



United States Department of Agriculture

North Savery Project

Draft Environmental Impact Statement



Forest Service

Medicine Bow-Routt National Forests and Thunder Basin National Grassland
Brush Creek/Hayden Ranger District

July 2017

Disclaimer:

The Forest Service uses the most current and complete data it has available. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, have represented features not in accurate geographic locations, etc. The Forest Service makes no expressed or implied warranty, including warranty of merchantability and fitness, with respect to the character, function, or capabilities of the data or their appropriateness for any user's purposes. The Forest Service reserves the right to correct, update, modify, or replace this geospatial information based on new inventories, new or revised information, and if necessary in conjunction with other federal, state or local public agencies or the public in general as required by policy or regulation. Previous recipients of the products may not be notified unless required by policy or regulation. For more information, contact the Medicine Bow-Routt National Forests and Thunder Basin National Grassland Supervisor's Office (2468 Jackson Street, Laramie, WY 82070, 307-745-2300).

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.

Note: We make every effort to create documents that are accessible to individuals of all abilities; however, limitations with our word processing programs may prevent some parts of this document from being readable by computer-assisted reading devices. If you need assistance with this document, please contact the Brush Creek/Hayden Ranger District at 307-326-5258.

**North Savery Project
Draft Environmental Impact Statement
Carbon County, Wyoming**

Lead Agency: USDA Forest Service
Brush Creek/Hayden Ranger District
Medicine Bow-Routt National Forests and Thunder
Basin National Grassland

Responsible Official: Melanie Fullman, District Ranger
2171 S. Hwy 130, Saratoga, WY 82331

For Information Contact: Josh Peck or Paula Guenther
Brush Creek/Hayden Ranger District
2171 S. Hwy 130, Saratoga, WY 82331
307-326-5258

The Brush Creek/Hayden Ranger District, Medicine Bow-Routt National Forests, proposes to authorize 6,670 acres of vegetation treatments including salvage logging, precommercial thinning, and hazard tree clearing on National Forest System lands in the North Savery Project Area. The district also proposes specific changes to the transportation system in the project area, including changing road maintenance levels, converting road segments to more suitable uses, adding routes to the road system, and decommissioning 21 miles of system roads that are impacting watershed resources. The project decision would identify and designate the minimum road system in the project area in accord with Subparts A and B of the Travel Management Rule. Two alternatives were considered: no-action and a modification of the proposed action that was scoped in 2015. The modified proposed action is the agency preferred alternative.

The environmental analysis for the North Savery Project will proceed according to **Section 104 of the Healthy Forests Restoration Act**. The decision will be subject to the U.S. Forest Service project-level pre-decisional administrative review process (36 CFR 218, Subparts A and C).

It is important that reviewers provide their comments at such times and in such a way that they are useful to the Agency's preparation of the final environmental impact statement. Comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. Submission of timely and specific comments can affect a reviewer's ability to participate in subsequent administrative or judicial review. Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered; however, anonymous comments will not provide the respondent with standing to participate in subsequent administrative or judicial reviews.

Send comments to: Paula Guenther, Central Zone NEPA Coordinator
Brush Creek/Hayden Ranger District
PO Box 249, Saratoga, WY 82331

Comments Must Be Received by **September 12, 2017**

Summary

The overall objective of the North Savery Project is to manage forest stands and the associated transportation system to restore future landscape resiliency by accelerating restoration of stands damaged by insects and disease, maintaining emergency access to and egress from National Forest System lands and inholdings, and restoring watersheds to a condition that would be more resilient to runoff and sedimentation during extreme conditions and events.

What is Being Proposed and Why

The Brush Creek/Hayden Ranger District, Medicine Bow-Routt National Forests, proposes to authorize 6,670 acres of vegetation treatments including salvage logging, precommercial thinning, and hazard tree clearing on National Forest System lands in the North Savery project area. The district also proposes specific changes to the transportation system in the project area, including changing road maintenance levels, converting road segments to more suitable uses, adding routes to the road system, and decommissioning 21 miles of system roads that are impacting watershed resources. The vegetation treatments and changes to the transportation system are integral to restoring resiliency to the landscapes and watersheds of the project area so that they contribute to sustainable forest product and water supply in the future. The project decision would also identify and designate the minimum road system in the project area in accord with Subparts A and B of the 2005 Travel Management Rule.

This action is needed because:

- Over the past decade, a mountain pine beetle epidemic has killed pine trees across thousands of acres of forest land in southern Wyoming. In lodgepole pine forests, approximately 70 percent of the trees greater than 6 inches in diameter are dead or dying from mountain pine beetle infestation. Management now will encourage growth of young, resilient trees in this area.
- Timber stands in the North Savery project area are among the most productive growing sites on the Medicine Bow National Forest, and it is a priority to reforest and return these stands to active timber production.
- There is a limited time in which to salvage these trees and recover a sawtimber product.
- Fuel breaks suitable for holding firelines and protecting values at risk do not exist in many parts of the analysis area.
- Standing dead trees create safety hazards for the public and Forest Service employees.
- A National Environmental Policy Act analysis and decision have not yet been made to designate the minimum road system for the North Savery project area to complete Subparts A and B of the 2005 Travel Management Rule.
- Some designated roads are contributing to degraded resource conditions on the Medicine Bow National Forest, including loss of vegetation, erosion, sedimentation to streams, reduced quality of wildlife habitat, and low resilience to extreme weather events. Road improvements, such as replacing failing culverts, are also needed to maintain the transportation system.
- The Chief of the Forest Service and the Governor of Wyoming have identified this project location as a priority area for treatment due to insect and disease infestation.

Current Conditions in the Project Area

The North Savery project area is located at the northern terminus of the Sierra Madre mountain range on the Brush Creek/Hayden Ranger District, Medicine Bow National Forest. The project area is about 15 miles northwest of the town of Encampment in Carbon County, Wyoming.

Contiguous forests and prevailing winds brought epidemic populations of mountain pine beetles and noticeable mortality to the project area beginning in 2004. Mountain pine beetle populations peaked in approximately 2009. Stand mortality reached a plateau about five years later as beetles depleted their food supply and returned to more typical levels. As a result of bark beetle mortality, dead trees now dominate the view in many areas of the foreground and are visible in the middle and background. Wind, snow, and ice continue to weaken and blow down dead trees, creating a landscape of jack-strawed lodgepole pine interspersed with regenerating forest.

Nearly all mature lodgepole stands include substantial amounts of standing dead timber, some as much as 90 percent dead. Spruce and fir stands are also being affected by insects and disease at smaller scales. Mature aspen stands are being affected by a combination of age, weather, and mortality agents which are causing quick and nearly complete deterioration of these stands.

Most stands in the project area rate above average or superior for the volume of wood produced. However, available volume is decreasing because of the impacts of the mountain pine beetle epidemic, weather, previous management, and other forest threats. Virtually all suitable timber production sites are important for near- and long-term contributions to the production of wood products to meet commitments to the timber industry made in the Forest Plan.

Current stand conditions are likely to result in fire behavior with increased rates of spread, fireline intensity, and risk to responders. These conditions are not conducive to using fire in its natural role, while protecting firefighters and important values at risk. Almost half (48 percent) of the North Savery project area is inside a community at risk identified by Carbon County's Community Wildfire Protection Plan.¹ When areas within 1.5 miles of the communities at risk are considered, the area in or near communities at risk increases to 82 percent.

The North Savery Project includes proposed actions to implement Subparts A and B of the 2005 Travel Management Rule. Of particular concern are roads and unauthorized routes causing erosion and sedimentation in three 6th-level watersheds. Degradation of water resources has been documented in site-specific locations, primarily as the result of road condition or motorized use. In addition, motorized travel is illegal on the 54 miles of unauthorized routes in the project area.

Background, Public Involvement, and Issues Raised

In August 2007, Brush Creek/Hayden District completed the Savery landscape-scale assessment to identify potential land management projects. Proposed actions were developed starting in 2008 and scoped with the public in 2010. The Savery project was delayed between 2011 and 2013 while Medicine Bow-Routt National Forests' personnel responded to the immediate hazards from the Rocky Mountain Region bark beetle incident. Timber and fuels program work

¹ Available at

<https://sites.google.com/a/wyo.gov/forestry/fire-management/fire-grants-assistance/fuels-mitigation>

resumed with an analysis and decision to implement the Bud Project in 2013, which authorized actions in a portion of the original Savery area, and the Divide Peak Project, which authorized prescribed burning in the area. The Bud project is now being implemented and is providing valuable lessons about timber salvage in beetle-killed stands.

In 2014, the Governor of Wyoming requested the North Savery area as a priority landscape for treatment due to impacts from insects and disease under the 2014 Farm Bill and the amended Healthy Forests Restoration Act. The Chief of the Forest Service designated it as a priority landscape on May 20, 2014. The interdisciplinary team used the northern portion of the original 2010 Savery proposal as a starting point for the North Savery Project. The 2015 proposed action released for public comment during scoping included very few changes from the 2010 proposal.

A notice of intent to prepare an environmental impact statement for the North Savery Project was published in the Federal Register on December 1, 2015. The notice of intent asked for public comment on the proposal from December 1, 2015 to February 1, 2016. As part of the public involvement process, the agency published a detailed scoping document which was made available on the Medicine Bow-Routt National Forests' website in November 2015. (http://www.fs.fed.us/nepa/nepa_project_exp.php?project=47913).

The Brush Creek/Hayden Ranger District held two public meetings: one on December 9, 2015 at the Bureau of Land Management Rawlins Field Office in Rawlins, Wyoming and one on December 10, 2015 at the Platte Valley Community Center in Saratoga, Wyoming. A total of 30 individuals attended the meetings. In addition to public meetings, Forest Service personnel have engaged directly with affected individuals, other agencies, and local governments to discuss this project and management of resources in the project area.

The interdisciplinary team considered three key issues from their analysis and public comments during scoping:

Issue 1. Effects of proposed timber salvage treatments on wildlife, wildlife habitat, and watershed function may be significant and not consistent with the Forest Plan

Issue 2. Effects of road closures and road decommissioning may have significant impacts on recreational access to the national forest

Issue 3. Effects of proposed vegetation treatments adjacent to the Continental Divide National Scenic Trail may not align with Congressional direction for management of National Scenic Trails

After reviewing the public comments, the interdisciplinary team modified the proposed action to include hazard tree clearing on level 1 roads, more specific design criteria to protect the Continental Divide National Scenic Trail, additional watershed-specific design criteria to mitigate cumulative effects, and minor changes to transportation system proposals.

Alternatives Analyzed

The Healthy Forests Restoration Act limits the range of alternatives to a maximum of three: no action, the proposed action, and, at most, one additional alternative, if that alternative is proposed during scoping or the collaborative process and meets the project purpose and need (HR 1904, Section 104). For the North Savery Project, two alternatives are considered in detail: the no-action alternative and the modified proposed action. Issues and concerns raised during scoping have been addressed by iterative development of the 2017 modified proposed action.

Vegetation treatments and transportation system and travel management proposed actions were influenced by public comment, agency collaboration, and environmental analysis. Travel management activities in the modified proposed action were developed from the 2015 Travel Analysis Report for the district (2005 Travel Management Rule Subpart A). The modified proposed action is the agency preferred alternative.

Modified Proposed Action

The modified proposed action includes silvicultural treatments for timber and fuels management as well as road relocation, reconstruction, and restoration (see table 1 and table 2 below). Most of the proposed activities would take place in Management Area 5.13 which emphasizes forest products and Management Area 5.12 which has a rangeland vegetation emphasis. No activities are proposed on State and private land in the project area or in Management Area 5.15 Forest Products, Ecological Maintenance and Restoration.

This alternative modified the proposed action scoped in 2015 by adding mechanical hazard tree clearing along level 1 roads that would be used to implement the vegetation management actions in the 2016 modified proposed action. Hazard trees would be cleared along roads that are not open for public travel and were not analyzed in the 2008 hazard tree environmental assessment and decision notice for the Medicine Bow-Routt National Forests. Watershed analysis refined design criteria for stream health protection by quantifying the extent to which harvest should be deferred in specific watersheds. Additional design criteria to guide management in the immediate Continental Divide National Scenic Trail corridor were developed in coordination with the Rocky Mountain Regional Office and national Continental Divide Trail Coordinator.

Table 1. Timber harvest activities under the modified proposed action.

Activity	Amount in Acres or Miles
Salvage harvest	5,634 acres
Precommercial thinning	1,035 acres
Temporary road construction and reclamation	24 miles
Clearing hazard trees	6.8 miles along fences 0.5 miles along water conveyance ditches 7.5 miles along maintenance level 1 roads
Extra slash treatment to create fuel breaks	220 acres

Table 2. Transportation system changes under the modified proposed action*

Activity	Amount in Miles
Relocate existing system roads to reduce resource damage	0.75
Add specific unauthorized routes to the designated road and trail system	5.5
Changing road or route segments to off-highway vehicle trails	2.6
Decommissioning roads adversely affecting watershed condition and wildlife habitats	20.1

*The location and uses of 137 miles of national forest system roads would not change.

No-action Alternative

The no-action alternative represents the existing condition and trend for resources in the project area. No additional timber harvest, salvage, silvicultural treatments, or changes to the existing designated road and motorized trail systems would be authorized or implemented to accomplish project goals. Additional National Environmental Policy Act analyses and decisions would be required in the future to implement any vegetation management or to designate the minimum road system as required by the 2005 Travel Management Rule (36 CFR 212, Subpart A).

Major Conclusions

Management actions proposed for this project would have both beneficial and adverse effects on natural resources in the North Savery area. Vegetation treatments are intended to create desired conditions and would have beneficial effects on timber stands. Proposed actions for the transportation system are intended to retain forest access for recreation and land management and to mitigate adverse conditions in watersheds and wildlife habitats. Many adverse effects of these activities can be avoided through careful design (see design criteria starting on page 82) and compliance with existing regulations. Table 3 summarizes the effects to watershed conditions, wildlife habitat, and recreation experiences and visual resources along the Continental Divide National Scenic Trail. A summary of effects to other resources is in table 20 starting on page 88. The complete effects discussion is in Chapter 3 starting on page 95.

Table 3. Summary of effects to watershed condition, wildlife habitat, and the Continental Divide National Scenic Trail.

Resource	Effects from the No-action Alternative	Effects from the Modified Proposed Action
Stream stability	Existing resource damage associated with current system roads and user-created routes would continue and possibly get worse. Some stream channels at risk of instability from existing degraded watershed condition.	Long-term stability of streambeds and streambanks expected at all decommissioned road-stream crossings. Some stream channels at greater risk of instability from cumulative effects of North Savery and other actions in watersheds with degraded existing conditions.
Streamflow	Predicted measurable increases in North Fork Savery Creek, McLain Creek, Jack Creek, North Spring Creek flows. May cause increased erosion and stream habitat changes.	Further increases in runoff and peak flows expected in portions of the project area. Effects greater in watersheds with the most proposed harvest: North Fork Savery Creek, Nugget Creek, McLain Creek, Jack Creek, and North Spring Creek.
Erosion and sedimentation	No temporary roads, landings or skid trails, so no new erosion or additional compaction at these sites. Existing resource damage associated with current system roads and user-created routes would continue and possibly get worse. Some impacts from nonsystem routes would be reduced as these were decommissioned.	Increased erosion and sediment in streams from 7 miles of temporary road within stream connected disturbed areas, and from harvest units, landings, and skid trails. Reduced runoff, erosion, and sedimentation from road decommissioning or relocation of system roads. Adding 6 miles of user-created routes would perpetuate the existing soil erosion and sedimentation at these sites unless maintenance was improved.

Resource	Effects from the No-action Alternative	Effects from the Modified Proposed Action
Canada lynx prey species	Habitat for, and abundance of, snowshoe hare and red squirrel (prey species) would decline for a period of time until hiding cover regenerates.	Proposed timber management would retain recruitment trees, snags, and coarse woody debris to contribute toward prey habitat in the future.
Pygmy shrew, American marten, northern goshawk, greater sage-grouse, boreal owl, olive-sided flycatcher, Brewer's sparrow, hoary bat, Hudsonian emerald, and western bumble bee	Decommissioning unauthorized routes would restore minor amounts of habitat. Coarse woody debris from beetle-killed trees would provide habitat for pygmy shrew and American marten.	Decommissioning existing system roads would restore additional minor amounts of habitat. Habitat removed by timber harvest would be lost to beetle kill if no harvest occurred. Some disturbance to pygmy shrews, greater sage-grouse, and Hudsonian emeralds from harvest activities.
Brown creeper, snowshoe hare, American three-toed woodpecker, golden-crowned kinglet, Lincoln's warbler, Wilson's warbler	Decommissioning unauthorized routes would restore minor amounts of habitat. This would likely improve territory quality for a few individuals. Beetle-killed stands would become unsuitable habitat for brown creeper and golden-crowned kinglet. Over time, snags from beetle-killed trees would provide communal winter roost sites for golden-crowned kinglets.	Decommissioning existing system roads would restore additional minor amounts of habitat. Brown creeper and snowshoe hare habitat removed by timber harvest would be lost to beetle kill if no harvest occurred. Forest Plan standards for recruitment trees, snags, and coarse woody debris would retain some future habitat for prey insects in harvested areas. Some displacement of snowshoe hares from harvest areas during activities.
Continental Divide National Scenic Trail	Falling trees and downed trees would make navigating the trail difficult and more hazardous than usual. Existing scenic integrity objectives for the 14 miles of trail in the project area are high to very high. Scenic integrity objectives do not evaluate natural changes to landscape.	Tree removal along the trail would improve navigation and safety. Managed areas along the trail would be unlikely to meet scenic integrity objectives of high to very high for 3 to 5 years after harvest. Scenic integrity would improve over time as understory vegetation obscured the evidence of timber salvage.

Decision to be Made

Based upon the effects of and public comments on the alternatives, the responsible official will decide whether to:

- implement any or all of the silvicultural and hazardous fuels reduction treatments proposed;
- salvage timber from harvest units up to the maximum acres determined by design criteria;
- allow construction of temporary roads to access vegetation treatments;
- add unauthorized routes to the transportation system to maintain motorized public access in some portions of the project area, including bringing routes to **engineered** road standards;
- remove certain roads from the system network to **reduce road density** and associated resource impacts so that cumulative effects from vegetation management are minimized;
- authorize physical restoration of certain roads and trails; and
- convert certain roads to motorized trails and construct new motorized trail segments to connect them.

Whether to obliterate and restore unauthorized routes is not a decision to be made, but the analysis includes effects disclosure for the methods believed best to physically restore the natural condition of those route locations.

Contents

Summary.....	i
What is Being Proposed and Why.....	i
Current Conditions in the Project Area	ii
Background, Public Involvement, and Issues Raised	ii
Alternatives Analyzed.....	iii
Major Conclusions.....	v
Decision to be Made	vii
Chapter 1. North Savery Project Development	1
Overview	1
Decision Framework.....	2
Introduction	3
Management Direction – Law, Regulation, and Policy	5
North Savery Project Modified Proposed Action	15
Affected Environment	20
Purpose and Need for Action	58
Chapter 2. Proposed Action and Alternatives	61
Overview	61
Public Involvement and Collaboration	61
Issues for Alternative Development and Analysis.....	62
Alternatives Considered in Detail.....	63
Alternatives Considered but Eliminated from Detailed Study	87
Comparison of Alternatives.....	88
Chapter 3. Environmental Consequences	95
Silviculture and Timber	95
Fire and Fuels	98
Transportation System and Travel Management	102
Continental Divide National Scenic Trail Corridor.....	106
Watershed Condition	108
Terrestrial Wildlife.....	112
Fish, Amphibians, and Other Aquatic Organisms.....	122
Inventoried Roadless Areas.....	123
Greenhouse Gas Emissions, Carbon Sequestration, and Climate Change	126
Cultural Resources.....	127
Botany and Rare Plants	128
Rangeland Management	130
General Recreation	133
Scenic Resources	136
Cumulative Effects Summary – All Resources	136
Forest Plan Consistency Summary – All Resources	144
Disclosure of Impacts to the Human Environment	149
Other Required Disclosures.....	149
Chapter 4: Administrative Material	165
Preparers and Contributors.....	165
Distribution of the Draft Environmental Impact Statement	173
References	179

Index.....	191
Appendices: Detailed Descriptions of Proposed Action Elements	195
Appendix A. Summary of Proposed Harvest in Project Area 7 th -Level Hydrologic Unit Code Watersheds.....	195
Appendix B. North Savery Proposed Actions and Rationale for National Forest Road System Decommissioning or Management Changes	199
Appendix C. Comparison of 2015 Travel Analysis Recommendations for the North Savery Project Area Road System with the 2017 North Savery Proposed Actions for Transportation System Changes and Travel Management (updated 7/13/2017)	202

List of Tables

Table 1. Timber harvest activities under the modified proposed action.	iv
Table 2. Transportation system changes under the modified proposed action*	iv
Table 3. Summary of effects to watershed condition, wildlife habitat, and the Continental Divide National Scenic Trail.....	v
Table 4. Management area (MA) prescriptions for the North Savery project area	7
Table 5. Timber harvest and other vegetation management activities under the modified proposed action.	16
Table 6. Transportation system changes and travel management proposals under the modified proposed action*	16
Table 7. Limited activities are proposed in Management Areas 3.31, 3.5, 8.6 and 8.21.....	17
Table 8. Proposed activities in Management Area 5.13 General Forest and Rangelands, Forest Products Emphasis (33,485 acres)	17
Table 9. Proposed activities in Management area 5.12 General Forest and Rangelands, Rangeland Vegetation Emphasis (7,386 acres).....	17
Table 10. Existing forested vegetation cover type and size class diversity in the North Savery project area	22
Table 11. Timber harvest since 1975 in the North Savery project area	30
Table 12. Miles of existing National Forest System roads in the North Savery project area	37
Table 13. Inventoried roadless areas and proposed activities in the North Savery Project Area.	41
Table 14. Management indicator species from the Medicine Bow Forest Plan and their associated habitats.	51
Table 15. Proposed activities in Management Area 5.13 General Forest and Rangelands, Forest Products Emphasis (33,485 acres)	65
Table 16. Proposed activities in Management area 5.12 General Forest and Rangelands, Rangeland Vegetation Emphasis (7,386 acres).....	65
Table 17. Proposed activities in other management areas.	65
Table 18. Transportation system and travel management proposals.	74
Table 19. Proposed national forest road and motorized trail system for North Savery project area	80
Table 20. Comparison of effects from the no-action alternative and the modified proposed action	89
Table 21. Existing forested vegetation cover type and size class diversity in the North Savery project area.....	96
Table 22. Other vegetation cover types in the North Savery project area.....	96

Table 23. Expected compaction in the North Savery project area.....	98
Table 24. Proposed designated National Forest road and motorized trail system for North Savery project area.....	103
Table 25. Effects of proposed action on roadless characteristics of three inventoried roadless areas (IRAs) partially within North Savery project area	125
Table 26. North Savery project components crosswalk between purpose and need and the Healthy Forests Restoration Act (HFRA) authority and objectives.....	158
Table 27. Relationship of recreation opportunity spectrum (ROS) classes and scenic integrity objectives (SIO) objectives (USDA Forest Service 2009).....	162
Table 28. Interdisciplinary team members and forest service resource specialists.....	165
Table 29. Content analysis of comments received during public comment period from December 1, 2015 to February 1, 2016.....	168
Table 30. North Savery proposed actions and rationale for travel management.....	199
Table 31. Comparison of North Savery transportation system proposed actions and actions in the 2015 Travel Analysis Report.....	202
Table 32. Comparison of North Savery proposed actions for unauthorized routes and actions in the 2015 Travel Analysis Report.....	215

List of Figures

Figure 1. Vicinity map of North Savery project area, Medicine Bow National Forest, Wyoming ..	4
Figure 2. Management areas, inventoried roadless areas, and the current road system in the North Savery project area	8
Figure 3. Extent of insect and disease damage in North Savery project area (2005 to 2015) and Farm Bill priority treatment area designation.....	11
Figure 4. Proposed locations of harvest units, thinning units, hazard tree clearing, fuel breaks and temporary roads in the North Savery project area	18
Figure 5. Transportation system and proposed travel management elements of the modified proposed action.....	19
Figure 6. Aerial image of North Savery project area and surrounding landscape (NAIP 2012) ...	21
Figure 7. Vegetation cover types based on dominant life form in the North Savery project area.	23
Figure 8. Map of North Savery Project and surrounding forest area showing the extent of insect and disease damage documented during annual aerial surveys from 2005 to 2015	24
Figure 9. Past timber harvest in the North Savery project area displayed by type of activity.....	29
Figure 10. Existing forest fuels condition and fire regime from LANDFIRE modelling**	31
Figure 11. Carbon County communities at risk identified in 2016 Community Wildfire Protection Plan update and areas within 1.5 miles of communities at risk.....	33
Figure 12. Current motor vehicle use map for the North Savery project area portion of the Sierra Madres, Brush Creek/Hayden Ranger District	36
Figure 13. Recreation opportunity spectrum and scenic integrity objectives for the North Savery project area	40
Figure 14. Overall watershed condition rating for North Savery project area from the nationwide Forest Service Watershed Condition Framework.....	43
Figure 15. Some watersheds in the North Savery project area have impaired function, due in part to high densities of existing open roads	44

Figure 16. Part of the upper Sierra Madre lynx analysis unit and Forest Plan inventoried and mapped old growth stands in the North Savery area.....	48
Figure 17. General and priority habitats for greater sage-grouse identified in the 2015 greater sage-grouse Forest Plan amendment	50
Figure 18. Livestock grazing allotments, pastures, fencelines, irrigation ditch, and stock ponds in the North Savery project area	55
Figure 19. Deadfall across post and wire boundary fence in the Jack Creek Allotment. Yellow arrows indicate series of fence posts moving away from viewer.....	56
Figure 20. Two lodgepole pine stands in the Bud Project area, just south of the North Savery project area, with different understory characteristics. These stands demonstrate the differences in existing stand condition, natural regeneration, fuel types, and habitats.....	67
Figure 21. Proposed locations of harvest units, thinning units, hazard tree clearing, fuel breaks, and temporary access roads	70
Figure 22. Estimated location of temporary roads in the North Savery project area compared to the existing system road network.....	73
Figure 23. Proposed changes to the transportation system and travel management in the North Savery project area	75
Figure 24. National Forest System Road 803.3F is proposed for decommissioning due to its location along an ephemeral stream and the deep ruts that contribute to degradation of water resources. Addition of an unauthorized route in a better location to the southeast would provide improved access to this area of the forest.	77
Figure 25. Proposed transportation system after implementation of 2017 North Savery proposed action	81
Figure 26. Vegetation mosaic after treatment showing treated lodgepole stands in matrix of mountain pine beetle mortality and other species.	97
Figure 27. Changes to existing fuels condition classes and fire regime as a result of fuel reduction and removal through North Savery Project	101
Figure 28. Transportation system network that would result from implementation of the North Savery modified proposed action	104
Figure 29. Proposed motor vehicle use map that would result from implementation of the North Savery modified proposed action.....	105
Figure 30. Detail map showing proposed actions within 0.5 miles of the Continental Divide National Scenic Trail.....	107
Figure 31. Larger streams in the analysis area with potential to be impacted by increases in streamflow magnitude from harvest and disturbance.....	111
Figure 32. Proposed action locations with respect to priority and general greater sage-grouse habitats in the 2015 sage-grouse amendment.....	118
Figure 33. Existing road density compared to effects of proposed action related to wildlife habitat	121
Figure 34. Proposed actions in livestock grazing allotments in the North Savery project area ..	132
Figure 35. Comparison of areas accessible within 0.5 miles of the proposed designated motorized routes compared to existing access	135

Chapter 1. North Savery Project Development

The overall objective of the North Savery Project is to manage forest stands and the associated transportation system to restore future landscape resiliency by accelerating restoration of stands damaged by insects and disease, maintaining emergency access to and egress from National Forest System lands and inholdings, and restoring watersheds to a condition that would be more resilient to runoff and sedimentation during extreme conditions and events.

Overview

The Forest Service has prepared this draft environmental impact statement in compliance with the National Environmental Policy Act, the Healthy Forests Restoration Act, and other relevant Federal and State laws and regulations. It is the basis for making public disclosures and for informing the deciding official of the existing conditions and considerations about direct, indirect, and cumulative environmental impacts that would result from implementing the North Savery Project.

The modified proposed action is the Forest Service's preferred alternative. The focus of the modified proposed action is timber salvage and silvicultural treatments to reduce hazardous fuels and to improve stand conditions for forest resiliency and timber production. **Connected actions are to clear hazard trees, create fuel breaks, and manage the transportation system. Connected actions are an integral part of the modified proposed action, and are included to improve public safety, manage access, and mitigate impacts to watersheds and habitat.**

Information in this draft environmental impact statement compares the impacts of implementing the no action with expected impacts of the modified proposed action. Some effects may be significant. Both beneficial and adverse impacts are described. Design criteria are included to mitigate anticipated effects through avoidance and minimization. These criteria are necessary to ensure components of the modified proposed action, if implemented, would be consistent with laws, regulations, and policies for protection of the natural and human environment. The proposed activities have been evaluated with respect to requirements of the Healthy Forests Restoration Act that shape the authorized scope and purpose of proposed projects. The draft environmental impact statement also documents interagency coordination and public involvement.

This draft environmental impact statement has been streamlined to emphasize information critical to understanding the project. It summarizes, and incorporates by reference, information that would make the document longer without substantially contributing to understanding of the pivotal issues. In addition, the organization of material may be different than readers have seen in other environmental impact statements.

Chapter 1 includes a brief introduction and any information that is important to understand the purpose and need for the proposal. This includes descriptions of the affected environment and existing conditions for key resources related to the modified proposed action and its anticipated effects. These discussions focus on forest vegetation, fuels, the Continental Divide National Scenic Trail, watersheds, and wildlife habitat conditions. Other material is summarized and incorporated by reference to documents in the project file.

Chapter 2 presents full details of the modified proposed action and other alternatives. Processes for collaboration, public involvement, and how input has been used are also described. Three issues have been identified. Issues form the basis for many design criteria and other modifications of the modified proposed action. Iterative modification addresses issues identified by the interdisciplinary team, cooperating agencies, or the public. Design criteria identified by the interdisciplinary team to address issues and ensure Forest Plan consistency are also described in this chapter. Design criteria included in the environmental impact statement have been selected or synthesized from a larger set suggested by resource specialists and reflect the leader's intent of the responsible official.

In Chapter 3, the issues also have been used to focus analysis of environmental consequences, cumulative effects, and consistency with applicable law, regulation, and policy. Again, these discussions focus on forest vegetation, fuels, the Continental Divide National Scenic Trail, watershed, and wildlife habitat conditions.

Chapter 4 includes administrative materials including the composition of the interdisciplinary team, individuals, and organizations contacted; and a summary of public comments provided during scoping. These comments are referenced throughout Chapters 1, 2, and 3 where they have informed and influenced the project and analysis.

Appendix A is a summary of proposed harvest in each 7th-level hydrologic unit code watershed for the modified proposed action.

Appendices B and C are included to document the interdisciplinary team's rationale for proposed changes to the transportation system, including whether the project would implement, or vary from, recommendations made in the 2015 Travel Analysis Report.

Additional documentation, including the complete analyses for project area resources, may be found online at <https://www.fs.usda.gov/project/?project=47913>, and in the project record located at the Brush Creek/Hayden Ranger District in Saratoga, Wyoming.

Decision Framework

After reviewing this information and comments from the public and cooperating agencies, the responsible official will decide whether additional alternatives or analyses are required to complete this environmental impact statement. Based on information in the final statement and from pre-decisional review, the responsible official will decide whether to adopt and implement the modified proposed action; implement an alternative to, or further modification of, the modified proposed action; or take no action with respect to some or all components of the North Savery Project.

Key considerations in the decision include tradeoffs between short-term impacts and long-term productivity and actions with adverse effects on some resources and beneficial effects on others.

Specific decisions to be made include whether to:

- implement any or all of the silvicultural and hazardous fuels reduction treatments proposed;
- salvage timber from harvest units up to the maximum acres determined by design criteria;

- allow construction of temporary roads to access vegetation treatments;
- add unauthorized routes to the transportation system to maintain motorized public access in some portions of the project area, including bringing routes to engineered road standards;
- remove certain roads from the system network to reduce road density and associated resource impacts so that cumulative effects from vegetation management are minimized;
- convert certain road segments to designated motorized trails to reduce resource impacts; including construction of short connector trails in more sustainable locations than the existing system roads; and
- physically obliterate and restore unauthorized routes using best available methods.

Introduction

The North Savery project area is located at the northern terminus of the Sierra Madre mountain range on the Brush Creek/Hayden Ranger District, Medicine Bow National Forest. The project area is approximately fifteen miles northwest of the town of Encampment in Carbon County, Wyoming. The project area includes Townships 14, 15, and 16 North, Ranges 86, 87, and 88 West. It is defined by watershed boundaries on the southwest and southeast, and by the national forest boundary on the north, west, and east. The entire project area encompasses approximately 45,700 acres; including 44,572 acres of National Forest System lands (98 percent), 357 acres of State of Wyoming land (less than 1 percent), and 769 acres of private land (2 percent). Elevations range from about 7,800 feet to almost 11,000 feet on the Continental Divide near Bridger Peak. Approximately 3,586 acres (8 percent) of the project area are in three inventoried roadless areas. Figure 1 is a map of the project area and figure 2 shows the project management areas, inventoried roadless areas, and current road system.

In August 2007, the Brush Creek/Hayden District completed the Savery landscape-scale assessment to identify potential land management projects in the larger Savery area in the western portion of the district. North Savery is the northern portion of the Savery area. Proposed actions for the Savery area were developed starting in 2008 and scoped with the public in 2010. The Savery project was delayed between 2011 and 2013 while the Medicine Bow-Routt National Forests personnel responded to the immediate hazards from the Rocky Mountain Region mountain pine beetle incident.

Work resumed with the decision to implement the Bud Project in 2013, which authorized actions in a portion of the original Savery area. The Bud project is now being implemented, and is providing valuable lessons about timber salvage in beetle-killed stands. Those lessons have informed design and analysis of the North Savery Project. Potential actions in the eastern portion of the original Savery analysis area are also being analyzed in the pending landscape vegetation analysis for the Sierra Madre and Snowy Ranges.

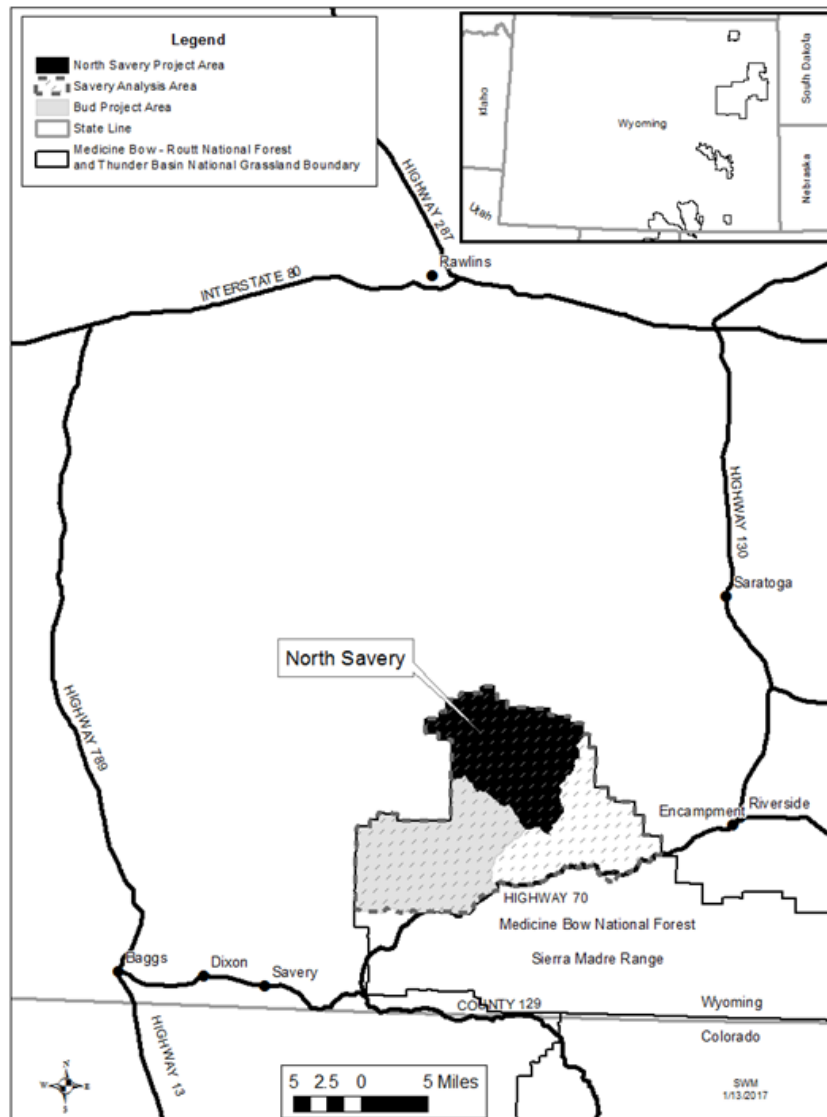


Figure 1. Vicinity map of North Savery project area, Medicine Bow National Forest, Wyoming

The Healthy Forests Restoration Act was enacted “to improve the capacity of the Secretary of Agriculture and the Secretary of the Interior to conduct hazardous fuels reduction projects on National Forest System lands and Bureau of Land Management lands aimed at protecting communities, watersheds, and certain other at-risk lands from catastrophic wildfire, to enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape, and for other purposes.”

The overall objective of the North Savery Project is to manage forest stands and the associated transportation system to restore future landscape resiliency by accelerating restoration of stands damaged by insects and disease, maintaining emergency access to and egress from National Forest System lands and inholdings, and restoring watersheds to a condition that would be more resilient to runoff and sedimentation during extreme conditions and events. This objective is consistent with the authorities and requirements of the Healthy Forests Restoration Act.

In 2014, the Governor of Wyoming used the authorities of the newly enacted Farm Bill amendment to the Healthy Forests Restoration Act to request that the North Savery area as a priority landscape for treatment due to impacts from insects and disease under Title VIII S8204 of the 2014 Farm Bill Amendment to the Healthy Forests Restoration Act. The Chief of the Forest Service designated it as such on May 20, 2014. In subsequent action, the entire Medicine Bow National Forest was designated an insect and disease area on March 22, 2017.

Information on these acts is available here:

www.forestsandrangelands.gov/resources/overview/hfra-implementation12-2004.shtml and www.fs.fed.us/farmbill/index.shtml. This designation allows the Forest Service to expedite decision making for forest treatments to restore lodgepole pine stands in this high-productivity, timber production area of the Medicine Bow National Forest back into active production and to deliver forest products to local mills before materials lose merchantable value. At the same time, the decision to be made includes important watershed restoration activities to achieve a more resilient forest landscape in the future. Authorities in the Healthy Forests Restoration Act allow fewer alternatives to be considered in detail, but the North Savery analysis fully addresses the issues brought forward by the interdisciplinary team, cooperators, and the public through detailed analysis of the no-action alternative and modifications to the proposed action.

The North Savery Project draft environmental impact statement focuses on a proposed action that is slightly different than was described for scoping in 2015. Changes to the proposed action include addition of hazard tree clearing on level 1 roads, more specific design criteria to protect the Continental Divide National Scenic Trail corridor, additional watershed-specific design criteria to mitigate cumulative effects, and minor changes to transportation system proposals.

After public scoping comments and during preparation of this draft environmental impact statement, the team used an iterative alternative development process to address internal and public issues, and to reduce adverse environmental effects from project implementation. Iterative alternative development is allowed under 36 CFR 220.5(e) (1): “The responsible official may modify the proposed action and alternative(s) under consideration prior to issuing a draft EIS.” Additional iteration, alternative development, or both may occur between the draft and final environmental impact statements.

Management Direction – Law, Regulation, and Policy

The Medicine Bow National Forest Land and Resource Management Plan 2003 Revision (Forest Plan) includes goals, objectives, and strategies to provide an overall strategy for managing the national forest. It also contains forestwide, geographic area, and management area direction to guide natural resource management and other activities. Additional direction for this project is drawn from the 2001 Roadless Area Conservation Rule; Travel Management Rule (36 CFR 212 2005 and 2015 revision; Southern Rockies lynx Amendment of the Forest Plan (2008); Continental Divide National Scenic Trail Comprehensive Plan (2009); 2014 Farm Bill Amendment to the 2003 Healthy Forests Restoration Act; and the greater sage-grouse amendment of the Forest Plan (2015). Other specific executive orders and directives are included where fitting.

Forest Plan management direction is implemented with the most site-specific (management area) direction overriding more general (forestwide or geographic area) direction. The North Savery Project specifically addresses several Forest Plan priorities:

- Goal 1: Ensure Sustainable Ecosystems (Forest Plan pages 1-3 to 1-6)
 - ◆ Sub-Goal 1.b: Provide ecological conditions to sustain viable populations of native and desired non-native species.
 - Strategy e: Implement management practices such as prescribed burning, timber harvest, thinning, and livestock grazing that mimic natural disturbances to move landscapes toward desired vegetation composition and structure.
 - ◆ Sub-Goal 1.c: When appropriate or where necessary to meet resource management objectives, increase the amount of forests and rangelands restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases, and invasive species.
 - Objective 3: Within 10 years, implement vegetation management activities in areas most susceptible to losses from insects and disease as directed in management area and geographic area direction. Limit mortality from insect and disease outbreaks in management areas where primary emphasis is timber production or developed recreation.

Strategy g: Plan management activities by considering the potential for insect and disease outbreaks. Design management activities to meet or enhance management area objectives.
- Goal 2: Provide Multiple Benefits to People (Forest Plan page 1-9)
 - ◆ Sub-Goal 2.c: Improve the capability of the Nation's forests and rangelands to provide a desired sustainable level of uses, values, products, and services.
 - Objective 1: Between the Medicine Bow and Routt National Forests, implement a consistent timber program each year.

Strategy b: Strive to offer to the public sawtimber, products other than logs, and firewood at the average annual Total Sale Program Quantity.

How to accomplish these priorities most effectively while limiting adverse impacts to other resources and programs is the focus of analysis and disclosure in this draft environmental impact statement. Consistency with requirements for meeting specific Forest Plan standards and guidelines for activities is described in Chapter 3 – Environmental Consequences

Forest Plan Direction – Geographic Areas

The North Savery project area encompasses portions of two Forest Plan geographic areas: North Savery and Northeast Sierra Madre. Proposed actions are consistent with direction for both geographic areas. North Savery geographic area direction to strategically identify motorized trail opportunities (Forest Plan, page 3-45) was considered while identifying watershed mitigation measures described in Chapter 2.

Forest Plan Direction – Management Areas

The North Savery Project area includes portions of seven management areas (table 4 and figure 2). Most proposed timber salvage, silvicultural treatments, and road system management actions are focused in Management Areas 5.12 and 5.13.

There are 44,573 acres of National Forest System lands in the project area and 1,127 acres of State and private land. The total acres in the North Savery project area equal 45,700.

Table 4. Management area (MA) prescriptions for the North Savery project area

MA #	Forest Plan Management Area Prescription and Description	Acres
5.13	Forest Products Emphasis: Produce commercial wood products.	33,485
5.12	General Forest and Rangelands, Rangeland Vegetation Emphasis: Sustain values associated with areas of woody vegetation and open grassland and provide habitat and forage for livestock and wildlife.	7,386
8.21	Developed Recreation Emphasis: Provide an array of recreational opportunities and experiences in a forested environment, with highly-developed multiple-use recreation complexes.	27
8.6	Administrative Sites: Manage administrative sites and facilities to meet Forest Service needs.	60
3.5	Forested Flora or Fauna Habitat Emphasis, Limited Snowmobiling: Provide adequate forage, cover, escape terrain, solitude, breeding habitat, and protection for wildlife and plant communities.	3,136
3.31	Backcountry Recreation Emphasis, Year-round Motorized: Provide recreation opportunities on primitive roads and trails in a landscape with a natural appearance.	476
5.15	Forest Products, Ecological Maintenance and Restoration: Maintain or restore healthy ecological conditions while providing for a mix of ecological and human needs, including wood products.	3

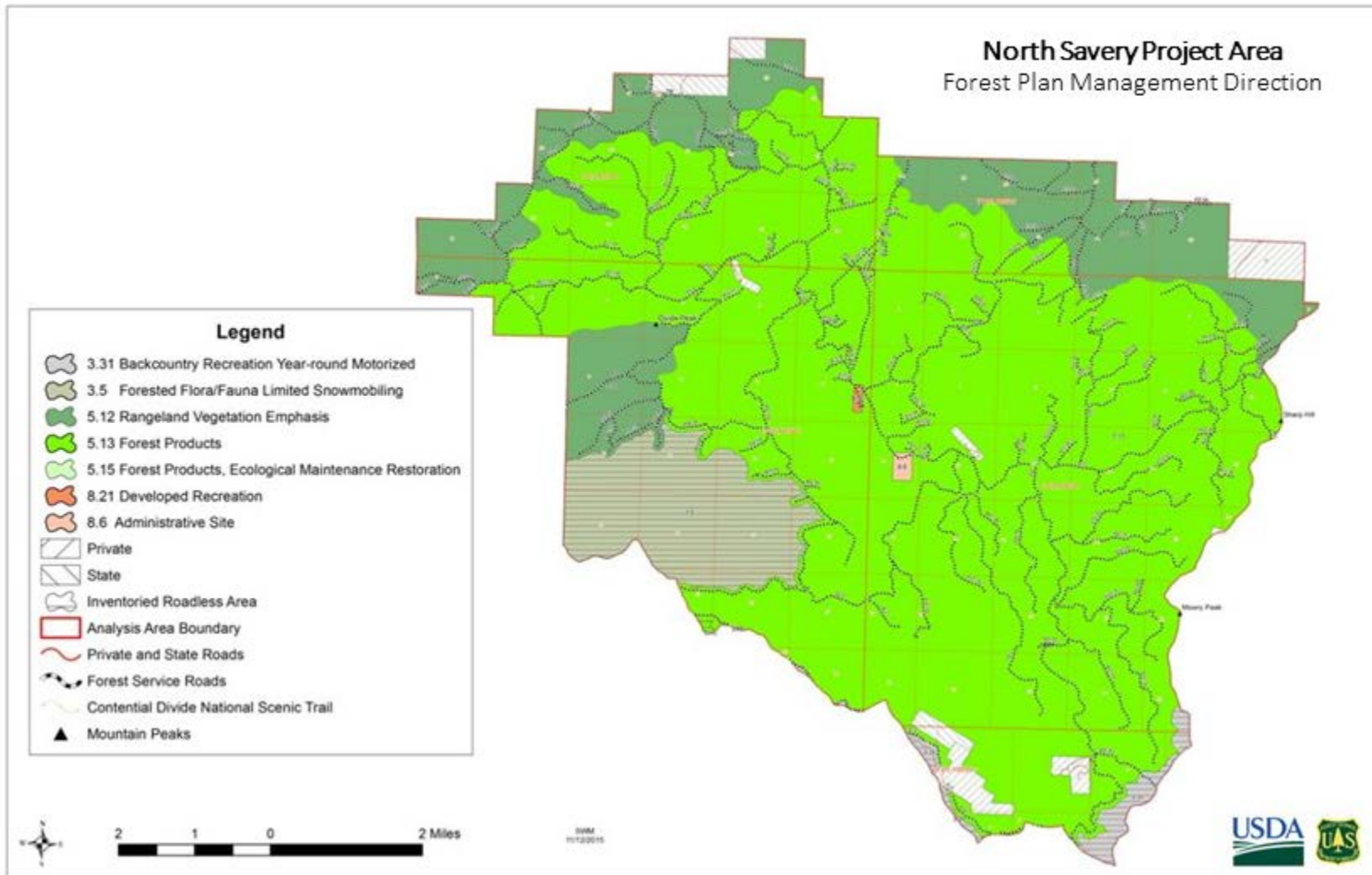


Figure 2. Management areas, inventoried roadless areas, and the current road system in the North Savery project area

Forest Plan Direction – Southern Rockies Lynx Amendment (2008)

The Southern Rockies Lynx Amendment amends forest plans in Colorado and on the Medicine Bow National Forest in Wyoming (USDA 2008c). The amendment decision supersedes the 2006 Lynx Conservation Agreement (USDA 2006) for national forests covered by the amendment, which includes the Medicine Bow-Routt National Forests.

All lynx habitat for the national forests in the southern Rockies is identified as occupied in the amendment. The amendment provides standards and guidelines for various management activities (vegetation management, recreation, forest roads and trails, highways, and oil and gas leasing) to establish management direction that conserves and promotes the recovery of lynx and reduce or eliminate potential adverse effects from land management activities. One goal (conserve the Canada lynx) and thirteen objectives were developed. Standards are management requirements to meet the objectives and cannot be deviated from. Under the amendment, standards are applied only to vegetation management activities that have the potential to directly affect snowshoe hare prey and thus impact lynx at the population level. Guidelines are recommended management and any deviations from guidelines would be considered after analysis of site-specific conditions and in compliance with Endangered Species Act Section 7 consultation requirements.

The upper Sierra Madre lynx analysis unit overlaps with the southern part of the North Savery project area and considerations under the amendment apply in that area. Consultation with the U.S. Fish and Wildlife Service is underway for the North Savery Project.

Forest Plan Direction – Greater Sage-grouse Amendment (2015)

In March 2010, the U.S. Fish and Wildlife Service found that the listing of the greater sage-grouse as threatened or endangered was warranted but precluded by higher priority listings. In their decision, the U.S. Fish and Wildlife Service identified the inadequacy of regulatory mechanisms (that is, forest plan conservation measures) as a significant threat to greater sage-grouse now and in the foreseeable future (75 Federal Register 13910, March 23, 2010). The Forest Service and Bureau of Land Management recognized the need to incorporate explicit objectives and concrete conservation measures into their land and resource management plans to conserve greater sage-grouse habitat and potentially avoid the need to list the species under the Endangered Species Act. The goal of incorporating these specific conservation measures into Forest Service forest plans is to protect, enhance, and restore greater sage-grouse and its habitat and to provide sufficient regulatory certainty that the need for listing can be avoided.

Identifying the affected National Forest System lands to be managed as greater sage-grouse habitat was a component of the Forest Plan amendment decision (USDA Forest Service 2015b). Although the majority of greater sage-grouse habitat is not located on the Medicine Bow National Forest, there are small areas of identified priority and general greater sage-grouse habitats along the low elevation forest-shrub interface along the forest boundary in the North Savery project area. Consistency with applicable Forest Plan guidance for greater sage-grouse with the modified proposed action is one of the findings required for approving the North Savery Project. Several of the project cooperating agencies identified the need for clarification on this point during an early review of the draft environmental impact statement. Additional information is now included with the “Affected Environment” material in this chapter and in Chapter 3 – Environmental Consequences.

Healthy Forests Restoration Act (2003) and Farm Bill Amendment (2014)

The North Savery Project has been designed to use the authorities that the Healthy Forests Restoration Act includes to improve planning processes for hazardous fuel reduction projects on certain types of at-risk National Forest System and Bureau of Land Management lands. The Healthy Forests Restoration Act as amended also provides other authorities and direction to help reduce hazardous fuels and restore healthy forest and rangeland conditions on lands of all ownerships. Specifically, Title I provides authorities for expedited vegetation treatments on certain types of National Forest System and Bureau of Land Management lands that are at risk of wildland fire; have experienced wind throw, blowdown, or ice storm damage; are currently experiencing disease or insect epidemics; or are at imminent risk of such epidemics because of conditions on adjacent land.

Implementation of projects using the authorities provided by the Healthy Forests Restoration Act and Farm Bill Amendment is a priority for the Forest Service. Criteria for designation of treatment areas include consideration of whether an area is:

- experiencing forest health decline based on annual forest health surveys;
- at risk of experiencing substantially increased tree mortality based on the most recent Forest Health Protection Insect and Disease Risk Map; or
- contains hazard trees that pose an imminent risk to public infrastructure, health, or safety.

The North Savery project area is included in insect and disease priority areas requested by the Governor of Wyoming and designated by the Chief of the Forest Service. Section 602 of the Healthy Forests Restoration Act required the U.S. Department of Agriculture to designate, as requested by the Governors and as part of an insect and disease treatment program, at least one landscape area (such as a subwatershed or 6th-level hydrologic unit code watershed) in at least one national forest in each State that is experiencing an insect and disease epidemic on federal lands defined by Section 102. The Secretary could designate additional areas to address insect and disease threats after the initial 60-day period. The National Forest System lands surrounding the North Savery Project were designated for insect and disease treatment on May 20, 2014. On March 22, 2017, the remainder of the Medicine Bow National Forest was designated according to Section 102. Figure 3 displays the extent of insect and disease damage and designation as a priority treatment area for the North Savery Project. Information on other State designations can be found at <http://www.fs.fed.us/farmbill/areadesignations.shtml>.

The North Savery project area reflects the defining features of priorities for forest restoration: wildland-urban interface, communities at risk, or both in community wildfire protection plans, condition class III on federal lands in watersheds at risk, federal lands in which epidemic disease is a factor, areas where fuel reduction will provide habitats for threatened or endangered species protection from catastrophic wildfire, and areas where forest conditions pose risks for public safety and infrastructure. Complexity of interrelated transportation proposals was recognized early on in the project, and the district sought advice on using Healthy Forests Restoration Act authorities for this project. Coordination with other Healthy Forests Restoration Act planning specialists in the Northern and Rocky Mountain Regions of the Forest Service in 2015 concluded with the understanding that the agency's national headquarters supports flexibility in using the Healthy Forests Restoration Act projects to address a broad range of activities to restore forest resiliency. The North Savery Project uses that flexibility.

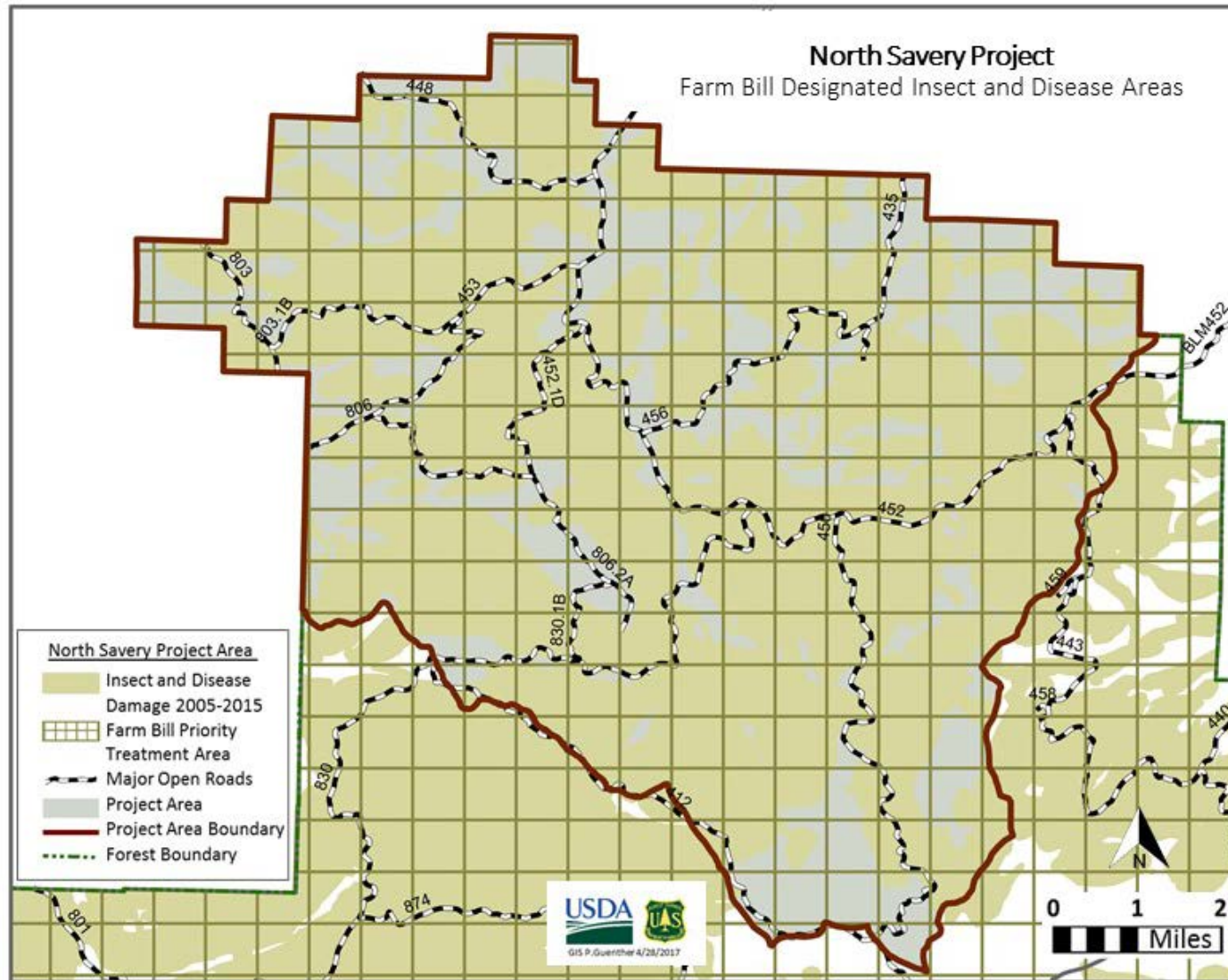


Figure 3. Extent of insect and disease damage in North Savery project area (2005 to 2015) and Farm Bill priority treatment area designation

The need for forest management actions to restore resiliency in the North Savery project area occurs in tandem with by the need to stabilize and restore watershed condition concurrent with regeneration of timber production stands. Just as restoration of active growth and production to increase resilience of forest stands, changes to the forest transportation system are crucial to achieving long term stream health and watershed resilience to extreme conditions and events. The North Savery Project also demonstrates the adaptation of new methods to integrate resource management actions and expedite planning so that action can be taken to address urgent needs in our nation's forests and watersheds in compliance with the Forest Plan and Forest Service mission.

Under Section 602(d), priority projects that reduce the risk or extent of, or increase the resilience to, insect or disease infestation may be carried out in designated areas in accordance with Sections 102(b)(c)(d), 104, 105, and 106 of the Healthy Forests Restoration Act, which provide for expedited National Environmental Policy Act reviews, pre-decisional objection review, and guidance on judicial review. This authority is available for projects for which scoping has been initiated by September 30, 2018. The North Savery Project was initiated for scoping on December 1, 2015.

The Forest Service and Bureau of Land Management developed decision screens to help land managers determine scope of projects that can be considered under the Healthy Forests Restoration Act. Activities proposed in the North Savery Project have been tested according to those screens. The activities in the modified proposed action are authorized and covered under the Healthy Forests Restoration Act.

Section 104 of the Healthy Forests Restoration Act establishes special procedures when agencies prepare environmental assessments or impact statements for authorized hazardous-fuel reduction projects. Except for the Healthy Forests Restoration Act's authorization to analyze fewer National Environmental Policy Act alternatives (Sections 104(c) and (d)), most of the requirements of Section 104 are consistent with normal National Environmental Policy Act practices. Section 104(e) of the act requires agencies to provide notice of the project and conduct a public meeting when preparing authorized hazardous fuel reduction projects. Section 104(f) encourages meaningful public participation during preparation of authorized hazardous-fuel-reduction projects. Public meetings were held in Rawlins and Saratoga (December 9-10, 2015) during the scoping public comment period, and will be scheduled coincident with release of the draft environmental impact statement.

Forest Service personnel are charged with facilitating collaboration when preparing authorized hazardous fuel reduction projects. As appropriate, collaboration should include representatives from Tribes, local representatives from Federal and State agencies, local governments, landowners, other interested persons, community-based groups, and other nongovernmental organizations. Cooperating agencies for this project include the local conservation districts and several State agencies. Cooperating agency comments from an early review of the draft environmental impact statement indicate support for treatment in the North Savery area, adding that more treatment, or additional treatment using other Healthy Forests Restoration Act authorities, could be needed to achieve desired outcomes in the project area. Collaboration during development of iterative alternatives to the modified proposed action is described in detail in Chapter 2 – Alternatives.

How many alternatives are required for analysis under the Healthy Forests Restoration Act varies depending on whether proposed treatment areas fall in the wildland-urban interface. At

scoping, none of the North Savery project area was considered to be in the wildland-urban interface. For areas outside the wildland-urban interface, analyses must describe the modified proposed action, a no-action alternative, and one additional action alternative, if one is proposed during scoping or the collaborative process. If more than one additional alternative is proposed, the agency will select one and provide a written record describing the reasons for its selection (Section 104(c)).

If the project area is in wildland-urban interface or within 1.5 miles of an identified community at risk, there are further limitations on whether action alternatives need be considered. New information on areas considered communities at risk by Carbon County became available in 2016. The North Savery Project is proposed both in, within 1.5 miles of, and outside, areas recently identified by Carbon County as communities at risk (2016). An alternative proposed during scoping for the portion of the project area within wildland-urban interface is discussed in Chapter 2 – Alternatives.

All actions proposed in Healthy Forests Restoration Act projects must be consistent with the applicable resource management plans. This means that any proposed action that would not be consistent with a resource management plan must be modified to make it consistent with the plan or be covered by a project-specific amendment. No Forest Plan amendments are proposed in conjunction with the North Savery Project, so specific design criteria and mitigation measures are required components of the project to assure Forest Plan consistency. Forest Plan consistency is discussed in detail in Chapter 3 – Environmental Consequences.

Forest Service Travel Management Rule (36 CFR 212, 2005 & 2015)

Motorized travel in the North Savery project area has been restricted to designated routes only for over 15 years (USDA Forest Service 2000). Changing conditions and directives have triggered reconsideration of the existing road system. New guidance under the Travel Management Rule includes three key requirements: a comprehensive travel analysis, a motor vehicle use map, and an over-the-snow motor vehicle use map.

Subpart A requires a comprehensive travel analysis to make recommendations on roads to be included in the minimum road system required for sustainable forest access and management. An initial roads analysis was conducted for the Sierra Madre Range in 2004 (USDA Forest Service 2004). The recently completed Travel Analysis Report (USDA Forest Service 2015d) summarized recommendations for whether individual roads and motorized trails were likely to be needed as part of the minimum road system for this unit. The travel analysis report is incorporated by reference in this draft environmental impact statement. In subsequent tables, the Travel Analysis Report is shortened to “TAR.” The report, and associated road and trail recommendation matrices, are available at the Brush Creek/Hayden Ranger District or can be found online at <https://www.fs.usda.gov/land/mbr/landmanagement>.

A National Environmental Policy Act analysis to formally designate the minimum road system and roads open for public motorized use has not been conducted for the North Savery project area. The North Savery Project includes specific actions to designate the minimum road system for this portion of the district based on the travel analysis report, additional information from field reviews and effects analysis, and input from cooperating agencies and the public. Roads identified as not needed are proposed for decommissioning or conversion to trails. The modified proposed action in this draft environmental impact statement would designate and work toward implementing the minimum road system needed for safe and efficient public

access and forest management in the North Savery project area. This action would complete requirements under Subpart A.

Subpart B requires that each Forest Service unit produce and maintain a motor vehicle use map that displays the designated routes open for public motorized uses. The criteria for designation of roads, trails, and areas are found at 36 CFR 212.55 (a) and 212.55(b). The current motor vehicle use map for the project area is available at the Brush Creek/Hayden Ranger District or can be found online at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3842001.pdf.

The Brush Creek/Hayden Ranger District motor vehicle use map for the Sierra Madre will be updated to display all designated roads and motorized trails as a result of this project in compliance with Subpart B. The Forest Service infrastructure database will be updated to reflect changes to maintenance level 1 (administrative roads closed to public motorized use) and open roads and motorized trails.

Subpart C requires that each Forest Service unit evaluate the routes and areas open for public over-the-snow travel. Units must also produce and maintain an over-the-snow motor vehicle use map that displays the designated routes or areas open for public motorized over-the-snow uses. The North Savery Project is not intended to address Subpart C, or to regulate use of over-snow vehicles on National Forest System roads, National Forest System trails and/or in areas on National Forest System lands. Over-the-snow vehicle uses will be addressed in a separate analysis and decision at the district or forest scale.

In addition to the Travel Management Rule, current policies for management of the transportation system and for travel management on system roads and trails are incorporated by reference from Executive Orders 11644 and 11989, and the Forest Service directives at FSM 7700 (Travel Management) and 2300 (Recreation) and corresponding handbooks FSH 7709 and 2309.

Forest Service Roadless Area Conservation Rule (2001)

The Forest Service Roadless Area Conservation environmental impact statement and decision were finalized in 2001, during the period the Medicine Bow Forest Plan was being revised. Deep Creek, Mowry Peak, and Strawberry Creek Inventoried Roadless Areas overlap with the North Savery project area (figure 2). Boundaries of the inventoried roadless areas in the project area generally coincide with Forest Plan management areas that are consistent with management for roadless characteristics.

Tree cutting and road construction are generally prohibited in inventoried roadless areas under the 2001 Roadless Rule, except for specific exceptions. An important exception related to the North Savery Project allows tree cutting when it is incidental to administration of an existing permit for use of National Forest System lands, such as a livestock grazing permit. The modified proposed action includes hazard tree cutting along boundary, allotment, and pasture fences to reduce damage to infrastructure and risk to permittees and employees. Where this activity is located in a roadless area, it was approved for scoping and analysis by the Rocky Mountain Regional Office of the Forest Service.

The modified proposed action also includes a short segment of road decommissioning in an inventoried roadless area. This activity is not prohibited under the Roadless Rule, and was also approved for scoping and analysis by the Rocky Mountain Regional Office.

Continental Divide National Scenic Trail Comprehensive Plan (2009)

Chief Thomas Tidwell approved the Continental Divide National Scenic Trail Comprehensive Plan in September 2009 (USDA Forest Service 2009). The purpose of the plan is to provide to provide a uniform Continental Divide National Scenic Trail program that reflects the purposes of the National Scenic Trail system, and allows for the use and protection of the natural and cultural resources found along the rights-of-way and located route on lands of all jurisdictions. In addition to direction for preferred trail locations and allowable uses, the plan includes direction on how the scenery management system and recreation opportunity spectrum are to be used to evaluate activities along the trail corridor. Scenic integrity objectives are to be achieved to the degree that they are consistent with the recreation opportunity spectrum through which the trail traverses. Additional information is included in the “Affected Environment” section in this chapter and in Chapter 3 – Environmental Consequences.

North Savery Project Modified Proposed Action

The modified proposed action described and analyzed in this draft environmental impact statement is the result of several years of iterative analysis and outreach to the public and collaborating agencies. Vegetation management activities proposed are included in table 5 and listed here:

- salvage harvest of up to 5,634 acres of mountain pine beetle affected lodgepole pine stands including areas near Forest Service administrative and recreation facilities
- precommercial thinning of up to 1,035 acres of overly dense pine stands
- construction and reclamation of approximately 24 miles of temporary roads for timber harvest access and hauling
- clearing hazard trees from along fencelines (6.8 miles), water conveyance ditches (0.5 miles), and level 1 roads (7.5 miles closed to public use but proposed for access to harvest units)
- providing extra slash treatment to create fuel breaks in 220 acres located to protect timber stands

Transportation system changes to complete subparts A and B of the Travel Management Rule include designating the minimum road system needed to safely and efficiently manage access to the Medicine Bow National Forest for public and management uses. Table 6 lists transportation and travel management actions to address those objectives:

- not changing the location and uses of 137 miles of national forest system roads
- relocating existing system roads (0.75 miles) to reduce resource damage
- adding to the designated road and trail system specific unauthorized routes identified for their potential to reduce resource impacts while providing public motorized use (5.5 miles)
- changing road or route segments to OHV use and constructing connecting trails (2.6 miles)
- decommissioning roads that are adversely affecting watershed condition and wildlife habitats (20.1 miles)
- updates to the motor vehicle use map for the Sierra Madre mountain range

Table 5. Timber harvest and other vegetation management activities under the modified proposed action.

Activity	Amount in Acres or Miles
Salvage harvest	Up to 5,634 acres
Precommercial thinning	Up to 1,035 acres
Temporary road construction and reclamation	24 miles
Clearing hazard trees	6.8 miles along fences 0.5 miles along water conveyance ditches 7.5 miles along maintenance level 1 roads
Extra slash treatment to create fuel breaks	220 acres

Table 6. Transportation system changes and travel management proposals under the modified proposed action*

Activity	Amount in Acres or Miles
Relocate existing system roads to reduce resource damage	0.75 miles
Add specific unauthorized routes to the designated road and trail system	5.5 miles
Changing road or route segments to off-highway vehicle trails	2.6 miles
Decommissioning roads adversely affecting watershed condition and wildlife habitats	20.1 miles

*The location and uses of 137 miles of National Forest System roads would not change.

The modified proposed action is responsive to the purpose and need of the project and is intended to move the North Savery project area toward its desired condition from the existing condition described in the “Affected Environment” section below. Overview maps of the vegetation and travel management proposals are included here. Specific details are described in Chapter 2 – Alternatives and in Appendix A. Larger scale, high resolution digital maps of the proposals can be downloaded from <https://www.fs.usda.gov/project/?project=47913>.

The modified proposed action includes silvicultural treatments for timber and fuels management as well as road relocation, reconstruction, and restoration. The activities are summarized for each management area in table 7 through table 9. No activities are proposed on the 1,126 acres of State and private land in the project area or for the 3 acres of Management Area 5.15 Forest Products, Ecological Maintenance and Restoration. Very few proposals are outside vegetation management emphasis areas, but are consistent with the areas in which they are proposed.

Most of the proposed activities would take place in Management Area 5.13 which emphasizes forest products. This management area contains timber stands where past investments in stand management are put at risk of additional loss from catastrophic events in addition to mountain pine beetle mortality. Actions to create fuel breaks between stands of regenerating lodgepole pine, thin dense stands to maintain resilience to drought and insects, and restore watershed health would help assure future sustainable management could occur in this management area. Some proposed activities would take place in Management Area 5.12 which emphasizes rangeland vegetation. Much of this management area is characterized by open shrub and grasslands at the forest fringe, so activities are related to protection of agriculture infrastructure (fencelines and ditch clearing) or to restoring the resilience of watershed areas where off road travel has developed unauthorized routes that put watersheds at risk of impaired function.

Table 7. Limited activities are proposed in Management Areas 3.31, 3.5, 8.6 and 8.21.

Management Area (MA)	Proposed activities	Amount (acres or miles)
MA 8.21 Developed Recreation Emphasis (27 acres)	Salvage timber harvest in campground	Approximately 11 acres
MA 8.6 Administrative Sites (59 acres)	Salvage timber harvest at work center	Approximately 5 acres
MA 3.5 Forested Flora or Fauna Habitat Emphasis, Limited Snowmobiling (3,136 acres)	Fenceline hazard tree clearing included in 7,693 acres analyzed salvage harvest	0.3 miles
MA 3.31 Backcountry Recreation Emphasis, Year-round Motorized (476 acres)	Decommission open system roads to reduce road impacts	0.3 miles

Table 8. Proposed activities in Management Area 5.13 General Forest and Rangelands, Forest Products Emphasis (33,485 acres)

Proposed activities	Amount (acres or miles)
Precommercial thinning	951 acres
Salvage timber harvest implemented from 7,693 acres analyzed	5,479 acres
Level 1 road hazard tree clearing included in 5,479 acres salvage harvest acres analyzed	322 acres
Fenceline hazard tree clearing included in 5,479 acres salvage harvest analyzed	2.7 miles
Create fuel breaks by complete slash removal in specific roadside harvest units	220 acres
Add routes to national forest road system	3.0 miles
Relocate existing system roads in locations with fewer environmental impacts	0.75 miles
Decommission closed (0.6 miles) and open (10.4 miles) system roads to reduce road impacts	11.0 miles
Create off-highway vehicle trail by National Forest System trail additions, construction, designation	1.0 miles

Table 9. Proposed activities in Management area 5.12 General Forest and Rangelands, Rangeland Vegetation Emphasis (7,386 acres)

Proposed activities	Amount (acres or miles)
Precommercial thinning	84 acres
Salvage timber harvest implemented from 139 acres salvage harvest analyzed	139 acres
Level 1 road hazard tree clearing included in 139 acres salvage acres analyzed	3 acres
Ditch and fenceline hazard tree clearing included in 139 acres salvage acres analyzed	2 miles
Change open road to closed road	1.15 miles
Add routes to national forest road system	2.5 miles
Decommission open system roads to reduce road impacts	9.1 miles
Create off-highway vehicle trail by National Forest System trail additions, construction, designation	1.6 miles

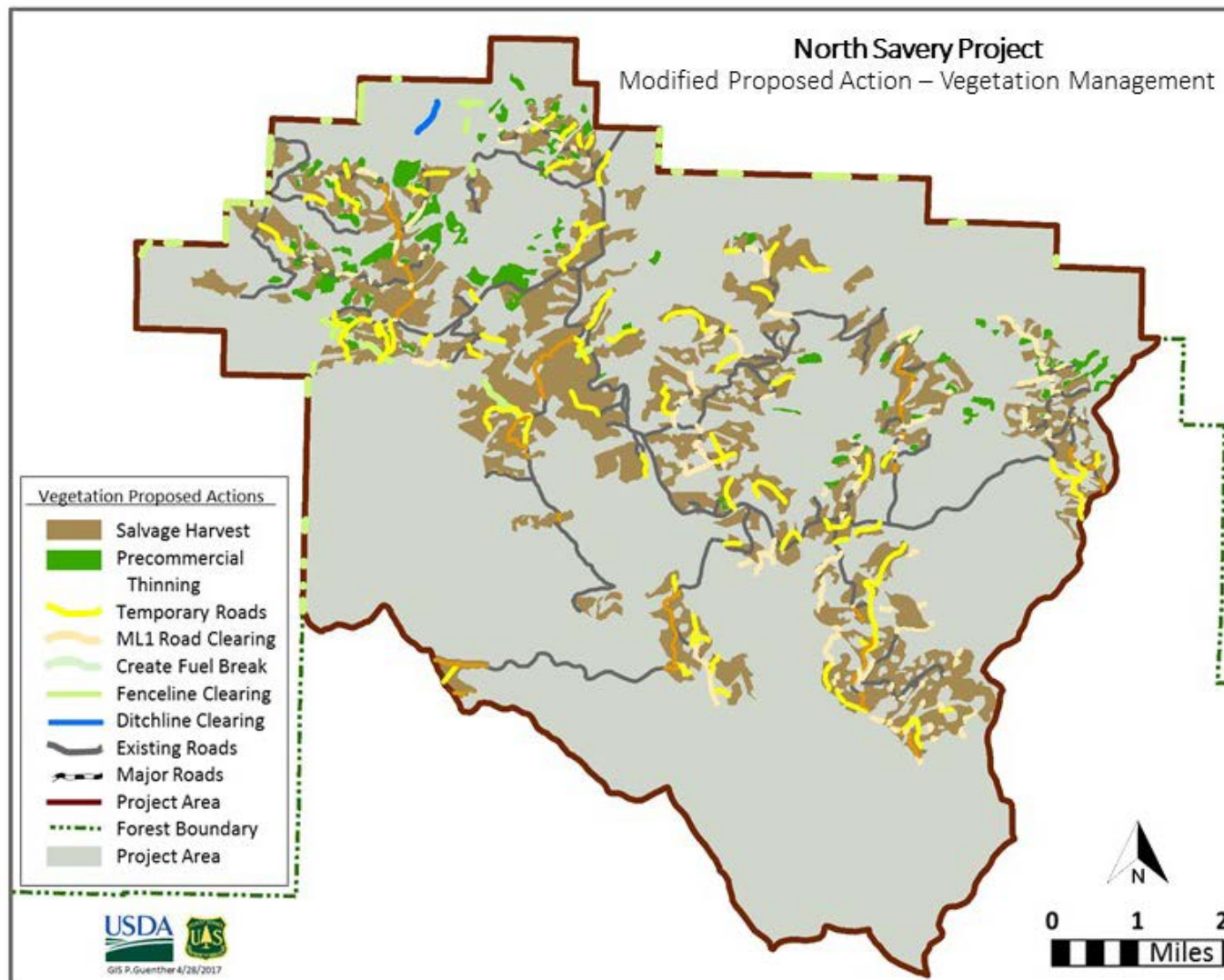


Figure 4. Proposed locations of harvest units, thinning units, hazard tree clearing, fuel breaks and temporary roads in the North Savery project area

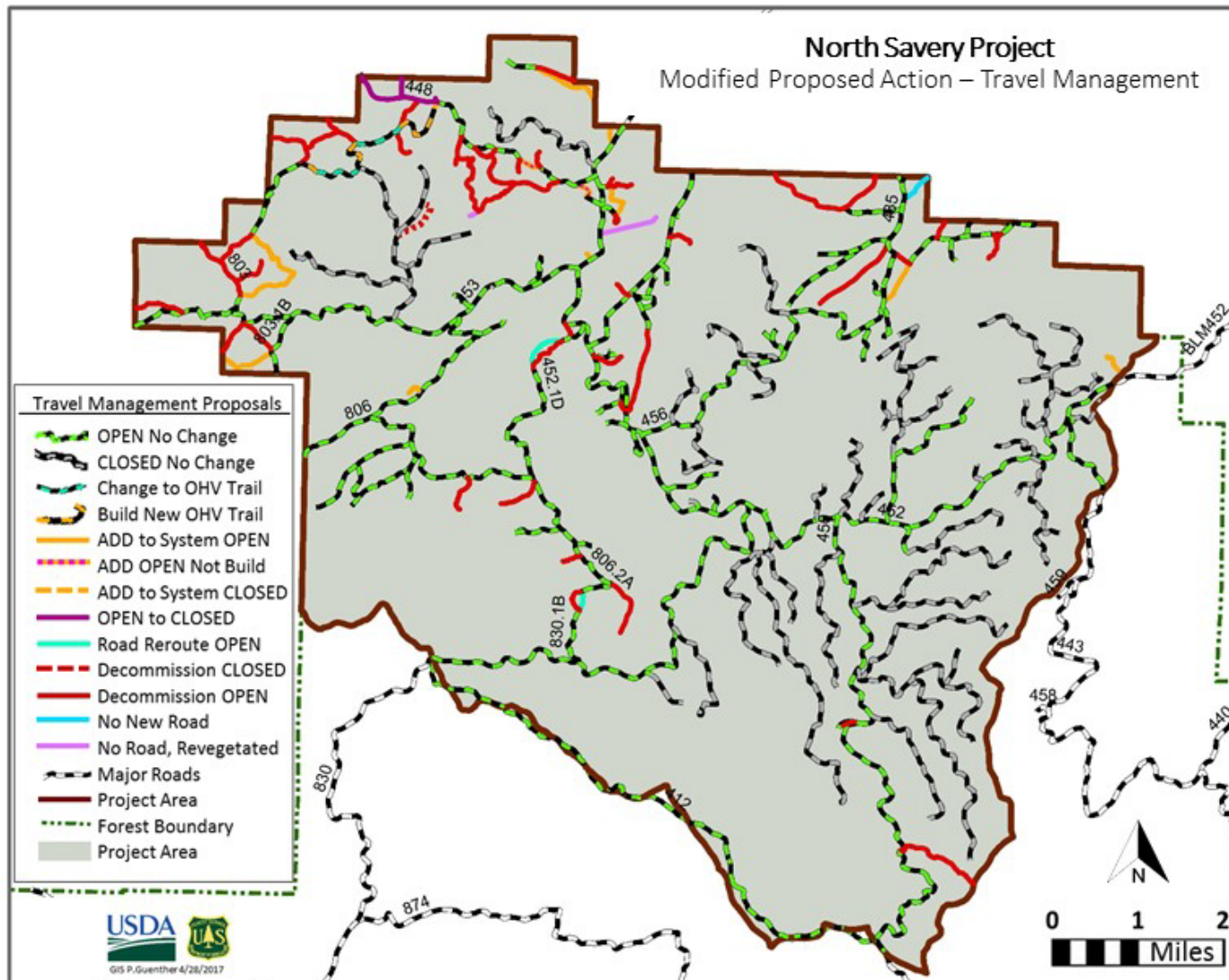


Figure 5. Transportation system and proposed travel management elements of the modified proposed action

Affected Environment

This section describes the characteristics of the North Savery project area most relevant to understanding the proposed actions analyzed in the draft environmental impact statement, the purpose of need for those actions, and the tradeoffs of taking or deferring action at this time. Additional information on the context and resources of the North Savery area can be found online at <https://www.fs.usda.gov/project/?project=47913> and in the project record located at the Brush Creek/Hayden Ranger District in Saratoga, Wyoming.

North Savery Project Area in the Larger Landscape Context

The Sierra Madre Range is one of the northern extensions of the Southern Rocky Mountains and displays Wyoming's classic **basin-and-range topography**. To the south, the range is contiguous with forested mountain ranges stretching through Colorado into northern New Mexico. The North Savery project area straddles the Continental Divide at the north end of the Sierra Madre Range. The range tapers toward the Great Divide Basin and Red Desert to the north, feeds the Little Snake River tributaries to the Green River to the west, and slopes into the North Platte valley to the east. The project area includes characteristic topography for its geology – a combination of steeply eroded canyons to the west, sloping grass and shrubland foothills, rolling forested ridges at higher elevations, ridges above treeline along the Continental Divide near Bridger Peak, and treeless summits at Divide Peak, Mowry Peak, and Sharp Hill. 

Existing landscape character in the North Savery analysis area consists mainly of Engelmann spruce and subalpine fir forests at higher elevations; lodgepole pine and **aspens stands** at mid elevations; and scattered cottonwood, blue spruce, Douglas fir, Gambel oak, and white fir at lower elevations. Lowest elevations near the Medicine Bow National Forest boundary include mixed shrub and grass/forb communities rather than forest. The landscape character in the analysis area has been shaped primarily by natural events such as fires, wind, insects, and disease and to a lesser degree by human actions, such as logging and road building, livestock grazing, mining, and developed and dispersed recreation activities.

Drought, warm winters, and stand ages in the mid-2000s combined to initiate an epidemic of mountain pine beetles in forests near the Continental Divide north of Interstate 70 in Colorado. Contiguous forests and prevailing winds brought epidemic populations of mountain pine beetles and noticeable mortality to the North Savery project area beginning in about 2004. Mountain pine beetle populations peaked in approximately 2009, with resulting stand mortality reaching a plateau about five years later as beetles depleted their food supply and returned to more typical levels. As a result of mountain pine beetle mortality in most timber stands, dead trees now dominate the view in many areas of the foreground and are visible in the middle and background. Wind, snow, and ice continue to weaken and blow down dead trees, creating a landscape of jack-strawed lodgepole pine interspersed with regenerating forest (figure 6). A mix of grasses, forbs, and shrubs are found in nonforested portions of the project area. Grasses make up nearly 11 percent of the area (4,932 acres); forbs make up 11 percent (5,030 acres); and shrubs, sagebrush, Gambel oak (165 acres combined), willow (50 acres), and lakes and ponds (40 acres combined) make up less than 1 percent.

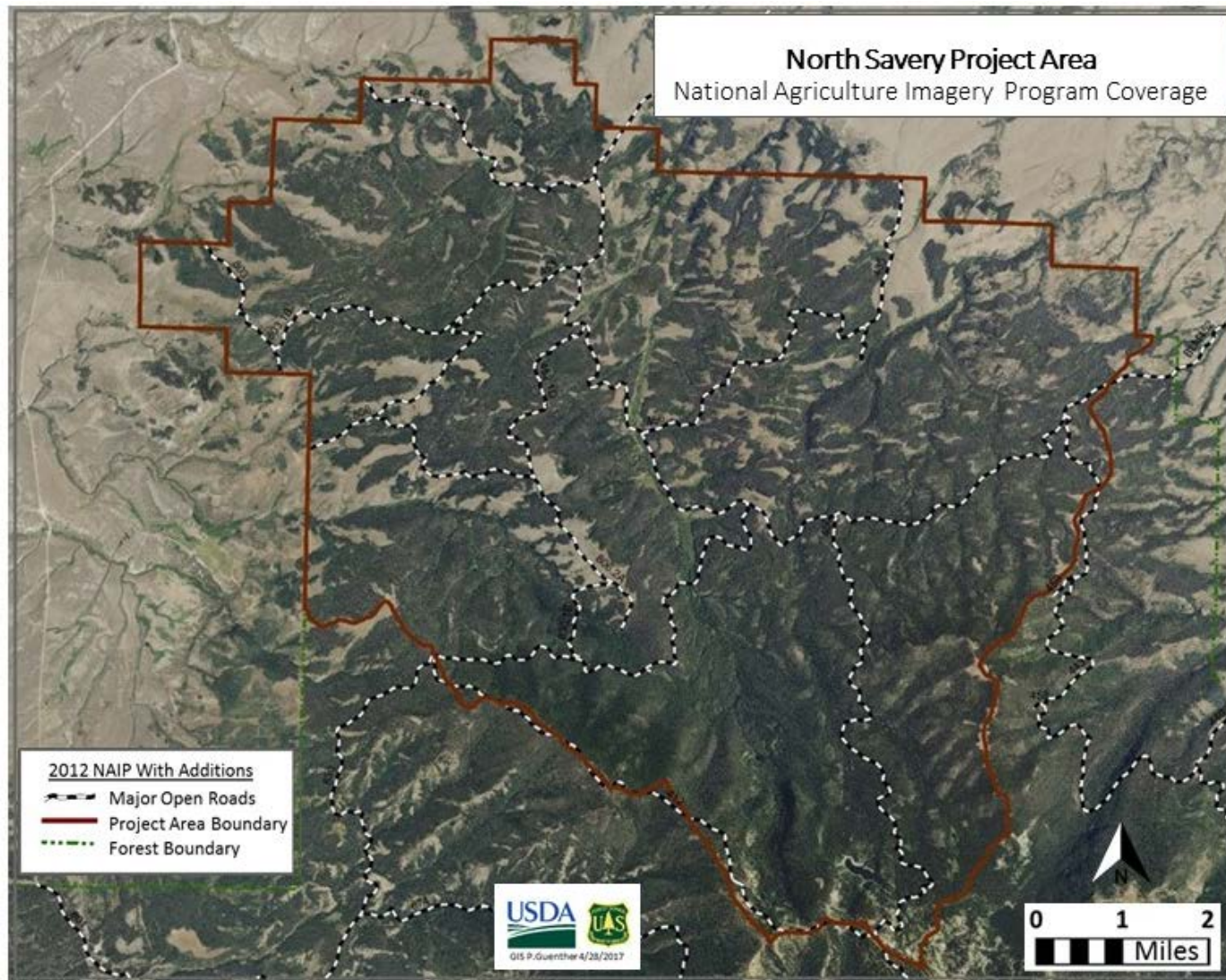


Figure 6. Aerial image of North Savery project area and surrounding landscape (NAIP 2012)

Timber: Forest Products, Fires and Fuels

The North Savery project area contains some of the most productive growing sites on the Medicine Bow-Routt National Forests. These areas have historically and consistently been managed to provide a continual supply of timber to local economies, and the majority of the project area is designated for timber production by Forest Plan direction. Most stands rate above average or superior when evaluated based on volume of wood produced. However, even these most productive stands, like many in the Rocky Mountain West, are in a state of downward transition because of the impacts of the mountain pine beetle epidemic, weather, previous management, and other forest threats.

The most critical consideration for the North Savery Project is that while insect and disease agents are native to the area and are present at all times, the scope and extent of forest mortality now is unprecedented in the management history in the project area and across much of the Medicine Bow-Routt National Forests. This is true regardless of the tree species and cover type. Lodgepole pine stands in the project area have experienced varying degrees of mortality, with some as high as nearly 90 percent dead. Nearly all mature lodgepole stands include substantial amounts of standing dead timber. Spruce and fir stands are also being affected by insects and disease at smaller scales. Mature aspen stands are being affected by a combination of age, weather, and mortality agents which are causing quick and nearly complete deterioration of these stands. The relationship between each tree species, insect and disease agents, and ecological and human uses are described in more detail below.

Forest Cover Types

More than three quarters of the North Savery project area is forested (table 10). There are approximately 35,483 forested acres in the analysis area, including 25,286 acres of lodgepole pine (72 percent), 8,016 acres of spruce/fir (22 percent), and 2,180 acres of aspen (6 percent). Lower elevations also contain cottonwood, blue spruce, Douglas-fir, Gambel oak, and white fir. Approximately 73 percent of the analysis area is within timber emphasis management areas, where harvested timber contributes to the allowable sale quantity of timber. These areas are characterized by forest stands that can be, and in some cases have been, intensively managed for wood fiber due to their accessibility, terrain, and resource conditions. Lodgepole pine is the primary species managed to produce sawtimber. Information in table 10 is from FSVeg data which is based on field plots, aerial imagery interpretation, and modeled extrapolation to unsurveyed stands. It is considered the best available information, despite limitations due to rapidly forest changing conditions, data collection inaccuracies, and statistical limitations.

Table 10. Existing forested vegetation cover type and size class diversity in the North Savery project area

Cover Type	All	% of Project Area	Established ¹	Small ²	Medium ³	Large ⁴	Very Large ⁵
Aspen	2,180	4.7	30	190	995	965	0
Lodgepole pine	25,286	55.3	2,502	1,541	10,510	10,627	106
Spruce-fir	8,016	17.5	582	68	812	5,616	938

1 Established – The majority of the stocking is less than 0.1 inches in diameter.

2 Seedling/Small – The majority of the stocking is between 0.1 and 4.9 inches in diameter.

3 Medium – The majority of the stocking is between 5.0 and 8.9 inches in diameter.

4 Large – The majority of the stocking is between 9.0 and 15.9 inches in diameter.

5 Very Large – The majority of the stocking is greater than 16.0 inches in diameter.

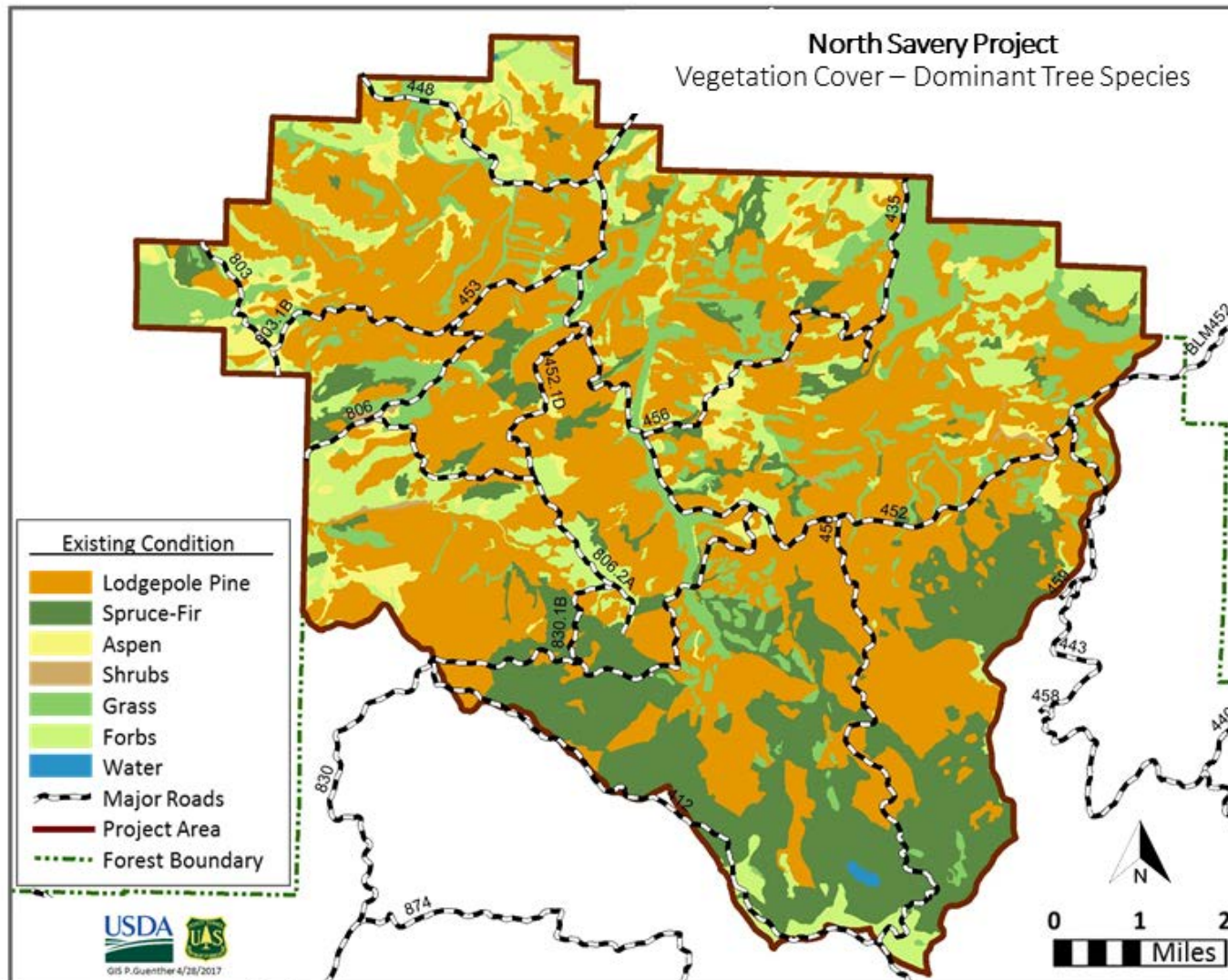


Figure 7. Vegetation cover types based on dominant life form in the North Savery project area.

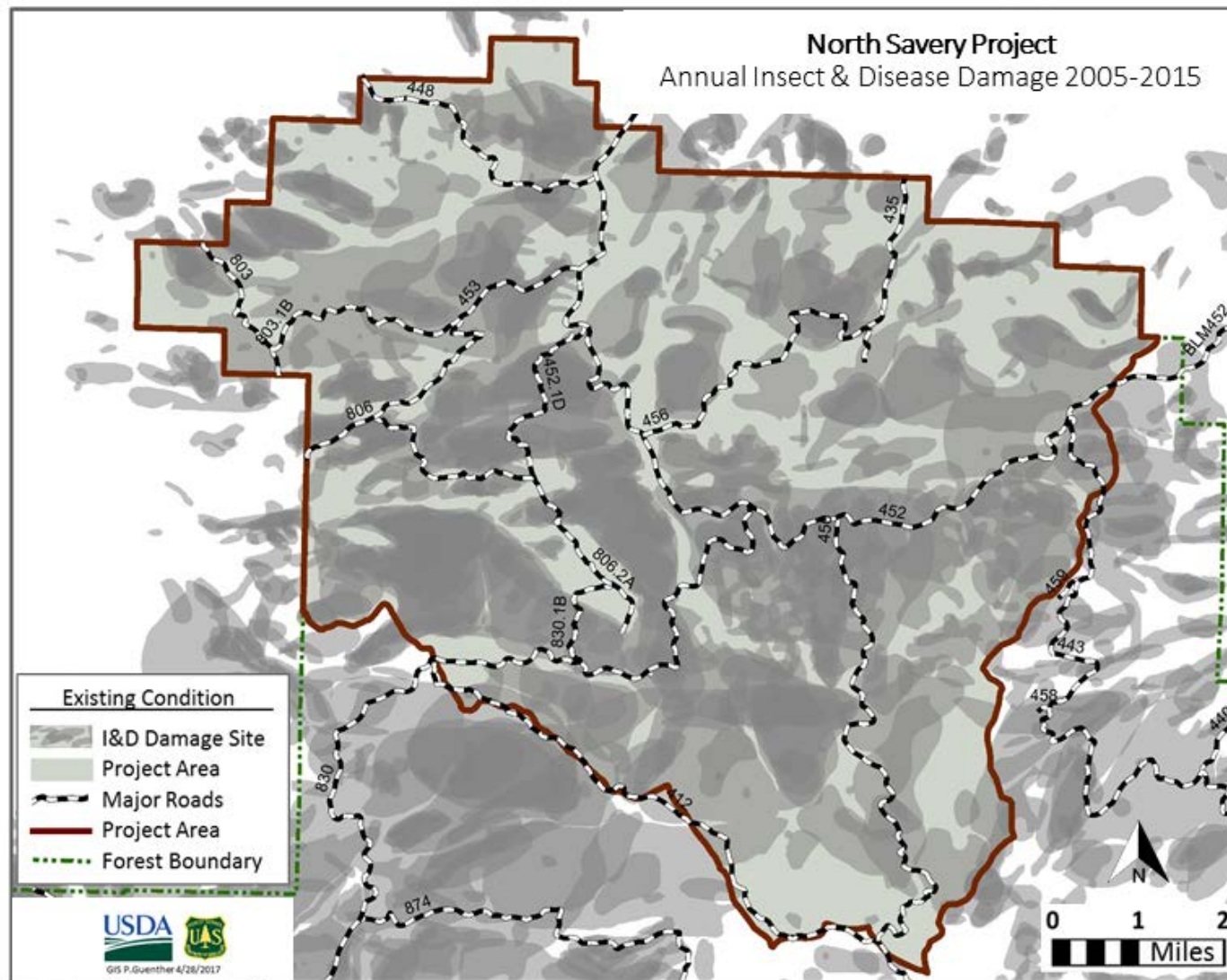


Figure 8. Map of North Savery Project and surrounding forest area showing the extent of insect and disease damage documented during annual aerial surveys from 2005 to 2015

Lodgepole Pine Cover Type

Lodgepole pine is one of the most widely distributed North American pines. It is the most widely distributed tree species on the Medicine Bow-Routt National Forests and is dominant in the upper montane and lower subalpine forest zones. **It is an important forest species because it provides watershed protection, water yield,** wildlife habitat, recreational and scenic viewing opportunities, as well as timber production.

In the North Savery project area, 72 percent of forested stands are in the lodgepole pine cover type. Medium and large size classes of make up over 75 percent of all lodgepole stands on the landscape. The stands are mature to over-mature and now have a high degree of mountain pine beetle mortality. Stands in the lodgepole pine cover type are the target of most vegetation treatments in the North Savery Project. Fuel breaks and hazard tree clearings may occur in other species cover types depending on locations appropriate for effective treatment.

Mountain pine beetle is the most serious insect threat to lodgepole. As lodgepole pine stands mature, they become increasingly susceptible to attack by mountain pine beetles. Prior to the current mountain pine beetle epidemic, research indicated stands were most susceptible if they were more than 80 years old, large diameter (average stand diameter over 8.0 inches in diameter at breast height), relatively high density, and at elevations lower than 9,500 feet. In recent years, lodgepole stands in the North Savery project area, including stands previously thought to be at moderate or low risk, have experienced epidemic population levels of mountain pine beetle, resulting in severe mortality regardless of predicted susceptibility rating. At this time, mountain pine beetle activity is continuing in the project area, but populations are considered to be at endemic levels. Based on field observations and aerial detection, it appears all lodgepole pine stands in the project area are affected, with various levels of infestation and mortality. Many have 80 to 95 percent mortality in sawtimber-sized pine trees (7.0 inches in diameter at breast height and larger) but also exhibit a range of mortality, rate of deterioration, and residual understory species.

Lodgepole pine is a shade intolerant species which regenerates vigorously following disturbances such as fire, mountain pine beetle infestation, and timber harvest. It generally occurs on the Medicine Bow-Routt National Forest in large, predominantly single-species, even-aged stands. This is historically attributed to drought cycles and associated stand-replacing fires. Monocultures of lodgepole pine are naturally occurring at the stand scale. Lodgepole pine occurs as both seral and climax stands and can function as a long-lived, subclimax species due to disturbance frequency. Lodgepole is the primary early successional seral species in Engelmann spruce and subalpine fir stands in the project area. If undisturbed, over time the lodgepole pine stands will be replaced by the more shade-tolerant spruce-fir through natural successional processes. Climax stands of lodgepole show no clear evidence of replacement by another tree species, although minor amounts of Engelmann spruce or subalpine fir or other species may be present.



Lodgepole pine may have serotinous seed cones (cones that do not open at maturity and persist on the tree with viable seed enclosed in the cone), non-serotinous cones (cones which open at maturity and disperse their seed), or a combination of both. Serotinous cones open and release the stored seed at temperatures between 113 and 140 degrees Fahrenheit (Lotan and Perry 1979). The heat source can be a fire which opens cones on standing trees or radiant heat from the sun which can open cones near the ground after wind throw or harvest. Cone serotiny is

thought to be an adaptation to fire or other rapid stand disturbances and provides a readily available seed source.

Lodgepole pine dwarf mistletoe is a native parasitic seed plant which occurs throughout the range of lodgepole pine in North America. It is the most damaging disease of lodgepole pine and results in severe growth loss, increased mortality, and reduced seed production of the host trees. The Hawksworth stand mistletoe rating is used to evaluate the extent of infection (Hawksworth 1977). In the North Savery Project, dwarf mistletoe is present in 78 percent of the acres in the lodgepole pine cover type. Over 20 percent of these acres have Hawksworth stand mistletoe ratings above 2 (USDA Forest Service 2015a). A rating above 2 indicates at least 67 percent of the trees are expected to be infected. The degree of mistletoe infection affects the range of silvicultural prescriptions that are most likely to produce optimal conditions for timber production.

Dwarf mistletoes present significant management challenges. No effective chemical or biological controls have been developed. Since dwarf mistletoe dies when the host tree dies, both harvest and fire influence infection levels in stands. Clearcutting and stand-replacing fires are effective in eliminating or greatly reducing mistletoe in the subsequent regenerated stand. Partial cutting and partial burns generally increase infection because they produce ideal conditions for rapid mistletoe spread, and the remaining infected trees are likely to infect new regeneration.

Engelmann Spruce/Subalpine Fir Cover Type

The spruce-fir cover type occupies some of the coldest and highest-elevation forest environments in the western United States. Spruce-fir stands are variable in composition and range from 51 percent to 100 percent spruce-fir. Although aspen is sometimes a stand component in spruce-fir stands, lodgepole pine is usually the third species in mixed-conifer stands. Some vegetation treatments in the North Savery Project are proposed in mixed-conifer stands in the spruce-fir cover type that include a significant lodgepole pine component.

Spruce is shade tolerant. In the project area, spruce rarely exists in pure stands and most frequently exists with subalpine fir. Subalpine fir is the most shade-tolerant tree on the Medicine Bow National Forest. It is shorter-lived than spruce and does not reach similar size due to its slow-growing characteristics. It can persist with faster growing spruce because it is very shade tolerant throughout its life and able to persist in the understory for many years. Spruce regenerate from seeds. Fir regenerates from seed, but it can also regenerate through layering, a form of vegetative reproduction in which an intact branch develops roots as a result of contact with the soil, giving it a distinct ecological advantage.

On the Medicine Bow National Forest, the majority of the spruce-fir cover type is mature or climax and is generally declining in growth and vigor (Alexander 1987). In the North Savery project area, the spruce-fir cover type comprises about 23 percent of the total forested acres. Of these, 70 percent is in the large size class (9.0 to 15.9 inches in diameter) and 12 percent is in the very large size class (16.0 inches in diameter and larger).

The spruce-fir cover type is normally displaced by infrequent, large-scale events such as fire, windstorms, insect epidemics, or logging. The type and severity of the disturbance is the most influential factor in how the resulting stand develops. Fire usually creates conditions favorable to lodgepole pine and aspen. Those stands develop until conditions are again favorable for spruce and fir to become reestablished as cohorts.

Spruce beetle is the most serious insect pest of Engelmann spruce and usually attacks larger (mature and over-mature) trees. Spruce beetles usually exist at endemic levels in spruce forests. Epidemic build ups of spruce beetles are most often precipitated by blowdown events. Populations of spruce beetle are active in the North Savery project area and have been causing mortality of individual trees or small patches of spruce in the spruce-fir and lodgepole cover types. Spruce beetles modify stand structure. They reduce the average age of surviving trees, lower the average diameter and height of the stand, and reduce the percentage of spruce within the stand. Spruce beetles also lower the density (trees per acre) and leave intermediate-sized trees as the dominant and codominant spruce. If spruce beetle is the disturbance agent, resulting stands are dominated by fir until spruce (the longer-lived species) regains its position.

Aspen Cover Type

Quaking aspen is the most widely distributed tree species in North America, occurring throughout Canada, in many locations in the United States, and in isolated locations in Mexico (Perala 1990). Aspen is a clonal species. In the West, it reproduces primarily by means of root suckers or less commonly through root collar sprouts or stump sprouts. In the North Savery project area, the aspen cover type makes up only about 6 percent of total forested acres. Forty-six percent of aspen are in the medium size class (4.9 to 8.9 inches in diameter) and 44 percent are in the large size class (9.0 to 15.9 inches in diameter). None of the proposed vegetation treatments in the North Savery project are focused on aspen management, but aspen may respond to treatments in other cover types.

Aspen is very shade intolerant. It is an aggressive pioneer species which readily recolonizes disturbed sites. This fast-growing tree often forms pure stands that gradually are replaced by slower-growing species. Without disturbance, stands gradually break up and transition into spruce-fir stands which reduces the overall abundance of aspen across the landscape. Numerous factors affect the viability, growth, and health of aspen stands. Mammals are heavy predators of the species, and aspen are susceptible to numerous diseases, blights, rust, bacteria, and fungi. Aspen are hosts to a variety of insects, such as defoliators and borers, whose presence may cause mortality or affect tree health and vigor. The suppression of large-scale natural disturbances, such as wildfire, throughout National Forest System lands system is thought to have influenced the reduction of aspen.

Most recently, aspen forests in the area have experienced widespread, severe, rapid diebacks and mortality. Rapid aspen die-off was first noted in the original Savery area in 2006. This phenomenon, termed sudden aspen decline has increased dramatically in recent years and is a concern for forest managers. The current mortality differs from changes seen over the last century in its landscape scale, rapid mortality, and mortality agents. Based on the aerial surveys, approximately 28 percent of the aspen on the Medicine Bow-Routt National Forests has been affected by severe defoliation typical of sudden aspen decline. Indications are that sudden aspen decline is more prevalent on south and southwestern aspects and in lower elevations and is related to drought. Observations in 2015, after several years of average or better snowpack, indicated decreased mortality and increased recovery in some stands.

Forest Succession

In the wake of mountain pine beetle mortality, the new forest now looks different than it did 10 years ago, and it will continue to change. Much of the mature, upper tree canopy is now dead, but the forest, as a whole, is still living. Less competition for sun and water provide the residual trees with more resources. Understory trees, including aspen, subalpine fir and lodgepole pine,

are released to grow. The forest is already in transition from homogenous stands of mature lodgepole pine to stands with a mix of species and age classes. Shade-tolerant species (spruce and fir) are favored due to the slow break up of stands because there isn't enough disturbance or sun for early seral species like aspen or lodgepole pine to regenerate. These changes are the natural ecological outcome of widespread mountain pine beetle mortality. While species changes are natural, subalpine fir and aspen provide little to no commercially viable timber compared to lodgepole pine. New technologies and products may allow commercial use of other species, but the continuing demand for building products to support economic recovery means virtually all suitable timber production sites are important for their near or long-term contribution to the production of wood products and to commitments to the timber industry made in the Forest Plan.

Timber Production

Timber harvest and processing are an important economic component in local and regional communities that draw products from the timber management program on the Brush Creek/Hayden Ranger District. The Medicine Bow National Forest has a vested interest in continuing to provide forest products to local economies. Local mills process sawtimber and smaller products such as posts and poles. There are typically operations in Encampment, Saratoga, and the Laramie Valley. Materials are processed at facilities in North Park and Middle Park, Colorado and as far away as the Black Hills of South Dakota, creating an economic web that connects Carbon and Albany counties in Wyoming with five counties in Colorado and one county in South Dakota.

Not only does the timber industry provide jobs, income, and products, but timber harvest itself is an indispensable tool for managing the land for multiple use and protection of public and private assets. Keeping a sustainable and continuous supply of forest products to forest-dependent industries is essential to the management of National Forest System lands. Opportunities to recover merchantable sawtimber from the dead trees are rapidly decreasing. Salvage harvest can be a tool to create an adequate seedbed and ensure sufficient seed for natural regeneration, initiate the artificial regeneration process, or allow natural forest succession.

The earliest commercial timber harvest in the project area occurred in 1975. Prior to this, unregulated cutting to provide fuelwood, post and poles, and house logs occurred in minor amounts but were not recorded. Since 1975, extensive harvesting has occurred (see table 11). According to the Medicine Bow-Routt National Forests' accomplishments database (FACTS), approximately 9.5 percent of the project area has received some form of timber harvest since 1955. Over five percent received a regeneration harvest (clearcutting, overstory removal, or shelterwood seed harvest) and 4.1 percent was partially cut (shelterwood preparation, commercial thinning, and sanitation and salvage). Partial cuts generally averaged about a 30 percent removal of sawtimber-sized trees. Much of the area road system was constructed or reconstructed in conjunction with past timber harvest. Following harvest, the clearcuts regenerated to predominantly lodgepole pine stands, along with minor amounts of spruce and fir. Today, these stands are young forests stands (aged 35 years and younger). These young forests, which regenerated following past clearcutting, are largely not beetle infested and will be among the oldest lodgepole stands in the post-epidemic project area. Past partial harvests generally remained typed as mature stands following harvest. These partially harvested stands often have significant age and size class diversity. Some partially harvested stands have increased species diversity due to retention of spruce and fir.

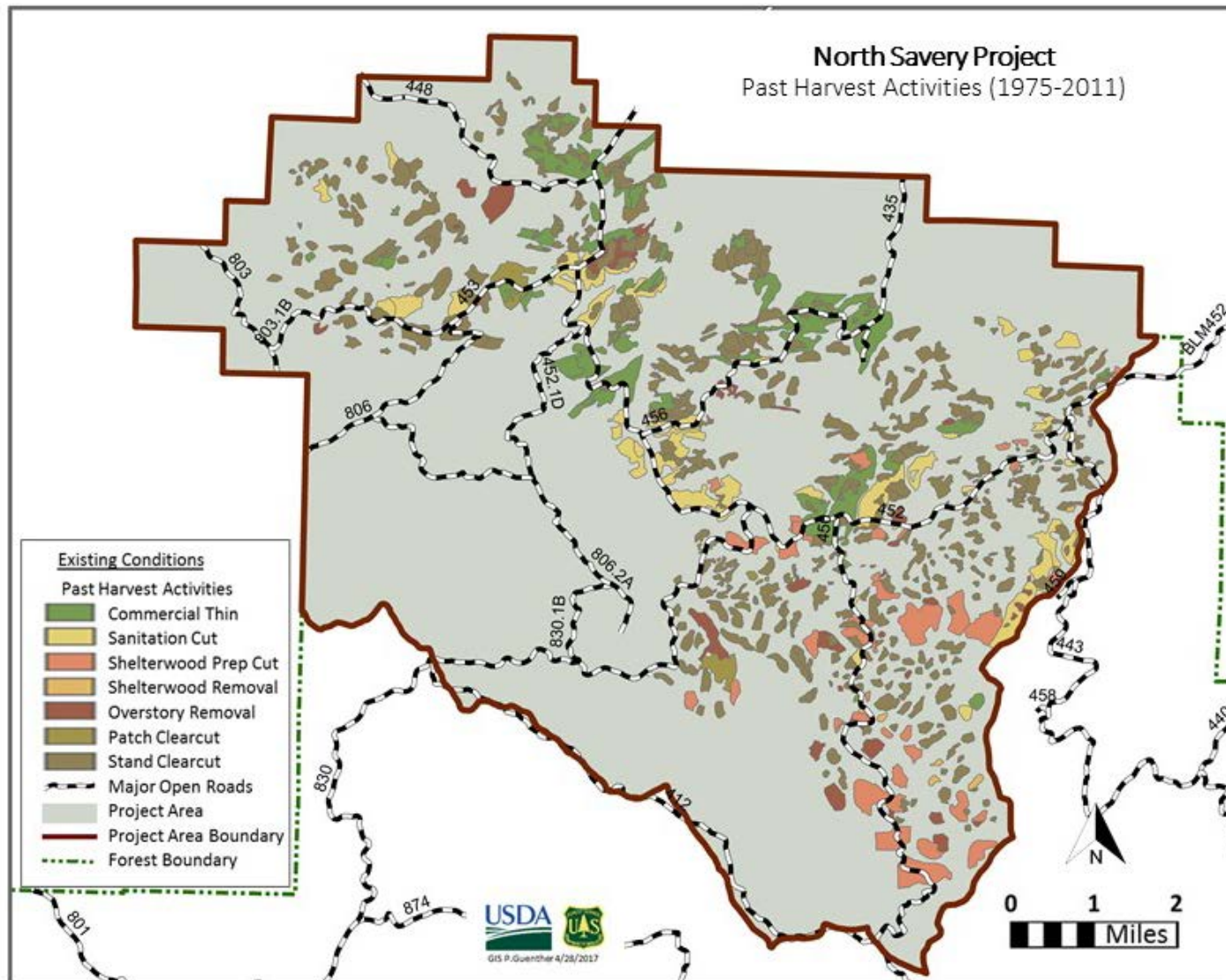


Figure 9. Past timber harvest in the North Savery project area displayed by type of activity

No commercial timber sales are currently under harvest in the project area. The Singer Peak timber sale (415 acres) and the Jack Creek #3 timber sale (540 acres) were harvested in the past 5 years. Hazard tree removal occurred in the Jack Creek Campground and Jack Creek work center during 2009, and the area continues to be monitored for hazard trees. Roadside hazard tree removal has occurred on the Jack Creek Road (National Forest System Road 452) and is proposed on the Deep Jack Road (National Forest System Road 830). Future roadside hazard tree removal would be achieved in conjunction with timber sale units as part of this project.

Table 11. Timber harvest since 1975 in the North Savery project area

Past Treatment	Acres
Clearcuts	4,165
Overstory removal	464
Shelterwood preparation cut	950
Sanitation salvage	1,273
Commercial thinning	1,816
Shelterwood removal cut	32
Patch clearcuts	167
Total	8,867

Source: FACTS database

Harvest records are not available for past harvest on lands of other ownership. Aerial photos indicate small amounts of harvest on private, State, and Bureau of Land Management land. It is anticipated harvesting will continue on the adjacent land ownership as a result of the high levels of mortality in lodgepole pine forests.

Fuel Profiles

There are other new and emerging characteristics of the forest in the project area that also cause concern. In addition to changing species composition, fuel loading and associated fire behavior are different now than in any of the management history of the national forest. Over time, existing dead trees will continue to deteriorate and fall, increasing the downed woody material in forest stands. A century of fire suppression, in combination with increased ladder fuels provided by subalpine fir, have created overall fuel loading that is substantially higher than historic conditions. While the likelihood of fire occurrence has not changed significantly, both fuel modelling and experience during the 2016 fire season indicate fires that become established in these conditions will be more intense, severe, and resistant to control.

The relationship between mountain pine beetle outbreaks, fire events, and lodgepole pine forests has been widely studied in recent years. The large increase in ground fuel and the associated increase in the probability of large, high-intensity fires due to beetle epidemics suggest the relationship between beetles, fire, and lodgepole pine tends to support retaining lodgepole pine in the ecosystem (Brown 1975). Thus, fire is a natural component of the ecosystem in the project area. Fuels specialists use computer-based fire modeling systems to predict fire behavior given specific fuels conditions combined with weather and topography. This helps identify different variables likely to create intense, severe fire conditions. Large fuel buildups, opening of the canopy, and the subsequent increase in surface wind and surface drying create conditions favorable for large, high-severity, potentially damaging fires. These conditions are of particular concern near boundaries with private lands, human improvements, and other valued resources that could be damaged in a future fire event.

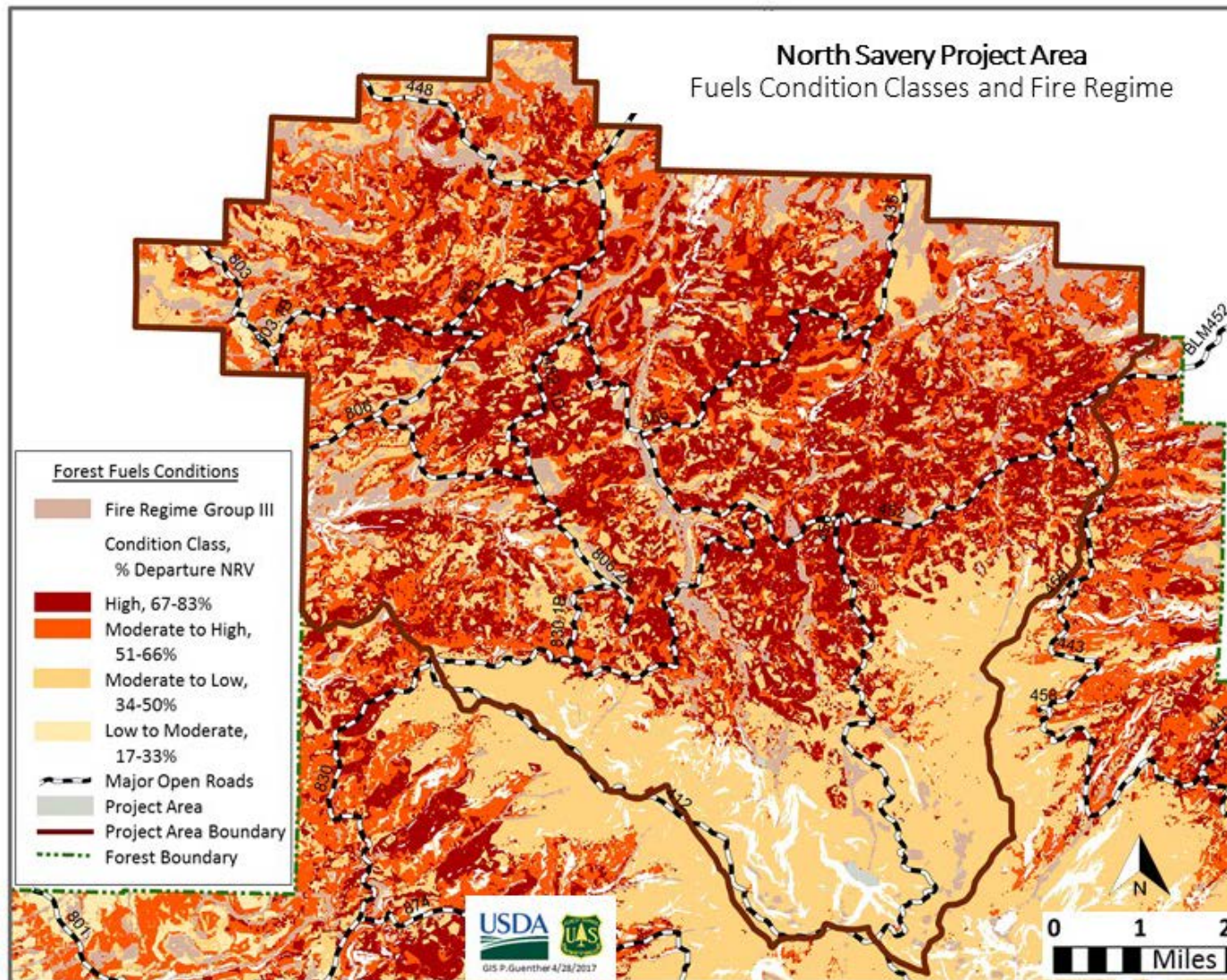


Figure 10. Existing forest fuels condition and fire regime from LANDFIRE modelling**

Fire Hazards

It is important to allow fire to maintain its natural role where possible in these ecosystems, but that approach poses some hazards. We must be cognizant of the hazards fire poses to forest resources, infrastructure, and other values near the Medicine Bow National Forest boundaries, and to the fire personnel charged with protecting these resources. During the Beaver Creek, Broadway, and Snake Fires in 2016, fire behavior demonstrated the potential for increased intensity and severity in the post-bark-beetle forest. These forest stands were similar to those in the project area. Overhead hazards created by complex stand conditions with large numbers of standing, hanging, and jack-strawed trees reduce the number of strategies and tactics available to fire managers, primarily due to the risk to firefighters from falling trees during suppression efforts, for example, when a firefighter was struck by a falling lodgepole pine during suppression of the Holroyd Fire near Big Creek in 2014. Current stand conditions are likely to result in fire behavior with increased rates of spread, fireline intensity, and risk to responders. These conditions are not conducive to using fire in its natural role while protecting firefighters or important values at risk. 

The best information on values at risk for the North Savery project area comes from the 2016 update of Carbon County's Community Wildfire Protection Plan.² The plan identifies two communities at risk in the North Savery project area: High Savery and Jack Creek (figure 11). The High Savery community at risk was identified as high risk; the Jack Creek community at risk was identified as moderate risk. Values considered included intermix and interface communities; wildland-industrial interface; agricultural and municipal watersheds; natural resources including wildlife and habitat for threatened, endangered, and sensitive species; and rehabilitated and restored forests. The importance of these values in the at-risk community boundaries was evaluated in the collaborative at-risk community prioritization process. Almost half (48 percent) of the North Savery project area is inside a community at risk identified by Carbon County. Including the areas within 1.5 miles of the communities at risk encompasses 82 percent of the project area. 

One of the values at risk in the North Savery project area is managed stands of timber. In addition to direct loss of timber value from fire, fires have long-lasting impacts. While they burn, higher-intensity fires can destroy seed sources. High-severity fires can damage and sterilize soil, resulting in areas where forest vegetation may be a long time returning. After fire, where damage is not severe, some forest stands will restock naturally if lodgepole pine was present in the pre-fire understory. However, lodgepole pine does not exert the strong dominance that results in self-thinning over time. Instead, overstocked trees would persist at high density, resulting in small-diameter trees referred to as "dog-hair." This lack of self-thinning results in stands with a commercially viable timber species but no commercially viable timber products. Thus, the scenarios of fire impact and recovery both represent threats to productive and sustainable timber management in the future.

² Available at <https://sites.google.com/a/wyo.gov/forestry/fire-management/fire-grants-assistance/fuels-mitigation>

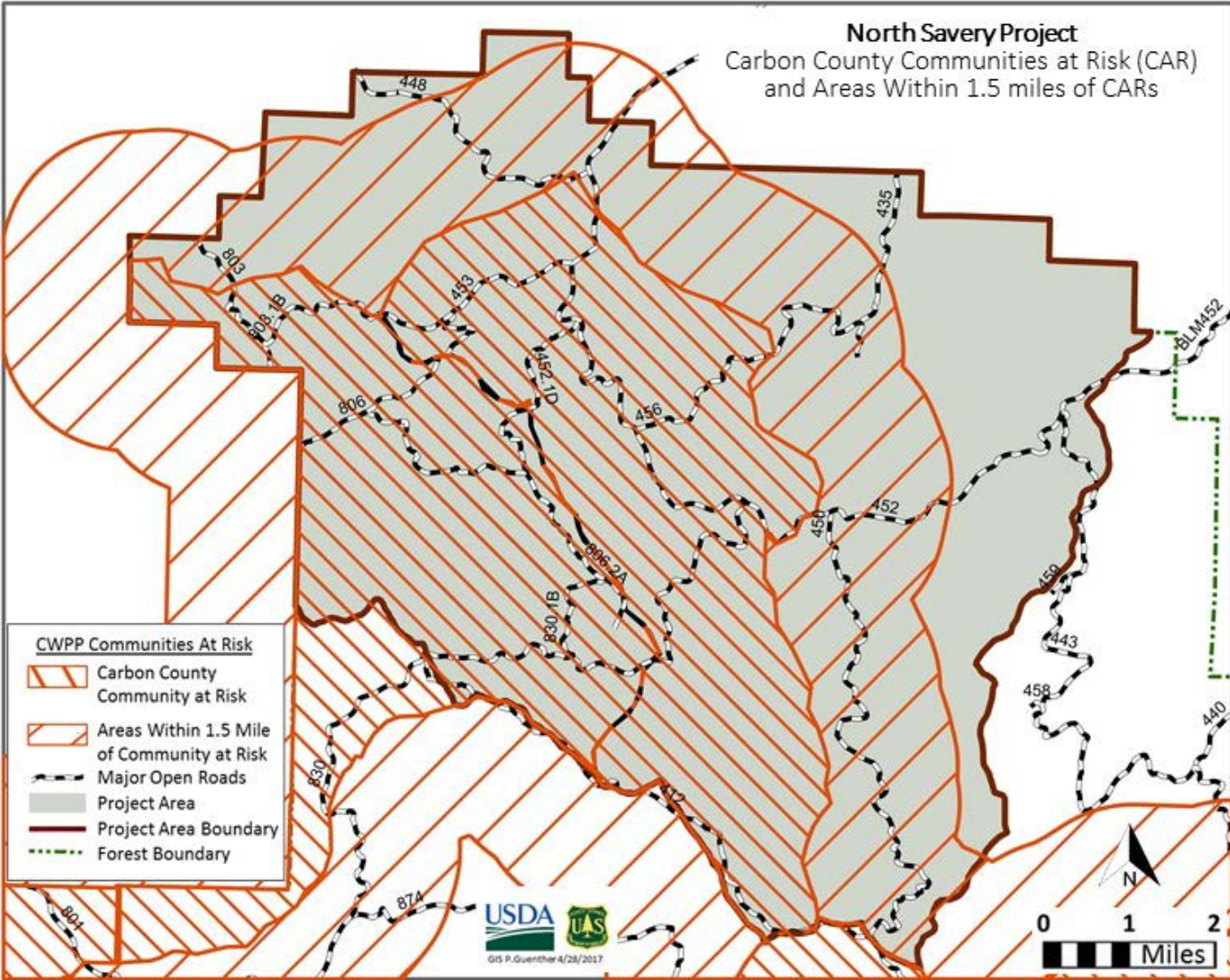


Figure 11. Carbon County communities at risk identified in 2016 Community Wildfire Protection Plan update and areas within 1.5 miles of communities at risk

Disturbance Events

Disturbances are an integral part of ecosystem processes under which forests in the North Savery project area developed and adapted. Short-term changes can be dramatic and substantial, like the recent mountain pine beetle epidemic, or slow and more difficult to see, like natural succession. In central Rocky Mountain ecosystems, disturbance is the critical factor in maintaining coexisting species. Without disturbance, climax species such as subalpine fir and Engelmann spruce would replace disturbance-dependent species such as lodgepole pine and aspen. Although disturbance brings stands to earlier successional stages and changes species composition, in time, forests will regenerate and continue to grow.

Disturbances are not always naturally occurring and may be directly or indirectly influenced by human actions. The most common disturbances that have influenced the North Savery project area are fire, insects and diseases, weather events, and timber harvest. Insects and diseases are addressed in the cover type discussions above. Blowdown events occur during extreme Wyoming weather and are important for providing natural concentrations of large woody material for habitat, microsites, and carbon recycling. Timber harvest history is briefly summarized above. The role of fire is described here in detail, because fire – or the lack of it – is the disturbance mechanism that has most heavily influenced vegetation patterns in the North Savery area in the past.

Fire History

Natural and human-caused wildfires have been major factors in forming the forests seen today in the Sierra Madre Range. Historical accounts indicate large fires occurred through the mid to late 1800s. There is much speculation as to the cause of these fires. Possible ignition sources included lightning as well as humans – sheepmen, pioneers, miners, and Native Americans. Increased fire frequency in the 1840s and 1850s seems to coincide with waves of pioneers crossing southern Wyoming. There are several historical accounts of a large fire in 1879 which originated on what is now the Routt National Forest. It burned onto the western Sierra Madres and burned until winter snows extinguished it (No author 1975 and Thybony, et al. 1986).

In the central Rocky Mountain ecosystem, disturbance is the critical factor in maintaining co-existing species. The presence of lodgepole pine and aspen at the lower and middle elevations of the project area is reflective of past fire disturbances. Fire burned large portions of this range, playing an important role in the appearance of the landscape and maintaining a mix of tree species in various successional stages. Lower elevations that tend to be drier have a shorter fire return interval, while wetter, higher elevations have a longer fire return interval. Stand origin dates, estimated from tree ring growth data, provide a rough map of where and approximately when stand-replacing and stand-regenerating fires occurred.

Currently, the area is composed of older forests that are highly susceptible to major landscape disturbances. Examination of fire history as inferred from stand origin dates for the Savery landscape analysis area, indicates 79 percent of the existing stands resulted from fires that burned the area between 1855 and 1905. Based on origin dates, most current stand ages are between 105 and 155 years, with an average of about 130 years. The lack of major fires or other natural disturbances since large, stand-replacing fire events has been attributed to effective fire control since the establishment of the area as a national forest in 1902. It can also be considered that post-fire stand initiation, growth, and development was not conducive to large scale disturbances until later in the 1900s.

Estimates of pre-settlement fire return intervals ranges from 35 to 50 years in lower-elevation shrub lands (fire regime condition class I and II). Lodgepole pine has an expected fire return interval that ranges from 100 to 200 years depending on elevation (fire regime condition class III and IV), and spruce-fir stands have a return interval between 200 and 400 years (fire regime condition class V). In spite of a predominance of mature timber types, most stands have not yet missed a fire cycle. Many of these stands are now in condition to experience a fire because of their condition from mountain pine beetle mortality rather than their age.

Transportation System and Travel Management

This draft environmental impact statement considers four parts of the transportation system in the project area: 1) permanent, system roads and trails whether open for public motorized travel, restricted to administrative access, or placed in long term storage between intermittent uses, 2) temporary roads for project implementation, 3) unauthorized routes, and 4) the Continental Divide National Scenic Trail. Only authorized system roads and trails are managed as permanent infrastructure. Public motorized use of permanent infrastructure is regulated through implementation of the Travel Management Rule (36 CFR 212) shown on the motor vehicle use map (figure 12).

Primary access to the North Savery area from the south is provided by Wyoming State Highways 230 and 70 (Battle Highway). From the east, west, and north, Carbon County roads 385, 401, and 500 connect access to National Forest System Roads 443, 452, and 830. Haul routes from the project area are readily accommodated in any direction.

National Forest System Roads

The authorized road system in the North Savery project area is characteristic of development density and conditions for the Medicine Bow National Forest. National forest system roads are described by function (arterial, collector, local) and by maintenance as level 1 (closed, limited administrative use only) and levels 2 to 5 (lowest to highest standard open roads). Levels 1 through 4 roads are present in the North Savery project area (table 8). When well located and maintained, roads can provide important multiple use access without undue resource damage.

In the North Savery area, there are currently 20 miles of arterial roads. These are major forest roads that provide primary access, a smooth running surface, good sight distance for drivers, fairly gentle grades, and good drainage. National Forest System Roads 443, 452, and 830 serve as arterial roads and are maintained for passenger car use (maintenance level 3 or 4).

There are 35 miles of collector roads. These roads connect arterial and local roads that access small areas such as timber harvest units or trailheads. They have good grades, alignment, and drainage. There are 12 collector roads in the North Savery area. Collector roads are maintained for passenger car use (14 miles), high-clearance vehicles (6 miles), or have been put into storage for future access and limited administrative use (15 miles).



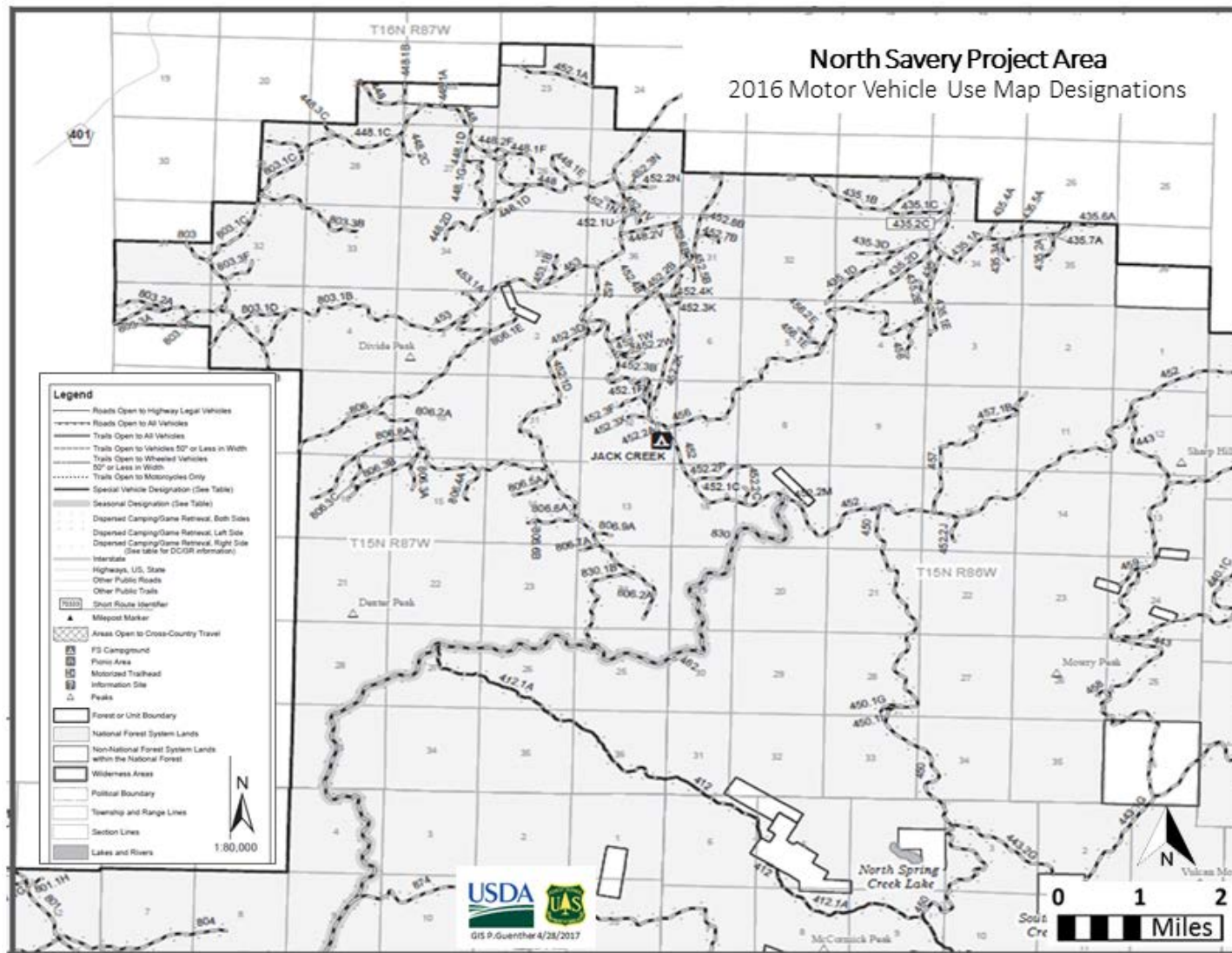


Figure 12. Current motor vehicle use map for the North Savery project area portion of the Sierra Madres, Brush Creek/Hayden Ranger District

There are 113 miles of local roads. Local roads terminate in smaller resource areas, are usually constructed for a single resource activity, such as timber harvest, and are designed to follow existing land contours. Forty-one miles of local roads in the project area have been closed (gated) to public motorized traffic after resource management activities have been completed. The roads were placed in storage in stabilized condition to reduce impacts on other resources, such as wildlife. However, many other open local roads (72 miles) provide access to popular recreation areas and are open to motorized traffic. Sixty-nine miles are maintained for high-clearance vehicles (maintenance level 2) with narrow widths, moderate to steep grades, and primitive or native surfaces. The North Savery project area also includes 3 miles of local roads maintained at level 3 (passenger vehicles).

Table 12. Miles of existing National Forest System roads in the North Savery project area

Maintenance level	Arterial	Collector	Local	Total by Level
1	0	15	41	56
2	0	6	69	75
3	14	14	3	31
4	6	0	0	6
5	0	0	0	0
Total	20	35	113	168

Approximately 112 miles of designated system roads in the project area open for public motorized use and shown on the motor vehicle use map for the Sierra Madres. This includes portions of National Forest System Road 412, which crisscrosses the southern project area boundary along the Continental Divide. Open system roads consist of approximately 75 miles of level 2 road (high-clearance, four-wheel drive), 31 miles of level 3 road (suitable for passenger cars), and just over 6 miles of level 4 road (higher standard passenger cars). There are also approximately 56 miles of level 1 roads have been put into storage to provide future access to portions of the project area but are closed to public motorized use. Limited administrative use may occur on these routes, and nonmotorized uses are allowed. These figures indicate that road density for system roads is 2.25 miles per square mile, including 1.48 miles per square mile of roads open to public motorized travel in the project area. When the 54 miles of unauthorized routes in the project area are included, the total route density is more than 3 miles per square mile. The Forest Plan includes no quantitative standards for road densities, but density can be used as a measure of public access, logging feasibility, habitat fragmentation, or stream network connectivity. The Watershed Condition Framework described this in more detail later in this chapter.

Temporary Timber Sale Roads

Although most of the project area is easily accessed from permanent, system roads, there are areas proposed for vegetation management that do not have sufficient road access for reaching timber stands, bringing in logging equipment, and hauling away forest products. In these areas, temporary roads would need to be constructed and then reclaimed during project implementation. A comment during scoping requested that the impacts of temporary roads be analyzed. Proposed temporary roads are described in Chapter 2 and analyzed in Chapter 3.

Unauthorized Routes

There are more than 54 miles of unauthorized routes in the project area. Unauthorized motorized routes were identified during field surveys over the last 8 years. These routes receive motorized use, but they are not part of the designated road or motorized trail network and they are not managed as part of the Medicine Bow-Routt National Forests' transportation system. Motorized travel on these routes is illegal. A comment from a cooperating agency during early review of the draft environmental impact statement requested that the status and treatment of unauthorized routes be clarified. Clarification is provided here and in the related sections of Chapters 2 and 3.

Unauthorized routes include unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail. Unauthorized routes also include roads that were once under permit or other authorization and were not effectively decommissioned when the authorization terminated (36 CFR 212.1, Forest Service Manual 7705 - Transportation System). Temporary roads from past timber harvest, if not effectively closed, may become unauthorized routes. User-created routes are also unauthorized. Unrestored temporary roads, user-created routes, and poorly located or unmaintained system roads can all have adverse impacts on soil, water, and wildlife resources.

System roads and unauthorized, non-system routes that have been decommissioned over the last two decades account for approximately 93 miles in the North Savery project area. However, some of the decommissioning has not been effective, and the routes are still being used. The effectiveness of past decommissioning methods was considered to determine most effective methods for physical obliteration of both system and unauthorized routes.

Unauthorized routes are not part of the designated road or trail system. A National Environmental Policy Act analysis and decision is required to add these routes to the designated road or trail system, and this is demonstrated by several elements of the modified proposed action. Except where specifically identified for addition to the National Forest road system, unauthorized routes are candidates for obliteration and restoration. There is no National Environmental Policy Act decision required to obliterate these roads, but the physical action of obliterating and restoring these routes has impacts that are disclosed and analyzed during the National Environmental Policy Act process.

The impacts associated with physical obliteration and restoration of unauthorized routes are included in this analysis and are a component of the decision to be made. Application of specific methods for closure and surveys to determine the presence of sensitive resources are determined during implementation and have not been included on a site-specific basis for unauthorized routes in the North Savery project area.

Continental Divide National Scenic Trail

The Continental Divide National Scenic Trail is the most unique recreation feature in the project area. All National Forest System trails in the project area are associated with the Continental Divide National Scenic Trail. Off-highway vehicles are allowed on a designated motorized route that coincides with National Forest System Road 412 and crosses back and forth over the geographic continental divide for approximately 10 miles from Bridger Peak along the North Savery southwest project area boundary (segments totaling 4 miles are inside the project area along this section). The designated nonmotorized route also follows National Forest System Road 412 for about four miles, then leaves the motorized route to cover approximately 10 miles from National Forest System Road 412 to the Hartt Creek Trailhead. The trail follows, crosses,

and parallels numerous open roads in keeping with the roaded natural and roaded modified recreation opportunity spectrum classes through which the trail corridor passes.

The Forest Plan includes adopted scenic integrity objectives to achieve or maintain desired scenic condition and landscape character. The scenic integrity objectives for most of the North Savery project area are low or moderate, consistent with the timber production emphasis of management areas and the recreation opportunity spectrum. In the immediate foreground of the Continental Divide National Scenic Trail, scenic integrity objectives of high and very high have been adopted as from the Continental Divide National Scenic Trail Comprehensive Plan when compatible with the management context of the area.

The current trail corridor is not regarded as the final trail location. Ideally the trail would be located in management areas more compatible with nonmotorized uses and that provide opportunities for recreation in a more natural-appearing environment. As the Continental Divide National Scenic Trail is further developed, it is expected that the trail will eventually be relocated off roads for its entire length (USDA Forest Service 2009). Decisions about the final location of the trail are not part of the decision to be made for the North Savery Project.

In the North Savery project area, the trail crosses Management Area 5.13, which has a recreation opportunity spectrum of roaded natural and roaded modified. Scenery along the trail is to meet the high to very high objective, which can be compatible with management activities when scenic integrity is addressed in design of the project. Design criteria to reduce the visual impact of activities proposed along the trail address this plan requirement and are described in detail in Chapter 2. Consistency with scenic integrity objectives is discussed in Chapter 3.

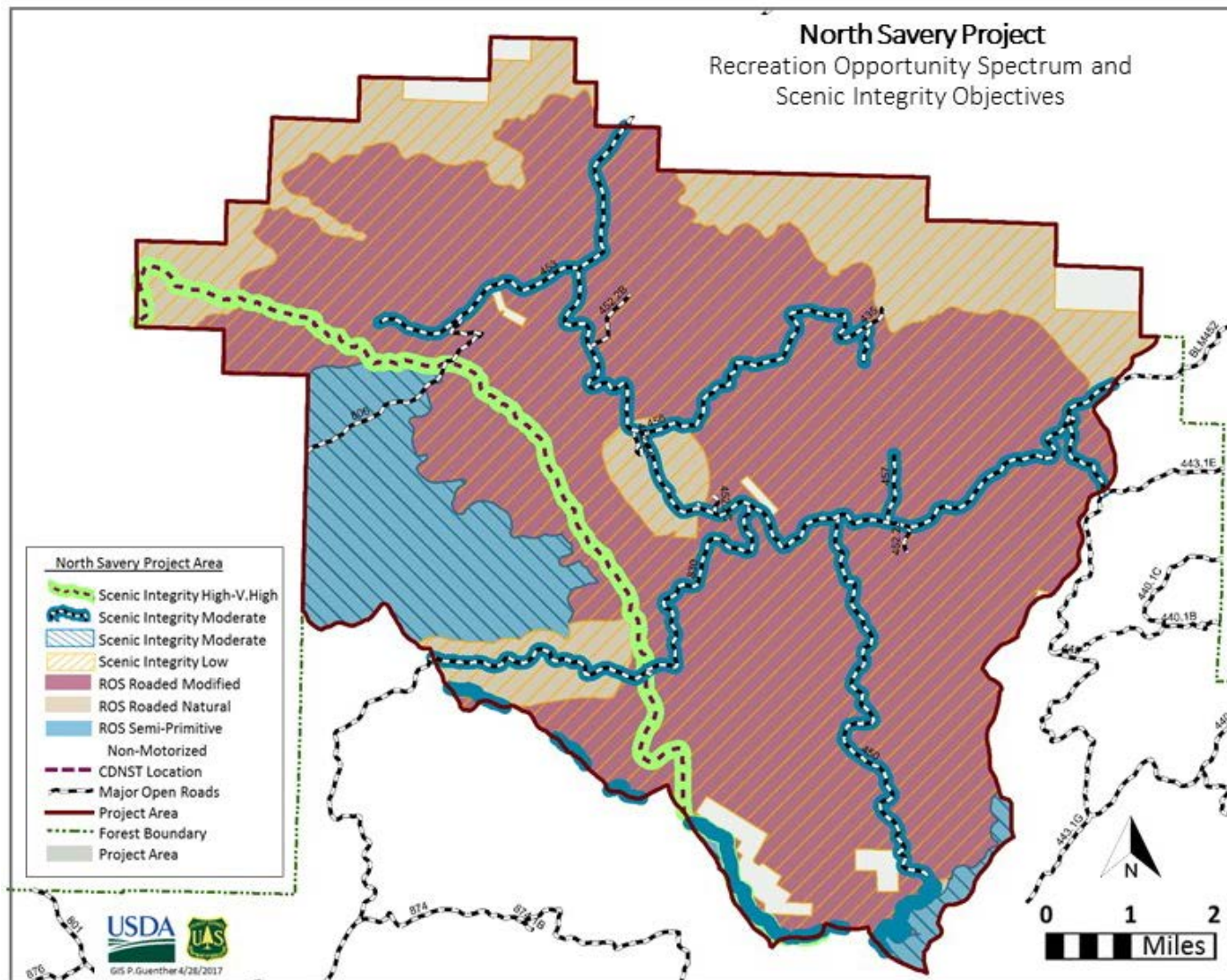


Figure 13. Recreation opportunity spectrum and scenic integrity objectives for the North Savery project area

Inventoried Roadless Areas

There are no designated wilderness areas in the project area, but portions of the Deep Creek, Mowry Peak, and Strawberry Creek Inventoried Roadless Areas provide locations for more primitive experiences (figure 2, table 13). The less accessible portions of the Strawberry Creek Inventoried Roadless Area are particularly remote. As noted above, 10 percent of the project area is classified as semi-primitive motorized, and these areas occur in the inventoried roadless areas. These areas have a predominantly natural-appearing environment, with moderate opportunities to experience solitude and closeness to nature. There are no system trails in any of the roadless areas except where approximately 1 mile of the Continental Divide National Scenic Trail skirts the very northern edge of the Strawberry Creek Inventoried Roadless Area.

The Deep Creek Inventoried Roadless Area extends a small distance into the southwest margin of the North Savery area; 84 acres of this inventoried roadless area are included. Deep Creek Inventoried Roadless Area is coincident with Management Area 3.31 (Backcountry Recreation) in this location. No activities in the inventoried roadless area are proposed in the North Savery Project.

The Mowry Peak Inventoried Roadless Area extends a small distance into the southeast margin of the North Savery area; 366 acres are included. The inventoried roadless area is coincident with Management Area 3.31 (Backcountry Recreation) in this location. The North Savery proposed action includes 0.3 miles of system road decommissioning to improve roadless character, watershed condition and wildlife habitat in the Mowry Peak Inventoried Roadless Area.

The northern lobe of the Strawberry Creek Inventoried Roadless Area extends farther into the North Savery area; 3,136 acres are included in the project area. The Strawberry Creek Inventoried Roadless Area is coincident with Management Area 3.5 (Forested Flora and Fauna Habitats Recreation) in this location. The North Savery modified proposed action includes 0.3 miles (approximately 4 acres) of fenceline hazard tree clearing along the forest boundary in this inventoried roadless area.

 **Table 13. Inventoried roadless areas and proposed activities in the North Savery Project Area.**

Inventoried Roadless Area (IRA)	Total IRA Acres	Acres in Project Area	Management Area of IRA in Project Area	% of Project Area	Proposed Activities in IRA
Deep Creek	6,411	84	3.31	Less than 1	None
Mowry Peak	6,241	366	3.31	Less than 1	Decommission open road (0.3 miles)
Strawberry Creek	5,876	3,136	3.5	Less than 7	Fenceline clearing (0.3 miles)

Water Resources: Agricultural Use and Aquatic Ecosystems

Water resources in the North Savery Project are in watersheds draining to the North Platte and Little Snake River drainages. Major streams include North Spring Creek, Jack Creek, and the North and East Forks of Savery Creek. There are numerous small lakes, ponds, and reservoirs, including North Spring Creek Reservoir, and over 900 acres of wetlands in the project area. Water originating in the area is used for a variety of beneficial uses, both on the Medicine Bow National Forest and downstream of the national forest boundary. Flows support aquatic life, fisheries, drinking water, recreation, wildlife, agriculture, and scenic values. The Ranger Ditch carries water from streams on the Medicine Bow for irrigation of lands in the valley.

Hard rock mining, cattle grazing, water developments, road decommissioning, prescribed fires, dispersed and developed recreation, logging, road construction and other activities have influenced stream channel morphology, aquatic habitat, water quality, and water quantity in the project area.

Equivalent clearcut area and connected disturbed area were used to describe the existing condition and as indicators of cumulative watershed effects for the project. Equivalent clearcut area levels above twenty-five percent and connected disturbed area increases over ten percent are commonly used as guides to indicate the potential for cumulative disturbances that may have measureable adverse impacts to water resources (Troendle and Olsen 1994). Current equivalent clearcut area ranges from zero to fourteen percent in project area watersheds. Connected disturbed area ranges from zero to nine percent (Purchase 2011).

The agency-wide Watershed Condition Framework can be used to provide a coarse view of watershed condition in the North Savery area (Purchase 2011). By this standard, current water resource conditions in the project area are fair. There are no State-listed degraded stream segments in the project area. Overall watershed conditions in the analysis area were rated as “functioning at-risk” (Class 2), the middle class of a three category classification system used in the Watershed Condition Framework. The higher and lower condition classes are “properly functioning” and “impaired function” respectively.

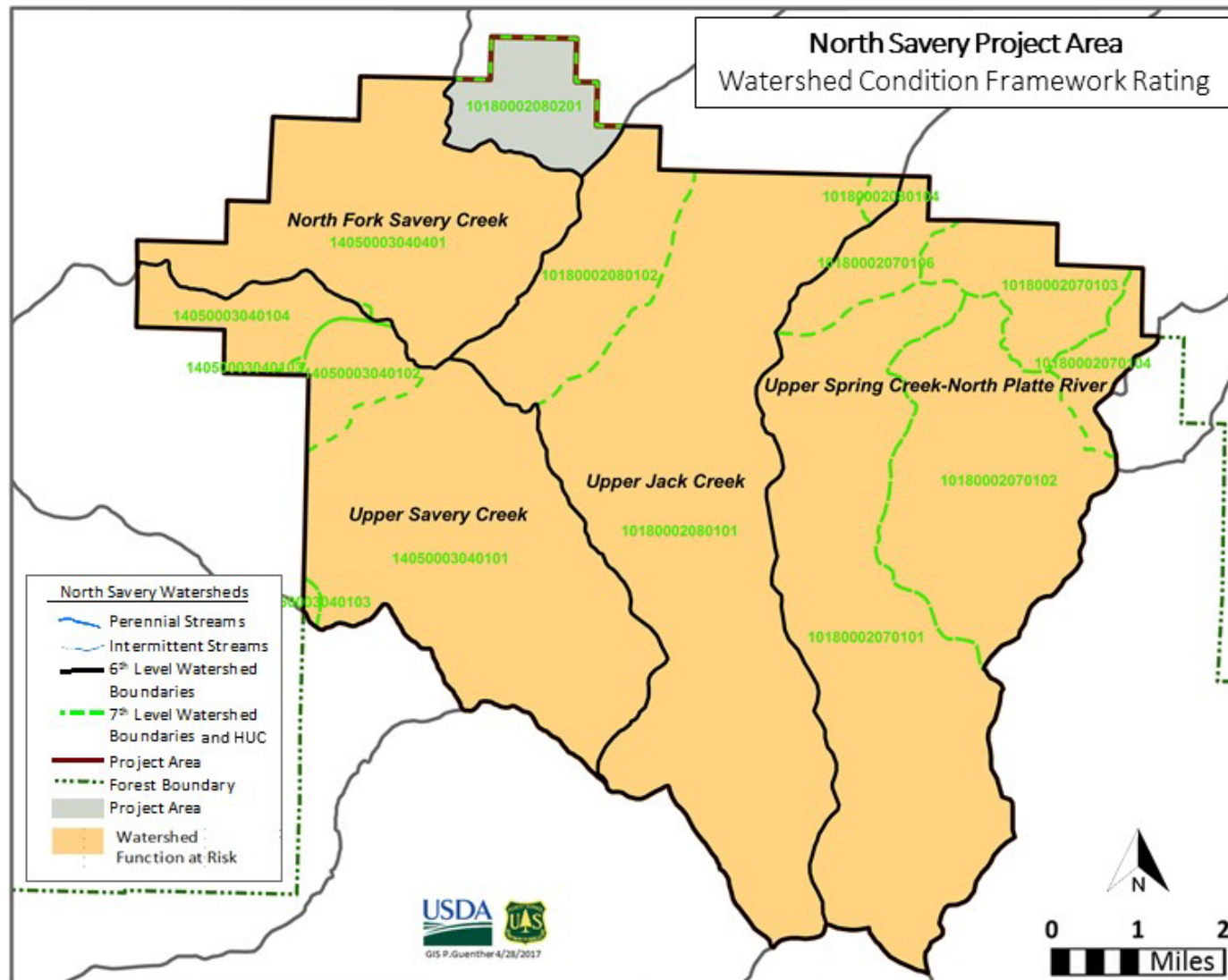


Figure 14. Overall watershed condition rating for North Savery project area from the nationwide Forest Service Watershed Condition Framework

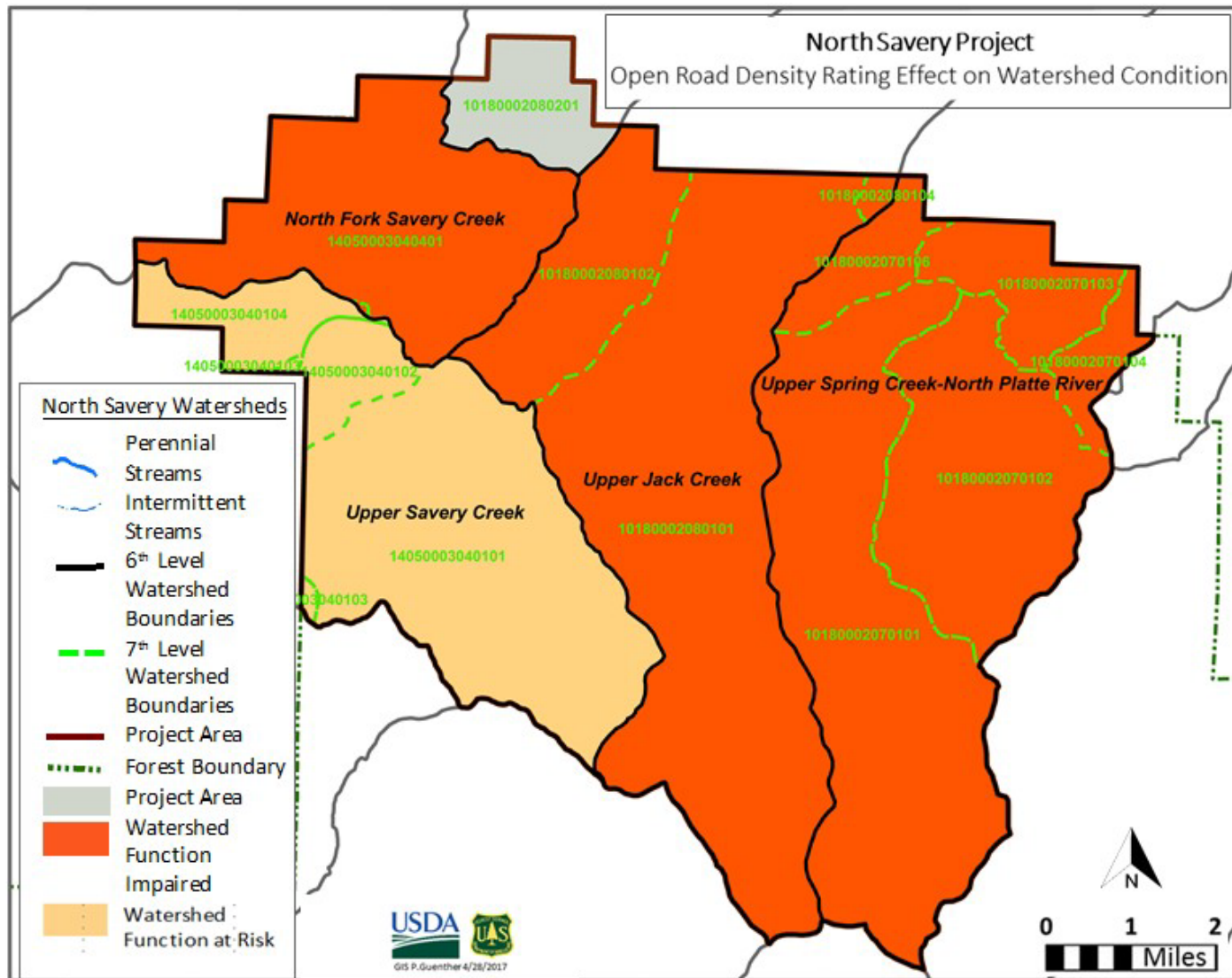


Figure 15. Some watersheds in the North Savery project area have impaired function, due in part to high densities of existing open roads

Degradation of water resources has been documented in site-specific locations, primarily as the result of road condition or motorized use on unauthorized or unsustainable routes (Gloss 2017). In addition, the overall density of roads in some project area watersheds is high. According to the Watershed Condition Framework, if there is a locally determined road density threshold supported by forest plans or analysis and data, those can be used. The Medicine Bow Forest Plan does not include quantitative road density standards, so the default classification values from the framework apply:

- Good (1) “Functioning Properly” = less than 1 mile per square mile
- Fair (2) “Functioning at Risk” = 1 mile to 2.4 miles per square mile
- Poor (3) “Impaired Function” = more than 2.4 miles per square mile

Using these criteria, the [open] road density attribute in the Watershed Condition Framework rated impaired function for three of the four 6th-level watersheds in the North Savery project area, with some of the highest road densities on the Sierra Madres occurring in these watersheds. This indicates the importance of the transportation system and travel management proposals included to mitigate effects of the project (USDA Forest Service 2017).

Waters in the project area include habitat for native and nonnative fish and a variety of amphibians. East of the Continental Divide, trout were not native in the Platte River basin and the existing populations were introduced starting in the late 1800s. Native species east of the divide include non-game species such as longnose dace, longnose sucker, white sucker, Johnny darter, and creek chub.

West of the Continental Divide, the Green River basin supports fourteen native fish species (Wyoming Game and Fish Department 2010). Native species in the analysis area include Colorado River cutthroat, mountain whitefish, mountain sucker, white sucker, speckled dace, longnose dace, creek chub, and mottled sculpin.

Both river basins now support game fish populations of introduced brown, brook, and rainbow trout. Fish habitat exists in all streams that have sufficient water; most streams appear to contain fish at levels comparable with other streams on the Medicine Bow National Forest. Streams in the project area are estimated to produce 1 to 300 pounds of fish per mile (WISDOM 2016). Higher-producing streams (50 to 300 pounds per mile) include the North and East Forks of Savery Creek, McLain, Jack, North Spring, Placer, and Nugget Creeks. All other streams in the area are less productive (1 to 50 pounds per mile). In comparison, blue-ribbon streams, such as the Upper North Platte River, are capable of producing over 600 pounds of fish per mile (Wyoming Game and Fish Department 2006).

All drainages on the western slope of the project area are classified as aquatic conservation areas by the Wyoming Game and Fish Department (2010). These areas are established for the conservation of Colorado River cutthroat trout. Stream records for the project area indicate Colorado River cutthroat trout were found in Beaver Creek (tributary to East Fork Savery Creek) in 1996 and in Joe Creek (tributary to Beaver Creek) in 1998. Decline of this species is attributed to hybridization with introduced trout species, and habitat loss through timber harvest, livestock grazing, and irrigation practices (Wyoming Game and Fish Department 2010). Habitat fragmentation due to road construction is another factor in habitat loss. Road culverts can both impede fish passage and protect upstream populations from hybridization. A known barrier culvert was replaced on National Forest System Road 452 at Nugget Creek in 2013. Most

culverts in the project area still need to be inventoried to determine whether they are aquatic organism passage barriers.

There are approximately 920 acres of mapped wetlands in the project area. A search of the amphibian databases revealed five occurrences of northern leopard frog and three of boreal toad. These species are Rocky Mountain Region Sensitive Species. The majority of these detections were in 1947. The most recent records are for boreal toad sightings in 1983 and 1996. According to Mease (2010), suitable amphibian habitat is likely present, but surveys did not document any special species status in the project area. Data from multiple years of surveying suggests federally listed amphibian species and Region 2 sensitive amphibian species are rare to absent in the project area.

Terrestrial Wildlife and Plant Habitats

The North Savery project area contains some important wildlife habitats. There is habitat for the federally threatened Canada lynx managed in a portion of the upper Sierra Madre lynx analysis unit. There are winter range and parturition areas for elk and stopover areas for migrating mule deer. The periphery of the area also has priority and general habitat for greater sage-grouse. Sagebrush, old forests, riparian habitat, and wetlands for several other Rocky Mountain Region sensitive species and forest management indicator species are distributed throughout the project area. During early review of the draft environmental impact statement, several cooperating agencies asked for, or provided clarification of, how sage-grouse habitats are interrelated with activities and resources in the project area.

Canada Lynx

The Forest received a list of federally threatened, endangered, or proposed species from the U.S. Fish and Wildlife Service in May 2016. Canada lynx is the only federally threatened or endangered wildlife species that might occur in the North Savery project area and might be affected by proposed actions. No other listed wildlife species would be affected by the North Savery project.

Lynx are known to have used areas on the Medicine Bow National Forest. In an effort to establish a viable population of lynx in Colorado, 218 lynx were reintroduced into southwestern Colorado between 1999 and 2006. Before their reintroduction, the most recent Canada lynx observations on the Medicine Bow National Forest were prior to 1912. By 2009, forty-nine lynx were still being monitored (Colorado Parks and Wildlife, accessed 02/2010). Colorado Parks and Wildlife personnel tracked reintroduced lynx to identify areas animals travel through or are using on a more regular basis. Generally, tracking results (Shenk 2008) indicated that habitat use by lynx decreased with increased distance from the southwest Colorado release sites. However, since 1999, nine lynx were confirmed on the Medicine Bow National Forest in locations obtained from aerial searches for very high frequency radio signals and from transmissions to satellites from the satellite transmitters (Shenk 2007). Telemetric monitoring was discontinued after 2010. Hair snare transects from 2000 to 2002 did not produce any lynx hairs on the Brush Creek/Hayden Ranger District.

Lynx may be present in the North Savery project area even though they have not been confirmed with the methods above. Because of their free-ranging habits, lynx need to be able to move between different geographic areas and mountain ranges. In some cases, they move long distances through unfavorable habitat (USDI Fish and Wildlife Service 2008). Conservation actions for Canada lynx on the Medicine Bow National Forest focus on preventing loss of habitat

suitable for the lynx or its primary prey, the snowshoe hare because habitat loss is a primary threat to lynx (Federal Register Volume 65, Number 58, p. 16074 and 16082).

Discussion of affected lynx habitats is limited to areas where the North Savery Project overlaps with the upper Sierra Madre lynx analysis unit. Habitat for lynx is categorized into cover, foraging, and denning. Foraging habitat consists of early successional forests where snowshoe hares are plentiful, especially at northern latitudes. These are the habitats that lynx favor for hunting. Regenerating lodgepole pine (or Douglas fir) provides short- to moderate-term cover and forage for lynx but primarily provides high-density food for snowshoe hare (Koehler 1990).

Mature, dense Engelmann spruce-fir forest provides long-term cover and forage opportunities for both lynx and snowshoe hare. Conifer-aspen forests, particularly those with dense regeneration or an extensive shrub and woody debris understory component, may also be important for prey species. Mature forest stands are used for denning, cover for kittens, and travel corridors. Denning habitat has been described as areas having dense downed trees and root wads or dense live vegetation (Koehler 1990, Mowat et al. 2000). For denning habitat to be functional, it must be in, or adjacent to, large areas of quality foraging habitat (Ruediger et al. 2000).

Habitat management for lynx occurs in lynx analysis units. Each lynx analysis unit on the Medicine Bow-Routt National Forests is approximately 50,000 acres, simulating the size of a lynx home range. The southern portion of the North Savery project area falls in the upper Sierra Madre lynx analysis unit. Management guidance for lynx is provided by the Southern Rockies Lynx Amendment and is incorporated into the Medicine Bow and Routt Forest Plans. Among this guidance is a standard to maintain 30 percent or less of the habitat in any lynx analysis unit in a currently unsuitable condition. Modeling of lynx habitat indicates that most lynx analysis units contain more than 30 percent of the habitat in an unsuitable condition due to changes caused by the mountain pine beetle outbreak. The upper Sierra Madre lynx analysis unit is estimated to contain 46 percent of the habitat in an unsuitable condition for lynx.

It is possible to predict the utility of forest stands as potential Canada lynx habitat by screening stand information used for timber management to account for lynx habitat preferences. A model for mapping lynx habitat was first developed using habitat definitions and descriptions contained in the lynx conservation assessment and strategy (Ruediger et al. 2000) and the Medicine Bow-Routt National Forests' Resource Information System vegetation database. This effort was completed in 2001. Since that time, annual field verification of some modeled lynx habitat, a thesis on snowshoe hare habitat use on the Routt National Forest (Miller 2005), updated and more detailed vegetation data in the Medicine Bow-Routt National Forests' R2Veg database, and changes from annual beetle mortality flights have led to changes in lynx habitat characterization across the lynx analysis units.

The pine beetle outbreak has killed an estimated 70 percent of the mid-aged and mature lodgepole pine across much of the Medicine Bow-Routt National Forests. As a result, this habitat is unsuitable for lynx. The stands no longer produce enough cone seeds for adequate red squirrel populations, and they do not have enough dense horizontal cover for adequate snowshoe hare prey. Snowshoe hares are the primary food source for Canada lynx. Alternate prey, such as red squirrels, can be important also. Quality snowshoe hare habitat is comprised of dense horizontal cover that is present above the snowline in winter. This habitat is provided by the later stages of regeneration and by older, multi-story forest. Red squirrels rely predominantly on cone seeds from conifer trees. The mountain pine beetle outbreak has changed these important prey habitats in the North Savery area.

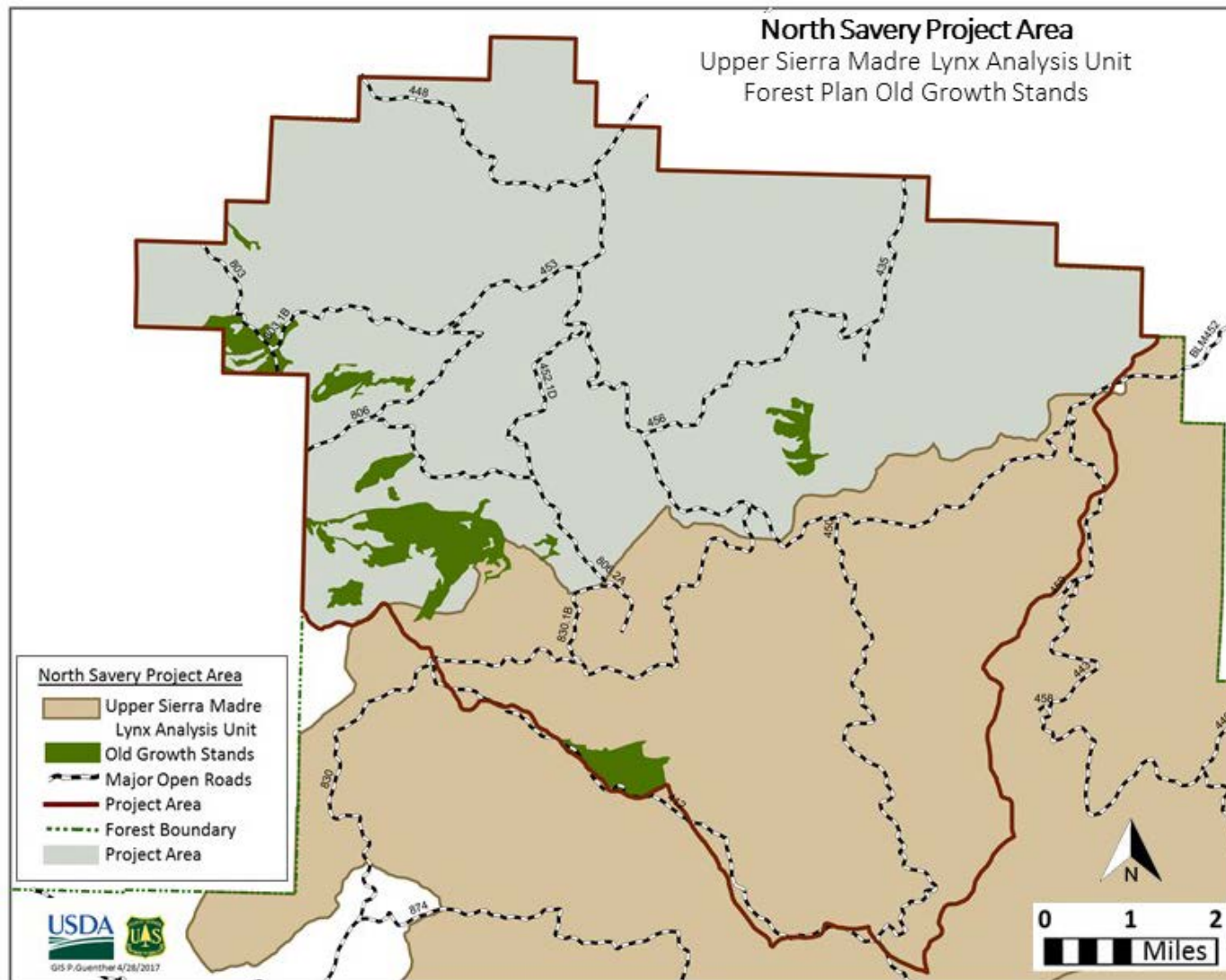


Figure 16. Part of the upper Sierra Madre lynx analysis unit and Forest Plan inventoried and mapped old growth stands in the North Savery area

A dramatic change from habitat mapping developed in 2001 is the conversion of live lodgepole pine stands to stands with high levels of mortality from the mountain pine beetle epidemic. This outbreak resulted in a large conversion of suitable lynx habitat to currently unsuitable condition (stand initiation structural stage) by 2008, not only in the North Savery project area but across the Medicine Bow-Routt National Forests as a whole. Minor annual adjustments continue to be made as a result of information from annual beetle mortality monitoring. Lodgepole pine mortality is likely to affect lynx by affecting the population dynamics of snowshoe hare and red squirrel. As canopy cover and horizontal structure decline, red squirrel and snowshoe hare abundance should decline. Lower prey abundance will exist until regeneration provides dense horizontal cover, overhead canopy cover, and conifer cone production.

A second overall revision of lynx habitat mapping was conducted in 2010 to account for more recent information about habitat characteristics, prey habitat, and pine-beetle-caused mortality (Dressen and Tolbert 2010). This effort changed lynx analysis units, unit boundaries, habitat characterization in lynx analysis units, and linkage corridor boundaries. U.S. Fish and Wildlife personnel in Wyoming and Colorado accepted these changes in December 2010. Some proposed thinning units brought forward from the 2010 Savery Project proposed action were eliminated from consideration for the North Savery project when revised lynx habitat mapping indicated they were in suitable habitat.

A third update of lynx habitat mapping is currently underway in conjunction with the Medicine Bow Landscape Vegetation Analysis. This updated information should be reflected in the final environmental impact statement. This effort is expected to change habitat characterization in lynx analysis units, but is not expected to change boundaries of lynx analysis units or linkage corridors. The primary expected change is that mapped habitat would use updated monitoring and modeling that more accurately reflects higher mortality in mature to over-mature lodgepole pine and other species, but lower mortality in stands of younger trees. Updated mapping will be subject to review and acceptance by U.S. Fish and Wildlife personnel in Wyoming and Colorado.

Greater Sage-grouse

The greater sage-grouse (*Centrocercus urophasianus*) is a large, rounded-winged, ground-dwelling bird. It has a long, pointed tail with legs feathered to the base of the toes and fleshy yellow combs over the eyes. Males are larger than females and sport a white ruff around their necks in addition to the typical mottled brown, black and white plumage. Males have bright yellow air sacks on their breasts, which they inflate during their mating display. Females are a mottled brown, black, and white. Sage-grouse are omnivores, eating mainly sagebrush, some other soft plants, and insects.

The breeding habitat for the greater sage-grouse is sagebrush country in the western United States and southern Alberta and Saskatchewan. They nest on the ground under sagebrush or grass patches. They live in elevations ranging from 4,000 to over 9,000 feet, and cannot survive in areas without sagebrush. A known lek is located 3 miles west of the project area.

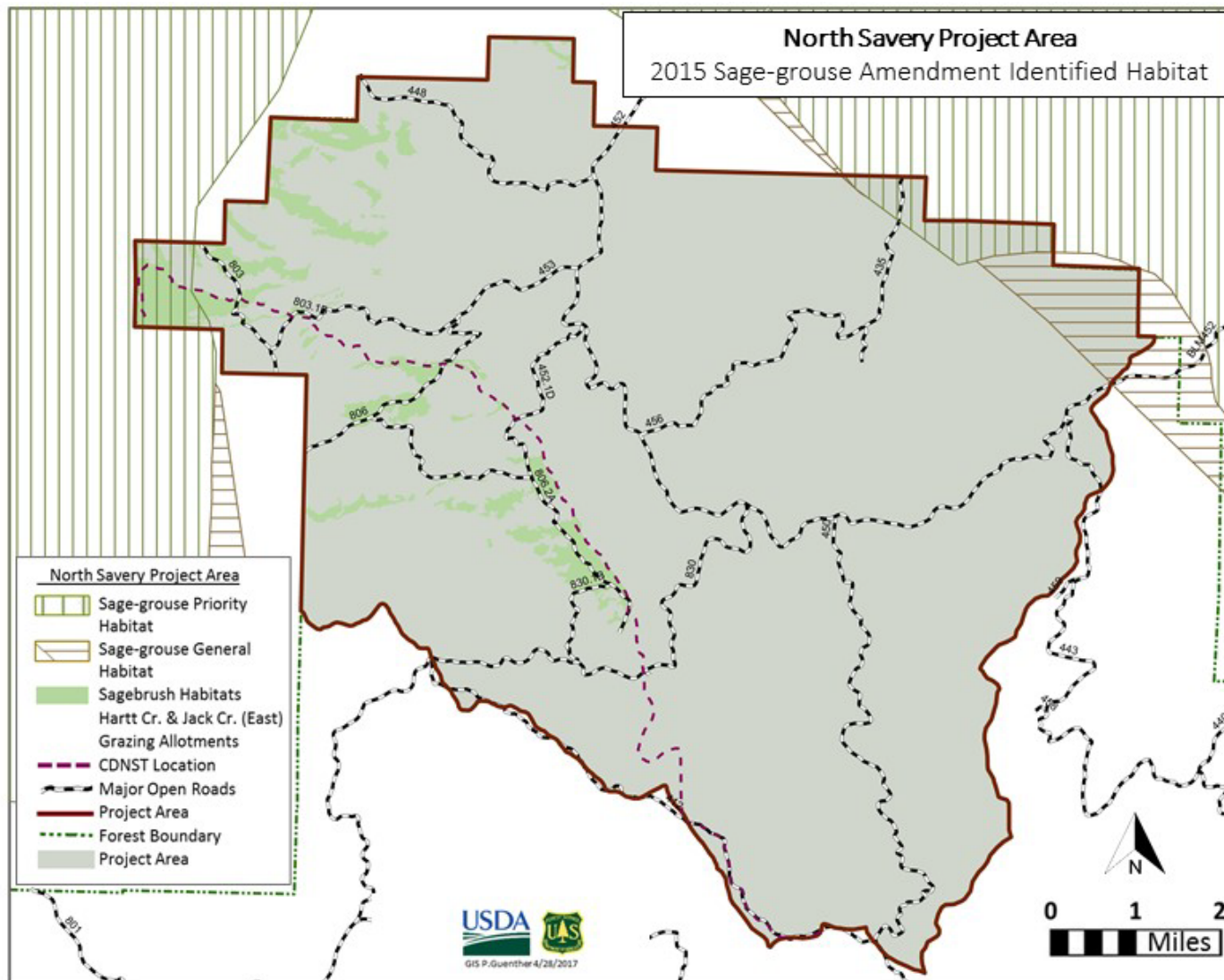


Figure 17. General and priority habitats for greater sage-grouse identified in the 2015 greater sage-grouse Forest Plan amendment

The historic range of the greater sage-grouse included Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Colorado, Utah, South Dakota, North Dakota, Kansas, Oklahoma, Nebraska, New Mexico, Arizona, and the Canadian provinces of British Columbia, Alberta, and Saskatchewan. Greater sage-grouse have apparently disappeared from Nebraska, Kansas, Oklahoma, New Mexico, Arizona, British Columbia, and Saskatchewan. Sage-grouse are widespread in Wyoming.

Habitats near the forest fringe at the lowest elevations of the North Savery Project area have been identified as priority or general habitat in the interagency analysis for the sage-grouse amendment (http://fsweb.mbr.r2.fs.fed.us/quick_picks/sagegrouse/2015-ROD-w-useful-bookmarks.pdf). More than 8,000 acres of upland shrub types occur in the North Savery project area, though a much smaller acreage is within the identified sage-grouse habitat shown in figure 17.

Other Special Status Species

There are three wildlife species of local concern with potential to occur in the North Savery project area: pika, brown-capped rosy finch, and brown creeper (USDA 2003b). Of these species, only the brown creeper occurs in habitats proposed for vegetation management in the North Savery project. The brown creeper occurs in large blocks of old spruce-fir and lodgepole forest. Threats include forest management that alters the structure of its preferred mature and old-growth forest with reductions in basal area of live trees, canopy closure, and the quantity, quality, and distribution of suitable snags. Designated old-growth stands are not included in proposed timber salvage or other treatments, but other mature forest habitat for this species is in areas affected by the modified proposed action.

Forest Plan management indicator species were identified according to habitat availability, the issue or habitat assemblage the species represent, relevance of the issue or habitat assemblage to the project, and whether the project has potential for substantial effects to the species or its habitat. Management indicator species relevant to the North Savery project are snowshoe hare, American marten, northern goshawk, golden-crowned kinglet, three-toed woodpecker, Lincoln's sparrow, and Wilson's warbler (table 14). There is habitat for all seven species in the North Savery analysis area.

Table 14. Management indicator species from the Medicine Bow Forest Plan and their associated habitats.

Species	Indicator of	Habitat Used
Snowshoe hare	Adequacy of habitat to support prey species of top predators	Habitats with dense understory
American marten	Spatial pattern or fragmentation-perforation at landscape scale and coarse woody debris	Spruce-fir, lodgepole pine
Northern goshawk	Late seral lodgepole and aspen	Aspen, lodgepole pine
Golden-crowned kinglet	Fragmentation within a stand	Spruce-fir, lodgepole pine
Three-toed woodpecker	Snags, old forest, recent forest burns	Spruce-fir, lodgepole pine
Lincoln's sparrow	Riparian zone, herbivory in willow community	Riparian areas
Wilson's warbler	Riparian zone, herbivory in willow community	Riparian areas

The North Savery project could have an impact to all 7 terrestrial management indicator species. Lincoln's sparrow and Wilson's warbler would be affected only by travel management since no vegetation management will occur in willow riparian areas.

In general, the mountain pine beetle outbreak reduced the quality and amount of breeding, foraging, or resting habitat for some individuals of most management indicator species because of the drastic reduction of the live overstory, significant loss of live trees, and related substantial reduction in forage or prey. Initially, these habitat changes had a positive effect on the three-toed woodpecker, which benefitted from increases in wood-boring beetles and snag creation. However, the benefits to three-toed woodpeckers have largely subsided as pine beetle prey have declined to normal abundance and large snags are now more abundant than necessary for three-toed woodpecker needs.

There are 10 Rocky Mountain Region sensitive species with potential to be affected by the North Savery Project: greater sage-grouse, northern goshawk, boreal owl, olive-sided flycatcher, Brewer's sparrow, pygmy shrew, hoary bat, American marten, western bumblebee, and Hudsonian emerald. Greater sage-grouse, Brewer's sparrow, western bumblebee, and hoary bat are most influenced by travel management decisions addressed later. Northern goshawk, boreal owl, olive-sided flycatcher, pygmy shrew, and American marten are dependent on a forest matrix that includes older, live forest. Generally, the pine beetle outbreak reduced the quality and amount of breeding, foraging, or resting habitat for some individuals of each sensitive species. The drastic reduction of the live overstory, significant loss of live trees, and related substantial reduction in forage or prey should have a negative effect to individuals as effects from the mountain pine beetle outbreak progress.

Plant Species of National and Local Concern

No federally threatened, endangered, or proposed plant species or designated critical habitat occur in the analysis area, but one species occurs downstream and would be affected by water depletions: western prairie fringed orchid. However, there are no water depletions associated with the North Savery Project, so this species is not described in detail here.

The Medicine Bow-Routt National Forests recognize 27 plant species of local concern that are known or suspected to occur on the North Savery project area (2016 list). Five of these were documented during field surveys; pale coralroot, broad-lipped twayblade, heart-leaf twayblade, blunt-leaved orchid, and white-veined wintergreen. No Region 2 sensitive plant species were located during field surveys. Changes in habitat suitability, particularly for shade-loving plants, are likely occurring in the project area as forest stand conditions change and more sunlight reaches the forest floor.

Big Game Species

Big game species including elk, moose, mule deer, and pronghorn occur in the North Savery project area. Annual migration routes and habitats used for specific life stages are known from the variety of foothills to high elevations of the northern Sierra Madre Mountains. Elk and mule deer are by far the most common big game animals in the project area. Elk herds are the object of high visitor use during fall hunting season. Elk populations have remained above herd objectives for the last decade. Mule deer, in contrast, are not as abundant as historic counts suggest they were. The Platte Valley mule deer project, sponsored by the Wyoming Game and Fish Department, is focused on identifying and implementing habitat improvement projects that could improve mule deer populations. The Bureau of Land Management, local conservation districts, the Forest Service, and other interested parties are involved with the project.

Wyoming Game and Fish Department biologists participated in evaluating whether the North Savery Project should include additional work to improve mule deer habitat in the project area.

Noxious Weeds

Noxious weeds are also increasing in abundance, invading some dead stands of lodgepole pine as a result of increased sunlight and available moisture, or both. Noxious weeds in the project area are musk thistle, Canada thistle, oxeye daisy, spotted knapweed, yellow toadflax, leafy spurge, and common tansy. Cheatgrass, the highly invasive annual, nonnative grass that has been increasing in abundance across the West, is also present in the project area, as well as other parts of the Brush Creek/Hayden Ranger District and surrounding Bureau of Land Management lands.

Livestock Grazing and Rangeland Management

Livestock grazing is the primary basis of the agricultural economy in southcentral Wyoming. Summer grazing on national forests and other public lands complements winter use on ranch base properties to provide year-round feed for cattle. Four livestock grazing permittees use the Jack Creek and Hartt Creek allotments to provide summer forage for cattle in the North Savery project area. Allotments are managed using annual operating plans to implement adaptive methods to achieve satisfactory rangeland condition and utilization. Rangeland conditions in the Jack Creek and Hartt Creek allotments are currently satisfactory. Specific proposals for changes in livestock management are not included in the decision to be made for the North Savery Project.

However, forest management and livestock management are closely linked, and that relationship is reflected in the modified proposed action. The affected grazing permittees collaborated in development of the North Savery Project and may share responsibility for implementing some elements of the project, such as fenceline clearing. During an early review of the draft environmental impact statement, several cooperating agencies asked for clarification of how livestock grazing management, project proposals, and sage-grouse habitats were interrelated. Clarification has been provided in the “Terrestrial Wildlife” section above and in Chapter 3 – Environmental Consequences.

Most cattle forage in the project area is located in upland shrublands, meadows, riparian areas, and aspen stands. Timber harvest can provide transitory range for cattle when grass grows in harvest units. Although most old timber harvest units in the project area have regenerated with young trees to the extent that understory forage has declined, pine mortality from the mountain pine beetle epidemic is creating new transitory range in some stands as increased sunlight reaching the ground and reduced competition for water create suitable growing conditions for palatable grasses and forbs.

Livestock movement in the project area is controlled by fences, natural barriers, and riders. Nearly all the national forest boundary around the project area is fenced (about 27 miles), and the boundaries between the two allotments and between pastures within allotments are partially divided by 8 miles of internal fences. Natural barriers created by contiguous stands of mature coniferous forest with little or no understory forage usually work in combination with constructed fences to keep cattle within allotments or pastures, but this is changing as the mountain pine beetle forest deteriorates. In some cases, fallen trees restore or maintain effective natural barriers in dead pine stands. In other locations, cattle may cross dead pine stands because the newly available forage attracts them and the natural barriers are gone.

There are about 6.8 miles of fence which are now susceptible to accelerated damage as dead trees fall on the fences more and more often. Private, State and BLM land managers adjacent to the forest recognize this threat and are clearing hazard trees from their side of the national forest boundary. Where hazard trees are cleared on only one side of a fence, the problem of blow-down trees increases substantially because the adjacent unharvested trees now have more wind exposure. There are approximately 0.46 miles of forest boundary fence with timber removed from the private land side on the Hartt Creek Allotment. On the Jack Creek Allotment, Bureau of Land Management personnel plan to remove dead timber from their side of approximately 0.5 miles of forest boundary fence in the next few years.

In addition to making fences very difficult to maintain and shortening their service life, falling trees put permittees who are maintaining these fences, and Forest Service employees administering livestock permits, at increased risk of injury compared to risk in live pine stands.

Permittee access for livestock management is also becoming more dangerous and difficult on the forested portions of these allotments. Downed trees block livestock movements as well as mobility of the riders trying to gather or move them.

Roads in the project area provide access for livestock management as well as other multiple uses. Permittees use both open and closed roads and motorized and nonmotorized trails in the project area to trail cattle to and from the allotments; move cattle between pastures; access fences, stock ponds and spring developments for maintenance and repair; and place salt or other livestock supplements. Roads are becoming increasingly important for trailing livestock in forested portions of the allotments since downfall trees have made horseback and livestock travel through many timber stands much more difficult and many times more hazardous due to the potential of falling beetle-killed trees. Though the permittees do most of their livestock management on horseback, roads that allow access by pickup truck and horse trailer can save time and improve livestock management by making it easier to check livestock distribution; put out mineral salt; and carry fence posts, wire, and heavy tools such as post pounders to maintenance sites.

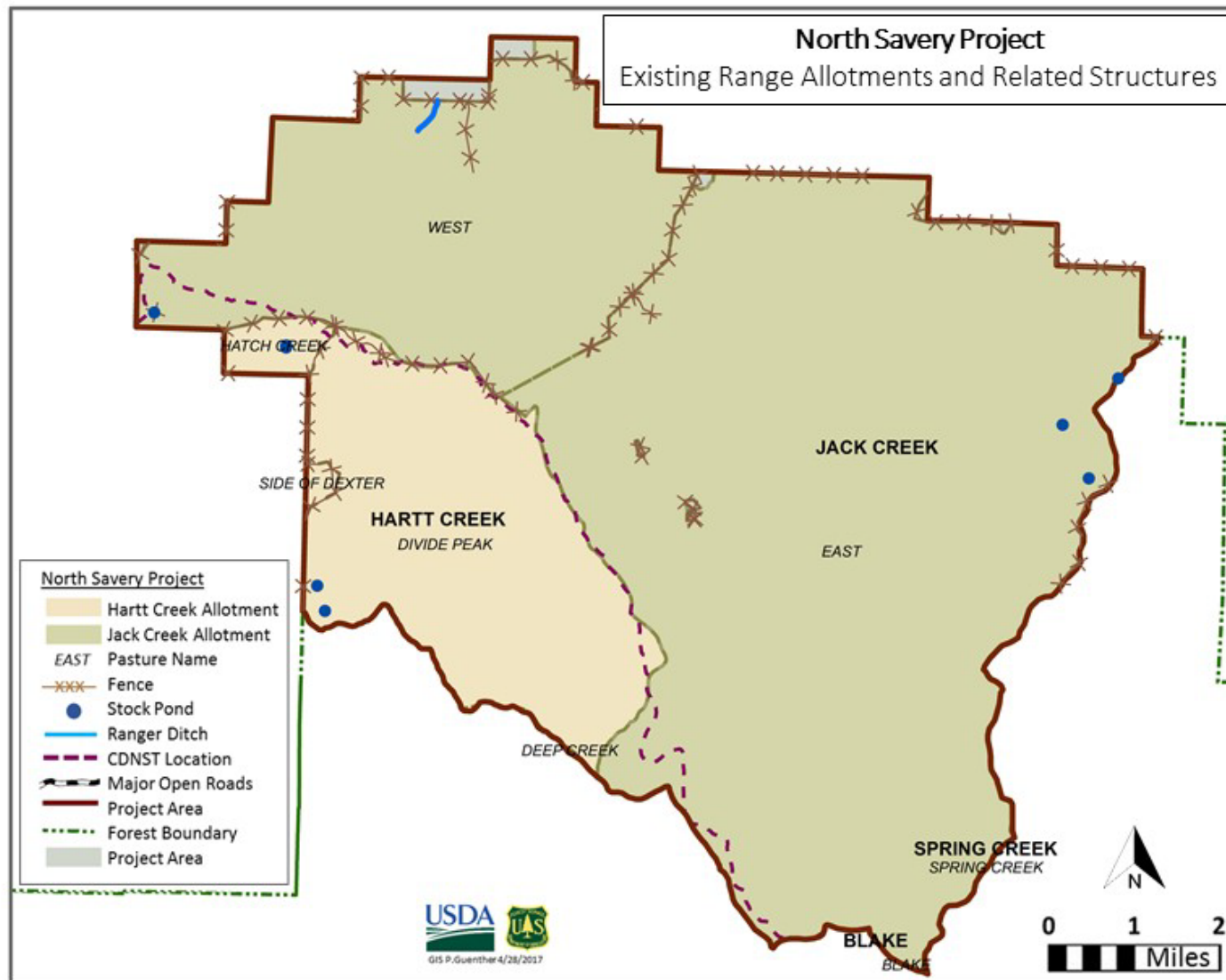


Figure 18. Livestock grazing allotments, pastures, fencelines, irrigation ditch, and stock ponds in the North Savery project area



Figure 19. Deadfall across post and wire boundary fence in the Jack Creek Allotment. Yellow arrows indicate fence posts.

Social and Economic Geography of the North Savery Project Area

Cultural Resources

People have lived in, visited, and utilized the resources of the North Savery area for thousands of years. Records on-file with the Wyoming State Historic Preservation Office and Brush Creek/Hayden Ranger District indicate 32,300 acres (70 percent) of the project area have been inventoried for cultural resources, with 132 archaeological sites documented. Of these sites, 44 are prehistoric, 74 are historic, and 14 have both historic and prehistoric components. Prehistoric resources consist of lithic scatters, camps, and stone circle sites. There are no known traditional cultural properties in project area.

Historic sites and uses include Forest Service administrative and recreation facilities; mining, logging, and hunting camps; mines; transportation infrastructure (railroads, trails, roads, and livestock driveways); and areas with concentrations of historic refuse. The Jack Creek Guard Station is listed on the National Register Historic Places. Many traditional historic uses of the project area continue today. Livestock grazing, recreation, firewood gathering, fishing and hunting, and water management are reflected in permitted and public uses in the area.

Local and Regional Economies

The lifestyles and livelihoods of residents and visitors in nearby communities including Baggs, Encampment, Riverside, Saratoga, and Rawlins are closely tied to experiences, goods, and services in the North Savery area. Local economies are directly tied to harvest, processing, and sales of forest products including logs, wood biomass, posts and poles, and firewood. Local ranches rely on the Medicine Bow National Forest for water and forage to support irrigated hay

production and feed for cattle, horses, and a limited number of sheep. Outfitters and guides provide services to allow local residents and visitors alike to enjoy hunting and fishing on the Medicine Bow National Forest and other private and public lands.

The location of the project area near Interstate 80 means North Savery hosts both destination visitors and those travelling through southcentral Wyoming. As public lands near Colorado's Front Range and the Wasatch Front in Utah become more crowded, weekend visitors seek less crowded recreation opportunities in Wyoming. Travelers toward Yellowstone National Park often stop in the Medicine Bow National Forest on the way.

Lower fuel costs and shrinking timber processing infrastructure means raw products from the project area may be transported to western Colorado or South Dakota for processing. This strengthens and widens the economic web around the Medicine Bow National Forest but also puts additional competitive pressure on local communities to update and diversify their economic foundation.

The University of Montana's Bureau of Business and Economic Research (BBER) analyzed Wyoming's forest product sectors, and found that in 2014, Wyoming mills received 91.4 million of board feet (MMBF) of timber for processing. Over half (54 percent) of the timber processed in Wyoming came from outside the state, including South Dakota and Colorado.

The 12 Wyoming sawmills active in 2014 had a combined annual production capacity of 225.7 MMBF lumber tally, of which 55 percent was utilized. There were 9 confirmed active post and pole manufacturers, with a combined annual output capacity of 2.2 million pieces (in 2014 more than 1.8 million pieces were produced). Wyoming has three log home manufacturers and two log furniture manufacturers operating in 2014, with a combined sales of \$1.4 million.

Other primary forest product firms include two wood pellet plants (one of which was inactive), a commercial firewood operation and a producer of bagged wood shavings for animal bedding, with a combined sales value of \$3 million in 2014 (McIver et al. 2016).

In 2014, total employment in the Wyoming forest industry was estimated at 1,032 full- and part-time workers. In addition to the approximately 391 workers employed in primary wood products manufacturing, McIver et al. (2017) estimated that roughly 161 workers were employed in forestry and logging, 213 workers provided supporting activities for forestry operations and the remaining 268 workers were employed in the secondary manufacturing of wood products. Workers in the forest industry earned just over \$39 million (constant 2014 dollars) in total labor income.

General Recreation

In the North Savery project area, dispersed camping, hunting, fishing, and off-highway vehicle use are popular activities. There are over 162 miles of National Forest System roads open to motorized travel in the area. This extensive network of roads provides users with many options to access and view the Medicine Bow National Forest. There are many dispersed campsites established throughout the analysis area. Other forms of dispersed recreation, including hiking, biking, horseback riding, and picnicking, are also popular. Many local residents and regional visitors have strong associations with the North Savery project area developed from their experiences connecting to nature through activities with friends and family here.

Recreation based on motorized travel is the largest public use in the project area, particularly during big game hunting season. The recreation opportunity spectrum settings in the North

Savery project area reflect this motorized emphasis and the timber harvest history of the area: roaded modified (70 percent), roaded natural (17 percent), and semi-primitive motorized (10 percent). Slightly less than 3 percent of the area is State and private inholdings that are not assigned to a recreation opportunity spectrum class. Although use cannot be assigned specifically to the North Savery project area, the Medicine Bow National Forest as a whole hosted substantial proportions of resident (10.3 percent) and nonresident (22.3 percent) off-highway vehicle recreation use in Wyoming during the 2012 season (Wyoming Comprehensive Off-Road Vehicle Recreation Report 2012.)

Most use occurs in the summer and fall, with only a hardy few braving heavy snow and high winds in the winter. Although snowmobiling is popular on the district, this area is not heavily used. The only identified snowmobile trails are ungroomed routes co-located on 18.7 miles of National Forest System Roads 443, 450, 452, and 830.

Developed recreation facilities are also consistent with the recreation opportunity spectrum. The Jack Creek Campground has 16 campsites and standard camping amenities. Approximately 365 people stayed in the campground during the 2015 season. The Jack Creek Crew Quarters and Guard Station rentals, located nearby, offers rustic indoor accommodations. Two designated trailheads (at Deep Jack and Hartt Creek) provide access to the Continental Divide National Scenic Trail.

Scenic integrity objectives are intended to define and protect the visual experience during forest management. They are related to recreation opportunity spectrum classes across the landscape, but can also include special consideration for the visual foreground. Figure 13 indicates the general scenic integrity objectives in the North Savery project area, as well as those specific objectives for arterial and collector road corridors and the Continental Divide National Scenic Trail corridor.

Purpose and Need for Action

There are clearly gaps between the desired condition and the existing conditions of resources that provide multiple uses and values in the North Savery project area. The goal of the North Savery Project is to narrow those gaps by improving and restoring ecosystem health and forest productivity in the project area through vegetation, fuels, and roads projects.

More specifically, the project **purpose** is to:

- promote forest regeneration, particularly in stands affected by mountain pine beetle;
- treat overstocked timber stands to improve growth, vigor and resiliency;
- reduce development of large, continuous, high-hazard fuel conditions in areas with high timber production;
- remove hazard trees from high-priority areas affecting public safety;
- provide merchantable timber products for sale from designated timber units; Relocate, reconstruct, or restore to natural conditions portions of the existing road system contributing to impaired function of watersheds to restore forest and ecosystem resiliency.
- designate and maintain a sustainable road system for management and public access.
- complete requirements of the Travel Management Rule (36 CFR 212 Subparts A and B).

The project is **needed** now in the North Savery area because:

- over the past decade, a mountain pine beetle epidemic has killed pine trees across thousands of acres of forest land in southern Wyoming, and management now could improve resiliency to future stresses on the forest;
- timber stands in the North Savery project area are among the most productive growing sites on the Medicine Bow National Forest, and it is a priority to reforest and return these stands to active timber production;
- there is a limited time in which to salvage these trees and recover a sawtimber product;
- fuel breaks suitable for holding firelines and protecting values at risk do not exist in many parts of the analysis area;
- standing dead trees create safety hazards to the public and Forest Service employees;
- a National Environmental Policy Act analysis and decision have not yet been made to designate the minimum road system for the North Savery Project area to complete Subpart A of the Travel Management Rule (36 CFR 212 Subpart A);
- some designated roads are contributing to degraded resource conditions on the Medicine Bow National Forest, including loss of vegetation, erosion, sedimentation to streams, and reduced quality of wildlife habitat;
- road improvements, such as replacing failing culverts, are also needed to maintain the transportation system; and
- the Chief of the Forest Service and the Governor of Wyoming identified this project location as a priority area for treatment due to insect and disease infestation.

The modified proposed action is intended to optimize the intersection between actions that would address the purposes of the project, and connected actions that are needed to minimize the adverse impacts of forest conditions and management on watersheds, wildlife, and recreation.

Specific design criteria and mitigation measures to assure the proposed project would restore resilient, sustainable forest and watershed conditions are described in Chapter 2.

Chapter 2. Proposed Action and Alternatives

Overview

This chapter describes and compares the alternatives considered for the North Savery Project. It includes a complete description and map of each alternative considered. This section also presents the alternatives in comparative form, showing the resource tradeoffs reflected in the proposed actions, and providing a clear basis for choice among actions by the decision maker. While the National Environmental Policy Act requires a range of alternatives, the Healthy Forests Restoration Act specifically limits the range of alternatives required during the National Environmental Policy Act analysis to a maximum of 3: no action, the proposed action, and at most one additional alternative, if that alternative is proposed during scoping or the collaborative process and meets the project purpose and need (HR 1904, Section 104)

Public Involvement and Collaboration

Management has been considered in the North Savery project area under a number of proposals beginning in early in the 2000s. The Savery Landscape Analysis that we finished in 2007 was scoped for action under an environmental impact statement for the original Savery Project in 2010. Changes in the scope of the project led to an environmental assessment and decision notice to proceed with timber management in the Bud Project Area, and a decision memo to implement prescribed burning near Divide Peak. These projects are being implemented now and provide valuable insight to conditions.

Continued deterioration of forest conditions in the timber production management area (Management Area 5.13) that makes up a large portion of the North Savery project area still call for action. The preliminary issues identified for the 2010 Savery proposed action were carried forward as the North Savery Project was developed.

A notice of intent to prepare an environmental impact statement for the North Savery Project was published in the Federal Register on December 1, 2015. The notice of intent asked for public comment on the proposal from December 1, 2015 to February 1, 2016. In addition, as part of the public involvement process, the agency published a detailed scoping document which was made available on the Medicine Bow-Routt National Forests' website in November 2015. (http://www.fs.fed.us/nepa/nepa_project_exp.php?project=47913).

The Brush Creek/Hayden Ranger District also held two public meetings: one December 9, 2015 at the Bureau of Land Management Rawlins Field Office in Rawlins, Wyoming and one December 10, 2015 at the Platte Valley Community Center in Saratoga, Wyoming. A total of 30 individuals attended those meetings, which were held in open house format to allow in depth discussion of questions and concerns.

In addition to public meetings, the Forest Service personnel have engaged directly with affected individuals, other agencies, and local governments around this project and management of resources in the project area:

- Saratoga-Encampment-Rawlins Conservation District has been involved as a cooperating agency for the North Savery Project. The conservation district contributed valuable information on the status of roads and other resources in the project area.

- Livestock grazing permittees were involved in development of proposals to treat hazard trees along forest boundary fences, allotment and pasture fences, and irrigation ditches.
- Wyoming Game and Fish Department personnel also contributed to the development of the North Savery Project by helping to evaluate how proposed vegetation treatments align with mule deer habitat needs and other habitat considerations.
- Forest Service personnel participated in the collaborative development of the 2016 update of Carbon County's Community Wildfire Protection Plan, including identifying two communities at risk in the North Savery project area. The Carbon County Community Wildfire Protection Plan, in turn, informed wildland-urban interface designations for the project.
- Forest Service wildlife biologists are engaged in ongoing information consultation with U.S. Fish and Wildlife Service personnel on potential effects to Canada lynx.

Contributions to project development, resource information, and analysis that shaped the modified proposed action for the North Savery project are described in more detail below.

Future collaboration and public involvement opportunities, including public meetings, project field review, and cooperating agency meetings, are planned prior to the release of the draft environmental impact statement, after receipt of public comment on the draft environmental impact statement, prior to release of the final environmental impact statement and draft record of decision, or some combination of these.

Issues for Alternative Development and Analysis

Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the decision maker and public to understand. (Forest Service Handbook 1909.15, Chapter 10, Section 12.4). The interdisciplinary team has identified three key issues from their analysis and from public comments during scoping:

- Issue 1. Effects of proposed timber salvage treatments on wildlife, wildlife habitat, and watershed function may be significant and not consistent with the Forest Plan.
- Issue 2. Effects of road closures and road decommissioning may have significant impacts on recreational access to the Medicine Bow National Forest.
- Issue 3. Vegetation management near the Continental Divide National Scenic Trail may not align with Congressional direction for management of national scenic trails; specifically, vegetation management may not allow for attaining high scenic integrity in the immediate trail foreground.

Issues 1 and 2 were identified in the notice of intent as preliminary issues and are key considerations for this project. These issues informed iterative development of the modified proposed action analyzed in this document. Effects of changes in the transportation system on recreation access are a key consideration for whether proposed changes to specific road segments will be made. Measures to reduce road impacts on wildlife, wildlife habitat and watershed function are included in the modified proposed action as specific design criteria for layout and as a mitigation measures to avoid watershed effects from authorized activities.

During the 2015 scoping comment period, 14 comments were submitted, including one comment received after the comment period closed. Several comments included additional information about

or suggestions for improving the travel management portion of the proposal. Several other comments included suggestions for what to include in the environmental analysis. Specific concerns about vegetation management near the Continental Divide National Scenic Trail were captured in Issue 3.

An alternative was suggested to exclude vegetation treatment within ½ mile of the Continental Divide National Scenic Trail. Consideration of the suggested alternative is described later in this chapter.

Alternatives Considered in Detail

This draft environmental impact statement considers two alternatives in detail: no action and the modified proposed action. Internal issues, public comments, and the public issue of potential impacts to the Continental Divide National Scenic Trail raised during scoping have been addressed by iterative development of the modified proposed action.

No-action Alternative

Under the no-action alternative, current management plans would guide management of the project area and ongoing management programs would be implemented. Expected program operations would include administration of livestock grazing and special use permits; recreation operations; resource inventories, monitoring and surveys; facility and road maintenance; law enforcement; and decommissioning of nonsystem, unauthorized travel routes under previous decisions. No additional timber harvest, salvage, silvicultural treatments, or changes to the existing designated road and motorized trail systems would be implemented to accomplish project goals.

Additional National Environmental Policy Act analyses and decisions would be required in the future to implement any vegetation management or to designate the minimum road system as required by the Travel Management Rule (36 CFR 212, Subpart A). The no-action alternative also represents the existing condition and trend for resources in the affected environment and is used as the baseline for analysis of the modified proposed action. Maps that reflect resource conditions and trends under the no-action alternative are included with individual resource disclosures in Chapter 3 to demonstrate the tradeoffs of deferring the proposed management.

The responsible official may decide to implement the no-action alternative for any or all of the activities proposed in the North Savery Project.

Modified Proposed Action

The modified proposed action is the result of iterative improvements in response to internal analysis and public comments submitted during scoping. The combination of activities analyzed in detail and for which the potential impacts are disclosed in the draft environmental impact statement was “frozen” for purposes of this analysis as of January 25, 2017. Public comment on the draft environmental impact statement and any resulting refinements to the modified proposed action and effects analysis will be reflected in the final environmental impact statement.

Since publication of the notice of intent and scoping document in 2015, public comments, additional resource surveys, new information from cooperating agencies, environmental analysis, and developments in planning policy and implementation have been used or required us to modify the proposed action.

- Public comment and input from cooperating agencies and other stakeholders provided information that modified the proposed management actions associated with specific National Forest System Roads.
- Public comments and consultation with specialists in management of the Continental Divide National Scenic Trail indicated specific design criteria should be used to mitigate short-term, adverse impacts on the trail while still meeting the project purpose and need.
- In response to interdisciplinary team findings from environmental analysis and comments from the timber industry, this alternative modified the 2016 North Savery proposed action. It was improved by adding mechanical hazard tree clearing along 7.5 miles of level 1 roads that would be used to implement vegetation management actions. Hazard trees would be cleared along roads that are not open for public travel and were not analyzed in the 2008 hazard tree environmental assessment and decision notice for the Medicine Bow-Routt National Forests. This safety concern was recognized by both Forest Service employees and by timber industry contractors working in similar stand conditions in other locations on the Medicine Bow-Routt National Forests. New information was obtained from vegetation surveys, mapping and modeling in the FSveg database, and ongoing research that improved the understanding of timber stand conditions and impacts of mountain pine beetle mortality on stand conditions, wildlife habitats, and watershed resilience.
- Detailed environmental analyses were conducted for timber, watersheds, and wildlife. The analyses indicated potential conflicts between need for management and potential for significant adverse impacts, creating tension between action and protection. Additional design criteria were developed to reduce, where feasible, the likelihood of adverse effects persisting in the long term.
- The district travel analysis process and travel analysis report (completed in 2015) made recommendations for the minimum road system. These recommendations were made public after the 2015 scoping period for the North Savery Project. Which of the recommendations to implement at this time has been evaluated in this draft environmental impact statement.
- Council on Environmental Quality guidance on specific analysis for greenhouse gases and climate change was withdrawn in early 2017.

The modified proposed action includes silvicultural treatments for timber and fuels management as well as road relocation, reconstruction, and restoration. The activities are summarized for each management area as shown in table 15 through table 17. No activities are proposed on the 1,126 acres of State and private land in the project area or for the 3 acres of Management Area 5.15 Forest Products, Ecological Maintenance and Restoration.

Most of the proposed activities would take place in Management Area 5.13 which emphasized forest products. This management area contains timber stands where past investments in stand management are at risk of additional loss from catastrophic events in addition to mountain pine beetle mortality. Actions to create fuel breaks between stand of regenerating lodgepole pine, thin dense stands to maintain resilience to drought and insects, and restore watershed health would help assure future sustainable management could occur in this management area.

Table 15. Proposed activities in Management Area 5.13 General Forest and Rangelands, Forest Products Emphasis (33,485 acres)

Proposed activities	Amount (acres or miles)
Precommercial thinning	951 acres
Salvage timber harvest implemented from 7,693 acres analyzed	5,479 acres
Level 1 road hazard tree clearing included in 5,479 acres salvage harvest acres analyzed	322 acres
Fenceline hazard tree clearing included in 5,479 acres salvage harvest acres analyzed	2.7 miles
Create fuel breaks by complete slash removal in specific roadside harvest units within the 5,479 acres analyzed	220 acres
Add routes to national forest road system	3.0 miles
Relocate existing system roads in locations with fewer environmental impacts	0.75 miles
Decommission closed (0.6 miles) and open (10.4 miles) system roads to reduce road impacts	11.0 miles
Create off-highway vehicle trail by National Forest System trail additions, construction, designation	1.0 miles

Table 16. Proposed activities in Management area 5.12 General Forest and Rangelands, Rangeland Vegetation Emphasis (7,386 acres)

Proposed activities	Amount (acres or miles)
Precommercial thinning	84 acres
Salvage timber harvest implemented from 139 acres salvage harvest analyzed	139 acres
Level 1 road hazard tree clearing included in 139 acres salvage acres analyzed	3 acres
Ditch and fenceline hazard tree clearing included in 139 acres salvage acres analyzed	2 miles
Change open road to closed road	1.15 miles
Add routes to national forest road system	2.5 miles
Decommission open system roads to reduce road impacts	9.1 miles
Create off-highway vehicle trail by National Forest System trail additions, construction, designation	1.6 miles

Table 17. Proposed activities in other management areas.

Management Area (MA)	Proposed activities	Amount (acres or miles)
MA 8.21 Developed Recreation Emphasis (27 acres)	Salvage timber harvest	Approximately 11 acres
MA 8.6 Administrative Sites (59 acres)	Salvage timber harvest	Approximately 5 acres
MA 3.5 Forested Flora or Fauna Habitat Emphasis, Limited Snowmobiling (3,136 acres)	Fenceline hazard tree clearing included in 7,693 acres salvage harvest acres analyzed	0.3 miles
MA 3.31 Backcountry Recreation Emphasis, Year-round Motorized (476 acres)	Decommission open system roads to reduce road impacts	0.3 miles

Silvicultural Treatments

The Brush Creek/Hayden Ranger District proposes to treat approximately 6,700 acres in the North Savery analysis area, including up to approximately 5,634 acres of salvage harvest, 1,035 acres of precommercial thinning, 231 acres of hazard tree clearing, and extra slash treatment to create fuel breaks (these fall within salvage harvest units) (figure 4).

The emphasis on salvaging dead and dying trees is to restore forest health and productivity, reduce hazardous fuels and hazard trees, harvest forest products, and promote forest regeneration to desired species. Forest Service personnel have identified and analyzed approximately 7,700 acres for salvage harvest, mostly in timber production emphasis areas, to have flexibility to choose the best locations for harvest during implementation.

Design criteria have been updated to more closely determine where deferring harvest in at-risk watersheds would be necessary to conserve watershed health and wildlife habitat. Harvest would be deferred on approximately 2,070 acres based on the analyzed effects to water yields in each watershed and the presence of wildlife and other resources of interest. The specific location and treatment of salvage treatments from the analyzed acres will be determined during implementation based on stand conditions identified during layout (figure 20).

Figure 20 shows the diversity in lodgepole pine stand conditions present in the northern Sierra Madres. Some stands, like the photo on the left, include both live and dead lodgepole pine in the overstory but few to no regenerating trees in the understory. Other stands, like the photo on the right, also include both live and dead lodgepole pine in the overstory but may have advanced regeneration of other species in the understory.

Depending on the management objectives for each stand, their condition may offer advantages or disadvantages. For instance, the stand to the left would be likely to readily regenerate to lodgepole pine, which would be advantageous in a timber production management area where lodgepole pine is a desired species. Regeneration to lodgepole pine would help assure continuous and sustainable timber production in future decades.

The stand to the right is more complex. It could be treated to retain the existing spruce-fir understory or to replace the understory with a new stand of lodgepole pine. In its existing condition, the stand offers good hiding cover and may contribute to habitat for snowshoe hare, the primary prey species for Canada lynx. Conversely, it would be rated fuel type TU5, a type with dense ladder fuels and heavy overstory fuels that would be likely to burn with intensity and severity. The specific location and management context of stands with these varying characteristics would determine the appropriate silvicultural treatment.

Silvicultural treatments attempt to simulate natural processes to create optimum conditions for forest resiliency, growth, and regeneration. Timber management through silvicultural systems considers not only growing and harvesting trees but the benefits and impacts of treatments to forest resources such as recreation opportunities, wildlife habitat, and water quality. Silvicultural prescriptions would be developed to achieve multiple natural resource management objectives.



Figure 20. Two lodgepole pine stands in the Bud Project area, just south of the North Savery project area, with different understory characteristics. These stands demonstrate the differences in existing stand condition, natural regeneration, fuel types, and habitats.

Salvage Harvest

Overstory removal and clearcut treatments would be used in lodgepole pine stands to salvage dead and dying trees. Although the intent is to remove dead and dying trees, live trees would probably also be removed as part of these treatments. Recent experience with similar projects indicates isolated live trees usually succumb to wind throw and do not contribute to later stand structure. Pockets of wind-firm, healthy trees would be left whenever feasible. Design criteria have been added to limit resource impacts by siting harvest away from sensitive resources and by limiting ground disturbance during harvest.

Overstory removal treatments are used in areas with a significant understory component. The intent is to harvest overstory trees while maintaining understory trees that are too small to be merchantable. Clearcut prescriptions are used in stands that have beetle mortality greater than 50 percent, are highly mistletoe infested, have low levels of existing regeneration, or where the remaining green trees would be at high risk of wind throw. Species present and the presence, distribution, and health of the understory would dictate the options are available for salvage treatments on a stand-by-stand basis. Generally, lodgepole pine trees over 7.0 inches in diameter at breast height would be designated for removal. Trees of all species less than 7.0 inches in diameter at breast height would generally remain on site. Areas within units that have large, contiguous components of Engelmann spruce may be retained for wildlife. Subalpine fir, when found as a minor component in lodgepole pine stands, would not be retained unless included as wildlife habitat.

The following stand conditions would be considered in developing adaptive salvage harvest prescriptions. The prescriptions would be adapted and applied based on stand conditions, access limitations, market conditions, treatment objectives, and other resource concerns. They are presented here to disclose the most likely treatments across the range of conditions in the project area. They are not a definitive guide for implementation.

Clearcut

- unit is predominantly lodgepole pine
- heavily beetle infested (mortality more than 50 percent)
- little to no healthy understory
- mistletoe infection is moderate to high

Clearcut with reserves

- unit is predominantly lodgepole pine
- heavily beetle infested (mortality more than 50 percent)
- pockets of healthy understory exist on less than 75 percent of the unit
- some live trees other than lodgepole pine exist and are desired
- mistletoe infection is low to moderate

Overstory removal with reserves

- unit is predominantly lodgepole pine
- some live trees other than lodgepole pine exist and are desired
- beetle infested (mortality more than 50 percent)
- healthy understory exists on more than 75 percent of the unit
- mistletoe infection is low or nonexistent

Commercial thinning

- unit may be predominantly lodgepole pine or mixed species composition
- generally small sawtimber or larger products other than logs
- more than 50 percent of overstory is expected to remain post mountain pine beetle
- beetle infested (mortality less than 50 percent) or species other than lodgepole pine
- mistletoe infection is low or to moderate
- not open enough after harvest to require reforestation
- healthy stand with potential to attain sawtimber after thinning

Sanitation and salvage (these will be a component of all prescriptions)

- unit may be mixed species with substantial spruce-fir present
- dead lodgepole pine component is generally sawtimber-sized stand
- more than 50 percent of overstory is expected to remain post mountain pine beetle
- beetle infested (mortality less than 50 percent) or species other than lodgepole pine
- mistletoe infection is low or to moderate
- species conversion to spruce-fir is desired in the stand

No salvage treatment or deferred treatment at time of reconnaissance

- unit contains small-sized timber, low volume, low market value
- potential for unacceptable damage to existing regeneration
- lack of feasible road access, low accessibility, steep slopes
- concerns for undue detrimental effects to other resources

Salvage units would be packaged into multiple timber sales, based on the availability and size of industry and the product that can be used at that time. Many harvest units in the North Savery Project may be larger than 40 acres in size due to the extent of the mortality caused by the mountain pine beetle epidemic (USDA Forest Service 2003a).

Precommercial Thinning

Precommercial thinning is proposed on approximately 1,035 acres in densely regenerating lodgepole pine seedling and sapling stands (figure 4). Precommercial thinning would improve growth and vigor, reduce stress from overcrowding and competition, and provide a future stand less susceptible to mountain pine beetles. The treatment is generally conducted by crews using chainsaws. This treatment would provide continued production of sawtimber as prescribed in the Forest Plan. No precommercial thinning is proposed in the upper Sierra Madre lynx analysis unit; activities are proposed consistent with requirements of the Southern Rockies Lynx Amendment.

Hazard Tree Clearing

Some areas identified for salvage harvest include hazard trees along roads, fencelines, ditches, trails, and administrative sites. Many of these same areas were approved for treatment under the 2008 Forestwide Hazardous Tree Removal and Fuels Reduction Project, which approved hazard tree clearing on maintenance level 2 through level 5 roads and at administrative areas. The 2008 decision also allowed hazard tree cutting along trails but did not authorize removal of cut materials. Harvest along the Continental Divide National Scenic Trail under the North Savery Project would allow removal of cut trees from the trail corridor to reduce fuels and improve scenic integrity. Specific design criteria developed in collaboration with the Continental Divide National Scenic Trail national trail coordinator and Rocky Mountain Region landscape architect have been added to mitigate impacts on the recreation experience and trail corridor.

Hazard tree clearing along 7.5 miles of maintenance level 1 roads has been added to the proposed action in response to concerns raised by Forest Service employees and timber industry representatives. Mountain pine beetle mortality has substantially increased downfall along roads not already cleared under the 2008 decision, creating a hazard for personnel and equipment in these locations.

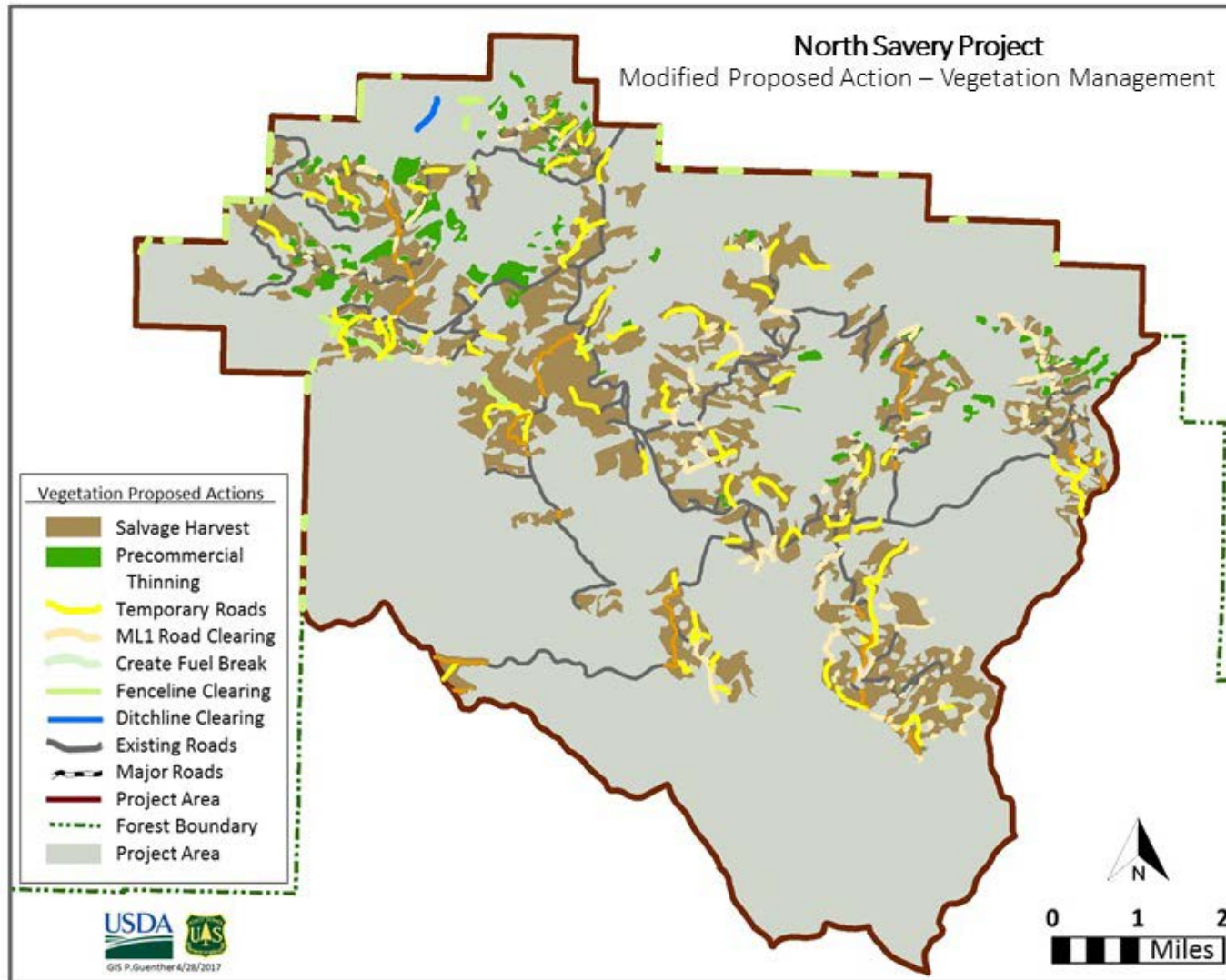


Figure 21. Proposed locations of harvest units, thinning units, hazard tree clearing, fuel breaks, and temporary access roads

There are 6.8 miles of allotment, pasture, and forest boundary fences proposed for hazard tree clearing in the North Savery Project. Of these, 1 mile was previously analyzed in roadside hazard tree clearing corridors along open forest roads authorized in the 2008 forestwide hazard tree environmental assessment. Depending on implementation schedules, the fencelines may be cleared before, or concurrent with, roadside hazard clearing. After accounting for disturbance acres along open and closed roads and in harvest units, there are approximately 4 miles (60 acres) of unique disturbance attributed to fenceline clearing. Of these, four segments totaling 0.32 miles (4 acres) are located on National Forest System lands inside the Strawberry Creek Inventoried Roadless Area. Regional Office review has been completed for this activity.

Additional hazard tree clearing would also occur along approximately 0.5 miles of the Ranger Ditch to prevent debris from damaging the ditch, clogging diversion structures, or causing structural failure of the ditch, with subsequent loss of irrigation capacity and resource damage.

Fuel Break Treatments

Suitable timber (classified as Management Areas 5.13 and 5.15) is considered a value at risk and is to be protected from wildland fire using direct control strategies. Fuel break treatment areas are located strategically in proposed salvage harvest units, generally along roads. The fuel break treatments would be approximately 200 feet wide (100 feet on either side of the road). In the fuel breaks, whole tree skidding would be used to minimize slash, and future tree regeneration would be managed to the lowest stocking level allowed for conifer species: 150 trees per acre (USDA Forest Service 2003a). If whole tree skidding was not feasible due to operation constraints (slope, rocky ground, or other protected areas), slash could be reduced by hand treating it. Approximately 220 acres of fuel breaks would be created along roads and where proposed unit boundaries intersect.

Slash Treatments

Slash treatments in harvest units would be determined by post-harvest conditions and could include logging and scattering, machine scattering, piling followed by burning piles, roller chopping, and whole-tree-skidding. Care would be taken to protect reserve and understory trees, retain serotinous cones throughout the site as available, and maintain large down woody debris. Design criteria are included to protect regeneration and other resources during slash treatment.

Implementation Details

The operational characteristics of each treatment differ slightly depending on size, shape, slope, and volume of each stand. Trees would typically be felled and stacked using a tracked or rubber-tired machine, called a feller/buncher, or possibly by using chainsaws. Bucking and delimbing would most likely be accomplished using a boom delimer but could also be done with a chainsaw. Some form of tractor or skidder would be used to transport logs to a landing; therefore, native-surface skid trails would wind through each treated stand. Many landing locations would be needed to collect felled trees in the stands where harvests are proposed. The density, pattern, and location of skid trails and landings depend on unit size and shape, terrain, and timber volume and are determined during contract implementation. The Forest Service anticipates using a combination of commercial timber sales, stewardship contracts, service contracts, and Forest Service crews to implement silvicultural treatments.

Once logging is complete, skid trails and landings would be scarified or otherwise rehabilitated to reduce compaction and erosion in compliance with the Forest Plan. A certified weed-free native grass seed mix may be spread over the former tractor trails, if needed, for erosion control. Lodgepole pine seed may be spread, and planting of lodgepole pine or other tree species may occur in treatment units as needed to achieve required tree stocking levels. Treatment of noxious weeds would occur as needed.

Temporary Roads for Harvest Access

Much of the project area is accessible from system roads. However, some areas proposed for treatment would require temporary road construction to access, harvest, and haul materials from the units. The general areas where temporary roads would be needed are indicated in figure 22.

Approximately 24 miles of temporary roads were identified to access all of the 7,700 analyzed harvest acres. However, because design criteria for watershed protection limit the number of analyzed acres that would be authorized for harvest in some watersheds, not all analyzed acres would be harvested, and not all temporary roads indicated would be constructed. Some of the identified temporary roads could be placed on existing disturbed areas (previously decommissioned system or unauthorized routes) and some constitute new disturbance. Specific design criteria for temporary roads are included to ensure construction and use have the least possible short-term impact and do not contribute to long-term adverse resource impacts. The final number, location, and extent of temporary roads would be determined during implementation, but would not exceed 24 miles of temporary road at any time during project implementation. After activities are completed, the temporary roads would be returned to a natural condition by a combination of ripping, recontouring, access control, and seeding.

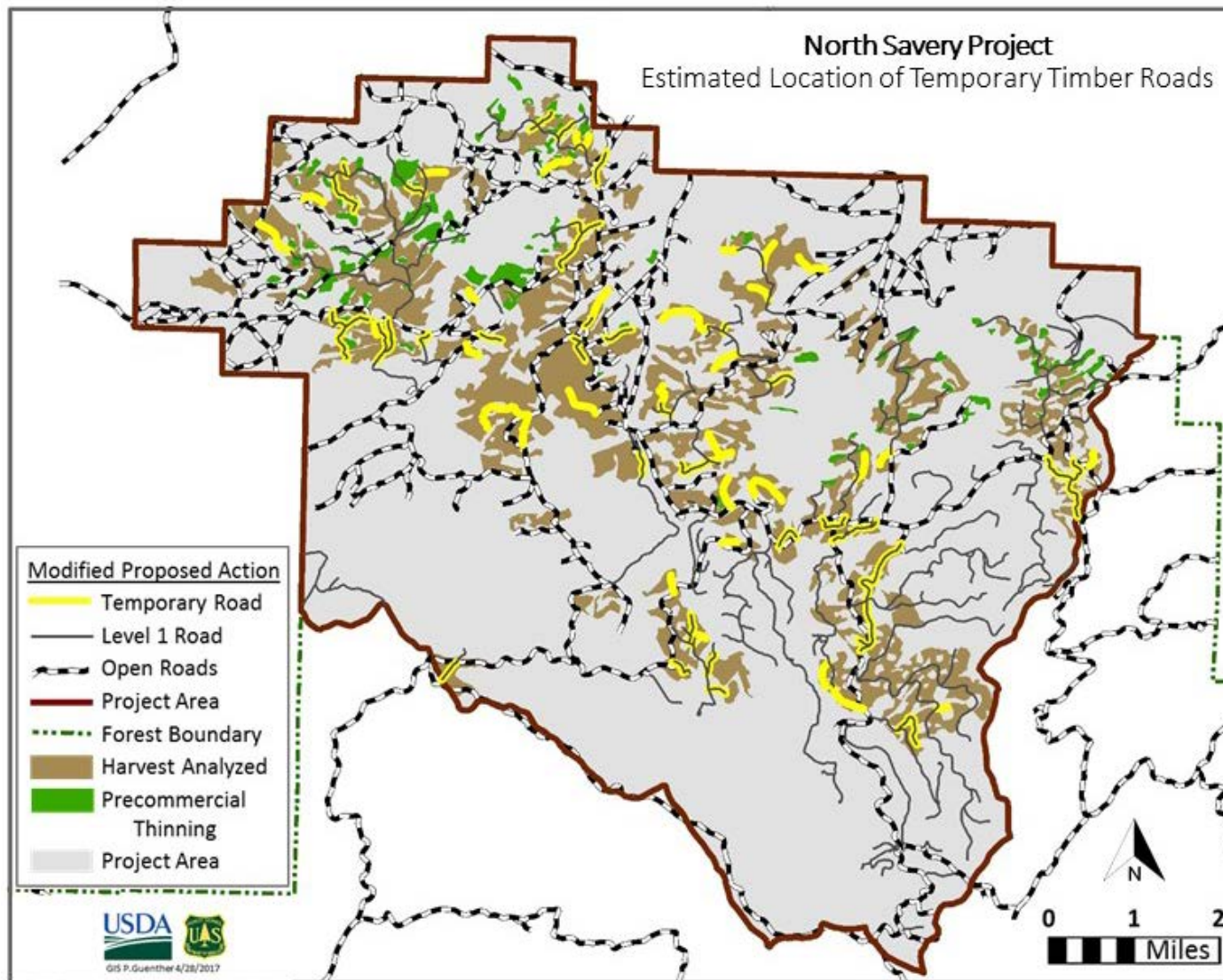


Figure 22. Estimated location of temporary roads in the North Savery project area compared to the existing system road network.

Transportation System and Travel Management

The proposed actions for the transportation system in the North Savery project area include administrative and resource management actions. While important to provide public and management access to the area, the existing network of system and unauthorized roads is contributing to adverse cumulative effects on watershed conditions and is affecting the quality of wildlife habitat in the project area. Some designated roads are contributing to degraded resource conditions on the Medicine Bow National Forest, including loss of vegetation, erosion, sedimentation to streams, and reduced quality of wildlife habitat. Management actions are proposed to relocate, reconstruct, or restore to natural conditions portions of the existing road system that are detrimentally contributing to watershed health or are needed to implement vegetation management. Furthermore, the North Savery Project would implement the Travel Management Rule for this portion of the Brush Creek/Hayden Ranger District by completing the National Environmental Policy Act analysis, designating the minimum road system necessary for safe and sustainable access to the project area, and informing the public of the designation.

Forest Service personnel took a comprehensive approach to developing this roads proposal, with the aim of maintaining motorized public access to many parts of the project area while minimizing impacts of roads and trails on natural resources. During analysis for the vegetation management proposals, it became clear changes in the existing road system were crucial to reducing cumulative watershed effects in the project area. The interdisciplinary team looked at whether improving access by rerouting many poorly placed roads and adding unauthorized routes to the system to make legal, passable connectors for full size and off-highway vehicles and logging traffic was compatible with reducing resource impacts. Then the team identified additional locations where decommissioning could be used to improve watershed condition and restore wildlife habitat by reducing areas of connected disturbance. The modified proposed action (table 18) includes many miles of roads for decommissioning but has been designed to maintain motorized access for recreation and other uses similar to existing levels in the project area. Stakeholder suggestions helped identify which road segments would be most useful in designating a safe and sustainable road system in the project area. Appendices B and C include information on all road segments.

Table 18. Transportation system and travel management proposals.

Treatment	Miles
Keep roads in current, open designated status	85
Keep roads in current, closed ML 1 status	56
Construct temporary roads for vegetation treatments	24
Add unauthorized routes to system	6
Reroute road with new construction	0.75
Decommission open designated roads	21
Decommission closed road	0.6
Convert open road to closed road	1.3
Convert road to off-highway vehicle trail	1
Build new off-highway vehicle trail	1.3

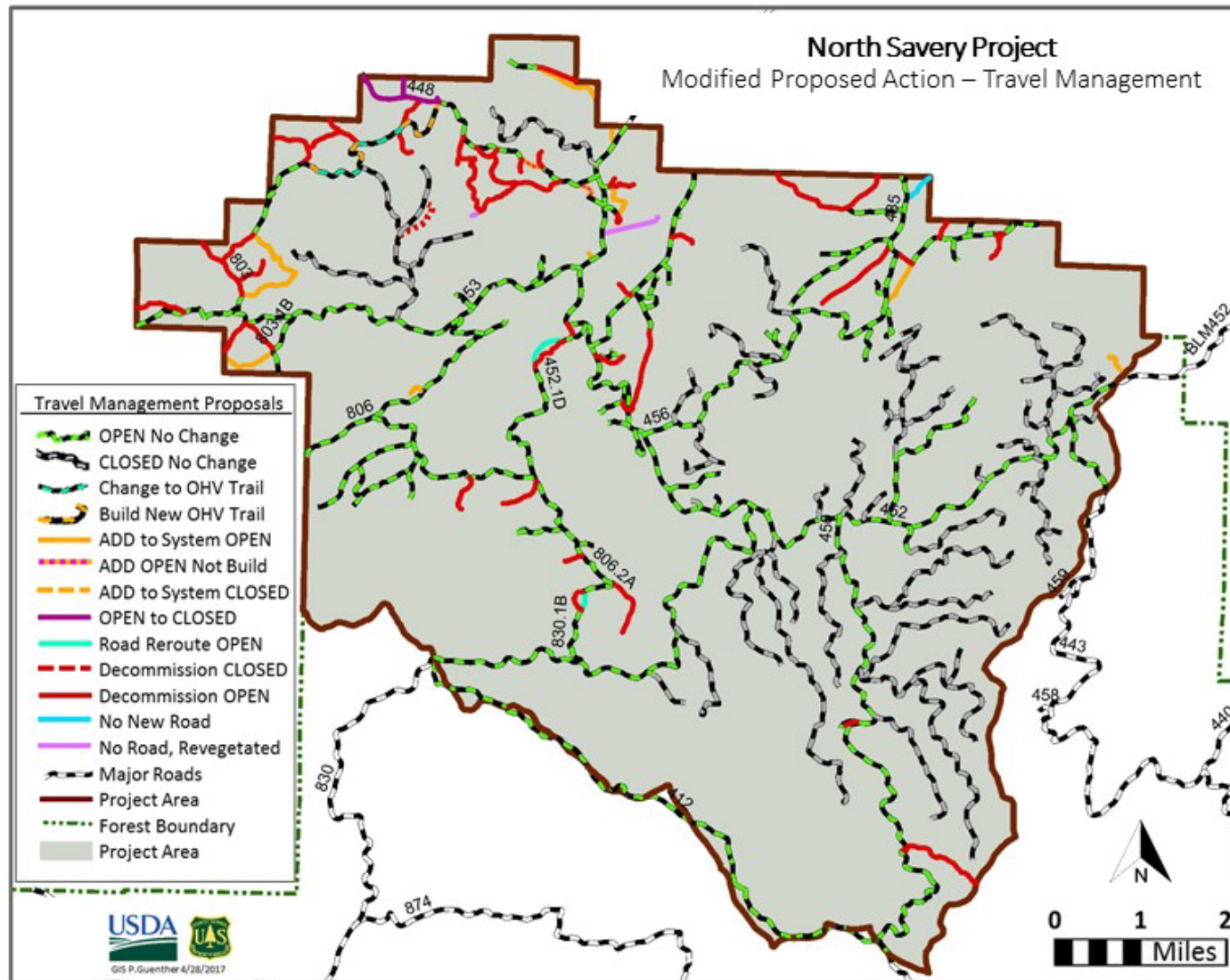


Figure 23. Proposed changes to the transportation system and travel management in the North Savery project area

Construction and Reconstruction

The existing road system of both open (designated) and closed (stored or administrative use) roads, along with new temporary road construction (24 miles) would provide the majority of access for vegetation treatments. No new permanent road construction is anticipated for the timber removal portion of the modified proposed action. Approximately 0.75 mile of road reconstruction is proposed to reroute National Forest System Roads 830.1B (0.19 mile) and 452.1D (0.52 mile). Existing unauthorized routes would be designated part of the minimum road system because their location is better suited to safe and sustainable public and management motorized use. These newly designated roads would connect National Forest System Roads 448.1E and 448.1F (0.27 mile), 452.1N, and 448 (0.25 mile). Where unauthorized routes would be added to the road system to provide new access or from road relocation, construction may be required to bring the added road segment up to engineering standards.

Site-specific reconstruction on National Forest System Road 435 would repair or stabilize the road where needed to address resource concerns, usually on segments that are less than 0.5 mile in length.

No new road construction would occur to connect National Forest System Road 435 to the Medicine Bow National Forest boundary (0.37).

All temporary road construction or reconstruction required to provide temporary access across existing non-system routes for access to timber would use minimum ground-disturbing standards. These standards would follow site-specific forestry best management practices included in timber sale contract provisions. Where possible, temporary roads would be located on existing road prisms so that they could be more fully obliterated after use. After project completion, temporary roads would be ripped to decompact soils, scattered with slash and rock, and closed to use.

Decommissioning

Approximately 21 miles of National Forest System roads and 49 miles of unauthorized routes are proposed for decommissioning, obliteration, or restoration (table 18, Appendix A). Decommissioning permanently removes unneeded system roads or unauthorized routes from the landscape. The objective of decommissioning is to restore the area to a more natural state that supports watershed resiliency. Typical road decommissioning on the Brush Creek/Hayden District includes an earthen berm at the road entrance with the road surface ripped with slash and rocks scattered on the roadbed. Some roads may have culverts removed and hardened stream crossings developed.

Decommissioning also precludes future motorized use. Methods to preclude motorized use include signing the entrance; scattering limbs and rocks on the roadbed; and physically blocking the road with fences, rocks, earthen berms, or debris. Restoration methods include scarification, revegetation, and water barring removing culverts and road fills from valley bottoms and reestablishing drainage ways; pulling back unstable shoulders; and recontouring slopes. Decommissioning methods would be determined on a site-specific basis.

The decision framework for decommissioning system roads and unauthorized routes is different, but both are considered in this analysis. In both cases, these roads and routes are not needed in the foreseeable future for forest management, public access, or emergency egress.

System Roads: Most system roads proposed for decommissioning are causing direct damage to wetlands, water resources, or sage-grouse habitat. Some system roads are proposed for decommissioning to decrease system road densities in extremely high road density areas (that is, where recreation access would not be lost) or in sage-grouse core habitat.



Figure 24. National Forest System Road 803.3F is proposed for decommissioning due to its location along an ephemeral stream and the deep ruts that contribute to degradation of water resources. Addition of an unauthorized route in a better location to the southeast would provide improved access to this area of the forest.

Many system roads are impassible due to their locations in very wet areas. They may be duplicate roads to similar locations, or may no longer be needed to address evolving forest land management allocations. The decision whether to decommission system roads, as well as the physical impact of decommissioning, is subject to analysis and disclosure during the National Environmental Policy Act process.

Unauthorized Routes: Some unauthorized routes have been developed illegally by illegal motorized traffic. Travel on unauthorized routes is illegal, and physical restoration of the routes is intended to reduce resource impacts and increase motorized compliance. Conversely, some unauthorized routes have been established in lower impact locations than system roads. Travel management decisions may include adding unauthorized routes to the national forest road or trail system, and those decisions are subject to environmental analysis and public input. Routes that are not added to the road or trail system become candidates for obliteration or restoration. National Environmental Policy Act documents may include the environmental impacts of ground disturbing restoration actions on unauthorized routes, but the decision of whether to obliterate non-system routes is not part of the decision to be made.

Add Unauthorized Routes to National Forest Road System

Some unauthorized routes are more suited to long term, sustainable use than system roads located nearby. Approximately 6 miles of unauthorized routes would be added to the designated minimum

road system to improve the sustainability of the permanent road network. These route additions are part of the overall proposal to reduce road densities and connected disturbed areas that threaten long term stream health. These are routes that are not causing negative environmental impacts and would then provide authorized access to the Medicine Bow National Forest. Restructuring the road network in these locations is an important part of restoring resiliency to the watersheds at risk in the North Savery project area. These routes would be added to the road and trail management programs and assigned specific management objectives, maintenance levels, vehicle types and seasons of use. Routes proposed to be added as roads designated open for public motorized travel total approximately 5.4 miles, and would be reflected on an updated motor vehicle use map as open to all vehicles. One segment shorter than 0.1 mile would be added to the system for use during the project, then designated level 1 and put in long term storage after project implementation is complete. In combination with road decommissioning, there would be a net reduction of 15 road miles under the modified proposed action.

Road Actions for Vegetation Management Access

Specific proposed changes to the transportation system were developed to address existing concerns with road location and condition for roads necessary to access proposed harvest units. There are 3.5 miles of unauthorized routes proposed for addition to the designated minimum road system open for public motorized use for that purpose. Approximately 0.2 miles would be added but only used for administrative access (maintenance level 1). Other proposed changes are to offset the impact of adding to the road system for purposes of timber harvest and to mitigate otherwise adverse cumulative effects that would limit present and future timber management in these areas. Some proposed actions only make sense in the context of the specific locations where they are proposed, where combinations of road relocation, decommissioning, construction, and additions to the system work together to improve the overall transportation system. These areas are described below.

With these changes, the modified proposed action includes rerouting approximately 0.75 miles of road in two segments on 452.1D and 830.1B. Forest Service personnel propose to decommission (return to a natural state) approximately 21 miles of roads causing direct impacts to water resources, including the sections that would be abandoned after the reroutes described below. This project would also add approximately 6 miles of unauthorized routes to the National Forest road system, convert 1 mile of road to off-highway vehicle trail, and build approximately 1.3 mile of off-highway vehicle trails (table 19). Approximately 24 miles of temporary roads may be needed to facilitate timber harvest; these are discussed more fully in the “Vegetation Treatment” section above. Rationale for road segments that would be changed in the North Savery Project is in Appendices B and C.

South Willow Road Relocation

This combination of proposed changes would maintain public access to National Forest System land and State land but would relocate the travelway to reduce impacts at stream and wetland crossings. The original proposal called for decommissioning the western portion of this road. The proposed action was modified so the west end of National Forest System Road 452.1A would be retained as a level 1 road to provide administrative access to adjacent State lands. The affected road segments are 0.45 miles of National Forest System Road 452.1A (South Willow Road) that would be decommissioned and approximately 1.2 miles of unauthorized segments that would be added to the system to retain access. A 0.84 mile segment of National Forest System Road 452.1A would remain unchanged, open to public motorized use. The State of Wyoming was consulted with regard to access needs and opportunities.

Joe's Park Road Relocation

This combination of proposed changes would maintain access to National Forest System lands but would relocate travelways to reduce impacts to streams and wetlands. The affected road segments are 3.7 miles of National Forest System Road 448 and spurs 448.1D, 1E, 1F, and 1G that would be decommissioned. The same access can be provided by designating approximately 0.52 miles of unauthorized segments for addition to the system to retain access. Some maintenance or spot reconstruction would be required to bring these better-located segments up to standards for public and logging traffic. These roads were originally included in the 2015 scoping proposed action as new construction but would actually be adding existing road prisms to the system and would not require full construction. National Forest System Road 448 and spurs 448.1F and 2F would remain open and be used as the designated motorized access route for this area.

Methodist Road Reconstruction Removed from North Savery Project

The 2015 scoping proposed action included proposed reconstruction of 2 miles of National Forest System Road 435 (Methodist Road). Comments from stakeholders and field inspection verified the proposal for overall reconstruction of the road could be changed. Only specific portions of the road would be repaired or stabilized where needed to accommodate logging and public traffic and to address resource concerns. These proposals are considered maintenance activities and involve less than 0.5 miles. In the same area, a new road segment was proposed to access the Medicine Bow National Forest boundary and private land beyond. This proposal has been dropped because alternate access is already available.

Other Route Additions to Maintain Public Motorized Access

There are some unauthorized, nonsystem routes that would be added to the designated road system as open to motorized travel to maintain access for hunting, fishing, dispersed camping, and other public forest uses. These routes have better locations, fewer resource impacts and they maintain motorized access to areas that would otherwise have reduced access as result of decommissioning other system roads. In addition to routes added for timber access, there are approximately 1.8 miles of unauthorized routes proposed for addition to the designated minimum road system open for the purpose of maintaining public motorized use across the project area. One point three (1.3) miles of off-highway vehicle trail construction would connect existing segments to create a new trail opportunity. Unauthorized road additions and trail construction (described next) are mitigation measures identified to retain public motorized access at levels as close as possible to the existing condition, while decreasing resource damage and associated impacts from other road segments that would be decommissioned.

Joe's Park Off-highway Vehicle Trail Designation

In this area, the objective of changes to the transportation system is to maintain public motorized use but reduce impacts associated with full size vehicles attempting to cross currently impassible road segments. Approximately 1.2 miles of existing open roads 448.1C and 451 would be converted to off-highway vehicle trail, and these segments would be connected with approximately 1.3 miles of new off-highway vehicle trail construction. The original open roads and spurs identified as National Forest System Roads 448.1C, 2C, 3C, and 801.1C would be decommissioned to restore watershed, wetlands, and wildlife habitat affected by these 2.3 miles of existing roads. Addition of the off-highway vehicle trail segments have been evaluated with regard to regulating motorized uses to minimize conflicts and impacts according to 36 CFR 212.55(a) and (b), Forest Service Manual 2350.3, and Forest Service Handbook 2309.18-21.2.

This proposal was included to ensure consistency with management direction in the Forest Plan in two regards. First, the proposal acts on direction to seek off-highway vehicle trail opportunities in this geographic area. Second, the proposal mitigates adverse impacts of road closures on the network of roads open to public motorized travel. Road closures and decommissioning that would otherwise reduce public access are interconnected actions to reduce cumulative watershed and wildlife effects of timber management activities to achieve consistency with Forest Plan direction for maintenance of long term stream health. Including the designated off-highway vehicle trail, the net change in system routes is approximately 11 miles. These actions are necessary to ensure that Healthy Forests Restoration Act decision screens for restoration objectives and Forest Plan consistency are met for the project.

Travel Management Rule Implementation

The decisions to be made would complete Subpart A of the Travel Management Rule by designating a safe and sustainable, minimum road system for the North Savery project area. The decision would also identify and designate those roads and trails open for public motorized travel, including the addition of some unauthorized routes to the system. These changes would be reflected on the Motor Vehicle Use Map for the Sierra Madre portion of the Brush Creek/Hayden Ranger District, as required by Subpart B. Travel management designation rationale are included in detail in Appendix A.

Table 19. Proposed national forest road and motorized trail system for North Savery project area

System Roads and Trails	Arterial	Collector	Local	Total by Level
Level 1	0	15	41	56 (no change)
Level 2	0	6	48	54 (21 miles less)
Level 3	14	14	2	30 (1 mile less)
Level 4	6	0	0	6 (no change)
Level 5	0	0	0	0 (no change)
Total by function	20	35	113	Total Roads 146 miles (22 miles less)
Trail open to off-road vehicles*	NA	NA	NA	3 (3 miles more)

* Off-road vehicle trail: A road or trail that is part of the Forest Service transportation system that is designated for motor vehicle use pursuant to 36 CFR 212.51 in a Motor Vehicle Use Map.

Off-road vehicle trails are open to type 1, 2, and 3 vehicles as described by the Wyoming State Trails Program off-road vehicle rules and regulations (<http://wyotrails.state.wy.us/ORV/Rules.aspx>). These include vehicles 50 inches or less, motorcycles, and off-road vehicles such as side-by-sides that are approximately 60 inches wide. Motorized trails do not allow use by full-size, "street-legal" cars and trucks, such as 4-wheel drive vehicles and pickups, regardless of their width. Those vehicles may only be used on roads designed and designated as maintenance level 2 or higher (open) roads. In all cases, travel is restricted to designated roads or trails; cross-country travel is prohibited. Adequate parking would be provided at motorized trailheads; specific locations will be identified.

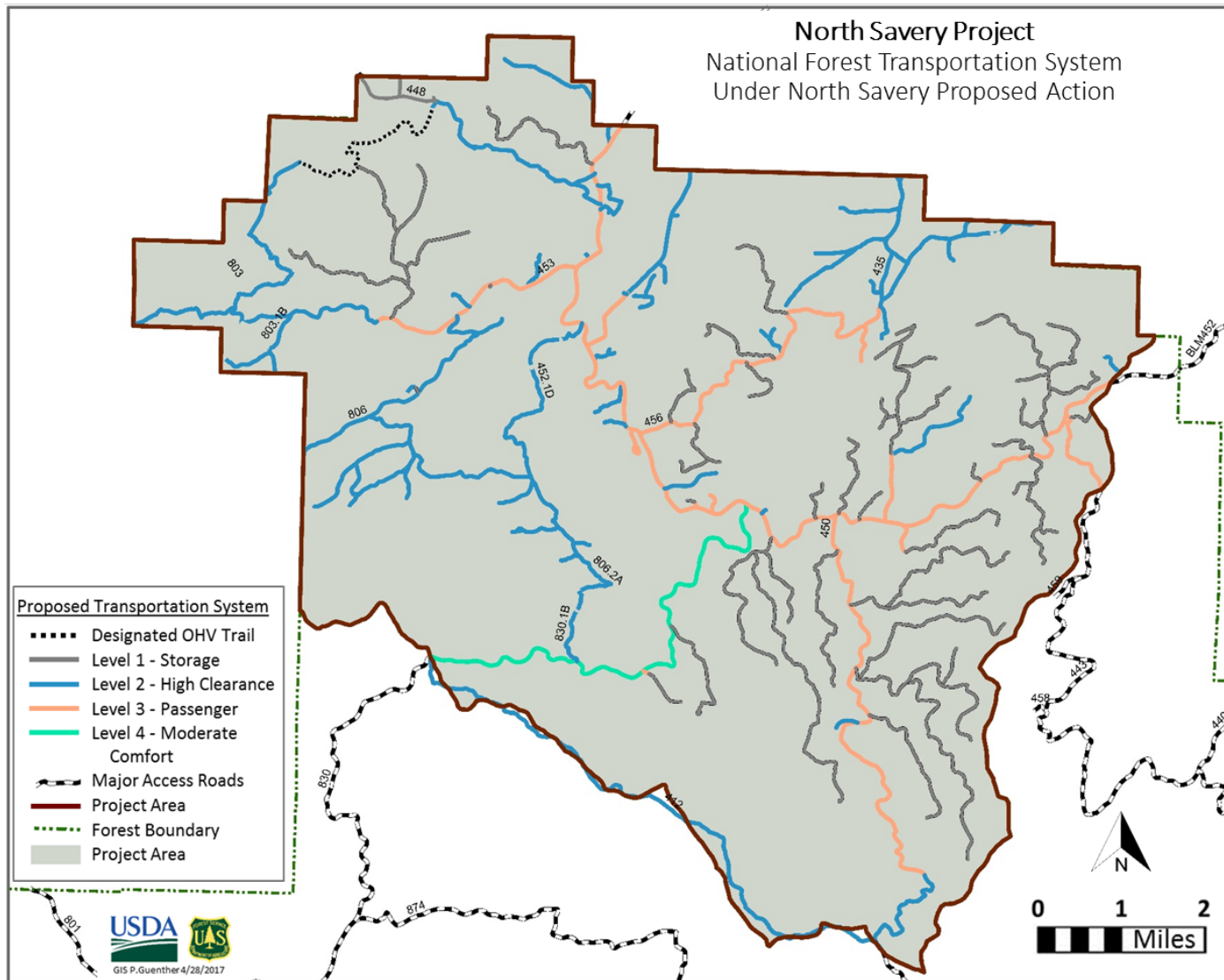


Figure 25. Proposed transportation system after implementation of 2017 North Savery modified proposed action

Design Criteria Applied and Analyzed

Forest Plan standards and guidelines appropriate for the proposed activities and the management areas where they are planned are applied as standard operating procedures and are not listed separately here. Consistency with Forest Plan direction is discussed in Chapter 3 on page 144.

Resource specialists recommended a variety of design criteria to optimize management outcomes and limit adverse effects during development of this project. Their individual reports contain recommendations for design criteria, and those recommendations were brought to the interdisciplinary team for additional discussion. Many design criteria were combined, modified, or found to be redundant with one another or with other standards or normal procedures. The responsible official specified which of the recommended design criteria would be analyzed for implementation of the North Savery Project.

The following design criteria were carried forward into analysis. They are intended to inform implementation of proposed management activities and are considered required. These design criteria, as well as standards and guidelines from the Forest Plan, Forest Service regional Watershed Conservation Practices Handbook, regional soil quality standards, and timber sale standard contract specifications, are needed to attain consistency with the Forest Plan, are consistent with requirements of the Wyoming best management practices in the Wyoming Nonpoint Source Management Plan, and are necessary to meet other regulations.

A. Conduct Vegetation Treatments

Manage Land Treatments to Protect Long-term Stream Health

1. Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff, by limiting harvested acres, to the amounts shown in the following watersheds of concern:

- Upper North Spring Creek: 1,111 acres
- Nugget Creek: 486 acres
- Upper Jack Creek: 1,818 acres
- McClain Creek: 322 acres
- North Fork Savery Creek: 808 acres

Harvested acres are salvage harvest proposed in the North Savery Project and any road, fence, or ditch clearing completed after 2016, including open roads covered under the forestwide hazard tree decision. Precommercial thinning should not be included because it has minor effects on runoff.

Plan for Effective Rehabilitation and Regeneration

2. Wherever possible, landings, slash piles, temporary roads, staging areas and logging camps will not be located in meadows, grasslands, or sagebrush openings to protect such areas from noxious weed infestation.
3. On sites where the probability of erosion or weed infestation is high, disturbed areas will be seeded with an appropriate mix of native grass species. Areas where duff or slash cover the ground, or where natural revegetation is expected to occur quickly, may not need to be seeded.

The intent is to intervene only if necessary to establish effective ground cover to control erosion, prevent weeds, and meet scenic objectives.

4. Main skid trails, temporary roads, slash piles, and landings will be rehabilitated as needed to ensure less than 15 percent site disturbance within each timber sale unit to prevent erosion and runoff, minimize soil compaction and rutting, enhance natural revegetation, and improve aesthetics.

5. Lop and scatter is the preferred slash treatment; however, whole tree skidding can be considered where adequate serotinous cones can be left on site and will be well distributed over the unit.

Avoid Impacts to Sensitive Areas and Resources

6. Operation of motorized equipment outside of unit boundaries will be approved by the District Ranger in consultation with appropriate resource specialists.

7. Staging areas and refueling locations will be located at least 100 feet away from streams (with definable beds and banks) and wetlands.

8. A Forest Service hydrologist or fisheries biologist and engineer will locate, design, and designate installation, replacement, or removal of all perennial stream crossing structures.

9. Heavy equipment will not be operated off-road when soils are “wet,” to avoid compaction and rutting. A soil is considered wet when it can be molded into a ball that holds together under repeated tosses, or if it can be rolled into a 3 millimeter thread without breaking or crumbling.

10. No tree harvest will occur in, and wheeled or tracked equipment will remain outside, water influence zones except at designated crossings, when winter logging conditions are met (see below), or when conducting authorized restoration work. In the absence of other indicators or field review by a hydrologist or fisheries biologist, the water influence zone will extend at least 100 feet from perennial and intermittent streams, riparian and wetland areas, lakes, and reservoirs.

11. Heavy equipment will remain out of streams during fish spawning periods (generally March 15 – May 31 for cutthroat and rainbow trout; October 31 – November 30 for brook trout and brown trout).

12. Heavy equipment will not operate on slopes greater than 40 percent unless approved by the District Ranger in consultation with appropriate resource specialists.

13. In areas where soil moisture makes over-snow logging necessary to prevent compaction and where winter logging is not precluded for other reasons, heavy equipment can only be operated when there is at least 12 inches of packed snow or 4 inches of frozen soil.

14. Local concern plant species will be subject to a 30 foot buffer, in which timber harvest activities and ground disturbance will be prohibited, unless specified by the botanist and approved by the district ranger. Threatened, endangered, and USDA Forest Service Rocky Mountain Region 2 sensitive plants will be subject to a 30 to 100 foot buffer with similar restrictions, to be determined at time of discovery.



15. Vegetation management and ground disturbing actions that are within ¼ mile of suitable goshawk nesting habitat will be surveyed using accepted protocol (Joy et al. 1994) between

June 19 and August 4 of the year prior to actions or the year actions are expected to occur. Where active nests or territories are identified, these Forest Plan standards will apply (USDA 2003a).

15 a. Within each occupied northern goshawk territory, select three nests and protect 30 acres of dense vegetation surrounding each, defining the boundaries of each area based on habitat quality. If fewer than 3 nests are found within an occupied territory, substitute 30-acre areas with characteristics of nesting habitat (USDA 2003a).

15 b. Within each occupied northern goshawk territory, designate a northern goshawk post-fledging area of a minimum of 200 acres that includes the three 30-acre nest sites selected. The large tree component within the post-fledging area should include snags, down dead wood, and clumps of trees with interlocking crowns. Within the post-fledging area, prohibit management activities that may degrade goshawk foraging habitat (USDA 2003a).

15 c. To help reduce disturbance to nesting goshawks, prohibit construction, drilling, timber harvest and fuel treatments, and other intensive management activities within ¼ mile of active northern goshawk nests from April 1 to August 30 unless site-specific conditions are such that a lesser distance can be shown to provide the same degree of protection (USDA Forest Service 2007b).

Protect Medicine Bow National Forest Infrastructure

16. Designate as protected improvements in subsequent contracts and work orders 1) fences, 2) cattle guards, 3) Ranger Ditch, 4) Continental Divide National Scenic Trail and trail markings, 5) recreation and transportation signs and other areas with resource protection restrictions.

17. Fences will be protected to the maximum extent possible during harvest, thinning, and fenceline clearing to maintain function (prevent livestock escape). Operations will be coordinated with grazing permit administrators and permittee.

18. Any cut trees or activity-related debris will be promptly removed from roadside or water conveyance ditches.

19 a. There will be no treatment operations on weekends and federal holidays during the snowmobile season in units and on access routes along State designated snowmobile trails. Information notices will be posted along the trails, at trailheads, and on the forest website.

Maintain Recreation Experience and Scenic Integrity on the Continental Divide National Scenic Trail

19 b. To the maximum extent possible, alternate route(s) or detours will be used during project implementation to allow continued trail use and to mitigate scenery management impacts during logging operations.

20. Continental Divide National Scenic Trail or alternate route or detour locations will be clearly signed and marked before, during, and after harvest activities to aid with implementing these measures:

- 20 a. The area within approximately 50 feet either side of the Continental Divide National Scenic Trail is considered immediate foreground. From approximately 50 feet to 500 feet is considered the middle ground.
- 20 b. If visible tree marking is necessary in treatment units along the Continental Divide National Scenic Trail, trees to be cut will be marked. Where feasible, tree marking paint will not be visible from the Continental Divide National Scenic Trail.
- 20 c. Boundaries of treatment units visible from the Continental Divide National Scenic Trail will be marked visually, including the use of stump/tag combination.
- 20 d. Skidding or temporary road locations will not be permitted on the Continental Divide National Scenic Trail tread. If necessary, skid trails or temporary roads would be allowed to cross perpendicular to the trail, but whenever possible routes should be angled or 'hook' into the trail to prevent long disturbed corridors visible from the Continental Divide National Scenic Trail.
- 20 e. From the Continental Divide National Scenic Trail, landings will not be visible within 500 feet.
- 20 f. From the Continental Divide National Scenic Trail, temporary roads will not be visible within 500 feet unless temporary road access is needed to meet project objectives and to provide trail user safety. If necessary, temporary roads would be allowed to cross perpendicular to the trail, and reclamation after use will address long term ecological and visual restoration.
- 20 g. Within 50 feet of the Continental Divide National Scenic Trail, stump heights will be as low as possible (6 inches or less). Beyond 50 feet, stump height should be as low as possible, but not higher than 12 inches unless otherwise agreed. Trees with Continental Divide National Scenic Trail markers will be high stumped to retain the trail marking.
- 20 h. Within 500 feet of the Continental Divide National Scenic Trail, slash will be scattered on all skid trails, reclaimed temporary roads, or both to achieve at least 50 percent ground cover. Slash distribution should be patchy, to mimic the irregular distribution of slash in the rest of the unit, and should not exceed 24 inches depth.
- 20 i. Heavy slash (4 inch minimum diameter at the small end and minimum 3 feet in length) will be removed from areas up to 50 feet from the edge of the Continental Divide National Scenic Trail. Smaller slash will be scattered across harvest areas, skid trails, reclaimed temporary roads, or some or all of these areas.
- 20 j. There will be no treatment operations on weekends and federal holidays in units and on access routes along the Continental Divide National Scenic Trail. Information notices will be posted along the trail, at trailheads, and on the forest website.
- 20 k. As soon as practical following harvest, provide trail tread to meet Forest Service standards at any skid trail or temporary road crossings. This would include recontouring or full rehabilitation within sight distance to restore scenic integrity.

Treat Activity Fuels to Reduce Fire Behavior

21. Unless other methods are specifically identified to leave little to no slash in roadside fuel breaks, whole tree skidding will be required within 100 feet of the running surface of roads identified as fuel breaks. Intent is to have no slash within fuel breaks to create zones of reduced fire behavior.

22. Fuel breaks will be managed at a low stocking level but not less than 150 trees per acre.

23. Stumps will be no more than 12 inches in height, except where design criteria along the Continental Divide National Scenic Trail are more restrictive.

24. All slash will be lopped to less than 24 inches above the ground unless otherwise specified.

25. In fenceline clearing areas that are not accessible for mechanical removal, trees felled along the fence will be limbed and tree boles bucked, where feasible, so they lay no more than 24 inches off the ground. Remaining slash will be lopped and scattered to a height of no more than 24 inches.

26. Any slash piles at landings or other locations will be constructed compact and dirt free to facilitate complete burning. Minimum pile size is 10 by 10 by 10 feet.

B. Designate and Manage the Minimum Road System and Other Motorized Routes

27. Manage land treatments to conserve site moisture and to protect long-term stream health from damage by increased runoff, by decommissioning unnecessary, unneeded system, nonsystem, user-created, and project temporary roads in the project area in order to reduce watershed-scale connected disturbed area.

28. Motorized use of decommissioned roads will be prevented with methods such as barriers, berms, woody debris, or obliteration; will be recontoured to sight distance from open routes; or both.

Motorized Trail Conversion

29. Where newly designated off-highway vehicle routes cross streams, harden trail tread across perennial and intermittent stream crossings and approaches and through riparian areas.

Access for Vegetation Management

30. Access routes for vegetation management will be approved by the district ranger in consultation with appropriate resource specialists.

31. Upon completion of fenceline clearing, decommission motorized access routes, skid trails, or both to prevent new motorized use patterns.

Level 1 Roads

32. When level 1 roads are put into use for project implementation, adequate drainage will be restored after use so the roads can endure with little to no maintenance. Culverts and fill will be removed and water bars installed as needed and in such a way so they do not drain directly into perennial or intermittent streams. Stream crossings will be armored and protected as needed. Roads will be outsloped where feasible.

33. Level 1 roads will be signed as closed to public use and future unauthorized motorized use will be prevented with gates, barriers, berms, or woody debris; obliterated; recontoured to sight distance; or other methods.

Temporary, Unauthorized, or Decommissioned Roads and Road Segments Abandoned by Reroutes

34. Temporary roads will be built on ridge tops, stable upper slopes, or wide valley terraces if practicable. Soils will be stabilized on site.

35. Restore and recontour temporary and decommissioned roads as needed to a natural state and to move toward the desired landscape character of the area.

36. At a minimum, the full length of temporary roads and roads slated for decommissioning will be ripped to a depth of 8 to 12 inches and 60 to 75 percent of the road surface will be decompacted.

37. Temporary roads will be fully recontoured within 300 feet of perennial streams, including removing all fill from valley bottoms and restoring valley bottoms and stream channels to natural contours, elevations, and dimensions. The rest of the road will be recontoured as necessary where resource or visual concerns exist. Rehabilitation will occur as soon as feasible after use ends, and temporary roads will be stabilized before the end of the operating season.

Mitigation for the Modified Proposed Action

Addition of unauthorized routes to the designated road and trail system is included as mitigation to maintain a similar level of public motorized access compared to current access. Road decommissioning is necessary to restore watershed resiliency, but would reduce public motorized access. Selective decommissioning of 21 miles of system roads is included in the modified proposed action to restore watershed function and resiliency as described in the project purpose and need.

However, achieving this element of the purpose need has adverse impacts to the amount of public motorized access. To mitigate the reduction in designated roads open to public motorized use, road segments identified for decommissioning have been selected that reduce impacts without unduly reducing public access. In addition, some public motorized access has been replaced and retained by adding unauthorized routes to the system and by converting several roads to an off-highway trail rather than decommissioning the subject routes.

Addition of 6 miles of unauthorized routes to the designated road system and creation of the Joe's Park off-highway vehicle trail are mitigation measures to reduce the impact on forest access from watershed restoration actions (see figure 23).

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by the National Environmental Policy Act to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). However, while the National Environmental Policy Act requires a range of alternatives, the Healthy Forests Restoration Act specifically limits the range of alternatives required during analysis to a maximum of 3: no action, the proposed action, and at most one additional alternative, if that

alternative is proposed during scoping or the collaborative process and meets the project purpose and need.

2016 North Savery Continental Divide National Scenic Trail Alternative: During project scoping, one commenter directly suggested an alternative that did not include vegetation treatments within ½ mile of the Continental Divide National Scenic Trail. The district ranger considered this proposal but determined it would not meet the purpose and need of the North Savery Project. Eliminating treatment in this area would eliminate an opportunity to reduce the amount of downed trees on the trail and to improve the safety by removing standing dead trees along the trail. It would also eliminate the opportunity to promote regeneration in areas affected by the mountain pine beetle, where standing dead trees are shading the understory and fallen dead trees are inhibiting regeneration and obstructing access for management. Alternatives considered in detail should be consistent with the Forest Plan as well as meet the project purpose and need, so this alternative was not carried forward for detailed analysis. The option to defer treatment in salvage units adjacent to the trail is available to the deciding official by selecting the no-action alternative for those units.

However, the district ranger also determined that the proposed action, as described, might not provide adequate protection for this important national recreation resource. The project team was directed to further modify the proposed action to include specific design criteria to protect the recreation experience and scenic integrity along the Continental Divide National Scenic Trail. For assistance in developing design criteria, the interdisciplinary team consulted in May 2016 and January 2017 with the Continental Divide National Scenic Trail program manager based at the Rocky Mountain Regional Office. The team also consulted with Grand Mesa, Uncompaghre, and Gunnison National Forests personnel regarding their recent vegetation analysis along the trail corridor to promote consistency in trail management in the region.

Based on these discussions, management direction and best practices for vegetation management along the trail corridor were incorporated in design criteria to protect and enhance the trail, the immediate foreground (0 to 300 feet) and middle ground (300 to 500 feet) viewed from the trail, and to inform trail users of detours during implementation (see “Design Criteria Applied and Analyzed” on page 82). Changes in how the Continental Divide National Scenic Trail was to be treated as a result of comments during public scoping were incorporated in the modified proposed action analyzed in this draft environmental impact statement.

Comparison of Alternatives

This section provides a concise summary of the effects and outcomes of implementing each alternative. Information in table 20 is focused on activities and effects where different levels of effects, outcomes, or outputs can be distinguished quantitatively or qualitatively among alternatives. Attainment of the project purpose and need and the degree to which alternatives address the issues for analysis are summarized and compared. Comparison of effects and outcomes are more fully discussed in Chapter 3.

Table 20. Comparison of effects from the no-action alternative and the modified proposed action

Resource	Effects from No Action	Effects from Modified Proposed Action
Forest products	Reduced timber available to local markets and limited amounts available to the public.	Forest products provided to local timber markets and the public.
Money from timber sales	No volume harvested, \$0 return to the Treasury or agency.	56 million board feet, yielding \$898,060 estimated return to the Treasury or agency.
Species composition and size	Shift to shade-tolerant species like subalpine fir. Remaining lodgepole pine would be pole size. Some spruce might establish.	Lodgepole pine would regenerate and would increase from pole size to medium and large sizes. Salvage harvest and thinning would protect pockets of Engelmann spruce and healthy, vigorous aspen in wetter sites.
Fuel load	Heavy dead and downed fuel load in these areas could increase the total heat output and increase the residence time of the flaming front. Greater risk of soil sterilization from hotter fires.	Fuel loads reduced so total heat output would be lower. Precipitation and wetter weather patterns would extinguish fires quicker.
Fire suppression risks	Increased risk of injury to fire personnel from dead trees will become more likely to falling on them.	Safer for firefighters because the overhead hazards posed by dead trees would be gone.
Access for fire suppression	No difference.	Road density reduced but no practical difference because accessible area is maintained and much initial attack utilizes aircraft.
Potential for human-caused fires	No difference.	No difference.
Potential for crown fire	Higher in lodgepole pine stands with mixed-species ladder fuels.	Lower potential in some stands where precommercial thinning occurs; lower potential in regenerating young stands because some ladder fuels from mixed-species stands would be removed through prescriptions.
Smoke from fires	Quantity and duration of smoke produced during a wildland fire would probably increase over time as stands decay and ladder fuels increase.	Somewhat lower quantities and duration of smoke from wildland fires because fuels profiles would be broken up across the project area.
Access	Most of the project area would be easily accessible from the extensive system of existing open system roads. Seventy-eight percent of the area is within ½ mile of open roads.	The portion of the project area easily accessible from system roads and trails open to public motorized use would change from 78 to 76 percent of the area within ½ mile of open roads.
Sustainability of the road system	Would not improve our ability to maintain existing roads (168 miles). Debris and downfall in streams may threaten culverts or bridges.	Would slightly improve our ability to maintain roads to meet standards because 22 miles would be decommissioned or closed. Slightly reduced risk of debris or downfall creating log jams at bridges or culverts.

Resource	Effects from No Action	Effects from Modified Proposed Action
Road density	2.25 miles per square mile road density of open and closed roads (all maintenance levels).	2.1 miles per square mile road density of open and closed roads (all maintenance levels).
Road density	1.48 miles per square mile of open roads (maintenance levels 2, 3, and 4). Density varies at smaller scales.	1.3 miles per square mile of open roads (maintenance levels 2, 3, and 4) and motorized trails. Density varies at smaller scales.
Streamflow	Predicted measurable increases in North Fork Savery Creek, McLain Creek, Jack Creek, North Spring Creek flows. May cause increased erosion and stream habitat changes.	Further increases in runoff and peak flows expected in portions of the project area. Effects greater in watersheds with the most proposed harvest: North Fork Savery Creek, Nugget Creek, McLain Creek, Jack Creek, and North Spring Creek.
Erosion and sedimentation	No temporary roads, landings or skid trails, so no erosion or additional compaction at these sites. Existing resource damage associated with current system roads and user-created routes would continue and possibly get worse. Some impacts from unauthorized routes would be reduced as these were decommissioned.	Increased erosion and sediment in streams from 7 miles of temporary road within stream connected disturbed areas, and from harvest units, landings, and skid trails. Reduced runoff, erosion, and sedimentation from road decommissioning or relocation of system roads. Adding 6 miles of user-created routes would perpetuate the existing soil erosion and sedimentation at these sites unless maintenance was improved.
Stream stability	Existing resource damage associated with current system roads and user-created routes would continue and possibly get worse. Some stream channels at risk of instability from existing degraded watershed condition.	Long-term stability of streambeds and streambanks expected at all decommissioned road-stream crossings. Some stream channels at greater risk of instability from cumulative effects of North Savery and other actions in watersheds with degraded existing conditions.
Riparian areas and wetlands	Increased water temperatures and more available large woody debris which could provide terrestrial habitat in riparian areas or aquatic habitat in streams.	Slight reduction in total coarse woody debris; however, harvest buffers would leave most trees adjacent to streams where they would be a source of coarse woody debris to streams.
Canada lynx determination	No effect determination for no action.	Determination is “may affect, not likely to adversely affect” Canada lynx.
Canada lynx habitat	Quality would improve over time as trees regenerated. Hazard of larger, stand-replacing fires could create some habitat loss if they occur. Approximately 28 acres would be restored by decommissioning unauthorized routes.	Salvage harvest in currently unsuitable habitat could accelerate development of hiding and hunting cover in regenerating timber stands. System and unauthorized road decommissioning would restore more habitat area (111 acres) than no action.

Resource	Effects from No Action	Effects from Modified Proposed Action
Canada lynx prey species	Habitat for, and abundance of, snowshoe hare and red squirrel (prey species) would decline for a period of time until hiding cover regenerates.	Proposed timber management would retain recruitment trees, snags, and coarse woody debris to contribute toward prey habitat in the future.
Pygmy shrew, American marten, northern goshawk, greater sage-grouse, boreal owl, olive-sided flycatcher, Brewer's sparrow, hoary bat, Hudsonian emerald, and western bumble bee	Decommissioning unauthorized routes would restore minor amounts of habitat. Coarse woody debris from beetle-killed trees would provide habitat for pygmy shrew and American marten.	Decommissioning existing system roads would restore additional minor amounts of habitat. Habitat removed by timber harvest would be lost to beetle kill if no harvest occurred. Some disturbance to pygmy shrews, greater sage-grouse, and Hudsonian emeralds from harvest activities.
Brown creeper, snowshoe hare, American three-toed woodpecker, golden-crowned kinglet, Lincoln's warbler, Wilson's warbler	Decommissioning unauthorized routes would restore minor amounts of habitat. This would likely improve territory quality for a few individuals. Beetle-killed stands would become unsuitable habitat for brown creeper and golden-crowned kinglet. Over time, snags from beetle-killed trees would provide communal winter roost sites for golden-crowned kinglets.	Decommissioning existing system roads would restore additional minor amounts of habitat. Brown creeper and snowshoe hare habitat removed by timber harvest would be affected by beetle kill if no harvest occurred. Forest Plan standards for recruitment trees, snags, and coarse woody debris would retain some future habitat for prey insects in harvested areas. Some displacement of snowshoe hares from harvest areas during activities.
Habitat for other wildlife species	Decommissioning unauthorized routes would restore 66 acres of habitat. Habitat would be improved in wetland and riparian areas along portions of Savery Creek, Jack Creek, and North Spring Creek.	Decommissioning authorized and unauthorized routes would restore 111 acres of habitat. Four acres of habitat would be restored in elk parturition and wintering areas and mule deer stopover areas. Twenty-five acres of riparian and wetland habitat would be restored.
Wildlife security areas	Eliminating unauthorized routes would slightly increase security areas. Road density would remain high in much of the project area.	No effective increase. Decommissioning would decrease road density but the areas without roads would be less than 250 acres or they would be in habitat that is not forested.
Continental Divide National Scenic Trail	Falling trees and downed trees would make navigating the trail difficult and more hazardous than usual. Existing scenic integrity objectives for the 14 miles of trail in the project area are high to very high. Scenic integrity objectives do not evaluate natural changes to landscape.	Tree removal along the trail would improve navigation and safety. Managed areas along the trail would be unlikely to meet scenic integrity objectives of high to very high for 3 to 5 years after harvest. Scenic integrity would improve over time as understory vegetation obscured the evidence of timber salvage.

Resource	Effects from No Action	Effects from Modified Proposed Action
Aquatic habitat	Six culverts that are known barriers to upstream passage of aquatic organisms would not be addressed and would continue to fragment habitat.	Decommissioning roads adjacent to streams would improve aquatic habitat by reducing or eliminating the risk of chronic sedimentation into stream channels. Removing culverts that act as barriers would eliminate habitat fragmentation.
Boreal toad, northern leopard frog, Colorado cutthroat trout, and mountain sucker	The no-action alternative would have “no impact” on these species.	Decommissioning system roads would have a “beneficial impact” to these species. Other activities could have marginal adverse impacts. Overall, the modified proposed action “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”.
Brook, brown, and rainbow trout	Fish populations ranging from depressed (primarily due to limited habitat in small streams) to strong populations (primarily of highly adaptable brook trout) would persist in the project area except as affected by local impacts from stream channel avulsion, fire effects or continued agricultural water diversions.	The North Savery Project is not expected to result in changes to fisheries populations in area streams.
Greenhouse gas emissions, carbon sequestration, and climate change	High amounts of carbon could be released into the atmosphere rapidly during a wildland fire (due to high fuel loads). Carbon stored in the soil organic layer could be volatilized. Carbon stocks might not be recovered for decades. As stands decompose and regenerate, carbon will be stored. Stands less resilient to climate change.	Minimal contributions of greenhouse gases. Negligible impact on global climate change. Short-term greenhouse gas emissions from burning and other vegetation management. Carbon sequestration as trees regenerate. Healthier, more resilient stands with a greater capacity to adapt to climate change because more resources are available.
Cultural resources	High tree mortality and subsequent tree fall could destroy cultural resources. Heavy fuel loads could increase the risk of a wildland fire destroying flammable or heat-sensitive cultural materials. A high-severity wildfire could increase erosion, resulting in the loss of context for archaeological material, the loss or alteration of surficial and subsurface archaeological features, and increased exposure of artifacts to vandals and collectors.	Low risk of direct or indirect impacts to cultural resources. Timber harvest and fuels treatment would decrease the potential for damage to sites from dead and dying trees. Treatments would avoid adversely affecting the historic property. New cultural resources would be protected until proper analysis could be conducted. Work in the vicinity of the discovery would cease until the findings were evaluated by a qualified archaeologist and proper protection measures were implemented. Some road closures would provide added protection to historic properties.

Resource	Effects from No Action	Effects from Modified Proposed Action
Western prairie fringed orchid	"No effect" determination because no water depletions would occur.	"No effect" determination because no water depletions would occur
Sensitive plants and plant species of local concern	Wildfires from fuel loading and dry, dead fuels could create high ground temperatures that could sterilize the soil and eliminate the mycorrhizal fungal species on which orchids and moonworts depend for survival. More open forest canopy means more light is reaching the forest floor. This may reduce or eliminate habitat for sensitive species that require cool, dark forest floors. User-created routes could be decommissioned for marginal benefit. Unnecessary system roads would remain open, increasing soil disturbance and erosion, leading to damage to native vegetation in these areas.	No adverse effects are expected if populations are avoided. Sensitive plants and plant species of local concern in timber treatment units would be flagged and avoided during treatment activities. Timber harvest could affect habitat by covering the ground with soil or fallen trees; creating open, warmer, drier conditions; disrupting mycorrhizae in the duff layer; introducing invasive plants; compacting the soil; and causing erosion. System road decommissioning would reduce incidences of crushing and soil disturbance, reduce the spread of invasive species, and reduce impacts of erosion and sedimentation.
Livestock management	More complex. Natural barriers may fall; cattle may wander, or falling trees may maintain barriers. Permittee access is more difficult and dangerous due to downed trees. Conditions would persist for decades.	Maintaining livestock distribution and moving cattle would be difficult in the short term during harvest operations. In the long term, road decommissioning would reduce livestock disturbance; reduce problems with gates being left open and cattle following open roads that cross allotment or pasture boundaries; reduce opportunities for new user-created off-highway vehicle routes; and reduce effects to soil and vegetation from damaged roads, inadequately maintained roads, or off-road use.
Fence maintenance	6.8 miles of fence may be affected by falling trees. Maintenance would be harder; fence service life would be shorter. Greater risk of injury to permittees.	Timber harvest activities could damage fences. Proposed fenceline clearing would help maintain fences, help them last longer, and reduce risks to permittees. 1.2 miles of fence might be needed to keep cattle in the appropriate allotments and pastures after timber harvest was completed.
Forage	New transitory range in some pine stands without mixed-species understory.	Approximately 8,160 acres of transitory range added.
Invasive plants	Increasing in some stands. Potential increases in abundance and distribution of cheatgrass, musk thistle, Canada thistle, oxeye daisy, spotted knapweed, yellow toadflax, leafy spurge, and common tansy.	Design criteria would reduce the likelihood of noxious weed establishment or spread. There would be 19 fewer miles of open roads acting as dispersal corridors for weed seed carried by motorized vehicles.

Resource	Effects from No Action	Effects from Modified Proposed Action
Recreation opportunities and access	The existing 1.5 miles of motorized trail co-located with open forest road would be available for use by legal all-terrain vehicles and motorcycles. Approximately 17 miles of nonmotorized trail would be available for use by the public. Because no open roads would be closed, the public would still have access to the areas they have typically used.	Some campers in the Jack Creek campground would view vegetation treatments as negative, others would regard the removal of dead trees as making the area safer. The modified proposed action would help with future foot and motorized trail loops from the campground and a potential campground expansion development plan. Road decommissioning would make some dispersed camping sites inaccessible by motorized vehicles.
Roads and trails	With off-road vehicle use increasing, the existing trail system may see heavier use with the associated potential for resource damage along the trails. User compliance with travel management regulations restricting travel to designated open roads is expected to remain at current levels.	Conversion of some roads to motorized trails would negatively impact some full-size vehicle users. There could be conflicts between motorized and nonmotorized users while each type of visitor adjusts to the change in designations between open and closed roads or motorized trails. User compliance with travel management regulations would be expected to decline from current levels until closures were established and signs installed.
Inventoried roadless areas	None of the 9 roadless characteristics would be adversely affected.	None of the 9 roadless characteristics would be adversely affected. There would be a marginal benefit to the roadless character in Mowry Peak Inventoried Roadless Area from small amounts of road decommissioning.
Scenery	Short-term, foreground and middle ground landscape dominated by standing beetle-killed trees. Over time, fallen trees would dominate the landscape. Decommissioning unauthorized, unauthorized roads would restore desired landscape character.	Numerous treated areas in the foreground of travelways and recreation sites would have low scenic integrity. Visual impacts would lessen as trees regenerated. Precommercial thinning would maintain a green, forested landscape. Decommissioning system roads would restore desired landscape character in addition to unauthorized decommissioning.

Chapter 3. Environmental Consequences

The purpose and need for the North Savery Project addresses the Forest Service's intention to have a significant and beneficial effect on the forest vegetation and fuels conditions in the project area. Actions are designed to accelerate the pace and scale of forest restoration in the area and reduce the short-term risk of catastrophic wildfire. The purpose and need also includes actions to identify and implement a sustainable motorized transportation system in the project area. Changes to the transportation system would reduce ongoing resource impacts from existing system roads.

Based on the purpose and need of the North Savery Project and the issues identified by the interdisciplinary team and through public scoping, the key resource considerations for the responsible official's decision are silviculture and timber, the transportation system, watershed condition, wildlife, and visual resources associated with the Continental Divide National Scenic Trail corridor and experience. Potential direct and indirect effects of the no-action alternative and of implementing the modified proposed action are described in detail for these resources. For resources where project effects are incidental, effects are summarized. Full analysis and disclosures are in the specialist reports filed on the Medicine Bow-Routt website, North Savery project page at <https://www.fs.usda.gov/project/?project=47913>. The cumulative effects and Forest Plan consistency discussions for the modified proposed action are at the end of effects discussions for all resources (see pages 136 and 144, respectively).

Silviculture and Timber

In all management areas, mortality from the mountain pine beetle epidemic has created considerably different stand conditions than existed before the beetle infestation just a few years ago. High mortality levels will set predominantly mature lodgepole pine stands back to early successional stages. Silviculture treatments proposed for the North Savery Project are intended to reduce fuels that threaten existing stands of commercial timber and to create beneficial growing conditions for commercially preferred species to sustain production in timber emphasis management areas. Stand conditions would be deliberately changed on approximately 6,670 acres (15 percent) of the project area.

Direct and Indirect Effects of the No-action Alternative

The no-action alternative has major implications to timber resources due to epidemic, landscape-scale mountain pine beetle activity which has impacted most timber stands with mature lodgepole pine. Due to high overstory mortality, water and sunlight are no longer limiting resources for understory species. The slow break-up of lodgepole pine stands would favor the establishment of more shade-tolerant species such as subalpine fir (Collins 2010). A small component of spruce may be established when a seed source exists and there is sufficient disturbance to create growing space. Aspen may recolonize some sites. In lodgepole pine stands, young seedlings and saplings will continue to grow. Where stands are overstocked, the trees may remain pole-timber size, approximately 4 to 6 inches in diameter.

All dead trees will eventually fall. High levels of dead, downed woody material and no fire would impede new tree regeneration and slow the establishment of subalpine fir and lodgepole pine. If fire occurs before the dead lodgepole falls, positive effects could include preparation of a seed bed, opening of serotinous cones, and seed dispersal leading to successful lodgepole pine regeneration. High intensity fire after the dead lodgepole falls could destroy seeds in

serotinous cones, kill young trees of all species in the understory, and damage soil (USDA Forest Service 1990).

In lodgepole pine stands, the beetle outbreak could cause an almost complete loss of mature timber. This would reduce timber production and limit the forest products available for public use until stands mature again in 80 to 100 years. Spruce-fir stands may become dominated by subalpine fir which persists for long periods and is a less desirable timber species. Rotation ages may need to be lengthened because of the relatively slow growth of fir.

Direct and Indirect Effects of the Modified Proposed Action

Implementation of the modified proposed action would provide forest products to local timber markets and stimulate local and national timber markets. Stands harvested in a method to promote regeneration would provide stand structure diversity throughout the area. Salvage harvest would shift lodgepole stands from medium and large size classes to the established size class through regeneration (see table 21 below).

The chances for natural lodgepole pine regeneration in heavily thinned stands would be increased, and regeneration would be assured, if necessary, through reforestation treatments. Pre-commercial thinning in lodgepole pine stands would improve growth and vigor, reduce stress from overcrowding and competition, and create future stands less susceptible to mountain pine beetles. These treatments would move dead, mature stands back into timber production faster, and would increase growth and vigor of thinned stands to favor sawtimber production as prescribed in the Forest Plan for Management Areas 5.12 and 5.13. Salvage harvest and thinning would protect pockets of Engelmann spruce and healthy, vigorous aspen in wetter sites, increasing the diversity of timber types in patches across the project area.

Table 21. Existing forested vegetation cover type and size class diversity in the North Savery project area

Cover Type	Total Acres	% of Project Area	Acres of Established ¹	Acres of Small ²	Acres of Medium ³	Acres of Large ⁴	Acres of Very Large ⁵
Aspen	2,180	4.7	30	190	995	965	0
Lodgepole pine	25,286	55.3	2,502	1,541	10,510	10,627	106
Spruce-fir	8,016	17.5	582	68	812	5,616	938

1 Established – The majority of the stocking is less than .1 inches in diameter.

2 Seedling/Small – The majority of the stocking is between .1 and 4.9 inches in diameter.

3 Medium – The majority of the stocking is between 5.0 and 8.9 inches in diameter.

4 Large – The majority of the stocking is between 9.0 and 15.9 inches in diameter.

5 Very Large – The majority of the stocking is greater than 16.0 inches in diameter

Table 22. Other vegetation cover types in the North Savery project area

Cover Type	Acres	% of Project Area
Grass	4,932	10.8
Forbs	5,030	11.0
Shrub and sagebrush, Gambel oak	165	0.4
Willow	50	0.1
Water (lakes and ponds)	40	0.1

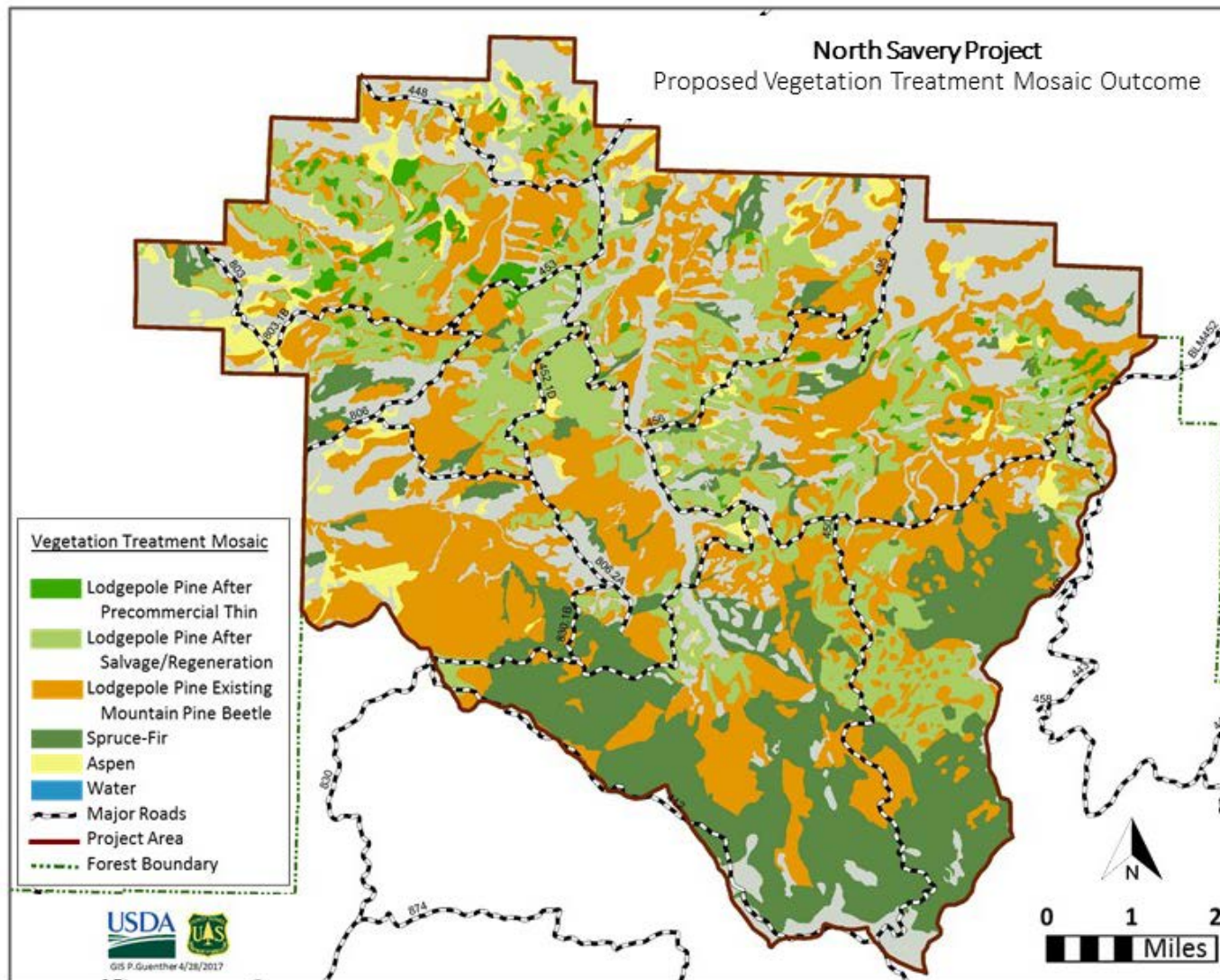


Figure 26. Vegetation mosaic after treatment showing treated lodgepole stands in matrix of mountain pine beetle mortality and other species.

Timber harvest and associated disturbances are a source of soil compaction. Soil compaction is an adverse impact that is regulated by standards in the Forest Plan. Not more than 15 percent of harvest units may be detrimentally compacted for consistency with the plan standard.

Temporary roads, landings, and skid trails are areas where compaction can be expected within harvest units (table 23). Calculations show the potentially compacted areas from temporary roads, landings and skid trails could be as high as 10.3 percent. Temporary roads and landings account for 2.6 percent of the estimated compaction. Compaction on temporary roads and landings is expected to be high so these areas would be ripped to reduce compaction as needed and would no longer be considered detrimentally affected. Skid trails (7.7 percent of the area) are not expected to have high levels of compaction, but main skid trails may be ripped as needed.

Table 23. Expected compaction in the North Savery project area.

Landings, (number and acres)	Percent Compaction from Landings	Temporary Roads, (number and miles)	Percent Compaction from Temp Roads	Percent Compaction from Skid Trails*	Maximum Potentially Compacted Area (%)
640 160 acres	2.1	41 24 miles	0.5	7.7	10.3

*Skid trails spaced 100 feet apart are expected to cover 11 percent of harvest unit area (Garland 1992).

Fire and Fuels

Large fuel buildups, opening of the canopy, and the subsequent increase in surface wind and surface drying that result from a mountain pine beetle epidemic create conditions favorable for large, high-severity, potentially damaging fire events. Managing fuels conditions to get lower rates of spread, lower fireline intensity, and a safer work environment for firefighters is important if the goal is to allow fire to continue its natural role in the ecosystem.

In the North Savery analysis area, it is important to determine whether the treatments increase or reduce fire hazard. To reduce fire hazard, treatments should achieve some combination of reducing flammability, reducing fire intensity, reducing the potential for fire-starting heat sources, and increasing firefighter safety and effectiveness (USDA Forest Service 2006b).

Direct and Indirect Effects of the No-action Alternative

Fuels and resulting fire behavior potential will continue to be heavily influenced by large amounts of falling dead timber and regeneration of young trees among the dead and downed material. The heavy dead and downed fuel load in these areas could increase the total heat output and increase the residence time of the flaming front. This may have negative impacts on other resources.

As the dead trees fall, there will be less canopy cover, and the ground would be exposed to more sunlight and increased winds. Increased sunlight would speed drying of surface fuels and increase fuel temperature resulting in an increase of potential fire behavior. An increase in surface winds would also increase fire behavior. These effects would slowly increase and eventually reach levels similar to those in treated units in approximately 5 to 10 years.

Over the next ten years, snow compaction and decomposition would result in a fuel model characterized by low flame lengths and rates of spread.

The quantity and duration of smoke produced during a wildland fire would probably increase. As the fire would be an unplanned event, it would be impossible to plan for and mitigate all of the negative effects associated with smoke and respiratory effects on people living in the area.

Fires in stands that receive no treatment will pose an increased risk to fire personnel in the future because the dead trees will become more likely to fall and injure them. The overhead hazard that currently exists, and is likely to exist for the next 10 to 15 years, severely limits safe fire suppression. This was demonstrated during the 2016 fire season in the Beaver Creek, Broadway, and Snake Fires.

Without precommercial thinning, thick stands of regenerating lodgepole pine would be more likely to maintain crown fire spread due to the higher crown bulk density. Not treating these stands would mean lower surface fire potential because the surface fuel load would remain relatively unchanged. The canopy base height would increase as the existing trees grew. The combination would mean crown fires from ladder fuels would be less likely.

Lack of travel management actions would not affect motor vehicle access and the resulting potential for human-caused fires. If fires start, response times by fire management resources would be little changed as well.

Direct and Indirect Effects of the Modified Proposed Action

The majority of the proposed timber management units are not close to typical values at risk (for example, residences, cabins, and agricultural structures) so the modified proposed action would not alter the threat of a severe wildfire affecting them.

Salvage and Sanitation Treatments

Salvage and sanitation treatments would reduce future surface fuel loads. The actual effect on the fuels profile will depend on the slash treatment. Whole-tree skidding would result in a fuel model characterized by low flame lengths and low rates of spread. Ten years after treatment fuels would still resemble this fuel model.

If slash is lopped and scattered throughout the unit, the fuel model would be characterized by low flame lengths and moderate rates of spread. Over the next ten years, snow compaction and decomposition would result in a fuel model characterized by low flame lengths and rates of spread.

Proposed treatments would result in less fuel that is larger than 3 inches in diameter so the total heat output would be lower during the flaming and smoldering stages of combustion. This would reduce the effects of fire on soils and vegetation. Fire would be less likely to jump existing roads in the area. Without the heavy dead and downed fuels, precipitation and wetter weather patterns would extinguish fires quicker.

Removing much of the overstory vegetation in the treatment areas would expose the ground to more sunlight and increased winds. Increased sunlight would speed drying of surface fuels and increase fuel temperature resulting in an increase of potential fire behavior. An increase in surface winds would also increase fire behavior.

Decrease of future fuel loading on or near the surface would subsequently decrease the volume and duration of smoke production during a wildland fire. As the fire would be an unplanned

event, it would be impossible to plan for, and mitigate, all negative effects associated with smoke and respiratory effects on people living in the area.

Treatments would result in areas where fireline could be constructed more quickly by hand and with equipment such as dozers. These areas would also be much safer for firefighters because the overhead hazards posed by dead trees would be gone.

Mechanical Fuels Treatment

Mechanical fuels treatments would be nearly identical to the salvage harvest treatment with the exception of the slash treatment. Slash in the mechanical treatment units would be removed from the unit, generally by whole tree skidding, and piled for later burning. This would reduce larger diameter fuels and smaller tops, branches, and twigs which would likely decrease potential fire behavior after treatment. Over time, the young trees and shrubs might increase the potential fire behavior unless further activities take place to maintain the effectiveness of the fuel break.

Precommercial Thinning

After precommercial thinning, the primary carrier of the fire would be moderate dead and downed activity fuel because the slash would be lopped and scattered. This would result in higher flame lengths and rate of spread. Over time, the fire hazard would moderate as needles and other small twigs work their way to the surface litter and begin to decompose and the slash is repeatedly compacted by annual snow loading.

Travel Management

The effects of the proposed travel management actions on fire risk and fire hazard would be negligible. Most of the fire starts on the Brush Creek/Hayden Ranger District are lightning caused so adding or decommissioning routes would have little effect on fire occurrence. In terms of access for fighting wildland fire, many areas cannot be accessed due to roads in poor condition or located in wet areas. Many of the roads also occur in areas of high road density, so firefighters would have access via other routes.

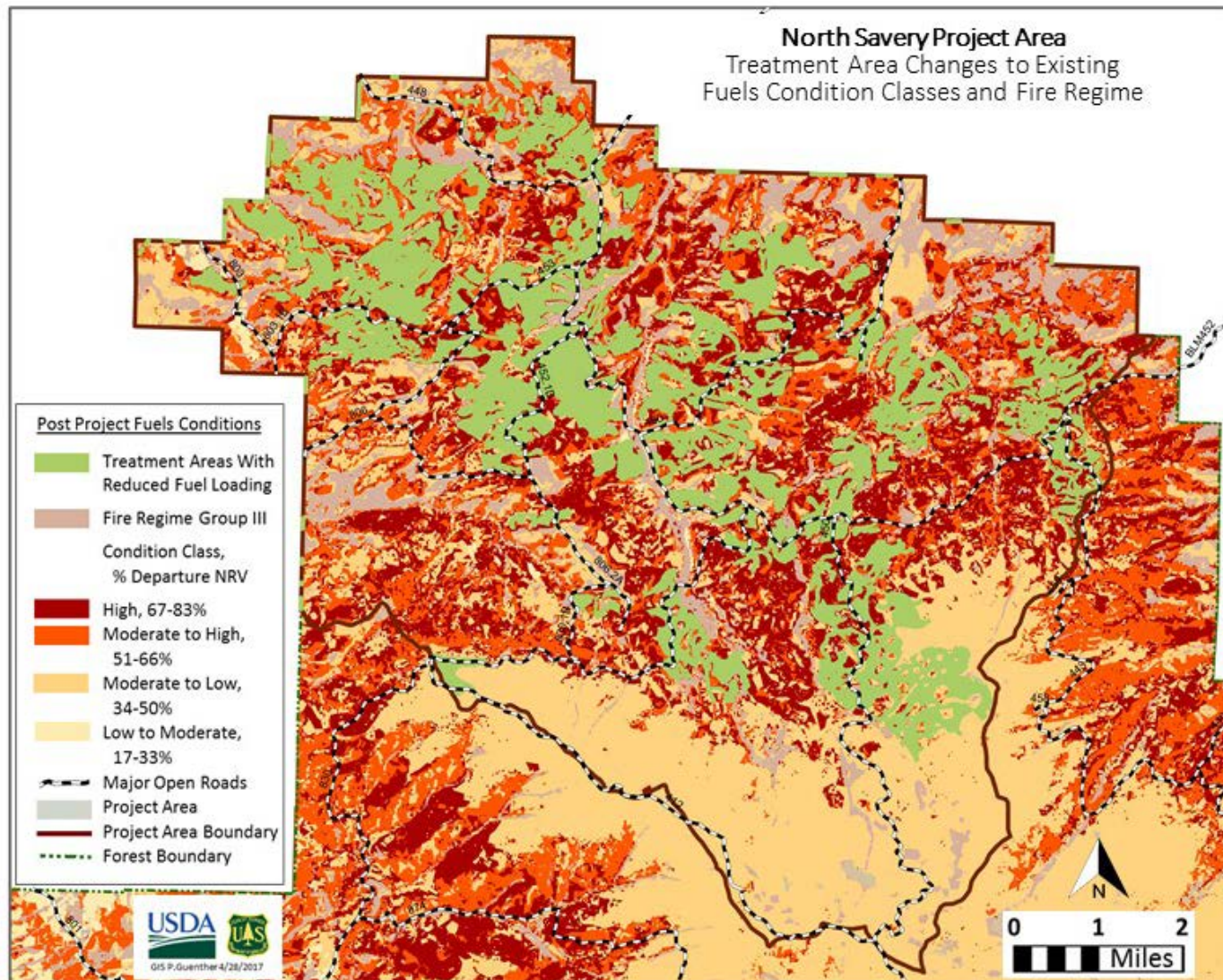


Figure 27. Changes to existing fuels condition classes and fire regime as a result of fuel reduction and removal through North Savery Project

Transportation System and Travel Management

This draft environmental impact statement considers the impacts of three parts of the transportation system in the project area: 1) permanent, system roads, and trails; 2) temporary roads for project implementation; and 3) unauthorized or nonsystem routes. Only system roads and trails are considered permanent infrastructure. Travel management considers ways to balance needs for agency and public access with minimizing the environmental impacts of the designated transportation system.

The existing transportation system provides important access for multiple use management in the North Savery project area. The majority of access is provided by permanent system roads. Designation of the minimum road system is required to comply with Subpart A of the Travel Management Rule, as well as to identify portions of the existing system that should be changed to reduce environmental impacts of forest roads. The modified proposed action would change maintenance levels of some roads, convert roads between closed and open to public motorized travel, realign some poorly located segments, add segments to the system, and decommission others to reduce cumulative effects from the transportation system. Changes to the transportation system would result in an 11 percent net decrease in total miles of the designated road and motorized trail systems. In compliance with Subpart B of the Travel Management Rule, these changes would be reflected on the motor vehicle use map for the Sierra Madre portion of the Brush Creek/Hayden Ranger District.

Direct and Indirect Effects of the No-action Alternative

The no-action alternative for the transportation system has no substantial implications for the majority of resources in the North Savery project area. The existing road system with no changes could be designated the minimum road system to comply with the Travel Management Rule requirements. Most of the area would be easily accessible from the extensive system of existing system roads. However, where existing roads are adversely affecting watershed conditions by concentrating and directing runoff or increasing sedimentation, those effects would continue. Addition of woody material to streams could increase debris moving downstream, contributing to increased risk of culvert blockage and road washouts. The road system will retain 20 miles of arterial roads, 35 miles of collector roads, and 113 miles of local roads.

The no-action alternative would retain more than 112 miles of open system roads (maintenance levels 2, 3, and 4), more than 55 miles of roads closed to unauthorized access (maintenance level 1), and more than 54 miles of unauthorized routes in the project area. Road densities would remain at 2.25 miles per square mile of open and closed system roads (all levels), and 1.48 miles per square mile of open roads (maintenance levels 2, 3, and 4) legally traveled by motorized vehicles in the project area.

Direct and Indirect Effects of the Modified Proposed Action

Implementation of the modified proposed action would provide compliance with the Travel Management Rule by designating and implementing a more sustainable transportation system and moving toward a minimum road system in the North Savery area. The overall transportation system would decrease by 22 miles of system roads and increase by 3 miles of system motorized trails. The largest change would be a decrease of approximately 21 miles of open maintenance level 2 roads.

Travel management implementation under the modified proposed action would result in 2.1 miles per square mile of open and closed roads and motorized trails and 1.3 miles per square mile of open motorized roads and motorized trails in the analysis area. This is a 7 percent reduction in the total motorized network density and a 12 percent reduction in the open motorized network density.

The portion of the North Savery project area easily accessible from roads would change from 93 to 92 percent, considering all system roads. The portion of the project area easily accessible from system roads and trails open to public motorized use would change from 78 to 76 percent considering only roads and trails open to public motorized use.

Table 24. Proposed designated National Forest road and motorized trail system for North Savery project area

System Roads and Trails	Arterial	Collector	Local	Total by Level
Level 1	0	15	41	56 (no change)
Level 2	0	6	48	54 (21 miles less)
Level 3	14	14	2	30 (1 mile less)
Level 4	6	0	0	6 (no change)
Level 5	0	0	0	0 (no change)
Total by function	20	35	113	Total Roads 146 miles (22 miles less)
Trails open to off-road vehicles*	NA	NA	NA	3 (3 miles more)

* Off-road vehicle trail: A road or trail that is part of the Forest Service transportation system that is designated for motor vehicle use pursuant to 36 CFR 212.51 in a Motor Vehicle Use Map.

Off-road vehicle trails are open to type 1, 2, and 3 vehicles as described by the Wyoming State Trails Program off-road vehicle rules and regulations (<http://wyotrails.state.wy.us/ORV/Rules.aspx>). These include vehicles 50 inches or less, motorcycles, and off-road vehicles such as side-by-sides that are approximately 60 inches wide. Motorized trails do not allow use by full-size, "street-legal" cars and trucks, such as 4-wheel drive vehicles and pickups, regardless of their width. Those vehicles may only be used on roads designed and designated as maintenance level 2 or higher (open) roads. In all cases, travel is restricted to designated roads or trails; cross-country travel is prohibited. Adequate parking would be provided at motorized trailheads; specific locations will be identified.

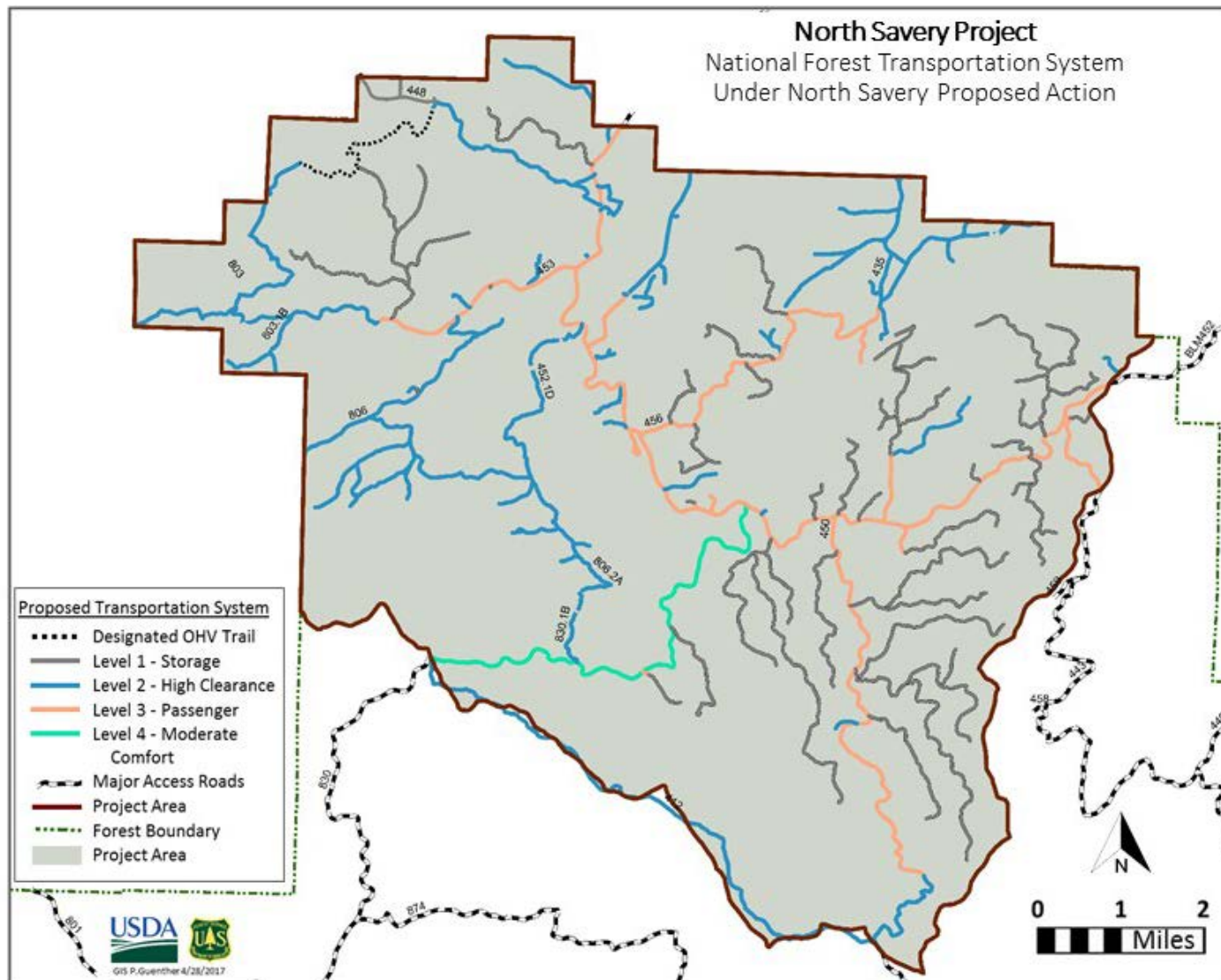


Figure 28. Transportation system network that would result from implementation of the North Savery modified proposed action

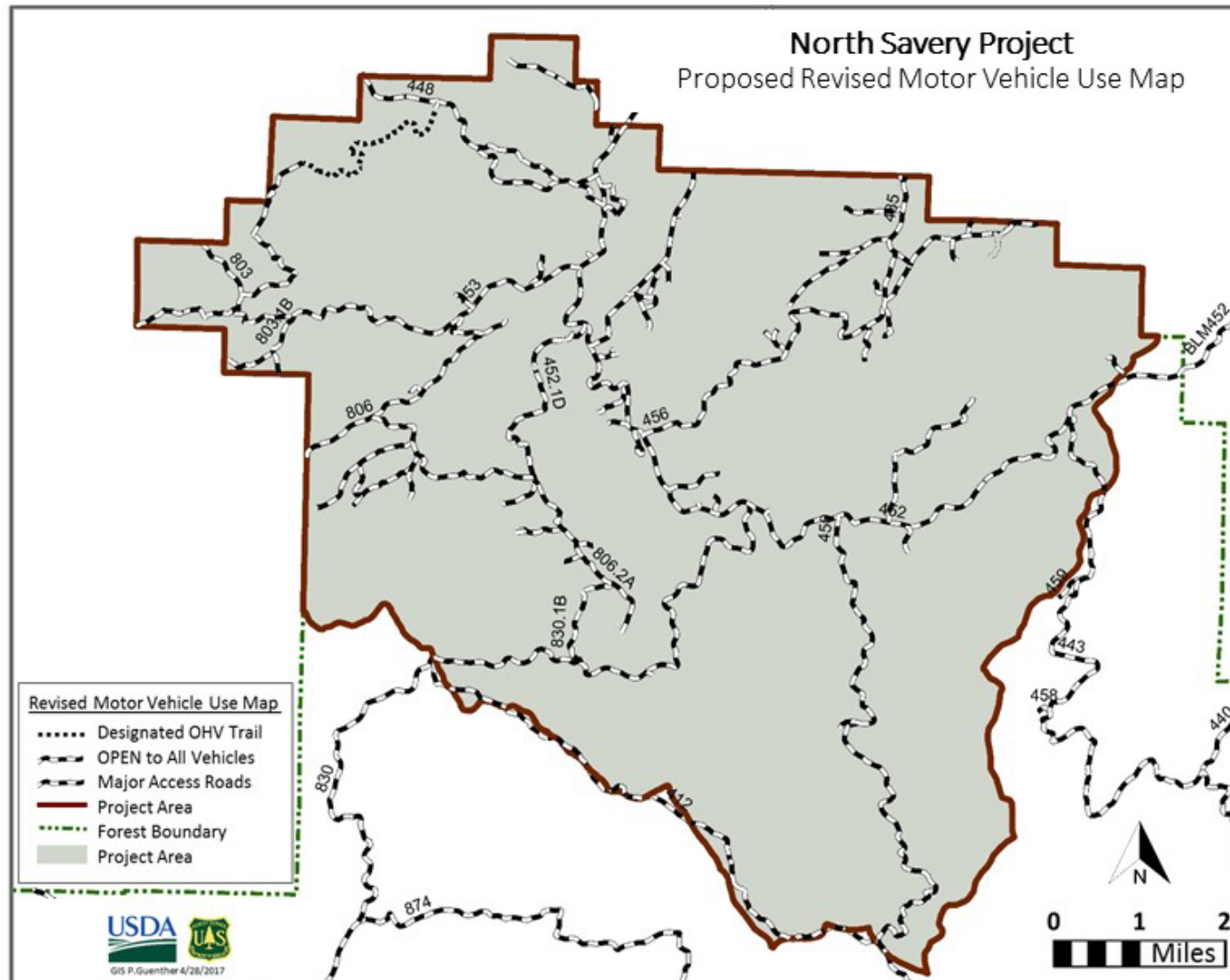


Figure 29. Proposed motor vehicle use map that would result from implementation of the North Savery modified proposed action

Continental Divide National Scenic Trail Corridor

Potential impacts to the trail corridor and user experience along the Continental Divide National Scenic Trail through the North Savery project area was an issue raised during the public scoping period for the 2015 proposed action. There was concern that proposed management was not consistent with direction for the trail, particularly for areas of high to very high scenic integrity.

Direct and Indirect Effects of the No-action Alternative

With the no-action alternative, no harvest would occur and no trees would be removed along or near the Continental Divide National Scenic Trail.

Annual trail maintenance would continue to treat portions of the trail one time during the season. Dead trees would fall after that clearing. In some years, trail navigation would be very tedious for hikers along many timbered stretches and riders would have a difficult time navigating some portions of the trail.

Hikers and horseback riders would continue to have to navigate along the trail with tangles of downed trees from more than 15 years of mountain pine beetle Mortality in the lodgepole pine along the trail averages 80 to 90 percent and the trail is littered with trees blown over by wind.

Direct and Indirect Effects of the Modified Proposed Action

The modified proposed action would remove overhead hazards along approximately 2.17 miles of the Continental Divide National Scenic Trail. This action would reduce annual downfall across the trail in the treated areas. Maintenance along this part of the trail could change from only removing downfall to work on tread, signing, brushing, bridges, or other trail maintenance needs that have been limited due to the consistent downfall on the trail.

These actions could also have significant, short-term impact on meeting scenic integrity objectives along affected portions of the trail. Where possible, natural features and topography would be used to screen areas of salvage and thinning from the trail, and characteristics of the trail corridor would meet the scenic integrity objectives of low and moderate. Specific design criteria for protection of the trail and the recreation experience are described in Chapter 2. For the first 3 to 5 years after harvest, the managed areas along the trail would be unlikely to meet scenic integrity objectives of high to very high. Impacts would decrease over time as sun and moisture allow regrowth of grasses and forbs, trees, and shrubs.

The remainder of the proposed harvest treatments are located in roaded natural and roaded modified recreation opportunity spectrum classes. These classes allow visual impacts from the treatments. The majority of the proposed units in these two classes are not close to the trail and would have little if any negative impacts to it. See also “Scenic Resources” discussion starting on page 136.

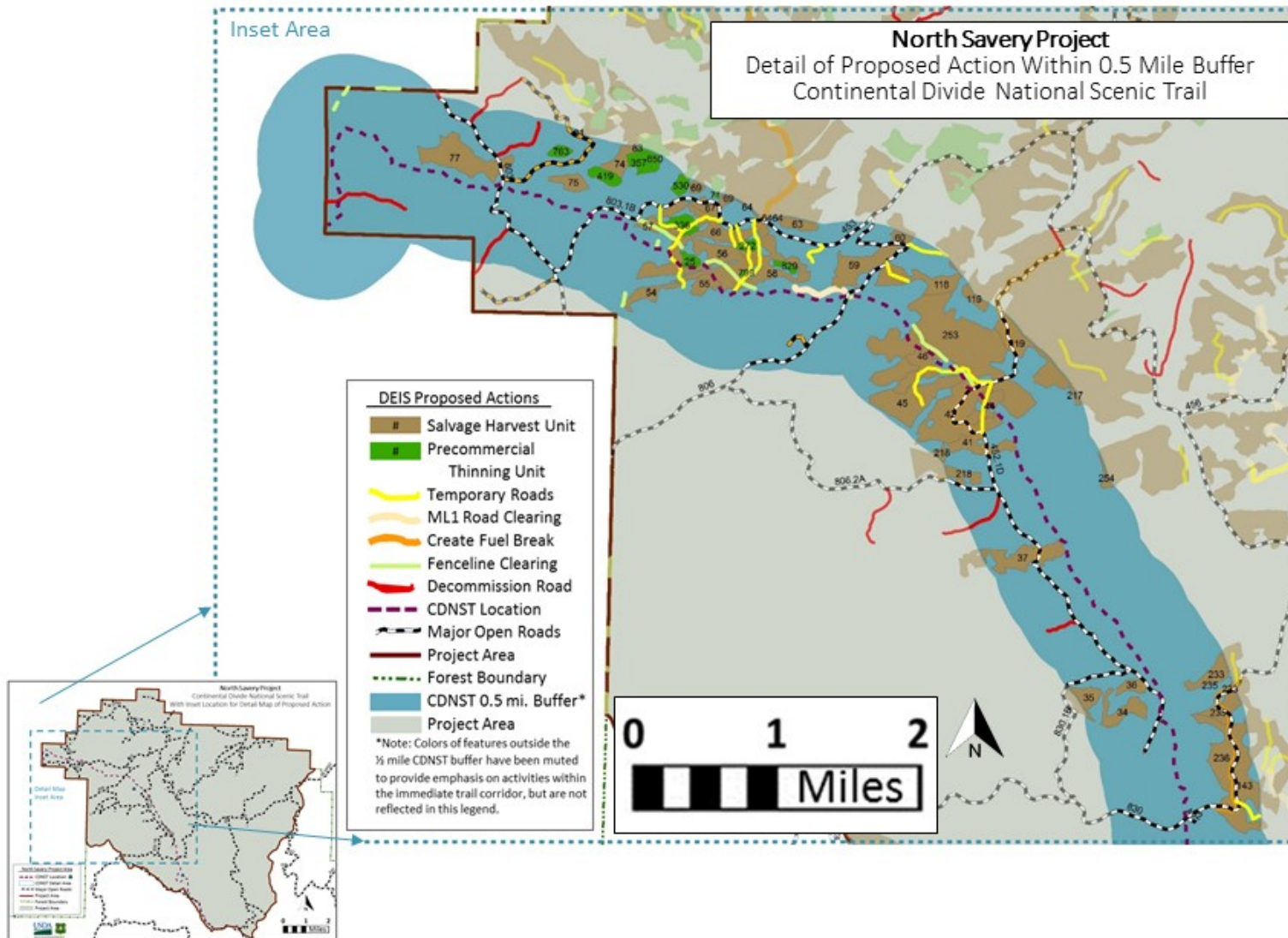


Figure 30. Detail map showing proposed actions within 0.5 miles of the Continental Divide National Scenic Trail

Watershed Condition

The tradeoff between restoring forest vegetation and maintaining or improving watershed condition is one of the key issues of the North Savery Project and is a key consideration in the responsible official's decision for this project.

The extent and intensity of vegetation treatments proposed is unprecedented in the recent management history of the Medicine Bow National Forest. As a result, there is risk and uncertainty about watershed impacts. The design of vegetation treatments and management actions for the transportation system would minimize the risk of unintended consequences while allowing beneficial changes in the forest vegetation in the project area.

The watershed analysis discloses the effects of the no-action alternative and the proposed activities on overall stream health in the North Savery Project watersheds. The analysis focuses on sedimentation, changes in water yield and peak runoff, and streambed and streambank stability. Effects to riparian areas and wetlands would be controlled by application of best management practices and other design criteria.

Direct and Indirect Effects of the No-action Alternative

Measureable increases in streamflow are possible in the following stream reaches which are sensitive to increased streamflow: North Fork Savery Creek, McLain Creek, Jack Creek, North Spring Creek (see figure 31). Increased streamflows can increase streambank erosion and may result in changes in stream habitat. Spring Creek (3.6 miles) and McLain Creek (2.0 miles) are dominated by grass and forb riparian vegetation; these reaches are expected to be more sensitive to increases in streamflow than many of the other reaches with shrubs as the dominant riparian vegetation.

Indirect effects to riparian ecosystems could occur as a result of increased mortality to riparian trees killed by mountain pine beetles. This is expected to increase water temperatures and increase the amount of available large woody debris which could provide terrestrial habitat in riparian areas or aquatic habitat in streams.

Taking no actions to create fuel breaks incrementally increases the risk of increased erosion, sedimentation, and runoff as a result of wildfire.

Existing resource damage associated with current system roads and user-created routes would continue and possibly get worse. Motorized travel routes in the project area are causing soil erosion, sedimentation to streams, detrimental effects to riparian or wetland habitats, or some combination of these things. National Forest System Road 452.1D would continue to erode and cause resource damage in the McLain Creek watershed.

Direct and Indirect Effects of the Modified Proposed Action

Sedimentation

The transportation system necessary for timber removal is estimated to be the primary source of erosion and sedimentation for the project. Erosion and sedimentation can be expected during construction and use of the temporary roads, especially near the stream crossings.

Approximately 7 miles of temporary road may be located in, or adjacent to, valley bottoms. Approximately 2.3 miles of temporary road may be located within 300 feet of perennial or

intermittent streams. Temporary roads may cross intermittent streams in 7 locations and may cross a perennial stream in 1 location.

Proposed road reconstruction (an estimated 7.7 miles) is expected to increase sediment delivery to streams in the first few years after ground disturbance, but is expected to decrease current levels of erosion and sedimentation over time due to the improved drainage and surfacing.

Erosion from harvest units located within 300 feet of drainages has some potential to be delivered to a stream channel. The erosion would be minimized by applying best management practices; in particular, the 100-foot buffer around streams, wetlands, riparian areas, and lakes. Approximately 230 acres of harvest units would be within 300 feet of perennial streams; 1,070 acres would be within 300 feet of intermittent streams; 2,008 acres would be within 300 feet of ephemeral draws.

The primary short-term increases in sediment and long-term reductions in sediment would come from the decommissioning at roads near perennial streams. Decommissioning roads in upland locations would reduce erosion and runoff.

Changes in Flow Regimes and Effects to Streambed and Streambank Stability

Increases in water yield and peak flows could increase rates of streambed and streambank scour in 5 streams which are more prone to degradation due to gradient, soil types, and riparian vegetation (see figure 31).

Increases in runoff and peak flows would be expected in portions of the project area. Effects would be greater in watersheds with the most proposed harvest: North Fork Savery Creek, Nugget Creek, McLain Creek, Jack Creek, and North Spring Creek. The increases would be caused by reductions in organic ground cover and soils compaction from activities such as skid trails, landings, and road construction.

Compacted areas from temporary roads, landings, and skid trails could be as high as 10.3 percent. Compaction on temporary roads and landings is expected to be high so these areas would be ripped, as needed, to reduce compaction after use. Temporary roads would generally be closed immediately after harvest; occasionally they might remain open for post-sale access and be closed during mechanical site preparation. All temporary roads would be closed and reclaimed by termination of the contracts for timber harvest.

The following hydrologic effects would be expected in many project area watersheds as a result of changes in water yield due to reductions in canopy cover from past harvest, road clearing, fires, beetle activity, and the proposed silvicultural treatments (adapted from Carlson 2008):

- increases in annual water yield, mostly in spring snowmelt runoff
- increase in peak flow size
- earlier timing of peak flows
- moderate effects in the early years following beetle activity, greater effects 5 to 15 years out and effects persisting at a declining rate possibly up to 60 years
- larger increases in water in high precipitation years

Long-term stability of streambeds and streambanks would be expected at all decommissioned road-stream crossings because there would be less vehicle traffic and natural revegetation would re-establish over time.

Effects to Riparian Areas and Wetlands

Disturbance in riparian or wetland areas from construction of temporary roads would be short-term. Approximately 2.3 miles of temporary road could be located within 300 feet of perennial or intermittent streams and the associated riparian areas. Riparian and wetland area function would return to current conditions after the temporary roads are rehabilitated. Clearing trees from riparian areas for temporary road construction could slightly reduce the total amount of coarse woody debris; however, harvest buffers would leave most trees adjacent to streams where they would be a source of coarse woody debris for aquatic habitat and channel roughness.

Limiting use of heavy equipment and harvest in and near riparian ecosystems has been recommended and would further reduce potential direct impacts to riparian and wetland ecosystems.

Relocating two existing sections of National Forest System roads 452.1D and 830.1B totaling 0.75 miles would cause 1 to 3 years of erosion and sedimentation from the road construction; however, the long-term effect would be a reduction in sediment. Adding 6 miles of user-created routes to the national forest transportation system would perpetuate the existing soil erosion, sedimentation to streams, detrimental effects to riparian or wetland habitats, or some combination of those things. For example, National Forest System Roads 803.1F and 803.2C would continue to cause resource damage. Adding the user-created routes to the transportation system could increase traffic on the routes and cause more resource damage.

Potential effects from the proposed off-highway vehicle trail system would be avoided or minimized by implementing design criteria to harden stream crossings and routes through riparian areas. The proposed trail would cross approximately 200 feet of a wetland in the headwaters of North Savery Creek.

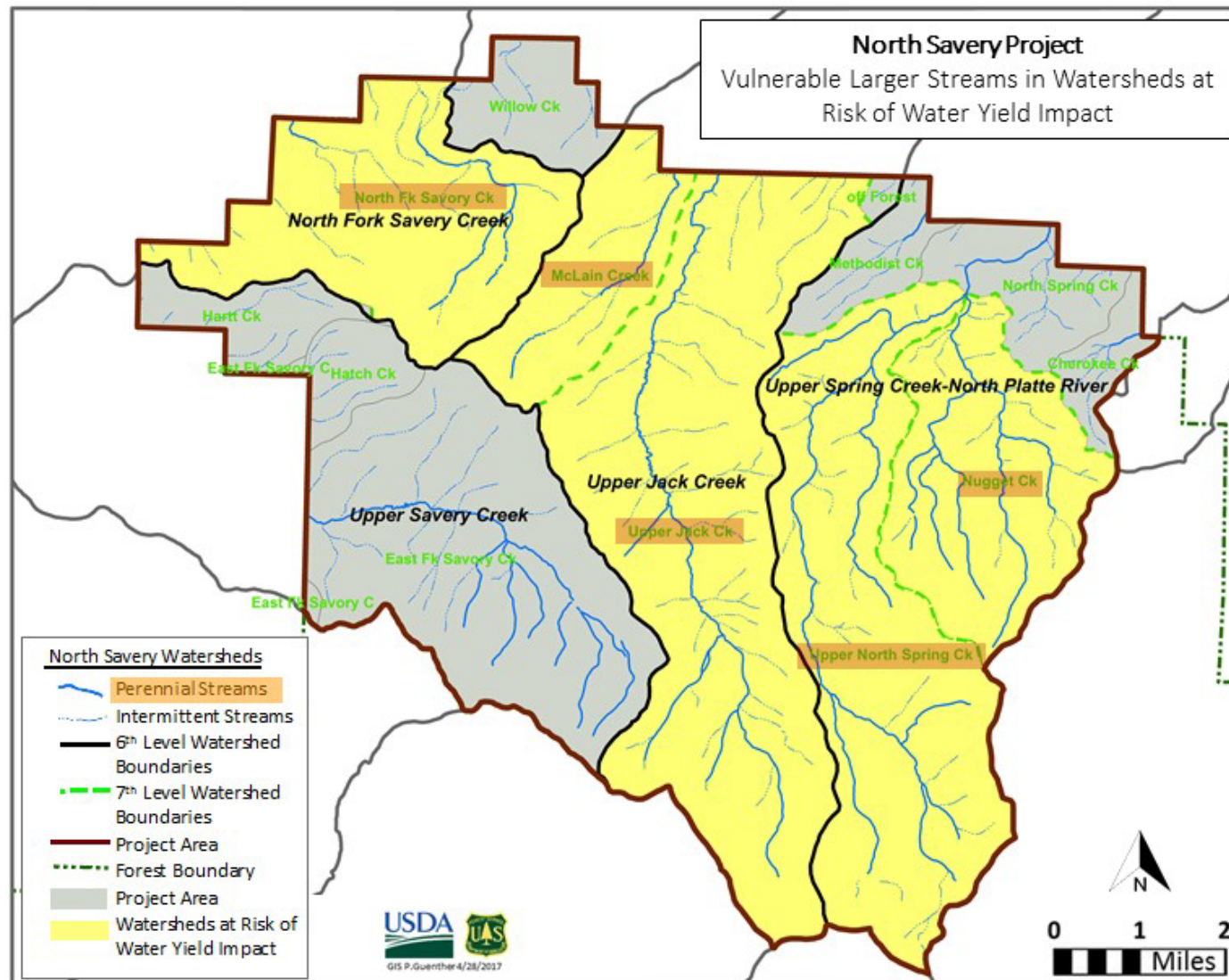


Figure 31. Larger streams in the analysis area with potential to be impacted by increases in streamflow magnitude from harvest and disturbance

Terrestrial Wildlife

The tradeoff between restoring forest vegetation and limiting adverse impacts on wildlife and their habitat is one of the key issues of the North Savery Project and is a key consideration in the responsible official's decision for this project.

The extent and intensity of vegetation treatments proposed is unprecedented in the recent management history of the Medicine Bow National Forest. As a result, there is risk and uncertainty about effects on wildlife. The design of vegetation treatments and management actions for the transportation system would minimize the risk of unintended consequences while allowing beneficial changes in the forest vegetation in the project area.

A pre-field review was conducted for terrestrial wildlife species to assemble occurrence records, describe habitat needs and ecological requirements, and determine whether field reconnaissance is needed to complete the analysis. No additional analysis was done for the following species because they are not known or suspected to occur in the project area and no suitable habitat is present:

- Sensitive species: American bittern, trumpeter swan, harlequin duck, bald eagle, ferruginous hawk, American peregrine falcon, northern harrier, Colombian sharp-tailed grouse, greater prairie chicken, white-tailed ptarmigan, mountain plover, long-billed curlew, black tern, burrowing owl, flammulated owl, short-eared owl, black swift, Lewis' woodpecker, black-backed woodpecker, olive-sided flycatcher, purple martin, loggerhead shrike, Cassin's sparrow, grasshopper sparrow, sage sparrow, McCown's longspur, chestnut-collared longspur, Rocky Mountain bighorn sheep, desert bighorn sheep, fringed myotis, spotted bat, Townsend's big-eared bat, black-tailed prairie dog, white-tailed prairie dog, Gunnison's prairie dog, Wyoming pocket gopher, water vole, swift fox, kit fox, river otter, North American wolverine, American hog-nosed skunk, Columbia spotted frog, plains leopard frog, desert massasauga rattlesnake, Black Hills redbelly snake, Rocky Mountain capshell, pygmy mountainsnail, Cooper's Rocky mountainsnail, Arapahoe snowfly, Susan's purse-making caddisfly, ottoe skipper, regal fritillary, nokomis fritillary, monarch butterfly.
- Species of local concern: pika, brown-capped rosy finch.

This summary focuses on the effects analysis for the Canada lynx, pygmy shrew, American marten, northern goshawk, greater sage-grouse, boreal owl, olive-sided flycatcher, Brewer's sparrow, hoary bat, Hudsonian emerald, western bumble bee, brown creeper, snowshoe hare, American three-toed woodpecker, golden-crowned kinglet, Lincoln's sparrow, and Wilson's warbler.

For the modified proposed action, a "may affect, not likely to adversely affect" determination is made for Canada lynx.

For the modified proposed action "may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability rangewide" determinations are made for pygmy shrew, American marten, northern goshawk, greater sage-grouse, boreal owl, olive-sided flycatcher, Brewer's sparrow, hoary bat, Hudsonian emerald, and western bumble bee.

Direct and Indirect Effects of the No-action Alternative

Canada Lynx (Threatened)

Dead lodgepole stands would be unsuitable habitat. Habitat quality would improve over time as a patchy distribution of standing dead and down trees and newly regenerating trees developed across the landscape. Habitat for, and abundance of, snowshoe hare and red squirrel (prey species) would decline. Prey abundance would be lower until regeneration provided dense horizontal cover, overhead canopy cover, and conifer cone production.

Use of existing roads and user-created routes would not change the amount of habitat in the lynx analysis unit, and it would not deter lynx from using the area or moving through it. Effects from roads and highways occur at a larger scale than that found in the project area. Alexander and others (2005) suggested traffic volumes between 3,000 and 5,000 vehicles per day may be the threshold above which successful crossings by carnivores are impeded. No roads in the North Savery project area approach these traffic volumes.

Decommissioning of 23 miles of user-created motorized routes would restore habitat quality on approximately 28 acres in the 50,160-acre lynx analysis unit. In a few decades to 100 years, the routes could revegetate and be incorporated into adjacent lynx habitat. Lynx would probably not be affected by the short-term noise, commotion, or dust from road decommissioning because lynx are rare on the Medicine Bow National Forest and they tend to be nocturnal (decommissioning would happen during the day).

Pygmy Shrew

Where small groups of beetle-killed lodgepole trees exist in pygmy shrew spruce-fir habitat, the increase in coarse woody debris could improve habitat quality over time. Unauthorized motorized routes would be decommissioned, restoring 0.8 acres of habitat over time. Road decommissioning and habitat restoration would reconnect a few travel corridors severed by roads. In less than 40 years, surrounding vegetation and canopy cover would make these segments pygmy shrew habitat.

American Marten

Road decommissioning would restore less than 10 acres of habitat for the American marten. Most lodgepole pine stands are not suitable habitat for the American marten due to the pine beetle outbreak. Forty years of regeneration and growth would need to occur before these stands provide marten habitat (Kozlowski 2008). In stands with more spruce and fir, habitat for prey species and denning sites would improve. The beetle-killed trees and subsequent stand growth and regeneration would add coarse woody debris and variable age classes of understory vegetation to provide quality year-round habitat.

Northern Goshawk

There would be a small amount of habitat restoration under the no-action alternative. Seven miles of unauthorized routes will be decommissioned under this alternative which would restore approximately 7 acres of habitat. Restored areas would be immediately incorporated into surrounding habitat, would become foraging habitat in 2 years as herbaceous vegetation establishes, and would become nesting habitat over 80 years as mature lodgepole or aspen trees are available.

Greater Sage-grouse

Decommissioning unauthorized routes could reduce effects to greater sage-grouse. Roads can fragment and remove habitat, degrade habitat by helping weeds become established, allow people and vehicles to disturb the birds, and give predators easier access. There are 3.5 miles of unauthorized motorized routes in sage-grouse habitat in the project area. The recent sage-grouse amendment (USDA 2015b) includes guidance to restore sage-grouse habitat when decommissioning roads:

“In priority and general habitat management areas and sagebrush focal areas, when decommissioning roads and unauthorized routes, restoration activity should be designed to move habitat towards desired conditions (table 1)(p. 109)”.

Boreal Owl

Decommissioning unauthorized routes would restore less than 10 acres of habitat for the boreal owl. Grasses and forbs would establish in a few years, providing habitat for small mammal prey. Mature forest structure necessary for nesting would develop in more than 100 years.

Olive-sided Flycatcher

Decommissioning unauthorized routes would restore less than 10 acres of habitat for the olive-sided flycatcher. The decommissioned routes would provide vegetated openings in spruce-fir forest for perching and catching insect prey. Where small groups of lodgepole trees exist in spruce-fir habitat, flycatcher habitat could improve as beetle-killed trees fall over and create small openings.

Brewer's Sparrow

Decommissioning unauthorized routes would produce 13 acres of foraging sites for Brewer's sparrows as herbaceous vegetation established. Sagebrush habitat would be reestablished over the following decades. These changes could benefit the fitness of a few individual Brewer's sparrows since unauthorized routes are scattered across sagebrush habitat in the analysis area.

Hoary Bat, Hudsonian Emerald, Western Bumble Bee

Decommissioning unauthorized routes would restore less than 1 acre of habitat for the hoary bat and less than half an acre of habitat for the Hudsonian emerald.

Decommissioning would produce 13 acres of foraging sites for the western bumble bee as flowering plants re-establish. These changes could benefit the fitness of individual bumble bees in a few colonies since unauthorized routes are scattered across suitable habitat in the analysis area.

Brown Creeper

Decommissioning unauthorized routes would restore 15 acres of habitat for the brown creeper. This would likely result in improvements in territory quality for a few individuals.

Beetle-impacted stands would eventually become unsuitable habitat. The density of live or dead canopy and limbs would be reduced which would expose nest sites to weather elements (Wiggins 2005). In lodgepole stands, habitat for prey species and their habitat would decline as bark falls from trees and canopy cover is reduced. Normal prey abundance is not likely to return for 100 years after the disturbance.

Snowshoe Hare

Decommissioning unauthorized routes would restore 32 acres of habitat. This would likely result in improvements in territory quality for a few individuals. The snowshoe hare population is persisting and is well distributed across the Medicine Bow National Forest.

American Three-toed Woodpecker

Habitat quality increased dramatically while the beetle outbreak occurred. There was a corresponding increase in three-toed woodpecker abundance during the outbreak. The utility of this habitat has declined, and the woodpeckers have returned to their endemic, low-abundance level.

No action would maintain most of the existing condition. Decommissioning unauthorized routes would restore 15 acres of habitat across the analysis area. This would likely improve territory quality for a few individuals.

Golden-crowned Kinglet

Decommissioning unauthorized routes would restore 15 acres of habitat across the analysis area. This would likely improve territory quality for a few individuals.

There are more than 16,000 acres of spruce-fir and lodgepole pine habitat in the analysis area. Most of these acres have been affected by pine beetles and no longer provide suitable habitat. Growth of the existing understory will reproduce golden-crowned kinglet habitat (mature lodgepole with closed canopy) in about 100 years.

The beetle epidemic increased snag density. Snags are critical for communal roosting to survive cold winter months. Time would be required for existing snags to develop natural cavities or have cavities excavated by woodpeckers to become suitable as winter roosts.

Lincoln's Sparrow, Wilson's Warbler

Decommissioning unauthorized routes would restore less than 2 acres of habitat across the analysis area. The habitat would be scattered across the analysis area so it would likely improve territory quality for a few individuals.

Other Wildlife Species and Habitat

Eliminating unauthorized routes would slightly decrease the patchiness of the landscape, increase habitat quality, and decrease stressors to individual wildlife. Under the no-action alternative, unauthorized routes would be eliminated unless needed as an improvement over an existing open road or for necessary access. Total road density would decline in the analysis area from less than 3 miles per square mile to 2.25 miles per square mile. Sixty-six acres would be restored to wildlife habitat by decommissioning these routes. Habitat quality in wetland and riparian areas along portions of Savery Creek, Jack Creek, and North Spring Creek would be improved by reducing road density in those areas.

Eliminating unauthorized routes through the continuing decommissioning program would increase security areas for big game species including elk and mule deer. Security areas are blocks of forested cover $\frac{1}{2}$ mile or more from an open road and 250 acres in size or larger (Hillis et al. 1991). Security areas were originally defined for bull elk survival but they are important for many wildlife species (USDA Forest Service 2003b). Security areas range from 11 percent to

24 percent across the North Savery project area. Hillis and others (1991) recommend 30 percent as the objective for bull elk survival during hunting season.

An existing executive order directs Federal agencies to protect migratory birds. A follow-up memorandum of understanding between the Forest Service and the U.S. Fish and Wildlife Service was developed to complement and implement this executive order in a collaborative effort between the two agencies. The executive order and memorandum of understanding have been reviewed. This analysis and project are consistent with criteria in these documents for the protection of migratory birds. Migratory birds of special interest are included in a recent cooperative conservation effort, referred to as Partners in Flight. The Forest Service is a signatory to Partners in Flight (USDA 2003b). Many of the birds identified as priority species of level I or II were discussed previously in the “Direct and Indirect Effects” section. They are also discussed in the management indicator species specialist report or the biological evaluation.

Direct and Indirect Effects of the Modified Proposed Action

Canada Lynx (Threatened)

The proposed actions would not change the amount of suitable habitat or unsuitable habitat in the lynx analysis unit. Proposed salvage harvest, temporary roads, and mechanical fuel breaks would occur in beetle-killed lodgepole pine stands that are currently unsuitable habitat. Harvest would retain these stands in unsuitable condition. The stands do not currently support snowshoe hares or red squirrel prey due to the loss of vegetation cover and cone production.

Reductions in prey abundance or prey habitat could lead to decreased fitness, survival, or reproduction of lynx. Changes in snowshoe hare and red squirrel availability as prey will be determined overwhelmingly by where habitat exists after the pine beetle outbreak and less significantly by where dead trees are removed by management actions. However, the proposed timber management would retain recruitment trees, snags, and coarse woody debris to contribute toward prey habitat in the future.

The proposed travel management decisions would not change the amount of habitat in the lynx analysis unit and they would not deter lynx from using the area or moving through it. Effects from roads and highways occur at a larger scale than that found in the project area. Alexander and others (2005) suggested traffic volumes between 3,000 and 5,000 vehicles per day may be the threshold above which successful crossings by carnivores are impeded. No roads in the North Savery project area approach these traffic volumes.

Few disruptive impacts to lynx would be anticipated from short-term noise, commotion, dust, and smoke produced by proposed treatment actions. Lynx are less likely to be in or near activity areas during vegetation management and road decommissioning or rerouting because they are rare on the Medicine Bow National Forest and they tend to be nocturnal. In the Lynx Conservation Assessment and Strategy, Ruediger and others (2000) describe lynx as generally tolerant of humans. The strategy also notes anecdotal reports suggesting lynx are not displaced by human presence.

Pygmy Shrew

Treatment most often will occur at the edges of shrew habitat. Pygmy shrews would be expected to move from their territory edges due to the noise disturbance caused by mechanical equipment. Pygmy shrews would have to adjust their territories near the wetlands to compensate for habitat lost. Harvest operations are expected to cause disturbance to pygmy

shrews. Extended diurnal noise, vibrations or commotion in a limited area might interfere with food gathering which could reduce reproductive success from postponed feeding of young or cause adult pygmy shrews to starve to death. Harvested areas would begin to blend into surrounding habitat in 40 years or more to provide some reduced quality habitat. Past harvest and Forest Plan standards for snag and coarse woody debris retention would provide a minimal amount of the coarse woody debris important to pygmy shrews.

Road decommissioning would restore 1.5 acres of habitat over time. A reduced road network would also allow pygmy shrews to move among isolated habitats.

Northern Goshawk

The proposed harvest actions would remove an additional 2,573 acres of nesting habitat or 28 percent of the remaining nesting habitat. However, this habitat would become unsuitable due to the beetle outbreak and the Forest Plan would protect goshawk nests and post-fledging habitat from disturbance with timing and distance stipulations during harvest.

American Marten

Road decommissioning would restore less than 10 acres of habitat for American marten. Proposed treatment in the area between Jack Creek and North Spring creek could temporarily eliminate a potential marten home range for several decades. Other home ranges would be intact after proposed vegetation management since management is focused on dead lodgepole stands no longer considered marten habitat in areas where less habitat exists. Eighty percent of the marten habitat in the analysis area is concentrated along the higher elevations of the Continental Divide, south or west of most proposed vegetation treatments.

Greater Sage-grouse

Figure 32 shows where activities are proposed in sage-grouse habitats. The limited amount of tree removal activities in core and general sage-grouse habitat could cause some disturbance to individual sage-grouse but sage-grouse avoid areas near trees. Sage-grouse could return to the few disturbed areas in suitable habitat when the short-term disturbances ceased.

Decommissioning 1.6 miles of unauthorized route in core and general habitat would convert roads to sage-grouse habitat over time, reduce opportunities for invasive plant distribution, decrease habitat fragmentation, and decrease disturbance to sage-grouse. Noise from equipment used for road decommissioning could cause short-term disturbance to individual sage-grouse. After the few hours needed for decommissioning, sage-grouse could return to the disturbed areas.

Boreal Owl

Decommissioning unauthorized routes would restore 0.83 miles (approximately 4 acres) of habitat for boreal owls. Within a few years, revegetation and surrounding vegetation would incorporate these segments as prey habitat. Nesting habitat would be restored in more than 100 years.

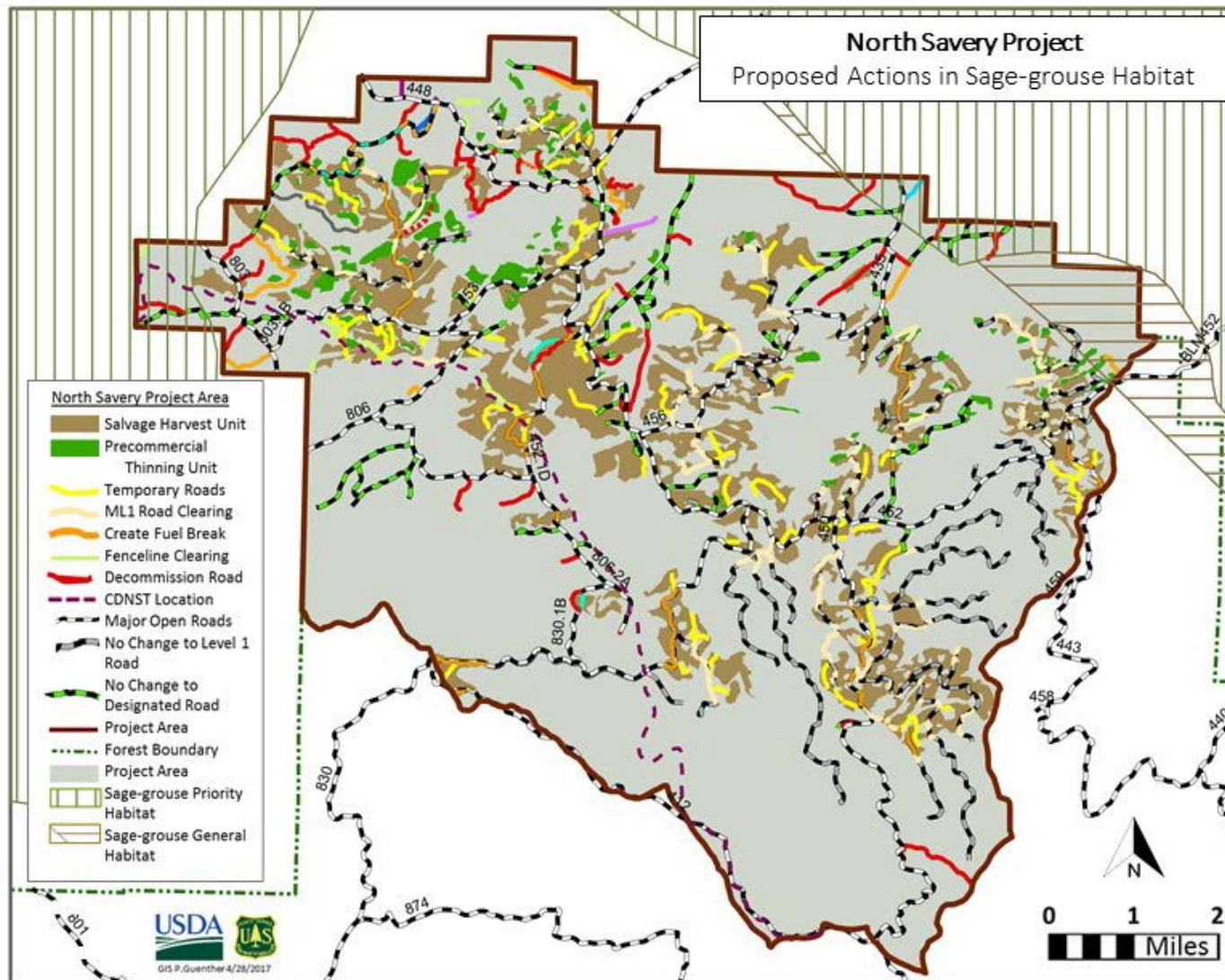


Figure 32. Proposed action locations with respect to priority and general greater sage-grouse habitats in the 2015 sage-grouse amendment

Olive-sided Flycatcher

Decommissioning unauthorized routes would restore 0.83 miles (approximately 4 acres) of habitat for olive-sided flycatchers. All acres could be used immediately as foraging openings and would progress to suitable forested habitat over decades.

Brewer's Sparrow

Decommissioning unauthorized routes would restore 24 acres of habitat for the Brewer's sparrow. Decommissioning would produce foraging sites within a few years as herbaceous plants establish and provide seeds and insect habitat. Sagebrush habitat would be reestablished over the following decades.

Hoary Bat, Hudsonian Emerald, Western Bumble Bee

Decommissioning unauthorized routes would restore less than an acre of habitat for hoary bats. Some habitat quality would be restored in a few years as forbs attract some insects.

Nineteen acres of Hudsonian emerald habitat would be affected by tree removal. Habitat quality would be reduced in 1.8 acres due to removal of dead and dying trees (future coarse woody debris), removal of some existing coarse woody debris (allowing greater sediment transport), and the disturbance of ground vegetation. Implementing the 100-foot buffer around wetlands and riparian areas and Forest Plan standards (p. 1-38, 39) for recruitment trees, snags, and coarse woody debris would maintain some habitat features in the 19 affected acres. Continuous loud noise, strong vibrations, or lengthy commotion from logging operations could have a disruptive and negative impact. Individuals could return and use habitat after treatment was completed.

Decommissioning unauthorized routes would increase western bumble bee habitat by 24 acres. This could increase the number of individuals or colonies to improve the forestwide population. Decommissioning would produce foraging sites within a few years as herbaceous plants established and provided nectar and pollen.

Brown Creeper

Road decommissioning would restore 5 acres of brown creeper habitat. All restored acres could be used for limited foraging when revegetation creates large, pole-size trees. Nesting habitat could be provided in 80 to 100 years.

The modified proposed action would eliminate 3,322 acres of beetle-killed habitat. Forest Plan standards for recruitment trees, snags, and coarse woody debris would retain some future habitat for prey insects in harvested areas. This would be very low-quality foraging habitat in approximately 50 years when beetles again begin infesting suitable older trees. The stands could return to nesting habitat in approximately 100 years as the trees mature.

Even with timber management, beetle-impacted stands would eventually become unsuitable habitat. The density of live or dead canopy and limbs would be reduced which would expose nest sites to weather elements (Wiggins 2005). In lodgepole stands, habitat for prey species and their habitat would decline as bark falls from trees and canopy cover is reduced. Normal prey abundance is not likely to return for 100 years after the disturbance.

Snowshoe Hare

Decommissioning unauthorized routes would restore 32 acres of habitat. This would likely result in improvements in territory quality for a few individuals. The snowshoe hare population is persisting and is well distributed across the Medicine Bow National Forest.

Some hares would probably be displaced from the treatment units by timber management activities. Changes due to beetle-kill would have already made most of these stands unsuitable. In the stands without sufficient cover, individual hares would move to unoccupied habitat or be eaten by predators.

American Three-toed Woodpecker

Travel management would restore 5 acres of habitat across the analysis area. Restored acres could be used for limited foraging when revegetation creates large, pole-size trees; nesting habitat could be provided in 100 years.

The modified proposed action would remove 3,322 acres of beetle-killed habitat. Forest Plan standards for recruitment trees, snags, and coarse woody debris would retain some future habitat for prey insects in harvested areas. This would be low-quality, foraging habitat in approximately 50 years when beetles begin infesting suitable older trees. The stands could return to nesting habitat in approximately 100 years as trees mature.

Golden-crowned Kinglet

Travel management would restore 5 acres of habitat across the analysis area. In less than 40 years, surrounding vegetation and canopy cover would incorporate these segments as kinglet habitat.

The modified proposed action would remove 3,322 acres of beetle-killed habitat. This would have little impact when compared to the overall habitat loss from the beetle outbreak. Forest Plan standards for recruitment trees, snags, and coarse woody debris would retain some future habitat for prey insects in harvested areas. This would be low-quality, foraging habitat in approximately 50 years when beetles begin infesting suitable older trees. The stands could return to nesting habitat in approximately 100 years as trees mature.

Lincoln's Sparrow

Vegetation management would not occur within 100 feet of wetland or riparian areas, so Lincoln's sparrow habitat would not be affected by these activities.

Decommissioning unauthorized routes would restore less than 2 acres of habitat across the analysis area. In 10 years, surrounding vegetation and willow establishment would incorporate these segments as sparrow habitat. The habitat would be scattered across the analysis area so it would likely improve territory quality for a few individuals.

Wilson's Warbler

Decommissioning unauthorized routes would restore more than 2 acres of habitat across the analysis area. In 10 years, surrounding vegetation and willow establishment would incorporate these segments as warbler habitat.

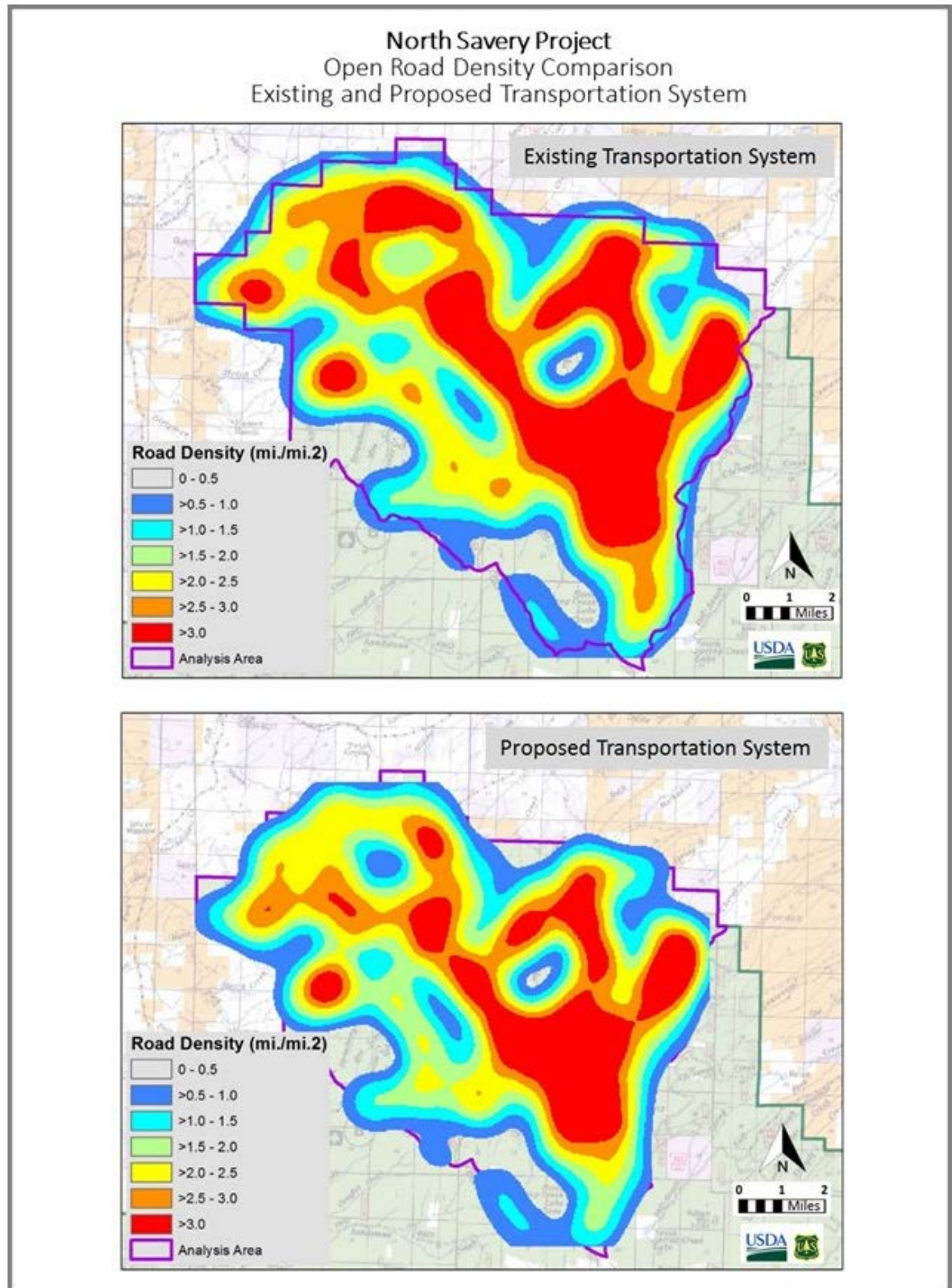


Figure 33. Existing road density compared to effects of the modified proposed action related to wildlife habitat

Other Wildlife Species and Habitat

Vegetation management would have minimal effects to wildlife habitat because tree removal would be primarily lodgepole pine killed during the pine beetle outbreak.

Most habitat restoration would occur as a result of decommissioning user-created motorized routes, and road density would be reduced noticeably in the northwest, northeast, and southeast corners of the analysis area. Unauthorized routes not needed as an improvement or replacement for part of the current road and motorized trail system would be decommissioned; this would restore 65 acres of habitat. Nineteen miles of authorized roads would be restored as wildlife habitat by decommissioning; this would restore another 46 acres of habitat. These improvements in general habitat would be beneficial to a variety of species including elk and mule deer. Transitional forage created in harvest units would benefit big game species by making more of the general forest area available for browsing and grazing.

There would be 4 acres of habitat restoration in elk parturition and wintering areas and mule deer stopover areas. The modified proposed action would also reduce the amount or frequency of disturbances by vehicles.

The modified proposed action would not change security areas. Road decommissioning would decrease road density but the areas without roads would be less than 250 acres or they would be in habitat that is not forested.

There would be more than 25 acres of restoration in wetland and riparian habitats from road decommissioning. In two riparian areas along Savery Creek, road decommissioning could reduce the likelihood of wood frogs and boreal toads being run over by vehicles.

Fish, Amphibians, and Other Aquatic Organisms

There are no threatened, endangered, or proposed fish species in the analysis area or downstream of the analysis area. Effects to the following sensitive species were not analyzed because the species are not known or suspected to occur in the project area and no suitable habitat is present: wood frog, hornyhead chub, Yellowstone cutthroat trout, and Rocky Mountain capshell snail.

All drainages on the western slope of the analysis area are classified as aquatic conservation areas by the Wyoming Game and Fish Department. These areas are established for the conservation of Colorado River cutthroat trout. Stream records in the analysis area indicate Colorado River cutthroat trout in Beaver Creek (tributary to East Fork Savery Creek) in 1996 and Joe Creek (a tributary to Beaver Creek) in 1998.

The decline of this species is attributed to hybridization with introduced trout species and habitat loss through timber harvest, livestock grazing, and irrigation practices (Wyoming Game and Fish Department 2010). Habitat fragmentation due to road construction is another factor in habitat loss.

Direct and Indirect Effects of the No-action Alternative

Aquatic habitat is generally functioning properly and in good condition and should remain so. Six culverts are complete barriers to upstream passage of aquatic organisms, and they contribute to habitat fragmentation. Eighteen culverts need to be surveyed to determine if they provide passage. One culvert on Road 452 was replaced in 2013 and now provides passage.

The no-action alternative would have “no impact” on the boreal toad, northern leopard frog, Colorado cutthroat trout, and mountain sucker.

Most streams in the analysis area are estimated to support depressed to strong populations of brook, brown, and rainbow trout (management indicator species). Fluctuations in relative abundance are usually due to naturally occurring habitat quality, quantity, and annual variation in species recruitment rather than human causes and effects.

Direct and Indirect Effects of the Modified Proposed Action

Approximately 9 miles of road adjacent to stream channels would be decommissioned.

Decommissioning roads adjacent to streams would improve aquatic habitat by reducing or eliminating the risk of chronic sedimentation into stream channels. Removing culverts that act as barriers would eliminate habitat fragmentation. Amphibian habitat would be improved by decommissioning roads that traverse through wetlands.

Road decommissioning would reduce chronic sedimentation to amphibian habitats for boreal toad and northern leopard frog. Decommissioning would have a “beneficial impact” to these species. This alternative as a whole “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”.

The Forest Plan standard and guidelines and timber sale provisions would reduce potential impacts to Colorado cutthroat trout and mountain sucker habitat. Decommissioning would have a “beneficial impact” to these species. This alternative as a whole “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”.

Most streams in the analysis area are estimated to support depressed to strong populations of brook, brown, and rainbow trout (management indicator species). Fluctuations in relative abundance are usually due to naturally occurring habitat quality, quantity, and annual variation in species recruitment rather than human causes and effects.

Inventoried Roadless Areas

The following resources or features are used to characterize inventoried roadless areas and form the basis for evaluation of effects. Roadless characteristics are:

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. naturally appearing landscapes with high quality scenic quality;
8. traditional cultural properties and sacred sites; and
9. other locally identified unique characteristics.

Direct and Indirect Effects of the No-Action Alternative

There would be no short-term or long-term changes in the quality of roadless characteristics under this alternative. Existing soil and water impacts of system roads in the Mowry Peak IRA would continue. Short-term impacts on air quality could occur as smoke from wildfires within or upwind from the roadless areas.

Direct and Indirect Effects of the Modified Proposed Action

Fenceline clearing proposed would occur along some short segments under this alternative.

Treated areas would be reclaimed to reduce the chance of motorized use along the treated portions. Treatment widths would be the tallest tree plus 10% or approximately 100 feet on both sides of a fenceline.

Four short stretches of proposed fenceline clearing, totaling approximately 0.3 acres, would occur in the Strawberry Creek Roadless Area. The proposed clearing is along the southwest boundary of the Analysis Area and lies adjacent to private lands. The private land side of the fence in this area has already had fenceline clearing completed.

In addition, a 0.3 mile segment of road decommissioning would occur in the Mowry Peak Roadless Area. In the long term, this action would improve the resource conditions and other roadless characteristics in this location. Air quality could be diminished for a short period of time during chainsaw, logging equipment, or other heavy machinery use, but no substantial long-term negative impacts are anticipated.

Soil would be disturbed but with little compaction or negative impacts anticipated. No public water source is located in the area.

Diversity of plant and animal communities would not be affected. Habitat for threatened, endangered, proposed, candidate, and sensitive species is present; however, the effects analyses resulted in the following determinations:

- “may affect not likely to adversely affect” for Canada lynx
- “may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability rangewide” for pygmy shrew, American marten, northern goshawk, greater sage-grouse, boreal owl, olive-sided flycatcher, Brewer’s sparrow, hoary bat, Hudsonian emerald, and western bumble bee
- “no effect” for western prairie fringed orchid

The proposed treatments occur in semi-primitive motorized recreation opportunity spectrum class; recreation opportunities would not be negatively affected. Road decommissioning would improve recreation settings.

Reference landscapes or naturally appearing landscapes with high quality scenic quality would not be negatively affected.

No cultural resources or other unique characteristics would be negatively affected.

One short segment of road decommissioning is proposed in the Mowry Peak inventoried roadless area.

Table 25. Effects of proposed action on roadless characteristics of three inventoried roadless areas (IRAs) partially within North Savery project area

Roadless Characteristics	Effects on Mowry Peak IRA	Effect on Strawberry Creek IRA	Effects on Deep Creek IRA
1) High quality or undisturbed soil, water, and air	Very short-term disruption; long-term improvement in roadless character from road decommissioning.	Very short-term disruption; long-term improvement in roadless character from road decommissioning.	Short-term, transient effects on air quality or sound pollution from nearby logging activity.
2) Sources of public drinking water	No effect on public drinking waters.	No effect on public drinking waters.	No expected effect because no activities are proposed.
3) Diversity of plant and animal communities	Very short-term disruption; long-term improvement in roadless character from revegetation.	Short- to moderate-term change in managed appearance along existing boundary fencelines.	No expected effect because no activities are proposed.
4) Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land	Very short-term disruption; long-term improvement in roadless character contribution to habitat for threatened, endangered, or other interior forest species.	Very short-term disruption during tree cutting in areas that may contribute to habitat for threatened, endangered, or other interior forest species.	No expected effect because no activities are proposed.
5) Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation	Very short-term disruption; long-term improvement in roadless character due to road decommissioning.	Short- to moderate-term change in managed appearance along existing boundary fencelines.	No expected effect because no activities are proposed.
6) Reference landscapes	Very short-term disruption; long-term improvement in roadless character as decommissioned roads disappear from landscape.	Short- to moderate-term change in managed appearance along existing boundary fencelines.	No expected effect because no activities are proposed.
7) Naturally appearing landscapes with high quality scenic quality	Very short-term disruption; long-term improvement in roadless character due to road decommissioning.	Short- to moderate-term change in managed appearance along existing boundary fencelines.	No expected effect because no activities are proposed.
8) Traditional cultural properties and sacred sites	None are known; no effect on this roadless characteristic.	None are known; no effect on this roadless characteristic.	None are known; no effect on this roadless characteristic.
9) Other locally identified unique characteristics	None identified.	None identified.	None identified.

Greenhouse Gas Emissions, Carbon Sequestration, and Climate Change

Public comment during the scoping period included a request that the project effects be analyzed according to the Council on Environmental Quality guidance on evaluating greenhouse gases and climate change ("Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews," which is referred to in "Notice of Availability," 81 Fed. Reg. 51866 (August 5, 2016)). That specific guidance was withdrawn at the direction of the White House (<https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economy-1>).

Regardless of the addition and subsequent withdrawal of specific Council on Environmental Quality guidance on this topic, the Forest Service has long-standing guidance to evaluate the impacts of projects on the climate and the impact of climate on the outcome of projects. Therefore, a brief summary of climate considerations is included here but not at the scope or level of detail included in the withdrawn Council on Environmental Quality guidance.

In general, projects that create forests or improve forest conditions and capacity to grow trees are positive factors in carbon sequestration at the local and cumulative scales. The modified proposed action falls into this category. Given the scale of this project relative to influence on global climate change, emissions from vegetation management activities were not estimated. However, a qualitative discussion on the role of forest management and disturbance on carbon cycling is important to recognize the relative effects of the action alternatives versus no action on emissions and carbon sequestration.

Climatic changes could occur at rates that will exceed the capacities of forest species to adapt to new conditions or to migrate to more favorable, future environments. Long-term resiliency and adaptation to climate changes will require healthy and productive forests in the short term. The project would help the forest withstand drier or seasonally drier conditions by maintaining proper stand densities, increasing tree vigor, and favoring drought resistant and more sustainable species in the treated stands.

Direct and Indirect Effects of the No-action Alternative

As dead trees fall and decompose, they gradually release carbon into the atmosphere in the form of carbon dioxide, turning many of these forests from a carbon sink into a carbon source. Heavy fuel levels created by high amounts of dead trees could lead to an increased risk of high-intensity wildfires in the future. The emissions under wildfires are generally very high and will vary depending upon the extent and intensity of the fires. If a large wildfire were to occur, high amounts of carbon could be released into the atmosphere rapidly in the short term rather than gradually. High-intensity wildfire could also result in the volatilization of carbon stored in surface organic soil layers. During wildfires, not all carbon is converted to carbon dioxide. Some black carbon and charcoal are also released and then deposited onto soil, but an area burned by a stand-replacing fire may not recover its pre-fire carbon stock for decades. As decomposition progresses and stands eventually regenerate, they will begin storing carbon again.

Direct and Indirect Effects of the Modified Proposed Action

This proposed project would have minimal contributions of greenhouse gases and its impact on global climate change would be negligible. The modified proposed action would treat about 1.3 percent of the forested land on the Medicine Bow National Forest or 0.03 percent of the forested land in Wyoming.

There would be short-term, direct greenhouse gas emissions associated with burning and other vegetation management actions using fossil fuel burning vehicles. However, as new trees and other vegetation were planted or regenerated naturally, carbon sequestration would be enhanced. The new stand's capacity to fix carbon dioxide, the most common greenhouse gas, would have an overall indirect beneficial impact to atmospheric concentrations. The modified proposed action would likely result in healthier, more resilient stands with a greater capacity to adapt to a variety of growing conditions.

Cultural Resources

Previous cultural resource inventories documented 132 archaeological sites in the North Savery analysis area. Seventy-four are historic, 44 are prehistoric, and 14 have both historic and prehistoric components. One site is listed on the National Register of Historic Places. Thirty-three sites are eligible, 85 sites are ineligible, and 13 sites have no official determination of eligibility. Historic sites found in the vicinity of the analysis area include Forest Service administrative and recreation facilities, mining, logging, and hunting camps, mines, transportation infrastructure (railroads, trails, and roads), stock driveways, and trash dumps. Prehistoric resources consist of lithic scatters, camps, and stone circle sites. No traditional cultural properties have been identified in the area of potential effect.

Direct and Indirect Effects of the No-action Alternative

The consequences of the no-action alternative would be detrimental to cultural resources. If no vegetation management occurs in the project area, high tree mortality and subsequent tree fall could result in cultural resources being destroyed (cabins) or covered (prehistoric sites). Additionally, tree mortality would result in heavy fuel loads in historic properties which would increase the risk of a high-severity wildfire. Should an uncontrolled wildfire pass through an archaeological site, flammable or heat-sensitive cultural materials would be affected and likely destroyed. A high-severity wildfire could also increase erosion, resulting in the loss of context for archaeological material, the loss or alteration of surficial and subsurface archaeological features, and increased exposure of artifacts to vandals and collectors.

Direct and Indirect Effects of the Modified Proposed Action

The risk of direct or indirect impacts to cultural resources would be low. Prior to project implementation, cultural resources would be identified through a combination of systematic survey and historical research as required by the applicable federal laws, policies, and management directives. Historic properties within treatment units would be protected using a variety of mitigation measures depending on the resource.

While vegetation treatment could affect the integrity of eligible prehistoric sites by impacting the visual setting of the site, this would be temporary and should not be considered adverse. For many of the historic sites, timber harvest could actually enhance a site's integrity by restoring the setting to a condition closer to that which existed during the period of

significance. Timber harvest and fuels treatment would also decrease the potential for damage to sites from dead and dying trees.

All treatments within the boundaries of the 33 eligible sites and one listed site would be consulted on with Wyoming State Historic Preservation Office, and treatments would be developed to avoid adversely affecting the historic property. If a new cultural resource is found during project activities, the site would be protected until proper analysis could be conducted. Work in the vicinity of the discovery would cease until the findings were evaluated by a qualified archaeologist and proper protection measures were implemented. If affected properties were discovered after project activities were completed, the Forest would document any damage to the resource and consult with the Wyoming State Historic Preservation Office and the Advisory Council on Historic Preservation, pursuant to 36 CFR 800.13(b), to determine how to proceed with management of the resource.

There would be no anticipated direct or indirect effects to sites from the transportation management portion of the modified proposed action. No ground-disturbing roadwork or changes in road designation are proposed in, or adjacent to, known historic properties. None of the actions would have any indirect adverse effects on sites, and some road closures would provide added protection to historic properties. If additional cultural resources were identified in the area of potential effect, the National Register of Historic Places eligibility for the resources would be determined and appropriate protection measures would be determined in consultation with Wyoming State Historic Preservation Office to avoid adverse effects to historic properties.

Botany and Rare Plants

A pre-field review was conducted to assemble known information and determine if field surveys were necessary. Locations of proposed management actions and known locations of threatened, endangered, proposed, and USDA Forest Service Rocky Mountain Region 2 sensitive species and species of local concern were reviewed prior to help focus field surveys in the appropriate plant communities and habitats.

No federally threatened, endangered, or proposed plant species or designated critical habitat occur in the analysis area, but one species occurs downstream and could be affected by water depletions: western prairie fringed orchid.

There are no reported occurrences of the following sensitive plant species: park milkvetch, slender moonwort, lesser panicled sedge, livid sedge, boreal spike rush, slender-leaved buckwheat, Rabbit ears gilia, Colorado tansyaster, dwarf raspberry, or silver willow. However, the analysis area may contain suitable habitat for some sensitive species so effects to habitats were analyzed.

There are 27 plant species of local concern known or suspected to occur in the project area: forked spleenwort, Lance-leaf grapefern, common moonwort, Mingan moonwort, pale moonwort, little grapefern, boreal bog sedge, Pale coralroot, western oakfern, Pacific clubmoss, streambank wild hollyhock, thread rush, pygmy bladderpod, bitter root, Hall's ragwort, broad-lipped twayblade, heart-leaf twayblade, Wasatch desert parsley, marsh felwort, stiff clubmoss, bluntleaved orchid, sagebrush beardtongue, northern hollyfern, white-veined wintergreen, curlyhead goldenweed, Pacific trillium, and squashberry. To avoid confusion with other species, scientific names are provided for the five species documented during field surveys: pale coralroot (*Corallorhiza trifida*), broad-lipped twayblade (*Listera convallaroides*), heart-leaf

twayblade (*Listera cordata*), blunt-leaved orchid (*Platanthera obtusata*), and white-veined wintergreen (*Pyrola picta*).

No further analysis is needed for sensitive plant species and plant species of local concern not known or suspected to occur in the project area and for which no suitable habitat is present.



Direct and Indirect Effects of the No-action Alternative

A determination of “no effect” is made for the western prairie fringed orchid. The no-action alternative does not cause downstream water depletion in the Platte River watershed.

Tree mortality from the beetle outbreak has contributed to fuel loading and the opening of the forest canopy in the analysis area. Wildfires from fuel loading and dry, dead fuels could create high ground temperatures that could sterilize the soil and eliminate the mycorrhizal fungal species on which orchids and moonworts depend for survival. If the area is not logged, it will soon have enough fallen snags and ladder fuel matrices to sustain a high-intensity wildfire. Other research has shown that the forest types affected by mountain pine beetle are naturally prone to severe, stand-replacing fire even in the absence of insect outbreaks (Romme et al. 2007) and many sensitive species that inhabit these habitats may be adapted to withstand fire.

The effects of canopy changes to sensitive understory plants would be expected with a moderate degree of confidence. The more open forest canopy means more light is reaching the forest floor. This may reduce or eliminate habitat for sensitive species that require cool, dark forest floors.

User-created and unnecessary roads would remain open, increasing soil disturbance and erosion, leading to damage to native vegetation in these areas.

Direct and Indirect Effects of the Modified Proposed Action

A determination of “no effect” is made for the western prairie fringed orchid. The modified proposed action does not cause downstream water depletion in the Platte River watershed.

If any discovered populations are adequately avoided, no adverse effects would be expected to sensitive plant species. Standard timber contract provisions dictate sensitive plant species in timber treatment units will be flagged and avoided during treatment activities. Approximately half the proposed timber units have been surveyed, and no new sensitive species populations have been discovered. The remainder of the units will be surveyed in 2017 and if sensitive species are found, efforts will be made to avoid direct and indirect impacts.

Thinning and salvage activities could cover habitat with soil or fallen trees, reducing its suitability for sensitive plant species. Light amounts of slash could create warmer, drier conditions, while heavier amounts of slash could create shading that increases microsite moisture and humidity. Changing the vegetation structure to more open, warmer, and drier conditions could be detrimental to species adapted to closed canopy forests and cool, moist, shaded conditions.



Canopy removal could cause shifts in hydrologic, solar, and soil characteristics of rare plant habitats and may also impact pollinators or mycorrhizae associated with rare plant species. Mycorrhizae require organic matter found in the duff layer, and mechanical treatment could disturb and disrupt the duff layer.

Timber harvest activities could introduce invasive plants which could lead to detrimental habitat changes. Use of machinery could increase soil compaction (particularly wet soils) and create ground disturbances that result in erosion. Soil compaction hampers seedling emergence (Thill et al. 1979). Erosion removes nutrients and exposes lower soil horizons which are unsuitable for colonization by most rare species. These soil disturbances would likely be detrimental to mycorrhizal relationships needed by some rare plant species (Goss and DeVarennnes 2002).

Temporary road construction and prescribed fire would not be expected to have measureable adverse impacts on wetland habitats; however, they could spread noxious weeds and bury wetland vegetation due to erosion in upland habitats.

Road decommissioning would benefit species by lowering direct impacts of crushing and substrate disturbance by motorized vehicle use on road sides and on user-created roads. Indirect impacts of erosion, sedimentation and the spread of noxious weeds may also be reduced.

If the populations of pale coralroot, broad-lipped twayblade, heart-leaf twayblade, blunt-leaved orchid, and white-veined wintergreen are adequately avoided, no adverse effects are expected. Standard timber contract provisions dictate plant species of local concern in timber treatment units will be flagged and avoided during treatment activities. Fifteen populations have been located and flagged for avoidance. Some locations contain multiple species indicated above. The remainder of the units will be surveyed in 2017 and it is expected the remaining surveys will result in additional occurrences.

Rangeland Management

The North Savery project area includes fenceline and ditch clearing proposals that are specifically intended to reduce impacts of the mountain pine beetle epidemic on agricultural infrastructure and operations.

Direct and Indirect Effects of the No-action Alternative

The North Savery Project decision would not change livestock grazing management. Grazing would continue in the portions of Jack Creek and Hartt Creek livestock grazing allotments in the project area. Current rangeland conditions are mostly good to excellent, trend is upward or static on most monitoring sites, and rangeland health is not expected to change substantially.

However, livestock management would become more complex. Under the no-action alternative, the natural barriers created by contiguous stands of mature coniferous forest may disappear as trees die and fall down. Cattle may cross dead pine stands that used to serve as natural barriers because the newly available forage attracts them. In other cases, fallen trees may restore or maintain the natural barriers in dead pine stands.

Approximately 6.8 miles of fence are susceptible to damage from dead trees falling on them. This makes the fences difficult to maintain and shortens their service life. Falling trees increase risk of injury to permittees who are maintaining these fences. Permittee access for livestock management is also becoming more dangerous and difficult on the forested portions of the Hartt Creek and Jack Creek allotments. Downed trees block livestock movements as well as mobility of the riders trying to gather or move them. Under the no-action alternative, fenceline clearing would be deferred, so this condition is expected to worsen for decades, until most dead trees have fallen and started to decay or until a wildfire consumes them.

Mortality from the mountain pine beetle epidemic is creating new transitory range in some pine stands. Increased sunlight reaching the ground and reduced competition for water is creating suitable growing conditions for grasses and forbs. Noxious weeds are increasing in abundance, are taking advantage of changed conditions to invade some dead stands of lodgepole pine, or both. There is potential for further increases in the distribution and abundance of cheatgrass, musk thistle, Canada thistle, oxeye daisy, spotted knapweed, yellow toadflax, leafy spurge, and common tansy.

Direct and Indirect Effects of the Modified Proposed Action

Proposed timber salvage and thinning would affect both Jack Creek and Hartt Creek allotments, but most of the proposed timber salvage and thinning would be in the Jack Creek allotment.

Maintaining good livestock distribution and moving cattle in the allotments would be more difficult during active treatment due to the increased vehicle traffic on roads and the noise and movement of harvest operations. Cattle may not stay in suitable grazing areas near treatment units. The permittees might have to ride more frequently or find alternate routes for trailing cattle in some parts of the allotment. If the disturbance is severe enough, they might have to forego using parts of the primary range until harvest activities were completed.

Timber harvest activities have the potential to damage fences. In some instances timber operators might need to temporarily take down fences if they need to skid or haul logs across the fenceline where there is National Forest System land on both sides. If the fences on cattle allotments were damaged or down during the grazing season, livestock control would be compromised.

Removing dead trees and wind-throw-risk trees along fences would help maintain them and make them last longer. Timber harvest is planned across or along approximately 2 miles of fence and fenceline clearing is proposed along another 4 miles. This would also decrease the risk to permittees who maintain the fences.

An additional 1.2 miles of fence might need to be constructed to keep cattle in the appropriate allotments and pastures after timber harvest was completed. One mile of natural barrier between the east and west pastures of Jack Creek allotment and 0.2 miles of natural barrier between Jack Creek and Hartt Creek allotments would be removed by the proposed salvage logging.

The proposed timber harvest, roadside hazard tree removal, and fenceline and ditch clearing could add approximately 8,160 acres of transitory range which could temporarily improve livestock distribution and decrease use in riparian areas normally preferred by the cattle. This additional forage would likely become available in two or three years after completion of treatments. These proposed actions would provide relatively open travelways for livestock and riders to get across some areas.

The fuel breaks created by timber harvest would decrease the risk of wildfire across large portions of the project area. Extensive burns could not only kill livestock on the National Forest and destroy fences but could also result in nonuse of affected allotments or parts of allotments for two or more years as vegetation reestablishes.

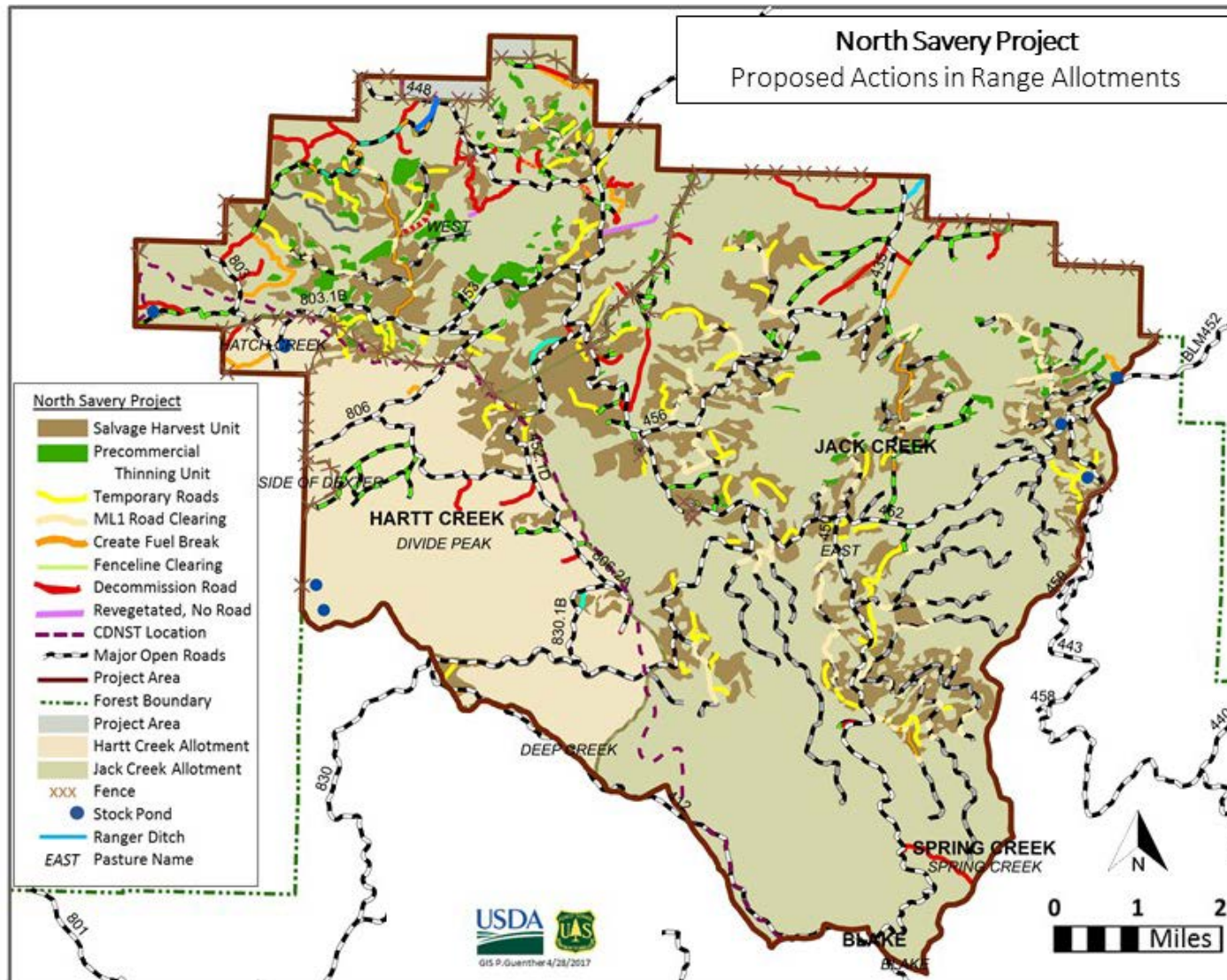


Figure 34. Proposed actions in livestock grazing allotments in the North Savery project area

Any activity that creates or maintains bare soil or reduces or eliminates native vegetation encourages establishment of invasive plant species where a seed source already exists or is introduced concurrent with the disturbance. Design criteria would reduce the likelihood of noxious weed establishment or spread (see page 82). The proposed road decommissioning would add to the risk of weed establishment and spread initially; however, over the long term, it would somewhat reduce the risk of new weed infestations because there would be 19 fewer miles acting as dispersal corridors for weed seed carried by motorized vehicles.

Road decommissioning would benefit the permittees by reducing livestock disturbance; reducing problems with gates being left open; reducing problems with cattle following open roads that cross allotment or pasture boundaries; reducing opportunities for new user-created off-highway vehicle routes; and reducing effects to soil and vegetation from damaged roads, inadequately maintained roads, or off-road use. Riparian areas along North Fork Savery Creek, Mill Creek, McLain Creek, Alameda Creek, and Jack Creek would be improved in the long run by the proposed road decommissioning. Affected range permittees collaborated in identifying the specific road segments scoped for decommissioning that would influence their livestock management. One permittee suggested a change to the proposed action to retain a road segment as open because it provided better access in one area, where the road currently open was seriously degraded and blocked by downfall.

General Recreation

Currently, there is little existing baseline data on the local recreation use patterns in the North Savery analysis area. National visitor use monitoring is done every 5 years and was last completed in 2012. It provided a forestwide view of how visitors are recreating. In the analysis area, field-observations, professional judgment, recreation opportunity spectrum management prescriptions, Forest Plan direction, and technical reports relating to off-highway vehicle use can be used to estimate recreational use. However, the effects of the alternatives on recreation opportunities and experiences are difficult to estimate because non-consumptive uses are challenging to quantify. Ease of access and compliance with visual resource standards are used to describe potential impacts.

Direct and Indirect Effects of the No-action Alternative

Effects on the recreation experience associated with the Continental Divide National Scenic Trail are discussed in that section on page 106

Under the no-action alternative, all roads and trails currently open to motorized travel would remain open, all closed roads would remain closed, and all unauthorized routes would remain illegal for motorized use. No new motorized trails would be developed. The existing 1.5 miles of motorized trail co-located with National Forest System roads would be available for use by legal all-terrain vehicles and motorcycles. Approximately 17 miles of nonmotorized trail would be available for use by the public. Because no open roads would be closed, the public would still have access to the areas they have typically used for hunting, fishing, dispersed camping, and other recreational activities available in the area.

The no-action alternative would have no direct effect on the recreation opportunity spectrum or on the characteristics of roadless areas. There would be no short-term or lasting adverse impacts to developed recreation, dispersed recreation, wilderness, inventoried roadless areas, or users of the designated trail system from the no-action alternative. Existing conflicts between users would be unaffected by the lack of action. However, if the unauthorized route system

expands or as nonmotorized trail conditions deteriorate from falling trees, the user experience could be negatively affected. With off-road vehicle use continually increasing, the existing trail system may see heavier use with the associated increase in potential resource damage along the trails. User compliance with travel management regulations restricting travel to designated open roads is expected to remain at current levels. If no action is taken, the existing unauthorized route systems would continue to expand and cause resource damage.

Direct and Indirect Effects of the Modified Proposed Action

The Jack Creek Campground would have harvest units directly adjacent to the south and west. Sixty-five acres are proposed to be clearcut with reserves. Some campers would view the vegetation treatments as negative, while others would regard the removal of dead trees as making the area safer. The modified proposed action would also help with future foot and motorized trail loops from the campground and a potential campground expansion development plan.

Some dispersed camping spots would be negatively affected by the modified proposed action. Some road segments and short routes proposed for closing have dispersed campsites that would no longer be accessible by motorized vehicles. Closed roads would typically have enough room left at the beginning for a dispersed campsite, so some dispersed sites would still be available.

User compliance with travel management regulations would be expected to decline from current levels until closures and signage can be established. Continued expansion of the existing unauthorized routes would likely continue even with relatively few miles of roads being closed.

The conversion of some roads to motorized trails would negatively impact some full-size vehicle users. This is only a few miles of road, and because of road condition, off-highway vehicles have already been the main traffic on the routes. There may be some conflicts between motorized and nonmotorized users while each type of visitor adjusts to the change in designations between open and closed roads or motorized trails.

Hunters could be positively or negatively affected by the modified proposed action. Some of the user-created routes and open road segments they use illegally would be decommissioned. Hunters who hike into hunting areas would likely have improved hunting experiences due to the reduced road density. However, the magnitude of this change is very small. Under the modified proposed action, 76 percent of the project area is accessible within ½ mile of an open road or motorized trail, compared to 78 percent in the existing condition. This 2 percent change in easy access is not considered substantial. Figure 35 below displays where changes in access would occur.

See the discussion on road density in the “Terrestrial Wildlife” section for additional information.

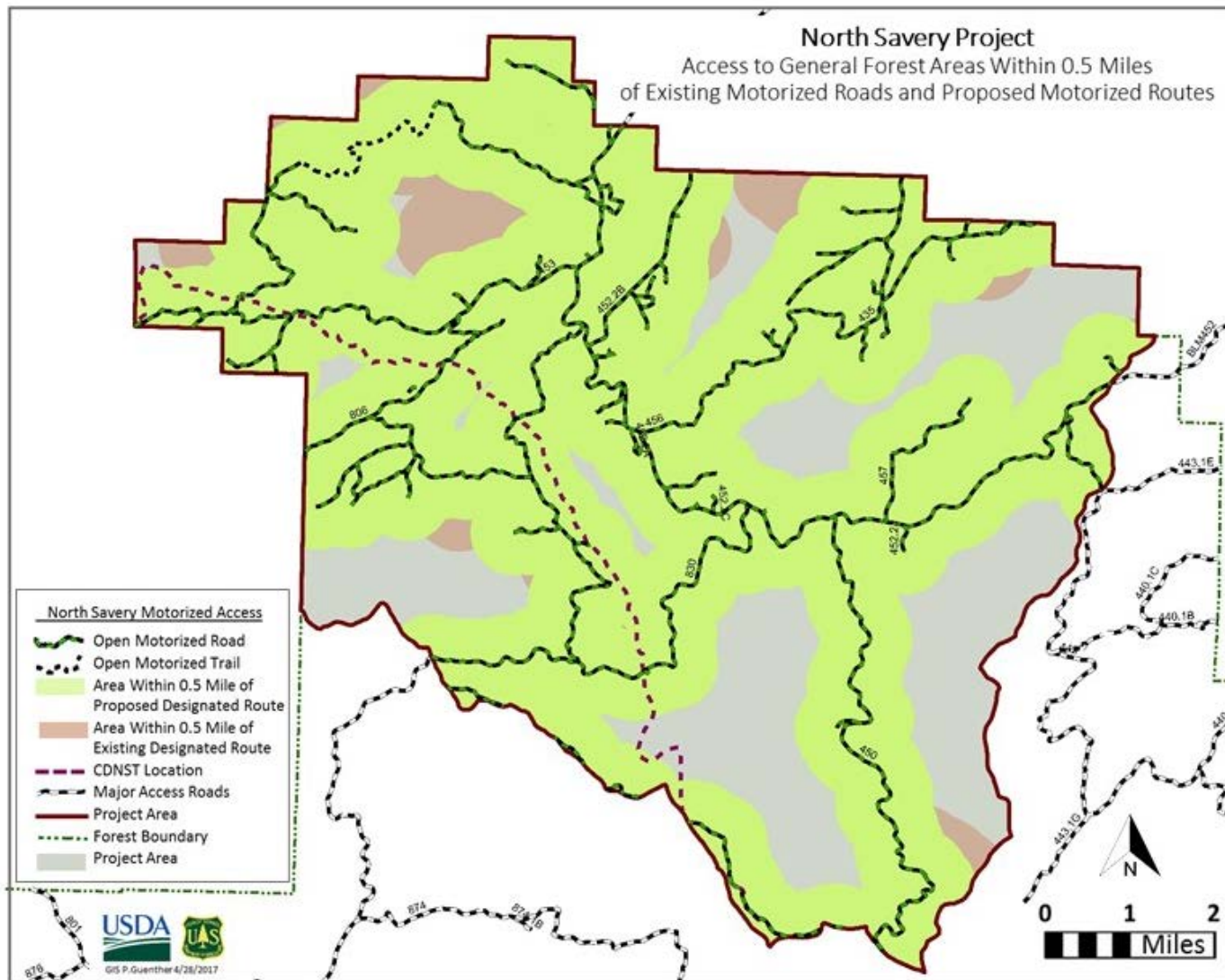


Figure 35. Comparison of areas accessible within 0.5 miles of the proposed designated motorized routes compared to existing access

Scenic Resources

The landscape character in the analysis area has been shaped by natural events (fires, wind, insects, and disease) and human events such as logging and road building, livestock grazing, mining and developed and dispersed recreation activities. The objectives for scenery integrity in the analysis area are moderate and low. A moderate scenery integrity objective means the valued landscape character appears slightly altered. Noticeable deviations are not as noticeable as the landscape character being viewed. A low scenery integrity objective means the valued landscape character appears moderately altered. Deviations begin to be more noticeable than the valued landscape character but they have similar attributes such as size, shape, edge effect, and pattern of natural openings; vegetative type changes; or architectural styles. Deviations must be shaped and blended with the natural landforms so unnatural edges, roads, landings, and structural do not dominate the view.

Direct and Indirect Effects of the No-action Alternative

Standing beetle-killed trees would dominate in certain areas of foreground and middle ground zones. Over time, winds, snow, and ice would cause the dead trees to fall, creating a landscape of downed lodgepole pine forest. Wildfire could cause lasting visible scars until new vegetation was reestablished. Decommissioning unauthorized roads through other travel management actions would restore desired landscape character.

Direct and Indirect Effects of the Modified Proposed Action

Numerous treated areas in the foreground zone of travelways and recreation sites would have short term reductions in scenic integrity. Scenic integrity is low to moderate in the existing condition, and so does not meet the objective of moderate in all locations. Due to regrowth of young trees, shrubs and grasses after the removal of most beetle-killed trees in treatment areas, visual impacts would lessen within 3-5 years of site treatment. Precommercial thinning of dense regenerated young lodgepole pine stands would maintain a green, forested landscape that provides scenic quality. Decommissioning unneeded roads would restore desired landscape character. Temporary roads constructed to access units would be rehabilitated to a natural appearing landscape after completion of treatments to meet scenic integrity objectives.

Cumulative Effects Summary – All Resources

For the North Savery Project, the impacts of past and present human activities conducted before 2016 are considered part of the existing condition which is described in the “Affected Environment” section in Chapter 1. The existing condition as of 2016 is the baseline for evaluating cumulative effects of the proposed project.

Two primary forces are contributing to the existing condition of resources in the project area. First, activities conducted by the Forest Service, permittees and contractors and the impacts of public recreation activities have shaped the managed landscape. Second, and much more visible, are the impacts climate, disease, and insects have had on vegetation, watershed condition, and wildlife habitats. Fire suppression and timber harvest programs have influenced vulnerability of forest stands in the project area, therefore the existing mortality from the unprecedented mountain pine beetle epidemic are considered as a component of cumulative effects.

Timber management, road construction, mining, and recreation activities had been occurring to varying extent since before establishment of what was then the Hayden National Forest in 1908. These activities can affect the integrity of aquatic and terrestrial ecosystems. Several watersheds in

the North Savery area are at risk of long-term destabilization from the combined impacts of human actions, primarily timber harvest and road construction, that change, concentrate, and redirect runoff from forested stands and road surfaces.

Some resources may incur significant cumulative impacts as a result of human activities that would occur under the modified proposed action or be deferred under the no-action alternative.

Significance is attributed to effects lasting 50 years or more, effects making it difficult or impossible to meet the Forest Service mission, and effects causing irreversible or irretrievable losses.

Road construction and timber harvest on forested private lands, energy projects, and developments on residential lands, and limited mining and grazing activities will continue to occur. Fires originating on private lands will continue to present a threat to resources in the project area.

Cumulative Effects of Deferring Action Under the No-action Alternative

To the extent that positive action would be deferred to an unknown future time, the cumulative effect of the no-action alternative would reflect adverse and beneficial effects, depending on the resource used as a frame of reference. Fuel build up would continue, although complex stand composition would also increase in the short term. Timber production stands would continue at risk of loss to fire. Community at Risk values would remain at risk. Where existing elements of the transportation system are degrading watershed condition and wildlife habitats, those impacts would continue. Refer to the condition and trend discussions in the “Affected Environment” section for treatment of risks associated with the existing conditions.

Cumulative Effects of the Modified Proposed Action

Vegetation

This project is only treating a small amount of land relative to the landscape, and negative effects could still occur from fires burning outside treated areas.

Past harvesting and the proposed treatments would create a patchwork of stand structure across the landscape. The openings created by projects in the analysis area would result in more rapid natural regeneration of primarily lodgepole pine and a quicker return to a healthy, commercially viable forest structure.

Salvage harvest on National Forest System land and surrounding private land would continue to provide a steady flow of forest products to local timber markets and as a result would improve the probability of local markets being available for future timber sales.

Changes in the Forest Service road system could help offset the additional impacts of road and resource development outside of National Forest System lands.

Fire and Fuels

Vegetation management actions from this project would cumulatively mitigate the risks of adverse effects described for the no-action alternative. The extent and distribution of treated and untreated vegetation would reduce the size of stand-replacing disturbances in the short and long term. Risk to firefighters and infrastructure would be reduced due to less available fuel in the treatment units. There would be approximately 5,600 fewer acres where soil sterilization, loss of viable seed sources,

and creation of hydrophobic soils from high-severity fires could permanently change site productivity.

Watershed Condition

Hard rock mining, cattle grazing, water developments, road decommissioning, prescribed fires, dispersed and developed recreation, logging, road construction and other activities have influenced stream channel morphology, aquatic habitat, water quality and quantity in the project area. Equivalent clearcut area and connected disturbed area were used as indicators of cumulative watershed effects for the project. The equivalent clearcut area method normalizes canopy cover data in a watershed based on the intensity and time since the activity which affects canopy cover occurred. Connected disturbed areas are high runoff areas like roads and other disturbed sites that have a continuous surface flow path into a stream or lake (USDA Forest Service 1999).

An equivalent clearcut area of more than 25 percent and a connected disturbed area over 10 percent are commonly used as thresholds for measureable adverse impacts to water resources. Current equivalent clearcut area ranges from 0 to 14 percent in project area watersheds. The connected disturbed area ranges from 0 to 9 percent. Overall water resource conditions in the project area are fair, with some localized degradation of water resources in site-specific locations, primarily the result of motorized use.

If the modified proposed action is implemented, additional degradation to water resources would occur; for example, sedimentation from temporary road construction. Equivalent clearcut area would increase and range from 6 to 30 percent in project area watersheds. Eight 7th-level hydrologic unit code watersheds would have an equivalent clearcut area greater than 24 percent. Increases in connected disturbed area would also be expected, ranging from 0 to 13 percent in 7th-level project area watersheds. Approximately 2.7 miles of roads near streams would be decommissioned and rehabilitated. This would improve water resource conditions by reducing the connected disturbed area in critical locations.

The timber harvest and associated activities in the modified proposed action are unprecedented. Harvesting the majority of available lodgepole pine sawtimber in 5,000 to 20,000-acre watersheds in approximately 60 years has not been done on the Medicine Bow National Forest. As a result, effects to water resources are uncertain. Combined with the activities in modified proposed action, other management actions could have significant adverse effects on water resources in the Nugget Creek, North Spring Creek, Jack Creek, McLain Creek, and North Savery Creek watersheds **if design criteria are not applied**. Increases in streambed and streambank erosion could occur in up to 20 miles of stream in these watersheds. Effects could persist for up to 80 years and influence the overall physical and biological stream health. However, the interdisciplinary team **believes** that the design criteria developed to mitigate the cumulative effects of past, present, and reasonably foreseeable future activities are sufficient to ensure that **no adverse long term effects occur**.

The North Savery project was designed to maximize the amount of stand replacing vegetation management in the project area without exceeding Forest Plan standards related to water resources in key watersheds. Therefore additional stand replacing management activities in the majority of project area from the reasonably foreseeable future landscape vegetation analysis are expected to either be very limited in extent or if not limited in extent may exceed Forest Plan standards for water resources. Prescribed fire and thinning activities which may occur through the landscape vegetation analysis projects are estimated to have minimal additional cumulative effects on water resources. These effects will be considered in the design and evaluation of the landscape vegetation analysis.

Canada Lynx

The cumulative effects from proposed management and activities on State and private land will not change the amount of suitable habitat or unsuitable habitat in the lynx analysis unit nor will it change the abundance of habitat for prey species. The scale of tree mortality from insects and disease dwarfs effects from human activities. Most lodgepole pine stands include substantial amounts of standing dead timber – some as much as 90 percent dead. Spruce and fir stands are also being affected by insects and disease at smaller scales. More than three quarters of the North Savery project area is forested. Lodgepole pine makes up 72 percent of the forested acres; spruce and fir make up 22 percent.

In the lynx analysis unit, activities on State and private land have been taking place since the Canada lynx was listed as threatened in 2001. The 640 acres of State trust land in the lynx analysis unit have some level of livestock grazing and timber production. The State of Wyoming is planning a future timber sale in 100 to 200 acres of beetle-killed lodgepole pine stands in currently unsuitable habitat. There are 1,178 acres of private land in the lynx analysis unit. The land is used for recreation, recreational cabins, and storing water in reservoirs; no other activities are planned for private land at this time.

Pygmy Shrew

Vegetation is being maintained to provide habitat for pygmy shrews. Habitat quality has declined compared to the historic range of variability, but improvement is expected. Riparian habitat, particularly coarse woody debris, has been reduced by historic actions such as timber harvest and tie-hacking.

American Marten

The Joe's Park and Jack Creek 3 timber sales removed 319 acres of habitat in the last 15 years. Most of these acres would have been lost as marten habitat due to the mountain pine beetle outbreak, so treatment impacts to martens are minimal. At best, stand regeneration would provide some habitat for foraging in 40 years (Kozlowski 2008).

Northern Goshawk

Nesting habitat and the quantity and quality of foraging habitat would be reduced. Habitat for prey species and their abundance would likely decline with or without the modified proposed actions. Timber stands harvested in the Joe's Park and Jack Creek 3 timber sales will provide some foraging habitat as vegetation reestablishes. Nesting habitat will reestablish in 80 years or more when sites are occupied by large, live lodgepole or aspen with moderate or high canopy cover. Natural and manmade activities across the Medicine Bow National Forest would regenerate more than 30 percent of habitat over the next several years; primarily due to the mountain pine beetle outbreak. This represents a modest change and would produce a noticeable change in the goshawk population trend forestwide in time.

Greater Sage-grouse

The cumulative effects of decommissioning roads under the modified proposed action and weed treatments and livestock grazing in the project area would be an improvement in sage-grouse habitat. Weed treatments over the past 15 years have improved quality of existing sagebrush habitat. Properly managing livestock grazing within 5.3 miles of occupied leks and in priority and general habitat as described in the sage-grouse amendment (USDA Forest Service 2015b) will provide adequate sage-grouse habitat from nesting through fall.

Boreal Owl

Cumulatively and over the long term, habitat changes from harvest, beetles, and travel management would ensure a continuing supply of prey and future nesting habitat and help maintain a boreal owl population on the Medicine Bow National Forest. The Jack Creek 3 timber sale removed 4 acres of nesting habitat in the last 15 years. Harvested stands currently provide limited foraging habitat where vegetation has reestablished. Nesting habitat will reestablish in more than 100 years.

Olive-sided Flycatcher

Cumulatively and over the long term, retention of spruce-fir and habitat gains from travel management would ensure a continuing supply of prey habitat and would help maintain olive-sided flycatchers on the Medicine Bow. The Jack Creek 3 timber sale removed 4 acres of habitat in the last 15 years. Harvested stands currently provide some limited foraging habitat near the edges. Nesting habitat will reestablish in more than 100 years.

Brewer's Sparrow

There have been more than 100 acres of weed treatments in the previous 15 years. Treatments have improved the quality of existing sagebrush habitat. Livestock grazing in the analysis area will retain habitat for Brewer's sparrows because it meets Forest Plan standards and guidelines and corresponds to Wyoming Partners in Flight (Nicholoff 2003) recommendations for proper grazing management.

Hoary Bat, Hudsonian Emerald

Cattle grazing in hoary bat and Hudsonian emerald habitat meets Forest Plan standards and guidelines for livestock grazing annually. These measures will provide adequate habitat quality for prey insects for the bat and for Hudsonian emeralds.

Western Bumble Bee

There have been more than 100 acres of weed treatments in the previous 15 years. Treatments have decreased habitat for western bumble bees by eliminating nonnative and exotic nectar- and pollen-producing plants. The land management plan amendment for greater sage-grouse (USDA 2015b) includes measures to conserve sage-grouse habitat while allowing properly managed livestock grazing within 5.3 miles of occupied leks and within priority and general habitat. The Forest Plan also includes measures to maintain or improve the quality of riparian habitats. Following these conservation measures will provide adequate habitat for bumble bees.

Brown Creeper

The accumulation of vegetation management activities in the analysis area would have a small but noticeable impact on local brown creeper density when added to the effects of thousands of acres of declining habitat from the beetle outbreak. Overall, suitable nesting and foraging habitat in spruce-fir cover types would be retained in the analysis area and across the Medicine Bow National Forest. Habitat changes from harvest, beetles, and forest regeneration over time would ensure a continuing supply of prey and future nesting habitat and would help maintain the brown creeper population on the Medicine Bow.

Hazard tree clearing along roads has removed or is removing 536 acres of habitat in the analysis area. Brown creepers avoid habitat within 328 feet of roads (Hutto 1995), so the result is likely a very small reduction in low quality habitat across many brown creeper territories. The Joe's Park and Jack

Creek 3 timber sales removed 573 acres of habitat in the recent past. These stands will regenerate to suitable habitat in approximately 100 years.

Snowshoe Hare

Hares should remain sufficiently abundant to provide a supply of prey. Natural and manmade activities across the Medicine Bow National Forest would regenerate more than 30 percent of habitat over the next several years; mostly due to the mountain pine beetle outbreak. This represents a modest change that is within habitat and hare population variations expected to occur naturally. Most snowshoe hare habitat is in spruce-fir; mountain pine beetles are not expected to change this habitat.

American Three-toed Woodpecker

Natural and manmade activities are regenerating more than 30 percent of habitat on the Medicine Bow National Forest; mostly due to the mountain pine beetle outbreak. The outbreak caused a noticeable change in the three-toed woodpecker population trend; however, the woodpeckers have returned to their endemic, low-abundance level. These changes are within habitat and population variations expected to occur naturally (Wiggins 2004).

Hazard tree clearing along roads has removed, or is removing, 536 acres of habitat in the analysis area. The result is likely a small reduction in low-quality habitat across many woodpecker territories. The Joe's Park and Jack Creek 3 timber sales removed 573 acres of habitat. These stands will regenerate to suitable habitat in approximately 100 years.

Golden-crowned Kinglet

The extensive beetle outbreak is reducing golden-crowned kinglet in lodgepole pine. Growth of the existing understory will reproduce golden-crowned kinglet habitat (mature lodgepole with closed canopy) in about 100 years. The golden-crowned kinglet would still be distributed across the Medicine Bow National Forest since their primary habitat – mature and older spruce-fir – would remain intact.

Hazard tree clearing along roads has removed, or is removing, 536 acres of habitat in the analysis area. The result is likely a small reduction in low-quality habitat across many golden-crowned kinglet territories. The Joe's Park and Jack Creek 3 timber sales removed 573 acres of habitat. These stands will regenerate to suitable habitat in approximately 100 years.

Lincoln's Sparrow, Wilson's Warbler

Monitoring suggests the Lincoln's sparrow population is stable across the Medicine Bow National Forest. Lincoln's sparrow habitat amount and distribution has changed very little between 1985 and the present. However, the condition of riparian areas has improved over the last century as a result of better livestock grazing management. This gradual recovery has improved the quality of Lincoln's sparrow nesting and foraging habitat. Monitoring suggest the Wilson's warbler population is stable or declining across the Medicine Bow National Forest.

Some sites will be in early seral ecological status from activities such as recreation, timber harvest, road maintenance and construction, and ditch maintenance. Elk could be affecting the Lincoln's sparrow and Wilson's warbler populations by heavily browsing willows and herbaceous understory vegetation. The Sierra Madre elk population is more than 200 percent above the management objective of 5,000 elk. The Wyoming Game and Fish Department has been reducing the population

for years with liberal harvest strategies. When the elk population is reduced, willow condition should improve.

Other Wildlife Species and Habitat

The pine beetle epidemic has caused a loss of mature and older-aged pine forest important to many Region 2 management indicator species such as northern goshawk, three-toed woodpecker, and American marten. Over time, perhaps 2 decades, the stands will have a high density of large snags and coarse woody debris which could provide habitat for cavity-nesting and denning, as well as habitat for many small mammals and several furbearing species.

Time since death of beetle-killed trees is an important factor determining usefulness of these trees for wildlife (Chan-McCleod 2006). Wildlife species that require mature forest cover are less affected in the first 3 to 5 years. As the stands continue to break up over time, they become less favorable to mature forest species. Wildlife species that thrive in open, edge, or coarse woody debris habitat benefit in the mid and long term. Salvage harvesting of beetle-killed stands might rejuvenate stands more quickly.

Continental Divide National Scenic Trail

Road construction and timber harvest on forested private lands, energy projects, and developments on residential lands, and limited mining and grazing activities will continue to occur. Fires originating on private lands will continue to present a significant threat to the project area. These impacts would create a more managed environment for through-hikers or visitors using segments of the trail at the north end of the Medicine Bow National Forest.

The Continental Divide National Scenic Trail corridor through the North Savery project area would offer a respite from other portions of the trail still clogged with downfall. The user experience would be challenging, but hazards from overhead trees and circumnavigating downfall would be reduced for a more satisfying experience in this area.

Fish, Amphibians, and Other Aquatic Organisms

The modified proposed action would reduce chronic sedimentation at some locations. Motorized travel which contributes to the chronic sedimentation at selected sites would be eliminated. The potential for increased water yields and high intensity wildfire would remain.

Cultural Resources

Fires originating on private lands will continue to present a significant threat to wooden historic and prehistoric structures. Treatment of fuels in the project area reduces that risk. With the application of appropriate protection measures and the removal of excess fuels and beetle-affected trees, no adverse cumulative effects to historic properties are expected.

Botany and Rare Plants

If adverse effects are not minimized at the local level, cumulative effects may result. Past and present forest management activities have caused changes in plant community structure and composition across the Medicine Bow National Forest. These management activities have altered the present landscape to various degrees and have had direct, indirect, and possibly cumulative effects on sensitive plant species and habitats.

Cumulative effects are not expected contribute to a change in status or viability of any sensitive plant species. They are not expected contribute to an increase in any current or predicted downward

trend in population numbers, density, or habitat capability. Sensitive plant species are not currently known to occur in the analysis area, and policies, standards, and guidelines would limit effects to soils.

Some sensitive species (such as moonworts) are somewhat tolerant of disturbance. Activities that cause light to moderate ground disturbance, such as timber harvest, may impact individuals but are not likely to severely impact suitable habitats (with the exception of wetlands and riparian areas). Light to moderate disturbances such as road decommissioning may also have long-term beneficial impacts by providing newly disturbed ground for colonization. Heavy ground disturbance, such as permanent road construction, may impact individuals by destroying habitat and is not expected to have any long-term beneficial effects. Weed spraying may also negatively impact individuals that come in contact with herbicide spray or drift. It is unknown how wildfire or prescribed burning affects slender moonwort, but it is possible the species is fire adapted since it is found in lodgepole pine ecosystems.

Rangeland

The most important cumulative effect on rangeland health is the increased potential for introduction and spread of noxious weeds and other invasive plants. The modified proposed action includes design criteria to minimize weed establishment and spread. Past and ongoing disturbances that contribute to an increase in weed populations are routine road and trail maintenance, road decommissioning, ditch maintenance, other timber management projects, off-highway vehicle use, dispersed camping, recreational use on motorized and nonmotorized trails, and livestock (recreational and permitted).

The project would not add appreciably to the other factors that would negatively impact livestock management and rangeland health for the affected producers or the allotments in the analysis area. Negative effects of the proposed treatments and travel management would be primarily short-lived and offset by positive effects such as an increase in transitory range, improved access, and reduction of damage to some fences from falling trees.

Vegetation treatment projects that may be implemented as part of the Landscape Vegetation Analysis project will have the same types of effects on livestock management and rangeland vegetation as those described for the North Savery Project; the primary difference being that more acres and more grazing allotments and livestock grazing permittees will be affected. As described for the North Savery project, some of those effects, such as creation of transitory forage, improved access through beetle-kill tree stands and protection of allotment fences, will be beneficial. Negative effects include a likely increase in noxious weed populations and other invasive plant species, elimination of natural barriers between allotments, and direct disturbance to livestock during project implementation. For some shrubland, aspen, or both treatments, there may be a need for protection of the treatment sites from livestock grazing for several years, which may require temporary adjustment in livestock numbers or season of use or construction and maintenance of temporary fences.

Recreation

Additional residents or visitors will contribute to the user base in the project area, increasing the probability that visitors will encounter one another, even in backcountry areas.

Converting roads to motorized trails would potentially reduce cumulative effects by reducing adverse environmental impacts from the proposed routes while maintaining transportation features in the

northwest portion of the project area. This would help accommodate use, as off-highway vehicle use is likely to increase in the future.

Under the modified proposed action, some users would continue to travel on routes that appear to be legal but are actually user-created routes previously decommissioned and reopened by the public. Some users would continue to create unauthorized routes. Although future compliance with closures and restrictions may be anticipated for most users, some noncompliance can be expected. This would result in the continuation and expansion of current negative trends as off-highway vehicle use in the area increases. These impacts would be addressed through engineering, education, law enforcement, and evaluation.

Cumulative trends in road decommissioning on the Brush Creek/Hayden Ranger District would be perceived by some stakeholders as limiting access to the Medicine Bow National Forest. Road decommissioning in future timber sales and other through other projects would be negatively perceived.

However, while road miles and road density would decrease slightly, the ease of access from open roads within the project area would change very little. The proportion of the project area that would be within ½ mile of open roads is currently 78 percent. Implementation of the modified proposed action would reduce this to 76 percent.

Scenic Resources

No adverse cumulative effects on scenic resources would result from the modified proposed action. The landscape character would remain in place, with some changes from human activities such as timber cutting, road building, developed and dispersed recreation, livestock grazing, and utility development. There would be a short-term impact on scenery from ground-disturbing activities in the analysis area but the activities would benefit scenery in the long term.

Forest Plan Consistency Summary – All Resources

No-action Alternative

The no-action alternative is not consistent with standards and guidelines for the timber resource under the Medicine Bow Forest Plan (2003). If implemented, it may result in deviation from Forest Plan direction for management areas 5.13 and 5.15. Divergence from Forest Plan direction may lead to the following consequences:

- A continuous flow of forest products will not be provided to local economies.
- The production of sawtimber is not emphasized in this alternative. Dead stands do not accumulate additional volume or value over time. Dead stands are less valuable than live stands.
- The forest in these areas is not managed to produce sawtimber in an economically efficient manner.

- The forest is not managed using treatments that maintain acceptable growth rates, nor do they favor commercially valuable tree species. Area spruce-fir and lodgepole pine stands will show a rapid deceleration in the rate of volume accumulation post-epidemic. Dead lodgepole pine and spruce are less valuable than green timber and value decreases further as deterioration increases. Merchantable sized live trees in the affected stands and in the assessment area could be largely subalpine fir, the least valuable of commercial species in the area.
- Vegetation is not managed to emulate or restore healthy ecological conditions. There will be less ability to manage the stands in many different successional stages to meet the desired balance.

A large portion of the area is moving to an early successional stage due to mountain pine beetle mortality. Not implementing management activities may result in more diversification by increasing the amount of fir and aspen across the landscape which may change fire susceptibility.

This no-action alternative is not consistent with goal 1, subgoal 1.c of the Forest Plan which outlines the following strategies for fuels reduction and response to wildfire:

- c) Implement fuel reduction treatments and treatment activities beginning with fire regimes I, II, and III and condition classes 2 and 3.
- e) Use appropriate management response (suppression or fire use) on all wildfires according to the Forest Fire Management Plan.

No fuels reduction would take place under the no-action alternative and taking no action limits the response strategies that can be used safely by future fire managers. The existing condition is unsafe for firefighters in most portions of the project area due to the abundance of dead trees that pose a significant risk.

Watershed condition: The no-action alternative is consistent with the Forest Plan to the degree that new actions authorized under this project would not contribute to or degrade existing watershed conditions.

The no-action alternative does not comply with cultural resource management directives in the Forest Plan because the accumulation of fuel sets the conditions for catastrophic wildfires, endangering any perishable materials present at historic properties and archaeological sites, particularly buildings and structures, will be susceptible to physical damage from falling trees.

Objectives, standards, and guidelines (USDA 2003a) for wildlife and wildlife habitat were reviewed. The no-action alternative would meet these objectives, standards, and guidelines. See the following for examples:

- The Forest Plan has measures to maintain or improve the quality of riparian habitats. These conservation measures also provide adequate habitat for bumble bees.
- The Forest Plan has standards to limit disturbance within ¼ mile of occupied goshawk nests during the nesting season and the surrounding post-fledging habitat (p. 1-42).
- The sage-grouse amendment (USDA 2015b) includes guidance to restore sage-grouse habitat when decommissioning roads: “In priority and general habitat management areas and sagebrush focal areas, when decommissioning roads and unauthorized routes, restoration activity should be designed to move habitat towards desired conditions (table 1)(p. 109)”.

- The Forest Plan has a short-term desired condition to decommission approximately 150 miles of unneeded roads and many user-created roads to reduce resource damage (p. 1-21).
- The Forest Plan has objectives (p. 1-4) to maintain or improve habitat across the Medicine Bow National Forest for management indicator species in the long term and for moving terrestrial, aquatic, and riparian area composition, structure, patterns, and processes toward conditions typical of those created by natural processes. No action in the analysis area would allow the natural process of mountain pine beetle outbreaks to occur.

Implementing the no-action alternative would be consistent with visual quality objectives for the Continental Divide National Scenic Trail but would not meet Forest Plan direction to manage known risks to visitors.

The no-action alternative would not change or affect the recreation opportunity spectrum settings in the analysis area.

The no-action alternative would be consistent with the scenic integrity objectives in the Forest Plan.

Modified Proposed Action

The modified proposed action is consistent with standards and guidelines for the timber resource under the Forest Plan (2003). The design criteria in Chapter 2 (see page 82) would be implemented to ensure compliance with multiple resource objectives.

Temporary road construction necessary to access and manage timber stands would be done in compliance with all Forest Plan direction and in conjunction with state of Wyoming best management practices. To achieve consistency, specific design criteria have been included in the detailed description of the modified proposed action.

Changes to the transportation system would be consistent with Forest Plan direction, because implementation of an improved system of roads for multiple and public uses would contribute to attaining the Forest Plan desired condition to reduce road density by decommissioning 150 miles of forest service roads per the Forest Plan in the planning period.

Mitigation measures and design criteria are recommended to address the potential for increased runoff and sedimentation and reduce the cumulative effects to water resources. Effective implementation of the mitigation measures, design criteria, and best management practices would reduce the cumulative effects to water resources, and the modified proposed action would be consistent with the Forest Plan and other applicable water resource laws, regulations, and policy.

The modified proposed action is consistent with the following strategies for fuels reduction and response to wildfire listed under goal 1, subgoal 1.c of the Forest Plan.

- c) Implement fuel reduction and treatment activities beginning with fire regimes I, II, and III and condition classes 2 and 3.
- d) Use appropriate management response (suppression or fire use) on all wildfires according to Forest Fire Management Plan.

Much of the project area meets the criteria outlined above in strategy c) and the modified proposed actions would be effectively reducing fuels in the treated areas. Areas treated under this alternative would also increase the strategic options available to future fire managers improving their ability to use an appropriate management response as outlined in the Medicine Bow National Forest fire

management plan. Treated areas would be much safer for firefighters to work in because most of the dead standing trees would be removed. Fire severity would also be reduced in treated areas, expanding the range of effective tactics in the event of a future fire. It is also consistent with biological standards and guidelines that apply to fire and fuel treatment.

Objectives, standards, and guidelines (USDA 2003a) for wildlife and wildlife habitat were reviewed. The modified proposed action would meet these objectives, standards, and guidelines. See the following for examples:

- The modified proposed action is consistent with Southern Rockies lynx amendment guidance. The objectives, standards, and guidelines of the amendment are incorporated in the revised Forest Plan. Additionally, the Forest Plan includes standards for retaining coarse woody debris and snags and live recruitment trees to help regenerate habitat.
- Riparian habitat will be protected under the Forest Plan aquatic standards and guidelines, watershed conservation practices handbook direction and the regional direction regarding fens (USDA 2003a and Appendix I). This direction is important for hoary bat, Hudsonian emerald, western bumble bee, Lincoln's sparrow, and Wilson's warbler.
- The Forest Plan (USDA 2003a) has standards for retention of live trees, snags, and coarse woody debris that will retain some habitat characteristics in the future. Important for pygmy shrews, American marten, hoary bat, Hudsonian emerald, and western bumble bee.
- The Forest Plan has an objective to decommission approximately 150 miles of unneeded roads and many unauthorized routes to reduce resource damage (USDA 2003a). Important for American marten, hoary bat, Hudsonian emerald, and western bumble bee.
- The recent sage-grouse amendment (USDA 2015b) includes guidance to restore sage-grouse habitat when decommissioning roads "In priority and general habitat management areas and sagebrush focal areas, when decommissioning roads and unauthorized routes, restoration activity should be designed to move habitat towards desired conditions (table 1)(p. 109)".
- The Forest Plan has objectives (p. 1-4) to maintain or improve habitat across the Medicine Bow National Forest for management indicator species in the long term and for moving terrestrial, aquatic, and riparian area composition, structure, patterns, and processes toward conditions typical of those created by natural processes. Proposed actions would remove less than 1.5 percent of forestwide habitat. This change can be expected to occur naturally.
- The Forest Plan guideline to consult Partners-in-Flight Conservation Plans (p. 1-40) for additional guidance was accomplished for greater sage-grouse, and brown creeper.

The following design feature was developed to ensure compliance with Forest Plan direction and to protect goshawk nesting:

Harvest units that include goshawk nests or are within ¼ mile of goshawk nests will be surveyed using accepted protocol (Joy et al. 1994) between June 19 and August 4 of the year harvest is expected to occur. Where active nests or territories are identified, the following Forest Plan Standards will be applied (USDA 2003a):

4. Within each occupied northern goshawk territory, select three nests and protect 30 acres of dense vegetation surrounding each, defining the boundaries of each area based on habitat quality. If fewer than 3 nests are found within an occupied territory, substitute 30-acre areas with characteristics of nesting habitat.

5. Within each occupied northern goshawk territory, designate a northern goshawk post-fledging area (PFA) of a minimum of 200 acres that includes the three 30-acre nest sites selected. The large tree component within the PFA should include snags, down dead wood, and clumps of trees with interlocking crowns. Within the PFA, prohibit management activities that may degrade goshawk foraging habitat.

6. To help reduce disturbance to nesting goshawks, prohibit construction, drilling, timber harvest and fuel treatments, and other intensive management activities within ¼ mile of active northern goshawk nests from April 1 to August 30 unless site-specific conditions are such that a lesser distance can be shown to provide the same degree of protection (USDA Forest Service 2007b).

No Forest Plan amendment would be required to ensure project consistency with Forest Plan direction for management of recreation or scenic resources. Design criteria described in Chapter 2 were developed to address potential negative effects to the Continental Divide National Scenic Trail.

Forest plan standard and guidelines and timber sale provisions relating to vegetative treatment and road construction adjacent to streams would be implemented to protect fish, amphibians, and other aquatic organisms.

The modified proposed action is consistent with cultural resource management directives in the Forest Plan.

The following avoidance measures for sensitive plant species would be implemented under the modified proposed action to align implementation with Forest Plan direction:

- Local concern plant species will be subject to a 30-foot buffer, in which timber harvest activities and ground disturbance will be prohibited, unless otherwise agreed to by the Botanist. Threatened, endangered, and USDA Forest Service Rocky Mountain Region 2 sensitive plants will be subject to a 30- to 100-foot buffer with similar restrictions, to be determined at time of discovery.

The modified proposed action includes recommended best management practices and design criteria which, if effectively implemented, would maintain consistency with the recreation resource Forest Plan standards, guidelines, and goals. The desired condition for recreation, as described by the Forest Plan in general terms, is to maintain or improve all existing opportunities that are currently available. No Forest Plan amendment would be required to ensure project consistency with Forest Plan direction for management of recreation resources.

The modified proposed action would be consistent with the scenic integrity objectives in most areas. Removal of all beetle-killed trees in the foreground of travelways would have low scenic integrity instead of moderate. However, removal of dead and dying trees allow quicker regeneration of new young healthy trees and move towards the desired landscape character for future generations.

Proposed fenceline clearing and road decommissioning in roadless areas have been reviewed by the Rocky Mountain Regional Office for consistency with current law, regulation, and policy.

Disclosure of Impacts to the Human Environment

Short-term Uses and Long-term Productivity

The National Environmental Policy Act requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16).

Tradeoffs between short-term impacts and long-term, sustainable resource management are pivotal considerations for the North Savery Project. The project is intended to have significant, beneficial, long-term effects for forest vegetation, fuels profiles, and the transportation system. These changes would have short- and long-term implications for the condition of watershed, wildlife, and recreation resources, particularly the recreation experience along the Continental Divide National Scenic Trail Corridor. Individual resource analyses highlight the relationship between short-term impacts and long-term attainment of desired conditions.

Unavoidable Adverse Effects

Cumulative adverse effects are associated with the impact of extensive past and proposed timber harvest and changed forest conditions due in part to the pattern of fire suppression and forest management in the project area. Some watershed effects are adverse, and some will be unavoidable. However, the interdisciplinary team believes that design criteria developed to mitigate these effects are sufficient to prevent adverse effects from persisting in the long term and at such a level as to be irreversible.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of 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.

Pivotal resource impacts with potential to constitute irreversible or irretrievable commitments of resources are disclosed in this draft environmental impact statement. There is risk for potential for loss of timber production (irretrievable in this planning cycle) and watershed stability (irretrievable or irreversible depending on degree of impact). See the “Timber and Silviculture” (page 95) and “Watershed Condition” (page 105) sections earlier in this chapter for additional information.

Incomplete or Unavailable Information

No incomplete or unavailable information is known to have limited this analysis.

Other Required Disclosures

The National Environmental Policy Act at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with ... other environmental review laws and executive orders.”

National Forest Management Act -- Forest Plan Consistency

The modified proposed action is consistent with direction in the Medicine Bow National Forest Land and Resource Management Plan 2003 Revision (Forest Plan). The Forest Plan contains forestwide, management area, and geographic area direction to guide natural resource management activities

and provide an overall management strategy for the Medicine Bow National Forest. The most site-specific direction (geographic area direction) supersedes more general forestwide direction.

The modified proposed action is consistent with forestwide subgoals, objectives, and strategies under goals 1 and 2. The subgoals, objectives, and strategies emphasize the following:

- timber harvesting and thinning that mimic natural disturbances to move landscapes toward desired vegetation composition and structure
- increasing the amount of forests and rangelands restored to, or maintained in, a healthy condition with reduced risk and damage from fires, insects and diseases, and invasive species
- implementing vegetation management activities in areas most susceptible to losses from insects and disease and limiting mortality from insect and disease outbreaks in management areas where primary emphasis is timber production or developed recreation
- planning management activities by considering the potential for insect and disease outbreaks
- implementing a consistent timber program each year
- striving to offer the public sawtimber, products other than logs, and firewood

The modified proposed action is consistent with Forest Plan standards and guidelines for biological diversity (Forest Plan Chapter 1, page 1-31), silviculture (pages 1-35 through 1-40), and insects and disease (page 1-50).

Biological Diversity Standards and Guidelines

The modified proposed action complies with Forest Plan direction for old growth because the planned vegetation treatments are outside mapped old growth blocks. Current percentages of old growth in the Sierra Madre Mountain Range are aspen – 20.89 percent (51,035 acres), lodgepole pine – 17.15 percent (144,014 acres) and spruce/fir – 29.85 percent (55,999 acres).

Biological Diversity Standard 1. Manage old forest to retain or achieve at least the minimum percentages of old growth by cover type by mountain range shown in the following table. If stands meeting the old growth definition do not exist at these percentages, manage additional stands that are closest to meeting old growth criteria as recruitment old growth to meet these desired percentages. (Forest Plan, pg. 1-31)

Limit management of stands to actions necessary to maintain or restore old growth composition and structure. [Medicine Bow NF] (Standard, p. 1-31)

Identify and map old growth blocks that mimic natural patch size and distribution. Include non-linear, unfragmented blocks (over 300 acres) where available. Old growth in small, scattered stands, larger patches, and streamside stretches shall be maintained to produce a pattern that is well distributed across the landscape by making sure that some old growth is maintained in every Geographic Area. Consider connectivity when identifying scattered stands. [Medicine Bow NF] (Guideline, p. 1-31)

The modified proposed action complies with Forest Plan direction for aspen stands because aspen treatments are not proposed.

Biological Diversity Guideline 2. Maintain some aspen stands, even at the expense of invading conifers. (Forest Plan, pg. 1-31)

The modified proposed action complies with Forest Plan direction for habitat needs of species or communities at risk because they are addressed through specific design criteria if they occur in the project area.

Biological Diversity Guideline 4. Operations (such as timber harvest and other vegetative treatments) and road and motorized trail construction and management should be conducted to create patch sizes of sufficient area or appropriate spatial pattern to serve the habitat needs of species or communities at risk. (Forest Plan, pg. 1-32)

Silviculture Standards and Guidelines

The modified proposed action complies with Forest Plan direction for desired patch sizes, distribution, abundance, and edges because the design of the units in irregular shapes and sizes imitates characteristics of natural disturbances. Units shaped with nonlinear boundaries will increase the edge-to-interior ratio.

Biological Diversity Guideline 5. When managing vegetation, maintain existing, or move towards desired patch size, distribution, abundance, and/or edge-to-interior ratios, which are characteristic of natural disturbances (fire, insects, and diseases) representative of the cover types, measured at the Geographic Area scale. (Forest Plan, pg. 1-32)

The modified proposed action complies with Forest Plan direction for opening size because treatments are not designed to create openings greater than 40 acres. However, due to the mountain pine beetle epidemic, openings greater than 40 acres may be created.

Use a 40 –acre maximum size for openings created by even-aged management, regardless of forest type, with the following exceptions: where larger openings are the result of natural catastrophic condition of fire, insect or disease attack, or windthrow (standard 1b, p. 1-35).

The modified proposed action complies with Forest Plan direction for appropriate silvicultural systems because proposed treatments fall within the silvicultural systems for each cover type. Clearcut is the preferred prescription for this project. However, due to the differing ground conditions and the desire to retain seedlings and saplings, overstory removal will also be used.

Appropriate silvicultural systems by forest cover type will be (standard 2, p. 1-36):

Ponderosa pine - shelterwood, clearcut

Mixed conifer - Seed tree, irregular shelterwood, group selection, single-tree selection

Lodgepole pine - clearcut, shelterwood, group selection, seed tree, irregular shelterwood

Engelmann spruce/subalpine fir - shelterwood, irregular shelterwood, group selection, single-tree selection

Aspen - coppice, coppice with standards, group selection

The modified proposed action complies with Forest Plan direction for reforestation because site preparation activities, regeneration surveys, and planting could be used to ensure required reforestation is met in areas where the post-harvest standard of 150 trees per acre for conifers may not be met due to mountain pine beetle mortality.

No minimum seedling height requirements are specified. Seedlings must have survived a minimum of 1 year and be expected (on the basis of research and experience) to be able to produce the desired future stand condition specified for the area in the Forest Plan. The number of seedlings [150 trees per acre for conifers] represents the minimum number of

seedlings required, considering natural mortality, to produce a merchantable timber stand at rotation age without intermediate treatments [R2 Desk Guide] (standard 3, p. 1-36).

The modified proposed action complies with Forest Plan direction for harvest on lands not part of the suitable timber base because these areas are small percentage of the stand and of the project area as a whole. Vegetation treatments in these areas are consistent with the purpose and need of the project to revegetate stands affected by mountain pine beetles.

When trees are to be harvested on other than suitable lands, exceptions to the 5-year restocking standard are appropriate as documented in project decisions when the harvest meets one of the following criteria: [R2 Desk Guide] (standard 4, p.1-37)

- a. For permanent openings that serve specific management direction.
- b. Where provided for in specific management practices and prescriptions.
- c. Where it is desirable to delay regeneration and crown closure to meet specific desired conditions and management objectives.

The modified proposed action complies with Forest Plan direction for snags and snag recruitment because snag retention will be addressed in the silvicultural prescriptions, project design criteria, or both. Generally, snags will be left in islands, clumps, edges, and other areas not suitable for timber harvest. Adjacent stands and areas not being treated will also provide abundant snags. Meeting Forest Plan direction for snags in a stand is difficult due the number of dead trees from the mountain pine beetle epidemic and the hazards they represent during logging.

Timber harvest units will be designed to retain snags and snag recruitments according to Forest Plan Table 1-11. Retained snags and snag recruits are designated as wildlife trees and will be left on site if blown over. (Standard 5, p. 1-37)

The modified proposed action complies with Forest Plan direction for coarse woody debris because coarse woody debris retention will be addressed by slash treatment methods described in silvicultural prescriptions or by project design criteria.

Final timber harvest units will be designed to retain coarse woody debris well distributed in accordance with the ranges specified in the following table. Unmerchantable trees should be left standing to replace downed wood that is expected to be lost during site preparation treatment or if existing material does not meet the desired tonnage. [Medicine Bow NF] (Standard 6 p. 1-38)

The modified proposed action complies with Forest Plan direction for emulating patterns and frequency of natural disturbances because the irregular shapes and sizes of the units, the treatment prescriptions, and the silvicultural systems imitate characteristics of natural disturbances.

The design of a silviculture treatment should emulate the pattern and frequency of natural disturbances found in the landscape being treated. (Guideline, p. 1-39)

The modified proposed action complies with Forest Plan direction for regeneration of even-aged timber stands because stands not meeting 95 percent of the culmination of the mean annual increment fall under exceptions a, b, and d (see below).

Regeneration harvests of even-aged timber stands should not be undertaken until the stands have generally reached or surpassed 95% culmination of the mean annual increment (CMAI) measured in cubic feet. Exceptions may be made where resource management objectives or special resource considerations require earlier harvest, such as: [R2 Desk Guide]

- a. Stands that are in imminent danger from insect or disease attack/mortality.
- b. Wildlife habitat improvement.
- d. Ecosystem restoration.

The modified proposed action complies with Forest Plan direction for reducing activity fuels because residual fuels from management activities will be treated based upon the silvicultural prescriptions or project design criteria.

Reduce activity fuels resulting from all projects/activities to acceptable levels in a cost effective manner, in consideration of soil protection and wildlife habitat needs for retention of downed wood. [Medicine Bow NF] (Guideline 3, p. 1-40)

Insects and Disease Standards and Guidelines

The modified proposed action complies with Forest Plan direction for integrated pest management because treatments are designed to benefit for wildlife, improve range conditions, revegetate stands affected by mountain pine beetles, reduce hazard trees, and reduce future heavy fuel loading. Treatments would reduce heavy fuel loadings adjacent to private and State lands and reduce future impacts from the mountain pine beetle.

Use integrated pest management techniques, including silviculture treatments, to meet management area objectives. Base treatments activities on achieving multiple use and ecosystem management objectives and reducing risks to adjacent private and public lands. Give priority to areas in which values to be protected exceed cost of protection; for example, areas adjacent to subdivisions, recreation sites, suitable timberlands, or areas of concentrated public use. (Guideline 1, p. 1-50)

The modified proposed action complies with Forest Plan direction for using vegetation management to meet objectives and reduce risk of insects and disease because all areas in the project have experienced epidemic levels of mountain pine beetle infestation. At this time, reduction of risk is not applicable to this project.

Use vegetation management practices to meet objectives and reduce risk of insects and disease. Give priority to cover types identified as moderate to high risk. (Guideline 2, p. 1-50)

The modified proposed action complies with Forest Plan direction for considering existing infestations of insects or disease within the project area because the project area has experienced epidemic levels of mountain pine beetle populations. Influence or spread of insects and disease will be minimized to the extent possible; however, since most areas have experienced heavy mortality, reducing the spread of insect infestation is not applicable to this project.

In project plans, consider existing infestations of insects or disease within the project area. Design activities to minimize risk of spreading infestation and meet multiple use and ecological objectives. (Guideline 3, p. 1-50)

Forest Plan Geographic Areas

The North Savery project area includes portions of two geographic areas: North Savery and Northeast Sierra Madre. The North Savery Project is consistent with direction for both geographic areas.

The Medicine Bow National Forest Plan established twenty-eight geographic areas. Geographic areas are watersheds or aggregations of watersheds in which management is directed towards achieving a

specific desired condition. They link the Forest Plan to management at a landscape or watershed scale and are the focal point for implementing Forest Plan decisions based on ecological assessments. The Savery landscape analysis (2007) forms the basis for understanding the ecosystems in the North Savery project area.

National Forest Management Act – Species Viability

The North Savery Project is consistent with direction for considering impacts to sensitive species at the project level during National Environmental Policy Act analysis and includes design criteria to avoid site-specific impacts. Forest Service sensitive species were considered in detail in the wildlife biological evaluation, available online or in the project record at the Brush Creek/Hayden Ranger District.

National Forest Management Act – Timber Suitability and Harvest

Timber Suitability

Section 6.g.2.a of the National Forest Management Act of 1976 requires identification of land suitability for resource management. Forest Service Handbook 2409.13 defines suitable forest lands as land to be managed for timber production on a regulated basis. Timber harvest is scheduled on suitable lands and timber volume harvested from suitable lands are charged to the Medicine Bow National Forest allowable sale quantity identified in the Forest Plan. The project area includes 24,785 (54 percent) acres classified as suitable for timber production, and the remaining 20,915 (46 percent) acres are classified as nonsuitable.

Timber Harvest [16 U.S.C. 1604 (g)(3)(E)]:

There is reasonable assurance that if prescriptions are implemented as described:

1. soil, slope, or other watershed conditions will not be irreversibly damaged;
2. lands can be adequately restocked within five years after final regeneration harvest;
 - a. In the majority of potential clearcut units, there are adequate existing lodgepole pine cones and seed to assure natural regeneration and cone serotiny ranges from moderate to high. Cone serotiny is low to moderate and more intensive artificial regeneration may be needed in some units.
 - b. In all the clearcut units, site preparation will occur as soon after harvest as possible, where needed. Monitoring will be done to determine if adequate natural regeneration is occurring and if not artificial regeneration will be planned. The Forest seed bank contains seed for reforestation purposes, and as needed additional seed will be collected for artificial regeneration.
3. streams, streambanks, shorelines, lakes, wetlands, and other bodies of water are protected from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment where harvests are likely to seriously and adversely affect water conditions or fish habitat; and
4. the harvesting system to be used was not selected primarily because it will give the greatest dollar return or the greatest unit output of timber.

Consistency [36 CFR 219.8(e)]:

1. Timber harvest would occur on lands suited for timber production or would occur in areas where timber harvest is permitted and is necessary to help achieve other resource management objectives; and
2. Silvicultural treatments are consistent with the Forest Plan.
3. Even-aged regeneration harvests are appropriate to meeting the objectives and requirements of the Forest Plan.
4. Projects are consistent with the area-specific components of the Forest Plan.

Even-aged Regeneration Harvests [16 U.S.C. 1604 (g)(3)(F)]:

1. Clearcutting is the optimum method because:
 - a. It meets the objectives of the Forest Plan for the management areas proposed for treatment.
 - b. It is a scientifically sound regeneration method for lodgepole pine (Alexander 1986).
 - c. It is a scientifically sound method for reducing the spread of dwarf mistletoe in lodgepole pine stands. (Alexander 1986);
 - d. Most stands have generally reached culmination of mean annual increment. However, since all proposed harvest in the Savery analysis is being done for the purpose of salvaging dead and dying stands, they are an exception to the requirement that stands have generally met the culmination of mean annual increment.
 - e. Proposed clearcut regeneration harvest would occur in stands which are currently beetle infested and where future reforestation is a concern (Amman et al. 1977). High percentages of mountain pine beetle mortality and dying infested trees, along with expected high levels of blowdown of residual live trees, makes clearcutting the only viable harvest option in stands where there are low to nonexistent levels of manageable understory trees.
2. Clearcuts and shelterwood regeneration harvests are appropriate to meeting the objectives and requirements of the Forest Plan.
3. An interdisciplinary review was completed and the potential environmental, biological, aesthetic, engineering, and economic impacts were assessed and the cutting methods are consistent with the multiple use of the project area.
4. Cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain and disturbance patterns.
5. Clearcut and shelterwood harvests may create openings larger than 40 acres. The Regional Guide and the 2003 Forest Plan both list the following exception to the 40-acre limitation:

“b. Where larger openings are the result of natural catastrophic conditions of fire, insect or disease attack, or windstorm”

The project silviculturist has certified the clearcuts and overstory removal treatments that will create openings greater than 40 acres in size fit the definition and situation of this exception and therefore regional forester approval and 60-day public review are not required.

6. Harvest will be consistent with the protection of soil, watershed, fish, wildlife, recreation, esthetic resources, cultural, and historic resources and the regeneration of timber resources.

Culmination of Mean Annual Increment [16 U.S.C. 1604 (m)]:

Stands of trees harvested have generally reached the culmination of mean annual increment of growth. “Generally reached culmination” is defined as the age at which the stand achieves at least 95 percent of the cubic foot volume at culmination. The culmination of mean annual increment requirement only applies to even-aged management on lands suited for timber production. The requirement does not apply to thinning, salvage, or sanitation harvests or to harvests designed to achieve nontimber resource objectives (Forest Service Manual 1921.12f). Culmination of mean annual increment occurs when the periodic annual increment equals the mean annual increment. The mean annual increment is calculated by adding the current stand volume with any mortality, previous removal, or both and then dividing by the stand age. Although most stands have generally reached culmination of mean annual increment, all proposed harvest in the North Savery analysis is being done for the purpose of salvaging dead and dying stands and as such are exceptions.

Forest Plan Direction – Southern Rockies Lynx Amendment

The Upper Sierra Madre lynx analysis unit overlaps with the southern part of the North Savery project area and considerations under the amendment have been applied in that area. Consultation with the U.S. Fish and Wildlife Service is underway for the North Savery Project. Potential impacts are described earlier in this chapter. The project activities are consistent with the Southern Rockies lynx amendment.

Forest Plan Direction – Greater Sage-grouse Amendment

Although the majority of greater sage-grouse habitat is not located on the Medicine Bow National Forest, there are small areas of identified priority and general greater sage-grouse habitats along the low elevation forest-shrub interface along the forest boundary in the North Savery project area. Several of the cooperating agencies identified the need for clarification on this point during an early review of the draft environmental impact statement. Consistency with applicable Forest Plan guidance for greater sage-grouse with the modified proposed action is one of the consistency requirements for the North Savery Project.

Small amounts of fenceline clearing (0.5 miles) and road decommissioning are proposed within mapped priority sage-grouse habitats reflected in the Forest Plan amendment. However, we believe this to be an artifact of the coarseness of habitat mapping at this scale rather than an indicator of true impact because sage-grouse use of mature conifer stands is very limited. Decommissioning 1.5 miles of open system roads would have a marginally beneficial effect on sage-grouse habitats to the extent that revegetation and reduced disturbance would be expected. These activities are believed to be consistent with the amendment.

Small amounts of precommercial thinning (17 acres) and addition of existing unauthorized routes to the designated road system (0.3 miles) are proposed within “general” sage-grouse habitats reflected in the Forest Plan amendment. Again, we believe the overlap between mapped sage-grouse habitat and proposed precommercial thinning to be an artifact of the coarseness of habitat mapping at this scale rather than an indicator of true impact, because sage-grouse use of dense young conifer stands is very limited. Designation of any existing unauthorized route as part of the open system of National Forest roads would have a marginal, potentially negligible, negative impact on sage-grouse habitats to the extent that disturbance may increase during periods of heavy forest visitation, such as during fall hunting seasons. However, fall is not a critically limiting season for sage-grouse, and

this effect is likely to be very small. These activities are also believed to be consistent with the amendment.

Healthy Forests Restoration Act and Farm Bill Amendment

The overall objective of the North Savery Project is to manage forest stands and the associated transportation system to restore future landscape resiliency by accelerating restoration of stands damaged by insects and disease, maintaining emergency access to and egress from National Forest System lands and inholdings, and restoring watersheds to a condition that would be more resilient to runoff and sedimentation during extreme conditions and events. This objective is consistent with the authorities and requirements of the Healthy Forests Restoration Act.

The specific relationship between each type of proposed activity and the authorities and objectives of the Healthy Forests Restoration Act are examined in table 26. The most important consideration is the way this project and its components are designed to work together to restore several elements of landscape resiliency in the North Savery project area. This relationship can be examined for each proposed action and its corresponding objective within the Healthy Forests Restoration Act.

There is a direct and immediate relationship between vegetation management activities proposed to reduce hazardous fuels and overhead hazards, and those objectives around protecting communities, human safety, and infrastructure. There is an indirect relationship between activities proposed to increase forest resiliency through regeneration and thinning of forest stands to improve the condition class of forest stands and the objective development of a more resilient forest able to withstand changing climate and risks of wildfire over the next 10 to 80 years. There is also an indirect but strong relationship between actions intended to reduce road density and connected disturbed areas, and objectives to restore landscape and watershed resiliency. These actions are intended to directly address the risks of watershed destabilization associated with both human caused impacts and natural variations in weather events. Actions the Forest Service initiates must be consistent with the Forest Plan, even when significant impacts are disclosed during the National Environmental Policy Act processes. Furthermore, the effect that existing conditions and cumulative effects must be factored into project determinations of consistency. The indirect but closely interconnected actions to manage the forest transportation system fall in this category.

Considering the integrated project development and interrelated effects of all proposed actions, the North Savery Project is believed to be consistent with the Healthy Forests Restoration Act.

Table 26. North Savery project components crosswalk between purpose and need and the Healthy Forests Restoration Act (HFRA) authority and objectives

Activity	Acres or Miles	Project Purpose & Need	HFRA Purpose	HFRA Priorities	Project Considerations
Salvage harvest to regenerate forest stands to desired species with lower fuel profile	5,634 acres	Provide merchantable timber, promote forest regeneration, improve stand growth and vigor, Restore ecosystem, forest and watershed resiliency	HFRA Section 2, Purposes 1, 3 and 6: Reduce wildfire risk to communities Protect watersheds and address threats to forest and rangeland health Protect, restore and enhance forest ecosystem components	Work in wildland-urban interface, communities at risk, within 0.5-1.5 miles of values at risk. Work in appropriate condition class and fire regime areas. Retain large trees. Work to protect watersheds and threatened or endangered species and habitats at risk of catastrophic fire.	North Savery Project does not include proposed treatment in mapped and inventoried old growth stands recognized under Forest Plan direction. 3,803 acres (48 percent) activity is planned in community wildfire protection plans and additional 3132 acres (40 percent) within 1.5 miles of communities at risk. Watershed design feature for some watersheds in communities-at-risk buffer would limit treatment below these values.
Precommercial thinning to increase stand resilience by reducing competition	1,035 acres	Improve stand growth and vigor large, reduce continuous, high-hazard fuel conditions, Restore ecosystem, forest and watershed resiliency	HFRA Section 2, Purpose 3: Protect watersheds and address threats to forest and rangeland health	Work in wildland-urban interface, communities at risk, within 0.5-1.5 miles of values at risk. Retain large trees	North Savery Project does not include proposed treatment in mapped and inventoried old growth stands recognized under Forest Plan direction. Thinning now creates more resilient future stands at maturity. 220 acres (21 percent) in communities at risk; additional 616 acres (60 percent) in 1.5 mile communities at risk buffer
Temporary road construction and reclamation	24 miles	Reduce continuous, high-hazard fuel conditions, promote forest regeneration, provide merchantable timber improve stand growth and vigor	HFRA Section 2, Purpose 1: Reduce wildfire risk to communities, implement authorized hazardous fuel reduction projects	Enhance efforts to protect watersheds and address threats to forest and rangeland health. Restore ecosystem components necessary for landscape resiliency.	Necessary to provide temporary access to treatment areas with minimum long term impact. Temporary roads are proposed only where existing access does not allow efficient access and would be restored to disconnect disturbance from affected stream courses.
Clearing hazard trees	6.8 miles along fences 0.5 miles along water conveyance ditches 7.5 miles along maintenance level 1 roads	Improve public safety by removing hazard trees, reduce continuous, high-hazard fuel conditions	HFRA Section 2, Purpose 1: Reduce wildfire risk to communities, implement authorized hazardous fuel reduction projects	Protect public safety and infrastructure, retain large trees	North Savery Project does not include proposed treatment in mapped and inventoried old growth stands recognized under Forest Plan direction.

Activity	Acres or Miles	Project Purpose & Need	HFRA Purpose	HFRA Priorities	Project Considerations
Extra slash treatment to create fuel breaks	220 acres	Reduce large, continuous, high-hazard fuel conditions	HFRA Section 2, Purposes 1 and 3: Reduce wildfire risk to communities, protect watersheds and address threats to forest and rangeland health	Work in wildland-urban interface, communities at risk, within 0.5-1.5 miles of values at risk. Work in appropriate condition class and fire regime areas. Retain large trees. Work to protect watersheds and threatened or endangered species and habitats at risk of catastrophic fire.	Fuel treatments are proposed to disrupt fuel profiles between timber production areas and other forest stands across the landscape.
Relocate existing system roads to reduce resource damage	0.75 miles	Restore ecosystem, forest and watershed resiliency	HFRA Section 2, Purpose 3: Protect watersheds and address threats to forest and rangeland health	Protect essential egress for communities at risk. Enhance efforts to protect watersheds and address threats to forest and rangeland health. Restore ecosystem components necessary for landscape resiliency.	Watershed Condition Framework identifies road density as contributing to “impaired function” in 3 of 4 6 th -level hydrologic unit code watersheds in the area. Replacement of roads will include construction to bring new routes to appropriate standard and minimize long term connection of disturbed area by road network.
Add specific unauthorized routes to the designated system	5.5 miles	Designate and maintain a sustainable road system for forest management and public access. Complete requirements of the Travel Management Rule (36 CFR Subparts A and B). Restore ecosystem, forest and watershed resiliency	HFRA Section 2, Purposes 1, 3 and 6: Reduce wildfire risk to communities, implement authorized hazardous fuel reduction projects. Enhance efforts to protect watersheds and address threats to forest and rangeland health. Restore ecosystem components necessary for landscape resiliency.	Protect essential egress for communities at risk. An authorized hazardous fuel reduction project shall be conducted consistent with the resource management plan and other relevant administrative policies or decisions applicable to the Federal land covered by the project.	Watershed Condition Framework identifies road density as contributing to “impaired function” in 3 of 4 6 th -level hydrologic unit code watersheds. Project has identified routes in better locations and with fewer resources than existing roads to be decommissioned; net change maintains access but improves watershed resilience to extreme events.

Activity	Acres or Miles	Project Purpose & Need	HFRA Purpose	HFRA Priorities	Project Considerations
Change road or route segments to off-highway vehicle trails to reduce level of vehicle impact	2.6 miles	Restore ecosystem, forest, and watershed resiliency Designate and maintain a sustainable road system for forest management and public access. Complete requirements of the Travel Management Rule (36 CFR Subparts A and B). Restore ecosystem, forest and watershed resiliency	HFRA Section 2, Purposes 3 and 6: Protect watersheds and address threats to forest and rangeland health. Restore ecosystem components necessary for landscape resiliency.	Protect essential egress for communities at risk. An authorized hazardous fuel reduction project shall be conducted consistent with the resource management plan and other relevant administrative policies or decisions applicable to the Federal land covered by the project.	Watershed Condition Framework identifies road density as contributing to “impaired function” in 3 of 4 6 th -level hydrologic unit code watersheds. Uncontrolled vehicle use is a threat to forest, rangeland, and watershed health. Change in vehicle type reduces site specific impacts without decommissioning routes. Action mitigates loss of public access otherwise reduced by reducing road density to restore landscape resiliency.
Decommission roads adversely affecting watershed condition and wildlife habitats	20.1 miles	Restore ecosystem, forest and watershed resiliency	HFRA Section 2, Purposes 3 and 6: Protect watersheds and address threats to forest and rangeland health Restore ecosystem components necessary for landscape resiliency.	An authorized hazardous fuel reduction project shall be conducted consistent with the resource management plan and other relevant administrative policies or decisions applicable to the Federal land covered by the project.	Watershed Condition Framework identifies road density as contributing to “impaired function” in 3 of 4 6 th -level hydrologic unit code watersheds. Action restores watershed resiliency by reducing connected disturbed area and increasing ability of watersheds to withstand extreme conditions and events. Necessary work to assure for connected actions and cumulative effects meet Forest Plan standards. Forest plan consistency required by HFRA.

Continental Divide National Scenic Trail Comprehensive Plan

The Continental Divide National Scenic Trail Comprehensive Plan (USDA Forest Service 2009) states that the primary policy is to administer the Continental Divide National Scenic Trail consistent with nature and purposes for which it was established. The nature and purposes of the Continental Divide National Scenic Trail are to provide for high-quality scenic, primitive hiking and horseback riding opportunities and to conserve natural, historic, and cultural resources along the trail corridor.

The trail is managed and administered within the guidelines for National Scenic Trails and the land and resource management policies of the respective agencies will further the national goal of promoting public enjoyment and appreciation of our scenic outdoor areas.

Ideally, the trail shall be located as close to the geographic Continental Divide as possible, but as far away as necessary to provide safe travel and diverse recreation appeal, to be economically feasible, and to keep environmental impacts to an acceptable level. Use public lands or existing public right-of-ways as much as possible. The Continental Divide National Scenic Trail in the North Savery analysis area is generally located in close to the Continental Divide. It is not located in any primitive or nonmotorized recreation opportunity spectrum areas as was recommended in the comprehensive plan. Several relocations of the Continental Divide National Scenic Trail in the North Savery area have already occurred to make connection with other public rights-of-way more feasible.

Land management agencies are to use the recreation opportunity spectrum system in delineating and integrating recreation opportunities in managing the Continental Divide National Scenic Trail. Where possible, it is best to locate the Continental Divide National Scenic Trail in primitive or semi-primitive nonmotorized recreation opportunity spectrum classes; provided the trail may have to traverse intermittently through more developed recreation opportunity spectrum classes to provide for continuous travel between the Canada and Mexico borders. In the North Savery area, the trail traverses more developed recreation opportunity spectrum classes based on its location near the divide.

The existing condition along the Continental Divide National Scenic Trail in the proposed North Savery project area has 80 to 90 percent mountain pine beetle-killed standing and falling dead lodgepole pine trees. If there is funding, trail maintenance only allows cutting out logs or downed trees across the trail. After that one-time maintenance occurs, trees continue to fall and hamper use of the trail. Forest Service personnel have contacted hikers along National Forest System Road 801. The hikers are off the trail due to heavy downfall or unpassable segments along the trail. The concern of those hikers is not scenery, it is how to use the trail. Management of dead scenery is not addressed in the Continental Divide National Scenic Trail Comprehensive Plan, but safe travel is. The North Savery Project would promote safe travel over the long and short term and improved scenery over the long term. There would be short-term negative impacts to scenery with the proposed design criteria implemented in activity areas along the trail corridor.

All of the proposed timber treatments along the Continental Divide National Scenic Trail in the North Savery project are located in 5.13 Forest Products management areas. The Continental Divide National Scenic Trail is a concern level 1 travel route, and the scenic integrity objective is high or very high depending on the Continental Divide National Scenic Trail segment. Of the segments that run through the North Savery project area, approximately 2.1 miles is in semiprimitive motorized with the remaining in either roaded natural or roaded modified. Forestwide standards and guidelines for dispersed recreation have recreation opportunity spectrum guidelines. Forestwide recreation opportunity spectrum has one standard; to conduct managed activities to comply with the requirements of the adopted recreation opportunity spectrum class and the scenic integrity

objective in the management area prescription. Management Area 5.13 Forest Products has the guideline for recreation to manage for a year-round recreation opportunity spectrum class of rural, roaded natural, semi-primitive motorized or, semi-primitive nonmotorized, as mapped. The guideline for scenery is to meet or exceed the scenic integrity objective of low.

Table 27 identifies the relationship of recreation opportunity spectrum classes and scenic integrity (visual resource management) objectives applicable to the Continental Divide National Scenic Trail. To the extent that roaded natural and roaded modified areas where the trail is located can be consistent to fully compatible with the scenic integrity objectives for the trail, this project is reliant on careful implementation of specific design criteria to achieve consistency with the comprehensive plan.

Table 27. Relationship of recreation opportunity spectrum (ROS) classes and scenic integrity objectives (SIO) objectives (USDA Forest Service 2009).

ROS Class	SIO Very High, Class I	SIO High, Class II	SIO Moderate, Class III
Primitive	Normally consistent	Inconsistent	Unacceptable
Semi-primitive nonmotorized	Fully compatible	Normally consistent	Inconsistent
Semi-primitive motorized	Fully compatible	Fully compatible	Normally consistent
Roaded natural	Fully compatible	Normally consistent	Normally consistent
Rural	Fully compatible	Fully compatible	Normally consistent
Urban	Fully compatible	Fully compatible	Fully compatible

Roadless Rule

Proposed fenceline clearing and road decommissioning in roadless areas have been reviewed by the Rocky Mountain Regional Office for consistency with current law, regulation, and policy. This review occurs prior to scoping and public disclosure of the draft environmental impact statement analysis, and again prior to the final project decision. Proposed activities are consistent with policies implementing the Roadless Rule.

Endangered Species Act

Species listed as threatened or endangered were considered in the wildlife biological evaluation and botany report, available in the project record at the Brush Creek/Hayden Ranger District. The North Savery Project is consistent with direction for considering impacts to listed species at the project level during National Environmental Policy Act analysis, includes design criteria to avoid site-specific impacts, and has been reviewed by the U.S. Fish and Wildlife Service, which concurs with findings disclosed in this draft environmental impact statement.

Environmental Justice Act

This disclosure and decision making process is accessible to all via a variety of mediums and in a wide range of locations, and is consistent with the Environmental Justice Act. The Environmental Justice Act (2016) is intended to assure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

National Historic Preservation Act

The Programmatic Agreement Among the USDA Forest Service, Wyoming Forests, Wyoming State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Compliance with the National Historic Preservation Act on the National Forests and Grasslands of Wyoming (2008, amended in 2014 and 2015) outlines alternative processes for consulting with the Wyoming State Historic Preservation Office for vegetation management and travel management undertakings. This document also defines the stipulations that must be met in order to invoke the programmatic agreement. Consultation with the State Historic Preservation Office is also the mechanism for ensuring consistency with other laws, regulations, and policies for cultural resource protection, including:

- **Antiquities Act of 1906**, which protects any object of antiquity on federal lands;
- **American Indian Religious Freedom Act of 1978 (AIRFA)** (P.L. 95-442), which preserves the inherent rights of American Indians ‘for freedom to believe, express and exercise “their traditional religions;
- **Archaeological Resources Protection Act of 1979 (ARPA)** provides for criminal and civil penalties for anyone collecting artifacts or damaging archaeological sites on federal lands without a federally issued permit to excavate for research purposes, and provides for consultation with affected tribal governments;
- **Executive Order 11593**-Protection and Enhancement of the Cultural Environment of 1971 provides for the protection and enhancement of the cultural environment;
- **Executive Order 13007**-Indian Sacred Sites of 1966 directs federal land managers to “(1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites” and to “where appropriate, agencies shall maintain the confidentiality of sacred sites”;
- **Executive Order 13084**-Consultation with Indian Tribal Governments of 1998 directs agencies to grant fee waivers in areas where the agency has the discretion to do so, when a tribal government makes a request;
- **Interior Executive Order (EO) 3175** of 1992 requires all federal agencies to carry out the trust responsibilities of the federal government, to assess the impacts of their actions on Indian trust resources and to consult with tribes when impacts are identified;
- **National Historic Preservation Act (NHPA) of 1966** as amended through 2000 requires federal agencies to take into consideration the effects of their activities or permitted activities on cultural properties, and provides for the participation of Indian tribes where there is the potential to affect sites identified as “Traditional Cultural Properties” or culturally significant to Americans Indians; and
- **Native American Graves Protection and Repatriation Act (NAGPRA)**, recognizes the rights of the Indian Tribes and American Indian organizations as caretakers of human remains, funerary objects, sacred objects, and objects of cultural patrimony with which they can demonstrate a reasonable biological or cultural affiliation, and conveys to such groups the rights to decide upon the disposition of such items.

Chapter 4: Administrative Material

Preparers and Contributors

The following individuals were primarily responsible for preparing the environmental impact statement or contributed to technical discussions as indicated.

Table 28. Interdisciplinary team members and forest service resource specialists

Team Member	Resource Specialty	Qualifications
Melanie Fullman	Responsible official, district ranger	BS in forestry, wildlife, and recreation; 28 years interdisciplinary experience with U.S. Forest Service and State and County agencies.
Bill Baer	Aquatic resources	BS in wildlife management; 23 years in fisheries and 7 years interdisciplinary U.S. Forest Service experience
Jillian Gantt	Cultural resources	MA in anthropology; 10 years of U.S. Forest Service experience in cultural resource management
Dave Gloss	Hydrology	BS in environmental resource management, MS in forest hydrology; 26 years of U.S. Forest Service experience in forest hydrology
Paula Guenther	Interdisciplinary coordination	BS in zoology, MS in water resource management; 27 years of interdisciplinary experience with U.S. Forest Service, Bureau of Land Management and The Nature Conservancy
Wendy Haas	Rangeland management	BS and MS in wildlife biology; 30 years of U.S. Forest Service experience in rangeland management
Dustin Hill	Cultural resources	BA in anthropology and biology, MA in anthropology; 8 years of U.S. Forest Service experience in cultural resource management
Kolleen Kralick	Cultural resources	BA in anthropology, BS in business administration, MA in anthropology, PhD in anthropology; 25 years of U.S. Forest Service experience in cultural resource management
Steve Loose	Terrestrial wildlife	BS in zoology and physiology, MS in wildlife management; 14 years of U.S. Forest Service experience in wildlife management
Ryan Nupen	Engineering	BS in geological engineering from South Dakota School of Mines and Technology; 15 years of U.S. Forest Service experience in engineering
Josh Peck	Timber and forest vegetation	BS in forest management; 8 years of U.S. Forest Service experience in forestry and timber management

Team Member	Resource Specialty	Qualifications
Christie Schneider	Timber and forest vegetation / Silviculturist	BS and MS in forest management; 30 years of experience in forestry with the U.S. Forest Service
Randy Tepler	Soils	BS in groundwater management and minor in soil science; 20 years soils and interdisciplinary experience with the U.S. Forest Service
Casey Cheesbrough	Fire and fuels	BSE in Biology; 15 years U.S. Forest Service experience in firefighting, fire behavior and modelling, and as a fuels specialist
Jeff Tupala	Scenic resources	BS in Forestry, MLA in Landscape architecture; retired
Brian Waugh	Recreation	BS in wildlife ecology; 25 years of recreation, timber and other interdisciplinary experience with U.S. Forest Service
Monique Nelson	Interdisciplinary coordination 2015 to 2016	BS in natural resource management, MS in ecology; 10 years U.S. Forest Service experience in resource inventory, monitoring, and National Environmental Policy Act analysis
Brenda Yankoviak	Continental Divide National Scenic Trail administrator	MS in recreation management; 17 years of U.S. Forest Service experience in recreation and trails management
Daniel Cressy	Landscape architecture, scenery management, recreation planning	MLA in landscape architecture, BA in environmental studies; 14 years U.S. Forest Service interdisciplinary experience

Collaborators and Stakeholders

Carbon County commissioners and other staff have been involved in two-way exchange of information about development of the North Savery Project. Most recently, the Forest Service participated in the collaborative development of the 2016 update of Carbon County’s Community Wildfire Protection Plan, including identifying two communities at risk in the North Savery project area.

The Saratoga-Encampment-Rawlins Conservation District and Wyoming Game and Fish Department have been acting as cooperating agencies for the North Savery Project. Staff of both organizations have provided relevant information to the North Savery Project team as described in the detailed discussion of the modified proposed action in Chapter 2.

To improve communication and information sharing between State agencies and the Forest Service, the Office of the Governor, State of Wyoming and the Intermountain and Rocky Mountain Regions of the U.S. Forest Service have entered into a memorandum of understanding (USDA Forest Service 2016c). Release of this draft environmental impact statement is the first opportunity to act on the memorandum of understanding by distributing the document to the suite of State agencies that expressed interest in receiving environmental documents dealing with forest management, fire and fuels, travel, recreation, visitor use, off-highway vehicle management, water resources, or air quality. The full list of agencies with whom we will engage is listed under “Distribution” (below).

Consultation with US Fish and Wildlife Service on potential effects to Canada lynx is up to date.

Considerable interest in proposed activities along the Continental Divide National Scenic Trail gave rise to detailed evaluation of the role that goals in the comprehensive plan for the trail play in determining suitable management activities in the trail corridor, and development of specific design criteria to protect the trail (see Chapter 2). The organization with a lead voice for management of the trail was in transition during project development, so efforts were made to engage with the Continental Divide Trail Alliance (now defunct), Continental Divide Trail Society, and National Scenic Trails, as well as with the Forest Service's National Continental Divide National Scenic Trail coordinator.

Potentially affected livestock grazing permittees were involved in development of proposals to treat hazard trees along forest boundary fences, allotment and pasture fences, and irrigation ditches. The project team appreciates involvement by Jack and Kirby Berger (Berger Ranches), Mike Crimmins (Kelley Cattle Co., LLC), Dick and Suzanne Mowry (Mowry Ranch, Inc.), and Gene Carrico (Dexter Peak Ltd.).

Potentially interested Tribes including were invited to participate in this project during scoping. Scoping information was made available to 20 Tribal entities (see list under "Distribution" below). No Tribal comments were received.

Comments Received During Scoping

Comments were received from the following individuals or organizations. Comment letters were assigned a commenter number (#) and subjected to analysis for the content of comments.

- Berger Ranches, Kirby Berger (2)
- Continental Divide Trail Society, Jim Wolf (14)
- Environmental Protection Agency Region 8, Philip Strobel (5)
- Forest Service Employees for Environmental Ethics, Matt Rasmussen (11)
- National Scenic Trails, Greg Warren (12)
- Saratoga-Encampment-Rawlins Conservation District, Joe Parsons (10)
- Wyoming Department of Agriculture, Doug Miyamoto (9)
- Wyoming Department of Environmental Quality, Mark Conrad (3)
- Wyoming Game and Fish Department, John Kennedy (8)
- Wyoming State Forestry Department, Carson Engelskirger (4)
- Dick Artley (1)
- Jack Berger (6)
- Barbara Parsons (13)
- Jean Public (7)

Table 29. Content analysis of comments received during public comment period from December 1, 2015 to February 1, 2016

Commenter	Comment
9	Supports road decommissioning projects, and insists MBNF provide adequate enforcement. Ensure reclamation plans to revegetate roads.
1	Present the effects of 21 miles of temporary roads.
1	Include the list of sources in the analysis and references cited. "Road Woes for the Forest Service", March 2002, The United States Forest Service: the World's Largest Socialized Road-Building Company", May 1993, "Think Like a River: the Cumulative Effects of Roads on Aquatic Systems", November 1998
10	Do not support addition of unauthorized roads or trails to the system. Sets a bad precedent.
10	Ensure special use permittees have access to permitted areas before implementation.
10	Add rationale in Appendix A for 1 mile of new road construction, 2 miles of reconstruction, addition of 6 miles of unauthorized routes, conversion to off-highway vehicle trail, conversion to foot trail, reroutes (830.1B, 452.1D, 435). Include a column for distance.
13	There is a demand for road and trail access to the forest; recommend keeping most roads and trails in place or providing a reroute to prevent route creation. There is not enough enforcement to stop 4 wheeler abuse. Keep roads that aren't duplicative or causing resource damage.
13	Use a PR campaign to build and maintain a trail and road system with user fees that minimizes damage to resources.
2	Road 435--Has been reconstructed and no further work needed.
10	Road 435--.37 miles is in sage-grouse core habitat. Road is sufficient for access but should be closed to general public.
2, 6, 10	435.1B-- No duplicate access, but good if enforced. Unclear where this will be decommissioned. There is a short spur going to the NE ending in a fence corner at the north end of the forest boundary. This spur is unnecessary and people who use it leave the gate open. The main road goes directly north to a cattleguard approximately 1/4 mile from where the gate is continually left open.
6, 10, 9	435.1B--map shows reconstruction. The creek crossing has been fixed. Nothing further needs to be done since this road connects to a BLM road that is an even lower standard road than this. Also shows a construction of new road to the corner of the forest to some private land. There is good access to this private land on the BLM side of the forest boundary. Instead of showing "construct new road," this user route should be decommissioned.
8	Recommend work with BLM and State Lands and Investments to address maintenance needs between forest boundary and county road 640 to allow continued access to the forest.
8	Do not construct new road to private land.
2	435.2A--This road should be decommissioned as well. It has been closed for many years by a camp that used to park at the trailhead and walk in. Now people are beginning to use this road that is close to growing back in.
6, 10	435.2D-- good if enforced.
2, 6, 10	435.4A-- Good proposal to decommission. The fence has been repeatedly cut on forest boundary adjoining BLM land. Was a temp logging road before Forest Service marked with a road sign.
2	435.5A and 6A--The gates leaving the forest are left open by hunters. I would propose a cattleguard be put in on 435.6A where it leaves the forest.

Commenter	Comment
2, 6, 10	448--Reroute-- good proposal of rerouting this road away from wetland and private land. I would consider the closing of the road on the northwest where it leaves the forest as a priority to enforce. It will require a large commitment to enforce this as people are used to using it and there is not another access for miles. People who access here trespass on private land and leave gates open continually. It would be good to have cooperation with private land owner on the other end of this road to enforce.
4	448 and 448.1B Recommend keep as L1 roads for access to state parcel; notify Wyoming State Forestry Division before installing gates to verify no boundary conflicts.
2	448.1B--close to public. Good proposal. Enforcement?
2, 6, 10	448.1C--Decommission--good proposal. Also another user route on ridge top just west of 448.3C that crosses 448.1C.
2, 6, 10	448.1D--Decommission--good proposal. Tried to decommission before but it was not enforced.
2, 6, 10	448.1F--Decommission--good proposal.
2, 6, 10	448.2C--Decommission--good proposal. Enforcement?
2, 6, 10	448.2D--Decommission--Road does not exist. Maybe a game trail. This road should be removed from the map completely so that no one sees it on the map and tries to find it. Remove from map instead of decommissioning.
6, 10	448.2V--Been closed for years, just needs removal from map.
2, 6	448.3C--Decommission--good proposal. This road is important to maintain fence by users of grazing allotment. I understand that we can get a permit to use some of these roads when needed. Is that correct? Cooperation with private land owner would help enforce this closure from other end of the road. How is access going to be controlled from outside the forest? Will be hard to enforce/control.
6, 10	451--shown for hazard tree removal. North end of road is mapped incorrectly.
2, 6, 10	452.1A--There is a very new road that continues on to the west of where this road ends. It is creating severe resource damage in a wet area. This new road (which is not on the map and should not ever be put on a map) should be blocked and have a sign for closing. There is a very narrow and good spot to close this new road. Need to close the recent extension of this road paralleling state land, turning south up the ridge.
6, 10	452.1F, 452.2N, 452.3B, 452.3D, 452.7B, 803, 803.1A, 803.1C, 803.1D, 803.2A, 803.3F--good if enforced.
8	435.1B, 435.4A, 4055, 4059.01, 452.3L--Support decommissioning
8	452.2L, 4260, 4268--Recommend against adding unauthorized routes, unless it is for the purpose of closing them to motorized vehicles.
6	452.3D--been closed before, was not enforced.
6, 10	452.4B--FS already placed buck and pole to stop traffic, support decommissioning
2	4059.01--Map shows decommission. Good proposal, this road has not been in use for some time. I would recommend removing this road from the map so people are not looking for it.
4	Recommend maximum harvested acres wherever possible (increase acres from 5,500 to closer to 7,700 of the acres analyzed, disclose reasons for not cutting more).
7, 1	Oppose logging project. It is destructive and will not help the forest recover from or be more resilient to mountain pine beetle; will not restore or improve forest health

Commenter	Comment
1	Discuss role of insects and disease and fire in project ecosystems. Describe why fire protection for timber resources is appropriate. Acknowledge that mountain pine beetle does not increase fire danger. Include role of dead trees in forest ecosystem; include effects of roads and temporary roads, effects to recreation and other resources.
13	Managing for a lodgepole monoculture is not sustainable. The forest should be managed for a mosaic of trees, shrubs, grasses, and forbs, and continuous components of Engelmann spruce should (not may) be retained for wildlife.
13	Forest vegetation is likely to shift to nonforest under future climate scenarios. Project assumes forest regeneration. How should this area be managed for future climate based on current science?
13	Aspen stands should be encouraged.
13	Prescribed fire should be used more in mountain pine beetle affected areas.
13	Identify areas where spruce will be seeded/planted and allowed to mature. Identify current and replacement old growth stands.
1	Disclose use of herbicides for weed treatments. Ensure that herbicides the contain glyphosate will not be applied. Chemical treatment of weeds should be a last resort.
8, 10	Include weed management plan that continues beyond the end of timber activities.
11	Include an alternative that precludes all ground-disturbing activities within one-half miles of the Continental Divide National Scenic Trail.
14	Ensure analysis of impacts to the use and enjoyment of the Continental Divide National Scenic Trail.
11,12	Must recognize the Continental Divide National Scenic Trail corridor as a congressionally designated area in the purpose and need and provide for its values. Continental Divide National Scenic Trail should be managed for high quality scenic, primitive hiking and pack and saddle stock opportunities. Project activities are not consistent with trail management objectives and responsibilities for the Forest Service.
14	Analyze silvicultural treatments within the viewshed of Continental Divide National Scenic Trail: Continental Divide National Scenic Trail management area/viewshed should be at least 1/2 miles but broad enough to protect natural and scenic features. It is a concern Level 1 route with scenic integrity objective of high or very high, depending on trail segment.
14	Do not interrupt foot and equestrian travel, especially during July through September summer season.
12, 14	Do not improve adjacent roads to a higher standard; maintain appearance and levels of traffic as before project implementation; include alternatives that would mitigate impacts if using the trail for access (where it is on pre-1978 roads). Vegetation and roads treatments may encourage increased motorized use on or near the Continental Divide National Scenic Trail.
1	Demonstrate no damage to recreation opportunities, scenery, and natural resources in and downstream of the project area.
13	Should have pleasant user experience and viewscape following harvest.
8	Reducing road density through decommissioning could restore fragmented habitats, provide better quality parturition areas, increase security cover, and decrease resource damage in riparian and wetland areas.
8	Many proposed treatment areas are in transition ranges, winter range, parturition areas, and high use stopover areas for deer and elk, including the Baggs and Platte Valley mule deer herds. Treatments may have many long term positive impacts to big game. Please work with our staff to further enhance treatments for wildlife benefit.
8	Recommend timing of harvest should not interfere with parturition activities from mid-May through end of June.
7	Logging project will kill wildlife and birds.

Commenter	Comment
5	Wildlife Habitat: disclose impacts to special status species, coordinate with other wildlife agencies, identify appropriate avoidance and mitigations.
3	Project is expected to improve water quality due to road improvements/closures/decommissioning and creation of firebreaks.
3	Wyoming Department of Environmental Quality permits and other requirements, depending on project scope, include: Stormwater associated with construction activities, discharge permit, temporary turbidity variance, spill reporting, aquatic invasive species, Army Corps of Engineers Section 404 permit
5	Hydrology analysis should include (see EPA comments): Existing conditions for water quality, groundwater, public drinking water supplies; effects to wetlands, effects to impaired waterbodies, water quality impacts of soil disturbance and vegetation changes, impact of roads and vehicle use on water quality, other potential impacts to water resources, protection and mitigation measures.
4	Applaud use of Healthy Forests Restoration Act and Farm Bill authorities. Will look for opportunities to use Good Neighbor Authorities on State land in Section 22.
9	Include Wyoming Department of Agriculture as interested party during objection process.
10	Include Saratoga Encampment Rawlins Conservation District as interested party in objection process.
6, 9, 10	Coordinate silviculture treatments and road closures with livestock permittees and consider their input for land stewardship. Where operation straddles a Forest Service drift fence, plan to reconstruct fence after timber operation.
13	Collaborate with Wyoming Game and Fish Department to address improper vehicle use while hunting.
9	Specifically address the multiple use mandate of Federal Land Policy and Management Act of 1976 (critical to livestock grazing) in the project analysis.
9	Include in EA the positive effects of livestock grazing on the environment and how livestock grazing assists in achieving environmental objectives and Forest Plan objectives.
9	We support continued livestock grazing at current animal unit months and considers reductions or limitations an adverse impact.
9	Consider potential for increased use of off-highway vehicles in the project area and impacts from illegal uses.
9	Support timber harvest to benefit forest, local economy, wildlife, and livestock.
9	Include economic analysis of impacts to agricultural producers and local communities. Suggest coordinate with Department of Agriculture and Applied Economics at University of Wyoming's College of Agriculture.
1	Include in analysis: economic analysis that includes mills that use timber volume, economic effects to tourism-related businesses, effect to local community if the sale doesn't go to local mill
5	Air quality: disclose current air quality conditions in and near the project area, particularly nearby wilderness and potential air quality impacts; impacts of harvest, transportation, and dust-related emissions; impacts of pile burns.
5	Climate change: use Council on Environmental Quality's 2014 guidance for consideration of greenhouse gas emissions and climate change impacts to analyze climate change impacts. Work with Trey Schillie for estimating greenhouse gas emissions and qualitatively describe climate change impacts and mitigations. How will project improve resiliency to climate change? Include how affected environment may be affected by climate change (mountain pine beetle), consider alternatives that may make the project area more resilient to climate change (see http://nca2014.globalchange.gov)

Commenter	Comment
5	Include existing soil disturbances from past management and disturbance that would occur from each alternative. Identify protection measures, best management practices, use of winter harvest, whole tree skidding, fertilization,
13	Soil, fungi, and mycorrhizal relationships are important for forest regrowth. Project activities may cause detrimental disturbance.
13	Roller chopping damages top soil and fungi. Recommend planting rather than roller chopping. Discuss site preparation, replanting, stand management, and successional trajectories following harvest.
13	Harvest units are large; recommend minimizing landings and skid trails.
5	Include in analysis: number and location of acres by treatment type, area management objectives for forest maintenance, regeneration and restoration, wildlife and plant habitat; high severity wildlife risk; public and infrastructure safety; baseline and effects to pest and disease status and trends, vegetation cover and condition, soil conditions, water quality, sediment loads, wetland and riparian health, wildlife/fish population and habitat health and trends, air quality; ecological history including insects and wildfire; management history, including vegetation treatments, invasive species control, prescribed fire; monitoring plan to assess how preferred alternative addresses concerns related to significant resource categories.
1	Include in monitoring plan: aquatic turbidity and temperature, logging units visible to recreation areas; locations of herbicide spraying in relation to human health concerns, habitat damaged by logging and road construction, particularly threatened and endangered species habitat, compaction of soils, chemical pollutants to streams.
5	Include as issues and disclose effects to: water resources, air quality, wildlife habitat, soil productivity and hydrological function, climate change.
5	Include maps: geographic areas; overlay treatments with streams, wetlands, wildlife areas and other wildlife information, wildlife fire hazard potential values.
5	Complete mitigation plan.

Distribution of the Draft Environmental Impact Statement

This draft environmental impact statement is the means to disclose to the public what the considerations, impacts, and tradeoffs associated with implementing an action or no action alternative would be. It is distributed to solicit comments from the public, agencies, other governments, organizations, and tribal concerns about the modified proposed action. These comments are used to refine the modified proposed action, shape further analysis, and inform the responsible official.

Whenever possible, the document has been distributed electronically to expedite delivery and reduce waste. Digital files have been used to deliver the documents when possible, and interested parties have been encouraged to access the project information webpage at http://www.fs.fed.us/nepa/nepa_project_exp.php?project=47913.

Copies of the draft environmental impact statement are available at these Forest Service offices:

- Brush Creek/Hayden Ranger District, 2171 South Highway 130, Saratoga, WY
- Medicine Bow-Routt National Forests Headquarters, 2468 Jackson Street, Laramie, WY

Copies are available at these Carbon County library system branch libraries:

- Baggs Library; 105 2nd Street, Baggs, WY 82321; (307) 383-7323
- Encampment Library; 202 Rankin Street, Encampment, WY 82325; (307) 327-5561
- Rawlins Library; 215 West Buffalo. Rawlins, WY 82301; (307) 328-2618
- Saratoga Library; 503 West Elm Street, Saratoga, WY 82331; (307) 326-8209

This draft environmental impact statement has been distributed to individuals who specifically requested a copy of the document, submitted comments during the scoping period, or otherwise contributed to the project:

- Berger Ranches, Kirby Berger
- Continental Divide Trail Society, Jim Wolf
- Environmental Protection Agency Region 8, Philip Strobel
- Forest Service Employees for Environmental Ethics, Matt Rasmussen
- National Scenic Trails, Greg Warren
- Saratoga-Encampment-Rawlins Conservation District, Joe Parsons
- Wyoming Department of Agriculture, Doug Miyamoto
- Wyoming Department OF Environmental Quality, Mark Conrad
- Wyoming Game and Fish Department, John Kennedy
- Wyoming State Forestry Department, Carson Engelskirger
- Dick Artley
- Jack Berger
- Gene Carrico

- Mike Crimmins
- Barbara Parsons
- Dick and Suzanne Mowry
- Jean Public

In accord with the memorandum of understanding between the Office of the Governor, State of Wyoming, and the Rocky Mountain Region of the U.S. Forest Service (USDA Forest Service 2016c), the draft environmental impact statement has been sent to the following contacts in the Governor's Office and State agencies:

- Office of Governor Matt Mead
- Wyoming Department of Agriculture
- Wyoming Department of Environmental Quality - Administration
- Wyoming Department of Environmental Quality - Air Quality
- Wyoming Department of Environmental Quality - Land Quality
- Wyoming Department of Environmental Quality - Water Quality
- Wyoming Department of Revenue
- Wyoming Department of Transportation
- Wyoming Game and Fish Department
- Wyoming Livestock Board
- Wyoming Office of State Lands and Investments
- Wyoming Office of Tourism
- Wyoming State Engineer's Office
- Wyoming State Forestry Division
- Wyoming State Historic Preservation Office
- Wyoming State Parks, Historic Sites and Trails
- Wyoming Water Development Commission

In addition, it has been distributed to the following Federal agencies, federally recognized tribes, local governments, and organizations representing a wide range of views.

Cheyenne and Arapaho Tribes	Lower Brule Sioux Tribe
Cheyenne River Sioux Tribe	Northern Arapaho Tribe
Chippewa Cree at Rocky Boys	Northern Cheyenne Tribe
Crow Creek Sioux Tribe	Northern Ute Tribe
Crow Nation	Oglala Lakota Nation
Eastern Shoshone Tribe	Rosebud Lakota Tribe
Fort Peck Assiniboine and Sioux Tribe	Sisseton-Wahpeton Oyate Tribes

Southern Ute Tribal Council	Motorized Recreation Council of Wyoming
Standing Rock River Sioux	Town of Baggs
Ute Mountain Ute Tribe	Town of Dixon, Matt Feldmann
Yankton Sioux	Town of Encampment
Santee Sioux Nation	Town of Rawlins
Bureau of Land Management, Rawlins FO	Town of Riverside
Carbon County Commissioners	Town of Saratoga
Carbon County Planning Commission	Town of Savery

The following individuals or organizations were contacted during scoping, but did not comment on the North Savery Project. They will not be provided a copy of the draft environmental impact statement but may access it online at http://www.fs.fed.us/nepa/nepa_project_exp.php?project=47913, or contact the Forest Service to request a copy.

A and R Real Estate Holdings LLC	Kelley Cattle Company LLC, Kelley O'Neill
Banjo Sheep Company LLC, Pat and Sharon O'Toole	Mill Creek Ranch LLC
Bigfoot 99	PH Livestock
Bould Luray LLC	Rawlins Daily Times, Tori Adams
Burlington National Insurance Company	Red Rim Inc
C&C Cattle Company LLC, Cody McKee	Saratoga Encampment Rawlins Conservation District, Garrett Pantle
Cobb Cattle Company, Jack Cobb	Saratoga Encampment Rawlins Conservation District, Jean Runner
Colorado Off Highway Vehicle Coalition	Saratoga Sun, Liz Wood
Continental Divide Trail Society	SI Partners LLC
Daley Basin Land Company Inc	Stratton Sheep Company, c/o Charles Jaure
Day Ranch Inc	Swanson and Johnson
Dynes Family Inc et al	The Alfred and Sarama Gort Living Trust
Elaine and Nancy Holt Partnership	The Craig Daily Press
Ferdinand Bahr Est, c/o Marlene Lippert	Wenger Ranches Inc
Forest Edge Ranch	Hal S Alcorn
Grand Encampment Mountain Resort LLC	William P and Walter B Alcorn
Hanson Parrish LLC	Robert M and Deidra A Anderson
HDH LLC, Bill Irvine	Stephanie B Anderson
HDH LLC, Scott Rakness	Paul D and Patricia Anselmi
Incandescence Inc, c/o Ronnie Roberts	Beverly Ann Armstrong Trustee
Milliken	Jone M and Rex R Baldwin
Industrial Mining Dev Co	Albert W Beich
Kelley Cattle Company LLC, Timothy Dwyer	

Raymond J Bond	Bradley D and Jeannine M Hutchinson
Chris J and Michelle R Borer	Ronald E and Alexandra L Iverson
Winston Swift Boyer	William A and Palma L Jack
Kenneth Earl and Ruth Elizabeth Bramall	William G and Anna L Jacobson
Stan Brooks	Harvie Lee and Margaret Ann Johhson
Arlin Browler	Stephen J and Sherri K Kaisler
David Lee Bustos	Tood N Kaisler
Michael Scott and Daniel Murray Butler	Trevor Kaisler
Arthur Canaday	Joseph H and Barbara E Kaspar
Brad Cary	Chrissie Len Kelly
Paula Rae Christensen	Kurt Kelly
Alden and Karen Conduct	Michael H Keyserling
Wynn G Conduct	Ben J and Mary A Koperski
Jeff Corson	Ronald Jeff and Tina R Kramer
Bradley Cosby	Frank B and Lajean Kubiak
Fannie Jo Counts	Joan W Lawrence
John V Crow	Patricia Lufkin
Mary Lou Crow	Raymond W Martin
Harold and Deborah Detweiler	Howard Mcdonald
Judy Ann Dixon	William N Mcdonough
Mike and Joyce Evans	Frankie Etal Mckee
Mike Fortman	Adam Mehlberg
Ernie Foster	Jim and Shirley Miller
Keith Fox	Edward P Moriarity
Carol L Garbutt	John R and H Ramona Niland
Judith Geiger	Joseph and Darlene Omelia
James H Haigh	L C Omstrom
John H Haigh	James C Oneil
Bob Halsell	Tony Ortega
Ron Hamilton	Martha Page
Terry Hankins	Steven L and Susan C Parker
Shane Henry	Harry Pauli Jr
Paul L and Susan J Herring	Dennis G and Connie M Poole
John D and Paul Joseph Hickey	Frank Pyle
Darren L and Penny Holland	Janell Raymond
Matt Hoobler	Valerie R Rodekohr
Thomas L and Constance E Hood	John Rowland
Randolph C Houseman	Dan Runner

Joyce B Saer
Chuck Sanger
Michael Robert and Cynthia Kay Shepard
Jean E Short Trustee
John J and Dorothy Sintek
Dale Skidmore
Allen L and Patricia A Smith
Mary V Stolcis
Arla Strass
Mark J and Nancy N Tanner
Tom Troxel
Mary F Waldron
Charles A and Jill K Webb Webb
Kurt Duane and Sandra Burdette Wilson
David Woodward
Robert Woodward
William G Woodward

References

- Alexander, M. E.; Yancik, R. F. 1977. The effect of precommercial thinning on fire potential in a lodgepole pine stand. *Fire Management Notes* 38(3):7-9,20.
- Alexander, R.R., 1986, Silvicultural systems and cutting methods for old growth lodgepole pine forests in the central Rocky Mountains. USDA, Forest Service, General Technical Report RM-127.
- Alexander, R.R. 1987, Ecology, silviculture, and management of the Engelmann spruce-subalpine fir type in the central and southern Rocky Mountains. USDA Forest Service, Agriculture Handbook 659.
- Alexander, S.M., N.M. Waters, and P.C. Paquet. 2005. Traffic volume and highway permeability for a mammalian community in the Canadian Rocky Mountains. *Canadian Geographer* 49: 321-331.
- Amman, G. D.; McGregor M. D.; Cahill, D. B.; Klein, W. H., 1977, Guidelines for Reducing Losses of Lodgepole Pine to the Mountain Pine Beetle in Unmanaged Stands in the Rocky Mountains. USDA, Forest Service General Technical Report INT-36, Intermountain Forest and Range Experiment Station, Ogden, UT.
- Andrews, Patricia L.; Rothermel, Richard C. 1982. Charts for interpreting wildland fire behavior characteristics. Gen. Tech. Rep. INT-131. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 21 p.
- Arias, C. 2010. Savery Project Existing Condition Hydrology Report. Brush Creek Hayden District, Medicine Bow-Routt National Forests. Saratoga, WY.
- Arias, Camilo 2010. Savery Analysis – Watershed Specialist Report and field notes. On file: Brush Creek Hayden Ranger District, Saratoga, WY.
- Behave Plus (v. 5.0.5) USDA Forest Service, Rocky Mountain Research Station, Systems for Environmental Management.
- Brown, J. (1975). Fire cycles and community dynamics in lodgepole pine forests. In: (D. Baumgartner, ed.) *Management of lodgepole pine ecosystems: symposium proceedings*. pp. 429-456.
- Carbon County, Wyoming. 2016. Community Wildfire Protect Plan Update 2016. Available at: <https://sites.google.com/a/wyo.gov/forestry/fire-management/fire-grants-assistance/fuels-mitigation>.
- Carlson, Joan. 2008. Potential risks and impacts to soil and water resources from mountain pine beetle mortality, potential treatments, and potential wildfire in Colorado and Wyoming national forests. March 2008. USDA Forest Service, Rocky Mountain Regional Office, Lakewood, CO.
- Chan-McCleod, A.C.A. 2006. A review and synthesis of the effects of unsalvaged mountain-pine-beetle-attacked stands on wildlife and implications for forest management. *BC Journal of ecosystems and Management* 7(2): 119-132.

- Cheng, J.D. 1989. Streamflow changes after clear-cut logging of a pine beetle infested watershed in southern British Columbia, Canada. *Water Resources Research* 25(3): 449-456.
- Collins, B.J. 2010. Initial and future stand development following mountain pine beetle in harvested and uncut lodgepole pine forests. M.S. thesis, Department of Forest, Rangeland, and Watershed
- Cordell, H.K., Betz, C.J., Green, G., Owens, M. 2005. Off-highway vehicle recreation in the United States, regions and states: A national report from the National Survey on Recreation and the Environment (NSRE). USDA Forest Service General Technical Report, Southern Research Station. Athens, GA.
- Crimmins, T. 1999. Colorado Off-Highway Vehicle User Survey: Summary of results. Colorado State Parks.
- Davis, M., Grime, J.P., Thompson, K. 2000. FORUM: fluctuating resources in plant communities: a general theory of invisibility. *Ecology* 88, 528-534.
- Dressen, M. and C. Tolbert. 2010. Medicine Bow-Routt National Forests Lynx Habitat Mapping Paper. Laramie, WY.
- Fire Family Plus, version 4.1 [Computer software]. (2013).
- Forest Practices Board. 2007. The effect of mountain pine beetle attack and salvage harvesting on streamflows. Special Investigation. FPB/SIR/16.
- Foulke, T., D. Olson, D.T. Taylor, C.T. Bastian, R.H. Coupal. 2006. A survey and economic assessment of off-road vehicle use in Wyoming for the Wyoming Department of State Parks and Cultural Resources, Division of state Parks and Historic Sites, State Trails Program. University of Wyoming, Dept. of Agriculture and Applied Economics. 85 pages.
- Furniss, M.J., S. Flanagan, and B. McFadin. 2000. Hydrologically-connected roads: an indicator of the influence of roads on chronic sedimentation, surface water hydrology, and exposure to toxic chemicals. USDA Forest Service, Stream Systems Technology Center, Stream Notes, July 2000. Fort Collins, CO.
- Grant, Gordon E; Sarah L. Lewis; Frederick J. Swanson, John H. Cissel, and Jeffrey J. McDonnell. In review. Effects of forest practices on peak flows and consequent channel response in western Oregon: a state-of-science report, Gen. Tech. Rep. PNWGTR-XXX. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Stations.
- Gloss, Dave. 2003. Forest plan revision water resources existing conditions, appendix C public water supply assessment. On file: USDA Forest Service Brush Creek/Hayden Ranger District, Saratoga, WY.
- Gloss, Dave. 2008. Sandstones allotments management plans. Watershed Specialist Report. Brush Creek Hayden District, Medicine Bow-Routt National Forests. Saratoga, WY.
- Gloss, Dave. 2010a. Savery project environmental impact statement. Watershed specialist report environmental consequences. On file Service Brush Creek/Hayden Ranger District, Saratoga, WY.

- Gloss, Dave. 2010b. Watershed project files: Bear Mountain South, Blackhall, Hell Canyon, and Big Creek Fires. On file: USDA Forest Service Brush Creek Hayden Ranger District, Saratoga, WY.
- Gloss, Dave. 2010c. Savery project analysis. On file: USDA Forest Service Brush Creek Hayden Ranger District, Saratoga, WY.
- Gloss, Dave. 2011a. Savery project analysis – alternative 2. On file: USDA Forest Service Brush Creek Hayden Ranger District, Saratoga, WY.
- Gloss, Dave. 2011b. Savery project environmental impact statement. Watershed specialist report environmental consequences. On file: USDA Forest Service Brush Creek Hayden Ranger District, Saratoga, WY.
- Gloss, Dave. 2011c. Savery project environmental impact statement. Watershed specialist report environmental consequences. On file: USDA Forest Service Brush Creek Hayden Ranger District, Saratoga, WY.
- Grant, Gordon E; Lewis, Sarah L; Swanson, Frederick J.; Cissel, John H; McDonnell, Jeffrey J., 200x. Effects of forest practices on peak flows and consequent channel response in western Oregon: a state-of-science report, Gen. Tech. Rep. PNWGTR-XXX. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Stations. XXXp. In review.
- Hammit, W.E., Schneider, I.E. 2000. Recreation conflict management. In Trends in Outdoor Recreation, Leisure, and Tourism, edited by W.C. Gartner and D.W. Lime, 347-356. New York: CABI Publishing.
- Hawksworth, F.G. 1977. The 6-class dwarf mistletoe rating system. General Technical Report RM-48. USDA Forest Service Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 7p
- Haynes, K. M., J. G. Proctor, and K. S. Roche. 2015. Prefield review for threatened and endangered, sensitive and local concern plant species. In TESP_PrefieldList_2010, editor. Microsoft Word. On file at U.S. Forest Service, Medicine Bow -- Routt National Forests and Thunder Basin National Grassland, Laramie, WY.
- Hood, P.R., Nelson, K.N., Rhoades, C.C., Tinker, D.B. 2017. The effect of salvage logging on surface fuel loads and fuel moistures in beetle-infested lodgepole pine forests, Forest Ecology and Management 390: 80-88.
- Hutto, R.L. 1995. Composition of bird communities following stand-replacement fires in northern Rocky Mountain conifer forests. Conservation Biology 9(5): 1041-1-58.
- Jenkins, M. J., Hebertson, E., Page, W., Jorgensen, C. A., 2008, Bark beetles, fuels, fires and implications for forest management in the Intermountain West. Forest Ecology and Management 254: 16-34.
- Joy, S.M., R.T. Reynolds, and D.G. Leslie. 1994. Northern goshawk broadcast surveys: hawk response variables and survey cost. Studies in Avian Biology 16: 24-30.

- Klutsch, J.G., M.A. Battaglia, D.R. West, S.L. Costello, and J.F. Negron'. 2011. Evaluating potential fire behavior in lodgepole pine dominated forests after a mountain pine beetle epidemic in north-central Colorado. *West. J. Appl. For.* 26: 101–109.
- Koehler, G. M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. *Canadian Journal of Zoology* 68: 845-851.
- Kougioulis, J. 2006. Northeast Sierra Madre allotments management plans. Watershed specialist report. Brush Creek Hayden District, Medicine Bow-Routt National Forests. Saratoga, WY.
- Kozlowski, S. 2008. Response of American marten to epidemic mountain pine beetle-caused mortality under a no-action alternative. [Online]. USDA Forest Service. Rocky Mountain Region. Available: <http://fsweb.r2.fs.fed.us/rr/ecology/barkbeetles/americanmarten.doc>
- LANDFIRE: LANDFIRE 1.1.0 FBFM40 layer. U.S. Department of the Interior, Geological Survey. [Online]. Available: <http://landfire.cr.usgs.gov/viewer/> [2014].
- Leaf, Charles F. 1970. Sediment yields from central Colorado snow zone. American Society of Civil Engineering, Journal of Hydraulics Division. 9 (HY1): 87-93, (Closure in 97 (HY2): 350-351).
- Lynch, H. J., R. A. Renkin, R. L. Crabtree, and P. R. Moorcroft. 2006. The influence of previous mountain pine beetle (*Dendroctonus ponderosae*) activity on the 1988 yellowstone fires. *Ecosystems* 9:1318-1327.
- MacDonald, L.H. and J.D. Stednick 2003. Forests and water: A state of the art review for Colorado. Colorado Water Resources Research Institute, Colorado State University, CSRRRI Completion Report No. 196. Ft. Collins, CO.
- Mealor, B.A., Cox, S., Booth, D.T. 2012. Postfire downy brome (*Bromus tectorum*) invasion at High Elevations in Wyoming. *Invasive Plant Science and Management*. 5:427-435.
- Mease, Chris 2010. Savery analysis – fisheries specialist report. On file: Brush Creek Hayden Ranger District, Saratoga, WY.
- Megahan, W.F. 1974. Erosion over time on severely disturbed granitic soils: a model. Gen. Tech. Rep. INT156. Ogden, UT. US Department of Agriculture. Forest Service, Intermountain Forest and Range Experiment Station.
- Megahan, W.F. and W.J. Kidd. 1972. Effects of logging and logging roads on erosion and sediment deposition from steep terrain. *Journal of Forestry* 70(3):136-141.
- McIver, Chelsea P.; Sorenson, Colin B.; Morgan, Todd A., 2016. Wyoming's forest products industry and timber harvest, 2014, part 2: industry sectors, capacity, and outputs. Forest Industry Brief No. 2. Missoula, MT: University of Montana, Bureau of Business and Economic Research.
- McIver, Chelsea P.; Marcille, Kate C.; Morgan, Todd A.; 2017. The contribution of the forest products industry in Wyoming, part 3: sales, employment and multiplier effect. Forest Industry Brief No. 5. Missoula, MT: University of Montana, Bureau of Business and Economic Research.
- Miller, Kent. 2006-2009. Road field survey notes and photos. On file: Brush Creek Hayden Ranger District, Saratoga, WY.

- Miller, M.A. 2005. Snowshoe hare habitat relationships in successional stages of spruce-fir, lodgepole pine and aspen cover types in northwest Colorado. Colorado State University. Fort Collins, Co. 55pp.
- Miller, R.F., Knick, S.T., Pyke, D.A., Meinke, C.W., Hanser, S.E., Wisdom, M.J., Hild, A.L. 2008. Characteristics of sagebrush habitats and limitations to long-term conservation. In Marti, C.D., Editor. Studies in Avian Biology.
- Mitsch, W. J. and J. G. Gosselink. 2007. Chapter 5: wetland hydrology. Page 600 Wetlands. John Wiley, New York, NY.
- Moline, B.R., R. R. Fletcher, D. T. Taylor, G. Fink, F. Henderson, L. Bourret. 1992. Contribution of Federal lands to Wyoming Range livestock production, 1992. University of Wyoming Cooperative Extension Service and Wyoming Farm Bureau Federation.
- Motorcycle Industry Flash Report. 2014.
- Nachtmann (2006). Northeast Sierra Madre allotments management plans. Fisheries and aquatic habitat resources specialist report. Brush Creek Hayden District, Medicine Bow-Routt National Forests. Saratoga, WY.
- Nagler, Amy M., Bastian, Christopher T., Taylor, David T., and Foulke, Thomas K. 2013. Wyoming comprehensive off-road vehicle recreation report 2012.
- NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. Available: <http://www.natureserve.org/explorer>.
- Nicholoff, S.H (compiler). 2003. Wyoming bird conservation plan, version 2.0. Wyoming Partners in Flight. Wyoming Game and Fish Department, Lander, WY.
- No author. 1975. History of the Routt National Forest, 1905-1972. Manuscript on file Supervisor's Office, Medicine Bow-Routt National Forests. Laramie, WY.
- NRIS. 2012. National Resource Information Services online dataset for locations of tracked plant species. USDA Forest Service, Rocky Mountain Region.
- Page, W.G., Jenkins, M.J., 2007. Predicted fire behavior in selected mountain pine beetle infested lodgepole pine stands within the Intermountain region. For. Sci. 53 (6).
- Packauskas, R.J. 2005. Hudsonian emerald dragonfly (*Somatochlora hudsonica*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/hudsonianemeralddragonfly.pdf>
- Parendes, L.A., Jones, J.A. 2000. Role of light availability and dispersal in exotic plant invasion along roads and streams in the H.J. Andrews Experimental Forest, Oregon. Conservation Biology 14: 64-77.
- Perala, D.A. 1990. *Populus tremuloides*. Michx. quaking aspen. Pp. 555-569, IN: R.M. Burns and B.H. Honkala. Silvics of North America. Volume 2. Hardwoods. USDA Forest Service Agric. Handbook 654. Washington, D.C.
- Perry, D.A. and J.E. Lotan. 1979. A model of fire selection for serotiny in lodgepole pine. Evolution 33(3): 958–968. DOI: 10.1111/j.1558-5646.1979.tb04749.x

- Purchase, Carol. 2011. Medicine Bow-Routt National Forests watershed condition framework. On file: USDA Forest Service Brush Creek Hayden Ranger District, Saratoga, WY.
- Ratchford, J. S., S. E. Wittman, E. S. Jules, A. M. Ellison, N. J. Gotelli, and N. J. Sanders. 2005. The effects of fire, local environment and time on ant assemblages in fens and forests. *Diversity and Distributions* 11:487-497.
- Robichaud, P.R. and T.A. Waldrop 1994. A comparison of surface runoff and sediment yields from low- and high severity site preparation burns. *Water Resources Bulletin* 30(1): 27-34.
- Romme, W. H., J. Clement, J. Hicke, D. Kulakowski, L. H. MacDonald, T. L. Schoennagel, and T. T. Veblen. 2007. Recent forest insect outbreaks and fire risk in Colorado forests: a brief synthesis of relevant research. Colorado Forest Restoration Institute Publication. Colorado State University. Fort Collins, CO. 24 pp.
- Rosenberger, Randall S. and Eric L. Smith. 1998. Assessing forest scenic beauty impacts of insects and management. FHET 98008. USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. Ft. Collins, Colorado.
- Rothermel, Richard C. 1972. A mathematical model for predicting fire spread in wildland fuels. Res. Pap. INT-115. Ogden, UT: U.S. Department of Agriculture, Intermountain Forest and Range Experiment Station. 40 p.
- Ruediger, Bill, Jim Claar, Steve Gniadek, Bryon Holt, Lyle Lewis, Steve Mighton, Bob Naney, Gary Patton, Tony Rinaldi, Joel Trick, Anne Vandehey, Fred Wahl, Nancy Warren, Dick Wenger, and Al Williamson. 2000. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication #R1-00-53, Missoula, MT. 142 pp.
- Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.
- Sharma, J., L. W. Zettler, and J. W. van Sambeek. 2003a. A survey of mycobionts of federally threatened *Platanthera praeclara* (Orchidaceae). *Symbiosis* 34:145-155.
- Sharma, J., L. W. Zettler, J. W. van Sambeek, M. R. Ellersieck, and C. J. Starbuck. 2003b. Symbiotic seed germination and mycorrhizae of federally threatened *Platanthera praeclara* (Orchidaceae). *American Midland Naturalist* 149: 104-120.
- Shenk, T.M. 2007. Post-release monitoring of lynx reintroduced to Colorado July 2006 – June 2007. Colorado Division of Wildlife. Ft. Collins, CO. pp.57.
- Shenk, T.M. 2008. Post-release monitoring of lynx reintroduction to Colorado, Annual Progress Report for the U.S. Fish and Wildlife Service. Colorado Division of Wildlife. Fort Collins, Colorado.
- Sieg, C. H. and R. M. King. 1995. Influence of environmental-factors and preliminary demographic-analyses of a threatened orchid, *Platanthera-praeclara*. *American Midland Naturalist* 134: 307-323.

- Sipes, S. D. and V. J. Tepedino. 1995. Reproductive-biology of the rare orchid, *Spiranthes diluvialis* - breeding system, pollination, and implications for conservation. *Conservation Biology* 9: 929-938.
- Skorkowsky, R.C. 2009. Response of northern goshawk to epidemic mountain pine beetle-caused mortality under a no-action alternative. [Online]. USDA Forest Service. Rocky Mountain Region. Available: http://fsweb.r2.fs.fed.us/rr/ecology/barkbeetles/northern_gosahwk.doc
- Stokowski, P.A., LaPointe, C.B. 2000. Environmental and social effects of ATVs and ORVs: An annotated bibliography and research assessment. School of National Resources, University of Vermont.
- Szalanski, A. L., G. Steinauer, R. Bischof, and J. Petersen. 2001. Origin and conservation genetics of the threatened Ute ladies'-tresses, *Spiranthes diluvialis* (Orchidaceae). *American Journal of Botany* 88:177-180.
- Taylor, D.T. 2003. The role of agriculture in maintaining open spaces in Wyoming. University of Wyoming, Open Spaces. B-1141.
- Taylor, D.T., R.H. Coupal, T. Foulke. 2005. The economic impact of federal grazing on the economy of Park County, Wyoming. Report to the Park County Commissioners.
- Taylor, K., Brummer, T., Taper, M.L., Wing, A., and Rew, L.J. 2012. Human-mediated long-distance dispersal: and empirical evaluation of seed dispersal by vehicles. *Diversity and Distributions*, *A Journal of Conservation Biogeography*. Pages 1-10.
- Taylor, K., Mangold, J., Rew, L.J. 2011. Weed seed dispersal by vehicles. Montana State University Extension MontGuide, MT201105AG 6/11, pages 1-3.
- Tepedino, V. J., T. R. Toler, B. A. Bradley, J. L. Hawk, and T. L. Griswold. 2007. Pollination biology of a disjunct population of the endangered sandhills endemic *Penstemon haydenii* S. Wats. (Scrophulariaceae) in Wyoming, USA. *Plant Ecology* 193: 59-69.
- Tepedino, V. J., W. R. Bowlin, and T. L. Griswold. 2006. Pollination biology of the endangered blowout penstemon (*Penstemon haydenii* S. Wats.: Scrophulariaceae) in Nebraska. *Journal of the Torrey Botanical Society* 133: 548-559.
- Thill D.C., R.D. Schirman, and A.P. Appleby. 1979. Influence of soil moisture, temperature, and compaction on the germination and emergence of downy brome (*Bromus tectorum*) *Weed Science* (27)6: 625-630.
- Thybonny, S., R. Rosenberg, and E. Rosenburg. 1986. *The Medicine Bows*. University of Wyoming Press. Laramie, Wyoming. 147 pp.
- Tolbert, Carol. 2008. Equivalent clearcut area analysis conducted for the Medicine Bow-Routt Forest Land and Resource Management Plan 5- and 10-year assessment. On file: USDA Forest Service Brush Creek Hayden Ranger District - watershed files, Saratoga, WY.
- Troendle, C.A. and R.M. King, 1985. The effect of timber harvest on the fool creek watershed, 30 years later. *Water Resources Research* 21(12): 915-922.

- Troendle, C.A. and W.K. Olsen, 1994. Potential effects of timber harvest and water management on stream flow dynamics and sediment transport. In: Sustainable Ecological Systems: Implementing an Ecological Approach to Land Management, USDA Forest Service General Technical Report RM-247, Fort Collins, CO, pp. 34-41.
- Troendle, C.A., M.S. Wilcox, G.S. Bevenger, L.S. Porth. 2001. The Coon Creek water yield augmentation project: implementation of timber harvesting technology to increase streamflow. *Forest Ecology and Management* 143: 179-187.
- U.S. Congress. 2003. Healthy Forests Restoration Act of 2003. HR 1904. 108th Congress, 1st session. <https://www.congress.gov/bill/108th-congress/house-bill/1904>
- USDA Forest Service. 1973. Handbook #434 National forest landscape management volume 1. Washington D.C.
- USDA Forest Service. 1980. Handbook #559 National forest landscape management volume 2, Chapter 5. Timber. Washington D.C.
- USDA Forest Service. 1985. Handbook #608 National forest landscape management volume 2, Chapter 6. Washington D.C.
- USDA Forest Service. 1990. Silvics of North America, Volume 1. Conifers. Agricultural Handbook No. 654.
- USDA Forest Service .1995. Handbook # 701 Landscape aesthetics – a handbook for scenery management. Washington D.C.
- USDA Forest Service. 1999. Indicators for analysis of watershed interactions, appendix 2. In: Roads analysis, informing decisions about managing the National Forest transportation system. Miscellaneous Report FS-643. USDA Forest Service, Washington Office.
- USDA Forest Service. 2000. Forestwide travel management decision. On file at the Brush Creek/Hayden Ranger District.
- USDA Forest Service. 2003a. Medicine Bow National Forest final land and resource management plan. Medicine Bow National Forest. Laramie, WY.
- USDA Forest Service. 2003b. Medicine Bow National Forest final land and resource management plan – final environmental impact statement. Medicine Bow National Forest. Laramie, WY.
- USDA Forest Service. 2004. Sierra Madre travel management. On file at the Brush Creek/Hayden Ranger District.
- USDA Forest Service. 2005. 36 CFR Parts 212, 251, 261, and 295. Travel management: designated routes and areas for motor vehicle use; final rule.
- USDA Forest Service. 2006a. Forest Service Handbook 2509.25. Watershed conservation practices handbook. Region 2 Amendment No. 2509.25-2006-2. May 5, 2006.
- USDA Forest Service. 2006b. Rocky Mountain Region, SPF – fire and aviation management, briefing paper, mountain pine beetle and fuels profiles interactions.

- USDA Forest Service. 2007a. Memorandum of understanding between the United States Department of Agriculture Forest Service and Natural Resources Conservation Service regarding snow survey and water supply forecasting program activities. FS# 08-MU-11132426-005 / NRCS# A-3A75-8-3. Washington Office, Washington DC.
- USDA Forest Service. 2007b. R2 desk guide for sensitive species.
http://fsweb.r2.fs.fed.us/rr/R2_TES_Site_2007/guidance.html
- USDA Forest Service. 2008. Southern Rockies lynx amendment record of decision. USDA Forest Service, Rocky Mountain Region.
<https://www.fs.usda.gov/detail/r2/landmanagement/planning/?cid=stelprdb5199567>
- USDA Forest Service. 2009. Continental Divide National Scenic Trail comprehensive plan. USDA Forest Service.
https://www.fs.fed.us/cdt/main/cdnst_comprehensive_plan_final_092809.pdf
- USDA Forest Service. 2010. Unpublished district and forest-wide data stored and available electronically and/or paper copy. Brush Creek Hayden District, Medicine Bow-Routt National Forests. Saratoga, WY.
- USDA Forest Service. 2015a. FSveg common stand exam user guide.
<https://www.fs.fed.us/nrm/fsveg/>
- USDA Forest Service. 2015b. Greater sage-grouse land management plan record of decision for Northwest Colorado and Wyoming. Lakewood, CO. 182 pp.
- USDA Forest Service. 2015c. Land and resource management, species conservation assessments. U.S. Forest Service Rocky Mountain Region, United States Department of Agriculture, Golden, Colorado. Available: <http://www.fs.usda.gov/goto/r2/projects/scp>.
- USDA Forest Service. 2015d. Travel analysis report:Brush Creek/Hayden Ranger District. USDA Forest Service, Medicine Bow-Routt National Forests.
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd527470.pdf
- USDA Forest Service. 2016a. Travel management road inventories – hydrology transportation inventory.
T:\FS\NFS\MBRTB\Program\2500Watershed\GIS\MB\EngineeringRoads\HydroTransInv\HydroTransInv.gdb (GIS and data)
O:\NFS\MBRTB\Program\2500Watershed\Photo\MB\101800_north_platte\02_up_n_platte (Photos, filed by location/road) and
O:\NFS\MBRTB\Project\BCH\1950NorthSaveryEA2016\NEPA\03_ProposalDevelopment\TravelManagement On file: USDA Forest Service Brush Creek Hayden Ranger District, Saratoga, WY.
- USDA Forest Service. 2016b. Memorandum of understanding between the USDA Forest Service and the Wyoming Department of Environmental Quality. Forest Service agreement #16-MU-11020000-042.
- USDA Forest Service. 2016c. Memorandum of understanding between the Intermountain and Rocky Mountain Regions, USDA Forest Service and the Office of the Governor, State of Wyoming. Forest Service agreement #16-MU-11020000-008.

- USDA Forest Service. 2017. Watershed condition framework.
http://www.fs.fed.us/biology/watershed/condition_framework.html.
- USDA Forest Service and USDI Fish and Wildlife Service. 2006. Canada lynx conservation agreement. On file in the project record. <https://www.fws.gov/mountain-prairie/species/mammals/lynx/FSlynxCA060105.pdf>
- USDI Bureau of Land Management. 1998. A user guide to assessing proper functioning condition and the supporting science for lotic areas. Bureau of Land Management Technical Report 1737-15. National Applied Resource Sciences Center. Denver, CO.
- USDI Bureau of Land Management. 2003. Supplemental Draft environmental impact statement for the Jack Morrow Hills coordinated activity plan/Draft Green River resource management plan amendment. Rock Springs Field Office
(http://www.blm.gov/pgdata/etc/medialib/blm/wy/field-offices/rock_springs/jmhcap/sdeis/vol1.Par.1453.File.dat/01_04vol1of2cov-dr-abs-sum.pdf)
- USDI Fish and Wildlife Service. 1991. National wetlands inventory. U.S. Fish and Wildlife Service 1991. National Wetland Inventory maps of wetland occurrence on 7.5 minute quadrangle maps for Wyoming, including the Medicine Bow National Forest.
- USDI Fish and Wildlife Service. 2008. Biological opinion for the Southern Rockies lynx amendment. Ecological Services, Colorado Field Office. Denver, CO. 93pp.
- USDI Fish and Wildlife Service. 2015. Western prairie fringed orchid (*Platanthera praeclara*) Species profile. Available: <http://ecos.fws.gov/speciesProfile/SpeciesReport.do?spcode=Q2YD>.
- USDI Fish and Wildlife Service. 2016. U.S. Fish and Wildlife Service endangered species program: species search [web application].
- Wemple, B.C. 1994. Hydrologic integration of forest roads with stream networks in two basins, western Cascades, Oregon. MS Thesis. Corvallis OR: Oregon State University.
- Whitehead, R. J., Russo, G. L., Hawkes, B. C., Taylor, S. W., Brown, B. N., Barclay, H. J., and Benton, R. A. (2006). Effect of a spaced thinning in mature lodgepole pine on within-stand microclimate and fine fuel moisture content. In *Fuels management: how to measure success*. Conference Proceedings.--Andrews PL, Butler BW, eds.
- Wiggins, D. 2004. American three-toed woodpecker (*Picoides tridactylus*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments>
- Wiggins, D.A. (2005, January 27). Brown creeper (*Certhia americana*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/browncreeper.pdf> .
- Wildland Fire Decision Support System: [web based computer application];
https://wfdss.usgs.gov/wfdss/WFDSS_About.shtml.
- Willard, C. 2008. Sandstones allotments management plans. Fisheries, amphibian, and aquatic habitat specialist report. Brush Creek Hayden District, Medicine Bow-Routt National Forests. Saratoga, WY.

- Wyoming Department of Environmental Quality (WYDEQ). 2001. Wyoming's method for determining water quality condition of surface waters. Wyoming Department of Environmental Quality. Cheyenne WY.
- WYDEQ. 2004. Wyoming nonpoint source management plan silvicultural best management practices Wyoming Department of Environmental Quality. Cheyenne WY.
- WYDEQ. 2016. Wyoming's 2014 integrated 305(b) and 303(d) report. Document #16-0126. February 25, 2016. Cheyenne WY. Online: <http://sgirt.webfactional.com/media/attachments/Water%20Quality/Water%20Quality%20Assessment/Reports/2014-Integrated-305b-and-303d-Report.pdf>.
- Wyoming Game and Fish Department. 2006. Modification of the Wyoming Game and Fish Department's system for classifying stream fisheries. <https://wgfd.wyo.gov/Fishing-and-Boating/Stream-Classification>.
- Wyoming Game and Fish Department. 2010. State wildlife action plan. On file at the Brush Creek/Hayden Ranger District.
- WYNDD. 2015. Wyoming Natural Diversity Database species assessments reports: State of Wyoming and Rocky Mountain Region 2. Wyoming Natural Diversity Database, University of Wyoming, Laramie. Available: <http://uwadmnweb.uwyo.edu/wyndd/info.asp?p=3493>.
- Yarbrough, A., Kapela, J., O'Brady, C. 2006. Ranching in the Rockies, threats and signs of hope. The 2006 Colorado College state of the Rockies report card. 6 pages. (<http://www.coloradocollege.edu/StateoftheRockies/06ReportCard/21-26%20Ranching%20in%20the%20Rockies.pdf>).
- Young, J.A., Clements, C.D. 2002. Weed problems on Great Basin rangelands. Restoration and management of sagebrush/grass communities workshop, Elko, NV, Nov. 4, 2002.

Index

- 2005 Travel Management Rule, i, ii, iv, v, 5, 13, 14, 15, 35, 58, 59, 63, 74, 80, 102, 159, 160
- agencies consulted with, 2, 9, 13, 46, 53, 64, 156, 166
- alternatives
 - not analyzed, 88
 - under the Healthy Forests Restoration Act, 61, 87
- aquatic conservation areas, 45, 122
- arterial roads, 35, 102
- aspen cover type, 27
- best management practices, 76, 82, 108, 109, 146, 148, 172, 189
 - 100-foot buffer, 109, 119, 148
- Canada lynx, vi, 9, 46, 47, 62, 66, 90, 91, 112, 124, 139, 166, 184, 188
 - food sources for, 47
 - habitat, 47
 - observations on the forest, 46
- canopy base height, 99
- climate change, 126
- collector roads, 35, 102
- communities at risk, ii, xi, 10, 13, 32, 33, 62, 151, 158, 159, 160, 166
- community wildfire protection plan, ii, xi, 32, 33, 62, 166
- compacted areas, 98
- compaction, v, xi, 72, 83, 90, 98, 99, 109, 124, 130, 172, 185
 - temporary roads and landings, v, xi, 72, 83, 90, 98, 99, 109, 124, 130, 172, 185
- Continental Divide National Scenic Trail
 - Comprehensive Plan, 5, 15, 39, 161
 - cumulative effects, 142
 - effects from the modified proposed action, 106
 - effects from the no-action alternative, 106
 - existing condition, 38
- crown bulk density, 99
- crown fire, 89, 99
- cultural resources, ix, 56, 127, 142, 180
- cumulative effects
 - modified proposed action, 137
 - no-action alternative, 137
- Deep Creek Inventoried Roadless Area, 41
 - design criteria, 82, 88
 - for travel management actions, 86
 - disturbance events, 34
 - Engelmann spruce/subalpine fir cover type, 26
 - equivalent clearcut area, 42, 138, 185
 - Farm Bill, iii, xi, 5, 10, 11, 157, 171
 - fire
 - rates of spread, ii, 32, 98, 99
 - fire history, 34
 - flame lengths, 98, 99, 100
 - forest cover types, 22
 - forest plan consistency
 - modified proposed alternative, 146, 147, 148, 149, 150
 - no-action alternative, 144, 145
 - forest succession, 27
 - fuel model, 30, 98, 99, 184
 - fuel profiles, 30
 - hazard tree clearing
 - fences, 17, 41, 54, 65
 - roads, 17, 64, 65
- Healthy Forests Restoration Act, i, iii, xi, 1, 4, 5, 10, 12, 13, 61, 80, 87, 157, 158, 171, 186
- inventoried roadless areas, ix, 41, 123
 - Deep Creek, ix, 41, 123
 - Mowry Peak, ix, 41, 123
 - Strawberry Creek, ix, 41, 123
- livestock grazing, 53
- livestock management, 93
- local and regional economies, 56
- local roads, 37, 102
- lodgepole pine cover type, 25
- lynx analysis unit, xii, 9, 46, 47, 48, 69
- management areas, xi, 8
- management indicator species, 46, 51, 52, 116, 123, 142, 146, 147
- mechanical fuels treatment, 100
- minimum road system, i, v, 13, 59, 63
- modified proposed action
 - effects to aquatic organisms, 123
 - effects to cultural resources, 127
 - effects to fences, 131
 - effects to fuels and fire behavior, 99

- effects to greenhouse gas emissions and carbon sequestration, 127
- effects to livestock management, 131
- effects to lodgepole and Engelmann spruce, 96
- effects to recreation, 134
- effects to riparian areas, 110
- effects to roadless area characteristics, 124
- effects to scenery, 136
- effects to sedimentation, 108
- effects to sensitive plants, 129
- effects to streamflow, 109
- effects to the Continental Divide National Scenic Trail, 106
- effects to the transportation system, 102
- effects to timber production, 96
- effects to wetlands, 110
- effects to wildlife, 116, 117, 119, 120, 122
- Mowry Peak Inventoried Roadless Area, 41, 94
- National Environmental Policy Act, i, v, 1, 12, 13, 38, 59, 61, 63, 74, 77, 87, 126, 149, 154, 157, 162, 166
- National Forest Management Act, 149, 154
- no-action alternative
 - effects to aquatic organisms, 123
 - effects to carbon stocks, 126
 - effects to cultural resources, 127
 - effects to fences, 130
 - effects to fuels and fire behavior, 98
 - effects to livestock management, 130
 - effects to lodgepole, spruce-fir, and aspen, 95
 - effects to recreation, 133
 - effects to roadless area characteristics, 124
 - effects to scenery, 136
 - effects to sedimentation, 108
 - effects to sensitive plants, 129
 - effects to streamflow, xii, 108, 111
 - effects to the Continental Divide National Scenic Trail, 106
 - effects to the transportation system, 102
 - effects to timber production, 96
 - effects to wildlife, 113, 114, 115, 116
- noxious weeds, 53, 72, 130, 131, 143
- peak flow, v, 90, 109
- plant species of local concern, 52, 93, 128, 129, 130
- priority landscape, iii, 5
- project area
 - description, 20
- public meetings, iii, 61, 62
- recreation, ix, 57, 133
- riparian areas, 51, 52, 53, 86, 90, 91, 108, 109, 110, 115, 119, 120, 122, 131, 133, 141, 143
- riparian ecosystems
 - effects from bark beetle mortality, 108, 110
- road decommissioning
 - effects to sediment, 109
- road types
 - arterial, collector, and local, 35
- Roadless Area Conservation Rule, 5, 14
- roadless characteristics, 123
- roads and trails, ix, 35, 74, 102
- scenery, 15, 39, 84, 94, 136, 144, 161, 162, 166, 170, 186
- silviculture and timber
 - effects from no action, ix, 95
- Southern Rockies Lynx Amendment, 9, 47, 69, 156
- Strawberry Creek Inventoried Roadless Area, 14, 41, 71
- surface winds
 - effects on fire behavior, 98, 99
- temporary roads, vi, 3, 15, 72, 78, 168
 - effects on sedimentation, 108
- timber production, 28
- timber suitability, 154
- travel analysis recommendations, x, 202
- travel management, iv, 77, 80, 102, 103, 120, 186, 187
- unauthorized routes, 38, 77, 113
- values at risk, i, ii, 32, 59, 99, 158, 159
- water yield, 25, 66, 108, 109, 142, 186
- wetland areas, 42, 46, 77, 79, 83, 90, 108, 109, 116, 119, 123, 143, 154, 171, 172, 188, 201, 213
- wildlife
 - big game species, 122
 - management indicator species
 - snowshoe hare, 51
 - sensitive species
 - American marten, 52
 - boreal owl, 52
 - Brewer's sparrow, 52
 - greater sage-grouse, 52

hoary bat, 52

Hudsonian emerald, 52

northern goshawk, 52

olive-sided flycatcher, 52

pygmy shrew, 52

western bumblebee, 52

species of local concern

brown creeper, 51

brown-capped rosy finch, 51

pika, 51

Appendices: Detailed Descriptions of Proposed Action Elements

This section is included to provide specific details for vegetation management and rationale for interconnected road decommissioning proposals in the modified proposed action.

Appendix A includes a summary of proposed harvest in each 7th-level hydrologic unit code watershed for the modified proposed action.

Appendix B includes the rationale for interconnected road decommissioning proposals in the modified proposed action.

Appendix C is a detailed comparison of the road by road recommendations from the 2015 Travel Analysis Report with the proposed designation of the minimum road system for the North Savery project area.

Appendix A. Summary of Proposed Harvest in Project Area 7th-Level Hydrologic Unit Code Watersheds

Maximum treatable acres of harvest for the following 7th-level watersheds of concern are as follows:

- Upper North Spring Creek: 1,111 acres
- Nugget Creek: 486 acres
- Upper Jack Creek: 1,818 acres
- McClain Creek: 322 acres
- North Fork Savery Creek: 808 acres

The following section lists the salvage harvest acres by unit in the 7th-level hydrologic unit code watersheds in the project area. Where harvest is restricted to mitigate cumulative watershed effects in the specific 7th-level watersheds listed above, the difference between analyzed acres and maximum allowed harvest acres is highlighted in the watershed summary.

East Fork Savery Creek	Unit 37 = 52.4 acres
Unit 29 = 92.7 acres	Unit 41 = 24 acres
Unit 34 = 22.3 acres	Unit 42 = 86.8 acres
Unit 35 = 21.8 acres	Unit 44 = 17.9 acres
Unit 36 = 9.1 acres	Unit 253 = 69.5 acres
Unit 45 = 59.8 acres	Unit 59* = 0 acres (in another watershed)
Unit 46 = 28.7 acres	Total analyzed acres = 522
Unit 218 = 37.4 acres	Total harvest acres = 522

McClain Creek

	Unit 119 = 231.4 acres
Unit 59 = 2.2 acres	Unit 120 = 19.3 acres
Unit 113 = 28.8 acres	Unit 121 = 36.3 acres
Unit 114 = 26.8 acres	Unit 125 = 10.7 acres
Unit 115 = 5.7 acres	Unit 215 = 43.2 acres
Unit 116 = 318.0 acres	Unit 253 = 125.6 acres
Unit 117 = 96.3 acres	Total analyzed acres = 1,014
Unit 118 = 69.9 acres	Maximum harvest acres = 322

North Fork Savery Creek

	Unit 71 = 27.0 acres	Unit 91 = 183.9 acres
Unit 58 = 19.5 acres	Unit 73 = 13.7 acres	Unit 92 = 30.1 acres
Unit 59 = 38.5 acres	Unit 74 = 4.7 acres	Unit 93 = 22.2 acres
Unit 60 = 15.3 acres	Unit 77 = 57.4 acres	Unit 95 = 55.6 acres
Unit 61 = 20.8 acres	Unit 81 = 12.5 acres	Unit 96 = 10.5 acres
Unit 62 = 47.6 acres	Unit 82 = 4.8 acres	Unit 106 = 40.2 acres
Unit 63 = 38.8 acres	Unit 83 = 24 acres	Unit 108 = 16 acres
Unit 64 = 63.7 acres	Unit 84 = 6 acres	Unit 113 = 2.2 acres
Unit 66 = 5.5 acres	Unit 85 = 9.6 acres	Unit 214 = 88.1 acres
Unit 67 = 2.0 acres	Unit 86 = 86.2 acres	Unit 220 = 35.2 acres
Unit 69 = 53.5 acres	Unit 87 = 39.2 acres	Total analyzed acres = 1,244
Unit 70 = 137.4 acres	Unit 88 = 31.9 acres	Maximum harvest acres = 808

Upper Jack Creek

Unit 127 = 112.6 acres	Unit 252 = 235.9 acres
Unit 133 = 12.7 acres	Unit 250 = 234.1 acres
Unit 131 = 244.8 acres	Unit 251 = 24.8 acres
Unit 130 = 64.0 acres	Unit 253 = 225.8 acres
Unit 128 = 5.4 acres	Unit 44 = 20.3 acres
Unit 149 = 83.7 acres	Unit 126 = 276.0 acres
Unit 142 = 69.2 acres	Unit 254 = 244.3 acres
Unit 146 = 45.6 acres	Unit 256 = 237.2 acres
Unit 148 = 0.1 acres	Unit 144 = 258.6 acres
Unit 136 = 19.6 acres	Unit 255 = 218.9 acres
Unit 132 = 4.1 acres	Unit 119 = 2109.1 acres
Unit 134 = 11.1 acres	Unit 237 = 222.7 acres
Unit 125 = 55.7 acres	Total analyzed acres = 2,007
Unit 147 = 46.2 acres	Maximum harvest acres = 1,818
Unit 129 = 125.4 acres	

Upper North Spring Creek (86 acres of precommercial thinning)

Unit 149 = 45.0 acres	Unit 225 = 21.2 acres	Unit 240 = 8.4 acres
Unit 153 = 26.9 acres	Unit 224 = 39.6 acres	Unit 242 = 92 acres
Unit 152 = 92.3 acres	Unit 156 = 18 acres	Unit 243 = 48.0 acres
Unit 155 = 83.6 acres	Unit 150 = 124.8 acres	Unit 244 = 3.6 acres
Unit 151 = 19.4 acres	Unit 226 = 64.4 acres	Unit 221 = 0.3 acres
Unit 148 = 67.1 acres	Unit 227 = 26.7 acres	Unit 230 = 46.2 acres
Unit 137 = 11.5 acres	Unit 231 = 36.6 acres	Total analyzed acres = 1,684
Unit 207 = 19.5 acres	Unit 232 = 47.5 acres	Total harvest acres = 1,684
Unit 158 = 611.5 acres	Unit 229 = 24.1 acres	
Unit 241 = 77.9 acres	Unit 157 = 27.6 acres	

Hartt Creek

Unit 75 = 13.5 acres

Unit 57 = 4.8 acres

Unit 74 = 12.7 acres

Unit 77 = 2.0 acres

Unit 66 = 16.8 acres

Unit 67 = 10.7 acres

Unit 69 = 0.3 acres

Total analyzed acres = 61

Total harvest acres = 61

Willow Creek

Unit 110 = 13.6 acres

Unit 109 = 62.3 acres

Unit 112 = 21.1 acres

Unit 111 = 15.8 acres

Unit 113 = 100.9 acres

Total analyzed acres = 214

Total harvest acres = 214

Hatch Creek

Unit 57 = 6.6 acres

Unit 58 = 23.0 acres

Unit 55 = 12.1 acres

Unit 54 = 15.0 acres

Unit 66 = 20.6 acres

Unit 56 = 80.4 acres

Total analyzed acres = 158

Total harvest acres = 158

Methodist Creek

Unit 131 = 0.1 acres

Unit 154 = 30.9 acres

Unit 137 = 0.01 acres

Unit 136 = 11.0 acres

Total analyzed acres = 42

Total harvest acres = 42

North Spring Creek

Unit 177 = 10.6 acres

Unit 178 = 7.6 acres

Unit 179 = 10.2 acres

Unit 180 = 27.9 acres

Unit 182 = 3.9 acres

Total analyzed acres = 60

Total harvest acres = 60

Cherokee Creek

Unit 182 = 61.5 acres

Unit 246 = 22 acres

Total analyzed acres = 83

Total harvest acres = 83

Nugget Creek

Unit 155 = 100.8 acres

Unit 177 = 2.3 acres

Unit 176 = 6.5 acres

Unit 182 = 6.12 acres

Unit 173 = 13.7 acres

Unit 207 = 10.5 acres

Unit 175 = 77.1 acres

Unit 156 = 117.1 acres

Unit 157 = 49.3 acres

Unit 240 = 2.3 acres

Unit 245 = 135.0 acres

Unit 246 = 82.9 acres

Unit 170 = 0.6 acres

Total analyzed acres = 604

Total harvest acres = 486

Appendix B. North Savery Proposed Actions and Rationale for National Forest Road System Decommissioning or Management Changes

See Appendix C for comparison to 2015 Travel Analysis Report and detailed segment descriptions for all road segments.

Table 30. North Savery proposed actions and rationale for travel management

Road Number	Proposed Action	Rationale
435.1B	Decommission	Proposed for decommissioning to decrease road density in sage-grouse core habitat. Road currently provides duplicate access. Goes to the same place and is within 0.5 miles of 435.
435.2D	Decommission	This road is causing riparian area and wetland damage at stream-wetland crossing and currently provides duplicate access – 435.1D parallels the route 0.25 miles to the northwest.
435.4A	Decommission	Proposed for decommissioning to decrease road density in sage-grouse core habitat. This road provides duplicate access to Bureau of Land Management land and receives very little use. National Forest System Roads 435 (0.75 miles away) and 435.1A (0.3 miles away) provide access to same general Bureau of Land Management land.
443.2G	Decommission	Proposed for decommissioning due to significant resource damage at wetland and stream crossings. The eastern portion of the road is in an inventoried roadless area, and there is no legal access from South Spring Lake since the road is on private land.
448	Reroute	Proposed to be rerouted onto 448.1E with addition of an unauthorized route to move traffic to an upland location. Road 448 parallels riparian and wetland areas for quite a distance and has multiple stream crossings causing erosion, sedimentation, and riparian damage. There is no public access from the west end of the 448 at the Medicine Bow National Forest boundary since it ends at private land. The westernmost portion of the road would be maintained as level 1 for permittee access.
448.1A	Administrative use only.	Proposed for closure to public motorized use because this short 0.25-mile spur leads to private land without public access. Would maintain for administrative use for access to Ranger Ditch.
448.1B	Administrative use only.	Proposed for closure to public motorized use because this short 1,000-foot spur in sagebrush leads to private land without public access. The proposed reroute for 448 would end just before this spur. Would maintain for administrative (permittee) access.
448.1C	Decommission portion, Convert portion to OHV trail	Proposed for decommissioning because of severe damage to stream and wetland resources at double stream crossing (T16, R87, S 29, NE/NE). This crossing is impassable by regular-sized, 4x4 vehicles and has been used only by all-terrain vehicles and off-highway vehicles, which are also causing significant damage. A better route for all-terrain and off-highway vehicles is proposed just south of this stream crossing location to connect to the 803 road system. Portions of the road would be converted to off-highway vehicle trail to reduce vehicle impacts.
448.1D	Decommission	Proposed for decommissioning because of location in wetland complex. South of Savery Creek, this old road is not being used and is already grown in with vegetation.

Road Number	Proposed Action	Rationale
448.1F	Decommission	Only the easternmost portion of this road is proposed for decommissioning to decrease road density in a high road density area. The proposed addition of an unauthorized route between 448.1F and 448.1E would provide access to the same area.
448.1G	Decommission	Proposed for decommissioning because this steep spur road runs down to a stream and is causing erosion, sedimentation, and loss of riparian and wetland characteristics at the stream crossing. The proposed reroute of 448 also restricts access to this road.
448.2C	Decommission	This 1,700-foot spur is proposed for decommissioning to decrease road density in an area of high road density. The proposed reroute of 448 also restricts access to this road.
448.2D	Decommission	Proposed for decommissioning to decrease road density in an area of high road density. The proposed reroute of 448 would restrict access to this road. Currently, this road cannot be accessed due to a lack of navigable crossing at Savery Creek.
448.2V	Decommission	Proposed for decommissioning due to poor drainage and significant wetland damage.
448.3C	Decommission	Proposed for decommissioning because this spur leads to private land without public access. The proposed reroute of the 448.1C off-highway vehicle trail also restricts access to this road.
450.1I	Decommission	Redundant road. Short spur is less than 400 feet away from, and parallel to, 450.
451	Convert to off-highway vehicle trail	Reduce resource damage from full size vehicles by designating this segment as suitable for use by off-highway vehicles.
452.1A	Reroute	Proposed to be replaced with a better located, currently unauthorized route (4004) that provides access to State lands.
452.1F	Decommission	Proposed to be decommissioned because this road has poor drainage and is steep and eroding. This is a high-road-density area, and this road provides redundant access with 452 to 452.3F.
452.2N	Decommission	The area between 452.2N on north and 452.1V on the south has a lot of user-created spurs. The road is poorly drained and deeply rutted. Proposal would add currently unauthorized eastern loop to connect to 452.1V.
452.3B	Decommission	This spur is proposed for decommissioning to decrease road density in an area of high road density and because it is gradually being extended into a riparian area. Parallel to 452.1W.
452.3D	Decommission	This redundant 750-foot spur connects 452 to 452.1D 1,000 feet from where 452 intersects 452.1D. Road is causing resource damage due to the steep, eroding slope.
452.4B	Decommission	Proposed for decommissioning because this road is causing erosion, sedimentation, and damage to riparian and wetland areas near McLain Creek. Decommissioning would start just past the first meadow to retain dispersed camp sites.
452.7B	Decommission	Proposed for decommissioning because this road is very steep and has poor drainage, with potential for erosion and sedimentation into Jack Creek. Would decommission near the forested edge in the first meadow to retain dispersed camping.

Road Number	Proposed Action	Rationale
803	Decommission	Proposed for decommissioning because this road parallels riparian wetland areas for quite a distance and is causing erosion, sedimentation, and riparian damage at multiple stream crossings. The road is poorly drained and deeply rutted. The proposal includes addition of several currently unauthorized routes that would provide improved access to the area. One segment of 803.1B would remain open for travel between 803.1D and the Medicine Bow National Forest boundary.
803.1A	Decommission	This road is proposed for decommissioning to decrease road density in an area of high road density. This northwest quarter of Section 6 is confusing due to so many 2-tracks. The proposal includes addition of several currently unauthorized routes that would provide improved access to the area.
803.1B	Decommission, one segment remains open	Proposal is to decommission a steep, rutted section of this road that has poor drainage. One segment of 803.1B would remain open for travel between 803.1D and the Medicine Bow National Forest boundary.
803.1C	Decommission	Proposal is to decommission a steep section of this road that runs down to a riparian area and is causing erosion, sedimentation and riparian and wetland damage.
803.1D	Decommission	Proposed for decommissioning because of its poor condition and location. Road leads to valley bottom and wetlands. Access to area would be provided by addition of 803.1E.
803.2A	Decommission	Proposed for decommissioning to decrease road density in sage-grouse core habitat. 803.2A is parallel to, and within 900 feet of 803.3A.
803.2F	Decommission level 1 road	Proposed for decommissioning because this road is no longer needed for administrative access. There will be no change to public motorized access. The road is parallel to, and within 500 feet of, 451.1C.
803.3F	Decommission	Proposed for decommissioning because this road parallels an ephemeral stream, has poor drainage, and is deeply rutted.
806.4A	Decommission	Proposal is to decommission a steep, rutted section of this road that has poor drainage.
806.5A	Decommission	Proposed for decommissioning to decrease road density in an area of high road density.
806.7A	Decommission	Proposed for decommissioning to decrease road density in an area of high road density. This road is within ½ mile of, and parallel to 806.6A and 830.1B.

Appendix C. Comparison of 2015 Travel Analysis Recommendations for the North Savery Project Area Road System with the 2017 North Savery Proposed Actions for Transportation System Changes and Travel Management (updated 7/13/2017)

Explanation of acronyms in table 31: NA = not applicable; mi = miles; HUC = hydrologic unit code; NE = northeast.

Table 31. Comparison of North Savery transportation system proposed actions and actions in the 2015 Travel Analysis Report

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
412	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change to any segment that traverses North Savery project area.
412.1A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
412.1B	Level 2 Open Road	Keep	No Proposal	NA
435	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change. Public comment supported keeping road in existing condition.
435	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change. Public comment supported keeping road in existing condition.
435.1A	Level 2 Open Road	Keep	Keep as open road (miles to be determined)	Consistent with 2015 Travel Analysis Report. No change.
435.1A	Level 2 Open Road Under no-action alternative, route 4258 would be decommissioned (0.5 miles).	Keep	Decommission (0.2 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation but would not reduce access. Reroute would address road condition and maintenance concerns. This section of 435.1A runs straight up and down steep slope, and therefore is eroding and difficult to maintain. Route 4258 would be added as an open National Forest System road. It would provide access to the same area but is better located (ridgetop) than 435.1A. Decommissioning would reduce 190 feet connected disturbed area in the Methodist Creek HUC 7. Decommission 0.2 miles of west end of road due to resource damage down steep slope. Remainder of road would stay open and tie into user-created road (4258), which would be added to system. Adding 4258 to system because it is a ridge-top road. Route 4258 is 0.5 mile in length.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
435.1B	Level 2 Open Road	Keep	Decommission (1.5 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Action would decrease road density in sage-grouse core habitat. Road currently provides duplicate access. Goes to the same place and is within 0.5 miles of 435. Decommissioning would reduce 1,300 feet of connected disturbed area in Upper Jack Creek HUC7. Decommission 1.5 miles of road due to location is in sage-grouse core habitat and duplicates access with road 435. Sage-grouse core area was designated after the 2015 travel analysis process.
435.1C	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
435.1D	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
435.1E	Level 2 Open Road	Don't keep	Keep as open road	Site-specific recommendation varies from 2015 Travel Analysis Report. Rationale
435.2A	Level 2 Open Road	Don't keep	Decommission (0.3 mi)	Consistent with 2015 travel analysis report recommendation. Public comment suggested and supported decommissioning. This road is causing damage to, and loss of, riparian and wetland habitat at North Spring Creek.
435.2C	Level 2 Open Road	Keep	No proposal	NA
435.2D	Level 2 Open Road	Keep	Decommission (1.1 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. This road is causing damage to, and loss of, riparian and wetland habitat at stream and wetland crossing and currently provides duplicate access – 435.1D parallels 435.2D 0.25 miles to the northwest. Decommissioning would reduce 430 feet connected disturbed area in the Methodist Creek HUC 7.
435.2E	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
435.3A	Level 2 Open Road	Don't keep	Keep as open road	Site-specific analysis differs from 2015 Travel Analysis Report. Rationale
435.3D	Level 2 Open Road	Don't keep	Keep as open road	Site-specific analysis differs from 2015 Travel Analysis Report. Rationale
435.4A	Level 2 Open Road	Keep	Decommission (0.2 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning to decrease road density in sage-grouse core habitat. This road provides duplicate access to Bureau of Land Management land and receives very little use. National Forest System Road 435 (0.75 miles away) and 435.1A (0.3 miles away) provide access to same general Bureau of Land Management land.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
435.5A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
435.6A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
435.7A	Level 2 Open Road	Keep	Decommission (0.2 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Very short spur route which leads to 435.2A, which is proposed for decommissioning due to riparian and wetland concerns.
443	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
443.1A	Level 1 Closed Road	Keep	No proposal	NA
443.1B	Level 1 Closed Road	Keep	No proposal	NA
443.1D	Level 1 Closed Road	Keep	No proposal	NA
443.1E	Level 2 Open Road	Keep	No proposal	NA
443.1F	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
443.1G	Level 2 Open Road	Keep	No proposal	NA
443.1H	Level 1 Closed Road	Keep	No proposal	NA
443.1I	Level 2 Open Road	Keep	No proposal	NA
443.1K	Level 2 Open Road	Keep	No proposal	NA
443.2G	Level 2 Open Road	Keep	Decommission (1.1 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning due to significant resource damage at wetland and stream crossings. The eastern portion of the road is in an inventoried roadless area, and there is no legal access to or from South Spring Lake since the road is on private land in this area. Access to private land is available and more direct via road 443.** from 443 main road. Decommissioning would reduce 210 feet connected disturbed area in the Upper North Spring Creek HUC 7.
443.2I	Level 2 Open Road	Don't keep	No proposal	NA
443.2J	Level 2 Open Road	Don't keep	No proposal	NA
443.2K	Level 2 Open Road	Keep	No proposal	NA
443.3K	Level 2 Open Road	Keep	No proposal	NA
448	Level 2 Open Road	Keep	Keep as open road (0.5 mi)	Consistent with 2015 Travel Analysis Report; public motorized access would be maintained and reroute would address resource concerns. Retain as motorized access for first 0.5 mile from origin at National Forest System Road 452.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
448	Level 2 Open Road	Keep	Reroute	Consistent with 2015 travel analysis report recommendation in that access is retained although road would be rerouted. Proposed to be rerouted onto 448.1E with addition of unauthorized route to move traffic to an upland location. 448 parallels riparian and wetland areas for 0.6 mile and has multiple stream crossings causing erosion, sedimentation, and riparian damage. There is no public access from the west end of the 448 at the forest boundary since it ends at private land. The westernmost 1.0 mile of the road (west of junction with proposed off-highway vehicle trail) would be maintained as a closed level 1 road for permittee access. Decommissioning would reduce 3,400 feet connected disturbed area in the North Fork Savery Creek HUC 7.
448	Level 2 Open Road	Keep	Decommission (1.35 mi)	Consistent with 2015 travel analysis report recommendation in that access is retained although road would be rerouted.
448	Level 2 Open Road	Keep	Change to level 1 closed road (1.69 mi)	Consistent with 2015 travel analysis report recommendation as road would be retained. Proposed change to maintenance level 2 but closed to public motorized use in Sections 21, 22, and 27 to retain access for grazing permittee. Closure to public motorized use.
448.1A	Level 2 Open Road	Keep	Change to level 1 closed road (0.1 mi)	Consistent with 2015 travel analysis report recommendation as road would be retained. Proposed for closure to public because this short 0.1 mile spur leads through 0.25 mile of State land to private land without public access. Would maintain as closed level 1 road for permittee access to Ranger Ditch.
448.1B	Level 2 Open Road	Keep	Change to level 1 closed road (0.19 mi)	Consistent with 2015 travel analysis report recommendation as road would be retained. Proposed for closure to travel because this short 0.19 mile spur in sagebrush leads to private land without public access. The proposed re-route for 448 would end just before this spur. Would maintain as level 1 road for permittee access.
448.1C	Level 2 Open Road	Keep	Decommission (1.1 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation because of need to control resource damage from motorized use. Proposed for decommissioning because of severe damage to stream and wetland resources at double stream crossing (T16, R87, S 29, NE/NE). This crossing is impassable by regular sized 4x4 vehicles and has been used only by all-terrain and off-highway vehicles, which are also causing significant damage. A better route is proposed south of this location to connect to the 803 road system. Decommissioning would reduce 1,700 feet connected disturbed area in the North Fork Savery Creek HUC 7.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
448.1D	Level 2 Open Road	Keep	Decommission (1.8 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation because of resource damage. Proposed for decommissioning because of location in wetland complex. South of North Fork Savery Creek, this old road is not being used and is already grown in with vegetation. Decommissioning would reduce 660 feet connected disturbed area in the North Fork Savery Creek HUC 7.
448.1E	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 travel analysis report recommendation. This road segment would be used to reroute National Forest System Road 448.
448.1F	Level 2 Open Road	Keep	Decommission (0.3 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation to reduce road density. Part of this road segment would be used to reroute National Forest System Road 448. Only the easternmost portion of this road is proposed for decommissioning to decrease road density in a high road density area. The proposed addition of an unauthorized route between 448.1F and 448.1E would provide access to the same area. Eastern portion of road would be decommissioned.
448.1G	Level 2 Open Road	Keep	Decommission (0.1 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation because of poor road location. Proposed for decommissioning because this steep spur road runs down to a stream and is causing erosion, sedimentation, and loss of riparian and wetland characteristics at the stream crossing. The proposed re-route of 448 also restricts access to this road. Decommissioning would reduce 49 feet connected disturbed area in the North Fork Savery Creek HUC 7.
448.2C	Level 2 Open Road	Keep	Decommission (0.3 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. This 1,700 foot spur is proposed for decommissioning to decrease road density in an area of high road density. The proposed re-route of 448 also restricts access to this road. Decommissioning would reduce 15 feet connected disturbed area in the North Fork Savery Creek HUC 7.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
448.2D	Brush Creek/Hayden motor vehicle use map shows Level 2 Open Road, but segment does not exist or is naturally revegetated	Keep	Remove from road system and database	Site-specific analysis differs from 2015 travel analysis report recommendation. This road is identified as a National Forest System road, but the route is not being used for motorized access and has revegetated to the point it no longer looks like a route. Public comment supported removing this road from system.
448.2F	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
448.2V	Brush Creek/Hayden motor vehicle use map shows Level 2 Open Road, but segment does not exist or is naturally revegetated	Keep	Remove from road system and database	Site-specific analysis differs from 2015 travel analysis report recommendation. This road is identified as a National Forest System road, but the route is not being used for motorized access and has revegetated to the point it no longer looks like a route. Public comment supported removing this road from system.
448.3C	Level 2 Open Road	Keep	Decommission (0.3 mi)	Site specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning because this spur leads to private land without public access. The proposed re-route of the 448.1C off-highway vehicle trail also restricts access to this road. Decommissioning would reduce 11 feet connected disturbed area in the North Fork Savery Creek HUC 7.
449	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
449.1A	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
449.1B	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
449.1C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
449.1D	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
450	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
450	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
450.1A	Level 1 Closed Road	Don't keep	Keep as closed road	Site-specific recommendation differs from 2015 Travel Analysis Report. Rationale
450.1C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
450.1D	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
450.1E	Level 1 Closed Road	Don't keep	Keep as closed road	Site-specific recommendation differs from 2015 Travel Analysis Report. Rationale

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
450.1G	Level 2 Open Road	Don't keep	Keep as closed road	Site-specific recommendation differs from 2015 Travel Analysis Report. Rationale
450.1I	Level 2 Open Road	Don't keep	Decommission (0.1 mi)	Consistent w/2015 travel analysis report recommendation. Redundant road. Short spur is less than 400 feet away from and parallel to 450.
450.2C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
450.2D	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
450.3D	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
450.4D	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
451	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
451.1A	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
451.1B	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
451.1C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 travel analysis report recommendation. No change.
452	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.1A	Level 2 Open Road	Keep	Keep as open road, Reroute (0.5 mi)	Consistent with 2015 travel analysis report recommendation because access would be maintained. Segment causing resource damage is proposed to be replaced with a better located, currently unauthorized route (4004) that provides access to State lands. Reroute would reduce 200 feet connected disturbed area in the Willow Creek HUC 7.
452.1B	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.1C	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.1C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.1D	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
452.1F	Level 2 Open Road	Keep	Decommission (0.1 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposed to be decommissioned because this road has poor drainage and is steep and eroding. This is a high road density area and this road provides redundant access with 452 to 452.3F. Decommissioning would reduce 44 feet connected disturbed area in the Upper Jack Creek HUC 7.
452.1N	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.1U	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.1V	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.1W	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.2A	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.2B	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.2B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.2C	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.2E	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.2F	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.2G	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.2H	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.2J	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.2J	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.2K	Level 2 Open Road	Keep	Keep as open road (0.7 miles)	Consistent with 2015 Travel Analysis Report. No change for 0.7 miles.
452.2K	Level 2 Open Road	Keep	Decommission (1.0 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Decommissioning would reduce 1,600 feet connected disturbed area in the Upper Jack Creek HUC 7.
452.2L	High Clearance	Not addressed	Add route to system	Rationale?
452.2M	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
452.2N	Level 2 Open Road	Keep	Some portion open? Decommission (0.3 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. The area between 452.2N on north and 452.1V on the south has a lot of user created spurs. The road is poorly drained and deeply rutted. Proposal would add currently unauthorized eastern loop to connect to 452.1V. Decommissioning would reduce 260 feet connected disturbed area in the McLain Creek HUC 7.
452.2P	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.2Q	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
452.2W	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.3B	Level 2 Open Road	Keep	Does some stay open? Decommission (0.4 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. This spur is proposed for decommissioning to decrease road density in an area of high road density and because it is gradually being extended into a riparian area. Parallel to 452.1W.
452.3D	Level 2 Open Road	Keep	Decommission (0.1 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. This redundant 750 foot spur connects 452 to 452.1D 1,000 feet from where 452 intersects 452.1D. Road is causing resource damage due to the steep, eroding slope.
452.3F	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.3K	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.3N	Level 2 Open Road	Keep	No proposal	NA
452.3X	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.4B	Level 2 Open Road	Don't keep	Decommission (0.2 mi)	Consistent with 2015 travel analysis report recommendation. Proposed for decommissioning because this road is causing erosion, sedimentation, and damage to riparian and wetland areas near McLain Creek. Decommissioning would start just past the first meadow to retain dispersed camp sites. Decommissioning would reduce 150 feet connected disturbed area in the McLain Creek HUC 7.
452.4K	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.5B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
452.6B	Level 2 Open Road	Keep	No proposal	NA

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
452.7B	Level 2 Open Road	Keep	Decommission (0.3 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning because this road is very steep and has poor drainage, with potential for erosion and sedimentation into Jack Creek. Would decommission near the forested edge in the first meadow to retain dispersed camping. Decommissioning would reduce 150 feet connected disturbed area in the Upper Jack Creek HUC 7.
452.8B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
453	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
453.1A	Level 2 Open Road	Keep	No proposal	NA
453.1B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
456	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
456.1A	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
456.1B	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
456.1C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
456.1D	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
456.1E	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
456.1F	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
456.2B	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
456.2E	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
457	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
457	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
457.1A	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
457.1B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
457.1C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
457.1D	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
457.1E	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
457.2C	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
460	Level 1 Closed Road	Don't keep	Keep as closed road	Not consistent with 2015 Travel Analysis Report. Rationale
460.1A	Level 1 Closed Road	Don't keep	Keep as closed road	Not consistent with 2015 Travel Analysis Report. Rationale
460.1B	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
461	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
461.1A	Level 1 Closed Road	Don't keep	Keep as closed road	Not consistent with 2015 Travel Analysis Report. Rationale
461.1B	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
462	Level 3 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
462	Level 1 Closed Road	Keep	Keep as closed road	Consistent with 2015 Travel Analysis Report. No change.
803	Level 2 Open Road	Keep	Keep as open road (** miles)	Consistent with 2015 Travel Analysis Report for this segment of National Forest System Road 803.
803	Level 2 Open Road	Keep	Decommission (1.3 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation for portions of National Forest System Road 803. Proposed for decommissioning because this road parallels riparian wetland areas for 0.2 mile and is causing erosion, sedimentation, and riparian damage at multiple stream crossings. The road is poorly drained and deeply rutted. The proposal includes addition of several currently unauthorized routes that would provide improved access to the area. Decommissioning would reduce 650 feet connected disturbed area in the Hartt Creek HUC 7 and 490 feet connected disturbed area North Fork Savery Creek HUC 7.
803.1A	Level 2 Open Road	Keep	Decommission (0.6 mi)	Site specific analysis differs from 2015 travel analysis report recommendation. This road is proposed for decommissioning to decrease road density in an area of high road density. This northwest quarter of Section 6 is confusing due to so many 2-tracks. The proposal includes addition of several currently unauthorized routes that would provide improved access to the area without increasing resource damage.
803.1B	Level 2 Open Road	Keep	Keep as open (miles to be determined)	Consistent with 2015 travel analysis report recommendation. No change.
803.1C	Level 2 Open Road	Keep	Keep portion as open (0.7 miles)	Consistent with 2015 travel analysis report recommendation in that 0.7 miles of this road would be retained to provide public motorized access.
803.1CDi	Level 2 Open Road	Keep	Decommission (1.2 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposal is to decommission a steep section of this road that runs down to a riparian area and is causing erosion, sedimentation and riparian and wetland damage. Decommissioning would reduce 451 feet connected disturbed area in the North Fork Savery Creek HUC 7.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
803.1D	Level 2 Open Road	Keep	Keep portion as open (miles to be determined)	Consistent with 2015 travel analysis report recommendation in that miles of this road would be retained to provide public motorized access.
803.1D	Level 2 Open Road	Keep	Decommission (0.4 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning because of its poor condition and location. Road leads to valley bottom and wetlands. Access to area would be provided by addition of 803.1E.
803.1E	Not on current road system	Not addressed	Add route to system (0.6 mi)	Differs from 2015 Travel Analysis Report because nonsystem routes would be decommissioned as part of operational program. Rationale. Designate as level 2 open road.
803.1F	Not on current road system	Not addressed	Add route to system (0.8 mi)	Differs from 2015 Travel Analysis Report because nonsystem routes would be decommissioned as part of operational program. Rationale. Designate as level 2 open road.
803.2A	Level 2 Open Road	Keep	Keep as open road (miles to be determined)	Site specific analysis differs from 2015 travel analysis report recommendation. Road is needed for **
803.2A	Level 2 Open Road	Don't keep	Decommission (0.6)	Consistent with 2015 travel analysis report recommendation. Proposed for decommissioning to decrease road density in sage-grouse core habitat. 803.2A is parallel to and within 900 feet of 803.3A. Decommissioning would reduce 85 feet connected disturbed area in the Hartt Creek HUC 7. Decommission to decrease road density in sage-grouse core habitat. Sage-grouse core habitat designated after 2015 travel analysis report recommendation.
803.2C	Not on current road system	Not addressed	Add route to system (0.9 mi)	Differs from 2015 Travel Analysis Report because nonsystem routes would be decommissioned as part of operational program. Rationale. Designate as level 2 open road.
803.2F	Level 1 Closed Road	Keep	Decommission closed road (0.6 mi)	Site specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning because this road is no longer needed for administrative access. There would be no change to public motorized access. The road is parallel to and within 500 feet of 451.1C.
803.3A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
803.3B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
803.3F	Level 2 Open Road	Keep	Decommission (0.4 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning because this road parallels an ephemeral stream, has poor drainage, and is deeply rutted. Proposed addition of road 803.2C would provide access to same general area. Decommissioning would reduce 230 feet connected disturbed area in the North Fork Savery Creek HUC 7.
806	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.1A	Level 1 Closed Road	Keep	No proposal	NA
806.1E	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.2A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report.
806.2D	Not on current road system	Not addressed	Add route to system	Differs from 2015 Travel Analysis Report because nonsystem routes would be decommissioned as part of operational program. Rationale. Designate as level 2 open road.
806.3A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.3B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.3C	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.4A	Level 2 Open Road	Keep	Decommission (0.6 miles)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposal is to decommission a steep, rutted section of this road that has poor drainage. Decommissioning would reduce 980 feet connected disturbed area in the East Fork Savery Creek HUC 7.
806.5A	Level 2 Open Road	Keep	Decommission (0.5 miles)	Site specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning to decrease road density in an area of high road density.
806.6A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.6B	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.7A	Level 2 Open Road	Keep	Decommission (0.2 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Proposed for decommissioning to decrease road density in an area of high road density. This road is within ½ mile of and parallel to 806.6A and 830.1B.
806.8A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
806.9A	Level 2 Open Road	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.
830	4	Keep	Keep as open road	Consistent with 2015 Travel Analysis Report. No change.

Road Number	No Action	2015 TAR	2017 DEIS Proposed Action	Action Consistent with Travel Analysis Report? Rationale for Change
830.1A	Level 1 Closed Road	Don't keep	Keep as closed road for administrative access	Site-specific analysis differs from 2015 travel analysis report recommendation. Road is needed for **
830.1B	Level 2 Open Road	Keep	Keep as open road (miles to be determined)	Consistent with 2015 travel analysis report recommendation as road is retained with short reroute.
830.1B	Level 2 Open Road	Keep	Decommission section of road abandoned due to reroute (0.2 mi)	Site-specific analysis differs from 2015 travel analysis report recommendation. Decommissioning would reduce 780 feet connected disturbed area in the East Fork Savery Creek HUC 7.

Table 32. Comparison of North Savery proposed actions for unauthorized routes and actions in the 2015 Travel Analysis Report

Unauthorized Route Identification	No Action	Transportation Program Treatment	2017 Modified Proposed Action	Rationale for Change
4004	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
4004	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
4004	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
4004	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
4029	Unauthorized route	Decommission	Add route to system	Add to system for administrative use because route is in better location, has fewer resource impacts, or provides administrative access not provided by current designated system roads. Designate as 1 - basic custodial care (closed) for maintenance and operation.

Unauthorized Route Identification	No Action	Transportation Program Treatment	2017 Modified Proposed Action	Rationale for Change
4034	Unauthorized route	Decommission	Keep as closed roads for administrative access	Add to system for administrative use because route is in better location, has fewer resource impacts, or provides administrative access not provided by current designated system roads. Designate as 1 - basic custodial care (closed) for maintenance and operation.
4053	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
4258	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
4307	Unauthorized route	Decommission	Keep as open roads	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
GIS ID ###	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
GIS ID ###	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
GIS ID ###	Unauthorized route	Decommission	Add route to system	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
GIS ID ###	Unauthorized route	Decommission	Relocate road to this new location	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.
GIS ID ###	Unauthorized route	Decommission	Relocate road to this new location	Add to system because route is in better location, has fewer resource impacts, maintains public motorized access in location that would otherwise have reduced access, or some combination of these things. Designate as Level 2 - high clearance vehicles for maintenance and operation.