resorts and campgrounds, in inventoried roadless areas that are operated by permittees.

The Forest Service administers 127 ski area special use permits in the United States, which attracted approximately 26 million visitors to the National Forest landscape in FY2024. Fifteen of the 127 ski areas are in or adjacent to inventoried roadless areas. Through special uses permitting, ski area operations and developments are limited to the assigned ski resort boundary (2709.14_61.1). As ski area operations and developments respond to increases in recreation demand, the ski areas regularly submit proposals to change or expand ski area boundaries. Additionally, the Forest Service works with ski resort entities to develop Master Development Plans (MDPs) (FSH2709.11_52.3 Clause C-7 Master Development Plan) with complementing environmental analysis to make transparent plans for growth, development, and mitigations within the ski resort permit boundary. Effects of new developments, such as a new chair lift, are identified in the MDP and analyzed through project-level environmental analysis as they may require ground disturbance and tree removal. These types of developments are legacy installations that will last decades or longer. Some developments can be adjusted to minimize environmental disturbance. On the other hand, developments such as chair lifts must be installed using precise engineering specifications.

Dispersed Recreation Special Uses without developed sites and facilities such as outfitting and guiding services, recreation events and non-commercial group uses.

Outfitters and guides for dispersed recreation activities such as sightseeing, hunting, fishing, and rafting, provide most recreation opportunities authorized by special use permits in roadless areas. Outfitting and guiding activities in inventoried roadless areas usually provide recreation opportunities for an unconfined type of outdoor recreation experience, free of the urban influence. Other common dispersed activities such as recreation events (trail running and mountain biking events) and non-commercial group uses are less likely to be affected because of their smaller scope and scale and often times they have the ability to change locations if conditions change or do not meet their needs. Long-distance events covering a hundred miles or more may be an exception, as they are more likely to encounter roadless areas and may find it difficult to choose another route.

Effects of Alternative 1 – No Action

A wide variety of recreation special uses, outfitting- and guiding-assisted dispersed recreation opportunities would continue, balanced with other key values such as, maintenance of high ecosystem and scenic integrity, clean water, wildlife viability and biodiversity, landscape character, research opportunities, traditional cultural properties, and sacred sites.

For the fifteen ski areas that are within or adjacent to inventoried roadless areas, it may be difficult for ski area expansion or new construction because of greater regulatory jurisdictions, complex procedures, and heightened public scrutiny. Impacts on categories (other than ski areas) of developed recreation special use permit holders would be minimal from a national perspective.

Proposed ski area, resort, or other recreation development expansion into inventoried roadless areas would be allowed to continue under existing Forest Service procedures if special use permits were in existence prior to 2001 and proposed activities take place within boundaries established by the special use permit before implementation of the 2001 Roadless Rule.

The no-action alternative would maintain existing levels of access to guided opportunities for dispersed recreation and no expansion of related accessible recreation opportunities where the permit boundaries at ski areas and resorts do not already encompass inventoried roadless areas.

Effects of Alternative 2 – Proposed Action

Under alternative 2, there could be an increase in road construction, timber harvesting, and other resource management activities in areas that are currently inventoried roadless areas (where land management plan prescriptions allow it). This potential increase of management activities could reduce the supply of unroaded or backcountry areas available for outfitter and guide assisted dispersed recreation opportunities. Short-term shifts in guided recreation use may occur because of timber harvesting allowed in the proposed action. For instance, most outfitters and guides prefer natural-appearing landscapes, so cutover areas could be avoided until they grow back; or, on the other hand, timber harvested areas may attract use because of increased hunting, wildlife viewing, or berry picking opportunities.

Some road-based guided activities could potentially shift into the current roadless areas if roads or motorized trails are developed through management activities as a means to offer additional locations or opportunities to provide recreation services. Alternative 2 could introduce a new opportunity (such as building a new road in a resort complex or guiding activities on a newly created system road) that a permittee could propose commercial use for. However, evaluating permit requests through Agency screening criteria, permitting process, site-specific environmental review, where applicable, and land management plan requirements would still apply.

Under this alternative, projects associated with campgrounds, resorts, ski areas, or other entities that hold special use authorizations would proceed with planning under existing Forest Service procedures.

Expanded opportunities for activity within permit boundaries may create new opportunities for accessible participation, while increased development or terrain modification could trigger additional analysis, accessibility review, and documentation requirements consistent with permit terms and conditions.

Effects of Alternative 3 – Modified Rule

This alternative would have similar effects as alternative 2 in the areas that would have a change in policy for the management. However, the scope would be reduced due to the reduced acreage that could be impacted. The areas that are not near roads or in WUI and would not have a change in policy for management from the existing 2001 Roadless Rule, would have similar effects as alternative 1.

Sixty-one of the 70 developed sites that are identified in the NRM database as operated by permittees would be in the affected area. This would allow these developed sites to potentially increase their development and operational footprint. The areas outside of the affected environment in this alternative, which would remain designated as IRAs, would allow the dispersed service providers, such as outfitters and guides, to operate in the backcountry, natural appearing landscapes that are desired by their clients.

Wilderness and Other Designated Areas

Congressional and administrative designations cover a large portion of the National Forest System, with each designation type directing the agency to manage the area for a particular purpose. The National Wilderness Preservation System, for example, encompasses nearly 112 million acres across the United States, with about 37 million acres located on National Forest System lands. These areas, established under the 1964 Wilderness Act, are meant to remain unimpaired for future generations, preserving qualities such as naturalness, solitude, and freedom from human control. Wilderness areas offer opportunities for primitive recreation and scientific study, while also serving as important ecological reserves. Although Congress alone can designate new wilderness, the Forest Service identifies recommended wilderness areas in its land management plans, maintaining their character until Congress acts. Roadless areas often lie adjacent to wilderness, providing transitional landscapes that blend natural processes with recreation opportunities not permitted in designated wilderness, such as certain motorized activities. Together, these lands receive millions of visits annually, reflecting their importance to the public.

Beyond wilderness, the Forest Service manages a wide array of other designated areas, each established to protect unique values such as scenic, geological, cultural, or recreational. These include national monuments, national recreation areas, wild and scenic rivers, and national scenic areas, among other. Management varies depending on whether the designation is prescriptive, with strict rules written into law, or descriptive, allowing more agency discretion. Regardless, the guiding principle is to emphasize the primary values for which the area was established while ensuring other uses remain compatible. Many of these areas are showcases for resource management and public recreation, though balancing recreation with protection of special attributes is often a challenge, particularly in places like scenic areas, recreation areas, and monuments where developed facilities are common.

Affected Environment

Inventoried roadless areas that overlap with other congressional or administrative designations are managed to meet all applicable requirements for both IRAs and the other designation.

As noted in Potentially Affected Environment, over 4 million acres designated as IRA managed under the 2001 Roadless Rule within wilderness, wilderness study areas, and wild and scenic river corridor segments classified as wild were removed from the potentially affected environment for this analysis but are displayed here because they are within IRAs designated under the 2001 Roadless Rule.

Table 43: Wilderness, Wilderness Study Areas and Wild and Scenic Rivers (wild classification) overlapping 2001 Roadless Rule IRAs

Designated Area Type	Acres overlapping 2001 Roadless Rule IRAs	Description
Wilderness	1.3 million acres	Areas designated by Congress as a part of the National Wilderness Preservation System
Wilderness study area	2.9 million acres	Areas designated by Congress for the Forest Service to study and report recommendations back to Congress on possible future designation as part of the National Wilderness Preservation System
Wild and Scenic Rivers (Wild Classifications)	85,000 acres	Preliminary administrative recommendations of areas identified by the Forest Service through Land Management Planning evaluation processes for possible future designation as part of the National Wild and Scenic River System and classified as wild.

Other administrative designations such as recommended wilderness and eligible/suitable river segments with a preliminary classification as wild are included but are expected to have land management plan components that do not allow or limit road construction or timber harvest.

Table 44. Other designated areas within IRAs managed under the 2001 Roadless Rule

Designated Area Type	Acres within potentially affected IRAs (Alt 2)	Acres within potentially affected IRAs (Alt 3)	Description
Recommended Wilderness	1.5 million	0.6 million	Preliminary administrative recommendations of areas identified by the Forest Service through Land Management Planning evaluation processes for possible future designation as part of the National Wilderness Preservation System
Wild and Scenic Rivers (Recreational, Scenic)	82,772	71,732	Areas designated by Congress as part of the National Wild and Scenic River System and classified as scenic or recreational.
Eligible/Suitable Wild and Scenic Rivers	551,908	320,708	Areas either designated by Congress for the Forest Service to study and report back recommendations to Congress or preliminary administrative recommendations identified by the Forest Service through a Land Management Planning or other evaluation process for possible future designation as part of the National Wild and Scenic Rivers System

Designated Area Type	Acres within potentially affected IRAs (Alt 2)	Acres within potentially affected IRAs (Alt 3)	Description
National Scenic Areas	113,604	52,134	Areas that contain outstanding scenic characteristics, recreational values, and geologic, ecologic, and cultural resources, designated by Presidential proclamation or by Congress.
National Recreation Areas	701,208	442,329	Areas established by Congress for the purpose of assuring and implementing the protection and management of public outdoor recreation opportunities.
National Game Refuges and Wildlife Preserves	80,933	70,856	Areas designated by Presidential proclamation or by Congress for the protection of wildlife.
National Monuments	467,135	210,646	Areas including historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest, declared by proclamation or by Congress as national monuments.
National Volcanic Monuments	26,860	15,106	Areas established to preserve volcanic features and promote research, recreation, and education, declared by proclamation or by Congress as national volcanic monuments.
National Scenic and Historic Trail Corridors	764	477	Congressionally designated trail corridor for long-distance, non-motorized continuous trails

Wilderness

The National Wilderness Preservation System includes approximately 111.9 million acres; of these, approximately 36.7 million acres are on National Forest System lands. Congressionally designated wilderness areas are required under Section 2(a) of the 1964 Wilderness Act “to be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character.” “Wilderness character” has been interpreted by the Forest Service and other federal wilderness administering agencies to include the following qualities: (1) “untrammeled” or free from intentional human control; (2) “natural;” (3) “undeveloped;” (4) “outstanding opportunities for solitude or a primitive and unconfined type of recreation;” and (5) “may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value” (Landres et al. 2015). Congress has

the sole authority for designating additions to the National Wilderness Preservation System. Congressionally designated wilderness within the National Forest System offers many similar recreation opportunities as roadless areas (except for motorized and mechanized trail activities) and receive about 13 million visits each year or 8 percent of the visits to all lands in national forests. Approximately 1.3 million acres of inventoried roadless area managed under the 2001 Roadless Rule (2.8 percent) are within congressionally-designated wilderness. Further, 2.9 million acres of IRAs under the 2001 Roadless Rule are within statutorily designated Wilderness Study Areas.

Recommended wilderness areas are administratively identified in Forest Service land management plans through an inventory and evaluation process (36 CFR 219.7(c)(2); FSH 1909.12, 70) and have plan components to maintain the characteristics that provide the basis for the agency's wilderness recommendation. Congress may consider these recommendations for future additions to the National Wilderness Preservation System. There are 1.5 million acres (3.7 percent) of the affected environment that are managed as recommended wilderness.

In addition, a substantial portion of inventoried roadless areas are near or adjacent to wilderness areas. Inventoried roadless areas near or adjacent to wilderness serve as natural transitions between land with road-based resource managed activities and lands affected substantially by natural processes. Some of the key characteristics of inventoried roadless areas lie in their unique Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized recreation opportunities (see Recreation Opportunities and Setting and; Trail-Based and Dispersed Recreation). These areas provide popular, appropriate alternatives to wilderness areas because, although they contain many attributes similar to wilderness, a wider range of recreation opportunities with fewer restrictions is available.

Wheelchairs and mobility devices as defined in 36 CFR 212.1 and FSM 2353.05, including those that are battery-powered, may be used anywhere on NFS lands where foot travel is permitted, including in designated wilderness areas.

Other Designated Areas

Certain areas of National Forest System lands (not designated as wilderness) that contain outstanding examples of plant and animal communities, geological features, scenic grandeur, or other special attributes merit special management. These areas are designated by law or may be designated administratively by executive order or action through Agency planning efforts as special areas. Areas so designated are managed to emphasize specific values identified in their enabling legislation or order such as recreation, geology, or history. Other uses are permitted in the areas to the extent that these uses are in harmony with the purpose for which the area was designated. Inventoried roadless areas managed under the 2001 Roadless Rule include congressionally and administratively designated areas such as National Recreation Areas, National Scenic Areas, and National Primitive Areas; Scenic Areas, and Recreation Areas; Game Refuges and Wildlife Preserves; National Monuments and Volcanic Monuments; Wild and Scenic Rivers; Wilderness Study Areas; Research Natural Areas; National Scenic and Historic Trail corridors; and others (Table 43).

Specific to designated wild and scenic rivers, 85,000 acres of inventoried roadless areas managed under the 2001 Roadless Rule are within designated river corridors classified as ‘wild’ segments, generally accessed only by trail. Nearly 83,000 additional acres are within river corridors classified as scenic or recreational. An additional 551,900 acres of inventoried roadless areas on NFS lands are within a quarter mile of river segments identified as eligible or suitable for future wild and scenic river designation.

The law, proclamation, order, or decision designating each area provides specific objectives and guidelines for management of the area. Some designations are prescriptive with management details written into law. Other designations are more descriptive, providing the Forest Service with more management discretion. Despite these differences, the Agency’s policies that guide management of most designated areas have some similarities. The Forest Service manages each designated area as an integral part of NFS lands with emphasis on the primary values and resources as directed by the law or order that established the area. Then the Forest Service manages values or resources not emphasized or prohibited by the establishing law or order in a manner that is complementary or enhances the primary values of the area and are compatible with overall NFS land management objectives. Further, the land management planning process requires certain steps to be taken during plan revision to inventory and evaluate areas for future designation and assign interim management protections to those areas identified, such as for recommended wilderness and wild and scenic river eligibility. This plan revision process also provides for the establishment of new administratively designated areas such as botanical areas, Forest Service recreation areas, historical areas, and paleontological areas, among others. Lastly, designated areas are managed as showcases to demonstrate resource management programs, services, and facilities.

With the exception of National Game Refuges and Wildlife Preserves, and Research Natural Areas, one of the objectives for special management involved providing for public outdoor recreation opportunities. However, the special values (that is, scenic, cultural, historic, wildlife, geologic, or other values) and attributes must be protected. Other resource values in the area are managed to enhance public recreation values or the special attributes of the area.

This situation is generally most acute in National Scenic Areas, National Recreation Areas, National Wild and Scenic Rivers classified as scenic or recreational, National Monuments, and National Volcanic Monuments because these areas are more likely than other categories of special designated areas to feature developed recreation.

Designated areas are characterized by the special values, attributes, or unique features for which they were established. As a result, the effects of the rulemaking on these areas will vary depending on each area’s management emphasis.

Effects of Alternative 1 – No Action

Under alternative 1, inventoried roadless areas in and around designated wilderness would continue to be managed under the 2001 Roadless Rule. Human use would continue to increase in inventoried roadless areas. Patterns of recreation and other uses would be managed to maintain or enhance roadless characteristics. Large tracts of land where natural processes occur uninterrupted would be maintained. Threat to wilderness character would be low overall. No

short-term disturbances from commercial timber harvesting or long-term benefits from timber harvesting for stewardship purposes would accrue, as there would continue to be limited or infrequent tree cutting and limited road construction only allowed by the current exceptions under the 2001 Roadless Rule and when consistent with any other applicable designation's management requirements. Other ongoing activities would continue in 2001 Rule IRAs.

Maintaining existing inventoried roadless areas under the 2001 Roadless Rule that are adjacent to designated wilderness would likely maintain existing levels of wilderness character protection. Inventoried roadless areas adjacent to or near wilderness areas can be more easily accessed by visitors than designated wilderness and provide an alternative location for certain recreation activities in unroaded areas, thereby relieving some recreational use pressure on designated wilderness. Any additional distance between wilderness areas and intense management activities also provides greater opportunities for natural processes to occur uninterrupted.

This alternative would continue to provide less flexibility than alternative 2 to local land managers of other designated areas to determine the long-term disposition of unroaded lands to meet developed and dispersed recreation needs within the context of the law, proclamation, order, or decision that established the area. Over the long term, this alternative would maintain the highest relative supply of lands with dispersed recreation potential in designated areas. Among all other designated areas, the availability of roadless areas for forest visitors seeking Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized recreation opportunities would be highest in Wilderness Study Areas, National Recreation Areas, and National Wild and Scenic River corridors because they have the greatest number of inventoried roadless acres. Therefore, this alternative would provide more opportunities than in alternative 2 for resolving issues between motorized and non-motorized dispersed recreation activities.

Effects of Alternative 2 – Proposed Action

Under alternative 2 the national prohibitions would no longer be applied to inventoried roadless areas. The proposed rulemaking would not change or affect any of the other designated area status of these lands, and where these designations occur, the lands would continue to be managed according to the requirements of the relevant laws, policies, or land management plan requirements.

Some designated areas would continue to prohibit or limit road construction and reconstruction or timber harvest. For example, these activities are not allowed in congressionally-designated wilderness, WSAs, and wild and scenic rivers segments classified as wild. Based on existing designations and land management plans, currently, road construction and timber harvest are generally not allowed in 55 percent and 66 percent of the potentially affected IRAs. Site-specific projects would be evaluated for consistency with applicable designated area plans, land management plans, and the relevant laws, regulations and policies for these areas.

Over time, if permanent roads are developed within IRAs, the supply of inventoried roadless areas available would decrease resulting in more developed recreation settings, increased resource management activity, and reductions in the size of lands available for uninterrupted natural processes. This trend of shifting human patterns, increased resource management activity,

and reduced ecological integrity near designated wilderness could increase the threat to the qualities of wilderness character of these areas.

This alternative would provide slightly more flexibility to local land managers of designated areas to determine how to meet developed and dispersed recreation needs within the context of the law, proclamation, order, or decision that established the areas and consistent with the land management plan. Over time, the land management plan components could be amended or revised to permit road construction or timber harvest in these areas. However, any amendment or revisions would need to be consistent with the statute, proclamation, or order designating the area. These remaining stipulations, for example in the case of designated wild and scenic river corridors classified as scenic or recreational, may not include outright prohibitions but instead allow for activities that are consistent with the statutorily required comprehensive river management plan and satisfied management objectives that protect and/or enhance identified river values.

Road construction, timber harvesting, and other resource management activities are reasonably foreseeable in inventoried roadless area and would be most likely to occur where current land management plans allow it and where the areas are operable for mechanized equipment (see Roads and Timber sections). Existing recreation settings could become more developed settings over time depending on activity location, design, and implementation. Because about 6 million more acres of existing non-motorized recreation settings (located within either operability category) could be impacted, this difference suggests that it might be more probable for non-motorized settings to be impacted in the short or long term from management activities. However, it is more likely for existing motorized settings to be impacted simply given that operability is based on the ability to reach and operate within a location proximate to existing roads and infrastructure.

Alternative 2 would have the least effect on the management of National Game Refuges/Wildlife Preserves, National Scenic Research Areas, and National Volcanic Monuments categories of other designated areas. Nationally, these categories have the fewest acres of inventoried roadless area.

This alternative would not change management of areas where road construction or timber harvest is otherwise prohibited by land management plans. However, land management plans could be revised in the future to permit road construction or timber harvest, unless otherwise stipulated by the statute, proclamation, order, or decision designating the area. For example in the case of designated wild and scenic river corridors classified as scenic or recreational, land management plans may not include outright prohibitions, but instead allow for activities that are consistent with the statutorily required comprehensive river management plan and satisfied management objectives that protect and/or enhance identified river values.

With regard to accessibility and universal design implications, greater management flexibility could allow for selective improvements to access routes or points of entry adjacent to or within designated areas where consistent with land management plans. Such changes may improve usability and safety but could alter landscape conditions that support low-development or low-

stimulus experiences. Evaluation of site-specific accessibility considerations would occur during project planning and implementation.

Effects of Alternative 3 – Modified Rule

In affected environment locations where alternative 3 removes roadless rule prohibitions that are within ½ mile of existing roads or within WUI, and on 9.3 million acres on the Tongass National Forest, the effects would be the same as those described for alternative 2. However, the potential geographic scope where these effects could occur would be less than the geographic scope of alternative 2. Specifically, across the Roadless Alternative 3 Affected Environment, 1,087,115 acres (after the hierarchy of overlapping categories was considered) are categorized as a designated area or recommended designated area.

This alternative also includes provisions to make needed modifications to the applicability of prohibitions within inventoried roadless boundaries. Where boundaries are modified that remove prohibitions, the effects would be the same as those described above.

In affected environment locations that continue current management, pursuant to the 2001 Roadless Rule in core roadless areas (prohibit road construction, reconstruction, and timber harvest with limited exceptions defined in the 2001 Roadless Rule), the effects would be same as those described for alternative 1.

Conclusion – Recreation and Scenery

Alternative 1 maintains primitive, undeveloped settings with the most opportunities for quiet, remote and self-reliant recreation opportunities and least flexibility for new developed recreation opportunities. Recreation settings would remain unchanged, preserving current roadless characteristics with lower-development, primitive settings that offer the most unroaded and quiet recreation opportunities. These areas provide dispersed recreation and help reduce pressure on designated wilderness, though this approach limits flexibility for meeting local recreation needs.

Alternative 2 has the greatest potential impact on recreation settings and scenery. When and where future timber harvest or road construction occur, short-term effects could include noise, visible infrastructure, and temporary closures during active management activities. Long-term, if roads are designated for public motorized access, recreation settings could shift toward more developed conditions, especially in areas with existing semi-primitive and roaded natural settings. Approximately 12 million more non-motorized acres could be affected by alternative 2 compared to Alternative 3.

Future potential management activities may have some short- and long-term scenery effects under both alternative 2 and 3, the management activities would strive to achieve long-term sustainable desired scenic character within the scenic integrity objectives identified in the land management planning process and any scenery related direction outlined in other statutory and regulatory requirements, including the procedural requirements of the National Environmental Policy Act. Scenic integrity objectives in land management plans would vary from high-to-moderate to low. Alternative 2 has the greatest potential for negative effects to scenery. Alternative 3 would potentially impact fewer areas.

Under Alternative 2, developed and road-based recreation could expand into inventoried roadless areas where land management plans allow road construction. Most new roads would likely be temporary and closed to public motor vehicle use, while permanent roads would support backcountry recreation with low-development facilities such as trailheads, primitive campsites, or staging areas—not large-scale infrastructure like campgrounds. This expansion would increase road-based recreation and accessibility improvements but reduce opportunities for quiet, remote and self-reliant recreation opportunities and increase user conflicts. Alternative 3 has similar effects to Alternative 2 but affects fewer acres overall, especially non-motorized settings. It preserves quieter, remote areas than Alternative 2 but fewer than Alternative 1. Some permanent road development is expected, increasing motorized access and dispersed recreation opportunities, but to a lesser extent than Alternative 2. Short-term impacts and user conflicts occur but are less severe than under Alternative 2.

Alternative 2 also has the highest potential for negative effects on National Recreation Trails and National Scenic and Historic Trails (NSHTs), including temporary closures and visual/noise impacts. Overall, this alternative provides the most flexibility for accessibility improvements and universal design but also results in the greatest changes to remote recreation settings. Alternative 3 has a lower potential for negative effects on NSHTs compared to Alternative 2 and offers modest improvements in accessibility and recreation opportunities compared to Alternative 1, though less than Alternative 2.

Cultural and Historic Resources

Introduction

Cultural resources include, but are not limited to, objects and specific locations linked to human activity, occupation, or use that is identifiable through field survey, historical documentation, or oral evidence. They include pre-contact (indigenous) and post-contact historic districts, archaeological sites, buildings, structures, objects, artifacts, sacred sites, cultural landscapes, and traditional cultural places, and also include land, mineral, water, animal, and plant resources important to Tribes and other cultural groups with traditional and contemporary practices tied to these resources (Forest Service Manual 2360.5). Pre-contact indigenous cultural resources date to a time before Europeans arrived in North America, while post-contact cultural resources date to a time after Europeans began occupying North America. Cultural resources may have significant spiritual and ceremonial value to one or several federally recognized Tribes. For Tribes, natural resources are cultural resources, and therefore it is impossible to fully list every type of potential cultural resource in this analysis.

Historic properties are defined in the National Historic Preservation Act as “any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register [of Historic Places], including artifacts, records, and material remains relating to the district, site, building, structure, or object” (54 U.S.C. 300308). The term includes properties of traditional religious and cultural importance to Indian Tribes. To be eligible for inclusion in the National Register, a cultural resource must meet at least one of four criteria and retain sufficient integrity to convey its significance. The four criteria are: A) resources that are “associated with events that have made a significant contribution to the broad patterns of our

history;” B) resources “that are associated with the lives of significant persons in our past;” C) resources “that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;” and D) resources “that have yielded or may be likely to yield information important in [pre- or post-contact] history...” A historic property can be eligible under one or more of these criteria and usually is at least 50 years old (36 CFR 60.4). A traditional cultural place is one that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that are (1) rooted in that community’s history and (2) important in maintaining the continuing cultural identity of the community. Because these sites are still in use and Tribes and Tribal members may exercise their rights to visit them under multiple laws and treaties, including but not limited to the American Indian Religious Freedom Act and Executive Order 13007 (sacred sites), traditional cultural places are an important part of the affected environment for cultural and historic resources.

Ground disturbance, including whether areas have previously been disturbed, is a key consideration when determining impacts to cultural resources. New ground disturbance may damage historic properties and other cultural resources. Activities that would not create new impacts beyond the extent of previous ground disturbance (from logging, natural disasters, and so forth) do not constitute new ground disturbance. Visual effects may also impact a historic property or other cultural resource, particularly if a visual change on the landscape affects culturally or historically significant features.

The rulemaking does not authorize any activities that can affect historic properties. In accordance with Section 106 of the National Historic Preservation Act, future actions in inventoried roadless areas require project-level, site-specific consideration of effects to historic properties.

Potentially Affected Environment

Historic properties and cultural resources, including those important to Tribes, are found across the potentially affected environment and reflect both human activity and natural resource use. The most common types of historical and cultural resources on National Forest System lands may include those from pre-contact (indigenous) and post contact (historical).

The pre-contact period, before Europeans arrived in North America, is understood through a mix of Western science and Indigenous Knowledge, with evidence of indigenous habitation dating back at anywhere from 13,000 years (Surovell et al. 2022) to 23,000 years ago (Pigati et al. 2023) although most Tribes cite occupation since time immemorial. These Indigenous peoples used local plants, animals, water sources, and minerals, travel routes, occupation sites, and resource gathering areas. Pre-contact sites range from lithic quarries and habitation sites to sacred locations and burial grounds. National Forest System lands are Tribal ancestral lands, and many Tribes and Tribal members continue traditional cultural and religious uses of the land. Treaties, agreements, and laws have reserved certain lands and rights for Tribes within National Forest System lands (see Tribal Rights and Interests section for a list of various authorities).

Spanish exploration and colonization in the 16th century established European sites in the Southwest and California, followed by other European settlements, especially in the eastern U.S. The 1800s saw westward expansion of European, Euro-American and other non-indigenous peoples driven by legislation like the Indian Removal Act of 1830 and the Homestead Act of 1862. These types of laws led to displacement, including forced removal of Tribes from their homelands. As non-Indigenous peoples moved westward, this led to the advent of railroads, leading to new industries and settlement sites such as mining camps and homesteads, which turned into towns and increased the demand for lumber. Federal forest management officially began in 1876, evolving through the creation of forest reserves and the U.S. Forest Service in 1905. Depression-era structures built by the Civilian Conservation Corps, including guard stations and fire lookouts, remain significant cultural resources.

Effects of Alternative 1 – No Action

In general, activities that do not create new ground disturbance or do not introduce visual changes to the landscape usually have little to no negative impacts on cultural resources. Under alternative 1, timber harvest and road construction and reconstruction would continue to be limited by the 2001 Roadless Rule, though allowed through limited exceptions for these activities. Any ground disturbing activities that occur within the potentially affected environment could have long-term negative effects on cultural resources including historic properties, though under alternative 1 exceptions are expected to continue to be infrequent. Site-specific planning for any proposed activities would require review under Section 106 of the National Historic Preservation Act, including early consultation with Tribes and other consulting parties to identify and evaluate historic properties and assess effects to them and, if needed, resolve adverse effects. These projects would also need to comply with land management plans and be reviewed under the National Environmental Policy Act, both of which would include consideration of cultural resources and opportunities to mitigate effects.

Effects of Alternative 2 – Proposed Action and Alternative 3 – Modified Rule

Under alternatives 2 and 3, ground disturbance or visual impacts from increased timber harvest and road construction and reconstruction could have long-term negative effects on cultural resources including historic properties. As site-specific projects are planned, the potential for impacts would be reduced through environmental review, compliance and consultation.

Across the potentially affected IRAs, effects would be more likely where land management plans allow these activities and on lands that are operable for mechanical equipment (see Roads and Timber analyses). Under alternative 3, the potentially affected environment would be limited to wildland urban interfaces and areas within ½ mile of roads, therefore the potential for impacts to cultural resources would be on less area.

Alternatives 2 and 3 do not authorize site-specific actions. Future proposals would require review under Section 106 of the National Historic Preservation Act and its implementing regulations. Future timber and road projects would require early consultation with Tribes and other consulting parties to identify and evaluate historic properties and assess effects to them and, if needed, resolve adverse effects. These activities would also require land management plan

compliance and review under the National Environmental Policy Act, which would include consideration of cultural resources.

The Forest Service often avoids and minimizes impacts to archaeological sites and other cultural resources by flagging them for avoidance, but there are many other ways to avoid, minimize, and mitigate impacts to historic properties and other cultural resources based on site-specific and project-specific information. Some activities can be designed to minimize impacts to archaeological sites and other cultural resources. For example, using vehicles and machinery that create little to no new ground disturbance will likely not have significant impacts on archaeological sites. However, ground disturbance by heavy machinery and even smaller tools such as a come-along can cause substantial ground disturbance from the machines themselves and/or by dragging or skidding trees across the land. Indirect impacts of timber harvest can include post-harvest erosion impacts to cultural resources. Erosion can be mitigated using soil stabilization methods such as seeding and mulching. Timber harvest can also change the visual character of cultural landscapes, which may include historic properties. In roadless areas, early and regular Tribal consultation can inform project design to avoid, minimize, or mitigate potential visual impacts to Tribally important cultural landscapes, sacred sites, and traditional cultural places.

New road construction always has the potential to impact cultural resources when roads are built in undisturbed areas where cultural resources are present, because they create substantial new ground disturbance. Many roads are built on historic travel routes often dating to thousands of years before the present, and cultural resources are commonly found in proposed road construction areas. Some roads can be aligned to avoid cultural resources, but often complete avoidance is impractical. In undeveloped areas, new roads can sometimes create visual impacts to Tribally important sites or cultural landscapes, and only Tribes with ancestral ties to these areas can identify these types of impacts. Activities such as road reconstruction and repairs in the same footprint of previous road construction and maintenance will have little to no impact on cultural resources, while road widening, realignments, and new roads usually have negative long-term impacts on cultural resources, when present, and these impacts may meet the threshold of an “adverse effect” to historic properties under implementing regulations for Section 106 of the National Historic Preservation Act (36 CFR 800). When the agency makes a finding of “adverse effect,” it will follow the procedures at 36 CFR 800.6 to resolve adverse effects, which usually requires a memorandum of agreement. By making cultural resources sites more easily accessed by the public, roads provide increased opportunities for vandalism, looting, and inadvertent degradation of cultural resources from human foot and vehicle traffic.

Conclusion

Under alternatives 1, 2, and 3 any timber harvest and road construction and reconstruction could potentially have long-term negative impacts on cultural resources including historic properties. The impacts would likely be more frequent and broader in scale under alternative 2. Impacts to cultural resources would likely be the least under alternative 1, because current restrictions allow limited exceptions for these activities. Impacts under alternative 3 would likely impact fewer cultural resources than alternative 2, because additional activities would be permitted on less land area. Under all alternatives, future timber and road projects would require review under

Section 106 of the National Historic Preservation Act including early consultation with Tribes, State Historic Preservation Officers, and other consulting parties to identify and evaluate historic properties and assess effects to them and, if needed, resolve adverse effects.

Tribal Rights and Interests

Introduction

The Forest Service has legal obligations under the United States Constitution, treaty rights, and Federal laws, regulations, and policy to protect and preserve the inherent rights of American Indians into perpetuity. These unique and expansive rights include access to lands, use of forest products, the freedom to practice traditional religions, ceremonial use of Indian sacred sites, and the avoidance of adverse impacts to such sites, cultural resources or products. National Forest System lands contribute to Tribal economic, social, and cultural sustainability by providing goods and services, including essential ecosystem services such as forest products, clean water, and biodiversity for subsistence and other traditional cultural practices. According to the U.S. Census Bureau, 9 million U.S. residents identify as American Indian and Alaska Native alone (2.7 million) or American Indian and Alaska Native in combination with one or more other races (6.3 million).

Each Tribe has slightly different rights according to treaties, executive orders, and various laws, regulations, and court orders. Ongoing and regular meaningful government to government consultation with Tribes on proposed Federal actions is legally mandated and provides an important opportunity for the Tribes to express information and concerns during evaluation of proposed actions.

Preliminary responses to the Notice of Intent, formal written consultation requests from Tribes, and documentation from consultations⁶⁵ indicate several important values, perspectives, and legal aspects to consider:

- 1) an intimate relationship with and broadscale reliance on forest resources for subsistence use, since time immemorial, to directly sustain community health and wellbeing in perpetuity;
- 2) the value of and legally binding requirements to shared decision-making between Tribes and federal agencies when proposed actions may impact trust assets;

⁶⁵ (see also Consultation with Federally Recognized Tribes and Alaska Native Corporations) Information shared by Tribes through official consultation, correspondence, and conversations with individuals provides a rich source of information on Tribal perspectives, resource uses, topics of interest, areas of importance, and the unique relationships Tribes have with Federal agencies. Information provided by Tribes is often protected from disclosure in accordance with section 304 of the National Historic Preservation Act – Confidentiality of the location of sensitive historic resources (54 U.S.C. 307103), section 9 of the Archaeological Resource Protection Act – Disclosure of Information (16 U.S.C. 470hh(a)), section 8106 of the Food, Conservation, and Energy Act of 2008 - Prohibition on disclosure (25 U.S.C. 3056), section 552(b) of the Freedom of Information Act (5 U.S.C. 552), and the regulations at 36 CFR 296.18 – Confidentiality of Archaeological Resource Information.

- 3) an emphasis on the co-stewardship opportunities that may exist for tribally led forest restoration using authorities such as Indian Trust Asset Reform Act and 638 contracting;
- 4) including Traditional Ecological Knowledge via co-management agreements and other formal mechanisms is critical to secure tribal data and knowledge, and protect cultural resources for future generations of Native people;
- 5) net benefit to Tribal economics through the protection of vast, intact landscapes that support ecotourism and recreation; and
- 6) clear and consistent strong opposition to the Roadless Rule Rescission citing past lawsuits that resulted in favoring Tribal interests (with a few exceptions).

The following indicators are used to assess the extent that each alternative responds to particular Tribal rights and interests.

- **Access:** Tribes' ability to access treaty resources, sacred sites, or other areas of importance to Tribes.
- **Resource Usability:** The quantity and quality are sufficient to meet Tribal needs.
- **Disturbance:** Any activity that could pose a potential threat to treaty resources, sacred sites, or other areas of importance to Tribes.

Together, these indicators give an overview of the major concerns and relative means of ranking alternatives. These are discussed qualitatively based on consistent feedback received from Tribes. However, both Tribes and the Forest Service have some quantitative information regarding the quantity and quality of resources in local, regional, and national databases. Site-specific Tribal consultation is essential to understanding what access, uses or resources may be affected, the extent it could affect Tribal rights and interests, and how to avoid, minimize, or mitigate disturbance.

Potentially Affected Environment

The United States has a unique, legally affirmed nation-to-nation relationship with American Indian and Alaska Native Tribal Nations, which is recognized under the U.S. Constitution, treaties, statutes, executive orders, and court decisions (See Consultation with Federally Recognized Tribes and Alaska Native Corporations). This section provides background information on current conditions as they relate to Tribal sovereignty, Trust Responsibility and Tribal Treaty Rights, Tribal Co-stewardship, Tribal Sacred Sites Indigenous Knowledge and Land Management.

Tribal Sovereignty

Tribal sovereignty refers to a Tribes' original, inherent authority to govern themselves, their lands, and their resources. It is not a power delegated to Tribes by Congress but is instead an inherent power that has never been extinguished (*Worcester v. Georgia*). Due to their unique status as sovereign nations, federally recognized Tribes maintain a government-to-government

relationship with the Federal government. The United States recognizes the right of Tribal governments to self-govern and supports Tribal sovereignty and self-determination.

Trust Responsibility and Tribal Treaty Rights

A trust relationship exists between the United States (including all Federal agencies) and Tribes, in which the government “has charged itself with moral obligations of the highest responsibility and trust” (*Seminole Nation v. United States*, 316 U.S. 286, 1942). The nature of the trust relationship is defined by federal law and includes particular duties or fiduciary obligations.

Indian treaties are government-to-government agreements between Tribes and the United States as sovereign nations. They are typically not grants of rights to Tribes but grants of rights from Tribes to the United States, with a reservation of those rights not granted, ceded, or relinquished. Under the U.S. Constitution, ratified treaties are the supreme law of the land, and their terms may be changed only by Congress. Treaties with Tribal Nations may explicitly secure rights for the Tribe, including rights to lands, fishing and hunting rights, water rights, and goods and services such as food, education, and healthcare. Rights not addressed by Tribal treaty provisions are presumptively reserved, so long as the rights retained are consistent with federal law.

Tribal Co-Stewardship

Federal lands are the original homelands of Tribes. Co-stewardship broadly refers to collaborative or cooperative agreements between Federal agencies and Tribes regarding the management, conservation, and protection of lands, waters, and associated flora, fauna, and resources. Co-stewardship can take many forms, including sharing technical expertise and Indigenous Knowledge, combining Federal and Tribal capabilities to improve resource management, as well as integrating Tribal views and values into land management.

In the 1970s, Congress enacted Public Law 93-638, also known as the Indian Self-Determination and Education Assistance Act (25 U.S.C. 5301). The Act initially established a contracting framework with federally recognized Indian tribes, authorizing agencies within the Department of the Interior and Department of Health to coordinate with tribal governments on planning and administrative programs. These contacts are often called “self-determination contracts,” as they enable federal agencies meet their trust responsibilities to tribes, and allows for better involvement of tribes in the stewardship of lands. The 2018 Farm Bill (Public Law 115-334) expanded ISDEAA funding to include approved USDA Forest Service Tribal Forest Protection Act (TFPA) projects. The USDA Forest Service therefore possesses discretionary authority to enter 638 “self-governance compacts” and funding agreements with Tribes to perform “administrative, management, and other functions” of TFPA ⁶⁶ projects. “Forest Service officials

⁶⁶ [1] There must be an approved Tribal Forest Protection Act project in order to utilize the Forest Service 638 authority. 638 agreements are for work on National Forest System (NFS) lands (while DOI forestry program funding is for work on tribal lands). Furthermore, 638 agreement projects must be in compliance with NEPA, ESA, and NHPA as applicable. 638 TFPA agreements are only available to Tribes and tribal organizations that can meet a reasonable standard of “adjacency” of tribal trust lands under TFPA. The first USDA 638 agreement was signed Sep 9, 2020, with the Tulalip Tribes. It consisted of a demonstration project to help ongoing work to restore beaver habitat and protect salmon. The 638 agreement supports the restoration of Nationals Forest Lands that were Tulalip’s ancestral land and treaty protected lands, in a way consistent with the spirit and purpose of the ISDEAA.

may provide advice and information to Indian Tribes in advance of Tribes' submitting proposals for stewardship contracts or agreements to assist Indian Tribes in developing proposals that are consistent with the criteria in the Tribal Forest Protection Act" (FSH 2409.16, chapter 60).

Tribal Sacred Sites

Executive Order 13007, Indian Sacred Sites, was issued in May 1996 to address the protection and preservation of Indian religious practices at sacred sites on federal lands. This order defines a sacred site as "...any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the Tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

Indigenous Knowledge and Land Management

There is no single definition or phrase that captures Indigenous Knowledge. Numerous phrases (Indigenous Knowledge, Indigenous Traditional Ecological Knowledge, Traditional Ecological Knowledge, Indigenous Science, or Native Science) have been used to describe knowledge that "includes Indigenous relationships to land, plants, animals, community, self, cosmos, spirit, and the creative animating processes of life (Cajete 2021:15)." Indigenous Knowledge incorporates direct experience, as well as long-term observations by individuals and across generations (Emery et al. 2014). For the purposes of this document, Indigenous Knowledge, as defined at 36 CFR 219.19, refers to the body of observations, oral and written knowledge, innovations, practices, and beliefs developed by Tribes and Indigenous Peoples through interaction and experience with the environment. Indigenous Knowledge is a holistic and ongoing accumulation of knowledge, practices, and beliefs about the relationships between living beings in a specific ecosystem, acquired by Indigenous people since time immemorial through direct contact with the environment, passed down through generations, and used for life-sustaining purposes. Tribes see themselves as inseparably intertwined with the land and natural world and have a responsibility to steward lands in perpetuity (Berkes 1999, Emery et al. 2014, Kimmerer 2000). Indigenous Knowledge research recognizes the deeply interwoven relationships between people and their environments. These relationships remain critical to sustaining Tribal lifeways (Asselin 2015, Burger et al. 2008, De Groot et al. 2002, Fisher 2017, Hoagland 2017, Tengberg et al. 2012, Long et al. 2018).

Tribes rely on forest products for fuel, food, medicines, and other materials for cultural purposes, and they desire to restore the land as well as Tribal relationships with the land (Rogers-Martinez 1992, Schroeder 1996). Travel routes that were carved out by Tribal use over thousands of years later, and many of these routes became Forest Service trails or roads. Benefits of these road systems to Tribal members include motorized access to areas once accessed only by foot or horse. Access by roads allows for trips to hunt, gather, or travel to religious sites.

Effects of Alternative 1 – No Action

In general, activities that do not impede Tribal access or use of National Forest System Lands, do not impact resource usability nor disturb resources reserved for Tribes and have little to no new

negative impact on Tribal rights and interests. Under alternative 1, timber harvest and road construction and reconstruction would continue to be infrequent and only where Responsible Officials approve exceptions for these activities. When exceptions are granted, timber harvest and road construction could have long-term negative effects on tribal rights and interests, and these impacts would be similar to those for alternatives 2 and 3 but would likely happen less frequently and affect less land area. Future projects that propose activities currently prohibited by the roadless rule would require early and regular consultation with Tribes to identify potential impacts to Tribally important areas and resources and to ensure the agency meets its Tribal trust responsibilities and that projects do not conflict with reserved rights in treaties and other laws.

Effects of Alternative 2 – Proposed Action and Alternative 3 – Modified Rule

Under Alternatives 2 and 3, additional timber harvest and road construction and reconstruction are reasonably foreseeable. These activities could have long-term negative effects on Tribal rights and interests. However, these alternatives would not authorize site-specific actions. Future projects would require early and regular consultation with Tribes to identify potential impacts to Tribally important areas and resources and to ensure the agency meets its Tribal trust responsibilities and that projects do not conflict with reserved rights in treaties and other laws. In addition, future activities would be compliant with land management plans, which are developed in consultation with Tribes and often contain plan components addressing Tribal rights and uses.

Across the potentially affected IRAs, effects would be more likely where land management plans allow these activities and on lands that are operable for mechanical equipment (see National Forest System Roads and Vegetation and Forest Management). Under alternative 3, outside of the Tongass National Forest, the potentially affected environment is limited to wildland urban interfaces and areas within ½ mile of roads, therefore, potential impacts to Tribal rights and interests would be similar, but over less area than alternative 2.

The following are general considerations for types of impacts that may result from timber and road construction projects based on the agency's experience and based on comments received from Tribes during the comment period for the notice of intent. Future projects that propose activities currently prohibited by the roadless rule would require early and regular consultation with Tribes to identify potential impacts to Tribally important areas and resources and to ensure the agency meets its Tribal trust responsibilities and that projects do not conflict with reserved rights in treaties and other laws.

Timber harvest and road construction in inventoried roadless areas could significantly alter Tribal access to treaty-reserved resources, sacred sites, and other culturally significant areas. These lands often encompass cultural forestscapes, sacred forests, ancestral trails, and Areas of Tribal Importance designated under 36 CFR §219.10(b)(1). Construction of new roads may fragment or obscure ancestral trails that hold deep religious, spiritual, and cultural significance. These trails are not merely transportation corridors but ceremonial pathways and links to oral histories and traditional knowledge. Increased road infrastructure may lead to unauthorized public access, vandalism, or desecration of sacred sites and traditional cultural places, especially if not adequately protected or monitored. This can erode the sanctity and privacy required for

traditional practices. Many Tribes rely on undeveloped, roadless areas for quiet, solitude, and spiritual renewal. The presence of roads and logging operations can compromise the acoustic and visual integrity of these spaces, diminishing their suitability for ceremonies and prayer. For Tribes engaged in cultural tourism, road development may either enhance or hinder access to interpretive sites. However, unmanaged tourism can also lead to overuse or degradation of culturally sensitive areas. Roads and timber harvest may create barriers to treaty-reserved hunting, fishing, and gathering areas, especially if access is restricted due to safety or operational concerns.

The usability of treaty resources—such as fish, game, plants, and clean water—is directly tied to their quantity, quality, and ecological integrity. Timber harvest and road construction can degrade these resources, undermining subsistence practices, economic development, and Tribal restoration goals. Timber harvest and road-building activities can increase sedimentation, alter hydrology, and impair fish and aquatic organism passage, directly affecting fisheries that are central to Tribal diets, economies, and ceremonies. Roads can fragment wildlife corridors, (see Biodiversity) reducing populations of game species. This diminishes hunting opportunities and violates the spirit of reserved hunting rights. Roads act as vectors for invasive plant species (see Non-Native Invasive Plant Species), which can outcompete culturally significant native plants used for food, medicine, and ceremony. This reduces the availability and quality of traditional resources.

Timber harvest can alter forest composition and structure, disrupting cultural forestscapes managed by Tribes for generations. These landscapes are often cultivated for specific species (such as beargrass or huckleberries) and spiritual purposes. Timber harvest in sacred areas may remove trees considered spiritually sentient or essential for ceremonial materials, undermining cultural continuity and spiritual well-being. Tribal-led restoration and economic development projects—such as non-timber forest product harvesting or eco-cultural tourism—may be compromised by competing land uses that degrade the resource base.

Disturbance includes both direct and indirect threats to Tribal resources and values. These can be ecological, cultural, or spiritual in nature, and often have cumulative and intergenerational impacts. Timber harvest and road construction increase the risk of disturbance, looting, or destruction of archaeological and cultural sites, especially in the absence of robust monitoring and protection protocols. The sensory impacts of machinery and increased human presence can disrupt ceremonial practices, wildlife behavior, and the spiritual character of sacred landscapes. The transformation of inventoried roadless areas into managed landscapes alters their character, which can be essential for religious and spiritual practices that require isolation and natural soundscapes. Projects that fail to integrate Indigenous knowledge into planning and design risk overlooking cultural sensitivities, ecological insights, and sustainable practices that could mitigate disturbance.

Conclusion

Generally, Tribes have shared concerns about current and future adverse effects on resources including all physical resources such as access routes, air, groundwater and surface water, plant and animal life, and landscapes, as well as less tangible attributes such as sense of place, sense of

historical, spiritual, religious, and Tribal identity; opportunities for solitude; and opportunities to continue traditional cultural practices and ceremonies. There would be the greatest potential for adverse effects under alternative 2 and slightly reduced potential under alternative 3. Under all alternatives, future projects that propose activities currently prohibited by the roadless rule would require early and regular consultation with Tribes to identify potential impacts to Tribally important areas and resources and to ensure the agency meets its Tribal trust responsibilities and that projects do not conflict with reserved rights in treaties and other laws.

Social and Economic Environment

Background

This section considers the social and economic conditions and effects of alternatives, including economic effects and effects on the quality of life of the American People. It focuses on the social and economic issues raised during the public comment period.

Activities on National Forest System lands affect the quality of life for many people, whether they live near or far from a national forest. Quality of life can be discussed as a positive or desirable existence, trait, action, or outcome based upon the interactions between social, economic, and environmental components influencing the human environment (Diener and Suh 1997; Reed and Brown 2003; Petrosillo et. al. 2013; Santacreu and Fernandez-Ballesteros 2023). Quality of life is multi-dimensional and comprised of interrelated subjective and objective indicators and measures that can be viewed from an individual, community, or population level (Diener and Suh 1997; Petrosillo et. al. 2013; Santacreu and Fernandez-Ballesteros 2023). The effects detailed below can collectively describe how peoples' quality of life could be impacted by the action alternatives.

For more detailed economic analysis, see the Cost Benefit Analysis for the proposed rule, available on the project website

This analysis is a mix of qualitative and quantitative effects, depending on the availability of information to aid in predicting potential effects. See Scope of Analysis section for more information. Recreation and timber data were available to estimate quantitative economic effects of the alternatives. National Visitor Use Monitoring data was used for the economic analysis of recreation effects. Forest Service Forest Inventory and Analysis and Timber Information Manager data were used for estimating potential timber volumes in operable roadless areas and stumpage rates. These quantitative analyses are provided only for comparative purposes across alternatives and are estimates of possible future activities. Under all alternatives local land management plans and site-specific decision-making would dictate what activities actually occur on the ground and are difficult to predict. A qualitative analysis is provided for other social and economic effects analysis, such as minerals, wildfire, and social values of roadless areas, because the effects were not possible to predict at the programmatic level.

Potentially Affected Environment

Demographics and Communities

More than 95 percent of inventoried roadless area acres managed under the 2001 Roadless Rule (outside of Colorado and Idaho) are in ten Western states, including (from largest inventoried roadless area acreage to smallest): Alaska, Montana, California, Utah, Wyoming, Nevada, Washington, Oregon, New Mexico, and Arizona. People in these areas could be affected by the action alternatives because they are living in close proximity to areas that could experience increases in road building and timber harvest. People outside of these areas and across the country could also be affected as visitors to these areas for recreation and people find value in knowing the areas exist.

The population across the United States and Puerto Rico has increased 9.7 percent since 2010 (U.S. Department of Commerce, 2021, 2025). This analysis focuses on the counties that contain potentially affected IRAs, referred to here as IRA footprint counties. To understand geographic differences, population trends are provided by Resources Planning Act Assessment regions⁶⁷. Overall, the populations in IRA footprint counties are growing at a rate (10.6 percent) greater than the national rate (9.7 percent), especially in the western states that contain the majority of roadless area (Great Plains, Intermountain, and Pacific Northwest RPA regions).

Table 45. Population trends for United States and IRA footprint counties by Resources Planning Act Assessment Region

RPA Region	States	Number of IRA Footprint Counties	Population estimate ⁶⁸ 2010	Population estimate 2024	Percent Change 2010-2024
Great Plains	ND, SD	14	197,013	226,491	15.0%
Intermountain	AZ, MT, NV, NM, UT, WY	124	13,164,896	15,758,951	19.7%
North Central	IL, IN, MI, MN, MO, WI	32	856,569	873,427	2.0%
Northeast	ME, NH, PA, VT, WV	22	726,043	713,868	-1.7%
Pacific Northwest	OR, WA	64	7,663,008	8,807,352	14.9%
Pacific Southwest	CA	38	26,260,019	27,422,697	4.4%

⁶⁷ Population related information is provided by Forest Service's Resources Planning Act Assessment regions because these regions are state-based and there is no overlap in counties. There are several instances of IRA footprint counties being in multiple Forest Service regions that using Forest Service regions would double count certain counties. The use of the Resources Planning Act Assessment regions allows for geographic differences to be highlighted while also ensuring a county is not double counted. CO and ID were excluded from the data in the table.

⁶⁸ Each year, the United States Census Bureau produces and publishes estimates of the population for the Nation, states, counties, state/county equivalents, and Puerto Rico. They estimate the resident population for each year since the most recent decennial census by using measures of population change.

RPA Region	States	Number of IRA Footprint Counties	Population estimate ⁶⁸ 2010	Population estimate 2024	Percent Change 2010-2024
South Central	AL, AR, KY, LA, MS, OK, TN, TX	33	1,703,198	2,019,911	18.6%
Southeast	FL, GA, NC, SC, VA	70	3,864,511	4,464,343	15.5%
Alaska	AK	14	430,873	431,169	0.1%
Puerto Rico	PR	7	238,009	203,732	-14.4%
United States footprint counties	All	397	55,104,139	60,921,941	10.6%
United States	All	NA	313,048,668	343,314,283	9.7%

The U.S. population is projected to increase by 8.7 percent between 2022 and 2055 (U.S. Department of Commerce 2023). These population projections are nationwide and reflect continued urban, suburban, and ex-urban development. Many counties surrounding National Forest System lands are becoming more densely populated. Growth within these counties is unlikely to be distributed evenly among local communities and can cause some areas to become more urban while others become increasingly more decentralized. Natural amenities have been found to influence employment changes, rural population change, and the development of rural recreation and retirement destinations (Knapp and Graves 1989, Clark and Hunter 1992, Treyz et al. 1993, Mueser and Graves 1995, McGranahan 1999, Lewis et al. 2002). Growing populations and the encroachment of human development place greater demand on forest goods and services and can impact the range of values people hold for these landscapes, as well as sense of place and quality of life in communities surrounding National Forest System lands (Stedman 2003).

Management of National Forest System lands contributes to social and economic sustainability in rural economies across the Nation. As a result, rural ways-of-life are related to forest management and are potentially affected by road building and timber harvest activities. Of the 397 IRA footprint counties, almost half (191) are rural⁶⁹ (USDA Economic Research Service 2024). Because of their proximity to National Forest System lands and rural status, those counties may depend on the ecosystem services and multiple uses provided by National Forest System lands to a greater degree than other counties. As populations and subsequent housing

⁶⁹Rural designation is based on the county's assignment to the three rural-urban continuum codes. The Office of Management and Budget (OMB) identifies metropolitan statistical areas as U.S. counties and county equivalents with at least one urban area of 50,000 or more, plus adjacent territory that has a high degree of social and economic integration with that core due to commuting patterns. The USDA Economic Research Service further subdivides the OMB division of counties to create three metro categories, based on the population size of the metro area of those counties, and six nonmetropolitan (nonmetro) categories, based on their degree of urbanization and adjacency to a metro area. Of the six non-metro categories, three are characterized as rural for the purposes of this analysis: 1) Counties, or equivalent, with an urban population of 5,000 to 20,000, not adjacent to a metro area; 2) Counties, or equivalent, with an urban population of fewer than 5,000, adjacent to a metro area; and 3) Counties, or equivalent, with an urban population of fewer than 5,000, not adjacent to a metro area (USDA Economic Research Service 2024).

increase near public lands, federal managers must contend with the complexity of managing natural resources in a rapidly changing social context (Mockrin et al. 2018).

Timber Industry and Forest-Dependent Communities

Since 1980, the amount of timber sold from the NFS has declined by more than 80 percent. The decline is attributable to multiple factors, including (but not limited to) changing legislative directives and related forest management policies and practices, changing market dynamics for wood products, public preferences, and litigation (Congressional Research Service, 2022). From 1980 to 2023, Forest Service timber harvest peaked at 12.7 billion board feet in 1987, then declined to a low of 1.7 billion board feet by 2002 owing largely to steep declines in harvest from national forests in the Pacific Northwest and Pacific Southwest Regions (Washington, Oregon, and California). For the last 15 years, timber harvest volume remained relatively constant, averaging about 2.5 billion board feet. In 2023, 2.9 billion board feet of timber was harvested from NFS lands, at a value of approximately \$163 million. In 2024, harvested timber value across all NFS lands was \$151 million and sold was nearly \$144 million (USDA Forest Service 2025b).

Declining timber supply from western national forests caused log shortages for many mills, contributing to changes in the structure of forest related industry nationally. Regardless of national trends, timber supply changes at smaller scales elicit a variety of responses from local industry. Typically, in response to short-term conditions, facility managers make curtailments, add or remove shifts, and schedule overtime or downtime. Longer-term decisions include building new mills, investing in capacity-boosting capital improvements in existing mills, or permanently closing facilities. Spelter (2002a) described the number of sawmills closed and opened and overall capacity changes that impacted the softwood lumber sector between 1995 and 2009. The number of softwood sawmills in the United States and Canada declined from 1,258 to 891, even as the combined sawmill processing capacity increased from 150 to 168 million cubic meters. In addition, the sawmill industry in the United States experienced a process of industrial concentration over this period. While the number of sawmills has decreased, larger sawmills have come to dominate the softwood industry (Spelter 2002a, 2009), a trend that continues to have implications for forest landowners, policymakers, and rural regions affected by sawmill closures.

Other than the drop during the recession of 2008, U.S. production and consumption of industrial roundwood, which comprises pulpwood, sawlogs and veneer logs, from 1961 to 2019 has remained largely unchanged, averaging around 250 million cubic meters (or 55.2 billion board feet applying the industry standard conversion factor for roundwood of 1 mbf = 4.53 cubic meters (Spelter 2002b)) per year (Johnston et al. 2023).

The reduction in timber harvest on national forests has resulted in increased harvests from private and state lands and increased lumber imports, mostly from Canada (MacCleery 2008). The shift towards state and private lands has impacted timber producing regions of the country differently. In the West, Northwest Forest Plan implementation drastically reduced Forest Service timber harvest in the Pacific Southwest and Pacific Northwest regions, contributing, along with market changes, mill efficiency improvements, and industry consolidation, to mill closures and

consolidation (Helvoigt and Adams, 2009) shifting timber harvest to state and private forestlands (Gale et al. 2012). In Oregon and Washington, most of the mills able to process large diameter logs had retooled to handle smaller logs or closed by the early 2000s. With the closure of sawmills and shift to shorter rotation forestry, the forest industry had to retool to cut smaller, more uniform saw logs to remain competitive in the global marketplace (U.S. Government Publishing Office, 2012). Adams and Haynes (1996) found that industrial production shifted from the West to the South in the 1990s following reduction of harvest from public lands in the West. The U.S. South contains few national forests and wood supply already originated on private and industrial lands engaging in short rotation forestry. In the Northeast, the timber industry is comprised of specialty hardwood lumber and higher end products like furniture along with commodity production of softwood lumber from both federal and private sources.

Timber harvest contributes to local economies and rural community well-being by supplying raw materials, supporting local jobs and income, and stimulating economic activity in supporting sectors. Timber harvest activities make positive contributions to rural communities, especially if wood harvested is processed locally. Economic contributions can expand more widely, as the ripple effect of job creation and money spent circulates throughout the related industries and economic sectors. In 2023, harvest and processing of forest products from NFS lands contributed approximately \$5.8 billion to the Gross Domestic Product of the U.S. economy, and supported about 51,200 jobs, both full-time and part-time (USDA Forest Service 2025a). Timber harvesting, whether for wood production or restoration objectives, provides employment and tax revenue in many counties throughout the Nation. These are especially important contributions to rural economies where there may not be other opportunities.

Direct employment in industries associated with timber and wood products include forestry, fishing and agriculture services and manufacturing, as displayed in Table 46 for North American Industrial Classification System (NAICS) for forestry and logging, support activities for forestry, wood product manufacturing, and paper manufacturing (U.S. Department of Labor 2024). Overall, timber sector employment has declined by 30.5 percent since 2001 with losses in paper manufacturing (37.3 percent), forestry and logging (33.1 percent), and wood product manufacturing (25.1 percent). On the other hand, employment in support services for forestry has grown by 25.5 percent. This category typically includes jobs associated with forest stand improvement and stewardship activities, such as pre-commercial tree thinning to reduce wildfire risk and ecological restoration to improve watersheds and fish and wildlife habitat. The expanding use of Forest Service authorities to engage in “goods for services” stewardship contracting and Good Neighbor Authority agreements to achieve ecological restoration goals is reflected in the support services employment trends. By providing opportunities for living wage jobs through local contracting and workforce development, Forest Service management activities contribute to economic opportunities in rural communities.

Table 46. United States timber industry employment from 2001 to 2022 (U.S. Department of Labor, 2024) by North American Industrial Classification System (NAICS) code

Timber Industry Sector	NAICS code	2001	2005	2010	2015	2020	2022
Forestry and logging	113	75,045	69,839	55,208	54,454	51,592	50,225

Timber Industry Sector	NAICS code	2001	2005	2010	2015	2020	2022
Support activities for forestry	1153	16,124	15,318	14,002	15,102	17,873	20,238
Wood product manufacturing	321	570,406	558,313	339,619	380,564	394,349	427,443
Paper manufacturing	322	578,412	483,789	393,931	372,145	352,149	362,711
Total		1,239,987	1,127,259	802,760	822,265	815,963	860,617

Forest dependence has been widely recognized as a valuable concept for understanding the well-being of human communities and their vulnerability to shocks in the forest sector and policy changes. Forest-dependence relates to communities’ abilities to cope with change, using concepts such as resiliency, stability, and adaptability. Frey et al. (2022) examined forest dependence by creating environmental, economic, and social criteria based on threshold levels for forest area, earnings, employment, and indigenous population. An environmentally forest-dependent community is one that relies on regulating and supporting ecosystem services to support basic community functions. These communities were defined by Frey et al. (2022) based on the percentage of forest land in a county (a baseline threshold of 75 percent forest land to be a forest-dependent community), using data from the USDA Forest Service’s, Forest Inventory and Analysis program data.

Economically forest-dependent communities rely on provisioning ecosystem services, such as timber and clean water, to support livelihoods and subsistence, and Frey et al. (2022) used the sum of employment and earnings from North American Industry Classification (NAICS) industry classes for forestry and logging, hunting and trapping, support activities for forestry, wood products manufacturing, and paper manufacturing, divided by total employment and earnings to determine the proportion of economic activity related to forestry-based sectors⁷⁰. A baseline threshold of 10 percent of workers employed in the forest sector or more than 15 percent of earnings from the forest sector determined whether a community met the economically forest-dependent criterion. Forests can provide a deep connection between community and nature, a sense of place, and people derive meaning from forest-based recreation, rites, rituals, and other cultural practices (Frey et al. 2022).

Measuring social forest-dependency is challenging, and Frey et al. (2022) used indigenous populations as a proxy for social or cultural dependence on forests. The percent of indigenous peoples among the total population was calculated from American Community Survey data, and this proportion was combined with forest land use to develop the criterion. A threshold of 5 percent indigenous and 30 percent forest land use was required to meet the third criterion (Frey

⁷⁰ No data source was found or provided for economic activity related to recreation that could be limited to forest-based recreation only and thus was not included (Frey et al. 2022).

et al. 2022). Meeting any one of the three criteria was sufficient for a community, characterized at the county-level, to be categorized as forest-dependent.

Forest-dependent communities are most likely to feel impacts from changing Forest Service policies. Using the criteria developed by Frey et al. (2022) and updated data, 158 of the 397 IRA footprint counties are considered forest-dependent (39.8 percent), with 21 of those counties (5.3 percent) meeting the thresholds for economic dependence. Over 23 percent of forest dependent counties (of any criterion) are rural, while nearly 80 percent of economically dependent counties are characterized as rural as defined by the USDA Economic Research Service’s rural-urban continuum code (USDA Economic Research Service 2024). As shown in , there is geographic variation in which RPA assessment regions meet the various thresholds and forest-dependency criteria. Over 90 percent of the IRA footprint counties in the Northeast RPA assessment region meet the threshold for environmentally forest-dependent, whereas zero percent of the IRA footprint counties in the Great Plains meet any of the thresholds. The Pacific Southwest and the state of Alaska have the highest proportion of socially forest-dependent counties (36.8 percent and 42.9 percent, respectively) while the Northeast and Pacific Northwest RPA assessment regions have the highest proportion of economically forest-dependent IRA footprint counties (18.2 percent and 12.0 percent, respectively). Given the reliance of the Frey et al. (2022) framework on forest land proportion (an environmental criterion) and forest sector employment and earnings (an economic criterion), dependence is likely to highlight certain regions more than others. Thus, connections between public lands and adjacent communities might be harder to detect for IRA footprint counties located in regions with higher proportions of grasslands or rangeland activities. However, IRA footprint counties in general are more likely to feel impacts from changing policies and management practices on National Forest System lands.

Table 47. Proportion of Forest Service inventoried roadless area (IRA) footprint counties considered forest-dependent based on criteria developed by Frey et al. (2022) for environmental, economic, and social thresholds

IRA footprint counties by Resources Planning Act Assessment Regions	Number of IRA Footprint Counties	Percentage Environmentally Forest-Dependent	Percentage Economically Forest-Dependent	Percentage Socially Forest-Dependent	Percentage IRA Footprint counties that are Forest-Dependent
Great Plains	14	0.0%	0.0%	0.0%	0.0%
Intermountain	124	5.6%	1.6%	17.7%	22.6%
North Central	32	37.5%	9.4%	31.3%	46.9%
Northeast	22	90.9%	18.2%	0.0%	90.9%
Pacific Northwest	50	28.0%	12.0%	36.0%	54.0%
Pacific Southwest	38	18.4%	2.6%	36.8%	39.5%
South Central	33	42.4%	3.0%	6.1%	45.5%
Southeast	63	47.6%	4.8%	4.8%	50.8%
Alaska	14	0.0%	7.1%	42.9%	42.9%
Puerto Rico	7	0.0%	0.0%	0.0%	0.0%
Total IRA Footprint Counties	397	26.2%	5.3%	18.9%	39.8%

Minerals and Energy

In 2023, energy and mineral production from NFS lands contributed more than \$7.6 billion to the Nation's economic growth in terms of Gross Domestic Product and supported approximately 37,800 jobs (USDA Forest Service 2025a). Even where its share of total U.S. supplies is small, National Forest System production can be very important to local economies.

Locatable minerals, such as gold, silver, copper, and iron, may be located and removed from Federal lands open to location and entry under the authority of the Mining Law of 1872, as amended ("the mining laws"). The Forest Service estimates that revenue generated in 2024 from 11 large mines on NFS lands totaled about \$1.4 billion (USDA Forest Service 2025c). Valuable deposits of locatable mineral resources may occur in inventoried roadless areas and exploration and development for these mineral resources is ongoing within IRAs (see Mineral Exploration and Development).

Leasable minerals are certain types of minerals, primarily energy resources (for example, oil, gas, coal, and geothermal resources) not subject to mining claim location but are available for exploration and development under provisions of the Mineral Leasing Act of 1920. Currently, 3.4 million acres of NFS lands are leased for oil, natural gas, coal, phosphates, other leasable mineral commodities, and geothermal resources. In 2024, energy and mineral development from Federal leases on NFS lands produced commodities valued at over \$4.8 billion, which generated \$533 million in revenue through royalties and other payments to the U.S. Treasury (\$106 million from coal, \$402 million from oil and gas, and \$25 million from other leasable mineral commodities) (USDA Forest Service 2025c). Leases for oil and gas and coal that pre-date the 2001 Roadless Rule continue within the potentially affected IRAs (they are considered 'valid existing rights' under the rule). Federal review and approval of any new exploration, leasing, or development is evaluated relative to the prohibitions of the rule as well as local land management plan requirements (see Mineral Exploration and Development section)

Recreation

Slightly more than half of the U.S. population engages in some form of outdoor recreation, including exercise and outdoor sports (White et al. 2023, Outdoor Foundation 2021). About 13 to 16 percent of individuals over age 6 in the United States engage in each of the most popular nature-based recreation activities: day hiking, camping, and fishing (White et al. 2023). Other activities, such as mountain biking, rafting and kayaking, skiing and snowboarding, hunting, and wildlife viewing, attract between 1 and 10 percent of the U.S. population aged 6 and older (White et al. 2023, Outdoor Foundation 2021).

Recreation is the primary way most people engage with forests and other natural resources. Exercise and spending time with friends and family are the most common motivations for recreation (Outdoor Foundation 2018). Other leading motivations for recreating include spending time in nature and viewing scenery. The most popular outdoor recreation activities in the U.S., such as using developed recreation sites, outdoor swimming, and day hiking (White et al. 2023), provide opportunities for exercise, socializing, and engaging with nature in forested settings. See also the Recreation and Scenery section.

Recreation is a key engine of the U.S. economy. U.S. outdoor recreationists supported about \$639 billion of U.S. gross domestic product (GDP)—about 2.3 percent of total U.S. GDP—with their expenditures on trips for outdoor recreation and purchases of gear and equipment to engage in recreation (U.S. Bureau of Economic Analysis 2024). The share of U.S. GDP associated with outdoor recreation is larger than the share of GDP associated with the mining (1.5 percent) or utility (1.6 percent) sectors, among others (U.S. Bureau of Economic Analysis 2025).

Future Recreation Demand

The share of the population engaging in outdoor recreation has remained steady to slightly increasing over the last nearly two decades (White et al. 2016, White et al. 2023, Outdoor Foundation 2023). Population increases in the United States over that time have led to sustained growth in the number of people participating in outdoor recreation and the aggregate number of days of outdoor recreation occurring each year. Recreation infrastructure—including trails, roads, picnic areas, nature viewing sites, and campgrounds—on public lands managed by all levels of government provides the primary means for meeting that recreation demand (White et al. 2023).

Demand for recreation activities common on national forests is projected to continue increasing, sometimes dramatically, by 2040 and 2070 (White et al. 2023) (Table 48). Local, state, federal and private lands will provide the settings to meet future recreation demand and recreation opportunities on NFS lands will certainly play a key role. By 2040, the number of days of recreation for most of the activities common on trails and in dispersed settings (such as day hiking, mountain biking, off-road driving) are projected to increase. For example, by 2040, those participating in off-road driving are projected to engage in at least 360 million days of recreation in that activity while day hikers are projected to engage in at least 500 million days of hiking in 2040. Demand for recreation at developed facilities, such as visiting natural and historic places, engaging in outdoor family gatherings, and picnicking, is also projected to increase across a wide range of potential futures with at least 1.2 million days of recreation engagement by 2040. Demand for camping in developed campgrounds is also projected to increase in the coming decades (at least 206 million days of developed-site camping by 2040). Demand for fishing and viewing nature (including viewing wildlife) are both projected to increase in the coming decades under a wide range of potential futures. Demand for hunting is projected to increase modestly (relative to fishing and viewing nature and other activities) in futures with moderate or high population and income growth but decline slightly in a future of low population and income growth.

Table 48. Numbers of days (millions) of recreation engagement for the conterminous U.S. estimated for 2020 and projected for 2040 on all land ownerships (adapted from Askew et al. in press and White et al. 2023)

Recreation Activity	Year 2020 estimate	Projected future (year 2040)
Developed site use	1,214	1,247 – 1,635
Developed camping	210	206 – 262
Day hiking	509	500 – 638
Primitive area use (visiting wilderness, primitive camping, backpacking)	11	11 - 14

Recreation Activity	Year 2020 estimate	Projected future (year 2040)
Mountain biking	135	136 - 182
Equestrian (horseback riding on trails)	50	50-67
Off-road driving	366	360-450
Motorized snow	27	20-26
Motorized water	402	429-592
Non-motorized water	63	58-115
Undeveloped skiing	34	29-39
Fishing	534	537-639
Hunting	243	235-275
Nature viewing	320	319-410

Economic Activity from Recreation in Roadless Areas

Visitors to national forests support the economies of communities located nearby when they spend money during their recreation trips. Visitors frequently incur a wide range of expenses while recreating, but the most common trip-related expenses are for food and beverages in restaurants and grocery stores, fuel, and lodging. Visitors to national forests and grasslands also often spend money on outfitter and guide services, souvenirs, and sporting goods. Many communities around national forests depend on visitor spending to sustain and grow their economies. Some communities located around Federal recreation lands have a high dependence on economic inputs from recreation visitor spending and may experience negative economic conditions if visitation declines or visitor spending patterns change (White et al. 2016). The 193 million acres administered by the Forest Service received approximately 164 million recreation visits in FY2024. Recreation visitors spent more than \$13.4 billion in economies surrounding NFS lands in FY2023. Visitor spending in FY2023 contributed approximately \$16.2 billion to U.S. GDP and supported about 167,000 jobs, both full-time and part-time (USDA Forest Service 2025a). In FY 2023 there were a total of 16.9 million recreation visits where the primary recreation activity was wildlife-related (fishing, hunting, and viewing wildlife). These visitors spent more than \$1.2 billion in economies surrounding NFS lands. Wildlife-related visitor spending contributed approximately \$1.4 billion to U.S. GDP and supported about 14,600 jobs, both full-time and part-time (USDA Forest Service 2024c).

The number of recreation visits to IRAs is unknown and, thus, the recreation visitor spending in local communities associated with IRA recreation cannot be directly quantified. However, using information from the Forest Service National Visitor Use Monitoring (NVUM) Program (USDA Forest Service 2026a), it is possible to quantify the amount of visitor spending associated with recreation to engage in the types of activities likely occurring within IRAs for the set of national forests and grasslands potentially affected by the roadless rule rescission. In addition, by assuming a percentage of those expenditures are caused by IRA recreation, one can estimate the potential magnitude of expenditures associated with IRA recreation. In 2024, visitors to the national forests and grasslands potentially affected by the roadless rule rescission spent \$8.5 billion in local communities during their recreation visits (Table 49). Of that amount, about \$2.2 billion in spending came from visitors engaging in trail-based and dispersed recreation (such as

hiking, backpacking, OHV recreation, snowmobiling, cross-country skiing and snowshoeing, motorized and non-motorized boating) in non-Wilderness, dispersed areas of those forests and grasslands (Table 48). Further, about \$753 million of the \$8.5 billion in spending came from visitors engaging in fishing, hunting, and viewing wildlife in the non-Wilderness dispersed areas of those forests. The potentially affected IRAs represent about 31% of the non-wilderness NFS ownership within the national forests potentially affected by the roadless rule rescission.⁷¹ Applying that percentage (31%), the potential magnitude of expenditures associated with trail-based and boating recreation in affected environment of IRAs is \$660 million and \$226 million in spending is associated with fishing, hunting, and viewing wildlife (for a total of \$886 million of visitor spending associated with IRAs potentially affected by a roadless rescission). Hjerpe and Aldrich (2018), using figures also derived from the NVUM data, estimated that visitors spent \$53.10 (2016 dollars) in communities near IRAs during their IRA visits. Those authors estimated there were 11.4 million visits to IRAs in 2017 (by assuming that IRA visitation rates mirror Wilderness visitation rates). Combining the Hjerpe and Aldrich (2018) figures yield an estimate of visitor spending from IRA recreation of about \$605 million in 2017. That figure compares well with the \$886 million in IRA visitor spending in 2024 estimated here.

Table 49. Expenditures within 50 miles of recreation destination by visitors to the non-Wilderness dispersed areas (including IRAs) of national forests potentially affected by the roadless rule rescission

FS Region	All visitors (millions of dollars)	Dispersed area visitors engaging in trail and boating activities (millions of dollars)	Dispersed area visitors engaging in hunting, fishing, and wildlife viewing *(millions of dollars)
Northern (1)	501	150	91
Rocky Mountain (2)	143	52	18
Southwestern (3)	1,113	364	75
Intermountain (4)	1,094	275	95
Pacific Southwest (5)	2,333	301	56
Pacific Northwest (5)	1,126	311	77
Southern (8)	978	364	154
Eastern (9)	1,177	355	171
Alaska (10)	83	29	16
Total	8,549	2,201	753

Economic Benefits from Recreation in Roadless Area Forests

Those engaging in outdoor recreation on public lands receive an economic benefit because their gains in economic well-being from having access to recreation opportunities outweigh their costs

⁷¹ There are 128.9 million non-wilderness acres of NFS ownership in the potentially affected forests and of that there are 40.1 million IRA acres potentially affected by a lternative 2.

of engaging in the recreation trips to use those opportunities (Mendelsohn and Markstrom 1988, Swanson and Loomis 1996). These benefits are measured as the consumer surplus of visitors or the difference between a visitor’s willingness to pay to use a recreation opportunity and what they had to pay to engage in their recreation trip. The sum of consumer surplus values across all visits to NFS lands reflect the benefits to society from government investments in providing NFS recreation opportunities. For the NFS units that have potentially affected IRAs, the economic benefits to visitors engaging in recreation anywhere in the unit in 2024 was about \$15 billion (using the economic benefit values in current year dollars and approach described in Rosenberger et al. (2017) and current estimates of visits by primary activity from the Forest Service NVUM Program).

The recreation opportunities presently available within IRAs primarily support trail-based and dispersed recreation activities, such as hiking, backpacking, OHV use, snowmobiling, cross-country skiing, snowshoeing, and boating and wildlife-related recreation. Based on agency recreation visit estimates from NVUM data, there are about 39 million visits for trail-based and dispersed recreation activities and 10 million visits for fishing, hunting, and viewing wildlife in the non-Wilderness portions of national forests that contain potentially affected IRAs. Those visits translate to about \$4.9 billion in economic benefit to those engaging in trail-based and dispersed recreation and \$1.3 billion in economic benefit to those who are engaging in wildlife-related recreation (Table 50). The potentially affected IRAs represent about 31 percent of this area (see footnote 71 on page 213). Applying that percentage to the above values, the potential aggregated economic benefits to visitors engaging in trail-based and dispersed recreation activities within the potentially affected IRAs is upwards of \$1.5 billion and the economic benefits to those engaging in fishing, hunting, and wildlife viewing is upwards of \$419 million. These values are greater than estimated by Hjerpe and Aldrich (2018) for inventoried roadless areas (nearly \$500 million) because we are using the activity-specific economic benefit values and the benefit calculation approach reported in Rosenberger et al. (2017) and the estimated number of visits to potentially affected IRAs used here is greater than that used in Hjerpe and Aldrich (2018).

Table 50. Economic benefit (\$ millions) to visitors to NFS lands affected by potential roadless rule rescission, 2024

FS Region	All visitors (millions of dollars)	Dispersed area visitors engaging in trail activities and boating (millions of dollars)	Dispersed area visitors engaging in fishing, hunting, and wildlife viewing (millions of dollars)
Northern (1)	1,229	466	159
Rocky Mountain (2)	263	91	34
Southwestern (3)	2,153	652	142
Intermountain (4)	2,324	815	183
Pacific Southwest (5)	2,236	576	68

FS Region	All visitors (millions of dollars)	Dispersed area visitors engaging in trail activities and boating (millions of dollars)	Dispersed area visitors engaging in fishing, hunting, and wildlife viewing (millions of dollars)
Pacific Northwest (5)	1,801	559	111
Southern (8)	1,943	716	305
Eastern (9)	976	348	143
Alaska (10)	397	126	43
Total	15,021	4,947	1,353

Fuels Management and Wildfire

Over the past century, fire suppression, logging, and grazing have disrupted natural fire cycles across the National Forest System. Many forests that once experienced frequent low-severity fires are now outside their historic fire regimes and are experiencing uncharacteristic high-severity fires. Severe wildfires, even when limited in extent, have often occurred near population centers, critical infrastructure, and other high-value resources, amplifying their impacts well beyond the burned footprint. Within potentially affected IRAs, 9.8 million acres (24.4 percent) overlap with the Healthy Forests Restoration Act (HFRA) definition of the Wildland-Urban Interface (WUI). See the Fire and Fuels Management section for more details on fire occurrence in IRAs and proximity to communities in the WUI. This overlap increases the likelihood wildfire events in IRAs will directly affect public safety, property, and the continuity of vital services such as transportation, energy, and water supply. Compounding these risks are other stressors, including widespread insect and disease outbreaks that have intensified in recent decades. These disturbances reduce forest health, contribute to hazardous fuel accumulation, and heighten the probability of severe wildfire. The combination of ecological stress, accumulated fuels, and expanding development in the WUI creates conditions where even relatively small fire events can result in disproportionate social, economic, and ecological consequences.

Forest restoration and fuels management have multiple benefits to society. Benefits range from enhanced ecosystem services (such as clean air and water) to avoided wildfire costs. Based on a study in the Western U.S., over seven dollars of benefit may be returned to investors for every dollar invested in forest restoration in high risk, high-value watersheds. Significant variation in the value of restoration and fuel treatment benefit types was found in the study, indicating that restoration benefits differ in value based on societal importance (Hjerpe et al. 2024).

The national budget for fuels management on NFS lands exceeds \$400 million annually as part of broader wildfire resilience and forest health initiatives. Costs for individual fuel management projects currently range from approximately \$100 to \$500 per acre, depending on terrain, treatment type, extent of ecological departure, and ecological value. High-value or complex ecosystems often require investments greater than \$2,000 per acre. The Forest Service is now treating over 3 million acres of NFS lands annually, reflecting a strategic expansion in response to increasing wildfire risks and extended wildfire seasons. Prescribed fire remains a primary

treatment method, though mechanical thinning and mastication are increasingly used in wildland-urban interface zones and ecologically sensitive areas. When conditions support the use of natural ignitions to play their ecological role, fire managers attempt to use this low-cost nature-based tool to reduce fire risk. The Southern Region continues to account for a significant share of treated acreage, though western states have seen notable increases due to intensified fire seasons. Mechanical pretreatment costs average between \$300 and \$2,000 per acre, reflecting higher labor, equipment, and compliance costs compared to earlier estimates.

Non-Commodity Values for Roadless Areas

In addition to the economic benefits described above, there are non-commodity and social values and benefits associated with roadless areas on NFS lands. Forest values are relatively enduring beliefs people hold about forests and the good, importance, or worth of specific aspects of them (Tarrant and Hull 2005, also see Cerveny et al. 2018 for a review). Once these values are established, they shape the relationships between people and forests, influencing both attitudes (tendencies to react favorably or unfavorably to situations, conditions, people, objects, or ideas) and actions (Bengston et al. 2020, Cerveny et al. 2018). Values and attitudes are thus at the core of conflicts over forest management (Brown and Reed 2000, Cerveny et al. 2018).

Understanding the values held by different groups of people is essential for successful policy development, informed decision-making, and the effective implementation of management actions (Bengston and Xu 1995, Bengston et al. 2020).

People value the ecological, recreation, passive use, and aesthetic benefits that undeveloped NFS lands provide, such as roadless areas (Bengston 1999). Some of these values include:

- Maintenance of ecosystem health,
- Conservation of plant and animal species,
- Conservation of air and water quality,
- Scenic quality,
- The desire to experience solitude and personal renewal in wild areas,
- Feeling a sense-of-place attachment to a specific area,
- Wanting to know that natural areas exist for their own sake,
- The desire to leave a legacy of natural areas for future generations to experience and benefit from,
- Protection of fisheries,
- Protection of wildlife for viewing and hunting opportunities,
- Provision of recreation opportunities associated with primitive and semi-primitive classifications,
- Preventing the spread of nonnative invasive species that degrade ecosystems,
- Providing current and future supplies of medicinally valuable plants,

- Well-functioning ecosystems and biodiversity,
- Enhanced quality of life.

Effects of Alternative 1 – No Action

The 2001 Roadless Rule would continue to guide management within inventoried roadless areas. Activities that are currently permitted would continue and, under the rule's prohibitions, timber harvest and road construction would continue to be limited.

Timber Industry

Timber volumes harvested from NFS lands are expected to increase by 25 percent (see Vegetation and Forest Management). This would result in increased economic contributions, jobs and income, to the timber industry overall. Even though overall agency timber harvest may increase nationally under the no-action alternative, timber harvest from inventoried roadless areas would not increase under the no action alternative (see Vegetation and Forest Management). Timber harvest from IRAs would not contribute to the agency's overall timber production and therefore there would continue to be no revenue, or benefits to the timber industry, from timber harvest in inventoried roadless areas.

Minerals and Energy

Under the no-action alternative, there would be no change to mineral and energy activities in inventoried roadless areas – locatable mineral exploration and development could continue and existing leases for oil and gas and coal could continue. Mineral and energy activity on National Forest System lands would continue to depend upon such factors as market conditions, environmental regulations, tax policies, technological advances, and mineral and energy resource potential (see Minerals section).

For leasable minerals, the road prohibition has not affected road construction and reconstruction providing access to and development of land under lease prior to the 2001 Roadless Rule, where valid existing rights exist. However, the 2001 Roadless Rule precluded expansion of existing lease areas into adjacent inventoried roadless areas, due to road building restrictions. Leases issued after 2001 within IRAs would have “no surface occupancy” stipulations (NSO) incorporated into the lease on land where the 2001 Roadless Rule applied.

Recreation

Under the no-action alternative, there is likely to be little extensive change to recreation opportunities or conditions within IRAs as vegetation management and road construction would likely continue to be limited and confined to discrete locations within IRAs. In the long-term, it is possible that the desirability of recreation trails and sites within IRAs could decline if the agency lacked the ability to complete maintenance activities because of difficult access within IRAs or if the current means of access for visitors (such as former roads or infrequently maintained trails) deteriorated to the point of being unusable. In addition, as elsewhere on NFS lands, natural disturbances could alter landscape conditions near recreation opportunities or damage recreation infrastructure, reducing the desirability or availability of recreation offerings

if managers were unable to reach damaged recreation opportunities or lacked the capacity to repair them.

Future Recreation Demand

Under this alternative, the existing recreation opportunities within IRAs would continue to be available to support increased demand for trail-based and dispersed recreation activities, such as hiking, backpacking, motorized trail use, snowmobiling, cross-country skiing and snowshoeing, boating, fishing, viewing nature, and hunting. Under this alternative, current IRAs would likely not contribute substantially to meeting demand for developed site and road-based recreation because developed sites are relatively infrequent within IRAs and little construction of new roads within IRAs (or on other Forest Service lands) is anticipated in the short or long term.

Economic Activity from Recreation in Roadless Areas

In the short term, there would likely be little change, aside from common year-to-year fluctuations, in the aggregate expenditures by visitors to roadless areas. Outfitters and guides and special use permittees would likely continue to have the same recreation opportunities available for their clients and guests.

In the long term, anticipated increased demand for days of recreation would likely translate to an increase in the number of trail-based and dispersed recreation visits within IRAs. Those additional trail and dispersed activity visits would likely result in increased visitor expenditures in the communities around IRAs. It is possible that declining quality of recreation opportunities within IRAs or natural disturbances could dampen potential increases in visitor expenditures if recreation offerings in IRAs become undesirable owing to difficulty in reaching those opportunities and lack of agency capacity to perform maintenance on lightly-used places.

Economic Benefits from Recreation in Roadless Area Forests

Under this alternative, in the short-term, the aggregate economic benefits to recreationists visiting IRAs would likely remain largely unchanged. In the long-term, it is probable that the aggregate economic benefits to recreationists visiting IRAs would increase (or at least not decline) as the demand for trail-based and dispersed area recreation (and hence the number visits to IRAs) increases in the coming decades.

Fuels Management and Wildfire

Under the 2001 Roadless Rule, hazardous fuels treatments can occur within inventoried roadless areas if they do not include road construction or tree cutting, or if exceptions are granted by the Responsible Official. Agency management records show that a lack of roads has not prevented fire prevention or protection measures, especially wildland fire use and prescribed fire. However, road restrictions limit opportunities for mechanical thinning and fire control (see Fire and Fuels Management).

Non-Commodity Values for Roadless Areas

The no-action alternative maintains the roadless characteristics of inventoried roadless areas and therefore conserves the non-commodity and social values and benefits associated with those

characteristics. However, values for roadless characteristics could be affected generally by increased development in the WUI based on increasing populations.

Effects of Alternative 2 – Proposed Action

By removing prohibitions on timber harvest and road construction in inventoried roadless areas, alternative 2 would give the most flexibility for local land managers to tailor forest management to local land conditions, as appropriate. Alternative 2 would provide the greatest opportunity for an increase in annual timber harvest and revenue for the timber industry and an economic benefit loss to recreationists, among other effects detailed below.

Timber Industry

Under alternative 2, it is reasonably foreseeable that an increasing proportion of timber volume sold would come from within the potentially affected inventoried roadless areas. Timber harvest would potentially increase within the affected IRAs due to the removal of prohibitions; however, harvest could only occur where allowed by land management plans and agency policy and areas where mechanized equipment can safely operate. Areas far from existing road networks, on steep slopes (greater than 70 percent), or that are not vegetated are less likely to present management opportunities due to decreased economic viability. However, where conditions are operable, and the current land management plans allow it, timber harvest is likely to occur (see Vegetation and Forest Management). The exact locations and actual amounts of timber harvest depend on many factors, including individual forest plan direction and demand from the wood products industry. In the long term, land management plan amendments and revisions could increase the area where timber harvest would be allowed. The additional harvest would result in increases in revenue from timber harvest estimated below.

As detailed in the Vegetation and Forest Management section, we estimated the potential volume available for timber harvest based on operable areas in IRAs, average annual harvest rates, and amounts of timber on National Forest system lands. Value of that potential volume was then estimated based on stumpage rates for timber sold on NFS lands. Value is presented in broad ranges and is best interpreted at broad scales due to the limited statistical reliability of Forest Inventory and Analysis data. Potential Timber Harvest Opportunity shows potential estimated annual timber harvest values based on observed rates associated with merchantable sawtimber potential volume opportunity per year from current national forest harvest levels with forest plan constraints included to better reflect current timber harvest opportunity. This only includes acres and volumes in likely operable or likely operable but complex categories within roadless areas that have current land management plan direction that generally allows forest management activities in these areas. See the Vegetation and Forest Management section for details on the volume estimates and the Cost Benefit Analysis, for details including the methodology. These estimates are for analysis and comparison purposes only to illustrate the differences between alternatives because it is not possible to fully predict annual harvest given local decision-making authority and local market conditions.

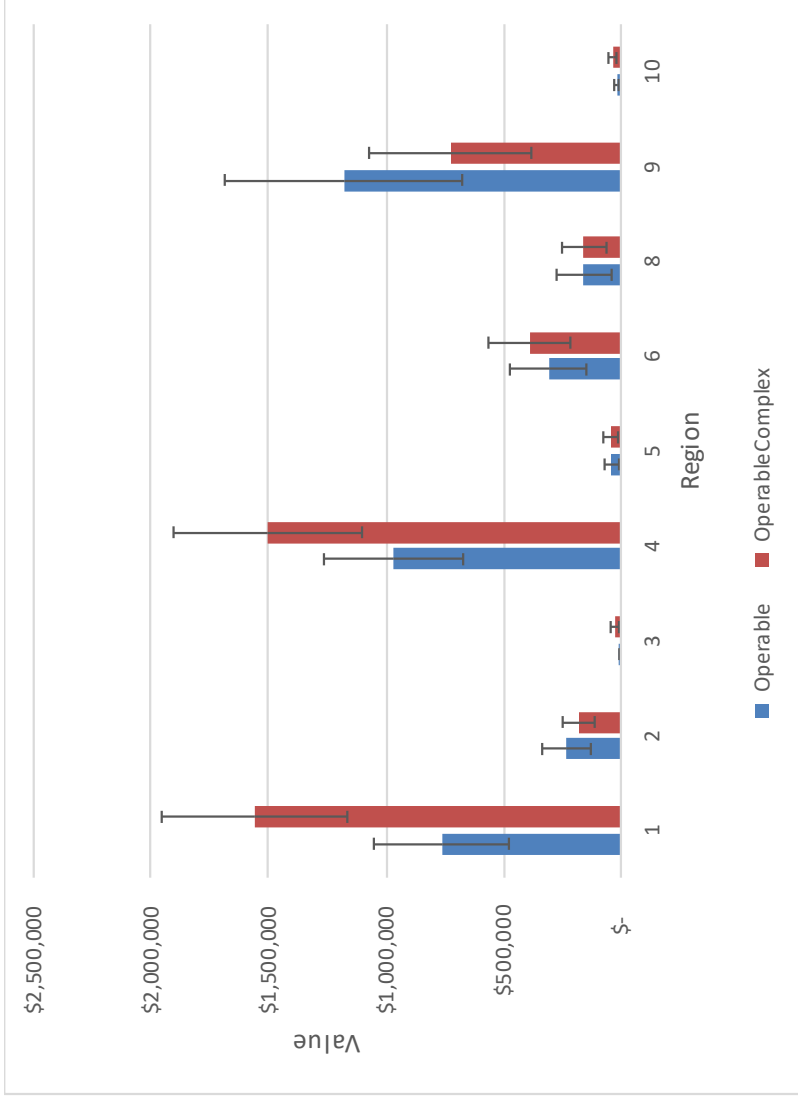


Figure 21. Alternative 2 Potential Merchantable Sawtimber Harvest Value per year in operable inventoried roadless areas applying current land management plan direction

Alternative 2 is estimated to potentially provide opportunity for an increase in annual timber harvest compared to the no-action alternative, which is estimated to result in a total increase of potentially \$5.2-11.4 million per year in revenue for the agency. Applying land management plan direction, national annual increases in sawtimber harvest in likely operable areas would be approximately \$2.2-5.2 million per year and an additional \$3.1-6.2 million per year of harvest would occur within the operable but complex areas. If all of this harvest occurred, it could represent a potential 5-10 percent annual increase in total sawtimber harvest on National Forest System lands. In the long term, land management plan amendments and revisions could increase the area where timber harvest would be allowed as well as increase potential timber harvest levels and revenue for the timber industry. See the Vegetation and Forest Management section for information on harvest estimates.

The potential annual increase in sawtimber harvest on operable IRA areas of National Forest System lands under alternative 2 could have economic impacts. This harvest could replace or substitute existing harvest in non-IRA areas, which wouldn't generate additional jobs. It is also possible that harvest in IRA operable areas is additional harvest which would generate new jobs. These economic impacts are not expected to be substantial overall given the harvest increase is potentially 5-10 percent across all forests nationwide within IRA operable areas, though impacts

to local communities could be larger. Estimating the economic impacts is not possible given the unknown degree of substitution.

Minerals and Energy

Under alternative 2, with prohibitions on road construction removed, this could influence exploration for minerals and energy resources in potentially affected IRAs. Exploration and development of any domestic mineral or energy resources is a function of fluctuating commodity prices, environmental and permitting costs associated with domestic mineral or energy resource development, accessibility to domestic mineral or energy resources, and level of public support for mineral and energy resource development on Federal lands.

Road construction and reconstruction for locatable mineral exploration and development is a right of access as provided by the General Mining Law, and therefore there are no anticipated changes in locatable mineral production and associated social and economic effects under alternative 2.

Under alternative 2, construction or reconstruction of roads that are reasonable and necessary for development of existing energy or mineral leases, for access to new or existing energy or mineral leases, and for access to associated product conveyance lines could be allowed as necessary in accordance with the terms of the lease, where they are consistent with land management plans. The removal of prohibitions within the potentially affected IRAs could generate renewed interest in mineral leasing where road building was previously not allowed. In accordance with the terms of the lease, approval of operations involving road building within areas previously designated as IRA would be more likely without the no surface occupancy lease stipulation. This does not suggest that lands no longer subject to the 2001 Roadless Rule would be leased for mineral development without road building restrictions. Site specific lease stipulations would still be developed for leasing (with additional conditions prescribed during permitting), which may restrict how the lease may be developed for mineral extractive activities. Such restrictions would be in accordance with all applicable laws and regulations and subject to the land management plan.

NFS lands designated as IRAs are currently open for leasable mineral development for entities that have existing leases or would like to apply for a lease (43CFR3200, 3400, 3500; 36CFR228 Subpart E). The current prohibition is that roads cannot be built in IRAs to access leasable minerals. Future leasing under alternative 2 may not require “no surface occupancy” because of the 2001 Roadless Rule, but is still subject to site specific lease stipulations, which may preclude road development.

In order to make site specific leasing decisions, reasonably foreseeable development scenarios for a given area or location are necessary for the analysis. However, reasonably foreseeable development is not possible to estimate for alternative 2 at the national scale because the development decision is dependent on the leasable commodity, method of extraction with consideration for geologic constraints and market conditions, operability of the land for building roads and accessing the mineral resources, land management planning, and other local considerations.

In general, oil, gas, and coal production is dependent on global markets and conditions. Under the proposed rule, there is additional flexibility for potential future leasable mineral development opportunities, and it is reasonably foreseeable that some development could occur in potentially affected IRAs, resulting in associated costs (environmental compliance, road building, loss in passive use values, etc.) and benefits (revenue to agency and industry). Exploration and development could only occur where allowed by land management plans and agency policy (such as lease stipulations and programmatic leasing availability decisions). We anticipate that there would be no net change, relative to baseline conditions, in domestic leasable minerals production under the proposed rule because domestic oil, gas, and coal production are projected to be steady or decline (U.S. EIA 2026). In addition, leasable mineral development in IRAs did not occur prior to 2001 or since then with available technological methods of extraction without the use of roads.

Recreation

This alternative, relative to the other two alternatives, would allow for more geographically extensive management actions and associated potential changes in recreation settings within potentially affected IRAs. Under this alternative it would be reasonably foreseeable that timber harvest and road construction in potentially affected IRAs would be 1) more than under alternative 1, and 2) more broadly distributed across current roadless area landscapes than in alternative 3. It is probable these projects and associated changes in recreation settings and landscape conditions would be near existing roads, within and on the periphery of potentially affected IRAs, and in areas with topography suitable for mechanized equipment. However, under this alternative, it is possible that changes could occur across the potentially affected environment, as allowed under current or future land management plans and other guidance.

Alternative 2 does not directly alter the types of recreation opportunities offered in potentially affected IRAs. However, in the long term, increases in timber harvest and road construction would have the potential to reduce the availability of the semi-primitive non-motorized, semi-primitive motorized, and primitive settings and increase the availability of roaded recreation settings.

Future Recreation Demand

In the short term, assuming there would be little change in management in the potentially affected IRAs, the supply of recreation opportunities would continue contributing to meeting recreation demand. In the long-term, changes in landscape conditions or the desirability of recreation opportunities within the potentially affected IRAs could shift some roadless area visitation to Wilderness and other places with primitive and semi-primitive opportunities. If the changes in landscape conditions or site desirability are not permanent any impacts to recreation demand could be temporary.

Any newly constructed roads open for public vehicular traffic or new campgrounds, trailheads or off highway vehicle staging areas in potentially affected IRAs that come about under this alternative may provide additional recreation opportunities that meet increased future demand for road-based and developed site recreation. However, given little expected increase in the publicly available road system under this alternative, the absence of additional funding under this

potential rule rescission, and little developed facility construction in the last decades on NFS lands, it seems unlikely that new developed campgrounds or day use sites (such as picnic areas or boat ramps) would be constructed under this alternative in potentially affected IRAs. Therefore, under this alternative, the potentially affected IRAs are expected to have a continued minor role (similar to that in alternative 1) in meeting future demand for road-based and developed site recreation demand.

Economic Activity from Recreation in Roadless Areas

In the short-term, expenditures in communities near potentially affected roadless areas would likely be similar between alternatives 2 and 1. In the long-term, losses in trail and dispersed recreation visits because of changes in the recreation opportunities or desirability of landscape conditions could yield lower aggregate expenditures from trail and dispersed area visitors in the communities around roadless areas. Those losses in visits are most probable in the likely operable and likely operable but complex portions of the affected environment—accounting for about 32 percent of the affected areas IRAs nationally. Applying that percentage (32 percent) to the affected environment annual visitor expenditures (\$2.2 billion for trail-based and dispersed recreation and \$753 million for wildlife-related recreation), the annual expenditures in communities around roadless areas by visitors to the likely operable and likely operable but complex areas is \$704 million for trail-based and dispersed recreation and \$241 million for wildlife-related recreation. In all regions, less than 1 percent of likely operable and likely operable but complex land area is anticipated to be involved in timber harvest or road construction annual under alternative 2 (see Vegetation and Forest Management). Assuming the upper limit of a 1 percent loss in visits translates to a potential nationwide annual loss of \$7 million in expenditures around national forests by those engaging in trail-based and dispersed area recreation and \$2 million loss in expenditures from those engaging in wildlife-related recreation. Losses to specific communities around potentially affected IRAs would reflect the amount of visitation displaced and the size of the local recreation economy. Any potential loss in visitor expenditures may be mitigated if visits displaced from roadless areas are shifted to Wilderness areas or other recreation locations near the affected communities. Further, any losses could be temporary if the conditions of landscapes altered in the course of management activity trend back towards prior conditions (such as temporary roads used in management revert to native vegetation and are closed to traffic).

It is reasonably foreseeable that some new roads open to public access within potentially affected IRAs may provide additional opportunities for road-based recreation (such as driving for pleasure, viewing nature, or gathering activities accessed via roads). However, given the existing road network outside IRAs is extensive, many of the potential visits that are facilitated by newly open roads in former roadless areas likely would have occurred anyway on nearby, similar recreation opportunities on NFS lands. Thus, it is likely, nationwide net increase in expenditures by visitors in local communities because of new developed and road-based recreation opportunities in roadless areas would be small. It is possible that some specific communities around potentially affected IRAs could experience gains in expenditures from visitors engaging in road-based recreation if new opportunities attracted visitors that would have otherwise recreated elsewhere.

This alternative would not change the procedures for obtaining new or altering existing permits or special use authorizations. The potential economic implications of this alternative for outfitters and guides and those operating under special use authorizations are uncertain but, conceivably, the potential magnitude of those implications are greatest under this alternative. In the short term, there is likely to be little change for outfitter and guide and those with special use authorizations in current IRAs. In the long-term, where timber harvest and road construction occur, they could create undesirable changes in landscape conditions, recreation quality, or wildlife habitat that reduces client numbers for some outfitters and guides or authorized users. There may also be increases in costs to outfitters and guides and authorized users to maintain quality client experiences in the face of different landscape conditions or settings. Conversely, any expanded opportunities for road-based recreation or improvements in wildlife habitat that result from the proposed alternative could provide new business opportunities for current or new outfitters and guides and authorized users or reduce the operating costs for outfitters and guides or authorized users.

Economic Benefits from Recreation in Roadless Area Forests

In the short-term, because vegetation actions would likely be limited in scope and spatial extent, the economic benefits to recreationists would likely change little from those under alternative 1. In the long-term, any changes in aggregate economic benefit to recreationists that occur under this alternative are most likely to be losses because timber harvest and road construction is most likely to negatively change the recreation settings and opportunities for trail-based and dispersed area recreation within potentially affected IRAs and yield little positive increase in road-based and developed site recreation within potentially affected IRAs. The magnitude of those losses is unknown, but it is likely those losses would be greater under this alternative compared to either alternative 1 or 3.

Losses in economic benefit to recreationists are most likely to be associated with the operable areas of current IRAs. Nationally, the likely operable and likely operable but complex areas under alternative 2 represent about 32 percent of the affected IRA environment. Applying that percentage to the affected IRA environment annual economic benefit values (\$1.5 billion for trail-based and dispersed recreation and \$406 million for wildlife-related recreation—see affected environment section), the annual economic benefit associated with recreation in the likely operable and likely operable but complex areas is \$477 million for trail-based and dispersed recreation and \$131 million for wildlife-related recreation. On average per region, NFS harvests less than 1 percent of operable areas annually (Forest Service Cut and Sold Reports 2014-2024, USDA Forest Service 2025c) (see Vegetation and Forest Management). Assuming an upper limit of a 1 percent annual loss of economic benefit within the likely operable and likely operable but complex areas translates into potential annual losses for trail and dispersed area recreation of \$4.8 million and \$1.3 million for wildlife-related recreation, nationally. Any losses could be temporary if the conditions of landscapes altered in the course of management activity trend back towards prior conditions (such as temporary roads used in management revert to native vegetation and are closed to traffic).

Fuels Management and Wildfire

Alternative 2 allows for the greatest flexibility to manage wildfire within inventoried roadless areas. Of particular concern is the potential effect of wildfire in the wildland–urban interface (WUI), where communities and infrastructure are most vulnerable. With increased road construction, there could be increased hazard from human-caused ignitions and increased opportunities for wildfire risk mitigation (see Fire and Fuels Management section). Although lifting restrictions on road construction could expand treatment options in the WUI, the high cost of road building and declining budgets for road construction and maintenance mean the overall increase in treatment capacity would be modest.

While wildfire risk reduction in IRAs is not quantified in this analysis, any reduction in risk provides meaningful benefits to the public, industry, and the agency. These benefits include reduced risk to homes and communities, protection of clean drinking water supplies, preservation of forest products vital to local economies, uninterrupted power and communication services, sustained access to recreational sites, and maintenance of healthy ecosystems. Such benefits can be measured in terms of avoided costs, for example, the costs of replacing destroyed homes, businesses, powerlines, communication infrastructure, timber resources, recreation facilities, and water treatment capacity following a wildfire.

Fuel treatment and wildfire risk reduction also carry costs, primarily borne by the agency. These costs include the expense of any new roads constructed for management purposes and the per-acre costs of treatment. Currently, fuel treatment costs range from approximately \$100 to \$500 per acre, with treatments in high-value or complex areas reaching \$2,000 per acre or more. Mechanical pretreatments, often necessary in dense stands or WUI zones, typically cost \$300 to \$1500 per acre.

Non-Commodity Values for Roadless Areas

People who believe that social values are compatible with multiple uses, including resource extraction and road development, may perceive no impact from alternative 2. However, the Soil, Water, and Air Resources section indicates that alternative 2 could have detrimental effects on ecosystem health including watershed health, forest health, and biodiversity from additional road construction and timber harvest. The Recreation Setting and Scenery section finds that alternative 2 could reduce scenic quality and Primitive and Semi-Primitive recreation opportunities, which often make it possible to experience solitude and personal renewal. The long term associated impacts on people who value the benefits of inventoried roadless areas could include:

- Diminished air and water quality within the airsheds or watersheds of affected inventoried roadless areas they visit or live in
- A degradation of scenic quality in affected inventoried roadless areas
- Reduced opportunities to experience solitude and personal renewal
- Alteration of special places within inventoried roadless areas that individuals or groups have a place attachment to

- A diminished legacy of undisturbed natural lands for future generations, and
- A threat to existence values.

Effects of Alternative 3 – Modified Rule

Alternative 3 would remove 2001 Roadless Rule prohibitions in areas that are within ½ mile of existing roads or within WUI to increase management flexibility, while retaining roadless rule prohibitions on timber harvest and road construction outside of those areas. Alternative 3 would provide some opportunity for an increase in annual timber harvest and revenue for the timber industry and an economic benefit loss to recreationists, though less than alternative 2, among other effects detailed below.

Timber Industry

Alternative 3 is estimated to potentially provide opportunity for an increase in annual timber harvest compared to the no-action alternative, but less so than alternative 2. It is estimated to result in a total increase of potentially \$4.2-9.7 million per year in annual revenue for the agency. Applying land management plan direction, national annual increases in sawtimber harvest in likely operable areas would be approximately \$2.1-5.2 million per year and \$2.1-4.5 million per year within likely operable but complex areas. If all of this harvest occurred, it could represent a potential 4-9 percent annual increase in total sawtimber harvest on National Forest System lands. In the long term, land management plan amendments and revisions could increase the area where timber harvest would be allowed as well as increase potential timber harvest levels and revenue for the timber industry.

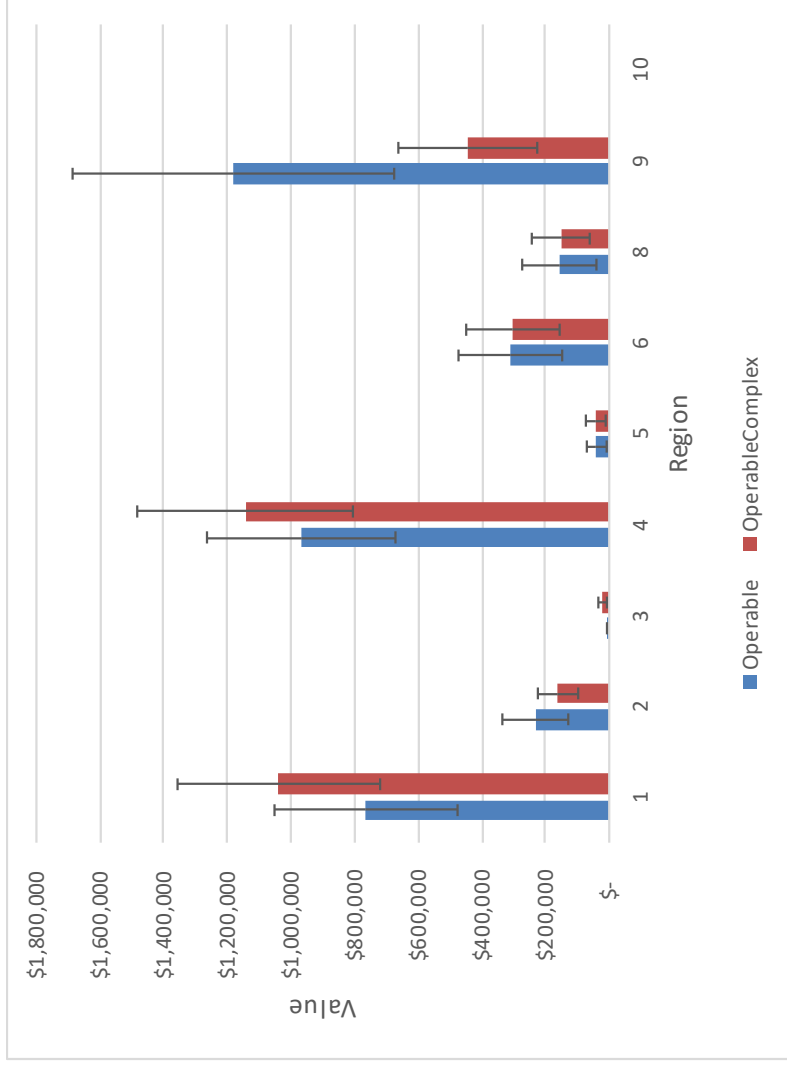


Figure 22. Alternative 3 potential merchantable sawtimber harvest value per year in operable inventoried roadless areas applying land management plan direction

The potential annual increase in sawtimber harvest on operable IRA areas of National Forest System lands under alternative 3 could have economic impacts. This harvest could replace or substitute existing harvest in non-IRA areas, which wouldn't generate additional jobs. It is also possible that harvest in IRA operable areas is additional harvest which would generate new jobs. These economic impacts are not expected to be substantial overall given the harvest increase is potentially 4-9 percent across all forests nationwide within IRA operable areas, though impacts to local communities could be larger. Estimating the economic impacts is not possible given the unknown degree of substitution.

Minerals and Energy

Under alternative 3, while maintaining some roadless rule prohibitions on road construction, this alternative could influence exploration for minerals and energy activities in inventoried roadless areas where prohibitions are removed. Mineral and energy activity on National Forest System lands continue to depend upon such factors as market conditions, environmental regulations, tax policies, technological advances, and mineral and energy resource potential.

In the areas where the 2001 Roadless Rule continues to apply, the effects would be similar to the no-action alternative. In addition, there are no anticipated changes in locatable mineral production and associated social and economic effects under alternative 3.

Under alternative 3, in areas that are no longer designated IRAs, the effects would be the same as alternative 2, such as new authorizations and expanded authorizations could include road construction and reconstruction, depending on other legal requirements, such as land management plan components, and resource protection considerations. The removal of land within the roadless rule boundary could generate renewed interest in mineral leasing where road building was previously not allowed.

Under alternative 3 there is additional flexibility for potential future leasable mineral development opportunities and some development and associated social or economic effects could occur, though less than alternative 2. However, we anticipate that there would be no net change in domestic leasable production on NFS lands under the action alternatives relative to alternative 1 because leasable mineral development in IRAs could still occur based on technological methods of extraction without the use of roads. Or as stated previously, would replace or substitute existing development outside of IRAs on federal, state, or private lands resulting in no net change in domestic production.

Recreation

Under alternative 3, potential changes in recreation settings and conditions, owing to timber harvest and road construction, would be confined to a smaller area of potentially affected IRAs. Where the 2001 Roadless Rule remains in place, landscape conditions and recreation settings would likely be similar to those under alternative 1. In the portions of IRAs potentially affected under alternative 3, timber harvest and road construction could lead to losses in trail-based and dispersed recreation opportunities or changes in recreation settings.

Future Recreation Demand

In the short term, the ability of roadless areas to meet recreation demand under this alternative would be similar to alternative 1, because it is most likely that the bulk of management activity in the short term would be what is already being planned. In the long-term, loss of recreation opportunities because of timber harvest and road construction that changes recreation setting could make it harder to accommodate future demand for trail-based and dispersed recreation. That loss in capacity to meet future demand would conceivably be less under alternative 3, compared to alternative 2, because the spatial extent of where prohibitions would be removed is smaller in alternative 3. Given no expectation of funding for construction of new recreation sites and little expected increase in permanent roads open to public vehicular traffic, it is unlikely that alternative 3 would result in significant opportunities to meet future demand for developed site and road-based recreation.

Economic Activity from Recreation in Roadless Areas

In the short term, community economic activity resulting from recreation in roadless areas associated would be consistent with that in alternative 1. In the long term there may be a loss in visits (and visitor expenditures) from current roadless areas under this alternative. However, because the spatial extent of potential changes in landscape conditions is more limited in this alternative, these losses in expenditures would likely be less than those under alternative 2. Further, losses in visitor expenditures may be mitigated better under this alternative, because there would be larger areas of potentially affected IRAs left in place to receive any displaced

visits. As in alternative 2, few new road-based and developed recreation opportunities are anticipated under alternative 3 and thus any increase in expenditures from those engaging in road-based and developed recreation is expected under alternative 3 is expected to be marginal nationally.

Economic Benefits from Recreation in Roadless Area Forests

In the short-term, the economic benefits to recreationists recreating in current roadless areas would likely be similar to those in alternative 1. In the long term, this alternative would likely yield losses in recreation visits (and aggregate economic benefits to visitors). However, the aggregate losses in recreation economic benefit would likely be less under alternative 3 than under alternative 2 because less of the present IRAs would be disturbed. Because the establishment of new developed recreation sites and permanent roads open to public vehicular traffic is anticipated to be minimal under this alternative, there would likely be little aggregate gain in economic benefit to visitors engaging in road-based and developed site recreation.

Fuels Management and Wildfire

Effects of alternative 3 would be similar to alternative 2 because more of the potential new road building and associated opportunities for mechanical hazardous fuels reduction and fire response are concentrated closer to the communities that they are intended to protect. With increased road construction, there could be increased hazard from human-caused ignitions and increased opportunities for wildfire risk mitigation (see Fire and Fuels Management section).

Non-Commodity Values for Roadless Areas

Similar to alternative 2, alternative 3 would remove 2001 Roadless Rule prohibitions, though on a smaller portion of the potentially affected IRAs. Where the 2001 Roadless Rule prohibitions are removed (in areas that are within ½ mile of existing roads or within WUI), further development of these areas could occur over time, and the effects would be similar to alternative 2. However, in contrast to alternative 2, alternative 3 would maintain and conserve roadless characteristics on a portion of inventoried roadless areas that are outside ½ mile of existing roads or within WUI, sheltering those more remote roadless areas from some forms of development and disturbance. Similar to alternative 1, this would support the social values and benefits associated with the roadless area characteristics.

Conclusion

Social and economic effects of the alternatives provide an understanding of the full realm and variety of influences on peoples' quality of life. Alternative 2 enhances the quality of life for people that value timber harvest and potential mineral and energy development and the economic contributions that these provide to the community. Both action alternatives would similarly enhance the quality of life for people living in communities near the IRAs, as there are increased opportunities for wildfire risk mitigation. Alternative 2 would have the greatest negative effects to those who primarily use recreation opportunities located within IRAs, businesses and communities that depend on the spending of recreationists using IRAs, and those that hold intrinsic value for the existence of roadless areas and the ecosystem services they provide.

Environmental Impacts Within the Tongass National Forest

In 2001, the USDA determined that the Tongass National Forest deserved “special attention in formulating alternatives due to its unique social and economic conditions,” stating:

“the agency has considered the alternatives of exempting and not exempting the Tongass National Forest, as well as deferring a decision per the proposed rule. Social and economic considerations were key factors in analyzing those alternatives, along with the unique and sensitive ecological character of the Tongass National Forest, the abundance of roadless areas where road construction and reconstruction are limited, and the high degree of ecological health. In developing the proposed action, the agency sought to balance the extraordinary ecological values of the Tongass National Forest against the needs of the local forest dependent communities in Southeast Alaska.” (66 FR 3254).

Similarly, the 2020 Alaska Roadless Rule Final Environmental Impact Statement (2020 FEIS) found that similar issues drove the Alaska-specific state rulemaking and analysis (page ES-3).

The effects associated with the potentially affected IRAs within the Tongass National Forest are fully disclosed in the 2020 FEIS for the Alaska Roadless Rule, analysis supporting the 2023 rulemaking, and associated record. This EIS uses those analyses as outlined in 7 CFR 1b.9 on efficient and effective environmental reviews (see Appendix 4 – Review of the Final Environmental Impact Statement for the 2020 Alaska Roadless Rule). The environmental impacts presented in the other sections of the DEIS are programmatic and nationwide in nature. However, the Tongass is a unique environment relative to other IRAs, includes a large proportion of IRAs (approximately 9.3 million acres, nearly 1/4 of the potentially affected inventoried roadless area acreage), and has a long history of special treatment in roadless rulemaking. The 2020 FEIS provides more specific, localized effects analysis for the Tongass National Forest affected environment, which supplement the broader nation-wide analysis.

The following section is a summary of effects from the 2020 FEIS. All page numbers referenced in the following section refer to the 2020 FEIS, unless otherwise noted). Only the conclusions related to the potentially significant impacts of the alternatives have been summarized here. All the related supporting information and findings represented in those documents are incorporated by reference.

Six alternatives were analyzed in the 2020 FEIS. Alternative 1 analyzed no action in which the 2001 Roadless Rule would remain in place for Tongass IRAs. This is the same as alternative 1/no-action alternative for this DEIS because the 2001 Roadless Rule is currently in effect for the Tongass. Alternative 6 of the 2020 FEIS analyzed a full exemption from the 2001 Roadless Rule for the Tongass. This would have the same effects as alternatives 2 and 3 for this DEIS. To avoid confusion with the differences in the alternative numbering, this section simply refers to ‘2001 Roadless Rule in place’ and ‘removing roadless rule prohibitions.’

Assumptions Common to All Alternatives

The 2020 FEIS had very similar baseline assumptions across all alternatives, and these are consistent with the assumptions for this DEIS. These include that the actual location, design, and

extent of future activities are not known and would depend on future project-level decisions (page 3-2). The 2016 Tongass Forest Plan was the basis for analysis in the 2020 FEIS.

National Forest System Roads

Impacts of the alternatives on National Forest System roads are discussed primarily in the section Transportation, Energy, Communications, and Infrastructure (pages 3-163-3-170) and under Key Issue 2; Infrastructure Development page 3-58). Estimated road miles under each alternative are summarized in Table 3.3-20 and 3.3-21 (pages 3-121 and 3-135). Note that the FEIS states that there is considerable uncertainty concerning the future development of Southeast Alaska's road system.

The amount of new road construction would be similar under all alternatives (page 3-166); though removing roadless rule prohibitions would have slightly more road miles than if the 2001 Roadless Rule remained in place. Removing the Roadless Rule prohibitions results in an estimated 49 miles more of potential new road construction within the Tongass compared to leaving the Roadless Rule in place (Table 3.3-21). The estimated average road density for all NFS lands is the same for whether the Roadless Rule is in place or not (0.23 miles/sq. mile). Removing the Roadless Rule prohibitions on all 9.3 million acres of roadless areas would allow the maximum level of road construction for timber harvest and all other uses. There would be a moderate beneficial effect for potential development of state roads and other transportation projects (pages 2-25, 3-58). However, the economics of building roads to access forest land farther from the forest transportation system would be a limiting factor for new road construction or project development.

Access and Uses (Special Uses, Minerals)

Effects to access for special uses is discussed in the section *Transportation, Energy, Communications, and Infrastructure* (pages 3-163-3-170). In general, access would not be significantly affected whether the Roadless Rule is in place or not because the amount of road construction and road reconstruction would be similar under all alternatives (see the Roads discussion above). Removing the Roadless Rule prohibitions would allow for the maximum level of road construction. Communications and infrastructure projects that do not require tree cutting or road construction/reconstruction are not prohibited in IRAs. No significant adverse consequences to energy projects and related infrastructure are anticipated by removing the Roadless Rule prohibitions. It would simplify the process for approving projects but would not necessarily result in an increase in the number of projects developed.

Effects related to minerals exploration and development are covered in two separate sections: *Mining and Mineral Development* under *Key Issue 2* (pages 3-48-3-49 and pp. 3-57 through 3-58) and *Minerals* under *Other Important Issues* (pages 3-177 to 3-180). The Tongass National Forest has three current geothermal leases where no development has occurred, and the probability of development is low, and the anticipated demand for leasable minerals elsewhere on the forest is expected to remain low. As a result, changes in designated roadless management are expected to have limited impacts on leasable mineral development. For locatable minerals, exploration, mining, and mineral processing activities, including road construction and reconstruction, are presently allowed to the extent provided by statute in IRAs and would

continue to be allowed under all alternatives. Changes in roadless management are, therefore, not expected to affect existing or future locatable mineral exploration or mining activities on the Forest (p. 3-57).

Forested and Non-Forested Ecosystems and Forest Management

Many aspects of forested and non-forested ecosystems are covered throughout the FEIS:

- Timber harvest pages 3-147 through 3-148, and 3-171 through 3-176,
- Forest products pages 3-34 through 3-43 and 3-50 through 3-55,
- Biological diversity (cover types, old growth) pages 3-61 through 3-88
- Old-growth forests pages 3-17 through 3-26,
- Climate change and carbon storage pages 3-143 through 3-150

Potential Timber Resources and Forest Products

The PTSQ for the 2016 Forest Plan would not change under any of the alternatives, so overall timber harvest levels and general composition (old-growth versus young-growth) are expected to remain unaffected by rulemaking within the Tongass. Timber program output levels are expected to remain constant and involve a similar number of acres whether the Roadless Rule is in place or not, varying only by the location of timber harvest. The main effect of removing the Roadless Rule on timber resources would be the ability to develop economic sales (see page 3-175-76).

The Alaska Roadless Rule, as analyzed in the 2020 FEIS, would expand the suitable areas, due to inclusion of an administrative change to the Tongass Forest Plan. That analysis found that with the timber suitability change to the Plan, a greater area would be available for the development of timber sales, allowing more choices for the development of economic ones. The resultant effect would be the same harvest spread out over a larger area. Removing the Roadless Rule would result in a greater increase in harvest in remote areas; however, economic conditions suggest that economic sale requirements may limit the level of entry into remote areas, at least for the next 5 or 10 years. With the Roadless Rule in place, approximately 564,000 acres (227,000 acres of old growth and 334,000 acres of young growth) were mapped as suitable for timber production. With the Roadless Rule removed and the timber suitability change, approximately 749,000 acres (395,000 acres of old growth and 354,000 acres of young growth) would be suitable for timber production (Table 3.8-1, page 3-175).

With the Roadless Rule in place, there would be no changes in the availability of suitable old growth acres for harvest. With the Roadless Rule not in place and the timber suitability change, former inventoried roadless areas would be managed in accordance with the 2016 Forest Plan, with an estimated net gain of about 168,000 acres of suitable old growth, including 59,000 acres of high-volume suitable old growth (Table 3.2-8, Figure 3.2-12). This alternative would also result in an estimated net gain of about 20,000 acres of suitable young growth, including 8,000 acres more distant from roads. Removing the Roadless Rule would not result in significant changes to the Projected Timber Sale Quantity (PTSQ), and the timber objectives of the Forest Plan would continue to involve the transition to primarily young-growth harvest. Young-growth

suitable acres would increase only slightly (3 to 6 percent) with the Roadless Rule removed (Table 3.2-8).

Timber harvest in productive old growth may reduce biological diversity by shifting the age-structure of the forest by replacing old growth trees with younger trees, changing the composition of understory vegetation, and removing key habitat features such as large decadent trees, snags, and downed logs (see page 3-73).

With the Roadless Rule in place, the current Forest Plan harvest levels would be maintained at about 42,500 acres of old growth and 284,000 acres of young growth over 100 years. Suitable high-volume POG and suitable large-tree POG would be about 96,000 acres and 31,000 acres, respectively. Overall impacts due to fragmentation and on the Old-growth Habitat Conservation Strategy are expected to be minor and consistent with the existing Forest Plan (see pages 3-74, 3-75).

With the Roadless Rule removed and the timber suitability change, implementation of the Forest Plan estimates harvest levels similar to the level projected with the Roadless Rule in place, about 42,500 acres of old growth and 284,000 acres of young growth over 100 years. Additionally, with the timber suitability change, the total suitable acres of young growth would increase by about 20,000 acres or about 6 percent relative to estimates with the Roadless Rule in place and suitable old-growth acres would increase by about 168,000 acres or about 74 percent. By removing the Roadless Rule, roads and timber harvest are likely to penetrate much farther into roadless areas, resulting in a greater degree of fragmentation (see pages 3-83, 3-84).

With the removal of the Roadless Rule there is the potential for young-growth harvest within the reserve system, beach and estuary fringe, or riparian management areas to affect the integrity of the Old-growth Habitat Conservation Strategy under the Forest Plan. Effects can include reduced functionality of these areas, reduced or fragmented buffers, and increased edge effects. For the action alternatives, the acres of suitable young growth in these special areas would not increase that much because most young growth occurs outside of roadless areas (see page 3-110). Because overall harvest levels would not change relative to keeping the Roadless Rule in place and because the broader Old-growth Habitat Conservation Strategy for the Tongass was developed prior to the roadless rule and would be maintained under the Forest Plan, the general effects of removing the Roadless Rule on wildlife and the Conservation Strategy are expected to be relatively low but greater than projected for the no-action alternative (retaining the rule) (page 3-84).

Forest Carbon

This scope and degree of timber harvest effects on forest carbon would be similar and minor whether the Roadless Rule is in place or not, affecting an estimated 3.5 percent of the 9.7 million acres of forested land, 6 percent of all productive forest land, and less than 1 percent of productive old growth forests on the Tongass over 100 years (based on the assumption that harvest occurs at the Projected Timber Sale Quantity rate over the next 100 years). The average harvest rate over the next 100 years would be about 425 acres per year for old growth and 2,842 acres per year for young growth (with more old growth and less young growth in the early years and the opposite in later years). Because all of the alternatives would result in the same harvest

volumes, effects are expected to be similar with or without the rule. Given the fact that the average harvest rate expected over the next 100 years is low by historical standards it is logical to assume that the rate of carbon loss due to disturbances would also be lower, because timber harvesting has been the dominant disturbance type.

Fire and Fuels Management

Not discussed in the 2020 Alaska Roadless Rule FEIS.

Invasive Species

Invasive species are discussed on pages 3-157 through 3-158 and 3-160 through 3-162. The potential for the introduction and spread of invasive plant species due to ground disturbance associated with timber harvest, road construction, and other development or management activity exists whether the Roadless Rule is in place or not. Timber harvest and road construction could potentially lead to the introduction and spread of invasive species where these species do not currently exist.

Soil, Water, and Air

Physical values (soil, water, and air) as a roadless characteristic are discussed on page 3-15. Potential effects to water are discussed within the fish analysis on pages 3-129 through 3-136.

Removing the Roadless Rule would have a slightly larger potential for adverse effects to physical resources than keeping the Roadless Rule in place because it is anticipated that there would be slightly more road development. However, the differences would be minor because project-level analysis would use best management practices and land management plan standards and guidelines to lessen or mitigate effects. Most of the potential effects would be for a short duration, with disturbed soil areas rehabilitated after projects are completed in those areas.

Road construction, road drainage, level of road use, number of road stream crossings, watershed road density, and related actions in forested areas may all influence the amount of sediment to streams. Density of roads is also a major factor in considering watershed condition. New road construction and road density would be similar whether the Roadless Rule is in place or not. Under existing conditions (with the Roadless Rule in place), average road density is about 0.19 miles per mile square mile. With the Roadless Rule removed the average road density is anticipated to increase to about 0.23 mile per square mile (see Table 3.3-21). This would translate into about 90 percent of all subwatersheds on the Tongass National Forest with road densities in the “properly functioning” range (less than 1 mile of road per square mile).

Biodiversity

Biological Diversity is discussed on pages 3-61 through 3-88. Effects to wildlife are discussed on pages 3-89 through 3-218. Effects to Fish are discussed on pages 3-129 through 3-142. Sensitive plants pages 3-155 through 3-158, and 3-160 through 3-162.

Threatened, Endangered, and Sensitive Wildlife Species

On the Tongass National Forest all Endangered Species Act listed species are associated with the offshore marine environment adjacent to the National Forest. There are no listed threatened or endangered species that occupy the terrestrial or aquatic ecosystems systems managed by the Tongass National Forest except for a few isolated haul-out locations for the Stellar sea lions associated with the western distinct population segment (DPS). The review of listed species and habitats for the action alternatives associated with this analysis were found to have ‘no effect’ to any threatened or endangered species or designated critical habitat and therefore there is no need for consultation with either the U.S. Fish and Wildlife Service or National Marine Fisheries Service. The National Marine Fisheries Service reviewed the biological assessment for threatened and endangered species under their regulatory jurisdiction and concluded that the 2016 Tongass Forest Plan Amendment EIS was “not likely to adversely affect” threatened or endangered species occurring on the Tongass (the 2020 Alaska FEIS summarizes the analysis on wildlife species and their habitat from the 2016 Forest Plan Amendment EIS).

Threatened, Endangered, and Sensitive Fish Species

No federally listed fish species or stocks originate from Alaska streams. However, some federally listed fish stocks may occur in marine waters within the boundary of the Tongass National Forest. There currently are no fish species designated as sensitive species in the Alaska Region (the Alaska Region Sensitive Species List was updated in 2009).

Effects to Non-TES Fish Species

Roads pose the greatest risk to fish resources on the Tongass, partly because they pose the largest risk of management-caused sediment input to streams. Density of roads is also a major factor in considering watershed condition as indicated by the Forest Service Watershed Conditions Framework. The amount of new road construction estimated in the 2020 Alaska FEIS would be similar under all alternatives. Overall, the potential effects to fish from road construction, reconstruction, and maintenance under projects that could be approved in the future would be similar among all alternatives and would be evaluated on a project-specific basis.

Overall effects to fish habitat are expected to be minimal whether the Roadless Rule is in place or not, because of the strong protections to fish habitats provided by Forest Plan direction and the riparian management strategy. Localized effects on fish habitat may occur, but these are expected to be minimal overall with low long-term risk. Any potential site-specific effects will be addressed under separate site-specific NEPA analysis, as this assessment will not authorize any site-specific actions.

Sensitive and Rare Plants

An increase in road miles that could result from removing the Roadless Rule could lead to indirect effects to sensitive plants such as increased off-road vehicle use, increased access, and increased use and associated trampling of plants.

Recreation

Recreation use and Tourism are discussed on pages 3-56 and 3-192 to 3-193. Under the 2001 Roadless Rule, most projected harvest is expected to occur in ROS settings where some modification of the natural environment is expected. Less than 1 percent of the acres currently allocated to Primitive (P), Semi-Primitive Non-Motorized (SPNM), and Semi-Primitive Motorized (SPM) ROS settings would be harvested after 100 years, assuming the maximum allowable levels of harvest were to occur. With removal of roadless prohibitions, recreational visitors with an expectation of a remote experience would be most affected by timber harvest in Primitive, SPNM, and SPM settings. With removing the roadless rule and changes in timber suitability, there would be an increase of SPNM acres, as a share of the estimated total potential timber harvest to 18 percent. With removal of the Roadless Rule, nearly all new roads constructed would be closed following timber harvest, so would not be available for highway or high-clearance vehicles, but may be available for access by other methods, though any potential increase in recreation access may be limited by road closures.

Impacts specific to outfitter/guide activities are on pages 3-56 through 3-57 and 3-181; also page 3-185, 3-193 through 3-220). Outfitter/guide activities have the potential to be affected by changes in future timber harvest allowed by removing the Roadless Rule. In most of the existing outfitter/guide use areas, harvest that could already occur in these areas (with the Roadless Rule in place) has the potential to conflict with existing outfitter/guide use. By removing the Roadless Rule, and thereby expanding the acres available for harvest, there is an increased potential for impacts to outfitter/guide use by increasing the number and geographic extent of the acres affected.

Scenery

Scenery is discussed under Key Issue 1 on page 3-11 (table 3.1-1) and page 3-16. Scenery is also discussed on pages 3-221 through 3-238. Effects to viewsheds are discussed by analyzing selected viewsheds on pages 3-224 through 3-237. Road construction and timber harvest can have varying degrees of adverse effects on the scenic integrity of a landscape. Removing the Roadless Rule would likely result in more road development to reach more remote places, which would have a greater adverse effect on scenery than with less road development with the Roadless Rule in place. There is not a big difference in the amount of estimated road mileage whether the Roadless Rule is in place or not.

No changes in the Scenic Integrity Objectives (SIOs) or related scenery standards and guidelines are proposed with the removal of the Roadless Rule. Harvest of old growth would follow the SIOs of the 2016 Forest Plan.

Removing the Roadless Rule would have the highest effects on scenery in most viewsheds. Viewsheds with the highest potential for negative effects from young-growth harvest include Chatham Strait, Duncan Canal, Frederick Sound, Lynn Canal, and Stikine Strait, based on both the percent increase and the increase in acreage of young growth suitable and projected harvest relative to keeping the Roadless Rule in place. Viewsheds with the highest potential for negative effects from old-growth harvest include Duncan Canal, Eastern Passage, Frederick Sound, Stikine Strait, Tenakee Inlet to Tenakee Springs, and Zimovia Strait, based on both the percent

increase and the increase in acreage of old growth suitable and projected harvest relative to keeping the Roadless Rule in place.

Cultural Resources, Tribal Rights and Interests

Traditional cultural properties and sacred sites are discussed on page 3-16 and pages 3-254 through 3-255. There would be an increased risk to cultural resources with the removal of the Roadless Rule because of potentially greater road lengths. There would also be an increased risk from potential activity in areas currently and previously protected from development and harvest activities with the Roadless Rule.

Access to native cultural sites, for tree harvest for Alaska Native cultural purposes, and for rural subsistence activities is discussed on p. 3-58 through 3-60. Also see table 3.2-10. Subsistence resources provide the foundation for Native culture, forming the basis for different clans and potlatch ceremonies, as well as reinforcing basic values of respect for the earth and its resources. The Tongass, with nearly 17 million acres of largely undeveloped land, includes extensive subsistence resources.

Timber cutting, sale, or removal is prohibited in IRAs with the Roadless Rule in place, with some exceptions if the regional forester or designated forest officer determines that one of a limited number of circumstances exists (as specified in 66 FR 3244 § 294.13). These circumstances include the provision of trees, portions of trees, or forest products to Indian tribes free of charge for traditional and cultural purposes. The timber cutting, sale, or removal exception for the provision of trees to Indian tribes for traditional and cultural purposes would remain in place with the Roadless Rule removed.

Removing the roadless rule would not require specific exceptions for access to Alaska Native cultural sites or to harvest trees important for cultural purposes. With the Roadless Rule not in place there would be the opportunity for an increase in timber harvest in some places. Access for cultural purposes has benefits but may increase competition with the timber industry for trees to be used for traditional or cultural purposes, and competition is the greater concern from the Tribes. Competition is noted as a concern from the Tribes. The type of access allowed with the Roadless Rule in place is preferable to Tribes compared to the access created by removing the Roadless Rule.

Economic Effects

Local economic factors are discussed on pages 3-46 through 3-47. The proportion of timber harvest occurring in roadless areas would vary with the Roadless Rule in place or not, but overall regional economic impacts are assumed to remain constant. These impacts were estimated for the first decade following implementation in the 2016 Forest Plan Amendment EIS, with an estimated annual average harvest of 46 MMBF.

A similar range of direct jobs and income are assumed to be supported whether the Roadless Rule is in place or not. Based on the 2016 Forest Plan Amendment EIS assessment, all the alternatives would support an estimated 92 jobs in logging, 49 to 100 jobs in sawmilling, and 29

to 46 jobs related to transportation and other services, with direct income ranging from \$9.8 million to \$10.4 million.

Within the context of Southeast Alaska’s seasonal and cyclical resource-based employment, subsistence harvest of fish and wildlife resources takes on special importance. The use of these resources may play a major role in supplementing cash incomes during periods when the opportunity to participate in the wage economy is either marginal or nonexistent. Because of high prices of commercial products provided through the retail sector of the cash economy, especially in remote communities, the economic role of locally available fish and game takes on added importance. Subsistence use of fish and wildlife has been and continues to be an important component of the economies of Southeast Alaska communities. Removing the Roadless Rule could have impacts on the amount and distribution of subsistence resources.

Subsistence Use and Alaska National Interest Lands Conservation Act (ANILCA)

Pages 3-239 to 3-252 considered effects related to subsistence, as defined in the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) Section 803. It includes a Forest-wide evaluation that assesses the three factors related to subsistence uses identified by ANILCA: abundance and distribution, access, and competition.

ANILCA requires the evaluation of the potential effects of certain actions on subsistence resources and uses and needs on federal lands in Alaska, related to three factors: abundance and distribution, access, and competition. Section 810 of ANILCA (16 U.S.C. 3120) provides that in determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands under any provision of law authorizing such actions, the head of the Federal agency shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. Section 810 also specifies that if the “withdrawal, reservation, lease, permit, or other use, occupancy or disposition” of Federal lands “would significantly restrict subsistence uses,” the agency must take certain additional steps. Specifically, the agency must give notice to the appropriate State agency and the appropriate local committees and regional councils and give notice of, and hold, a hearing in the vicinity of the area involved, and determine that (1) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (2) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (3) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions.

An ANILCA Section 810 (16 U.S.C. § 3120) evaluation and determination is not required for approval of the proposed rule, which is a rulemaking process and a programmatic level decision and not a determination whether to “withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition” of National Forest land. Therefore, this EIS, as part of that rulemaking process, does not require an ANILCA Section 810 evaluation and determination. However, the 2020 Alaska Roadless Rule FEIS (pages 3-239 to 3-252) and 2020 Alaska

Roadless Rule (85 FR 68692) voluntarily considered a forest-wide evaluation in accordance with ANILCA Section 810. ANILCA subsistence hearings were conducted for the DEIS and proposed rule, consistent with Section 810 in 2019.

Alternatives 2 and 3 in this DEIS propose the same action, relative to the inventoried roadless areas on the Tongass National Forest, as the 2020 Alaska Roadless Rule. The previous analyses were reviewed and are still relevant (see Appendix 4 – Review of the Final Environmental Impact Statement for the 2020 Alaska Roadless Rule).

Other Environmental Review and Consultation Requirements

Compliance with applicable laws or regulations and executive orders are documented in the sections as noted in and , below. Requirements for USDA rulemaking procedures under regulatory laws and executive orders would be addressed in the Proposed and Final Rule.

Table 51: Applicable legal and statutory requirements

Legal requirement	Section
National Forest Management Act	Relationship of the 2001 Roadless Rule to Land Management Planning
Clean Water Act	Water Resources
Clean Air Act	Air
Endangered Species Act	Biodiversity
National Historic Preservation Act	Cultural and Historic Resources
Congressionally designated areas	Wilderness and Other Designated Areas

Table 52: Applicable executive orders

Executive Order	Section
EO 13175 Consultation and Coordination with Indian Tribal Governments; EO 13007 Indian Sacred Sites	Consultation with Federally Recognized Tribes and Alaska Native Corporations; Tribal Rights and Interests
EO 13112, Invasive Species – prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.	Non-Native Invasive Plant Species
EO 13186, Migratory Birds – identify actions that may have a measurable negative effect on migratory bird populations.	Biodiversity
EO 13443, Facilitation of Hunting Heritage and Wildlife Conservation – expand and enhance hunting opportunities.	Recreation Setting and Scenery
EO 14154, Unleashing American Energy; EO 14225, Immediate Expansion of American Timber Production; EO 14241, Immediate Measures to Increase American Mineral Production	Mineral Exploration and Development; Vegetation and Forest Management

No Federal permits, licenses, or other authorizations must be obtained to implement the proposed action.

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Appendix 1 – IRA Acreage Summarized by Region

This appendix provides more detail about the potentially affected inventoried roadless areas. For each Forest Service Region, the tables show the 2001 Roadless Rule acres (based on the official national maps maintained by Forest Service headquarters and posted on the Forest Service Roadless Area website (<https://www.fs.usda.gov/managing-land/planning/roadless>)). The tables also show the potentially affected acres – this is smaller than the total IRA because it removes the non-NFS lands as well as Congressionally designated areas, as described in Potentially Affected Environment section.

As stated in the Scope of the Analysis section, the analysis in the EIS focuses on the difference where reasonably foreseeable activities, particularly road construction and timber harvest, **are more or less likely to occur** within inventoried roadless areas under the alternatives, and the resulting differences in ecological and social effects. Estimates of areas where activities are more likely, were prepared for effects analysis purposes (see National Forest System Roads, Vegetation and Forest Management and other sections) – they do not reflect proposed or planned activity areas. The tables display two key factors evaluated: areas where plans currently allow these activities and areas with potential timber harvest operability.

Current Land Management Plan Direction

Land management plans were analyzed to better understand where geographically the applicable plan direction applies and what timber management and road construction uses may or may not be allowed according to those plans. Land management plans include plan direction that may apply to the entire national forest or grassland in the form of a Forest-wide plan component. They may also include plan direction that only apply to a specific management area, geographic area, and designated area. Plan components include desired conditions, standards, guidelines, goals, and objectives, which may constrain certain uses or activities to meet the management intent for that area to varying degrees (see Relationship of the 2001 Roadless Rule to Land Management Planning).

Some examples of more recently revised plans under the 2012 Planning Rule are included in the table below – because the Plans are variable due to differences in local conditions and interest, the age of the plan, or the policy in which the plan is developed under, not all plans contain language similar to these examples.

Table 53: Example land management plan components specific to inventoried roadless areas subject to the 2001 Roadless Rule (plans developed under the 2012 Planning Rule)

Example plan text	Forest or grassland
Inventoried Roadless Areas (IRA) Desired Conditions (FW-DC-IRA) 01 Inventoried roadless areas provide semi-primitive non-motorized and motorized settings. A diversity of recreation opportunities are available, including both motorized and nonmotorized trail opportunities. Standards (FW-STD-IRA) 01 New road construction or road reconstruction shall not be allowed, except for the exceptions listed in the 2001 Roadless Area Conservation Rule. Suitability (FW-SUIT-IRA) 01 Inventoried roadless areas are not suitable for timber production. Vegetation management, including timber harvest, is suitable consistent with the 2001 Roadless Area Conservation Rule. 02 Inventoried roadless areas are suitable for restoration activities that can be accomplished consistent with the 2001 Roadless Area Conservation Rule.	Custer-Gallatin National Forest
Desired Conditions for Scenic Resources (FW-SCENIC-DC) 3 High-quality scenery dominates the landscape in areas the public values highly for scenery (such as scenic byways, major roads and trails, developed recreation sites, backcountry areas, and high scenic integrity areas such as wildernesses, wild and scenic rivers, and inventoried roadless areas). Desired Conditions for Inventoried Roadless Areas (DA-IRA-DC) 1 Inventoried roadless areas (IRAs) encompass large, relatively undisturbed and unfragmented landscapes that function as biological strongholds for populations of threatened and endangered species. They serve as safeguards against the spread of invasive plant species and provide reference areas for study and research. 2 In IRAs, ecosystems are intact and function to provide a full range of ecosystem services. 3 IRAs appear natural, have high scenic quality, and provide opportunities for primitive recreation and solitude. Guidelines for Inventoried Roadless Areas (DA-IRA-G) 1 IRAs should be managed for primitive, semi-primitive non-motorized, and semi-primitive motorized recreation opportunity settings (ROS). 2 Management activities should be consistent with the scenic integrity objective of high.	Santa Fe National Forest
Inventoried Roadless Areas Desired Conditions (DA-DC-IRA) 01 Inventoried roadless areas provide remote primitive and semiprimitive recreation opportunities. A diversity of recreation opportunities is available, including both motorized and nonmotorized trail opportunities. 02 Ecological restoration and enhancement activities are encouraged in inventoried roadless areas. These activities include forest health improvements, wildlife habitat enhancements, fuels reductions, trail maintenance and improvements, and range improvements.	Ashley National Forest

Example plan text	Forest or grassland
Suitability (DA-SUIT-IRA) 01 Inventoried roadless areas are not suitable for timber production. Timber harvest may be allowed for other resource benefits consistent with the 2001 Roadless Area Conservation Rule. 02 Inventoried roadless areas are not suitable for road reconstruction or new road construction unless excepted per the 2001 Roadless Area Conservation Rule.	
FW-GDL-VEG-05. Prohibition on Timber Cutting, Sale, or Removal in Inventoried Roadless Areas Timber removal activities will comply with requirements of the Roadless Area Rule in effect at the time project-level decisions are made. As of the implementation of this forest plan, the Roadless Area Rule in effect is the 2001 Roadless Area Conservation Rule. In this Rule, direction on timber removal activities can be found in Subpart B of 36 CFR 294.13 (b). FW-GDL-AS-06. Prohibition on Road Construction and Reconstruction in Inventoried Roadless Areas Road construction and reconstruction activities will comply with requirements of the Roadless Area Rule in effect at the time project-level decisions are made. As of the implementation of this forest plan, the Roadless Area Rule in effect is the 2001 Roadless Area Conservation Rule. In this Rule, direction on road construction and reconstruction activities can be found in Subpart B of 36 CFR 294.12 (b). FW-DC-REC-01. Recreation Settings and Experiences Inventoried roadless areas maintain their overall roadless character (see FEIS appendix F for maps of roadless areas). BACKCOUNTRY (BC) This section provides management direction for Backcountry Management Areas. Backcountry Management Areas emphasize summer and winter non-motorized recreation opportunities and can include foot, horse, and mechanized (e.g., mountain bikes) modes of travel. Motorized recreation is not allowed in Backcountry Management Areas. Backcountry Management Areas are spatially defined by the upper reaches of watersheds identified in the 2001 Roadless Area Conservation Rule. Inventoried Roadless Areas maps, the roadless areas identified during the plan revision wilderness evaluation process, and include wildlife habitats such as grizzly bear recovery areas, deer/elk winter range, and threatened, endangered, and sensitive plant communities. Desired Conditions MA-DC-BC-01. Vegetation - The landscape is natural-appearing. It contributes to the variety of native plant communities and the structure as defined in desired conditions for vegetation, aquatic, and wildlife habitats. The desired conditions for vegetation are achieved through a combination of ecological processes and management activities. While the landscape is predominantly natural-appearing, a few locations have a vegetation structure that is altered to contribute to the recreational setting such as openings created and retained for scenic views. The scenic integrity objective is high.	Colville National Forest

Example plan text	Forest or grassland
Management Area: Backcountry Part of this management area includes Inventoried Roadless Areas (IRAs) governed by the Roadless Area Conservation Rule that are not within Wilderness Study Areas, or areas recommended for Wilderness, and these areas have additional management guidance specified below. These IRAs were identified in the national 2001 Roadless Area Conservation Rule, which prohibits road construction and reconstruction in IRAs (apart from a few exceptions) and outlines their Roadless Area characteristics. IRAs are characterized as having an undeveloped character and are valued for many resource benefits including wildlife habitat, biological diversity, and dispersed recreation opportunities. Restoration activities in IRAs will have different management guidance, as specified below, consistent with national policy. Standards BAC-S-01 Wildlife These lands are unsuitable for timber production. BAC-S-02 Within Inventoried Roadless Areas lands are not suitable for timber production. Timber may not be cut, sold, or removed except when 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. Follow the latest Forest Service policy regarding delegation of approval for the following activities: • To improve threatened, endangered, or proposed species habitat; • To maintain or restore the characteristics of ecosystem composition and structure; • The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited; • The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use. BAC-S-03 Outside of Inventoried Roadless Areas, in order to retain Backcountry character, the cutting, sale, or removal of timber must meet the same purposes as within IRAs; however, there is not a diameter size restriction. Transportation and Access Desired Condition BAC-DC-11 Within Inventoried Roadless Areas, the undeveloped character identified in the 2001 Roadless Area Conservation Rule is retained. Standards BAC-S-08 Maintenance of existing system roads is permissible. BAC-S-09 Across the Backcountry management area (both outside and within Inventoried Roadless Areas) system roads may not be constructed or reconstructed unless one of the following conditions applies. Within Inventoried Roadless Areas, the latest Forest Service policy regarding delegation of approval of these activities must be considered.	Nantahala and Pisgah

For both timber harvest and road construction, the forestwide, management area, geographic area, and designated area plan components were reviewed. Across the potentially affected IRAs, the lands were categorized in the following four categories. Where multiple plan components apply to a given area, the most restrictive category was applied.

- Not allowed: Use is prohibited, except where needed for reserved and outstanding rights or other exemptions mandated by law, regulation, or policy. These include plan standards that are mandatory. For example, timber harvest and road construction is prohibited in these types of areas:

- ‘key watersheds’ under the Northwest Forest Plan
- designated and recommended wilderness areas, research natural areas, and backcountry non-motorized areas
- Generally not allowed: Use is generally restricted based on a desired condition or guideline and not a mandatory restriction. For example, timber harvest and road construction is generally not allowed in these types of areas:
 - denning habitat for species
 - areas that protect soil and watershed conditions
 - areas that avoid interfering with natural processes in certain ecological areas
 - areas that protect recreation experiences, facilities, and scenic resources
- Generally allowed: Use is generally not restricted, except under some specific exceptions based on the purpose of and need for the use, or use limitations, or protection of natural resource values. For example, these types of areas generally allow timber harvest and road construction:
 - grazing, hunting, big game, and wild horse and burro areas
 - winter ranges
 - early successional areas
 - adaptive management areas
- Allowed. Use is allowed for any multiple-use management need, where consistent with law, regulations, or policy. For example, these types of areas allow for timber harvest and road construction:
 - General forest and active management areas
 - Areas designated for multiple uses

This is a national review at a programmatic level to help compare alternatives by looking at plan direction specific to road construction and timber harvest. Land management plans do not compel action or authorize projects and future decisions would be subject to local interpretation of the plan and site-specific project analysis. It is important to note that the Potentially Affected Environment and the discussion of ‘areas where plans allow’ activities across the Environmental Impacts do not include the consideration of all of the individual land management plan direction that is oftentimes unique to local conditions which may not directly limit road construction or timber harvest but may still influence planning and design of future site-specific projects. For example, the relationship of how forests manage habitat conditions for spotted owl or grizzly bear are not reflected in this analysis.

Potential Timber Harvest Operability

Operability indicates the potential timber harvest opportunity (or likelihood) in the potentially affected environment. A nationwide geospatial analysis was used to estimate potential operability, or the capability of mechanized treatment or activities, in each area based on slope, distance from roads, site productivity, and statutory restrictions – see Potential Timber Harvest Opportunity.

- **Likely Operable:** Potentially forest areas that are less than 0.5 miles from a road, on slopes less than 40 percent, are productive for restocking (greater than 20 cubic feet/acre/year), and have no statutory restrictions from timber harvest.
- **Likely Operable but Complex:** Potentially forested areas that are less than 0.5 miles from a road and on slopes between 40 percent and 70 percent or between 0.5 miles and one mile from a road and on slopes less than 70 percent. These areas have the same productivity for restocking as likely operable areas, and have no statutory restrictions from timber harvest.
- **Likely Not Operable:** Potentially forested areas that are further than 1 mile from a road, within one mile that exceed 70 percent slope, are not productive for restocking, or include statutory restrictions from timber harvest.

The potential operability is for analysis purposes only, actual feasibility and need for timber harvest would be determined locally based on many factors.

IRA Acreage, Current Plans, and Operability Summarized by Region

Table 54. Alternative 2 summary by region

Region	Total National Forest System Lands (thousands of acres)	2001 Roadless Rule IRA not including Co or ID (thousands of acres)	Alternative 2 potentially affected environment (thousands of acres)	Alternative 2 potentially affected environment where current LMPs allow/generally allow road construction (thousands of acres)	Alternative 2 potentially affected environment where current LMPs allow/generally allow timber harvest (thousands of acres)	Proportion of Alternative 2 forested potentially affected environment operable	Proportion of Alternative 2 forested potentially affected environment operable, but complex	Proportion of Alternative 2 forested potentially affected environment not operable
1	25,624	6,707	5,951	3,635	1,253	19%	39%	42%
2	22,059	1,761	1,733	109	443	30%	33%	37%
3	20,539	2,724	2,529	1,085	1,216	7%	12%	80%
4	31,856	8,946	8,474	6,187	5,621	16%	20%	64%
5	20,253	4,200	3,635	1,085	1,578	19%	42%	39%
6	25,012	3,967	3,730	617	611	22%	44%	34%
8	13,457	954	839	113	158	41%	47%	13%
9	12,180	664	606	264	271	45%	32%	23%
10	22,132	14,779	12,565	5,125	2,255	6%	10%	84%
Total	193,112	44,701	40,063	18,221	13,406	17%	27%	56%

Table 55. Alternative 3 Summary by Region

Region	Total National Forest System Lands (thousands of acres)	2001 Roadless Rule IRA not including Co or ID (thousands of acres)	Roaded roadless (thousands of acres within ½ mile of road)	Alternative 3 potentially affected environment (IRA and prohibitions removed) (thousands of acres)	Alternative 3 modified boundary (IRAs and prohibitions remain) (thousands of acres)	Alternative 3 potentially affected environment where current LMPs allow/generally allow road construction (thousands of acres)	Alternative 3 potentially affected environment where current LMPs allow/generally allow timber harvest (thousands of acres)	Proportion of Alternative 3 forested potentially affected environment operable	Proportion of Alternative 3 forested potentially affected environment operable, but complex	Proportion of Alternative 3 forested potentially affected environment not operable
1	25,624	6,707	2,004	3,542	2,409	2,569	922	32%	44%	23%
2	22,059	1,761	662	1,314	419	108	357	39%	37%	24%
3	20,539	2,724	924	1,651	878	826	857	11%	13%	75%
4	31,856	8,946	3,316	5,376	3,098	3,997	3,751	25%	22%	53%
5	20,253	4,200	1,556	2,353	1,282	772	1,048	28%	41%	31%
6	25,012	3,967	1,656	2,315	1,415	496	489	36%	47%	17%
8	13,457	954	492	815	25	113	155	42%	46%	12%
9	12,180	664	303	393	213	217	221	69%	21%	10%
10	22,132	14,779	433	12,566	3,196	5,121	2,252	7%	11%	82%
Total	193,112	44,701	11,345	30,325	12,935	14,220	10,052	24%	28%	48%

Appendix 2 – Rule Language by Alternative

The following provides representational rule language for all alternatives. Final rule language could vary from what is presented in this appendix based on comments received and other considerations.

Alternative 1 – 2001 Roadless Rule (Existing Rule)

Refer to the 2001 Roadless Area Conservation Rule, available at:

<https://www.federalregister.gov/documents/2001/01/12/01-726/special-areas-roadless-area-conservation>.

Subpart B—Protection of Inventoried Roadless Areas

294.10 Purpose.

294.11 Definitions.

294.12 Prohibition on road construction and road reconstruction in inventoried roadless areas.

294.13 Prohibition on timber cutting, sale, or removal in inventoried roadless areas.

294.14 Scope and applicability.

Authority

16 U.S.C. 472, 529, 551, 1608, 1613; 23 U.S.C. 201, 205. § 294.10 Purpose

The purpose of this subpart is to provide, within the context of multiple-use management, lasting protection for inventoried roadless areas within the National Forest System.

§ 294.11 Definitions

The following terms and definitions apply to this subpart:

Inventoried roadless areas: Areas identified in a set of inventoried roadless area maps, contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, which are held at the National headquarters office of the Forest Service, or any subsequent update or revision of those maps.

Responsible official: The Forest Service line officer with the authority and responsibility to make decisions regarding protection and management of inventoried roadless areas pursuant to this subpart.

Road: A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary.

- (1) **Classified road:** A road wholly or partially within or adjacent to National Forest System lands that is determined to be needed for long-term motor vehicle access,

including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service.

(2) **Unclassified road:** A road on National Forest System lands that is not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization.

(3) **Temporary road.** A road authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be part of the forest transportation system and not necessary for long-term resource management.

Road construction: Activity that results in the addition of forest classified or temporary road miles.

Road maintenance: The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective.

Road reconstruction: Activity that results in improvement or realignment of an existing classified road defined as follows:

- (1) **Road improvement:** Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.
- (2) **Road realignment:** Activity that results in a new location of an existing road or portions of an existing road, and treatment of the old roadway.

Roadless area characteristics: Resources 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.

§ 294.12 Prohibition on road construction and road reconstruction in inventoried roadless areas

(a) A road may not be constructed or reconstructed in inventoried roadless areas of the National Forest System, except as provided in paragraph (b) of this section.

(b) Notwithstanding the prohibition in paragraph (a) of this section, a road may be constructed or reconstructed in an inventoried roadless area if the responsible official determines that one of the following circumstances exists:

- (1) A road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause the loss of life or property;
- (2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;
- (3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;
- (4) Road realignment is needed to prevent irreparable resource damage that arises from the design, location, use, or deterioration of a classified road and that cannot be mitigated by road maintenance. Road realignment may occur under this paragraph only if the road is deemed essential for public or private access, natural resource management, or public health and safety;
- (5) Road reconstruction is needed to implement a road safety improvement project on a classified road determined to be hazardous on the basis of accident experience or accident potential on that road;
- (6) The Secretary of Agriculture determines that a Federal Aid Highway project, authorized pursuant to Title 23 of the United States Code, is in the public interest or is consistent with the purposes for which the land was reserved or acquired and no other reasonable and prudent alternative exists; or
- (7) A road is needed in conjunction with the continuation, extension, or renewal of a mineral lease on lands that are under lease by the Secretary of the Interior as of January 12, 2001, or for a new lease issued immediately upon expiration of an existing lease. Such road construction or reconstruction must be conducted in a manner that minimizes effects on surface resources, prevents unnecessary or unreasonable surface disturbance, and complies with all applicable lease requirements, land and resource management plan direction, regulations, and laws. Roads constructed or reconstructed pursuant to this paragraph must be obliterated when no longer needed for the purposes of the lease or upon termination or expiration of the lease, whichever is sooner.

(c) Maintenance of classified roads is permissible in inventoried roadless areas.

§ 294.13 Prohibition on timber cutting, sale, or removal in inventoried roadless areas

(a) Timber may not be cut, sold, or removed in inventoried roadless areas of the National Forest System, except as provided in paragraph (b) of this section.

(b) Notwithstanding the prohibition in paragraph (a) of this section, timber may be cut, sold, or removed in inventoried roadless areas if the responsible official determines that one of the following circumstances exists. The cutting, sale, or removal of timber in these areas is expected to be infrequent.

(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;

(2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited by this subpart;

(3) The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use, as provided for in 36 CFR part 223; or

(4) Roadless characteristics have been substantially altered in a portion of an inventoried roadless area due to the construction of a classified road and subsequent timber harvest. Both the road construction and subsequent timber harvest must have occurred after the area was designated an inventoried roadless area and prior to January 12, 2001. Timber may be cut, sold, or removed only in the substantially altered portion of the inventoried roadless area.

§ 294.14 Scope and applicability

(a) This subpart does not revoke, suspend, or modify any permit, contract, or other legal instrument authorizing the occupancy and use of National Forest System land issued prior to January 12, 2001.

(b) This subpart does not compel the amendment or revision of any land and resource management plan.

(c) This subpart does not revoke, suspend, or modify any project or activity decision made prior to January 12, 2001.

(d) This subpart does not apply to road construction, reconstruction, or the cutting, sale, or removal of timber in inventoried roadless areas on the Tongass National Forest if a notice of

availability of a draft environmental impact statement for such activities has been published in the Federal Register prior to January 12, 2001.

(e) The prohibitions and restrictions established in this subpart are not subject to reconsideration, revision, or rescission in subsequent project decisions or land and resource management plan amendments or revisions undertaken pursuant to 36 CFR part 219.

(f) If any provision of the rules in this subpart or its application to any person or to certain circumstances is held invalid, the remainder of the regulations in this subpart and their application remain in force.

Alternative 2 – Proposed Rule

PART 294—SPECIAL AREAS

The authority citation for part 294 continues to read as follows:

Authority: 16 U.S.C. 472, 529, 551, 1608, 1613; 23 U.S.C. 201, 205.

Subpart B—[Removed and Reserved]

Remove and reserve subpart B, consisting of §§ 294.10 through 294.18.

Alternative 3

Subpart B—Protection of Inventoried Roadless Areas

294.10 Purpose.

294.11 Definitions.

294.12 Prohibition on road construction and road reconstruction in inventoried roadless areas.

294.13 Prohibition on timber cutting, sale, or removal in inventoried roadless areas.

294.14 Scope and applicability.

Authority

16 U.S.C. 472, 529, 551, 1608, 1613; 23 U.S.C. 201, 205. § 294.10 Purpose

The purpose of this subpart is to provide, within the context of multiple-use management, lasting protection for inventoried roadless areas within the National Forest System.

§ 294.11 Definitions

The following terms and definitions apply to this subpart:

[REVISED] Inventoried roadless areas: Areas identified in a set of inventoried roadless area maps held at the National headquarters office of the Forest Service **and made available to the**

public on the [Agency's Roadless Rule website](#), or any subsequent update or revision of those maps. See part 294.14(g) [Boundary Modifications below](#).

Responsible official: The Forest Service line officer with the authority and responsibility to make decisions regarding protection and management of inventoried roadless areas pursuant to this subpart.

Road: A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary.

1. **Classified road:** A road wholly or partially within or adjacent to National Forest System lands that is determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service.
2. **Unclassified road:** A road on National Forest System lands that is not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization.
3. **Temporary road:** A road authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be part of the forest transportation system and not necessary for long-term resource management.

Road construction: Activity that results in the addition of forest classified or temporary road miles.

Road maintenance: The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective.

Road reconstruction: Activity that results in improvement or realignment of an existing classified road defined as follows:

1. **Road improvement:** Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.
2. **Road realignment:** Activity that results in a new location of an existing road or portions of an existing road, and treatment of the old roadway.

Roadless area characteristics: Resources 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.

§ 294.12 Prohibition on road construction and road reconstruction in inventoried roadless areas

(a) A road may not be constructed or reconstructed in inventoried roadless areas of the National Forest System, except as provided in paragraph (b) of this section.

(b) Notwithstanding the prohibition in paragraph (a) of this section, a road may be constructed or reconstructed in an inventoried roadless area if the responsible official determines that one of the following circumstances exists:

- (1) A road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause the loss of life or property;
- (2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;
- (3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;
- (4) Road realignment is needed to prevent irreparable resource damage that arises from the design, location, use, or deterioration of a classified road and that cannot be mitigated by road maintenance. Road realignment may occur under this paragraph only if the road is deemed essential for public or private access, natural resource management, or public health and safety;
- (5) Road reconstruction is needed to implement a road safety improvement project on a classified road determined to be hazardous on the basis of accident experience or accident potential on that road;
- (6) The Secretary of Agriculture determines that a Federal Aid Highway project, authorized pursuant to Title 23 of the United States Code, is in the public interest or is

consistent with the purposes for which the land was reserved or acquired and no other reasonable and prudent alternative exists; or

(7) A road is needed in conjunction with the continuation, extension, or renewal of a mineral lease on lands that are under lease by the Secretary of the Interior as of January 12, 2001, or for a new lease issued immediately upon expiration of an existing lease. Such road construction or reconstruction must be conducted in a manner that minimizes effects on surface resources, prevents unnecessary or unreasonable surface disturbance, and complies with all applicable lease requirements, land and resource management plan direction, regulations, and laws. Roads constructed or reconstructed pursuant to this paragraph must be obliterated when no longer needed for the purposes of the lease or upon termination or expiration of the lease, whichever is sooner.

(c) Maintenance of classified roads is permissible in inventoried roadless areas.

§ 294.13 Prohibition on timber cutting, sale, or removal in inventoried roadless areas.

(a) Timber may not be cut, sold, or removed in inventoried roadless areas of the National Forest System, except as provided in paragraph (b) of this section.

(b) Notwithstanding the prohibition in paragraph (a) of this section, timber may be cut, sold, or removed in inventoried roadless areas if the responsible official determines that one of the following circumstances exists. The cutting, sale, or removal of timber in these areas is expected to be infrequent.

(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;

(2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited by this subpart;

(3) The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use, as provided for in 36 CFR part 223; or

(4) Roadless characteristics have been substantially altered in a portion of an inventoried roadless area due to the construction of a classified road and subsequent timber harvest. Both the road construction and subsequent timber harvest must have occurred after the area was designated an inventoried roadless area and prior to January 12, 2001. Timber may be cut, sold, or removed only in the substantially altered portion of the inventoried roadless area.

§ 294.14 Scope and applicability

- (a) This subpart does not revoke, suspend, or modify any permit, contract, or other legal instrument authorizing the occupancy and use of National Forest System land issued prior to January 12, 2001.
- (b) This subpart does not compel the amendment or revision of any land and resource management plan.
- (c) This subpart does not revoke, suspend, or modify any project or activity decision made prior to January 12, 2001.
- (d) **[REMOVED]**
- (e) **[REVISED]** Other than boundary modifications made pursuant to subsection (g) of this section, the prohibitions and restrictions established in this subpart are not subject to reconsideration, revision, or rescission in subsequent project decisions or land and resource management plan amendments or revisions undertaken pursuant to 36 CFR part 219.
- (f) If any provision of the rules in this subpart or its application to any person or to certain circumstances is held invalid, the remainder of the regulations in this subpart and their application remain in force.

(g) [ADDITION] Boundary modifications

- a. Modifications to boundaries: Responsible officials, working with local government, Tribes, and interested parties, may propose boundary modification to the Chief. Modifications and additions approved by the Chief will be reflected in the set of maps maintained at the national headquarters office of the Forest Service. Modifications of inventoried roadless area boundaries may be made to correspond with geographic features, land management plan management areas, or for other reasons. A boundary modification is not required to perform work done under an exception pursuant to §§ 294.12(b) or 294.13(b). Public notice with a minimum 30-day comment period will be provided for any proposed boundary modifications.
- b. Administrative corrections to boundaries: The Chief of the Forest Service may issue administrative corrections. Administrative corrections to the maps of any inventoried roadless area are adjustments to correct clerical errors, to conform with new statutory or regulatory requirements, or to correspond with changes based on improvements in mapping technology.

Appendix 3 – Notice of Intent Comment Summary

Introduction

This appendix provides a summary of written comments received in response to the publication of the National Environmental Policy Act (NEPA) notice of intent (NOI) to prepare an Environmental Impact Statement (EIS) for the proposed 2001 Roadless Area Conservation Rule Rescission. It captures concerns identified in the written comments received during the comment period and the range of perspectives but is not exhaustive of all written comments.

Public Comment Period Overview

The Department published a NOI to inform the public that it would prepare an EIS on August 29, 2025, initiating a 21-day comment period. The NOI requested public comments on alternatives or effects and on relevant information, studies, or analyses with respect to the proposal (7 CFR 1.7(b)). Comments received in response to the NOI were used to inform the development of a range of alternatives and the analysis of environmental impacts.

Over 220,000 comment letters were received during the NOI comment period. These comments came from Federally Recognized Tribes and Alaska Native Corporations and Tribal members; members of Congress and other elected officials; Federal, State, and local governments; and businesses, organizations, and individuals. Throughout this report, these commenters and the comments are generally referred to as “commenters” or “public comments”, without identifying the commenter type. In addition to sending letters directly requesting government to government consultation, some Tribes and Tribal organizations submitted comments during the comment period via the online portal. Any letters received from Tribes that were submitted via the online comment portal are also summarized here. Letters received through other methods and information received in consultation are not summarized (see Tribal section of DEIS). Counting all signatures submitted with the petitions as individual submissions, the letters represent over 625,000 submissions.

Of the comment letters received, approximately 99 percent were generally opposed to the proposed rule rescission, while approximately 1 percent were generally in support. Those containing substantive⁷² comments related to the NEPA process, potential alternatives, and/or specific issues⁷³ to be addressed in the EIS are summarized below. Similar issues and recommendations are grouped or paraphrased.

⁷² Substantive – as defined in the USDA NEPA regulations 7 CFR 1b.11(a)(53) “Substantive means information that meaningfully informs the consideration of reasonably foreseeable impacts on the human environment and the resulting significance determination or decisions on how to proceed (i.e., alternatives to be considered or analyzed or the alternative selected for implementation).”

⁷³ Issue definition from the USDA NEPA regulations 7 CFR 1b.11(a)(23) “Issue means a logical cause-effect relationship between the actions proposed (cause) and the reasonably foreseeable impacts (effect) on resources found in the affected environment. An issue may be addressed by modifying the proposed action, developing an action alternative, or supplementing, improving, or modifying the analysis to better understand the effects.”

All NOI comments were reviewed, coded, and analyzed to develop the below overarching themes, concerns, and recommendations. The agency responded by:

- Modifying the proposed action, developing action alternatives, or considering additional alternatives;
- Using information to inform/conduct the analysis (including consideration of various literature/references cited);
- Making factual corrections or updating content to read more clearly and be more readily understood; or
- Considering but making no change because the concern/recommendation was already accounted for, outside the scope of the rulemaking, and/or outside the authority of the Department/agency.

Comment Themes

Legal, Process, and Other Environmental Review and Compliance Concerns

Commenters raise numerous concerns about compliance with NEPA and other Federal legal requirements.

Commenters raised concerns that the public involvement process and comment period duration for the Notice of Intent restricted meaningful input in comparison to the extensive process used for the original rule. Commenters sought a longer comment period, public meetings, government-to-government consultation, and inclusion of Tribes, states, and local governments as cooperating agencies.

Commenters were concerned about compliance with the Administrative Procedure Act, Endangered Species Act, National Forest Management Act, Clean Water Act, and the agency's multiple-use mandate. Some commenters said that the 2001 rule itself exceeds statutory authority by functioning as de facto wilderness designation. Commenters also expressed concern about potential conflicts with Alaska National Interest Lands Conservation Act.

The NRPM and DEIS include description of the Agencies and Persons Consulted.

The NRPM and DEIS provide preliminary findings regarding compliance with various relevant laws and policies (Other Environmental Review and Consultation Requirements). The FEIS and Final Rule will include final determinations.

Purpose and Need

Commenters expressed concern that the stated purpose and need are inadequately justified, noting that the existing rule already allows exceptions for fire suppression, fuel reduction, and habitat improvement. Commenters question the scientific basis for rescission, asserting that long-term monitoring supports retaining the rule.

Local Involvement and Decision-Making vs. National Consistency

There were conflicting views about whether management of inventoried roadless areas should remain governed by a national standard or be shifted to local decision-makers. Commenters wrote that the 2001 Roadless Rule provides a consistent, science-based framework that ensures stable, nationwide conservation protections. They expressed concern that rescission would create a fragmented patchwork of policies vulnerable to local political and economic pressures and potential favoring of short-term extractive interests over long-term national environmental priorities. Commenters also expressed concern that many local offices lack the staffing and resources to carry out the additional environmental reviews required, making decentralized management burdensome and potentially less effective.

Others commented that local or state authorities are better positioned to tailor management to site-specific conditions through the forest planning process. They contend that returning authority to local Forest Supervisors would improve responsiveness and align decisions with local needs.

The Notice of Proposed Rulemaking and DEIS include minor clarifications to the purpose and need for the proposed rulemaking. The DEIS provides additional information regarding IRA management (Background) transportation system costs (National Forest System Roads), management needs and flexibility (Vegetation and Forest Management).

Range of Alternatives and Recommendations

Commenters expressed concern that the NOI described only two alternatives: full rescission of the 2001 Roadless Rule (proposed action) and retaining the rule (no-action alternative). They suggested the Department evaluate a broader range of alternatives, including variations of the no-action alternative, alternative forest management strategies to achieve the purpose and need, and various action alternatives.

Variations of the No-action Alternative

Commenters proposed several variations on the no-action alternative. There were recommendations for a strengthened rule alternative that would expand the scope of the rule by removing exceptions and prohibiting additional activities, including mining, grazing, oil and gas development, and motorized use. Some commenters sought permanent protective designations similar to the National Wilderness Preservation System.

There were comments suggesting alternatives focused on addressing the existing road maintenance backlog, prioritizing road repair and decommissioning unsafe or failing roads. Some commenters proposed revising Forest Service Manuals, Handbooks and other policies to improve oversight and increases in active management using existing exceptions.

Alternative Forest Management Strategies (non-rulemaking) to Achieve the Purpose and Need

Commenters recommended non-road-dependent management strategies to meet forest health and fire safety goals including using aircraft, drones, or other technologies. Additional alternatives include a no-net-roads policy requiring decommissioning equivalent or greater road mileage for

any new construction and limiting development to existing transportation corridors. Some commenters sought prioritizing resource extraction only in areas already roaded or previously developed to avoid new ecological disturbance in roadless landscapes.

Suggested Rulemaking Alternatives to meet the Purpose and Need

Many alternatives suggested modifying the rule’s prohibitions, exceptions, or application to provide opportunity for local decision-makers to address pressing management issues, especially wildfire risk mitigation.

Modified Rule for Targeted Access – Commenters proposed a hybrid alternative designed to address management concerns (like wildfire risk) without sacrificing roadless protections. These suggested alternatives involve retaining the roadless character but modifying the rule to allow specific, limited actions under strict environmental oversight.

Time-Bounded, Decommissioned Access for Fuels Treatments – Comments suggest the Department analyze an alternative that retains the Roadless rule while enabling time-bounded, decommission-on-completion access for hazardous fuel reduction near communities.

Wildland Urban-Interface-Limited Alternative – Comments suggest the Department analyze an alternative strictly limiting changes to the wildland-urban interface (WUI) for fuels management.

Refine Existing Exceptions – Comments suggest the Department analyze an alternative modifying the existing 2001 Roadless Rule by refining or expanding its current exceptions for specific management needs, such as allowing for ecologically based restoration needs or forest thinning in the WUI.

Modified Boundaries– Comments suggest the Department analyze an alternative redrawing roadless boundaries to exclude existing roads, or to exclude roaded areas and note the inability to have boundaries modified under the existing rule. Commenters suggest the Department consider alternatives involving partial rescission or boundary modification to remove the land base with high timber production values and/or areas near at-risk communities while retaining boundaries that protect high-value watersheds and biodiversity.

Regional or State-Specific Rules

Commenters suggested the Department analyze an alternative allowing regional, Tribal, or state-specific rules, such as those modeled after the Idaho and Colorado Roadless Rules, which involve tiered protections or a petition process.

The Proposed Action and Alternatives section describes the alternatives considered in detail, as well as those not considered in detail with a brief rationale.

Road Maintenance and Transportation System Costs

Commenters expressed concerns about the financial burden of expanding the road network into inventoried roadless areas, emphasizing that the Department already struggles to maintain its vast existing road system. Commenters note that the current deferred maintenance backlog totals billions of dollars, leaving the agency able to maintain only a fraction of its roads each year and argue that building new roads would add to that burden.

Conversely, some commenters contend that the 2001 Roadless Rule contributes to maintenance challenges by restricting reconstruction or repairs in certain areas, leading to higher costs for access using specialized means, such as helicopters. These commenters argue that rescinding the rule could support more efficient maintenance.

The National Forest System Roads section includes road construction and maintenance financial impacts.

Tribal and Cultural Resources

Commenters were concerned that rescinding the 2001 Roadless Rule could harm Indigenous rights, cultural heritage and subsistence practices by allowing road construction in culturally significant or traditionally used areas. Commenters emphasized the importance of upholding Federal Tribal trust responsibilities and conducting meaningful and early government-to-government consultation, noting concerns about compliance with the National Historic Preservation Act, Executive Order 13175, and subsistence protections under the Alaska National Interest Lands Conservation Act.

Commenters were concerned that new development and increased access could infringe on treaty-protected rights to hunt, fish, and gather; undermine Tribal sovereignty and food security by degrading habitats essential to subsistence species such as salmon, game animals, and culturally important plants; and damage or destroy sacred sites, archeological resources, ancestral homelands, and other cultural properties, causing irreversible loss to indigenous cultural and spiritual heritage.

The Consultation with Federally Recognized Tribes and Alaska Native Corporations section describes Tribal consultation. The Tribal Rights and Interests subsection includes effects on Indigenous people and various interests as well as treaty-protected rights. The Cultural and Historic Resources section includes impacts to archeological and cultural resources.

Fire Risk and Management

Commenters expressed conflicting views about how rescinding the 2001 Roadless Rule would affect wildfire risk and management. There is concern that building new roads would increase human-caused ignitions such as those from campfires, cigarettes, and vehicles, thereby raising wildfire risk rather than reducing it. Commenters contend that logging can worsen fire severity by removing fire-resistant old-growth trees, increasing fine fuels, drying forest conditions, and promoting invasive, highly flammable vegetation. They also argue that the existing rule already contains exceptions that allow road construction for timber harvest, fire management and public safety.

Conversely, commenters wrote that the 2001 Roadless Rule has limited access for fuel reduction, salvage logging, and suppression operations, contributing to dense, overgrown forests with high fuel loads and heightened vulnerability to catastrophic wildfires. Commenters wrote that access roads are needed for thinning, treating diseased and dead trees, safe firefighting operations, and providing evacuation routes. Some commenters also note that nearly half of roadless acres are rated at high or very high wildfire risk and that millions of acres have burned since the rule's enactment.

The Fire and Fuels Management section includes effects on wildfire risk in IRAs and the Vegetation and Forest Management section includes effects on forest health.

Biodiversity and Wildlife

Commenters were concerned that road construction and logging would fragment habitat, disrupt migration corridors, and degrade large, intact ecosystems that support sensitive, threatened, endangered, and wide-ranging species, including impacts to old-growth forests. There is concern that roads create edge habitat, increase human disturbance and contribute to vehicle strikes, poaching, chemical contamination, and aquatic habitat degradation, particularly through sedimentation and altered stream conditions that harm aquatic species.

In contrast, some commenters wrote that the rule's passive management has allowed fuels to accumulate and contributed to severe wildfires, insect outbreaks, and habitat decline. Commenters said that active management, such as thinning, prescribed fire, and forest restoration, requires road access and is necessary to maintain resilient and diverse wildlife habitat.

The Biodiversity section includes effects on wildlife habitat, including effects on sensitive, threatened, and endangered species. The Vegetation and Forest Management and Fire and Fuels Management sections include impacts due to accumulated fuels and insect and disease infestations.

Invasive Species, Pests, and Pathogens

Commenters expressed concern that road construction and increased human access into inventoried roadless areas may introduce and spread invasive species resulting in and exacerbating adverse ecological impacts and potentially increasing fire risk. Commenters identify road construction and resulting vehicle traffic as the leading cause of invasive species spread within national forests. This occurs because seeds and pathogens are often transported via vehicle tires, disturbed soil, and construction materials. The spread of invasive species is cited as a significant threat to native ecosystems, biodiversity, and forest health, because invasive species may outcompete and displace native plants.

The Non-Native Invasive Plant Species section includes effects on invasive species and the Vegetation and Forest Management section includes effect implications for vegetation and forest health.

Water Quality and Watershed

Commenters noted that roadless areas provide critical drinking water for hundreds of municipal watersheds and function as natural infrastructure that maintains clean, reliable water supplies. Commenters wrote that allowing road construction and access is needed to perform fuels reduction activities to protect water infrastructure. Others expressed concern that introducing roads and development into currently intact roadless areas would harm water quality and watershed health. There is concern that road construction and logging increase erosion, sedimentation and chemical runoff, raise water treatment costs, degrade aquatic ecosystems and destabilize steep terrain. Concerns also include contamination from vehicle pollutants, mining activity enabled by new access, and waste from unauthorized camps. Commenters note that roads can alter surface and groundwater hydrology by redirecting drainage, increasing flood risks, and reducing groundwater recharge. There were conflicting comments about improvements in road design and maintenance mitigating these effects.

The Soil, Water, and Air Resources section includes impacts to water quality and watershed health.

Geology and Soils

Commenter concerns related to geology and soils focus on the impacts associated with road construction and logging within roadless areas and potential to cause erosion, sedimentation, and slope instability. Commenters also expressed concern that motor vehicle damage can destroy biological soil crusts, compact soils, and alter drainage and they contend that reversing these ecological impacts is far more difficult and costly than maintaining the roadless status. There is concern related to the physical structure and geological stability of the landscape because increased ground disturbance, road construction, logging, and high precipitation are factors that lead to increased slope instability and the likelihood of landslides.

The Soil, Water, and Air Resources section includes impacts to soils, including the likelihood of landslides.

Forest Carbon

Commenters were concerned that rescinding the 2001 Roadless rule would allow logging, road construction and resource extraction that release stored carbon, create long-lasting “carbon debt”, and diminish the landscape’s ability to absorb future emissions, thereby accelerating climate change. Commenters argue that intact forests can store more carbon than managed or degraded forests, and that inventoried roadless areas collectively hold billions of metric tons of carbon. Conversely, other commenters wrote that passive management under the existing rule increases forest mortality from insects, disease, and severe wildfire, which can reduce carbon storage capacity and, in some cases, turn forests into net carbon emitters.

The Vegetation and Forest Management section includes impacts to carbon.

Air Quality

Commenters raised concerns that rescinding the 2001 Roadless Rule would degrade air quality by increasing both direct and indirect sources of pollution. There is concern that road

construction, logging operations, and added vehicle and truck traffic would introduce dust, noise, and a range of pollutants, including particulate matter, diesel emissions, oil, heavy metals, carbon dioxide, and carbon monoxide, into areas currently valued for their clean air. Commenters were also concerned that rescinding the 2001 Roadless Rule could lead to a potential increase in wildfire frequency or severity, resulting in more smoke impacting nearby communities and elevating associated public health risks.

The Soil, Water, and Air Resources section includes effects on air quality, including the effects of smoke due to wildfire (also see the Fire and Fuels Management section).

Recreation and Access

Commenters raised competing concerns about how rescinding the 2001 Roadless Rule would affect recreation quality and access. Some emphasize that road construction in inventoried roadless areas would permanently degrade the quiet, remote, wilderness-like experiences that visitors value. There is concern that roads would introduce noise, light pollution, and visual impacts that diminish backcountry recreation experiences such as hiking, hunting, fishing, climbing, and backcountry skiing. Commenters also expressed concern about risks to protected trails including sections of the Continental Divide, Pacific Crest, and Appalachian National Trails which depend on adjacent roadless buffers to maintain their character and scenic value.

Conversely, commenters wrote that current roadless designations limit public and motorized access, creating de facto wilderness areas that disadvantage motorized users, campers, hunters, snowmobilers, and people with disabilities or limited mobility. Commenters expressed interest in expanded access to disperse recreation pressure and ensure equitable opportunities for all user groups. There was concern that recreation access being concentrated in smaller areas leads to overcrowding and greater potential for user conflict and resource damage.

The Recreation and Scenery section describes recreation quality and access effects.

Socioeconomic

Commenters highlight competing socioeconomic concerns. Supporters of rescinding the 2001 Roadless rule write that roadless protections restrict logging, mining, energy development and road construction, leading to job losses, mill closures and economic instability in rural, resource-dependent communities. They contend that the rule limits traditional economic opportunities and reduces revenue for local infrastructure and public services. Some recreation industries, including ski areas, further note that unmanaged wildfire risks in adjacent roadless areas may threaten their economic viability.

Conversely, other commenters said that intact roadless areas serve as powerful long-term economic assets, driving sustainable tourism and outdoor recreation industries that generate substantial economic output and support millions of jobs. They emphasize that businesses, guides, outfitters, and gateway communities rely on undeveloped landscapes.

The Social and Economic Environment section describes the economic effects.

Intrinsic Value of Roadless Areas

Commenters expressed concern that road construction would cause irreversible ecological harm and permanently diminish landscapes that hold unique recreational, cultural, and spiritual value. They view road construction as a “forever decision” that trades long term environmental health for short term benefits, negatively impacting resources meant to be preserved for future generations.

Quality of life concerns focus on the loss of the quiet, remote character that roadless areas provide. Commenters emphasize that these undeveloped spaces support mental and physical well-being by offering rare refuge from stress, noise, and modern life. They argue that roads would introduce traffic, noise, light pollution, and other disturbances that erase the solitude and wilderness experience visitors seek, undermining what they consider an essential public health asset.

The Biodiversity section describes ecological effects, the Tribal Rights and Interests sections describe cultural and spiritual effects, the Recreation and Scenery section and the Non-Commodity Values for Roadless Areas subsection of the Social and Economic Environment section describe recreation experience and social impacts associated with roadless areas qualities.

Public Health and Safety

Commenters expressed concern about expanding road access into currently roadless areas, emphasizing safety risks, environmental degradation, and increased vulnerability to illegal or harmful activities. There is concern that new roads would enable illegal dumping, drug cultivation, poaching, unauthorized motorized use, and other behaviors that threaten wildlife, water quality and overall ecosystem health. Commenters indicated concern that added industrial traffic from logging would increase hazards on rural routes.

Additional concerns include the strain on forest personnel and infrastructure, with commenters concerned that greater access may lead to more vandalism and more incidents requiring search and rescue. Some, however, expressed the opposite concern, writing that the existing Roadless Rule has sometimes limited access for property owners, the Department, and Search and Rescue Teams, creating its own safety challenges. Commenters also highlight public health risks, noting that increased human presence may elevate the likelihood of zoonotic disease transmission and the spread of tick-borne and mosquito-borne diseases.

Alternatives 1 and 3 provide for limited exceptions to prohibitions on road construction and timber harvest for public health and safety. The Fire and Fuels Management and National Forest System Roads sections disclose human safety effects. The Tribal Rights and Interests section disclose effects such as unauthorized public access, vandalism, or desecration of sacred sites and traditional cultural places that could erode the sanctity and privacy required for traditional practices, quiet, and spiritual renewal.

Minerals and Mining

Commenters note that the 2001 Roadless Rule is a barrier to accessing critical mineral resources by prohibiting necessary road construction for exploration and development, particularly in

Alaska. Others note that mineral exploration is allowed pursuant to the General Mining Law of 1872.

The Social and Economic Environment section describes effects on accessing mineral resources.

Impacts of the Proposed Action on Specific Locations

Comments received related to specific geographic locations primarily focused on the irreplaceable ecological value of unique regional ecosystems, the necessity of clean drinking water protection, and the potential impacts on Indigenous cultural and subsistence resources.

The Soil, Water, and Air Resources section describes the effects on water resources, including municipal water supplies. The Tribal Rights and Interests subsection section includes effects on Indigenous cultural and subsistence resources.

Appendix 4 – Review of the Final Environmental Impact Statement for the 2020 Alaska Roadless Rule

In response to a petition from the State of Alaska and after extensive engagement with the public, Alaska Native Tribes, Alaska Native Corporations, and others, in 2020, the USDA issued the final rule entitled “Special Areas; Roadless Area Conservation; National Forest System Lands in Alaska,” (2020 Alaska Roadless Rule) (85 FR 68688). A Final Environmental Impact Statement (hereinafter “2020 Final EIS”) was prepared to analyze the effects of the proposed Alaska Roadless Rule and several alternatives. In 2021, the Department initiated a new rulemaking process to reconsider the 2020 Alaska Roadless Rule, and it was subsequently repealed in 2023 (2023 Repeal) (88 FR 5252). The 2020 Final EIS that was issued in association with the promulgation of Subpart E (85 FR 68688) and the supporting analysis, including a Determination of NEPA Adequacy, relative to the 2023 Repeal, may be found on the [project website](#) (see project documents).

This 2020 Final FEIS analysis, 2023 Determination of NEPA Adequacy, and other supporting information and analyses provide information necessary for findings and conclusions required for this proposed national rulemaking EIS and has been relied upon and incorporated by reference for a portion of the effects analysis, specific to effects to resources within the Tongass National Forest. This appendix documents review and re-evaluation of the 2020 FEIS (7 CFR 1.9(e)(7 and 8) and (q)).

Similarity Between the Proposed Action and Alternatives

Both rulemakings expressly addressed application of the 2001 Roadless Rule to the Tongass National Forest.

The current no action alternative (continuation of the 2001 Roadless Rule) was also analyzed as alternative 1 of the 2020 Final EIS, because the 2001 Roadless Rule was in effect on the Tongass at the initiation of the 2020 rulemaking effort. Following promulgation of the Subpart E exemption in October 2020, the directed administrative change to the 2016 Tongass Land and Resource Management Plan (hereinafter “2016 Forest Plan”) was not issued and no timber harvest or roadbuilding in roadless areas that would have been prohibited by the 2001 Roadless Rule occurred. Effectively, roadless management on the Tongass National Forest has been consistent with the 2001 Roadless Rule for over a decade. In addition, as a result of the 2023 repeal of the 2020 Alaska Roadless Rule, the 2001 Roadless Rule is in effect today and serves as the ‘no action’ alternative.

The current proposed action (alternative 2) would rescind the 2001 Roadless Rule on all national forest system lands, including within the Tongass National Forest. Alternative 6 of the 2020 Final EIS analyzed a full exemption of the Tongass National Forest through an Alaska Roadless Rule, which meant that the 2001 Roadless Rule would not apply to the Tongass National Forest under that alternative. Alternative 6 was selected by then-Secretary Purdue and is also referred to as the 2020 Alaska Roadless Rule. The current Alternative 3 would exempt the Tongass National Forest. This is the same as the alternative analyzed in detail as Alternative 6 of the 2020 Final

EIS (full exemption of the Tongass National Forest through an Alaska Roadless Rule) and the effects would be the same as current Alternative 2.

Four additional alternatives for managing roadless area conservation specific to the Tongass National Forest were considered in the 2020 Final EIS, an appropriate range of alternatives for that rulemaking. The following is a brief description of the alternatives evaluated in the 2020 Final EIS (Chapter 2 of the Final EIS contains a complete description of the alternatives):

- Alternative 2 provided limited additional timber harvest opportunity by making timber harvest, road construction, and road reconstruction permissible in areas where roadless characteristics have already been substantially altered, while maximizing Inventoried Roadless Area (IRA) designations where roadless characteristics have not been altered.
- Alternative 3 increased the available land base from which timber harvest opportunities could occur by making timber harvest, road construction, and road reconstruction permissible in areas where roadless characteristics have already been substantially altered and in areas immediately adjacent to existing roads and past harvest areas. Alternative 3 also established a Community Priority category to allow for small-scale timber harvest and associated road construction and reconstruction.
- Alternative 4 provided additional available land base from which timber harvest opportunities could occur while maintaining IRA designations for areas defined in the 2016 Forest Plan as Scenic Viewsheds, T77 Watersheds, and The Nature Conservancy/Audubon Conservation Priority Areas.
- Alternative 5 maximized the land base from which timber harvest opportunities could occur by removing 2.32 million acres from IRA designation.

Taken together, the six alternatives represented the spectrum of management regimes identified to the Forest Service through interdisciplinary review, public comments, public meetings, Tribal and Alaska Native corporation consultations, and cooperating agency input. Alternatives 1 through 5 would not meet the purpose and need for the current rulemaking, as they would not comply with Executive Order 14153. See also Alternatives Considered but Eliminated from Detailed Study.

Similarity Between the Potentially Affected Environment

While the 2020 Final EIS addresses only the Tongass National Forest, the current proposed action would also apply to areas outside the Tongass National Forest. This current EIS considers roadless area conservation and the effects of various alternatives nationwide, including on the Tongass National Forest. The geographic area within the Tongass National Forest relevant to the current proposal and the previously analyzed are the same. Both pertain to the inventoried roadless areas on National Forest System lands within the Tongass National Forest.

New Circumstances or Information

2023 Review of New Information/Changed Circumstances

The agency conducted a review of new information or circumstances relevant to the 2023 Rescission/Repeal of the 2020 Alaska Roadless Rule. This review considered (1) if there is new information or circumstances since publication of the 2020 FEIS that would be relevant to environmental concerns and (2) if new information or circumstances would substantially change the analysis in the 2020 FEIS. New information or changed circumstances considered included: the release of the USDA Southeast Alaska Sustainability Strategy (SASS) in July 2021, Sealaska Corporation’s announced plan to transition away from logging its lands in January 2021, introduction of the Unrecognized Southeast Alaska Native Communities Recognition and Compensation Act in November 2021 by Senator Lisa Murkowski (this was introduced again most recently in 2025)⁷⁴, and completion of the Alaska Mental Health Trust Land Exchange in October 2021. As explained in greater detail in the 2023 Determination of NEPA Adequacy, the agency concluded that the existing analysis remained valid and adequate in light of the new information and potential changed circumstances identified by the public.

Additional New Information/Changed Circumstances

The following new information or changed circumstances were reviewed to see if they presented anything that may substantially change the effects from the 2020 and 2023 analyses and findings.

Executive Orders and SASS

Changes since 2023 include executive orders including the 2025 Executive Order 14153, *Unleashing Alaska’s Extraordinary Resource Potential* and Executive Order 14225, *Immediate Expansion of American Timber Production*. These orders state the policy of the United States to maximize the development and production of natural resources in Alaska and to increase timber production to protect national and economic security.

SASS was a press release that did not represent law, regulation, directive, or an agency action. SASS no longer provides context for project development and priority use of discretionary funds.

Accordingly, although the Tongass has renewed its focus on timber production, including that associated with old growth, circumstances relevant to the effects analysis have not changed. Projected forest management on the Tongass continues to be in alignment with the existing (2016) forest plan, which includes an annual Projected Timber Sale Quantity of 46 MMBF old- and young-growth timber during the first decade, and approximately 72 MMBF during the

⁷⁴ In 2025, the Alaska Congressional delegation introduced the “Unrecognized Southeast Alaska Native Communities Recognition and Compensation Act” (H.R. 41) and the “Alaska Native Landless Equity Act (S.2554). Both bills proposed to amend the Alaska Native Claims Settlement Act of 1971 (43 U.S.C. 1601 et seq.) (ANCSA) to form 5 new Urban Corporations for the communities of Haines, Ketchikan, Petersburg, Tenakee, and Wrangell, and convey 23,040 acres of National Forest System lands to each. The legislation identifies a proposed total conveyance of approximately 115,000 acres of National Forest System land. Approximately 50 percent of the lands included in the proposed legislation are within the inventory for the 2001 Roadless Rule.

second decade as more young growth reaches harvestable age. This is consistent with the 2020 FEIS, for which the analysis was based on the PTSQ reflected in the 2016 Forest Plan.

Tongass National Forest Plan Assessment

In 2025, the full Assessment for the Tongass Forest Plan Revision, including 22 individual assessment reports, was published. <https://www.fs.usda.gov/r10/tongass/planning/forest-plan/tongass-national-forest-plan-revision>.

The Tongass Forest Plan assessment was reviewed to determine if it may present ‘new’ conditions relative to the 2020 EIS. One circumstance that was noted as a change since the 2023 DNA is that Gulf of Alaska Chinook salmon was identified as a candidate species for listing under the Endangered Species Act⁷⁵. However, more recently, the NOAA National Marine Fisheries Service determined that listing of the Gulf of Alaska Chinook salmon under the Endangered Species Act is not warranted. The 2020 FEIS evaluated effects to fish habitat and found that there would be overall effects to fish habitat are expected to be minimal whether the Roadless Rule is in place or not, because of the strong protections to fish habitats provided by Forest Plan standards and guidelines and the riparian management strategy (page 3-138).

In addition, in accordance with the 1990 Tongass Timber Reform Act (TTRA), a new long-term timber demand analysis is underway at the USDA Forest Service Pacific Northwest Research Station to inform the revised plan. This information is not yet available for consideration.

Tongass National Forest Plan Revision

On February 18, 2026, the Forest Service published a [Notice of Initiation of the Development of a Proposed Plan Revision and Notice of Intent to Prepare an Environmental Impact Statement](#). The preliminary need to change is focused on updating and modernize the plan consistent with the 2012 Planning Rule, prioritizing local and regional prosperity of Southeast Alaska, incorporating strategies to address significant changes in recreation and tourism, including plan content that encourages collaboration and shared stewardship with a variety of partners, considering needs for subsistence uses such as hunting, fishing, and gathering, and considering indigenous knowledge related to land stewardship, cultural issues, and culturally-significant sites.

This NOI acknowledged this proposed rulemaking to rescind the 2001 Roadless Area Conservation Rule and indicated that the EIS for the revised plan will analyze one or more alternatives that do not include IRA designations so final decision on the revised plan can align with the outcome of this rulemaking process.

In March 2026, the Tongass National Forest posted preliminary draft plan content and requested public comment and input received.

Neither the notice of intent to prepare a draft plan and EIS nor the preliminary draft plan content result in any changed effects and at this stage it would be speculative to consider what potential changes could be. Effects of any changes from the Revision relative to the uses of existing inventoried roadless areas, including timber suitability, would be analyzed in the EIS for the Plan Revision.

⁷⁵National Marine Fisheries Service (NMFS) found that the Gulf of Alaska Chinook salmon (*Oncorhynchus tshawytscha*) may be warranted for listing as threatened or endangered on May 24, 2024 (89FR 45815), after being petitioned. Following on the positive 90-day finding, in May 2026, NOAA Fisheries completed a status review and [12-month finding](#) for Gulf of Alaska Chinook salmon in response to a January 2024 petition. NOAA determined that listing any of the three evolutionarily significant units of Gulf of Alaska Chinook salmon under the Endangered Species Act is not warranted.

Greens Creek North Extension Project

This decision was signed in November 2024 and authorized mine expansion in an inventoried roadless area. This project approval is consistent with the analysis in the 2020 FEIS, which recognized that “mining activities are expected to expand at existing sites, including Greens Creek on Admiralty Island”.

Cruise Ship Tourism

Cruise ship tourism and associated investments have increased, with associated attention on visual priorities along the cruise ship routes. This trend is consistent with the analysis in the 2020 FEIS, which recognized that “Over the long-term, recreation and tourism are expected to continue and increase in the future” and also recognized the uncertainty regarding levels of recreation and tourism in the near-term due to the ongoing coronavirus pandemic.

Recent Defoliator Outbreaks

The Tongass NF has experienced recent defoliator outbreaks across the landscape, including Western black headed budworm (*Acleris gloverana*) and hemlock sawfly (*Neodiprion isugae*) causing mortality and decline of forested stands. The 2020 FEIS recognizes these common insects and more generally that they are an integral and natural part of forest ecosystems.

Adequacy of Effects Analysis for the Proposed Action

- The potential new information and changed circumstances have been found to result in no substantial changes to the analysis and the analysis remains adequate. The environmental effects of the alternatives would be similar to those analyzed in the 2020 FEIS. Effects of the 2020 FEIS are summarized (see Environmental Impacts Within the Tongass National Forest section and incorporated by reference in the sections of the current DEIS, where relevant, to support findings.
- After an assessment of the subsistence evaluations in the 2020 FEIS and 2020 Final Rule, those evaluations have also been found to remain valid and adequate for consideration under Section 810 of ANILCA to support a new decision by the Department (see Subsistence Use and Alaska National Interest Lands Conservation Act (ANILCA)).

Disclosure of Ongoing Judicial Action

The 2023 decision to repeal the Alaska Roadless Rule is subject to an ongoing judicial action. Judicial review of the complaint, 2023 decision, and the relevant environmental review documents, is stayed pending the proposed 2001 Roadless Rule Rescission.

Appendix 5 – Biodiversity Analysis Supplemental Information

The following tables provide supplemental information for the Plant and Animal Communities Affected Environment discussion (Table 56 and Table 57) and the ESA-Listed Species and Designated Critical Habitat discussion (Table 58) under the Biodiversity section of the EIS.

Affected Environment – Fragmentation

We assessed fragmentation of the land area within the affected environment minus a 100-foot buffer for roads for each Forest Service region (Table 56). We divided the two Eastern regions, which have very wide extent across the eastern U.S., into geographically-based subregions for processing purposes. The Northern region and Northeastern subregion had the largest patches on average, while patches tended to be smallest (MPA, LPI) in the Southern Region (8), in the southeastern U.S. Intermountain, Northern, and Pacific Southwestern Region patches were relatively close to one another (NN) but also had the greatest amount of edge (ED) relative to other regions. The two Eastern Regions (8 and 9) had more fragmented, intricate shapes relative to area (ED, LSI).

Table 56. Fragmentation metrics for land areas of the affected environment. Eastern regions were split into subregions of grouped National Forests.

Region Number	Region Name	Subregion	Mean patch area (MPA) (hectares)	Largest patch index (LPI)	Mean distance to nearest neighbor (NN) (meters)	Edge density (ED) (meters per hectare)	Landscape shape index (LSI)
1	Northern		1117	1.66	170	2.65	52
2	Rocky Mountain		922	0.43	238	0.97	30
3	Southwestern		728	0.50	434	1.83	42
4	Intermountain		656	0.96	126	3.46	69
5	Pacific Southwest		420	0.26	195	2.92	57
6	Pacific Northwest		698	0.60	327	2.36	54
8	Eastern (SE)	Ozark	139	0.30	250	1.37	25
8	Eastern (SE)	Gulf	320	0.29	3076	0.37	12
8	Eastern (SE)	East	332	0.46	639	1.78	27
9	Eastern (Midwest/NE)	South	174	0.69	402	1.35	20
9	Eastern (Midwest/NE)	Northeast	1020	2.59	1165	2.11	13
9	Eastern (Midwest/NE)	Great Lakes	430	0.15	1382	0.45	18
10	Alaska		3721	6.21	284	1.99	36

Table notes: Puerto Rico was omitted from the Southern Region (8) because of technical constraints. The analysis area was the affected environment minus the area within 100 feet of roads. Largest patch index reflects habitat continuity and approaches 0 for highly fragmented landscapes. Landscape shape index higher values indicate more fragmented or intricate shapes relative to area.

We also assessed fragmentation-related metrics of forest type groups (Table 57). For this analysis, we also divided the two eastern regions, which have very wide extent across the eastern U.S., into geographically-based subregions for processing purposes.

Forest patches in the affected environment varied in size by vegetation type, from smaller aspen/birch patches in the Rocky Mountain Region (2) and the Southwestern Region (3), tanoak/laurel in the Pacific Southwest and Pacific Northwest Regions (5 and 6), and oak/pine in the Southern and Eastern Regions (8 and 9); to larger patches of forest types such as pinyon/juniper in the Southwestern and Intermountain Region (3 and 4), California mixed conifer in the Pacific Southwest Region, Douglas-fir in the Northern, Rocky Mountain, and Pacific Southwest Regions (1, 2, and 6), fir/spruce/mountain hemlock in the Northern, Rocky Mountain, Intermountain, and Pacific Northwest Regions (1, 2, 4, and 6), spruce/fir, maple/beechn/birch in the Southern and Eastern Regions, and longleaf/slash pine and loblolly/shortleaf pine in the Southern Region.

Common vegetation types with high fragmentation (more than 10 percent incidence and ≤ 0.05 LPI) included ponderosa pine in the Southern Region, aspen/birch in the Intermountain Region, loblolly/shortleaf pine in the Southern Region Gulf, and maple/beechn/birch in the Eastern Region Great Lakes. Distance to the nearest neighbor patch of the same type (NN) was relatively high for some cover types regardless of patch size; for example, oak/hickory in the Southern Region East was 92 percent of landscape with 125 ha average size, and pinyon/juniper in the Pacific Southwest Region was 10 percent of the landscape with 2ha average size. Most cover types were highly aggregated (CI), with none resembling a checkerboard pattern.

Table 57. Fragmentation-related metrics of forest type groups

Region	Sub-region	Forest Type Group	Percentage of affected environment	Mean patch area (MPA) (hectares)	Largest patch index (LPI)	Mean shape index (MSI)	Mean distance to nearest neighbor (NN) (meters)	Edge Density (ED) (meters per hectare)	Clump-iness Index (CI)
1		Douglas-fir	42	4.32	0.24	1.32	84	17.22	0.81
1		Fir/spruce/mountain hemlock	37	3.30	0.39	1.29	86	15.52	0.81
1		Lodgepole pine	18	1.44	0.06	1.28	91	12.77	0.69
2		Douglas-fir	22	1.97	0.13	1.30	95	3.53	0.75
2		Fir/spruce/mountain hemlock	35	2.65	0.10	1.30	91	4.71	0.78
2		Lodgepole pine	32	2.67	0.12	1.29	94	4.02	0.80
2		Aspen/birch	6	0.53	0.00	1.21	119	1.64	0.53
3		Pinyon/juniper	73	7.07	0.28	1.30	85	9.12	0.87
3		Douglas-fir	4	1.92	0.05	1.27	116	1.03	0.76
3		Ponderosa pine	12	2.00	0.05	1.33	101	3.31	0.73
3		Aspen/birch	1	1.50	0.00	1.29	134	0.32	0.71
3		Woodland hardwoods	8	1.36	0.04	1.29	109	2.89	0.68
4		Pinyon/juniper	43	5.88	0.27	1.28	97	10.52	0.88
4		Douglas-fir	7	0.99	0.02	1.25	109	5.37	0.65
4		Fir/spruce/mountain hemlock	22	2.52	0.14	1.29	92	10.71	0.77
4		Aspen/birch	11	1.11	0.02	1.26	95	8.06	0.66
4		Woodland hardwoods	9	1.00	0.05	1.26	95	6.79	0.65
5		Pinyon/juniper	10	2.20	0.08	1.24	130	2.57	0.80
5		Fir/spruce/mountain hemlock	9	1.55	0.02	1.32	90	3.81	0.67
5		California mixed conifer	40	3.89	0.10	1.33	86	9.26	0.81
5		Western oak	25	1.92	0.08	1.28	98	8.15	0.74

Region	Sub-region	Forest Type Group	Percentage of affected environment	Mean patch area (MPA) (hectares)	Largest patch index (LPI)	Mean shape index (MSI)	Mean distance to nearest neighbor (NN) (meters)	Edge Density (ED) (meters per hectare)	Clump-iness Index (CI)
5		Tanoak/laurel	2	1.23	0.02	1.26	167	0.75	0.65
6		Douglas-fir	39	4.28	0.12	1.33	88	10.18	0.83
6		Ponderosa pine	8	1.06	0.02	1.27	104	4.74	0.65
6		Fir/spruce/mountain hemlock	38	5.06	0.16	1.30	87	9.34	0.84
6		Tanoak/laurel	2	1.40	0.02	1.32	90	0.92	0.66
8	Ozark	Loblolly/shortleaf pine	16	2.78	0.03	1.36	109	1.41	0.77
8	Ozark	Oak/pine	2	0.26	0.00	1.18	92	0.49	0.32
8	Ozark	Oak/hickory	83	23.74	0.21	1.44	83	2.32	0.93
8	Gulf	Longleaf/slash pine	37	6.54	0.21	1.38	116	0.79	0.89
8	Gulf	Loblolly/shortleaf pine	20	1.49	0.02	1.27	97	0.93	0.74
8	Gulf	Oak/pine	1	0.16	0.00	1.10	148	0.18	0.19
8	Gulf	Oak/hickory	17	3.72	0.07	1.34	116	0.58	0.81
8	Gulf	Oak/gum/cypress	24	3.31	0.06	1.33	126	0.91	0.79
8	East	Loblolly/shortleaf pine	4	3.00	0.18	1.21	245	0.51	0.90
8	East	Oak/pine	2	0.48	0.00	1.26	146	1.54	0.46
8	East	Oak/hickory	92	124.72	0.45	1.51	191	3.72	0.97
8	East	Maple/beech/birch	2	2.70	0.05	1.26	202	0.45	0.82
9	South	Oak/pine	2	0.80	0.01	1.25	167	0.54	0.61
9	South	Oak/hickory	63	9.85	0.57	1.35	87	4.19	0.91
9	South	Maple/beech/birch	34	10.24	0.46	1.34	93	3.05	0.89
9	Northeast	Spruce/fir	38	9.68	0.62	1.32	114	6.87	0.90
9	Northeast	Oak/hickory	4	5.28	0.10	1.33	230	1.18	0.85
9	Northeast	Maple/beech/birch	53	15.32	0.80	1.34	97	7.73	0.92
9	Northeast	Aspen/birch	5	0.81	0.01	1.31	91	3.98	0.56

Region	Sub-region	Forest Type Group	Percentage of affected environment	Mean patch area (MPA) (hectares)	Largest patch index (LPI)	Mean shape index (MSI)	Mean distance to nearest neighbor (NN) (meters)	Edge Density (ED) (meters per hectare)	Clump-iness Index (CI)
9	GreatLakes	White/red/jack pine	5	0.55	0.00	1.22	153	0.52	0.54
9	GreatLakes	Spruce/fir	39	4.69	0.07	1.37	102	1.66	0.82
9	GreatLakes	Elm/ash/cottonwood	3	0.75	0.01	1.23	205	0.31	0.62
9	GreatLakes	Maple/beech/birch	27	4.61	0.05	1.33	112	0.99	0.85
9	GreatLakes	Aspen/birch	25	1.69	0.02	1.31	97	1.71	0.73

Table notes: Eastern regions were split into subregions of grouped National Forests. Puerto Rico was omitted from Region 8 due to technical constraints. Analysis area was affected environment minus the area within 100 feet of roads. Results are shown for the top 3 softwood and top 3 hardwood groups if >1% of the affected environment. Largest patch index (LPI) reflects habitat continuity and approaches 0 for highly fragmented vegetation type patches. Mean shape index (MSI) averages patch shape complexity (perimeter vs. area) across all patches of the vegetation type. Clumpiness index (CI) measures how aggregated or dispersed a specific land cover type is in a landscape, and approaches 1 for maximally clumped patches, with 0 indicating a random pattern and -1 indicating maximally dispersed (e.g. a checkerboard pattern).

ESA-Listed Species - “May Affect, Likely To Adversely Affect” Determinations

Under alternative 2 (the proposed rule), preliminary findings resulted in a “may affect, likely to adversely affect” determination for the threatened, endangered, and proposed species listed in the table below. Note that a likely to adversely affect determination for the species does not always indicate a likely to adversely affect determination for that species’ designated critical habitat; the table below notes in parentheses when the designated critical habitat determination was not likely to adversely affect (NLAA). The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) Biological Assessments contain the full evaluations for ESA-listed species and designated critical habitat, including the rationale for the determinations listed below. The biological assessments also list the species with “no effect” or “may affect, not likely to adversely affect” determinations.

Table 58. May affect, likely to adversely affect determinations for threatened, endangered, and proposed species and designated critical habitat under the Endangered Species Act

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Alabama moccasinshell	Threatened	No
Alabama streak-sorus fern	Threatened	No
Alligator snapping turtle	Proposed Threatened	No
Amber darter	Endangered	No
American burying beetle	Threatened	No
American Chaffseed	Endangered	No
American Hart's-tongue fern	Threatened	No
Anthony's riversnail	Endangered	No
Arizona cliffrose	Endangered	No
Arizona eryngo	Endangered	No
Arkansas fatmucket	Threatened	No
Arroyo toad	Endangered	Yes
Ash-grey paintbrush	Threatened	Yes
Bakersfield cactus	Endangered	No
Bartram's stonecrop	Threatened	No
Bear Valley sandwort	Threatened	No
Beardless chinchweed	Endangered	No
Big Creek crayfish	Threatened	No
Big sandy crayfish	Threatened	No
Black-footed ferret	Endangered & Experimental Population	No
Blowout penstemon	Endangered	No
Blue ridge goldenrod	Threatened	No
Blue shiner	Threatened	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Blunt-nosed leopard lizard	Endangered	No
Bonytail	Endangered	No
Braunton's milk-vetch	Endangered	No
Bull trout	Threatened & Experimental Population	Yes
Bunched arrowhead	Endangered	No
California jewelflower	Endangered	No
California Orcutt grass	Endangered	No
California red-legged frog	Threatened	Yes
California spotted owl	Proposed Endangered & Proposed Threatened	No
California taraxacum	Endangered	Yes
California tiger salamander	Threatened	No
Canada lynx	Threatened	Yes
Canby's dropwort	Endangered	No
Candy darter	Endangered	Yes
Capa rosa	Endangered	No
Carolina northern flying squirrel	Endangered	No
Carson wandering skipper	Endangered	No
Cheat Mountain salamander	Threatened	No
Cherokee darter	Threatened	No
Chihuahua chub	Threatened	No
Chinook salmon, California Coastal	Threatened	Yes
Chinook salmon, Central Valley Spring	Threatened	Yes
Chinook salmon, Lower Columbia River	Threatened	Yes
Chinook salmon, Puget Sound	Threatened	Yes
Chinook salmon, Sacramento River Winter	Endangered	No
Chinook salmon, Snake River Fall	Threatened	Yes
Chinook salmon, Snake River Spring-Summer	Threatened	Yes
Chinook salmon, Upper Columbia River Spring	Endangered	Yes
Chinook salmon, Upper Willamette River	Threatened	Yes
Chipola slabshell	Threatened	No
Chiricahua leopard frog	Threatened	Yes
Chum salmon, Columbia River	Threatened	Yes
Chum salmon, Hood Canal Summer	Threatened	Yes
Chupacallos	Endangered	No
Clay phacelia	Endangered	No
Clear Lake hitch	Proposed Threatened	No
Clubshell	Endangered	No
Coho salmon, Central California Coast	Endangered	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Coho salmon, Lower Columbia River	Threatened	Yes
Coho salmon, Oregon Coast	Threatened	Yes
Coho salmon, Southern Oregon-Northern California Coast	Threatened	Yes
Colorado pikeminnow	Endangered	No
Conasauga logperch	Endangered	No
Cook's tomcat	Endangered	No
Coosa moccasinshell	Endangered	Yes (NLAA)
Cumberland moccasinshell	Proposed Endangered	No
Cushenbury buckwheat	Endangered	Yes
Cushenbury milk-vetch	Endangered	Yes
Cushenbury oxeye	Endangered	Yes (NLAA)
Dakota Skipper	Threatened	Yes
Decurrent false aster	Threatened	No
Desert pupfish	Endangered	No
Desert tortoise	Threatened	No
Dusky gopher frog	Endangered	No
Duskytail darter	Endangered	No
Dwarf Lake iris	Threatened	No
Eastern hellbender	Proposed Endangered	No
Eastern indigo snake	Threatened	No
Eastern massasauga	Threatened	No
Eastern prairie fringed orchid	Threatened	No
Encinitas Baccharis	Threatened	No
Etowah darter	Endangered	No
Eulachon, Southern	Threatened	Yes
Fassett's locoweed	Threatened	No
Fat threeridge	Endangered	No
Fineline pocketbook	Threatened	Yes (NLAA)
Fisher	Endangered	Yes
Fleshy-fruit gladebush	Endangered	No
Florida skullcap	Threatened	No
Foothill yellow-legged frog	Endangered	Yes
Franklin's bumble bee	Endangered	No
Frecklebelly madtom	Threatened	No
Frosted flatwoods salamander	Endangered	Yes
Gambel's watercress	Endangered	No
Gentner's Fritillary	Endangered	No
Georgia pigtoe	Endangered	No
Georgia rockcress	Threatened	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Gila topminnow	Endangered	No
Gila trout	Threatened	No
Godfrey's butterwort	Threatened	No
Goldline darter	Threatened	No
Gopher tortoise	Threatened	No
Gray bat	Endangered	No
Gray wolf (44-entity)	Endangered	No
Gray wolf (MN)	Threatened	Yes (NLAA)
Greater sage-grouse (Bi-state sage-grouse)	Proposed Threatened	Yes
Green floater	Proposed Threatened	Yes (NLAA)
Greene's tuctoria	Endangered	Yes (NLAA)
Grizzly bear	Threatened	No
Guajon	Threatened	No
Harperella	Endangered	No
Harper's beauty	Endangered	No
Heliotrope milk-vetch	Threatened	Yes
Heller's blazingstar	Threatened	No
Hermes copper butterfly	Threatened	Yes (NLAA)
Holy ghost ipomopsis	Endangered	No
Houghton's goldenrod	Threatened	No
Huachuca water-umbel	Endangered	No
Humpback Chub	Threatened	No
Indiana bat	Endangered	Yes (NLAA)
Interrupted (=Georgia) Rocksnail	Endangered	No
Jaguar	Endangered	Yes
Jemez Mountains salamander	Endangered	Yes
Keck's checker-mallow	Endangered	No
Kentucky arrow darter	Threatened	No
Kern Canyon slender salamander	Proposed Threatened	Yes
Kern primrose sphinx moth	Threatened	No
Kincaid's lupine	Threatened	No
Kral's water-plantain	Threatened	No
Kuenzler hedgehog cactus	Threatened	No
Laguna mountains skipper	Endangered	Yes (NLAA)
Lahontan cutthroat trout	Threatened	No
Lakeside daisy	Threatened	No
Large-flowered skullcap	Threatened	No
Lassies lupine	Endangered	Yes
Last chance townsendia	Threatened	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Layne's butterweed	Threatened	No
Leafy prairie-clover	Endangered	No
Least Bell's vireo	Endangered	Yes
Lee pincushion cactus	Threatened	No
Lewton's polygala	Endangered	No
Little Colorado spinedace	Threatened	Yes
Little Kern golden trout	Threatened	Yes (NLAA)
Longsolid	Threatened	Yes (NLAA)
Louisiana pigote	Proposed Threatened	No
Louisiana pinesnake	Threatened	No
Louisiana quillwort	Endangered	No
Lyrate bladderpod	Threatened	No
Macfarlane's four-o'clock	Threatened	No
Madison cave isopod	Threatened	No
Maguire primrose	Threatened	No
Marbled murrelet	Threatened	Yes
McDonald's rock-creep	Endangered	No
Mead's milkweed	Threatened	No
Mexican long-nosed bat	Endangered	No
Mexican spotted owl	Threatened	Yes
Mexican wolf	Endangered & Experimental Population	No
Missouri bladderpod	Threatened	No
Mitchell's satyr butterfly	Endangered	No
Mohr's Barbara's buttons	Threatened	No
Monarch butterfly	Proposed Threatened	No
Morefield's Leather flower	Endangered	No
Morro shoulderband (=Banded dune) snail	Threatened	No
Mount Charleston blue butterfly	Endangered	No
Mount Graham red squirrel	Endangered	Yes
Mountain golden heather	Threatened	Yes (NLAA)
Mountain yellow-legged frog	Endangered	Yes
Munz's onion	Endangered	No
Narrow-headed gartersnake	Threatened	Yes
Navasota ladies-tresses	Endangered	No
Neches river rose-mallow	Threatened	No
Neuse River waterdog	Threatened	No
Nevin's barberry	Endangered	No
New Mexican ridge-nosed rattlesnake	Threatened	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
New Mexico meadow jumping mouse	Endangered	Yes
No common name (<i>Ilex sintenisii</i>)	Endangered	No
No common name (<i>Ternstroemia subsessilis</i>)	Endangered	No
No common name (<i>Schoepfia arenaria</i>)	Threatened	No
North American Wolverine	Threatened	No
Northeastern bulrush	Endangered	No
Northern long-eared bat	Endangered	No
Northern Mexican gartersnake	Threatened	No
Northern riffleshell	Endangered	No
Northern Spotted owl	Threatened	Yes
Northern wild monkshood	Threatened	No
Northwestern pond turtle	Proposed Threatened	No
Ocelot	Endangered	No
Ochlockonee moccasinshell	Endangered	No
Ocmulgee skullcap	Endangered	No
Oregon silverspot butterfly	Threatened	No
Oregon spotted frog	Threatened	Yes (NLAA)
Ouachita rock pocketbook	Endangered	No
Ovate clubshell	Endangered	Yes (NLAA)
Ozark big-eared bat	Endangered	No
Ozark hellbender	Endangered	No
Pacific marten, Coastal DPS	Threatened	Yes
Paiute cutthroat trout	Threatened	No
Palo Colorado	Endangered	No
Palo de Jazmin	Endangered	No
Papery whitlow-wort	Threatened	No
Parish's daisy	Threatened	Yes
Pearl darter	Threatened	No
Peninsular bighorn sheep	Endangered	No
Pigeon wings	Threatened	No
Pima pineapple cactus	Endangered	No
Pitcher's thistle	Threatened	No
Pondberry	Endangered	No
Prairie bush-clover	Threatened	No
Price's potato-bean	Threatened	No
Puerto Rican Boa	Endangered	No
Purple amole	Threatened	Yes
Purple bankclimber	Threatened	No
Purple bean	Endangered	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Pygmy fringe-tree	Endangered	No
Quino checkerspot butterfly	Endangered	Yes (NLAA)
Rabbitsfoot	Threatened	No
Rayed bean	Endangered	Yes (NLAA)
Relict trillium	Endangered	No
Relictual slender salamander	Proposed Endangered	Yes
Riverside fairy shrimp	Endangered	No
Roan Mountain bluet	Endangered	No
Rock gnome lichen	Endangered	No
Rough-leaved loosestrife	Endangered	No
Round hickorynut	Threatened	No
Rush darter	Endangered	No
Rusty patched bumble bee	Endangered	Yes (NLAA)
Ruth's golden aster	Endangered	No
Sacramento Mountains thistle	Threatened	No
Sacramento prickly poppy	Endangered	No
Salamander mussel	Proposed Endangered	No
San Bernardino bluegrass	Endangered	Yes
San Bernardino Merriam's kangaroo rat	Endangered	Yes
San Bernardino Mountains bladderpod	Endangered	Yes
San Diego fairy shrimp	Endangered	No
San Diego thornmint	Threatened	No
San Francisco peaks ragwort	Threatened	No
San Joaquin adobe sunburst	Threatened	No
San Joaquin kit fox	Endangered	No
Sand skink	Threatened	No
Santa Ana River woolly-star	Endangered	No
Santa Ana speckled dace	Proposed Threatened	No
Santa Ana sucker	Threatened	Yes
Scaleshell mussel	Endangered	No
Schweinitz's sunflower	Endangered	No
Shale barren rock cress	Endangered	No
Shasta crayfish	Endangered	No
Short-tailed snake	Proposed Threatened	No
Showy stickseed	Endangered	No
Sierra Nevada bighorn sheep	Endangered	Yes (NLAA)
Sierra Nevada red fox	Endangered	No
Sierra Nevada yellow-legged frog	Endangered	Yes
Silverspot	Threatened	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Slender Orcutt grass	Threatened	Yes
Slender-horned spineflower	Endangered	No
Small whorled pogonia	Threatened	No
Smoky madtom	Endangered & Experimental Population	No
Smooth coneflower	Threatened	No
Snuffbox mussel	Endangered	No
Sockeye Salmon, Snake River	Threatened	Yes
Sonora chub	Threatened	No
Southern clubshell	Endangered	Yes (NLAA)
Southern elktoe	Proposed Endangered	No
Southern mountain caribou DPS	Endangered	Yes
Southern Mountain wild-buckwheat	Threatened	No
Southern pigtoe	Endangered	Yes (NLAA)
Southwestern pond turtle	Proposed Threatened	No
Southwestern willow flycatcher	Endangered	Yes
Spalding's catchfly	Threatened	No
Speckled pocketbook	Endangered	No
Spikedace	Endangered	Yes (NLAA)
Spreading avens	Endangered	No
Springville clarkia	Threatened	No
St. Francis River crayfish	Threatened	Yes (NLAA)
Steelhead, California Central Valley	Threatened	Yes
Steelhead, Central California Coast	Threatened	No
Steelhead, Lower Columbia River	Threatened	Yes
Steelhead, Middle Columbia River	Threatened	Yes
Steelhead, Northern California	Threatened	Yes
Steelhead, Puget Sound	Threatened	Yes
Steelhead, Snake River	Threatened	Yes
Steelhead, South-Central California Coast	Threatened	Yes
Steelhead, Southern California	Endangered	Yes
Steelhead, Upper Columbia River	Threatened	Yes
Steelhead, Upper Willamette River	Threatened	Yes
Suckley's cuckoo bumble bee	Proposed Endangered	No
Suwannee alligator snapping turtle	Threatened	No
Swamp pink	Threatened	No
Taylor's (=whulge) Checkerspot	Endangered	Yes (NLAA)
Tennessee pigtoe	Proposed Endangered	No
Tennessee yellow-eyed grass	Endangered	No

Species/Habitat	Status	Proposed or Designated Critical Habitat Present? ^(a)
Texas fawnsfoot	Threatened	No
Texas golden gladeceess	Endangered	No
Texas heelsplitter	Proposed Endangered	No
Texas prairie dawn-flower	Endangered	No
Thread-leaved brodiaea	Threatened	No
Todsens pennyroyal	Endangered	No
Triangular kidneyshell	Endangered	Yes (NLAA)
Tricolored bat	Proposed Endangered	No
Trispot darter	Threatened	No
Unarmored threespine stickleback	Endangered	No
Utah prairie dog	Threatened	No
Ute ladies'-tresses	Threatened	No
Uvillo	Endangered	No
Vail Lake ceanothus	Threatened	No
Vernal pool fairy shrimp	Threatened	Yes
Virginia big-eared bat	Endangered	Yes
Virginia sneezeweed	Threatened	No
Virginia spiraea	Threatened	No
Webber's ivesia	Threatened	No
Wenatchee Mountains checkermallow	Endangered	No
Western fanshell	Threatened	No
Western lily	Endangered	No
Western prairie fringed orchid	Threatened	No
Western regal fritillary	Proposed Threatened	No
Western Spadefoot toad	Proposed Threatened	No
White birds-in-a-nest	Threatened	No
White bladderpod	Endangered	No
White fringeless orchid	Threatened	No
Whitebark pine	Threatened	No
Whorled sunflower	Endangered	No
Yaqui chub	Endangered	No
Yellow-billed cuckoo	Threatened	Yes
Yellowfin madtom	Threatened & Experimental Population	No
Yosemite toad	Threatened	Yes
Yreka phlox	Endangered	No
Zuni fleabane	Threatened	No

(a) For proposed or designated critical habitat present ("Yes"), the determination is LAA unless otherwise noted in parentheses.