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Bud Project
Environmental Assessment

Brush Creek/Hayden Ranger District

Medicine Bow-Routt National Forests

Carbon County, Wyoming

T13-15N R86-88W

Responsible Official: **Melanie Fullman**
District Ranger

For Further Information: **Monique Nelson, ID Team Leader**
(307) 745-2310
Email: moniquelnelson@fs.fed.us

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Cover Photo: Lodgepole pine stand in the Sierra Madre, summer 2013.

Table of Contents

Tables

Maps

Chapter 1 – Need for the Proposal

Background

The purpose of this environmental assessment (EA) is to disclose the effects and consequences of alternative strategies to manage resources in the Bud Analysis Area. This information enables the Responsible Official to make decisions with a full understanding of the alternatives and allows the USDA Forest Service to disclose the nature and potential effects of proposed actions to the public.

Our objective is to furnish enough site-specific information to demonstrate consideration of environmental consequences of the proposed alternatives, with a focus on the issues identified by the public and our interdisciplinary team. Additional documentation is located in a project file (i.e., a compilation of documents prepared for this project), which can be reviewed upon request. This document, as well as the Notice of Proposed Action and other project information, is available on the Forest web site at <www.fs.usda.gov/projects/mbr/landmanagement/projects>.

Based on information in this EA and the project file, the Responsible Official can decide to take no action, to defer activities, or to implement an action alternative or portions of the alternatives. In her decision, the Responsible Official will determine:

- Selection and site-specific location of appropriate vegetation, fuels, and habitat treatments, if any;
- Selection and site-specific location of appropriate travel management activities, if any.
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The USDA Forest Service has prepared this EA in compliance with the National Environmental Policy Act (NEPA), the National Forest Management Act, the 2003 Revised Medicine Bow National Forest Land and Resource Management Plan ("Forest Plan"), and other relevant Federal and State laws and regulations.

Analysis Area

The Bud Analysis Area is located in Carbon County, WY, approximately 20 miles west of Encampment on the Sierra Madre portion of the Brush Creek-Hayden Ranger District ("the District"). The legal description is T13-15N, R86-88W. The analysis area lies north of Battle Highway (Hwy 70) and south of the Forest boundary, and encompasses the Dirtyman Fork, Middle Savery, Big Sandstone, and Little Sandstone Creek watersheds (Map 1).

The analysis area of approximately 51,869 acres includes 50,837 acres of National Forest System land (98%) and 1,032 acres of private land (2%). Inventoried Roadless Areas (IRAs) account for 57% percent of the analysis area. Elevation ranges from approximately 7,000 feet to just over 9,500 feet at Singer Peak. Management actions within the analysis area would occur only on National Forest land.

Purpose and Need

The purpose of the Bud Project is to improve ecosystem health and forest productivity in the analysis area through vegetation, fuels, habitat, and travel management projects.

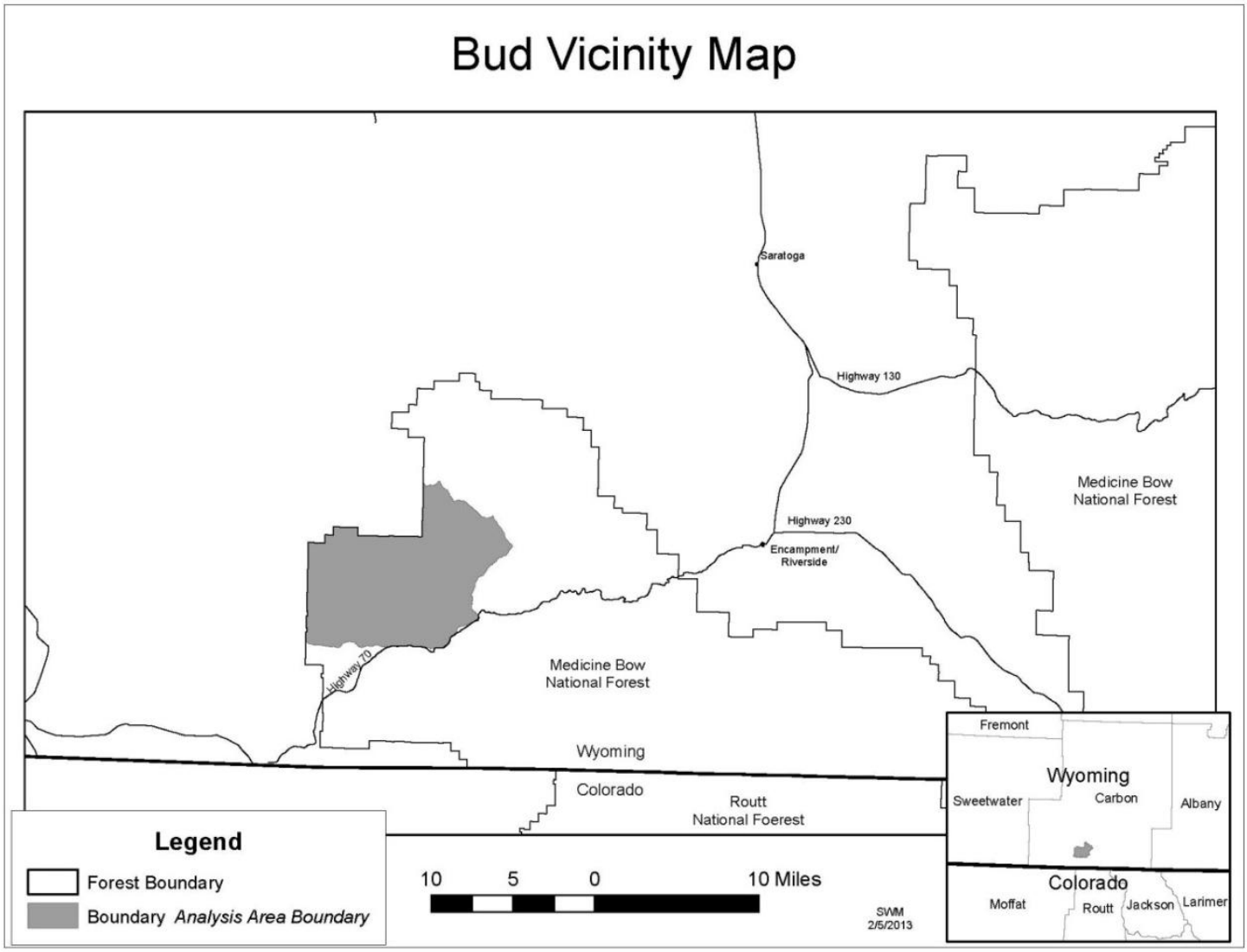
Vegetation, fuels, and habitat treatments are needed because there are:

- hazardous trees in high priority areas;
- poor age class diversity and high fire hazards in shrublands and aspen/conifer communities;
- continuous, high-hazard fuel conditions in high timber production areas;

- opportunities to improve Colorado River cutthroat trout habitat and maintain aspen stands needed for plant diversity and wildlife habitat;
- limited regeneration of lodgepole pine in suitable timber stands;
- overstocked timber stands with limited growth and vigor; and
- opportunities to provide merchantable timber products for sale from designated timber units.

Travel management actions are needed because:

- existing road systems are contributing to degraded resource conditions or are detrimental to watershed health; and
- opportunities exist to improve long-term transportation system management.



Map 1. Bud Project vicinity map.

Chapter 2 – Proposed Action and Alternatives

Alternative Development

This project was initiated in April 2010 as part of the Savery Analysis. A notice of intent to publish an environmental impact statement (EIS) and opportunity to comment were printed in the Federal Register on April 16, 2010. In January 2013, the Responsible Official made a decision to analyze only the westernmost four watersheds of the original Savery analysis area and to document the "Bud" analysis in an EA.

Fifteen comments were received in response to the 2010 scoping period. Those comments were used to develop the two action alternatives analyzed in this EA. The issues raised during scoping are described in detail in the July 2013 Notice of Proposed Action. Both action alternatives presented in this EA apply to a smaller analysis area than proposed during scoping, eliminating several watersheds of concern and recreation use areas from the proposal.

The Notice of Proposed Action was released in July 2013, initiating the formal 30-day comment period for the Bud Project. We received nine comment letters, seven from State and local Agencies, and two from private organizations or individuals. A list of commenters is included in Chapter 4, on page 40 of this document. Seven of the commenters provided specific comments that have been directly addressed in this EA. Rather than preparing a separate "response to comments" document, those comments have been incorporated in the Alternatives and Environmental Consequences chapters.

The action alternatives presented in this EA specifically address timber salvage needs in the Green Ridge area. These stands were chosen because they are highly productive, with high site indexes and high timber volumes, and are located in timber production emphasis management areas. These stands are priorities for future timber production because they are capable of producing the highest timber volumes and yield the biggest return on stand management investments. Although there may be other locations within the analysis area ready for timber harvest, this proposal is designed to expedite salvage only within Green Ridge due to time and funding constraints. The two action alternatives do not include proposals for timber salvage in lower priority timber stands within the analysis area.

Alternatives

2010 Savery Alternative

The 2010 Savery proposal includes vegetation, fuels, habitat, and travel management activities designed to meet the purpose and need for the project. Detailed treatment descriptions begin on page 14.

Vegetation, Fuels, and Habitat Management

This alternative includes (Table 1 and Map 3):

- Clearcut with Reserve Trees and Overstory Removal treatments for timber salvage,
- Mechanical fuelbreaks and prescribed burning for vegetation and fuels management, and
- Aspen regeneration treatments for wildlife habitat improvement.

Portions of the aspen regeneration treatments and prescribed burning would occur within IRAs (Table 2 and Map 7). All vegetation, fuels, and habitat management proposals described in this alternative are also part of the 2013 Bud Alternative.

Travel Management

This alternative includes (Table 3 and Map 4):

- Construction of temporary roads to access timber harvest units,
- Designation of new Level 2 system roads, and
- Decommissioning of user-created routes and some existing Level 2 roads.

In this alternative, temporary roads would be constructed for all vegetation treatments and would be decommissioned following use.

2013 Bud Alternative (Preferred Alternative)

The 2013 Bud Alternative also includes vegetation, fuels, habitat, and travel management activities designed to meet the stated purpose and need for the project, plus additional proposals relevant to resource management in the project area that are not included in the 2010 Savery Alternative. Detailed Treatment Descriptions begin on page 14.

Vegetation, Fuels, and Habitat Management

This alternative includes (Table 1 and Map 5):

- Clearcut with Reserve Trees and Overstory Removal treatments for timber salvage, as described in the 2010 Savery Alternative,
- Mechanical fuelbreaks and prescribed burning for vegetation and fuels management, as described in the 2010 Savery Alternative,
- Aspen regeneration treatments for habitat improvement, as described in the 2010 Savery Alternative.
- Fenceline hazard tree clearing, and
- Two additional prescribed burn units.

Portions of the aspen regeneration treatments, fenceline clearing, and prescribed burning would occur within IRAs (Table 2 and Map 7).

Travel Management

This alternative includes (Table 3 and Map 6):

- Construction of temporary and Level 1 roads to access timber harvest units,
- Designation of new Level 2 system roads,
- Decommissioning of user-created routes and some Level 2 system roads,
- Designation of a temporary route to access an existing fish barrier on Mill Creek.

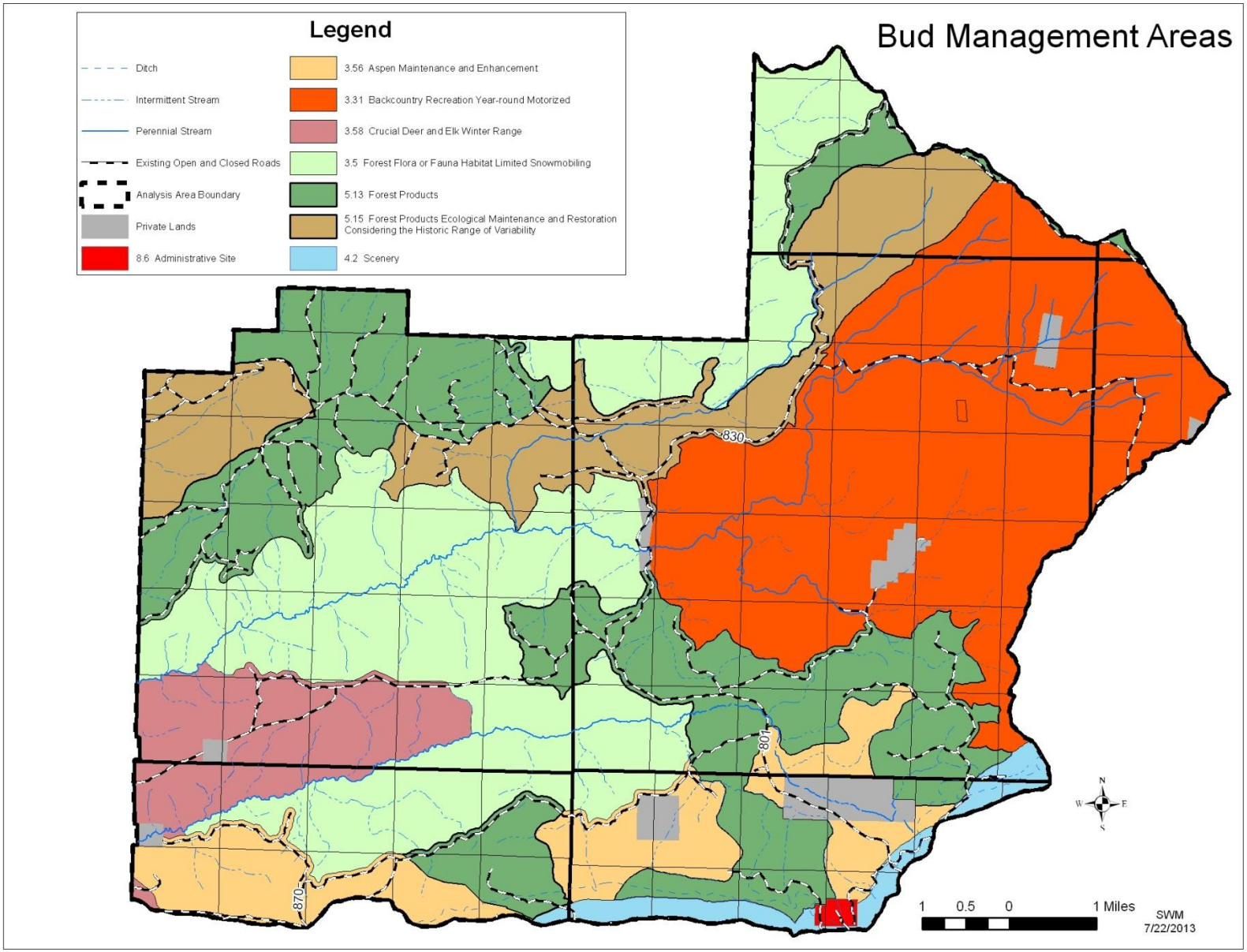
In this alternative, all but 0.25 miles of roads constructed to access timber harvest units would be added to the National Forest road system as Level 1 roads closed to the public. Temporary roads constructed to access fenceline clearing units would be decommissioned following use. The temporary route to access the Mill Creek fish barrier is within the Singer Peak IRA; equipment would cross the ground but no road would be created, and impacted areas would be fully restored following use.

Table 1. Comparison of vegetation, fuels, and habitat treatment acres by alternative.*

Management Area (MA)	MA Description	MA Acres in Analysis Area (AA) (% AA)	2010 Savery Alternative Treatment Acres (% of MA treated in AA)	2013 Bud Alternative Treatment Acres (% of MA treated in AA)
3.31	Backcountry recreation, year-round motorized	13,263 (26%)	Aspen Regeneration – 107 Fenceline Clearing – 0 Total – 107 (<1% of MA in AA)	Aspen Regeneration – 107 Fenceline Clearing – 13 Total – 120 (<1% of MA in AA)
3.5	Forested flora or fauna habitat, limited snowmobiling	12,541 (24%)	Precommercial Thinning – 1 Fenceline Clearing – 0 Prescribed Burning – 0 Total – 1 (<<1% of MA in AA)	Precommercial Thinning – 1 Fenceline Clearing – 24 Prescribed Burning – 37 Total – 62 (<1% of MA in AA)
3.56	Aspen maintenance and enhancement	4,080 (8%)	Precommercial Thinning – 33 Fenceline Clearing – 0 Total – 33 (<1% of MA in AA)	Precommercial Thinning – 33 Fenceline Clearing – 8 Total – 41 (1% of MA in AA)
3.58	Crucial deer and elk winter range	3,141 (6%)	n/a	n/a
4.2	Scenery	982 (2%)	Precommercial Thinning – 47 Fenceline Clearing – 0 Total – 47 (5% of MA in AA)	Precommercial Thinning – 47 Fenceline Clearing – 39 Total – 86 (9% of MA in AA)
5.13	Forest products	11,218 (22%)	Clearcut with Reserves – 1,622 Overstory Removal – 176 Mechanical Fuelbreak** – 69 Precommercial Thinning – 786 Aspen Regeneration – 15 Fenceline Clearing – 0 Prescribed Burning – 0 Total – 2,599 (23% of MA in AA)	Clearcut with Reserves – 1,622 Overstory Removal – 176 Mechanical Fuelbreak** – 69 Precommercial Thinning – 786 Aspen Regeneration – 15 Fenceline Clearing – 94 Prescribed Burning – 15 Total – 2,708 (24% of MA in AA)
5.15	Forest products, ecological maintenance and restoration considering the historic range of variability	5,521 (11%)	Clearcut with Reserves – 942 Mechanical Fuelbreak**– 52 Precommercial Thinning – 157 Fenceline Clearing – 0 Prescribed Burning – 170 Total – 1,269 (23% of MA in AA)	Clearcut with Reserves – 942 Mechanical Fuelbreak**– 52 Precommercial Thinning – 157 Fenceline Clearing – 14 Prescribed Burning – 170 Total – 1,283 (23% of MA in AA)
8.6	Administrative Sites	91 (<1%)	Fenceline Clearing – 0 Total – 0 (0% of MA in AA)	Fenceline Clearing – 1 Total – 1 (1% of MA in AA)
PVT	Privately Managed	1,032	n/a	n/a
TOTAL		**51,869**	**4,064 (8% of AA)**	**4,335 (8% of AA)**

*Treatment acres may vary on the ground to facilitate project implementation.

**Treatment acres for mechanical fuelbreaks are accounted for in the Clearcut with Reserve Trees and Overstory Removal treatments, so they are not added into total treatment acres.



Map 2. Bud Project, Forest Plan management areas.

Table 2. Comparison of vegetation, fuels, and habitat treatment acres in Inventoried Roadless Areas by alternative.*

Inventoried Roadless Area (IRA)	Total IRA Acres	IRA Acres in Bud Analysis Area	2010 Savery Alternative Treatment Acres (% of total IRA treated)	2013 Bud Alternative Treatment Acres (% of total IRA treated)
Deep Creek	6,411	5,687	None	None
Big Sandstone	7,170	7,170	Road Decommissioning [1] – 1	Road Decommissioning [1] – 1
Little Sandstone	5,481	5,481	None	Fenceline Clearing [2] – 2 Prescribed Burn – 37
Singer Peak	10,491	8,832	Aspen Regeneration – 107	Aspen Regeneration – 107 Access Route to Fish Barrier [3] – 2
Strawberry Creek	5,876	2,738	None	Fenceline Clearing [4] – 22
TOTAL	**35,429**	**29,909**	**114 (<1% of IRAs)**	**177 (<1% of IRAs)**

* Treatment acres may vary on the ground to facilitate project implementation.

1 – 0.7 miles would be decommissioned. This is a user-created route for which the only access is from private land outside the forest boundary.

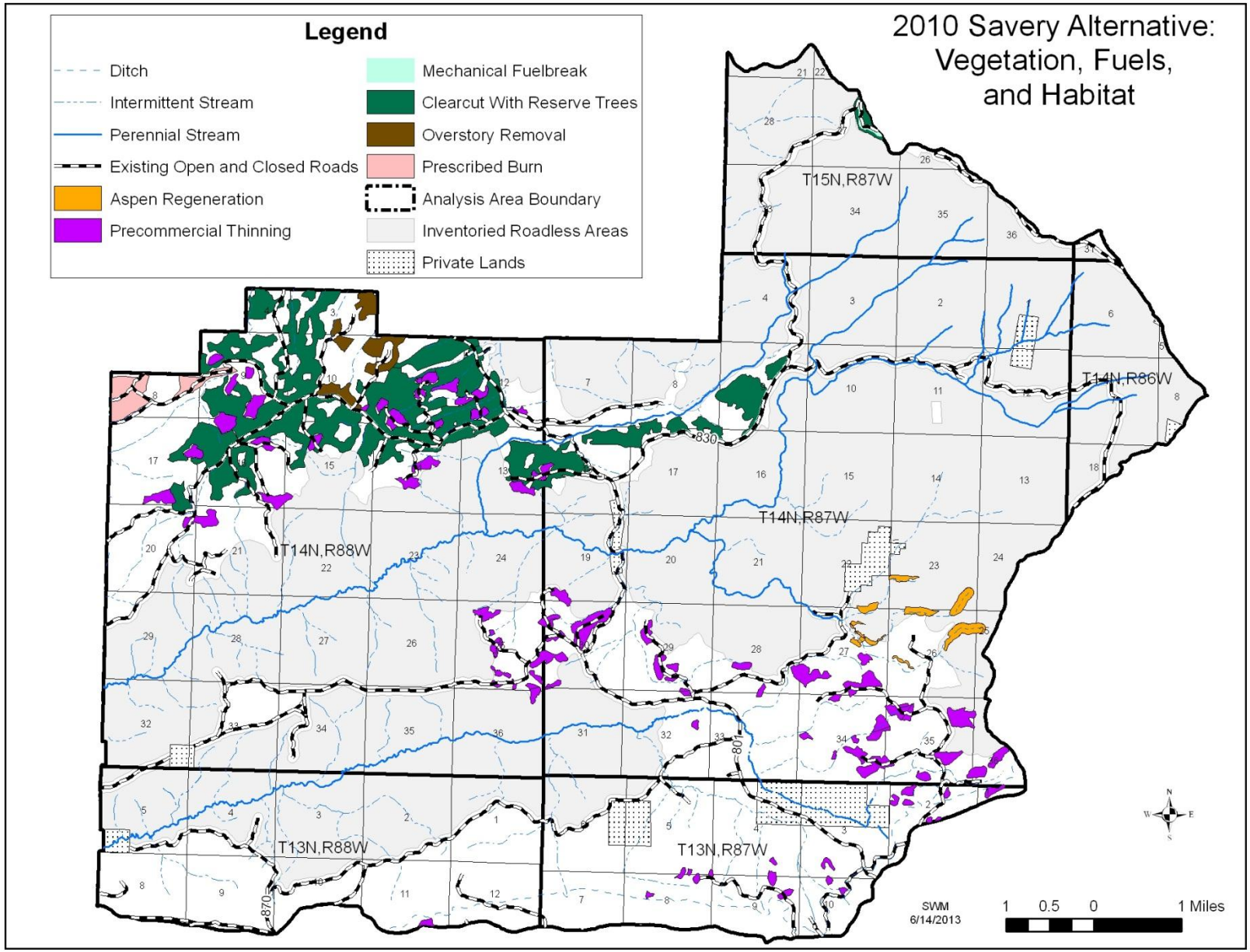
2 – Fenceline extends approximately 0.2 miles into IRA; trees would be cut and removed along fenceline without road construction.

3 – 1.14 miles (approximately 16 feet wide) of cross-country travel with incidental tree removal.

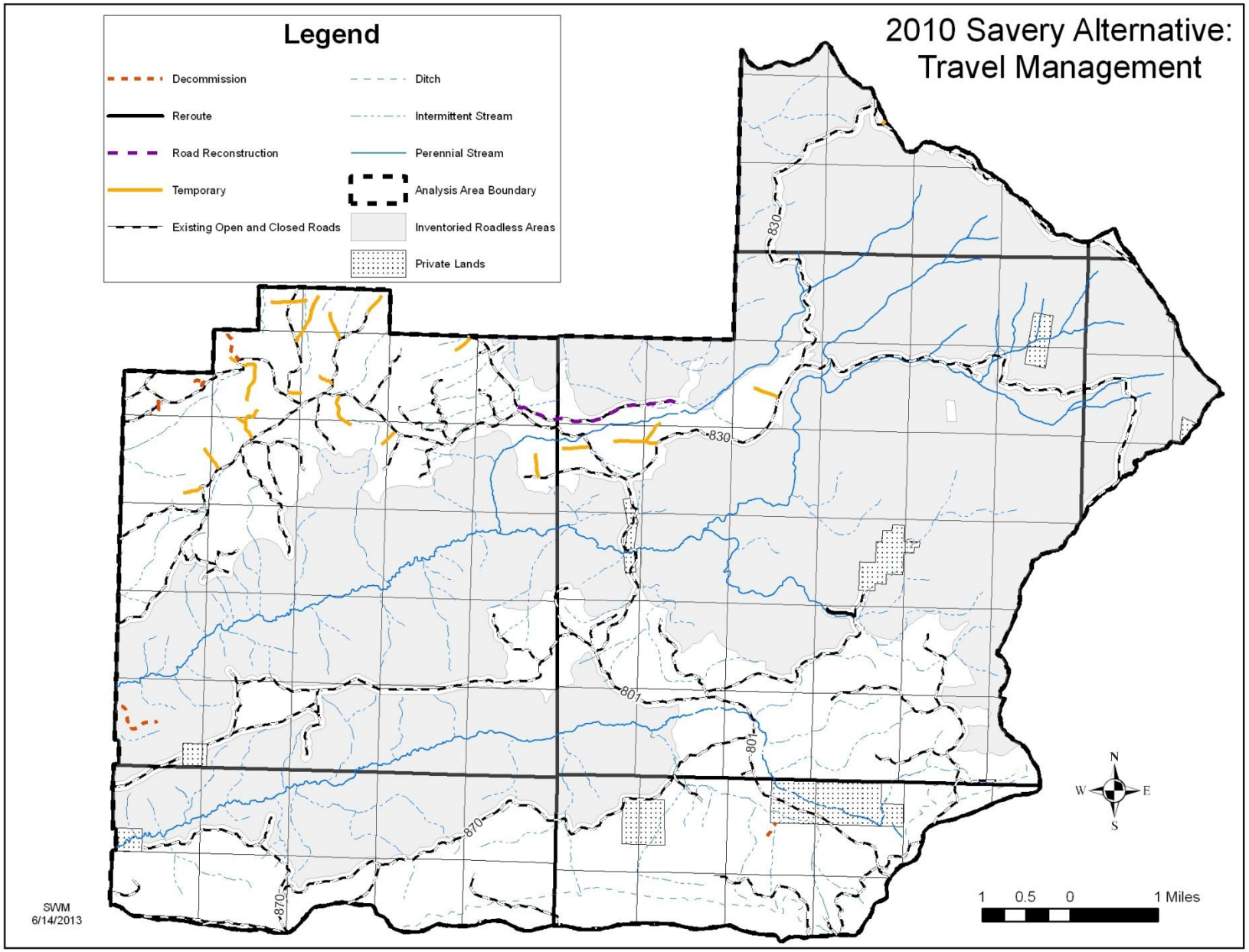
4 – 1.7 miles of fenceline along Forest boundary. Unless access is possible from adjacent land ownerships, trees would be hand-felled, and then cut to lie within 24 inches of the ground.

Table 3. Comparison of transportation system and travel management activities by alternative.

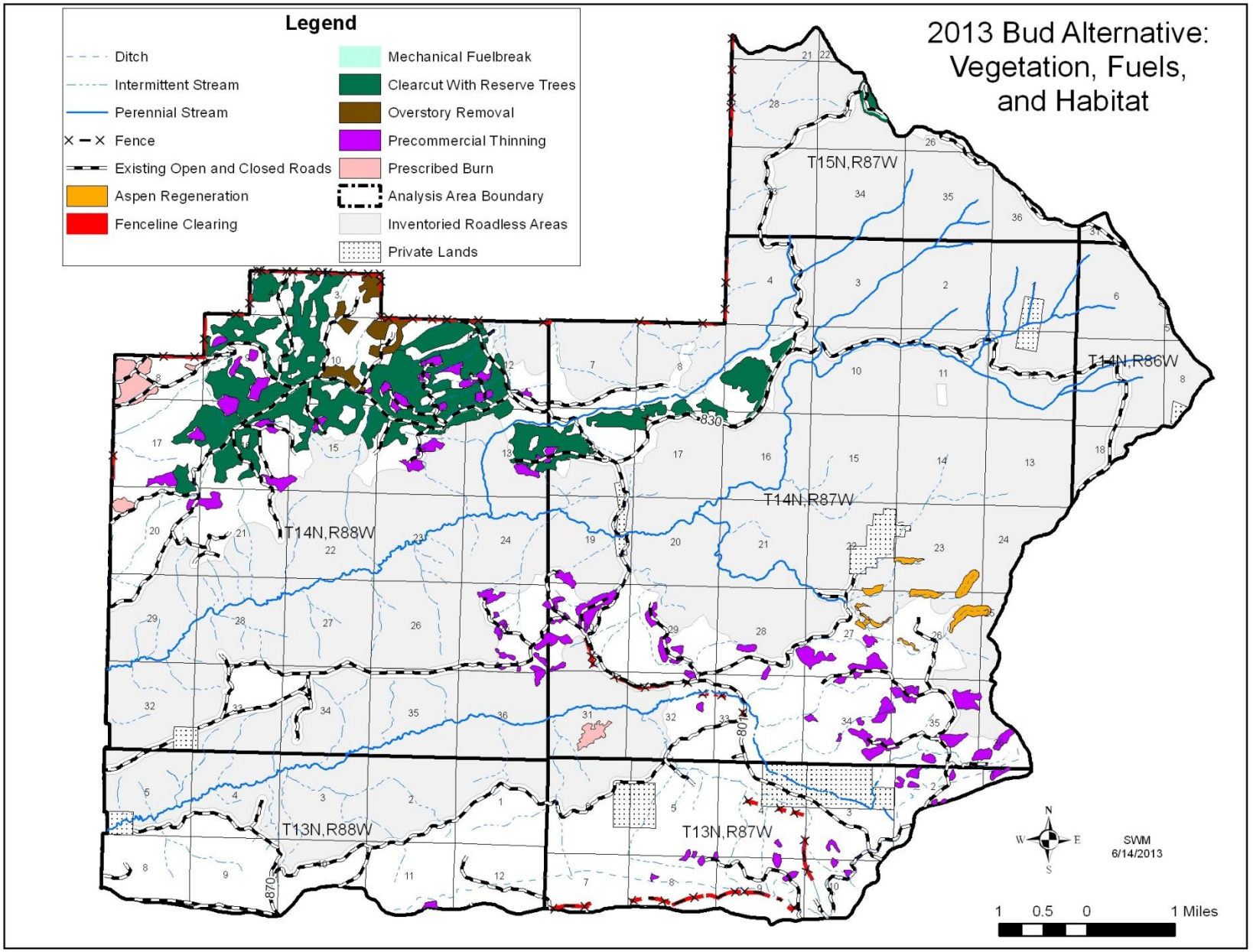
Travel Management Action Description	No Action / Existing Condition	2010 Savery Alternative Travel Management	2013 Bud Alternative Travel Management
Temporary access to fish barrier with full restoration	Evidence of original access route	None	1.14 miles for fish barrier access; not open to public motorized use.
Construct temporary road for vegetation treatments, then decommission	No known existing road template.	3.73 miles for timber management access; not open to public motorized use.	0.25 miles for timber management access; not open to public motorized use.
	Existing road template at location; no legal motorized use.	2.99 miles for timber management access; not open to public motorized use.	3.58 miles for fenceline clearing; not open to public motorized use.
Construct Level 1 road for vegetation treatments	No known existing road template.	None	3.73 miles Level 1 road ADDED to NF Road System for timber management and administrative access; not open to public motorized use.
	Existing road template at location; no legal motorized use.	None	3.23 miles Level 1 road ADDED to NF Road System for timber management and administrative access; not open to public motorized use.
Designate Level 2 road	Existing route at location; no legal motorized use.	0.8 miles Level 2 road ADDED to NF Road System; open to public motorized use (includes reroute of 822.1B).	1.6 miles Level 2 road ADDED to NF Road System; open to public motorized use.
Decommission road or route	Existing NFS road at location; open to public motorized use.	2.05 miles of existing NFS road would be closed to public motorized use and decommissioned.	2.85 miles of existing NFS road would be closed to motorized public use and decommissioned.
	Existing route at location; no legal motorized use.	2.03 miles of existing unauthorized route would be closed to public motorized use and decommissioned.	1.41 miles of existing unauthorized route would be closed to public motorized use and decommissioned.
Reconstruct road	Existing Level 2 road at location; open to public motorized use.	Reconstruct 1.91 miles for resource protection; open to public motorized use.	Reconstruct 1.91 miles for resource protection; open to public motorized use.



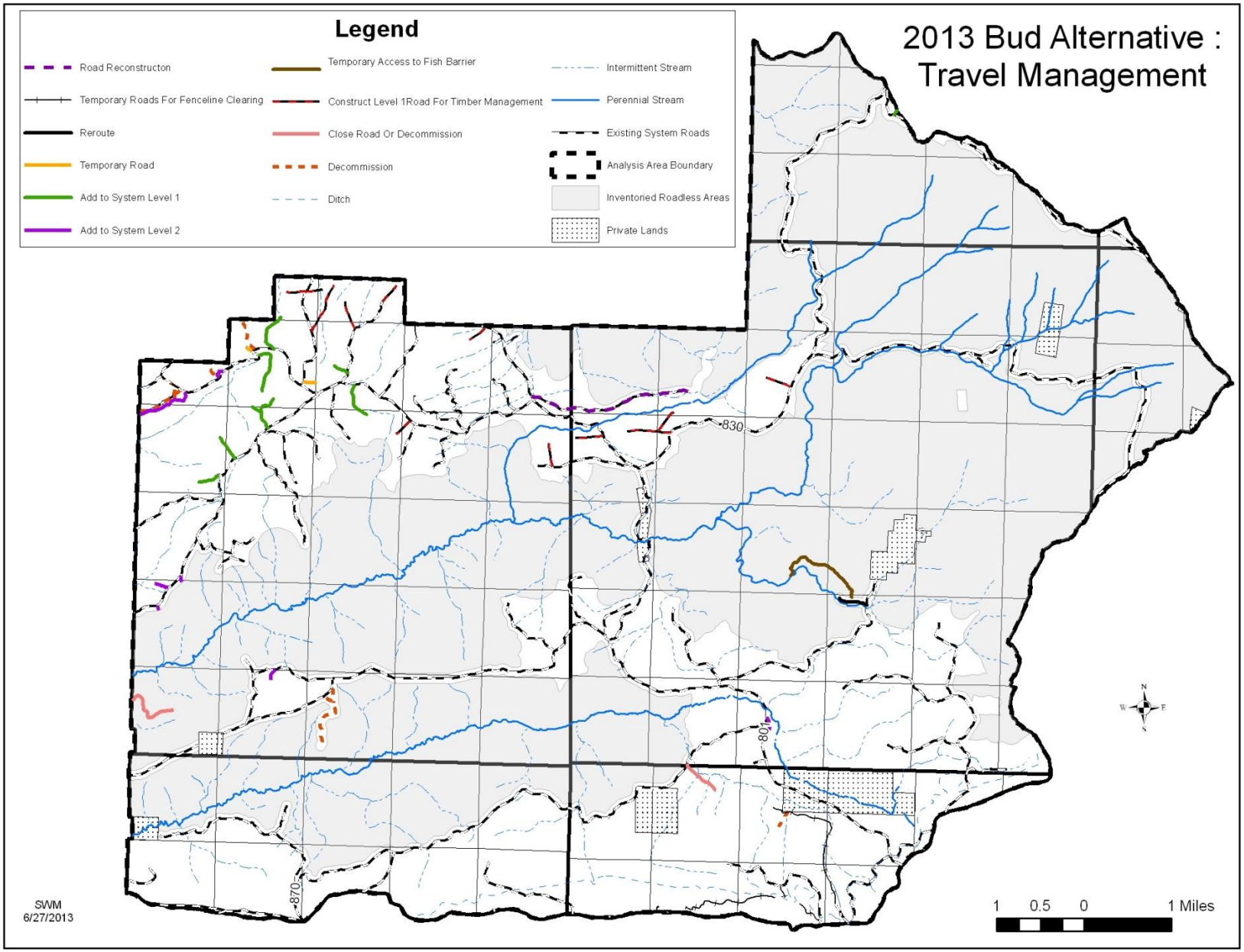
Map 3. 2010 Savery Alternative vegetation, fuels, and habitat treatments.



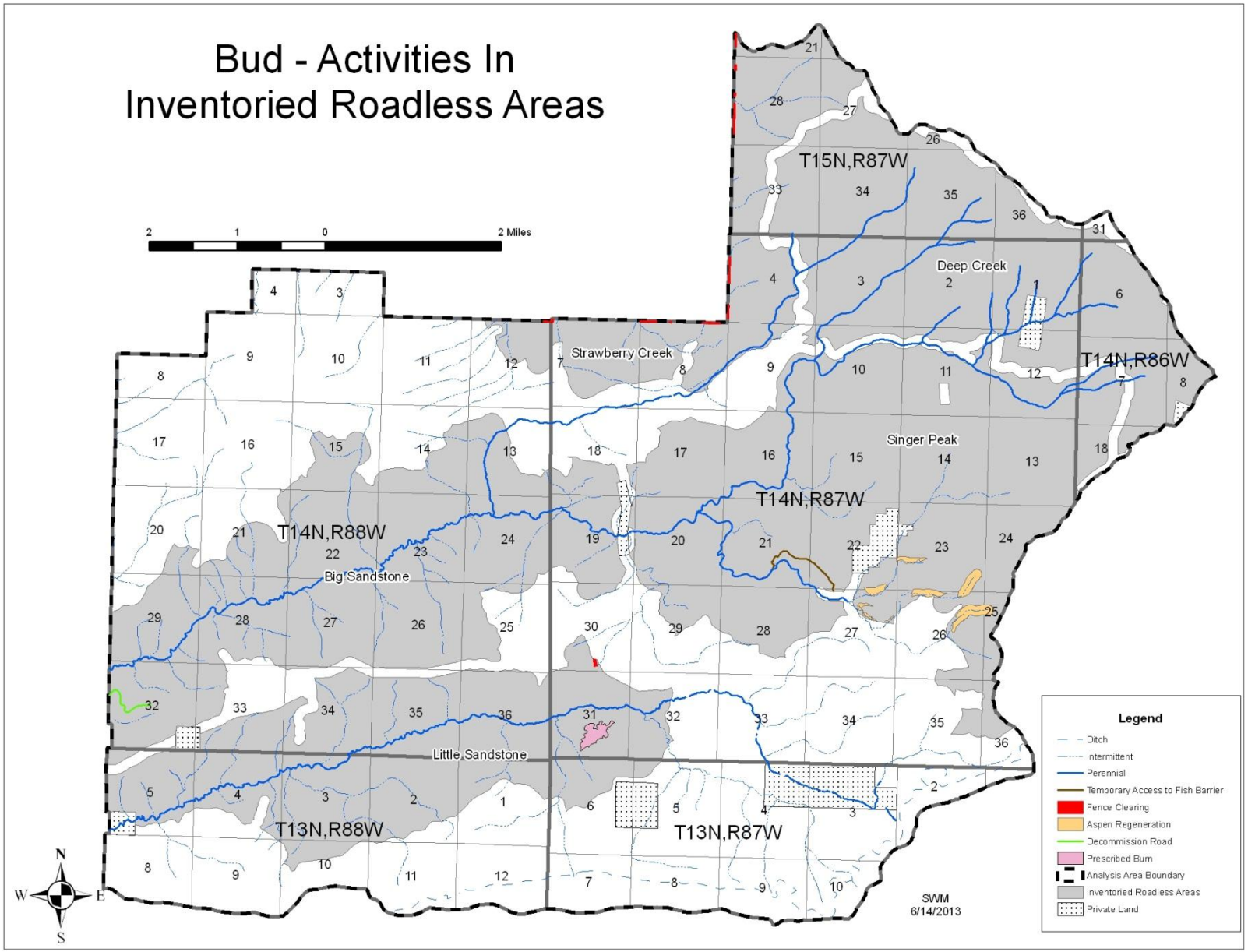
Map 4. 2010 Savery Alternative travel management.



Map 5. 2013 Bud Alternative vegetation, fuels, and habitat treatments.



Map 6. 2013 Bud Alternative travel management.



Map 7. Summary of proposed activities in Inventoried Roadless Areas.

Treatment Descriptions

All proposed treatments are consistent with management direction set forth in the Forest Plan. In addition, Design Features that outline specific methods for implementation, as well as Forest Service Region 2 watershed conservation practices that meet the requirements of the Wyoming best management practices in the Wyoming Nonpoint Source Management Plan, will prevent undesirable effects from management activities.

Clearcut with Reserve Trees

This treatment would be applied to lodgepole pine stands with high levels of dead and beetle infested trees and pockets of understory and/or other species of sawtimber-sized trees. The purpose of the treatment is to establish healthy, resilient stands of young trees with a high lodgepole pine component. There would not be enough remaining trees to fully stock the stand following harvest, but healthy green trees that can be expected to remain standing following harvest, as well as select overstory "wildlife" trees, would be retained. All unhealthy trees, including understory trees infected with dwarf mistletoe, would be removed to promote healthy regeneration.

Bud Project proposed Clearcut with Reserve Trees unit Summer 2013

After harvest, areas of heavy slash concentrations could be treated by a variety of methods, including lopping and hand scattering, machine scattering, roller-chopping, chipping (with chips carried off site), or piling and burning. Whole-tree yarding would not be a common method of slash treatment and will usually be precluded in Clearcut with Reserve Trees units. Specific slash treatments will be determined in the silvicultural prescriptions developed for timber harvest units. Care will be taken to protect reserve trees, retain serotinous cones throughout the site, and maintain woody debris to protect new seedlings, benefit wildlife, and prevent soil erosion. Stocking surveys would be done to certify regeneration is successful. If not successful, further reforestation treatments, such as planting, would be done. In future years, pre-commercial thinning would be scheduled as needed.

Overstory Removal

This treatment would be applied to stands in which a reasonably healthy understory already exists. Such stands are expected to be at least 75% stocked with healthy young trees following harvest. Overstory removal harvests generally result in removal of 80 – 100% of the overstory. Healthy, live non-lodgepole sawtimber sized trees such as Engelmann spruce, subalpine fir, and aspen would be retained to the extent possible. Unhealthy trees, including green trees infected with dwarf mistletoe, would be removed to promote healthy regeneration.

Lopping and scattering of harvest slash is typically the most desirable slash treatment in these stands because it best protects residual trees. In large units, there are likely to be under-stocked inclusions that may need another slash treatment, such as machine scattering, roller-chopping, chipping (with chips carried off site), or piling and burning. Whole-tree yarding is generally not a preferred method of slash treatment and may be precluded in overstory removal units. Specific slash treatments will be determined in the silvicultural prescriptions developed for each timber harvest unit. As indicated above, care will be taken to protect reserve trees, retain serotinous cones throughout the site, and maintain woody debris. Stocking surveys will be used to determine if further reforestation treatments are needed in under-stocked areas. Release and weed thinning in younger trees would be scheduled as needed following harvest.

Mechanical Fuelbreaks

Mechanical fuelbreaks would be constructed on either side of NFSR 801, NFSR 830, NFSR 876, and NFSR 877. These fuelbreaks would be approximately 200 feet wide (100 feet on either side of the road, measured from the ditch) and are intended to create strategic locations for wildland fire prevention and response. Fuelbreak units will undergo more aggressive slash treatments than Clearcut with Reserve Trees or Overstory Removal treatments, such as whole-tree yarding, where slash is piled and later burned at landings. These slash treatments reduce fuels while enhancing the scenic quality in the immediate roadside zone. Fuel breaks are considered wildland-urban interface fuel treatments; they are managed to the lowest tree stocking level allowed in the Forest Plan (150 trees/acre, Forest Plan page 1-36) and are exempt from Snag and Coarse Woody Debris Standards (Forest Plan page 1-37).

Precommercial Thinning

This treatment would be applied to stands of dense, vigorous, young (sapling and pole sized) lodgepole pine trees. The purpose is to adjust stocking, improve tree growth and vigor, reduce stress from overcrowding and competition, and decrease future susceptibility to bark beetles. Desired spacing is generally 8 to 12 feet between trees. Most of the proposed thinning units were harvested 15 to 40 years ago.

Harvesting slash is typically lopped and scattered within the unit and/or hand piled for subsequent burning. Commercial timber products are generally not produced in a precommercial thinning, although evolving markets for small-diameter wood, such as wood pellets, biomass, etc., could make some of these trees merchantable.

Fenceline Clearing

Fenceline clearing would be used to remove mostly dead and dying trees from either side of rangeland fences. The treatment area width would be the height of the tallest tree, plus 10%. Live trees that are likely to fall on a fence after surrounding trees are removed (e.g., because they would be more exposed to wind) may also be cleared. Trees and slash would be removed from within 8 feet of the fence to allow reasonable access by grazing permittees. In areas where mechanical removal is feasible (Map 5), fenceline clearing will attain a secondary benefit as a fuelbreak. Most merchantable material would be whole-tree yarded to a landing where slash can be piled for later burning; other slash would be lopped and scattered to a height of less than 24 inches. In areas not accessible by machinery, primarily in or adjacent to IRAs, trees would be hand felled, then cut up so they lie within 24 inches of the ground; slash would be lopped and scattered to a height of less than 24 inches.

Prescribed Burning

Prescribed burning would be used to improve age class diversity and reduce the risk of wildfire in shrubland and aspen/conifer vegetation types. In shrublands, emphasis would be on creating a mosaic with approximately 30–60% of the targeted acres burned. In aspen stands where conifers are encroaching, emphasis would be on killing the conifers. The result would be the regeneration of young, healthy aspen stands. Burns would take place whenever conditions are favorable.

Aspen Regeneration

122 acres of aspen regeneration treatments would be implemented in the Mill Creek watershed to regenerate aspen, create beaver forage and dam construction materials, and improve habitat for the native Colorado River cutthroat trout population of Mill Creek. Treatments would include cutting mature aspen, cutting overstory conifers, and reducing understory conifers to stimulate regeneration of aspen. To protect future aspen sprouts from browsing by wildlife and domestic sheep, fencing and hinging (incompletely cutting mature trees at about 5 feet above the ground to create an exclosure) would be used. Some areas may require fencing to reduce browsing and promote regeneration. Seven units would be treated first, and then monitored to determine how/if treatment of the remaining four units should occur. 107 acres of the 122 acres of desired aspen treatments are in the Singer Peak IRA, so roads would not be constructed to access the stands and no road grading would occur.

Fish Barrier Access Road

A 1.14 mile, 16-foot wide access route is needed to perform maintenance on the Mill Creek fish barrier, located inside the Singer Peak IRA. This fish barrier separates a designated conservation population of native Colorado River cutthroat trout from non-native trout populations downstream. The original access route, built before designation of the Singer Peak IRA, would be reused to the extent possible. Much of it is on stable hillsides away from riparian areas and has revegetated with grasses, sedges, and small diameter trees since the barrier was originally constructed. The route avoids riparian and wetland areas except for the end point that leads to the barrier. The route would have some trees and logs cleared to provide adequate clearance for safe travel, but would not be otherwise cleared. It is expected that the route would be used for approximately 3 weeks and then restored.

Road Construction and Maintenance

Access to proposed vegetation treatment units would require use of existing open and closed system roads, reconstruction/heavy maintenance of system roads, and road construction. To address soil, water, and wildlife concerns, minimum ground-disturbing standards would be incorporated into road designs. Some roads used to access timber salvage units could be added to the National Forest road system as Level 1 roads. Temporary roads would be decommissioned following use by providing adequate drainage and erosion control, removing fill from active stream channels, and installing signs and barriers to deter unauthorized use (see Design Features pages 21–22).

Road Decommissioning

Temporary roads, some existing user-created routes, and some Level 2 roads would be decommissioned according to the Design Features described on pages 21–22. Decommissioning permanently removes a road from the transportation system. Decommissioned roads are no longer needed for forest management access, duplicate better roads, or are user-created routes that do not benefit the public. The objective is to stabilize and restore the former road to a more natural state and preclude future motorized use. Appropriate drainage and erosion control would be provided, the road surface would be recontoured within 300 feet of perennial streams, and unauthorized re-use would be discouraged through signing, updates to maps, entrance barriers, and enforcement.

Design Features

The following Design Features are implementation criteria that prevent undesirable effects from proposed management activities. These design features, as well as Forest Plan standards and guidelines and the Forest Service Region 2 Watershed Conservation Practices Handbook meet the requirements of the Wyoming best management practices in the Wyoming Nonpoint Source Management Plan.

All Project Actions

<u>General Rehabilitation</u>

1. Wherever possible, landings, slash piles, temporary roads, and logging camps will be placed in forested (or formerly forested) areas instead of meadows, grasslands, or sagebrush openings to protect such openings from noxious weed infestation.
2. On disturbed 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 control erosion, prevent weeds, and meet scenic objectives.
3. Main skid trails, temporary roads, and landings will be rehabilitated as needed to ensure less than 15% site disturbance, prevent erosion and runoff, enhance natural revegetation, and improve aesthetics.
4. Burned soil under machine slash piles will be rehabilitated by mixing unburned soil into burned soils. This will probably be done by ripping with a tractor to a depth of 8 to 12 inches and preventing berms that can channel water.

<u>Use of Motorized Equipment</u>

5. Heavy equipment will not be operated outside of unit boundaries unless otherwise authorized by the Forest Service.

6. All off-road equipment will be cleaned and inspected before moving into the project area to reduce the spread of non-native plants.
7. Staging areas and refueling locations will be located at least 100 feet away from streams (with definable beds and banks) and wetlands.
8. Stream crossings will be located on straight and resilient stream banks as perpendicular to flow as practicable, and designed to provide passage of fish and other aquatic life. These crossings will be able to withstand normal flows and to sustain typical bankfull dimensions of width, depth, and slope.
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 the soil can be rolled into a 3 mm thread without breaking or crumbling (*3 mm is approximately the size of this "o" in soil)*.
10. 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, this will be 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%, except for slopes less than 100 feet long.
13. Winter logging is an option on upland soils without additional design features. The following requirements are only for areas where soil wetness makes over-snow logging necessary to protect soil from compaction and where winter logging is not precluded for other reasons.
    - Heavy equipment will be operated in winter only when frozen soil is $\geq$ 4 inches deep OR snow is $\geq$ 12 inches deep OR a combination of compactable snow and frozen soil is $\geq$ 12 inches in thickness. Snow quality should be such that it will compact and form a running surface for equipment by being moist and non-granular.
    - Designated skid trails are not required while over-snow logging except to meet other resource concerns.

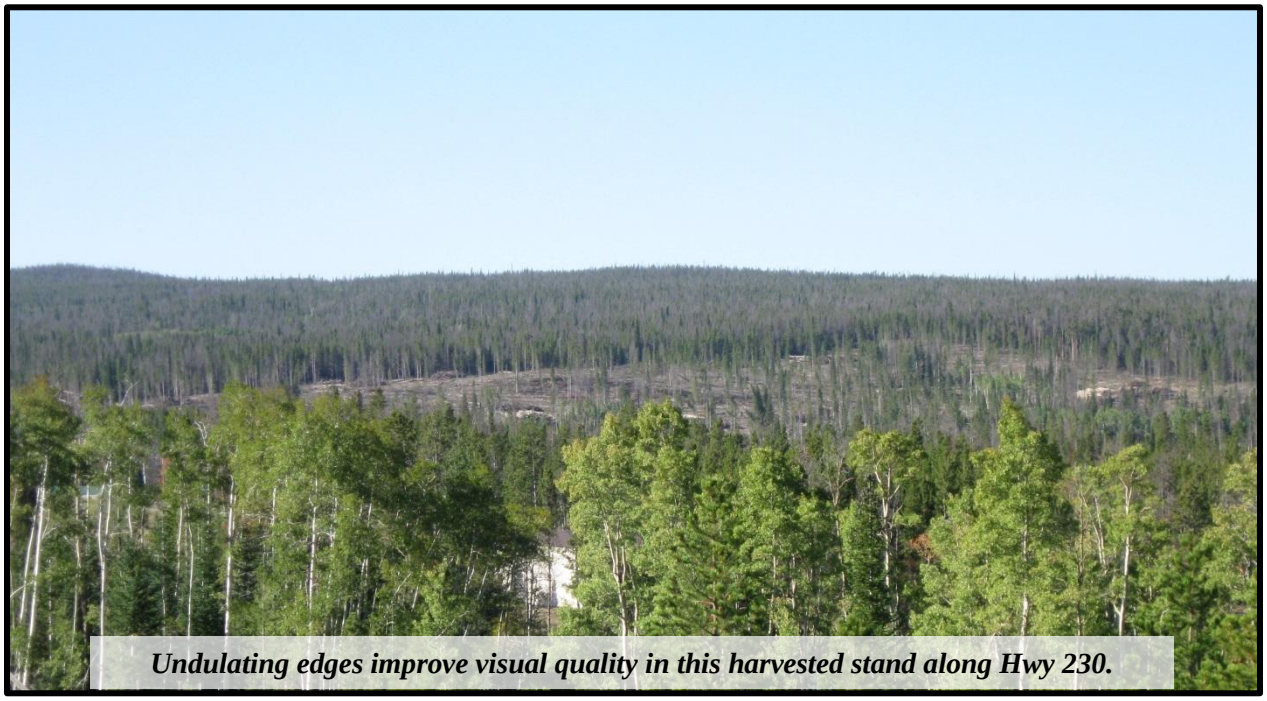
Other Resource Protections

14. New motorized access routes (e.g., along fencelines) will not be authorized, unless approved by the Forest Service.
15. Motorized use within vegetation treatment areas will be limited to authorized personnel (e.g., permittees for fence maintenance or Forest Service employees).
16. Fences will be protected during harvest, prescribed burning, and fenceline clearing.
17. Threatened, endangered, sensitive, and local concern plant species will be subject to a 30 to 100 foot buffer, in which timber harvest activities may be restricted or limited, to be determined at time of discovery.
18. Adverse effects to historic properties will be avoided or mitigated as required by the National Historic Preservation Act of 1966 as amended, Antiquities Act, Archaeological Resource Protection Act, and all other applicable laws and regulations.
19. All personnel associated with operations will be informed of cultural resource protection laws. Historic or prehistoric resources, including artifacts, features, graves or grave markers, human remains, and ruins must not be damaged, destroyed, removed, moved, or otherwise disturbed.

20. If historic or prehistoric cultural materials are discovered or known historic properties are impacted during project activities, work in the area shall be halted immediately. Materials will be evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983). The SHPO and the Advisory Council on Historic Preservation (ACHP) shall be notified immediately if a previously documented or newly discovered historic property is affected by project activities. If Native American human remains are discovered, the Forest shall follow the requirements established in the Native American Graves Protection and Repatriation Act (NAGPRA) (43 CFR 10).''

Vegetation Treatments

21. To reduce livestock disturbance in Overstory Removal and Clearcut with Reserve Trees units, harvest will be limited to units or small groups of units in close proximity to each other, between June 20 and Oct. 15. Restrictions will be coordinated with the District Range Conservationist.
22. Vegetation treatment units will follow natural contour lines and create irregular and undulating edges whenever possible. Edges of units will also be adjacent to existing aspen stands whenever feasible.



Undulating edges improve visual quality in this harvested stand along Hwy 230.

23. Young, healthy trees, understory trees, and shrubs will generally be retained and protected. Stumps will be no more than 12 inches in height. All slash will be lopped to less than 24 inches above the ground.
24. No tree harvest (excluding aspen treatments) will occur within 100 feet of streams, riparian and wetland areas, lakes, and reservoirs, unless approved by a hydrologist or fisheries biologist.
25. Any cut trees or activity-related debris will be promptly removed from the Belvidere Ditch.
26. At least 65% ground cover will remain 1 year following treatment. Ground cover includes all living and dead herbaceous and woody materials in contact with the ground, rocks greater than ¾ inch in diameter, and biotic crusts.
27. Well-distributed coarse woody debris will be retained in accordance with the ranges specified in the following table:

Downed Wood with a diameter > 3 in. and length > 25 ft.		
Spruce/fir	10-15 tons/acre	80% over 10", 50% over 25"(if available)
Lodgepole pine (sawtimber)	5-10 tons/acre	80% over 6"
Lodgepole pine (pole)	1 ton/acre	
Ponderosa pine	5-10 tons/acre	100% over 10", 50% over 25"(if available)

28. Options for erosion control and prevention include but are not limited to placement of slash and waterbars:

Recommended minimum waterbar spacing for roads and trails	
Grade of Road or Trail (%)	Unstable Soils or High Erosion Hazard
2	135 ft.
5	100 ft.
10	80 ft.
15	60 ft.
20	45 ft.
25+	30 ft.

29. All fenceline clearing units and timber harvest units that include goshawk nests or are within ¼ mile of goshawk nests will be surveyed prior to harvest 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:
    a. Within each occupied territory, three nests will be protected by 30 acres of surrounding dense vegetation with the boundaries of each area based on habitat quality. If there are less than three nests in an occupied territory, 30-acre areas with characteristics of nesting habitat will be substitutes. Within each occupied territory, a post-fledging area (PFA) of at least 200 acres will be designated. The PFA will include the three 30-acre nest sites selected and snags, down dead wood, and clumps of trees with interlocking crowns. Management activities that would degrade goshawk foraging habitat are prohibited within this PFA.
    b. To reduce disturbance to nesting goshawks, construction, drilling, timber harvest, fuel treatments, and other intensive management activities are prohibited within ¼ mile of active northern goshawk nests from April 1 to August 30 unless conditions are such that a lesser distance can be shown to provide the same degree of protection.
30. In Unit 29, which is bisected by NFSR 412 and the motorized part of Continental Divide National Scenic Trail:
    a. Skidding will not be allowed on NFSR 412. Hauling will be minimized.
    b. The number of skid trail crossings will be minimized and will be perpendicular to NFSR 412.
    c. The trail will be maintained at its present condition or better and will be open for use by ATVs/OHVs during harvesting activities.
31. Hauling on Hwy 70 will not be allowed while Snowmobile Trail D is active and the road closed for winter, unless agreed to by the State.
32. Burn piles will be as compact and dirt free as possible to facilitate burning.

Fenceline Clearing

33. Merchantable sawlogs and products other than logs will generally be whole-tree skidded to a landing and the slash piled for later burning. Remaining slash will be lopped and scattered to a height of no more than 24 inches.
34. In areas that are not accessible to mechanical removal, trees 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.
35. Where fenceline clearing occurs within suitable lynx habitat, operations will retain live understory vegetation to the greatest extent possible. Understory plants are defined here as live trees and other live vegetation 8 feet high or less. This retention does not apply within 8 feet of the fence or 25 feet of the road prism to provide for public safety and maintenance.

    Explanation: Suitable lynx habitat is usually comprised of aspen, spruce/fir, or mixed conifer with some live trees. Retaining live understory vegetation will provide habitat for snowshoe hares and other prey of lynx. Retaining live understory vegetation will meet guidance in the Southern Rockies Lynx Amendment and revised Forest Plan, including objective HUO5 and guideline HUG8 for promoting human uses while providing for lynx habitat.

Prescribed Burns

36. Prescriptions will be designed for low-severity burns.
37. Direct ignition in riparian and wetland areas will be avoided, but fire will be allowed to burn into these areas in a mosaic pattern.
38. Livestock grazing will generally be deferred for at least 1 year, until after most herbaceous forage plants have matured and set seed. Vegetation response the first year will determine if a second year of deferment is needed.
39. If burned aspen stands receive excessive browsing or trampling by livestock or wildlife, temporary fencing will be used to protect regenerating aspen until they are no longer vulnerable to such damage.
40. Fire lines will be rehabilitated as soon as possible after burning.

Aspen Regeneration

41. In the aspen regeneration unit that crosses Mill Creek Meadow in the NE ¼ of Section 27, T14N, R87W (unit #13), logs and/or fence will be configured to allow passage by domestic sheep. On one side of the creek, at least 20 feet will be left between the edge of the timber stand and the logs or fences set up in the adjacent meadow.

Travel Management

Level 1 Roads

42. Following use of Level 1 roads, adequate drainage will be provided so that the roads can endure with little to no maintenance. Culverts will be removed as needed and water bars installed where necessary 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.
43. Effective groundcover will be established; sites will be seeded or planted where necessary.
44. Fill will be removed from active channels.
45. The roads will be signed as closed to public use, and future unauthorized use discouraged with gates, barriers, berms, woody debris, obliteration to sight distance, or other methods.

Temporary and Decommissioned Roads

46. Temporary roads will be built on ridge tops, stable upper slopes, or wide valley terraces if practicable. Soils will be stabilized on site.
47. Adequate drainage will be provided following use of temporary roads and as part of decommissioning. Culverts will be removed, water bars installed, and the road surface outsloped where feasible.
48. Erosion control following use of temporary roads and as part of decommissioning will include establishment of effective groundcover through straw mulch, seeding, or planting where necessary.
49. The full length of temporary roads and roads slated for decommissioning will be ripped to a depth of 8-12 inches and a minimum 65% of the road surface will be decompacted.
50. 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 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.
51. Unauthorized public use of former roads will be discouraged with methods such as barriers, berms, woody debris, or obliteration to sight distance.

Road decommissioning immediately after completion and 6 years later, showing a return toward natural state (Sierra Madre T13N, R87W, Sec 25).

Project Monitoring

- Harvest units, prescribed burns, and other sites where native vegetation cover was removed or bare soil was exposed will be monitored for at least the first 5 years after treatment to detect and treat any noxious weeds that become established.
- Fenceline clearing locations will be monitored for establishment or proliferation of new user-created roads. Closure barriers/techniques may be modified to improve effectiveness.
- Burned aspen stands will be monitored for browsing. If browsing or trampling by livestock or wildlife is excessive, temporary fencing or other barriers may be installed to protect regenerating aspen until they are no longer vulnerable to such damage.

Chapter 3 – Environmental Impacts of the Alternatives

This chapter summarizes the potential impacts of the alternatives, both positive and negative, as analyzed by an interdisciplinary team of District resource specialists. The analysis tiers to the Forest Plan and its Final Environmental Impact Statement (FEIS) and Record of Decision. Many of the larger-scale effects were addressed in the Forest Plan FEIS, allowing us to narrow the focus of this analysis to the site-specific effects of implementing the Bud Project.

This chapter focuses on concerns raised during the 2010 scoping period and the 2013 Notice of Proposed Action formal comment period. Analyses beyond those documented here were completed to support the responsible official's decisions and to ensure compliance with laws and regulations such as the Endangered Species Act, the National Historic Preservation Act, the Clean Water Act, and the National Forest Management Act. Those analyses are part of the Bud Project record and available for public review at the Brush Creek Hayden Ranger District office or by request to the ID Team Leader.

The interdisciplinary team analyzed direct effects, indirect effects, and cumulative effects of all alternatives. Direct effects occur at the same time and place in which the activity is implemented. Indirect effects occur at a later time or a distance from the site of the activity. Cumulative effects are those impacts that result from the combined effects of the alternative in addition to any effects of past, present, or foreseeable future activities. Past activities and events include natural disturbances such as the mountain pine beetle and spruce beetle outbreaks and the Hell Canyon Fire, the effects of system and non-system roads, timber management activities, and other disturbances such as the reroute of Battle Highway, noxious weed spraying, and fenceline clearing on adjacent lands. The current condition of the project area serves as a proxy for the impacts of past actions in understanding the contribution of past actions to the cumulative effects analysis for this project.

Analyses are based on a variety of information sources including field surveys, aerial photographs, topographic maps, forest geographic information system data, forest resource information databases, Forest Plan direction, agency manual and handbook direction, relevant available scientific literature, and professional judgment. All calculations used in the analysis are estimated and subject to change based upon implementation needs. Analyses assume that all treatments and design features will be implemented as described.

Effects of Timber Salvage Treatments

Current Conditions in Clearcut with Reserve Trees and Overstory Removal Units

Within and beyond the project area, management areas 5.15 and 5.13 have been considerably altered from desired stand conditions due to widespread mortality during the bark beetle epidemic. High tree mortality exists in lodgepole pine forests throughout the project area, including in the nearly 30,000 acres of IRAs.

In the lodgepole pine dominated stands targeted for harvest, mortality levels of mature trees range from 50 to 90 percent. Understory regeneration varies: while some stands have existing understories of spruce, fir, and aspen, others have very little tree regeneration, and some are dominated by sod-forming grasses that impede regeneration. In general, dead stands of lodgepole are not expected to provide habitat for many Forest wildlife species. The proposed treatment area is not cultivating commercial forest products and generally is not in an ecological condition that can provide for a mix of ecological and human needs.

The Big Sandstone and Hartt Creek range allotments are located within proposed timber salvage units. In these allotments, the majority of forage is located in upland shrublands, meadows, riparian areas, and aspen stands. Past timber harvest units provide some transitory range. As trees killed by the mountain pine beetle continue to fall in the forested portions of these allotments, more sunlight reaches the ground and there is more forage in the understory, but livestock management is becoming more difficult. Downed trees block livestock movement as well as mobility of the riders trying to gather or move them. Dense downfall areas will become barriers to livestock travel and may make full utilization of suitable grazing areas more difficult.

Effects of the 2010 Savery Alternative and the 2013 Bud Alternative:

Effects on Timber

Stands targeted for treatment in the Bud Project are generally highly productive stands with high site indexes and high timber volumes that are in timber production emphasis management areas. These stands are priorities for future timber production because they are capable of producing the highest timber volumes and yield the biggest return on stand management investments. Managing less valuable stands might require paying to have the material removed. If the high percentages of dead and dying trees are harvested and removed from these sites, the land will return to high productivity fairly rapidly. If the sites are not harvested, dead trees will remain on site where they will deteriorate slowly and contribute to more patchy regeneration, with higher subalpine fir composition than current stands. There is a limited time in which current sawtimber can be salvaged to maintain its commercial value.

Bud Project proposed Overstory Removal unit Summer 2013

Implementation of the clearcut with reserve trees and overstory removal treatments would benefit the forest timber resource and provide needed forest products such as dimensional lumber and wood pellet/biomass to local timber markets. While the majority of the forested land within the analysis area will be allowed to naturally recover from the bark beetle epidemic, proposed treatments would put some stands with a high rate of mortality back into production more rapidly. Treatments would increase structural, species, and age class diversity within the analysis area, promoting ecological sustainability and reducing the forest's susceptibility to insects and disease. Mistletoe infection could be greatly reduced in treated areas.

The proposed treatment units would be predominantly in areas that have had past

timber sale entries. Regeneration of treated stands would be assured through the process of certifying stocking and scheduling artificial reforestation treatments, such as planting, where needed. Silvicultural prescriptions for each unit will define the site specific conditions most conducive to natural regeneration. Prescriptions will include treatment specifications, including options for slash treatments that are designed to achieve protection of existing regeneration, retention of existing cones and seeds, retention of down woody debris to meet Forest Plan standards, development and protection of microsites for regeneration, protection of soil, and erosion control. In units where retention of residuals is important, the Forest Service will not allow whole tree skidding. Stands regenerated through harvest will tend to have a higher percentage of lodgepole pine regeneration compared to stands that would not be salvaged.

Following treatment, current and future fuel accumulations would be reduced and fuel continuity among stands would be reduced. Treatments would decrease the potential detrimental effects of fire to regenerated stands and reduce the potential for soil erosion and soil damage.

Effects on Range

Proposed timber salvage would affect Big Sandstone and Hartt Creek allotments. Big Sandstone Allotment will be affected most, as it includes the majority of the harvest units. The permittees on Big Sandstone and Hartt Creek allotments are likely to experience difficulty in moving cattle through or near areas where timber salvage operations are active due to the increased vehicle traffic on roads and the noise and movement of harvest operations. Cattle may not stay in suitable grazing areas that are near areas where treatments are underway. The ultimate effect will be that maintaining good livestock distribution and moving cattle around within the allotments will be more difficult during the active treatment phase. The permittees will have to compensate for the disturbance by riding more frequently or possibly by finding alternate routes for trailing cattle in some parts of the allotment. They may have to forego using parts of the primary range until harvest activities are completed. However, disturbance from logging is short-lived, and treatments will not be in the major forage areas in the affected allotments. There are not additional allotments available to provide alternative forage, but the Forest Service will seek to accommodate and coordinate with permittees to minimize impacts.

Timber harvest units will provide transitory range for livestock as herbaceous species increase in response to more sunlight reaching the ground. Transitory range would be created in regenerating clearcut units for approximately 15 years and could be used by domestic livestock or wild ungulates. This additional forage would become available within a year or two of completion of the treatments. The amount of additional forage available will vary among treatment sites depending on the amount of overstory removal, the understory plant species present, and the accessibility of the unit to livestock. In some instances, transitory range can temporarily improve livestock distribution and decrease use in riparian areas.

Though the permittee would not be granted an increase in permitted numbers as a result of this additional forage, the job of distributing livestock through the allotment and regulating grazing use in riparian areas will become easier. This can save the permittee some management expense, put more weight on cattle, and help ensure that livestock will not have to be brought home early due to overuse of riparian areas. The Forest Service does not anticipate deferring grazing in timber salvage areas, and animal unit months (AUMs) will remain stable for each allotment during and after treatments.

There are several options available for slash treatment in timber salvage units, including lopping and hand scattering, machine scattering, roller-chopping, chipping (with chips carried off-site), piling and burning, and whole-tree yarding in some areas. Lopping and scattering in this forest type has been a successful slash treatment; it is important for protection of soil, water, and regeneration, is not detrimental to resource recovery, and leaves an acceptable amount of fuel on the forest floor. Conversely, chipping with chips left off site has been shown to impede regeneration of trees and forage, and is not considered an option for slash management in these areas. Slash in harvest units may create some barrier to livestock movement for a few years; however, conditions will be more favorable than those created by falling trees and down logs. As dead trees start fall in unharvested areas, it will be very difficult or impossible for cattle, and the riders who manage them, to travel through those stands. The regenerating harvest units and the fuel break areas will provide relatively open travel-ways and may be the only way livestock and riders can get across some areas.

If any landings, skid trails or temporary roads are located in open meadow edge, shrubland or grassland adjacent to treatment units, there will be small areas where rangeland vegetation will be temporarily eliminated or damaged and soils will be compacted or otherwise disturbed. It may take 5 or more years for these sites to revegetate with desirable native plant species if the compaction or disturbance is severe. The area undergoing this type of disturbance will be small and can be kept minimal by locating landings and skid trails primarily in forested or formerly forested sites, as stipulated in the Design Features for this project.

Range fences are designated as protected improvements, but accidental damage can sometimes occur during timber harvest. In some instances, timber operators may need to temporarily take down fences if they need to skid or haul logs across the fenceline where there is National Forest land on both sides. If the fences on cattle allotments are damaged or down during the grazing season, livestock control will be compromised. This impact would only occur during the harvest period. Once harvest has been completed and any incidental damage repaired, the fences are likely to last much longer and have fewer needed repairs than they would have if no harvest had been carried out.

Although there will be increased vehicle traffic associated with timber management activities along haul routes, travel speeds on the roads within the analysis area will be quite low, so the risk of livestock/vehicle collisions would not likely be high. Permittees will have to exercise greater caution while working in the vicinity of harvest activities and may have to schedule some livestock moves for days or time periods when there is reduced log truck traffic. Dust production in the area may be higher due to higher traffic volumes, but wind, rainfall, and the availability of forage away from roadsides are expected to mitigate any potential effects to palatability of forage.

Effects on Wildlife

Proposed timber salvage treatments are expected to have little to no impact on the majority of forest wildlife species. Treatments focus on dead and dying beetle-killed stands of lodgepole pine in timber management areas and near existing roads, where wildlife habitat quantity and quality has already been reduced. Proposed treatment units represent only 20% of all mature lodgepole pine in the analysis area, so this habitat type will remain widely available.

Several benefits may be associated with the proposed treatments. Treatments would promote early successional stages of lodgepole pine comprised of grass, forbs, and shrubs preferred as foraging areas by big game animals. Within treatment areas, Forest Plan standards for coarse woody debris and recruitment trees, project design features, and the project's design to protect younger live trees during harvest will promote future wildlife habitat. Harvest units avoid important habitats such as wetlands, security areas, and important big game seasonal ranges. No timber harvest will occur in elk security areas mapped on the Forest. Only 340 acres of harvest is proposed in elk parturition habitat and almost all of this would occur where there is an existing seasonal road closure from May 15 – June 15 for elk calving. Harvest will take place within winter-yearlong elk range, but this habitat type is abundant within and adjacent to the analysis area.

Some disturbance to wildlife may occur. Although the size (mean 105 acres) and location of harvest units reduces the potential for fragmentation of this habitat across the analysis area, the treatments are concentrated and may remove some home ranges or temporarily eliminate habitat for a particular wildlife species. In cases where treatments may remove or reduce the quality of habitat for a particular species, individuals are expected to require larger territories or home ranges in order to meet all their survival needs. As a result, the density of individuals would decline in that reduced quality habitat.

Noise and activities associated with the proposed actions can disturb some individuals for a short time in untreated areas that are adjacent to project treatment units. Individuals may leave the immediate area during the brief period of treatment but can return to the adjacent untreated areas immediately after treatment is completed. Habitat, prey density, and prey habitat will not be changed in the untreated adjacent areas. Individuals or their prey could forage in nearby undisturbed areas while treatment occurs. The temporary disturbance in adjacent untreated areas is not expected to cause decreased reproductive success, decreased survival, or increased territory size for any species.

Forest Service Region 2 sensitive species are not expected to be negatively impacted by salvage operations. Stands of beetle-killed lodgepole pine generally do not provide quality habitat for goshawk, sage grouse, boreal owl, three toed woodpecker, olive-sided flycatcher, brewer's sparrow, or hoary bat, and no notable change to reproduction, population, or prey availability forest-wide for these species is expected. Design features that align with Forest Plan wildlife standards will protect occupied goshawk territories within proposed treatment areas (page 20).

Forest Management Indicator Species that have habitat in the analysis area, represent an issue/habitat assemblage that can be affected by the project, and might have more than a negligible effect caused by the project include snowshoe hare, American marten, northern goshawk, golden-crowned kinglet, and three-toed woodpecker. Northern goshawk, American three-toed woodpecker, golden-crowned kinglet, and American marten populations are stable, and the project will not impact the Forest wide population trend. Snowshoe hare populations are stable to slightly decreasing, consistent with the declines occurring in cover as a result of the beetle outbreak. The project will not impact the Forest wide population trend.

The brown creeper is the only species of local concern in the analysis area. In the shorter-term, implementation of the proposed vegetation management activities in the analysis area will have a small but noticeable impact on local brown creeper density. The thousands of acres of untreated beetle-killed forest will continue to provide exceptional habitat in the short-term, then abruptly decline in value as brown creeper habitat. Variation in habitat availability and quality due to harvest, beetles, and forest

regeneration over time will ensure a continuing supply of prey and future nesting habitat and will contribute toward maintaining the brown creeper population on the Forest.

The Canada lynx is a threatened species with habitat within the analysis area. No other threatened or endangered species have suitable habitat or are present in the analysis area. The Bud project area includes a portion of the Upper Sierra Madre Lynx Analysis Unit (LAU). Currently, 46 % of the Upper Sierra Madre LAU is classified as unsuitable habitat. The high percentage of unsuitable habitat is primarily a result of the mountain pine beetle outbreak; management actions in the past 10 years have caused only 0.5% of the unit to be in unsuitable condition. Consultation with the US Fish and Wildlife Service has been completed as required by the Endangered Species Act. The Fish and Wildlife Service has concurred on a finding of "*may affect, likely to adversely affect*" for the Canada lynx.

Proposed treatments in the LAU include a single 133 acre Clearcut with Reserve Trees unit and 300 feet of road decommissioning in currently unsuitable habitat in the northeast corner of the analysis area; 6 segments of approximately 100 foot wide fenceline clearing totaling 4 acres of unsuitable habitat and 7 acres of suitable habitat; and 3 aspen treatment units (72 acres) that occur in the LAU in suitable habitat. The harvest unit, associated skid trails, landings, and some fenceline clearing will retain lynx habitat as it currently exists – unsuitable. These stands already do not support snowshoe hares or red squirrel prey due to the loss of vegetation cover and cone production. Only 79 acres of aspen treatment and fenceline clearing will convert suitable habitat to currently unsuitable. This is <0.2% of the suitable habitat in the LAU.

Effects on Watershed and Riparian Resources

The effects of timber salvage treatments to watershed health, function, and stability were considered with an analysis of sediment production, alteration of flow regimes, stream bed and bank stability, and effects to riparian and wetland ecosystems. Both timber harvest operations and the road system required to access the timber resource may contribute to effects.

The transportation system necessary for timber removal is estimated to be the primary source of erosion and sedimentation for the project. Both action alternatives would require construction of an estimated 7 miles of roads for access to harvest units. Approximately 3.2 miles of these roads may be on previously used routes, while 3.7 miles would be new construction. Where roads are located on previously used routes, there is expected to be less erosion and sedimentation, as existing templates normally require less ground disturbance compared to new construction. Most new construction would be located in upland areas, but some segments may be located in or adjacent to valley bottoms. There are an estimated four locations where newly constructed roads may cross dry valley bottoms with possible ephemeral flow, four locations where they may cross intermittent streams, and no locations where they would cross perennial streams. Erosion and sedimentation can be expected during construction and use of the new roads, especially near stream crossings. Roads may be open for as short as one season, or as long as 5 years or more, depending on timing of project implementation. If the 2013 Bud Alternative is implemented, new Level 1 roads would be stabilized after use to minimize erosion and would be closed to public use (Design Features page 21). Erosion and sedimentation rates will decrease after the roads are closed and stabilized, but would continue indefinitely at low levels and be higher than current levels. If the 2010 Savery Alternative is implemented, temporary roads would be decommissioned after use (Design

Features page 25) and erosion and sedimentation can be expected to return to background rates within a few years.

Erosion from the majority of the harvest unit area is uncommon; however erosion from main skid trails, landings, and temporary roads within the harvest units, which are estimated to be 10 to 15% of any given harvest unit, can occur. Approximately 2/3 of the harvest units are located in upland areas and more than 300 feet from drainages; any erosion from these sites is not expected to reach a stream channel or affect water quality. Erosion from the remaining 1/3 of the harvest unit area has some potential to be delivered to a stream channel, but would be minimized through the application of the Forest Service Watershed Conservation Practices Handbook and project-specific design features, in particular the 100 foot buffer around streams, wetlands, riparian areas, and lakes.

Erosion and sedimentation impacts for both alternatives are expected to be short-term (up to a decade). The effects may be reduced from current conditions in the long-term (several decades) under the 2010 Savery Alternative following implementation of design features to restore infiltration, such as scarification of temporary roads.

Streamflow regimes can be indirectly affected by reductions in canopy cover, which lead to a reduction in evapotranspiration and interception loss and an increase in runoff. Runoff and peak flows can also be indirectly affected by reductions in organic ground cover and compaction of soils from activities such as skid trails, landings, and road construction. Canopy cover reductions following the mountain pine beetle outbreak are expected to increase streamflow in many streams in the project area. Big Sandstone Creek is the only watershed with proposed timber salvage that is susceptible to increased rates of channel bed and bank scour due to increases in streamflow. However, because timber salvage treatments would occur in less than 10% of the National Forest System land in this watershed, additional detrimental effects from timber salvage related to streamflow increases or stream bed and bank stability are not anticipated.

Direct effects to riparian and wetland areas will be limited through the use of Design Features that preclude harvest within 100 feet of riparian areas and wetlands and require avoidance of these areas when feasible for activities such as road construction. There will be no effect to stream shading or potential large woody debris from silvicultural activities. No-harvest buffers adjacent to riparian areas will leave much coarse woody debris throughout the riparian areas. Under the 2013 Bud Alternative, stream crossings for Level 1 roads would result in permanent conversion of riparian habitat to road.

Use of best management practices and associated monitoring would be used in this project in order to meet the Clean Water Act and State of Wyoming State Water Quality Standards. While there may be some effects to water quality as described above, the designated uses of water bodies in the project area is expected to be maintained through the implementation of standard recommended practices.

Effects on Recreation

Dispersed camping, hunting, fishing, and ORV use are highly popular activities on the Brush Creek/Hayden Ranger District. The area is managed for summer motorized uses on over 85% of the analysis area. These activities should be minimally impacted by the proposed project. Dispersed camping opportunities may be improved with the removal of the dead and dying lodgepole pine in many locations;

in other locations, dispersed sites may lose their appeal following salvage operations. It is not anticipated that either alternative would significantly increase or decrease dispersed sites in the area.

Timber harvest activities would provide additional openings for hunters to find big game during big game hunting seasons and would favor those individuals that prefer to access on foot, as most units are accessed by roads that would be decommissioned or closed to the public after the project is completed.

The Continental Divide National Scenic Trail lies adjacent to a timber salvage unit. The treatment would provide for better safety along the portions of the trail that would be affected by the removal of the overhead. Salvage treatments may open up areas adjacent to and along portions of the trail, which may lead to unwanted access via user-created routes. Design Features have been included to protect the trail and minimize impacts to trail users.

Winter logging may be an option during the implementation of timber sales. Haul routes from the Bud Project area would be limited to the northern routes of Forest Road 801 and County Road 401, to reduce conflicts with snowmobile trail use (primarily on Trail D/Hwy 70). Un-groomed trails, such as "C" and "G" could be used for haul routes if alternate snowmobile routes are found. Design Features will ensure that mixed use by log trucks and over-snow vehicles will be precluded to the greatest extent possible.

Effects of Prescribed Burning Activities on Range Management

Current Condition

The shrubland unit proposed for burning is on the north rim of Hell Canyon and consists primarily of mountain big sagebrush, snowberry, and serviceberry. The stand is likely at least 65 years old. The shrubs are tall and fairly dense (estimated total shrub canopy of 25-35%), but most are not decadent. The serviceberry bushes are mostly quite tall, about 6-10 feet in height. There is a diverse understory of native forbs and grasses.

The aspen stands proposed for burning are islands within shrublands; one in Canyon Trail Allotment and the other in Big Sandstone Allotment. These aspen stands presently have a heavy conifer component and provide very little forage.

Effects of the 2010 Savery Alternative and the 2013 Bud Alternative

The proposed prescribed burn of the shrubland unit within Big Sandstone Allotment would burn approximately 30 to 60 % of the unit in a mosaic pattern. The burn would kill any affected big sagebrush. Although some other shrubs (bitterbrush, serviceberry, rabbit brush, snowberry, silver sagebrush) may also die, many would resprout from the root crown after fire and provide nutritious and palatable forage for wildlife and domestic livestock. Because a mosaic pattern is planned and the entire burn unit is only about 165 acres, there should be sufficient big sagebrush seed nearby to allow for establishment of sagebrush seedlings within a few years. The prescribed burn will create more diversity in shrubland age classes than currently exists, consistent with Forest Plan desired conditions, and some native grasses and forbs will likely increase in vigor and productivity as they respond to the release of nutrients and decreased competition with sagebrush.

In order to ensure rapid recovery of native plants in the first growing season after the burn, utilization by livestock should be light and, ideally, should be deferred until after forage plants have set seed.

Depending on how well the vegetation recovers after the first growing season and how it is utilized by livestock and/or wildlife, a second growing season of special management might be required. Deferment of the burned area for 1 or 2 growing seasons may be achievable by more riding and/or temporary electric fence. This will have some impact upon the permittee, but it will likely be a temporary impact of only 1 or 2 years to promote establishment and/or vigor of herbaceous vegetation and shrubs. Forage generally becomes more palatable and easily accessible on recovering burned areas, an effect that could last for 3 years or more. The burned areas may enhance livestock distribution by drawing livestock away from traditionally favored sites such as riparian areas.

If the aspen burns are successful, conifers will be killed, some above-ground aspen stems will be killed, and the aspen will resprout from live roots. The aspen stands may need to be fenced if browsing of young aspens by wildlife or domestic livestock becomes detrimental to their survival. After the aspens are tall enough to be free from detrimental browsing, the fence can be removed and forage availability will be much higher than prior to treatment.

Effects of Travel Management Activities

Current Condition of the Road System

According to current Forest Service GIS and infrastructure database information, there are currently 137 miles of National Forest System roads in the Bud Project analysis area:

- 23 miles of Level 1 roads. These are unpaved, minimally maintained roads used for administrative access only and closed to the public.
- 48 miles of Level 2 roads. These are unpaved roads with low maintenance requirements suitable only for high clearance vehicles.
- 15 miles of Level 3 roads. These are normally single-lane roads with turnouts and native surface or some spot surfacing; they are maintained for prudent drivers in standard passenger cars.
- 24 miles of Level 4 roads. These are normally double-lane roads with aggregate surface that provide a moderate degree of use comfort.
- 28 miles of Level 5 roads. These are normally double-lane, paved roads that provide a high degree of user comfort (Highway 70).

There are also approximately 2 miles of documented unauthorized routes within the analysis area, many of which contribute to degraded watershed and resource conditions.

Roads are necessary for management of resources and for access by forest visitors. Permittees use both open and closed roads within the project area to trail cattle to and from the allotments and to move them between non-contiguous primary range areas, to place salt blocks and to access fences or stock ponds for maintenance purposes. The road networks provide recreationists with a variety of options to access and view the Forest.

Effects of the 2010 Savery Alternative and the 2013 Bud Alternative

Effects on Timber

Open and closed National Forest System Roads, newly constructed temporary roads, and temporary roads reconstructed on existing non-system road templates would be used to access timber salvage units and haul timber. The 2010 Savery Alternative and the 2013 Bud Alternative differ in their proposals for using

almost entirely temporary roads to access timber units (Savery) versus building and designating most roads used to access timber as Level 1 roads (Bud). Both alternatives would provide the necessary access to timber stands for salvage, regeneration, and timber stand improvement and both would have beneficial effects for the timber resource.

Effects on Range

New Level 1 roads and/or temporary roads constructed to access timber salvage and fenceline clearing units would have very little effect upon the rangeland resource because they would be closed to motorized use. All the proposed new Level 1 roads are within Big Sandstone Allotment, which is over 11,000 acres in size. The small number of acres taken out of forage production will not affect allotment capacity. The proposed new system roads do not breach any natural barriers or go through any fences and would therefore not compromise the integrity of allotment or pasture boundaries. Temporary road construction activity is not likely to affect livestock management within the analysis area. These roads are within forested sites or harvest units and will not disturb any primary foraging areas for livestock.

Proposed reconstruction of NFSR 804 will help revegetate adjacent rangelands. Reconstruction will create one stable route and eliminate a "braided" system of parallel routes that damages vegetation and accelerates soil erosion. Reconstruction will also improve access for the permittees on Big Sandstone and Hartt Creek allotments.

Although proposed road decommissioning may add to the risk of weed establishment in the short term, it will somewhat reduce the risk of new weed infestations in the long term because there will be fewer miles of road acting as dispersal corridors for weed seed carried by motorized vehicles. Road decommissioning may reduce disturbance to livestock from motorized use by the public. However, it may also make access and maintenance of improvements slightly more difficult for the permittees. Three roads proposed for decommissioning in the 2013 Bud Alternative would affect permittees' improvements and/or access: NFSR 876.1I, NFSR 872.1E, and NFSR 870.1D. If these roads are decommissioned, the permittees will need to travel additional distances off road to access pastures, stock ponds, and salt grounds. Changes in road status are not expected to have detrimental effects to permittees because permittees are able to gain access to their allotments and improvements via cross country motorized travel and use of closed roads on Forest Service land. Permittees may request and receive permission on an annual basis for special access authorization.

Effects on Wildlife

Proposed travel management will result in small changes in motorized access in the analysis area. There will be a small, permanent loss (<14 acres) of habitat resulting from the construction and reconstruction of roads used for timber harvest. Under the 2013 Bud Alternative, these roads will be closed to motorized use by the public but will allow motorized use for Forest Service administration, permittees, contractors, and cooperators. Impacts to wildlife in the analysis area will generally be minor due to the limited amount of permanent habitat loss and the assumption that administrative use will be infrequent. Road density will increase noticeably in the Green Ridge area (T 14N, R 88W sections 3, 4, 9, 10, and 16) by adding roads that will be closed after harvest, but this is a small portion of the entire analysis area. It is expected that there will be a small increase in forest fragmentation and in disturbance to habitat and wildlife adjacent to

the road, and some avoidance by wildlife. This will be a minor change on the landscape as long as administrative use of closed roads is infrequent and irregular.

Effects on Watershed and Riparian Resources

Erosion and sedimentation can be caused by road decommissioning, construction, and reconstruction activities. The majority of roads proposed for decommissioning are low standard, native surface roads that were located primarily for ease of access, rather than environmental protection. Some of the roads proposed for decommissioning are located near streams and can deliver sediment to project area streams. Decommissioning is expected to result in a short term (1-3 years) increase in sediment, although due to increased infiltration, erosion is expected to be minor and infrequent. After the first few years, there is expected to be an overall reduction in sediment reaching stream channels as existing sediment sources from roads decommissioned are reduced or eliminated. Decommissioning of roads in upland locations is expected to reduce erosion and runoff.

Road construction will be primarily in upland areas more than 300 feet from drainages. Erosion can be expected during construction and use of the roads, but due to their location, stream sedimentation is not expected. Erosion will be greatest during and immediately following construction, but will decrease to lower levels after the ground disturbed during construction has stabilized. There would be short term (1-3 years) increase in erosion and sedimentation from road reconstruction activity as well.

Stream bed and bank stability has the potential to be directly affected by the decommissioning of road crossings on perennial streams in the project area. Short-term stream bed and bank stability will be achieved through the use of best management practices designed to restore natural channel geometry and stabilize stream banks. Long-term stability is expected at all decommissioned crossings due to a reduction in vehicle use and natural revegetation over time.

Roads may influence riparian areas by direct encroachment as they parallel or cross stream channels. There is also the potential for a road system to indirectly affect these areas due to changes in flow regimes or addition of sediment or other pollutants. Many of the roads proposed for decommissioning in the project area are located in riparian areas. Riparian areas have the potential to be directly affected by the decommissioning of roads in the short term. Later, there would be an increase in the amount, quality, and function of riparian areas in the project area.

Any addition of roads to the National Forest road system may result in increased road use and add to current water resource effects.

Road reconstruction and road construction proposed in the project may require a short-term exemption from turbidity standards. The work should be evaluated during road contract preparation, and a waiver secured as part of the road contact if needed prior to implementation.

Most road reconstruction and temporary road construction for the project is associated with proposed silvicultural activities and exempt from storm water discharge permit requirements per 40 CFR 122.3(e) and 40 CFR Section 122.27. Road construction should be evaluated during implementation planning, and a storm water discharge permit secured as part of the project implementation if needed prior to implementation.

Effects on Recreation

While most of the National Forest system roads in the analysis area are open to ATV/OHV use, there is little designated summer motorized trail to be found in the analysis area. ATV/OHV use on open roads is restricted to licensed drivers and little opportunity for family outings for younger operators is available in the area. The majority of ATV/OHV users prefer the experiences associated with backcountry trail travel, as opposed to those gleaned from road-based recreation, and it is not uncommon for unauthorized routes to be created or used.

Travel management proposals will decommission some of the existing Level 2 roads, as well as some user-created routes. Although there would be a net loss of access opportunities for recreationists, several segments would also be added to the National Forest Road System as Level 2 roads, offsetting some impacts to recreationists and preserving some of the well-placed and more desirable user-created routes.

If Level 1 roads are constructed to access timber harvest units, these roads would be available for foot traffic, including use by hunters. These roads would be closed and would have to be blocked effectively to ensure no unauthorized access. Effective closure methods will also have to be employed in areas such as fenceline clearing units, where new cleared areas appear as opportunities for motorized use.

Effects of Proposed Activities on Roadless Character

Inventoried roadless areas are undeveloped lands, typically larger than 5,000 acres, that meet the minimum requirement for wilderness and are managed primarily to maintain the nine roadless area characteristics listed below (36 CFR 294: Roadless Area Conservation). Portions of the proposed aspen regeneration treatments, fenceline clearing, prescribed burning, road decommissioning, and fish barrier access route would occur within four IRAs for a total of 171 treatment acres.

1. High Quality or Undisturbed Soil, Water and Air

Road decommissioning would affect approximately 1 acre in the more than 7,100 acre Big Sandstone Roadless Area. The ripping action of a tracked dozer-like piece of equipment would affect the soil along the existing road prism. Water resources would not be directly affected, but would benefit in the long term from erosion control treatments applied as part of decommissioning (e.g., ripping, water bar placement, slash placement). Air quality would be negatively affected for a short time period when diesel powered equipment was operating.

Fenceline clearing would affect 22 acres in the more than 5,876 acre Strawberry Creek IRA and 2 acres in the Little Sandstone IRA. Some soil disturbance may occur as a result of fenceline clearing where mechanical equipment travels to cut and remove trees. This would affect less than 15% of the of project area. No water course or water body would be impacted by the proposed fenceline clearing. Air quality would be negatively impacted for short durations and over a short time frame during implementation of the project. Hand falling in areas that cannot be accessed with equipment would have no effect to the soils and water but would have a minimal impact to the air quality during chainsaw operation. Regeneration with grass, forbs and seedlings would occur over time and blend into the landscape.

Prescribed burning of 37 acres in the more than 5,400 acre Little Sandstone IRA would have no effect on soil or water if burn plan prescriptions are adhered to and a mosaic burn with the prescribed percentage of

residual cover is retained. Air quality would be negatively affected for a short period of time during the burning, but smoke dispersal requirements would have to be met. Regeneration of grass/forbs would begin the year following burning, and any aspen mortality would result in young aspen suckers.

In 107 acres of the more than 10,400 acre Singer Peak IRA, proposed aspen treatments would have no effect on the soil or water, as no ground disturbance would occur. Air quality would be negatively affected for a short period of time during the felling operations with the use of chainsaws. These would be short-term effects and would dissipate after equipment use was completed.

Also in the Singer Peak IRA, the proposed access route and fish barrier repair would have a small negative affect on the soil as a tracked vehicle would be used to access and repair the fish barrier. Water quality would be negatively impacted for the short period of time while it is rerouted during the barrier repair. Air quality would be negatively affected for a short period of time during equipment operations.

2. Sources of Public Drinking Water

The watersheds that are encompassed in the project area are source water areas for domestic water use. The proposed projects are small in size and located a long distance from domestic water use areas; these projects would have an immeasurable effect on the source water areas.

3. Diversity of Plant and Animal Communities

Plants and wildlife may be affected by the proposed road decommissioning, fenceline clearing, prescribed burning, aspen regeneration, and fish barrier access route projects; however, the projects are of such a small scale that the diversity of plant and animal communities is likely to remain unaffected. Animals may be pushed from the area for short periods of time during implementation, but would migrate back into the area after activities cease. There are no known threatened, endangered, sensitive, or local concern plant species within the IRA project areas; any new populations found during implementation would be protected with a minimum 30 foot limited action buffer.

4. Habitat for Threatened, Endangered, Proposed, Candidate, and Sensitive Species and for Those Species Dependent on Large, Undisturbed Areas of Land

Proposed projects within the IRAs are not expected to impact species dependent on large, undisturbed areas of land due to the small size and short duration of the proposed activities. Furthermore, little quality habitat remains within the forested areas of the Bud Project area due to the mountain pine beetle and spruce beetle outbreaks.

Threatened, endangered, proposed, candidate, and sensitive species are not present within the road decommissioning and prescribed burning project areas.

Some fenceline clearing units lie within the Strawberry Creek IRA as well as the Upper Sierra Madre Lynx Analysis Unit (LAU), totaling 4 acres of unsuitable habitat and 7 acres of suitable habitat. In addition, three aspen treatment units totaling 72 acres occur in the Singer Peak IRA in suitable lynx habitat. These 79 acres will convert currently suitable habitat to unsuitable, a total of less than 0.2% of the suitable habitat in the LAU.

The proposed access route to the Mill Creek Fish barrier in the Singer Peak IRA would enable maintenance of the fish barrier, which ensures separation of a conservation population of the Region 2 sensitive Colorado River cutthroat trout from non-native trout species downstream. Without access by heavy equipment for maintenance, the existing gabion barrier would eventually fail, allowing exotic fish species to move into habitats currently occupied by native fish species. The brook trout and brown trout populations would colonize the headwaters of Mill Creek, and the Colorado River cutthroat trout population would decrease substantially and be at risk of extirpation in the drainage. While the Mill Creek population makes up a small segment of the overall Colorado River cutthroat trout population, it has been designated as a conservation population and any losses will result in negative cumulative effects to the overall population.

5. Primitive, Semi-Primitive Motorized, and Semi-Primitive Non-Motorized Classes of Dispersed Recreation

The road decommissioning project is located in semi-primitive motorized and roaded natural recreation areas. The proposed project would be in a narrow curving corridor and would not negatively impact dispersed recreation opportunities.

Fenceline clearing is located in a semi-primitive motorized area, and effects to the dispersed recreation in would be negligible. Care will be taken during implementation to block access and limit illegal motorized access along the fenceline corridors.

Prescribed burning is located in a semi-primitive motorized area. Effects to dispersed recreation would be negligible due to the short duration and short-term effects of the project.

Aspen regeneration is located in a semi-primitive motorized area. Dispersed recreation would not be negatively affected by the proposed aspen regeneration due to the short implementation time and short-term effects.

The fish barrier access route is located in a semi-primitive motorized area. Dispersed recreation would not be negatively affected due to the short implementation time and short-term effects.

6. Reference Landscapes

There are no Research Natural Areas or areas identified as reference landscapes in the analysis area. Roadless areas would maintain the characteristics of unmanaged, reference landscapes in all but 171 of more than 35,400 acres. Roadless areas would still be able to serve as a contrast to managed timber stands in the surrounding areas.

7. Natural-Appearing Landscapes with High Scenic Quality

Road decommissioning would minimally affect the scenic quality and natural appearance of less than 1 acre of land in the site-specific treatment area.

Fenceline clearing project locations are small in size and impact would be minimal although negative.

Prescribed burning and aspen regeneration treatments would slightly diminish natural appearing landscapes with high scenic quality in the short term, but would enhance the landscape in the long term through the establishment of new aspen and shrub communities.

The fish barrier access route would slightly diminish natural appearing landscapes with high scenic quality. The proposed access route and fish barrier repair would negatively affect a small area; the visual effects would be short-lived and have minimal impact on natural appearing landscapes with high scenic quality.

8. Traditional Cultural Properties and Sacred Sites

The Forest Service will use a combination of historic research and systematic cultural resource survey to comply with the Programmatic Agreement with the State Historic Preservation Officer and the Advisory Council on Historic Preservation and all cultural resource protection laws.

9. Other Locally Identified Unique Characteristics

No other locally unique characteristics to these roadless areas were determined present.

Social and Economic Considerations

Forest Plan Direction

The Medicine Bow Forest Plan includes goals, objectives, and strategies related to the social and economic contributions of the Plan area. Goal 2 of the Forest Plan is to "provide a variety of uses, values, products, and services for present and future generations by managing within the capability of sustainable ecosystems." Objectives and Strategies outlined in the Forest Plan include implementing a consistent timber program each year; striving to offer sawtimber, poles, firewood, and other wood products; and continuing to satisfy the demand for livestock grazing that is economical, environmentally sound, and compatible with other resources.

In the context of Forest Plan direction, the Responsible Official must consider social and economic effects as well as environmental effects. No specific social or economic concerns were raised during the Bud Project analysis. As highlighted by one commenter, however, changed conditions in the local timber industry between the 2010 scoping period and the 2013 formal comment period increase the Forest's ability to contribute to local economies. The Responsible Official must also consider the opportunity costs, to both market and non-market values, associated with taking no action.

As part of sale and contract preparation, the District generally uses the least-cost methods in the Forest Service Timber Sale Preparation Handbook (FSH 2409.18). Cost effective and least-cost methods involve achieving specified outputs or objectives under given conditions for the least cost. In some cases, the cost of implementing the project (i.e., project planning, sale administration, cutting and hauling logs, and reforestation) may exceed the economic gains of a timber sale. However, this is consistent with the purpose and need of the project and may be necessary for protecting infrastructure and regenerating forests to healthy productive stands as rapidly as possible.

Costs and Benefits for Timber

All acres proposed for Overstory Removal or Clearcut with Reserve Trees treatments are in timber emphasis management areas, where an important objective is to manage timber to produce sawtimber and other commercial products. Several opportunities for timber removal and utilization are now available to the District and the local timber industry. It is anticipated that a combination of commercial timber sales, service contracts, stewardship contracts, and/or Forest Service crews would be used to implement the project. Forest product industries in the local to regional area have the capability to process a variety of sawlog and biomass products, including dimensional lumber, boards, paneling, and wood pellets. The estimated harvest volume from salvage treatments is 43,000 CCF, based on 2,740 whole-stand acres. Since it is anticipated that only 70- 80% of the potential salvage treatment units will be harvested due to project design features and timber sale design, the actual amount of timber harvested will likely be lower than the estimated volume.

Implementation of either the 2010 Savery Alternative or the 2013 Bud Alternative would result in a positive cumulative effect for the following: 1) availability of employment opportunities in the logging industry, 2) employment related income and subsequent generation of federal tax dollars, 3) supply of timber products to support area mills, 4) providing non-priced benefits, such as habitat improvement; and 5) support of local businesses and industries in the communities that provide products and services to those engaged in harvesting or processing timber.

In addition, salvage harvest treatments would provide a steady flow of forest products to local timber markets, thus improving the probability that local markets will be available for future removal of forest products. Industry is essential in effectively and economically managing forested land on a sustained large scale basis. Although future sale values may fluctuate due to the variation in timber quality and demand for timber products, implementation of future projects would result in maintaining and/or increasing current employment levels in the logging industry, which would sustain the local communities' economic status as a whole through dollars spent at local businesses. Future timber harvest management opportunities would improve stand conditions, thereby maintaining the quality of residual trees for future uses.

The value and growth of the timber products in the project area is likely to increase over time as unhealthy and over-stocked trees are removed from treated stands. A variety of forest products as well as non-market values such as wildlife habitat, grazing forage, and outdoor recreation would be offered. All of these factors can positively affect the forest-influenced community as a whole. Providing forest products, sustaining timber-related jobs, and maintaining habitat for game species would continue to provide spending dollars and income for local communities because workers, hunters, and other recreating public are likely to continue to shop, visit and recreate in the local area.

Costs and Benefits for Range

The Medicine Bow National Forest recognizes that livestock grazing is an important component of the agriculture industry throughout the economic impact area. For many ranchers located near the National Forest, permitted use is an important part of their overall livestock operations. When viability of ranches is taken into consideration, economic impacts of forage provided on the National Forest could be 2-5 times greater than those pertaining strictly to the value of the forage and the jobs it generates. It has been

estimated that each AUM of forage for cattle in southern Wyoming has a total economic impact of about $65 per year. Since a change in federal grazing affects the optimal use of the rest of the forage resources on a ranch, it is estimated that the economic impact of the production associated with federal grazing is actually $161.05 per AUM per year. The jobs and revenue associated with the ranching sector contribute to local and regional economic stability.

Secondary benefits associated with a healthy ranching-based economy are various and complex. Privately owned ranch lands adjacent to National Forests provide year-round habitat for many wildlife species and often critical winter habitat for big game, as well as scenic and open space values. Their condition and uses therefore directly affect wildlife resources and quality of life for the non-ranching public in the area. Across the West, private ranches are being turned into subdivisions, which negatively impacts wildlife habitat, scenery, and open space values. Reports show that almost a quarter of the West's ranches have been converted to other uses in the last 30 years, and an additional 24 million acres of ranchland are expected to be converted by 2020. The American Farmland Trust has estimated that 2.6 million acres of prime ranchland in Wyoming could be converted to residential development by 2020.

While the purpose and need for this project is not to augment rangelands, the decision-maker will consider impacts to allotment management in the analysis area. Design features have been included to decrease impacts to allotment permittees.

Chapter 4 – Agencies and Persons Consulted

In accordance with 40 CFR 1501.2a, the Responsible Official selected a team of resource specialists to utilize a systematic, interdisciplinary approach in planning and analyzing the Bud Project:

- Shawn Anderson, Aquatics and Fisheries
- Jillian Gantt, Heritage
- Dave Gloss, Hydrology
- Paula Guenther, Travel Management
- Wendy Haas, Range
- Katie Haynes, Botany
- Mick Hood, Fire and Fuels
- Steve Loose, Wildlife
- Steve Mottus, Geographic Information Systems
- Monique Nelson, ID Team Leader
- Christie Schneider, Silviculture/Timber
- Randy Tepler, Soils
- Jeff Tupala, Scenic Resources
- Brian Waugh, Recreation
- Brad Weathered, Range

The Forest Service provided information on this project directly to 188 individuals and local agencies and to Wyoming State agencies and departments. Tribal government to government consultation was completed in the form of a letter from the District Ranger to the tribal leads of the Northern Arapaho Tribe, Northern Cheyenne Tribe, Crow Tribe of Indians, and Eastern Shoshone Tribe.

Comments during the 2010 scoping period were received from:

- Jean Public
- Heggie Logging & Equipment Co.
- Tribal Historic Preservation Officer
- Randy Shipman
- State Historic Preservation Office
- Ronald and Lisa Famiglietti
- Wyoming Game and Fish Department
- Wyoming Stock Growers Association
- Bockman Timber & Pole, Inc.
- Saratoga-Encampment-Rawlins Conservation District
- National Park Service – Intermountain Regional Office
- Wyoming Farm Bureau Federation
- Berger Ranches
- Wyoming Department of Agriculture
- Biodiversity Conservation Alliance

Comments from the 2013 formal comment period were received from:

- Wyoming State Parks & Cultural Resources
- Randy Shipman
- Wyoming Department of Agriculture
- Wyoming Game and Fish Department
- Wyoming State Forestry Division
- Wyoming Farm Bureau Federation
- Tom Troxel, Intermountain Forest Association
- Cheyenne and Arapaho Tribes
- Saratoga-Encampment-Rawlins Conservation District

Finding of No Significant Impact

As the responsible official, I am responsible for evaluating the effects of the project relative to the definition of significance established by the CEQ Regulations (40 CFR 1508.13). I have reviewed and considered the EA and documentation included in the project record, and I have determined that neither the 2013 Bud Alternative nor the 2010 Savery Alternative would have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. My rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance cited above.

Context

Disclosure of direct, indirect, and cumulative effects in this EA demonstrate analysis of the proposed action and alternatives in the context of the analysis area (i.e., effects within the Bud Project area), the locality (e.g., effects beyond the boundaries of the analysis area, including downstream, to adjacent landowners, and to local industry), and the geographic region (e.g., effects to the Medicine Bow-Routt National Forest, to forest and range industries in Southern Wyoming). Both short-term and long-term effects of the alternatives were found to be of limited extent and are not expected to affect national resources.

Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis of this EA and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. My finding of no significant impact is based on the context of the project and intensity of effects using the 10 factors identified in 40 CFR 1508.27(b).

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

The interdisciplinary team analyzed the direct, indirect, and cumulative effects of the proposed action on biological, physical, and cultural resources in and around the Bud Project analysis area. Due to the concerns expressed by public commenters, particular attention was paid to the effects of timber salvage treatments and travel management on watershed health and function, wildlife habitat, and range resources. The analyses documented in the Environmental Consequences chapter of the EA (pages 23–39) state that some direct, indirect, and cumulative effects are expected in the short term in the context of the analysis area. However, beneficial effects are expected in the long term and in the broader context of the Brush Creek-Hayden Ranger District. Design features have been agreed upon by the interdisciplinary team to ensure that even short term impacts to these resources will not be significant. Although not described in detail in the EA, the project record also includes detailed analyses of the effects of the alternatives to soil, fisheries and aquatic, fire and fuels, heritage, recreation, botany, and scenery resources. These analyses contribute to my understanding of the effects of the alternatives and confirm that there will be no significant impacts to those resources.

2. The degree to which the proposed action affects public health or safety.

The proposed action and alternatives are not expected to affect public health or safety. One component of the preferred alternative, fenceline clearing, is specifically designed to improve safety for range permittees who need to maintain fences for allotment management. During scoping and public comment periods, the only concerns raised related to safety were with regard to winter hauling conflicting with snowmobile use on highway 70. This concern is addressed in the EA on page 29 and with a specific Design Feature on page 20. The Wyoming Department of Transportation has confirmed that they will not be opening the highway for winter hauling in 2014 or 2015 due to budget limitations and conflicting interests. Unless agreed upon with the State, hauling will not occur on highway 70 while the road is closed during the winter and snowmobiles are active.

3. Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

The analysis area does not include parklands, prime farmlands, wild and scenic rivers, or ecologically critical areas. Portions of four inventoried roadless areas are located within the analysis area, and the 171 acres of treatments proposed in roadless have undergone extensive review by the Forest Service to ensure that there will be no significant impacts to roadless area characteristics (EA pages 34–37). A survey of cultural resources will be completed in accordance with the programmatic agreement with Wyoming State Historic Preservation Office and Section 106 of the National Historic Preservation Act to ensure that any cultural resources found within proposed treatment areas will be protected. Wetlands, including streamside riparian areas, are protected by project-specific Design Features (EA pages 17–22). No other unique characteristics have been identified within the proposed treatment areas.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

Most of the activities proposed in the alternatives (e.g., timber salvage treatments, road construction, prescribed fire, hazard tree removal) are common forest management activities for which watershed conservation practices, best management practices, and Forest Plan standards and guidelines exist to provide resource protections (EA pages 14–17) . While past projects and research are available to inform implementation of the proposed aspen regeneration treatments, we plan to implement these treatments in phases in order to assess the site-specific effectiveness of aspen cutting, conifer removal, and fencing and hinging (EA page 16). The interdisciplinary team has reviewed comments from both the scoping period and the formal comment period, and confirmed that no unresolved conflicts remain related to the proposed action (EA page 3).

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The effects analyses documented in the EA and in the project record incorporated accepted techniques and methods, the best available scientific literature, reliable data, field review, and the judgment of qualified professional resource specialists (EA pages 23–39). Neither these analyses nor public comments identified highly uncertain effects or unique or unknown risks associated with the alternatives.

6. *The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.*

The activities associated with the 2010 Savery Alternative and the 2013 Bud Alternative are similar to many that have previously been implemented and will continue to be implemented by Forest Service line officers for timber harvest, fuels reduction, travel management, and habitat improvement on National Forest System lands (EA pages 14–171). The activities are within the scope of the Forest Plan and are not expected to establish a precedent for future actions (EA page 1).

7. *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.*

The analysis completed for the EA demonstrates that there are no significant cumulative effects on the environment, either when combined with the effects created by past and reasonably foreseeable future projects or the effects from natural changes taking place in the environment (EA pages 23–39).

8. *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.*

The Forest Service will use a combination of historic research and systematic cultural resource survey to identify historic properties in the treatment units prior to project implementation. The Forest Service is required to inventory and assess effects to historic properties in accordance with the Programmatic Agreement with the Wyoming State Historic Preservation Officer. As required by the Programmatic Agreement, the EA project record includes a heritage specialist summary report which does not disclose sensitive site information, but discusses significant sites within the areas potentially affected by vegetation management activities. Standard avoidance procedures will be used to ensure sites that are eligible for, or listed on, the National Register of Historic Places will not be impacted by project activities. If an eligible site cannot be avoided, the Forest Service, in consultation with the Wyoming State Historic Preservation Officer, will develop site-specific mitigation measures to avoid adversely affecting the historic property. Design Features have been incorporated into project design to protect heritage resources (EA pages 18–19)

9. *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.*

The Forest Service consulted with the U.S. Fish and Wildlife service to determine the degree to which the alternatives would affect Canada lynx, the only endangered or threatened species with habitat in the analysis area. Concurrence was received on September 13, 2013 on a determination of *"may affect, likely to adversely affect."* Both the 2013 Bud alternative and the 2010 Savery Alternative are consistent with the Southern Rockies Lynx Amendment (USDA 2008), utilizing exception 5 of VEG S5 for vegetation management (EA pages 28, 35).

The project will contribute up to 72 acres toward the incidental take statement from the Biological Opinion (USDI 2008), less than 0.2 percent of the lynx habitat in the Upper Sierra Madre Lynx Analysis Unit (LAU), which is well below the allowable 1% cap for the Forest. The 72 acres of aspen stands that will be treated provide some limited habitat for snowshoe hares during summer; however, horizontal and vertical structure is too limited to provide hare habitat during winter. Proposed vegetation management in the Upper Sierra Madre LAU also includes 133 acres of timber harvest of dead and dying beetle-killed trees, but these acres currently do not provide winter snowshoe hare habitat. There is no linkage corridor in the area. After implementation of proposed forest management actions, unsuitable lynx habitat in the Upper Sierra Madre LAU will increase to 46.8 percent (19,011 acres; an increase of 0.7 percent).

According to the U.S. Fish and Wildlife Service concurrence letter, while treatments will reduce some horizontal cover within these stands in the short term, they currently do not provide winter snowshoe hare habitat. Therefore, the proposed Project treatments are consistent with all other applicable SRLA vegetation management standards and guidelines: VEG Si (less than 30 percent of lynx habitat of an LAU in stand initiation structural stage), VEG S2 (no more than 15 percent of lynx habitat in an LAU shall be regenerated in a 10-year period), VEG S6 (no multi-story mature or late-successional conifer forests will be impacted), VEG G4 (prescribed fire will not create permanent travel routes that facilitate snow compaction), VEG G5 (habitat for alternate prey will still be provided), and VEG 011 (denning habitat will not be treated); and Human Use HU G7 (no new permanent roads will be built).

The determination of *"may affect, likely to adversely affect"* is based on the finding that treatments may lead to reductions in prey abundance or prey habitat and lead to decreased fitness, survival, or reproduction of lynx. However, it is expected that landscape connectivity will be maintained in the analysis area since vegetation management changes occur on a smaller scale and do not add to any other large scale fragmentation. Proposed actions will retain recruitment trees, snags, and coarse woody debris to contribute toward future prey habitat.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

Both the 2010 Savery alternative and 2013 Bud Alternative complies with Federal, State, and local laws and requirements imposed for the protection of the environment. These include the Clean water Act, Wetlands and Floodplains Executive Orders (EA page 29), the Endangered Species Act (EA page 28), The National Historic Preservation Act (EA pages 18–19), the National Environmental Policy Act (EA page 1), and the National Forest Management Act (EA page 1). The alternatives comply with all Forest Plan desired conditions, objectives, standards, and guidelines (EA page 1).