ENVIRONMENTAL ASSESSMENT
LIME/RUBY SALVAGE and FOREST HEALTH TREATMENT

ENVIRONMENTAL ASSESSMENT # MT060-2009-0001

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LEGAL DESCRIPTION OF THE PROPOSED PROJECT AREA
Portions of Sec's 16,17,18,19 and 20, T16N, R19E, PMM

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Chapter 1.0
Purpose of and Need for the Proposed Action

1.1 Purpose of the Proposed Action

The Bureau of Land Management (BLM) and the Montana Department of Natural Resources (DNRC) propose a combination of vegetation treatments, road construction, acquisition of easements and related projects to reduce the risk and damage associated with a windstorm that occurred in the Judith Mountains. These projects would promote forest health by salvaging wind damaged timber, reducing Stand Densities and Basal Area along with Prescribed fire and site preparation to help regenerate new tree seedlings. Additionally, these treatments would reduce potential losses associated with a stand replacing wildfire. The project area is located in portions of Sec's 16,17,18,19 and 20, T16N, R19E, PMM approximately 6 miles Northeast of Lewistown, MT.

1.2 Need for Treatments

These projects would provide for enhanced forest health by salvaging damaged timber and reducing current stocking levels of conifers. In addition, improved access routes and designed stream crossings will minimize resource damage while maintaining recreational values in the Limekiln drainage.

High fuel loadings associated with the downed timber and vegetative composition and structures existing in the proposed management area pose a high hazard of stand-replacement fire. A wildfire would threaten human health and safety as well as private property. Stands of Aspen and other hardwood shrubs are declining in vigor as they are out competed for nutrients and water by the adjacent stand of Conifers.

1.3 Objectives of Vegetative Treatments

Improve forest health and minimize resource impacts;

- Ensure protection of values associated with the Judith Mountains Scenic Area of Environmental Concern (ACEC) and the Judith Mountain special Recreation Management Area (RMA);
- Minimize the safety hazards that wind damage trees pose to the recreating public along the trail system;
- Salvage wind thrown and otherwise damaged timber;
- Relocate an existing public access route to minimize resource damage;
- Reduce stocking levels of conifers to a level within the historical range of variation for adjacent stands;
- Increase available hardwood wildlife habitat (species diversity and acres).
- Reduce potential for losses associated with a stand replacement wildfire and/or insect and disease outbreak;
- Earn income from the harvest of State Land timber for the Common School Trust.

1.4 Scope of this Environmental Analysis

1.4.1 History

- Initial reconnaissance and mapping began in June of 2008 following reports of blowdown timber in the Judith Mountains;
- Letters to the Judith Moccasins Landscape Analysis (JMLA) collaborators along with a general Public Service Announcement sent out September, 2008;
- Draft Proposed Action formerly introduced to General Public during a September 17th public scoping meeting;
- Open comment period for the draft proposed action established thru October 17th, 2008;
- Meeting with Central Montana Resource Advisory Council (RAC) Travel Plan Sub-group on November 17th, 2008; provide for RAC Sub-group comments thru December 1st;
- Project presented at the January 15, 2009 RAC meeting in Malta, MT;
- Preliminary (EA) completed and presented at public meeting February 4, 2009.

1.4.2 Relevant Planning Documents

The proposed management action identified in the EA conforms to the Judith Valley Phillips RMP and the rules and statutes of the State Forest Management Plan (SFLMP). In addition, the JMLA clearly defines forest health issues and treatments for the forested lands on both BLM and DNRC lands within the Judith and Moccasin Mountain ranges. The project area was identified as the number two priority area in the JMLA for treatment.

1.5 Decisions that must be made

The Lewistown Field Office (BLM) and the Northeast Land Office (DNRC) Managers must decide whether to implement vegetation treatments with the objective of salvaging dead and dying timber

along with reducing Stand Densities and Basal Area in adjacent stands. If selected, the proposed action would involve:

1. Hand and mechanical forest treatments to salvage wind damaged trees along with reducing adjacent surrounding stand densities and stocking levels on approximately 570 acres of BLM and 267 acres of lands managed by the DNRC.
2. Identification of where and when to implement prescribed fire for hazardous fuels reduction and forest health purposes;
3. Re-locate a portion of the existing Limekiln easement and continue to provide public access to the BLM lands in Burnette Creek.
4. Abandon the portion of the easement that currently allows motorized access up to the existing "jeep trail" in the bottom of Limekiln canyon.
5. Enter into a reciprocal Right Of Way (ROW) agreement with an adjacent landowner for approximately the first 6000' of new construct road.
6. Overall, construct approximately 7.0 miles of temporary new road. All of the new road (except that portion within the ROW and easements) would be reclaimed and stabilized, except portions that would enhance the existing Limekiln Trail system and other recreational uses of the area.

1.6 Applicable Statutes, Regulation, and other plans.

- The Federal Land Policy and Management Act (FLPMA) of 1976 established policy and guidelines for the administration, management, protection, development, and enhancement of public lands (43 U.S.C 1701 et seq.: 90 Stat. 2743; P.L.94-579).
- Archeological Resource Protection Act of 1974
- National Environmental Policy Act of 1969, as Amended (42 U.S.C. 4321 *et seq.*)
- 1973 Endangered Species Act, as amended
- Clean Air Act of 1977, as amended, U.S.C. 7401 *et seq.*
- Montana Environmental Policy Act of 1971 and 1996 State Forest Land Management Plan (SFLMP)
- 1994 Judith Valley Phillips Resource Management Plan, (JVP-RMP) as amended by the 2003 Fire/Fuels Management Plan;
- 2006 Judith Moccasins Landscape Analysis, (JMLA)

Chapter 2.0
Alternatives including the Proposed Action

2.1 Introduction

"Alternatives Including the Proposed Action" is the heart of this EA. It describes the activities of the Vegetative Treatment alternative, as compared to current management practices implied by the No Action Alternative. This chapter summarizes the objectives that the BLM and the DNRC intends to reach if the Vegetative Treatment Alternative is implemented, and describes the steps that would be taken to minimize unnecessary environmental degradation.

2.1.1 History and Process Used to Formulate the Alternatives

In addition to the Public Involvement listed under section 1.4 above, the results of interdisciplinary involvement, (See Chapter 4.0 Consultation and Coordination) were taken into consideration when formulating alternatives.

2.2 Alternatives Considered but Eliminated From Further Study

2.2.1 Prescribed Fire Only Alternative: Prescribed fire under existing fuel conditions would be difficult, costly, and an unacceptable risk to human health and safety and surrounding private property. Current hazardous fuels loadings are too high for even a moderate intensity prescribed fire. The prescription and expected fire behavior needed to reduce fuel loadings would be unacceptable and lead to undesirable overstory and understory mortality in the treatment area. The area would still need mechanical treatments after a prescribed fire. Low to moderate intensity prescribed fire may be used as part of a two- or three-step maintenance treatment in another alternative but should not be considered an alternative in itself.

2.2.2 Non-conventional Logging Systems Alternative: (Helicopter and other specialized logging equipment). Market research was done thru phone calls, informal site tours and appraisals of timber value to determine if other means of logging could be economically completed without road building. In all cases alternative logging systems were not economically viable without any change anticipated in the immediate future.

2.3 Description of Proposed Alternatives

2.3.1 Alternative 1: No Action

In this case, No Action has been defined as a continuation of past management practices.

Stand Density reduction by mechanical or prescribed fire methods would not occur in this area until completion of other projects identified in the JMLA.

Wind damaged and downed timber would continue to decay until it no longer had commercial value. Hazardous fuel loadings caused by downed timber would not be mitigated in a timely manner resulting in an unacceptable risk to public and State lands along with adjacent landowners. The likelihood of insect and disease infestation would increase due to no treatment. The adjacent Forests would continue to decline in health and vigor. Public Road access into Limekiln Canyon (Burnette Creek) would continue across a domestic spring and through unimproved stream crossings on public land.

2.3.2 Alternative 2: Vegetative Treatment, Road Construction with Reciprocal Right-of-Way along with Prescribed Fire: (Proposed Action)

For the purpose of defining the treatment, the project has been divided into 4 distinct treatment areas using existing vegetative and fuel conditions, topography, ownership and similar treatment characteristics. The "Proposed Action" consists of various mechanical and hand treatments along with prescribed fire on approximately 570 acres of public land and 267 acres of STATE land.

Specific Forest treatments, described in the attached silvicultural prescriptions, (Appendix A1-A4) would result in varying degrees of timber salvage along with related Forest management activities and prescribed fire in a mixed conifer stand. Specific treatments would be accomplished through use of hand or mechanized fallers and cable or ground yarding to designated landing sites. Leave trees may be left in patches or spread unevenly across portions of the units. This would provide for a more natural look to the stand while meeting the forest health objectives. Additionally, some areas will be clearcut due to the wind damage that has occurred in the area. Ground based mechanized equipment would be limited to operating on sustained slopes that are 40 percent or less and are outside any designated restriction areas.

Cable systems will be used on sustained slopes in excess of 40 percent and/or to avoid resource damage within sensitive areas. Operation of ground based equipment would only be permitted when the soils are dry, frozen, or sufficiently covered by snow to reduce impacts.

The BLM and DNRC, prior to any treatments being implemented, would establish all treatment unit boundaries. A BLM and DNRC resource specialist would periodically inspect the treatment area to assure compliance with all contract stipulations.

Noxious weed control measures would be incorporated into all contracts. Weed control would be in conformance with guidelines and procedures described in Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Final EIS, June 2007. All noxious weed control efforts would be monitored by the BLM and the DNRC. Seeding disturbed areas, major skid roads, any temporary roads and burned piles would discourage weed infestation. Contracts would include a requirement to pressure wash all off-road equipment before entering the project area. Periodic weed spraying by BLM and DNRC personnel or contractors would occur (as necessary) along newly established travel routes and within treatment areas throughout the life of the contract.

Approximately 7.0 miles of road construction would be needed to implement all of the salvage and forest management treatments. The proposed road is completely within the scenic ACEC (except for a segment on private land), all of which is in a Class II VRM area. For the action to occur, it requires meeting the Class II objective of ensuring full rehabilitation of the temporary road, as previously described. The retention or enhancement of the visual quality of the area over the long term can be accomplished by conforming to established mitigation methods. Additionally, as the project is occurring, it must conform to the Class II objective by using all mitigation methods available, such as screening or hiding the road construction from public view; blending the fuel treatment areas into untreated stands of timber to keep the contrasts low, and reestablishing the blowdown area's natural characteristics (see VRM mitigation section).

A portion of the new road system will require a re-location of an existing easement. The re-location would continue to allow public, motorized access onto the same block of public land, however. The existing two tracked trail and stream crossings (on BLM land) further up Burnette Creek will be stabilized and rehabilitated to minimize erosion and sedimentation into the creek. An additional portion of the new road will be a reciprocal right of way with an adjacent landowner allowing both private access to private lands and administrative access only to public lands. It is possible that temporary, public use would be allowed for the purposes of firewood gathering or other incidental, personal uses. Once all salvage operations have been completed this segment of the (west side of Burnette Creek) remaining new road would be fully reclaimed. Unauthorized motorized travel will not be permitted on the road beyond that portion established as a reciprocal Right of Way.

All Forest treatments and road activities would adhere to the Water Quality Best Management Practices (BMPs) for Montana Forests (MSU Extension, 2001).

2.4 Description of Relevant Past, Present, and Reasonably Foreseeable Future Actions Not Part of the Proposed Action

Scattered tracts of private land have had varying degrees of timber harvest in the past 15-20 years. There has been no recent commercial timber harvest or other significant forest management other than incidental, personal uses such as post and pole or firewood in this portion of the Judith Mountains. The new road construction required for this action will continue to provide a point of access for the public into the Limekiln Canyon area. It is likely that the reciprocal ROW with an adjacent landowner would stimulate opportunities for the landowner sometime in the future. However, any private, commercial activities utilizing the reciprocal ROW would require a special uses permit from the BLM. Impacts would be addressed at that time.

2.5 Summary comparisons of the Activities, the Predicted Achievement of the Project Objectives, and the Predicted Environmental Effects of all Alternatives.

Table 2.1 presents a predictive comparison of the forest health issues and fire type likely to occur under each alternative.

2.6 Identification of the Preferred Alternative

Alternative 2, (Vegetation Treatment and Salvage), is the Preferred Alternative.

Table 2.1: Summary Comparison:		
	Alternative 1 (No Action)	Alternative 2 (Vegetation Treatment)
Fire Type (based on fuel conditions)	Wind damaged downed and dead trees provide a continuous fuel bed that, in turn provides a readily available fuel source for a wildfire. Expected fire type would be a stand replacement crown fire due to a continuous fuel bed leading from the ground into adjacent overstocked stands with ladder fuels and a closed canopy.	Where treatments take place the horizontal and vertical continuity of excessive fuel and tree canopies would be broken up. Therefore, any fire would tend to be more of a low to moderate intensity ground (surface) fire with individual tree torching and small crown runs. As less combustible hardwoods and wood shrubs increased over time the treated area would be more resistant to fire spread.
Forest Health	The dead and dying wind damaged timber is attracting insects and disease. The adjacent stands will likely be infected if salvage does not take place along with treatments of stands directly adjacent. As the adjacent stands become infected there is a likelihood that insect damage could spread to adjacent ownerships. Stand decay would be accelerated.	Vegetation Treatment and maintenance actions would mimic the stand-improvement effects of the natural fire cycle and promote fire tolerant species. Scarification and low to moderate intensity prescribed burning would regenerate a new forest and improve quantity and quality of hardwood trees and browse. Decreasing stand density and basal area per acre reduces the chances for insect and disease problems.
Public Safety	Standing, wind damaged trees will continue to pose threats to recreational users until they fall. High intensity wildlfires are typically rapid moving and pose a high safety hazard to fire suppression crews and private property.	Unstable, wind damaged trees would be salvaged. The forest canopy would be more open and/or scattered lessening the chance for a sustained crown fire. Ground fires would pose fewer hazards to fire suppression crews, residents, and private property.
Private Property	Insects and disease will continue to be a threat to spread to adjacent ownerships. Wildfires could spread to surrounding private land depending on fire conditions.	Insects and disease are a part of the natural process of forest growth and cannot totally be eliminated. However, salvaging damaged timber and thinning adjacent stands will help minimize the threat insects and disease in the general area. The intensity of a wildfire would be drastically reduced under normal burning conditions lessening the probability of private property losses. However, private property owners would still need to take it upon themselves to provide for some kind of forest and fuels management on their respective properties.
Transportation	Public travel continues over a spring used for domestic water. The general public continues to drive up the Burnette Creek drainage (on BLM lands) through the creek thereby contributing to increased sediment flow into the creek. No additional trail system would be built in the near future.	Re-locating the public travel route on an existing travel way (away from the domestic spring) will continue to allow for public, motorized access to the boundary of the public lands in the upper end of the Burnett Creek/Limekiln area. However, potential damage to the spring along with related resource damage from unimproved, drive thru crossings in the creek itself would be eliminated. A Reciprocal Right of Way with an adjacent landowner will provide long term administrative access to BLM land for future management. Overall, construct approximately 7.0 miles of temporary new road. All of the new road (except that portion within the ROW and easements) would be reclaimed and stabilized

		except portions that would enhance the existing Limekiln Trail system and other recreational amenities of the area.

Chapter 3.0
Affected Environment and Environmental Consequences

3.1 Introduction

"Affected Environment and Environmental Consequences" summarizes current conditions and provides a baseline against which to measure the features of the alternatives. It also describes how conditions might be affected under the Treatment Alternative and the No Action alternatives. The Environmental Consequences portion of the analysis provides the scientific basis that supports the summary found in Chapters 1.0 and 2.0.

3.2 Description of Relevant Affected Resources

3.2.1 Critical Elements: The BLM NEPA and the State MEPA process require consideration of those elements of the human environment, which are considered especially important to the quality of human life. Protections for these values are provided through Federal and State Executive Orders, statutes, and regulations.

Air Quality: Any decisions or actions related to vegetative Treatments plans and maintenance activities must comply with air quality legislation, including the 1955 Clean Air Act, as amended.

Affected Environment: The proposed treatment area is rural with a few, scattered ranches within a 5-mile radius. The nearest populated area is Lewistown, which is approximately 5 miles SW. There is no Class I air sheds, wilderness areas or any non-attainment areas within the immediate area.

Environmental Consequences: Mechanical Vegetation Treatment Projects in themselves do not typically pose any environmental consequences related to air quality. However, there may be related slash disposal and fuels management activities that include burning piles and under burning which have the potential to exceed air quality standards such as particulate matter for short periods of time. However, the overall effects on air quality from burning slash or a low to moderate intensity, prescribed burn would be less severe than the smoke impacts resulting from a high intensity stand replacement wild land fire that is likely to occur under the No Action Alternative.

Mitigation: Any prescribed burning would be implemented on a predicted "good" or better smoke dispersal day to limit smoke impacts from prescribed fire. Compliance with local smoke management programs would minimize the effects of temporary increases in particulates and carbon monoxide and decreased visibility during prescribed burning activities.

Areas of Critical Environmental Concern (ACECs): The BLM designates certain sites as Areas of Critical Environmental Concern (ACECs) in accordance with FLPMA. Any actions occurring in the ACEC must ensure protection of the values for which the designation occurred.

Affected Environment: The project area is located within a Scenic ACEC of approximately 3000 acres along the front of the Judith Mountains visible from Lewistown. The ACEC nomination was made in the JVP RMP 1994 in response to the amount and degree of hard rock mining, which at the time was occurring in the North Moccasin Mountains just fifteen miles north of Lewistown. The concern during the JVP RMP development process was that visual or scenic quality objectives would be severely reduced or degraded if hard rock mining were to occur on the front range of the Judith Mountains, just five miles away from Lewistown.

Environmental Consequences: The proposed action must meet management objectives for a Scenic ACEC located within a Class II Visual Resource Management (VRM) area. Because the Judith Mountains were designated a Class II area, and the range is viewed from Lewistown, protecting or retaining the scenic quality is non- discretionary. Contrasts to the form, line, color , and texture of surrounding landscape from roads and skid trails created by the thinning operation, as well as the salvage operation from the blowdown, must be substantially unnoticeable, as previously described .(Manual 8410-1)

Mitigation: Road construction and skid trails for the salvage and thinning project would conform to VRM Class II objectives (See VRM Mitigation measures, Page 19). The Class II visual quality objective of retention or preservation of the existing natural characteristics of the landscape making the proposed action substantially unnoticeable must be met.

Cultural Resources: A check of the Montana State Antiquities Database and the Lewistown Field

Office's site and survey atlas indicated the likelihood for evidence of historic period mining within the project area. The project area is within the Warm Springs Mining District, which dates to the latter part of the 19th Century-early 20th Century. The mining district encompassed much of the Judith Mountains. In accordance with BLM's Programmatic Agreement and the Montana Protocol, a Class III inventory of the areas proposed for salvage was determined appropriate. The areas within the analysis area proposed to be hand thinned and treated with prescribed fire, but outside those units proposed for salvage or harvest activity would be considered in accordance with the prescribed fire protocol for the Montana BLM.

Affected Environment: A class III inventory was conducted from August 27 to November 3, 2008 (Cultural Resource Inventory Report #09-MT-061-007). Four newly-discovered mining sites were documented, and one previously-recorded mining site was monitored. None of the five sites is considered eligible for listing on the National Register of Historic Places. No mention of them has been found in the historic records documenting mining activity or mineral production of the Warm Springs Mining District.

Environmental Consequences: As a result of the cultural resource inventory, no historic properties would be affected by the proposed action. The Montana State Historic Preservation Office (SHPO) will receive a copy of the cultural resource inventory report documenting our findings, effects analysis, and eligibility determinations.

Mitigation: All contracts for Vegetation Treatments and related fuels reduction activities would contain guidance for protection of any historic properties eligible for listing on the National Register of Historic Places discovered during fulfillment of the contract.

Environmental Justice: On February 11, 1994, President Clinton issued Executive Order No. 12898, Environmental Justice. The purpose of the order is to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of program, policies, or activities on minority or low income populations.

Affected Environment: Recent logging reductions have increased local unemployment. This project will be put out for public auction and would therefore, provide an opportunity for all interested parties to bid.

Environmental Consequences: While Native American, Hispanic or other minority populations may live near the project area, no disproportionate negative impacts to these groups are anticipated, neither through smoke from prescribed fires nor mechanical treatment activities. Therefore, the standard set by the Executive Order on Environmental Justice would not be breached.

Farmlands (Prime or Unique): The Farmland Protection Policy Act of 1980 and 1995 requires identification of proposed actions that would affect any lands classified as prime and unique farmlands. This act is administered by the US Natural Resources Conservation Service to preserve farmland.

Affected Environment: No prime or unique farmlands have been identified in the project area.

Flood plains: Executive Order 11988, Flood plain Management was enacted to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct or indirect support of flood plain development wherever there is a practicable alternative.

Affected Environment: No flood plains exist in the project area.

Invasive, Non-Native Species: Executive Order 13112 (Invasive Species) directs Federal agencies to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause

Affected Environment: Limekiln Gulch and Ruby Gulch contain established infestations of spotted knapweed, houndstongue, and Canada thistle. The majority of these weed species are located in and adjacent to roads and trails.

Environmental Consequences: The project area is accessed via public travel routes in both Limekiln Gulch and Ruby Gulch. The public roads extend into private, federal, and state lands; all current roadways and trails contain noxious weeds. The proposed Vegetative Treatment does call for ground skidding and prescribed fire, which will expose some bare mineral soil, (a potential seed bed). The contractor will be required to deposit a non-refundable fee with the BLM and DNRC, which is used for site re-habilitation including, but not limited to, weed control. The proposed action could also lead to off-site movement of weed seeds or vegetative material

by equipment, log trucks, logs, and associated vehicular traffic thereby increasing the chance of noxious weed spread outside the project area. Implementation of Alternative 2 would initiate a comprehensive, cooperative weed control effort to systematically treat noxious weeds in the planning area. Infested acres of noxious weeds would decrease through an aggressive, concentrated effort involving all facets of an integrated weed management program.

Mitigation and Monitoring: Noxious weed mitigation in the project area would continue with treatments and monitoring. Timing of activities with dry periods or when ground is frozen and following the Montana BMP's to minimize ground disturbance would minimize the further spread of noxious weeds. Seeding disturbed areas, major skid roads, any temporary roads and burned piles would discourage weed infestation. Any contracts would include a requirement to wash all off-road equipment before entering the project area.

Native American Religious Concerns: The American Indian Religious Freedom Act of 1978 (AIRFA) declares that it is the policy of the United States to protect and preserve for the American Indian, Eskimo, Aleut, and native Hawaiian the inherent right of freedom to believe, express, and exercise traditional religions, including access to religious sites, use and possession of sacred objects, and freedom to worship through ceremonials and traditional rights.

Affected Environment: There are no known Native American religious concerns associated with this project.

Threatened, Endangered, and Special Status Species: Section 7 of the Endangered Species Act of 1973 requires consultation with the US Fish and Wildlife service regarding the presence of threatened or endangered species or their habitat where any proposed federal action could jeopardize the existence of a threatened or endangered species or their habitat.

Affected Environment: There are no known Threatened or Endangered wildlife species in or adjacent to the project area. Wildlife species included on the latest Threatened and Endangered (T&E) list of Montana counties for Fergus County include pallid sturgeon (Endangered) and Black-footed Ferret (Endangered). The pallid sturgeon is found in the Missouri River which is 40 miles north of the proposed project. The nearest black-footed ferrets are at the U-L Bend Experimental release area on Charles M Russell National Wildlife Refuge 70 miles northeast of the Lime/Ruby area. The Canadian Lynx which is listed as a threatened species was documented by MFW&Ps trapping records in the early 1980s in the Little Belts and Little Snowy Mountains south and west of the Judiths 25 to 50 miles. Lynx are no longer considered residents of Fergus County. The nearest critical lynx habitat as mapped by the USFWS is at McDonald Pass and north along the Rocky Mountain Front west and northwest of Helena.

Bald eagle, peregrine falcon, Townsend's Big-Eared bat, wolverine and northern goshawk are BLM special status species that have been known to occur in the vicinity of the proposed project. Bald Eagle and peregrine falcon occurrence in the area is uncommon and most probable during seasonal migration. No Active nests of either species have been identified within Judith Mountains. Nest trees are abundant for eagles but forage is limited except during hunting season. There are no cliffs in the project area that would be suitable for a peregrine nest sites and foraging opportunities would be very limited in the vicinity of the Lime/Ruby project. The nearest Bald Eagle nest is on Cow Island in the Missouri River 40 miles northeast of the proposed project. The closest known active peregrine eyries from the project area are on the Smith River to the west and on the Yellowstone River near Billings to the south. Peregrine falcons were surveyed in conjunction with the JMLA in 2002. The scope of the survey was based on historical falcon nesting, release records and other information from local biologists. Since 1991 more than 60 peregrine falcons have been released within 100 air miles of the project area. No evidence of nesting peregrine falcons was discovered and it is clear that either prairie falcons or golden Eagles occupy virtually all appropriate nesting habitats.

Townsend's big-eared bat is a BLM special status species that is known to exist around old mine shafts and other natural caves in Montana. From 1997 to 1999 Hendricks (2000) surveyed several areas on BLM lands in the Judith Mountains. He documented one cave inhabited by Townsend's big-eared bat several miles west of the project area. An additional survey was conducted in 2002 in conjunction with the JMLA on four sites in the Judith and Moccasin and mountains and no Townsend's bat activity or evidence of occupation was confirmed at any of the four sites.

The wolverine has recently been included on the Montana BLM special status species list. Wolverines are known to occur on USFS land in the Little Belts. MFW&P's furbearer harvest records indicate that wolverines were harvested in the Little Belts in 2001 and 2004. BLM employees and mountain lion hunters have both reported wolverine tracks and sightings of wolverines the Judith Mountains in the past 10 years. No crucial habitat for wolverine has been identified on or near the project area.

The northern goshawk is the BLM special status species that is most likely to occur on or near the Lime/Ruby project area. All portions of the forested landscaped in the vicinity of the proposed project may contain suitable habitat for northern goshawk. Rogers et al. (2000) did a call back inventory for northern goshawks on BLM lands in the Moccasin, Judith and Little Belt mountains. Five goshawks were observed during this inventory and one was in New Year Gulch just north of the Lime/Ruby project area. In 2002, five sightings of northern goshawks were recorded in the Judith and Moccasin Mountains area during forest inventory work for the JMLA. There were several unofficial sightings of one northern goshawk in Limekiln Canyon during the construction of the Limekiln Canyon trail in 2004. In July of 2008, shortly after the Lime/Ruby blow down occurred, BLM conducted an intensive northern goshawk inventory of the proposed project area and the potential effected area (see Appendix D1). The goshawk inventory was conducted using the guidelines and methods of the Northern Goshawk Inventory and Monitoring Technical Guide (Woodbridge et. al. 2006).

Environmental Consequences: No effect to any of the threatened or endangered species is likely as a result of the Vegetative Treatment Alternative. None of the three T&E species known to exist in central Montana are likely to be present in the Lime/Ruby area.

The special status species Bald Eagle, peregrine falcon and Towsend's big-eared bat are also very unlikely to be found in the project area. The last reports of wolverine sightings and tracks were in the late 1990's. Wolverines are not likely to be encountered in the project area and if there are still wolverines in the Judith Mountains they can easily avoid this small project area during the treatment period. Logging activity will discourage establishment of goshawk territories during the harvest period. Most of the logging activity is planned to occur in down, dead or dying trees so there is currently little value for goshawk nesting in much of the project area.

Mitigation: Track surveys will be conducted during the timber cruising work in the winter of 2008/2009. If wolverine tracks are located further investigation will occur to identify any possible den site in the project area. Den sites will be avoided until parturition has occurred and all wolverines have dispersed. Goshawk nests that are located prior to or during the harvest period will be avoided by a reasonable out of sight distance until the young have fledged. Harvest of healthy trees will be minimized around any active nests that are discovered just prior to or during the harvest period.

Wastes, Hazardous or Solid: All Vegetation Treatments and maintenance activities must comply with the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). RCRA provides "cradle to grave" control of hazardous and solid wastes by imposing management requirements on generators and transporters of the wastes. Spills of retardant, fuels and other chemicals may be subject to the spill reporting requirements of CERCLA or the Clean Water Act.

Environmental Consequences: The only material that constitutes a hazardous waste as defined by the EPA associated with the proposed project would be ordinary fuel (gas and diesel) and motor oils or hydraulic fluids. These materials would be distributed and used in containers designed for their use. Caution would be exercised when transferring the material as not to allow spills to occur. If a spill does happen, it would be cleaned up immediately, by the contractor, and moved to a site that is designed to handle the recycling or disposal of the material.

Water Quality: All Vegetation Treatments and prescribed fire and fuel reduction activities must comply with the Safe Drinking Water Act of 1974 (as amended) and the Clean Water Act (CWA) of 1977(as amended by the Water Quality Act of 1987). The Safe Drinking Water Act establishes protective measures for culinary water systems by providing standards, which regulate allowable contaminant levels. The CWA requires agencies to develop and implement programs to control both point and non-point pollution.

Affected Environment: The Lime/Ruby Salvage project occurs within two watersheds; Burnette Creek (Limekiln Canyon) and Ruby Gulch. For the

purposes of this environmental assessment, the watershed drainage areas were evaluated above the lowest point of public land ownership. Burnette Creek drainage area above the lowest point of public land ownership is approximately 1,222 acres or 1.91 square miles. Ruby Gulch is approximately 410 acres or 0.64 square miles. Neither waterbody is listed as water quality impaired by the Montana Department of Environmental Quality.

Although no stream segments are listed as water quality impaired because of siltation, sediment is a common non-point source pollutant in the Limekiln and Ruby Gulch area. Most uses that occur or have occurred within the Limekiln/Ruby Gulch area have the potential to deliver sediment to streams. These uses include timber harvest, mining, livestock grazing, road construction, and recreational use of trails. Montana water quality standards require that no increases are allowed above naturally occurring concentrations of sediment or suspended sediment. According to the Administrative Rules of Montana, "naturally occurring means conditions or material present from runoff or percolation over which man has no control or from developed land where all reasonable land, soil and water conservation practices have been applied."

The upper reaches of Burnette Creek and Ruby Gulch are relatively low sensitivity waterbodies. As mentioned above, neither waterbody is listed as a water quality impaired stream. Furthermore, the existing beneficial uses are also low sensitivity. The reaches of stream described in this analysis contain no fisheries, no primary contact recreation, and are not public water supplies.

Roads and trails that are near streams have the greatest potential to affect water quality. The table 3.1 presents the number of road miles and road density within a 100' buffer of streams within the Limekiln and Ruby Gulch areas. This does not indicate that every road segment within 100' of a stream is contributing sediment as the sediment yield is dependent on slope gradient, slope length, and vegetative condition of the buffer. However, roads within a 100' buffer do have the largest risk for sediment delivery. The potential for sediment delivery is very high at stream crossings where you have a direct source for sediment. The table below also identifies the number of stream crossings and stream crossing density within a 100' buffer.

Table 3.1 Summary of Existing Roads within 100' of Burnette Creek and Ruby Gulch.

	Number of Stream Crossings	Stream Crossing Density (#crossings/mi^2) within 100' Buffer	Road Miles (mi) within 100' Buffer	Road Density (mi/mi^2) within 100' Buffer
Traveled routes within 100' buffer of Burnette Creek	11	134.1	1.35	16.46
Traveled routes within 100' buffer of Ruby Gulch	1	23.8	0.38	9.04

Removal of vegetative canopy cover has the potential to affect water quantity and quality. When tree canopy cover is removed, there is less water loss to interception and evapotranspiration. This makes more water available for runoff, which can lead to subsequent erosion. Two areas in the Burnette Creek drainage have caused a removal of vegetation. The Burnette Peak fire, which occurred in October of 91, burned approximately 155 acres within Burnette Creek. Logging on private in-holdings removed tree canopy cover from approximately 85 acres. These areas are probably minimally impacting soil erosion and water yield because both occurred 15 to 17 years ago and have re-growth of trees. Furthermore, their combined acreages account for less than 20 percent of the watershed. The Burnette Creek fire burned about 28 acres in Ruby Gulch, or 7 percent of the watershed. In fact, annual water yield in Limekiln and Ruby Gulch may be less than historic yields because the remainder of the watershed is forested by stands that are characterized by denser canopy cover

and larger patch sizes of trees than would have occurred under historic conditions.

Stream channel conditions in Limekiln and Ruby gulch are variable. Stream/riparian assessments were completed in 2002 by Northwind Environmental Inc. as part of the JMLA. Burnette Creek above the private land in-holding was evaluated as proper functioning condition (PFC). This reach is a steep-gradient, mountain stream. According to the assessment, a diversity of aquatic plants exists, and regeneration of Rocky Mountain maple and service berry is common. The lower reach of Burnette Creek, below the private land in-holding, is lower gradient and a losing stream. Surface water flow begins to disappear as the stream crosses limestone outcropping. This reach was evaluated as functioning; however, a soil/hydrology attribute makes this reach at risk. The streambanks have been heavily altered through this reach with road construction and culverts.

Most of Ruby Gulch through the project area is proper functioning condition. However, the lowest reach above the public land ownership boundary is nonfunctional. During the Burnette Peak fire, a cat line was dozed right in the bottom of the creek. Topsoil, parent material, vegetation, and a functional channel were completely removed.

Minimal livestock use does occur in the Limekiln and Ruby Gulch areas. Because of the steep terrain, livestock grazing pressure is concentrated in areas that are accessible to livestock. Riparian area soils are vulnerable to compaction, decreased productivity, and erosion as a result of livestock grazing. A grazing allotment exists in Limekiln Canyon, but it is un-leased. Horse use does occur on the private land in-holding. The Ruby Gulch area is also permitted for livestock. Assessments completed for Burnette Creek and Ruby Gulch did not identify livestock grazing as an issue or significant contributor to degradation.

Environmental Consequences: Under the No Action Alternative, no direct, indirect, or cumulative impacts would occur. If a wildfire occurred under existing fuels conditions, the intensity would be greater than under reduced fuel loads. This could lead to greater quantities of runoff and sediment yield. Existing road and trail systems would continue to route water and contribute sediment to streams, particularly in the area of Burnette Creek above the private in-holding where steep trail gradients directly access Burnette Creek at unimproved crossings.

With the Vegetative Treatment Alternative several activities would occur that have the potential to influence water quantity and quality. These activities include the vegetative treatments themselves, road construction, and log skidding and yarding.

Over the vegetative treatment acres, tree canopy cover and basal area would decrease. Because less interception loss and evapotranspiration would occur, the potential would exist for a direct impact of an increase in water yield. The potential for snow redistribution from wind would also lead to the potential for greater snow accumulation in treated areas although this occurrence is usually associated with clear cut type harvest treatments. This can lead to indirect impacts of sedimentation and erosion downstream.

Within the vegetative treatment units, the greatest risk for erosion and subsequent sedimentation in streams would be from the tractor skidding and cable yarding. These activities can remove vegetative cover, organic matter, and compact soils, resulting in accelerated runoff and erosion. However, the tons of sediment erosion in the treatment units would be small. (See Table 3.4. WEPP results for each treatment unit.) Erosion rates would decrease as vegetation recovers.

Furthermore, even less sediment from the treatment units would reach streams. Most sediment would be captured by the 50’ to 100’ buffers required by the Montana Streamside Management Zone (SMZ) Law. On the tractor ground, a 50’ buffer decreases the amount of sediment leaving the buffer to 0.013 tons/acre. On the cable ground, a 50’ buffer decreases the sediment leaving the buffer to 0.031 tons/acre. A 100’ buffer decreases the sediment leaving the buffer to 0.018 tons/acre. The values listed above should not be taken as absolute values. At best, any predicted runoff or erosion value, by any model, will be within only plus or minus 50 percent of the true value.

The new road construction would lead to accelerated runoff and erosion on the road surface. Sediment yield from the road surface would have the greatest risk of entering waterbodies at stream and tributary crossings and where little vegetative buffer exists between the road and the stream. Under the proposed action, two new crossings would be constructed (one on Burnette Creek and one on Ruby Gulch), and one low water crossing would be improved (Burnette Creek). One significant side tributary to Burnette Creek would also have a crossing that would have the potential for contributing sediment to streams.

Although it would be a dry crossing, the potential would exist for sediment transport from the crossing area to Burnette Creek during periods of flow.

From the Forest Service Water Erosion Prediction Project (FSWEPP), the estimated sediment yield to the stream channel would be 165-315 lbs/year depending on whether the surface is native or graveled on the low water crossing on Burnette Creek. The side drainage crossing on Burnette Creek would contribute approximately 490 lbs/year, and the largest crossing would contribute approximately 1526 lbs/year. The Ruby Gulch crossing would have the potential to contribute 742 lbs/year of sediment. These impacts would exist during the 3-5 year window of project implementation. As road segments are stabilized, rehabilitated, or removed, erosion and sedimentation would return to near current levels.

Cumulative impacts would be possible, particularly in Ruby Gulch where there would be an increase in the number of stream channel crossings, road density, and harvest units. However, in Burnette Creek, cumulative impacts would be minimal, and there could be a net improvement in water quality. As part of the proposed action, the inappropriate segments of existing road with steep gradients and unimproved crossings would be obliterated, actually leading to a decrease in the number of crossings and road miles within a 100' buffer of streams.

Table 3.2 Alternative Comparison of Roads within a 100' Buffer of Burnette Creek and Ruby Gulch.

Alternative 1 – No Action	Number of Stream Crossings	Stream Crossing Density (#crossings/mi^2) within 100' Buffer	Road Miles (mi) within 100' Buffer	Road Density (mi/mi^2) within 100' Buffer
Traveled routes within 100' buffer of Burnette Creek	11	134.1	1.35	16.46
Traveled routes within 100' buffer of Ruby Gulch	1	23.8	0.38	9.04
Alternative 2 – Vegetative Treatment	Number of Stream Crossings	Stream Crossing Density (#crossings/mi^2) within 100' Buffer	Road Miles (mi) within 100' Buffer	Road Density (mi/mi^2) within 100' Buffer
Traveled routes within 100' buffer of Burnette Creek	8	97.56	1.10	13.41
Traveled routes within 100' buffer of Ruby Gulch.	2	47.6	0.49	11.67
Alternative 2 – Vegetative Treatment Following Road Rehabilitation	Number of Stream Crossings	Stream Crossing Density (#crossings/mi^2) within 100' Buffer	Road Miles (mi) within 100' Buffer	Road Density (mi/mi^2) within 100' Buffer
Traveled routes within 100' buffer of Burnette Creek	7	85.36	1.00	12.19
Traveled routes within 100' buffer of Ruby Gulch.	1	23.8	0.38	9.04

The preferred alternative would not violate the Safe Drinking Water Act or the Clean Water Act. Although sediment delivery to Burnette Creek and Ruby Gulch would be possible, it is unlikely that a public water supply or existing beneficial uses would be impaired.

Mitigation: All Montana Streamside Management Zone Law and Rules would be followed. All Best Management Practices (BMPs) found in Water Quality BMPs for Montana Forests (MSU Extension, 2001) would be implemented during and after road construction and harvest treatments. New road construction and the existing two track road up Burnette Creek would be stabilized, rehabilitated, or removed to the extent possible.

Wetlands/Riparian Zones: Executive Order 11990, Protection of Wetlands, requires federal agencies to minimize the destruction, loss or degradation of wetlands while preserving and enhancing their natural and beneficial values on public property.

Affected Environment: See the Water Quality section of the Affected Environment for a description of the streams and associated riparian areas within the Limekiln/Ruby Gulch area.

Wild and Scenic Rivers: The Wild and Scenic Rivers Act of 1968, as amended, provides a way to protect selected streams "in their free flowing condition" together with their immediate environments for the benefit of present and futures generations, rather than allowing them to be developed by the building of dams and other stream-altering features.

Affected Environment: There are no proposed or designated Wild and Scenic Rivers in or near the project area.

Wilderness: The Federal Land Policy and Management Act (FLPMA) of 1976 and the Wilderness Act of 1964 both affect the management of proposed or designated wilderness. Section 603 of FLPMA requires BLM to conduct wilderness suitability studies on all roadless areas of 5,000 acres or more, using the criteria in the Wilderness Act "a wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain...."

Affected Environment: There are no wilderness areas or wilderness study areas in or near the project area. The proposed project does not meet the 5,000 acre or more, size objective or the characteristic of being unchanged by man's activities.

Climate Change:

Affected Environment: On-going scientific research has identified the potential impacts of anthropogenic "greenhouse gas" (GHG) emissions and their effects on global climatic conditions. These anthropogenic GHG's include carbon dioxide; methane; nitrous oxide; and several trace gases, as identified by the Intergovernmental Panel on Climate Change (IPCC). The general consensus is that as GHG emissions continue to rise, average global temperatures and sea levels will raise, precipitation patters will change, and climatic trends will change and influence earth's natural resources in a variety of ways.

Montana's GHG emissions were recently updated and a forecast was made of expected emissions through 2020 (Montana DEQ 2007). The inventory indicates that Montana's electricity generation, heating needs, commerce, agriculture practices, and transportation needs accounted for 0.6% of the GHG emissions in the United States in 2005 or about 37 million metric tons of gross consumption-based carbon dioxide equivalents. The states forests, cropland, and rangeland provides a vast terrestrial carbon sink that helps balance the states emissions, however, a 14% increase GHG emissions from 1990 to 2005 moved Montana from a net carbon sink to a net carbon emitter.

Environmental Consequences: Potential impacts to natural resources due to climate change are likely to be varied. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' ranges could potentially move north and due to the potential loss of habitat, or from competition from other species whose ranges shift northward, the population of some animal species could change. While many existing climate prediction models are global or regional in nature, the lack of scientific tools designed to predict climate change on local scales limits the ability to project potential future impacts of climate change on the specific area for this project. It is not possible to predict with any certainty site-specific effects on climate change relative to the proposed action.

3.2.2 Other Relevant Affected Resources

Fire Ecology and Management:
Affected Environment: Fuels in the Limekiln/Ruby Salvage project area are represented by dense and continuous stands of mixed conifer dominated by Lodgepole pine and Douglas-fir. Many of these stands have few ladder fuels and contain a moderate load of fine litter and coarse fuels including small diameter downed logs. They are represented by Timber Litter 4 (TL4) as described in the Standard Fire Behavior Fuel Models (Scott & Burgan, 2005). The blowdown areas involved almost all overstory trees and resulted in a fairly continuous fuel bed 4 to 6 feet deep in many places. The fuel bed is not compacted and most foliage and fine fuels are still attached to the blowdown. The damaged trees are represented by Slash-Blowdown 4 (SB4). Treated stands resulting from the Vegetation Treatment Alternative are classified as Slash-Blowdown 1 (SB1).
The following table contains fuel loadings by size class for TL4, SB1, and SB4.

SFBFM Fuel Loadings

Fuel Model	Fuel Load (t/ac)		
	1-hr	10-hr	100-hr
TL4	0.50	1.50	4.20
SB1	1.50	3.00	11.00
SB4	5.25	3.50	5.25

(1-hr = Less than 0.25" dia., 10-hr = 0.25-1" dia., 100-hr = 1" – 3" dia.)

Natural fire regimes in the project area are generally classified as low frequency, high intensity events with a stand replacing event occurring approximately every 100-200 years.
From 1980 to 2004 the Judith and Moccasin mountains have had 87 wildfires with an average size of 78 acres. The entire Judith and Moccasin mountains average 3.6 wildfires a year. The majority of these fires are in size class A and B with the average size being skewed by the Burnette Peak fire. Human caused wildfires are rare with lightning being the dominant ignition source.

The current fuel loadings within the proposed project area along with the insect, disease and the wind damage set the stage for a catastrophic, wind driven, fire event. As fuels continue to increase, the potential for this type of wildland fire event would increase. Most of the treatment area is past due for a return of fire. One of the objectives of this project is to protect the stand and adjacent private property and respective improvements from this type of catastrophic fire event by completing the proposed vegetative salvage and fuel treatments.

Environmental Consequences: Under the No Action Alternative hazardous fuels would not be treated and the fire hazard would remain at dangerous levels and increase over time. Dead and down fuels will continue to accumulate and contribute to horizontal continuity of the fuel bed as mixed conifer and other species continue through natural succession. Vegetation growth will sustain and/or increase stand density and ladder fuels which contribute to vertical continuity and accommodate movement of fire from surface fuels up into the crown of surviving trees and vegetation. In addition, high fuel loadings of large diameter fuels greater than 3" diameter can be expected to cause high fire severity (below ground effects) resulting in extensive resource damage. There are few if any barriers to fire spread in the treatment area.

Under the Vegetation Treatment Alternative hazardous fuel loadings would be reduced by removing available fuels. Treatment would also break up the horizontal and vertical continuity of the fuel bed and reduce the ability of an unwanted wildfire to spread. The reduction in stand densities and ladder fuels would tend to cause wildfire to stay on the surface of the ground instead of transitioning to crown fire in the overstory trees. Lower flame lengths and fireline intensities at the fire's edge would enable fire suppression personnel to more effectively control a wildfire. The decrease in fire behavior would reduce the threat to residual trees in the project area, and, adjacent private property and other improvements.

Potential fire behavior for the project area was modeled using the software program BehavePlus. Fuel moistures for each fuel model and weather inputs were taken from FireFamily Plus percentile weather in the High fire danger rating for the Armells weather station. The following table contains fire behavior outputs for the assigned fuel models.

Fire Behavior Outputs

Fuel Model	Flame Length (ft)	Surface Rate of Spread (ch/hr)
TL4	2.4	7.8
SB1	6.1	25.4
SB4	26.7	241.5

As predicted fire behavior and empirical evidence indicate, the untreated stands will display much higher flame lengths and surface rates of spread when compared to original stand conditions or treated

stands, should an unwanted wildfire occur. Flame lengths (FL) and fireline intensities (FLI) at the fire's edge will decrease firefighter and public safety and increase fire resistance to control by fire suppression personnel. Crown fire is likely and flame lengths in untreated stands can be expected to kill all residual overstory trees either through direct flame contact or due to scorch from radiant heat.

Environmental Consequences: Without treatment (No Action Alternative), fire within the proposed treatment area would quickly become a crown fire under current conditions and especially during a hot, dry summer. It is unlikely that fire crews would be able to enter the area in the event of a crowning stand replacement level fire. Under the Vegetation Treatment Alternative, the lack of ladder fuels along with stand density reduction would make it more likely that fire would stay on the surface of the ground. Fire crews could more effectively combat a surface fire than crown fire and better protection could be provided for human life and private property. In addition, the fire would less likely become a stand-replacement fire, which would create fewer environmental consequences than if the entire area suffered total or near total tree mortality.

Access and Transportation: *Affected Environment:* The project area is currently accessible by a public road up the Burnette Creek drainage on a typical one-lane forest road that turns into a two-track jeep trail.

The project area is within a transportation (travel) planning unit that was delineated by BLM in 2007 for the Judith-Moccasins Travel Plan. The Central Montana Resource Advisory Committee (RAC) appointed several members of the general public to assist the Lewistown Field Office in the travel planning process, which occurred throughout 2007. Several recommendations were made with regard to travel uses in the Limekiln Canyon Planning Unit. The foremost recommendation made is to keep Limekiln Canyon a non-motorized use area, with the exception of the access roads in the canyon bottom.

The travel plan was delayed due to the effects of the timber blowdown on recreation use in and around Limekiln Canyon. Travel planning decisions (trails to be open, closed, or limited to specific uses) would not be made within this document, and deferred to the travel planning process.

The proposed action would require abandoning the last 400 feet of an existing easement across private land and then re-locating the road on private land with an improved "low water" crossing. The BLM would continue to provide motorized public access to the boundary of public lands in upper section of the Limekiln canyon area. However, the existing jeep trail up Burnette Creek and all stream crossing sites will be re-claimed and/or rehabilitated to the extent possible including, but not limited to pulling culverts, log placement on old travel ways, water bars or dips, breaking down cut slopes and re-vegetation. Overall public access into Limekiln Canyon would be improved thru a safer, better-designed road. With the exception of the easement re-location the new road system will not be open to public travel across private land without permission from the landowner. However, BLM will maintain a perpetual reciprocal ROW with the landowner to allow for future administrative uses.

Environmental Consequences: Road building, logging and skidding operations all have the potential to cause erosion and soil degradation.

Mitigation: Roads, stream crossings, skid trails and landings will be designed and administered so as to cause the least impact. Logging, skidding and hauling operations are limited to dry, frozen or snow covered conditions. Road cuts and fill slopes will be stabilized and re-seeded to native vegetation, including planting small trees, where necessary. At the conclusion of the salvage operations unnecessary roads will be rehabilitated and reclaimed to the extent possible. The Montana Forestry BMP's will be applied during and after activities to ensure road use and maintenance does not promote erosion and degrade water quality. All operations taking place within the SMZ will require a separate alternative practices to be approved by DNRC prior to beginning work.

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Forest Management: *Affected Environment:* The project area for both BLM and DNRC is approximately 837 acres. The area is completely forested and contains mostly an overstory of Douglas-fir and Lodgepole Pine with small pockets of Aspen and other hardwood shrubs. Douglas-fir is the climax forest for this area. Lodgepole Pine is a fire dependent species and requires openings and heat, (usually from fire) to successfully regenerate. Ponderosa pine exists in the area, mostly on the drier aspects and is the most fire tolerant tree species within the project area.

Forest Health issues (especially wind damage) exist throughout the project area. Besides wind damage other unhealthy conditions include: overstocking, insect and disease damage, lack of diversity along with a reduction in herbaceous wildlife browse.

Almost the entire forested area is in a late successional stage with dense stands of Douglas-fir in both the overstory and understory. Some homogeneous stands of Lodgepole Pine lack virtually any understory grasses, forbs or shrubs, however.

There are approximately 416 acres proposed for immediate mechanical treatment. The remaining acres may be treated by hand consisting mostly of pre-commercial thinning in the understory, limbing, hand piling, lop and scatter, grinding and pile burning. Hand treatments will be focused in the "West Limekiln" drainage and mostly around existing summer cabins.

Of the 416 acres of Mechanical Treatment approximately 135 acres occur on ground steeper than 40% and therefore will be treated by "Cable Systems". The remaining acres are on slopes less than 40% and will be treated by more conventional ground based equipment, i.e. tractors, feller-bunchers and skidders.

Treatment priorities are:

1. Salvage all wind damaged trees regardless of species.

2. Adjacent stands with minimal wind damaged will be thinned by concentrating on removal of the Lodgepole Pine, thinning the Douglas-fir and retaining Ponderosa Pine. The target species mix would be 50%-70% Ponderosa Pine; 30-40% Douglas-fir and 5%-10% Lodgepole Pine. Stocking levels would range from 60-120 square feet of Basal Area.

Environmental Consequences: Implementation of the Vegetation Treatment Alternative would result in clearcuts in the most heavily wind damaged areas along with a thinning of the overstory conifer tree component and a removal of most of the Lodgepole Pine in the adjacent stands. The new road, skid trails and landings would be susceptible to some erosion until stabilization occurs. Roads and trails and some treatment units will be visible from various points along the hiking trail for several years until re-seeding and natural re-sprouting of shrubs and forbs. Smoke from any prescribed fires will cause some short-term impacts to local residents and obscure views in the mountains for a short period of time. Impacts from hand treatments will be minimal and consist mostly of short term traffic and activity related noise around the summer cabins.

Mitigation: All treatment area boundaries meander and parallel natural features such as ridges and drainages. "Islands" of leave trees are left within units as well as corridors of shrubs and trees. These leave islands tend to break up sight distances across treatment areas and the meandering edges mimic natural openings more so than straight lined or "block" units. Heavy traffic areas such as roads, trails and landings are reseeded immediately following activity and typically are revegetated within 18-24 months. As new trees grow in the treatment units they begin to "soften" in their appearance until the only noticeable change is the difference in canopy heights from one stand to another.

Any prescribed burning requires the approval from the Montana Department of Health and Environmental Science, Air Quality Bureau. Compliance with state regulations and local smoke management programs is mandatory and would minimize the effects of temporary increases in particulates, carbon monoxide, and decreased visibility during prescribed burning.

Recreation: *Affected Environment:* The project area is within the Judith Mountains special RMA and ACEC. This area typically produces moderate to high recreation visitation during the spring and summer. The Judith Mountains were designated an RMA because of their proximity to Lewistown, Montana, which generates most of the recreation visitors to the area. The RMA is an intensively managed area because of its proximity to Lewistown and due to the development of a new six mile loop trail located along Limekiln Canyon. The loop trail has a spur that takes visitors to a scenic vista called the Lewistown Overlook, which is about a half mile from the from the main loop trail.

Motorized recreation access is permitted along the Burnette Creek road on public land in Limekiln Canyon, and contributes to recreational use throughout the year. The entire Limekiln Loop Trail, however, is closed to motorized recreational activities. Activities such as hiking, bicycling, and horseback riding are the only recreational uses allowed in the area, with the exception of the access road into Limekiln Canyon, therefore, project interference from ATVs or motorcycles should not occur.

Environmental Consequences: The proposed project would displace recreational users that would want to hike the loop trail when project activities are occurring as sections of this trail would be closed to

protect the public (See Appendix E1). The Limekiln Overlook Trail is the most heavily used part of the trail system, and while it will be in close proximity to the salvage and thinning operation it would not be closed .

Approximately one mile of the trail along the Limekiln Canyon/Ruby Gulch Ridge is now impassable because of the blowdown event, (see Appendix E1). A new, temporary section of the trail was re-routed along the west side of the ridge where there was no safety concern to the public from wind damaged trees. The temporary trail reroute did not require cutting a bench in the slope, and only removed some of the dead and down timber so that horseback riders and hikers could pass unimpeded by these obstacles if attempting to circumnavigate the canyon on the loop trail.

This one mile section of the temporary re-route along Limekiln/Ruby Ridge would be closed during operations to protect the recreating public. Much of the recreation use that will occur on the rest of the trail (five miles) could occur, regardless of the logging activity, because it would not conflict with or create safety problems. Hiking to the Lewistown Overlook would be impacted by sight and sound of the logging operation, but no safety issues would cause it to be closed. However, most of the logging activity and road building is proposed to occur along this side of the canyon, causing the loop trail to be closed beyond the Limekiln Overlook junction.

Mitigation: Signs and a map of the closed trails and roads would be placed at the trailhead and other appropriate places in the canyon. The signs and maps would inform the visitor to Limekiln which segments of the trail are available for daily recreation use, as well. The public would be notified through press releases of the length and duration of the closures. Additionally, the temporary trail along Limekiln/Ruby Canyon Ridge would be closed, but the Lewistown Overlook Trail segment would remain open. BLM has other opportunities for hikers, equestrians, and mountain bicycling enthusiasts approximately 25 miles from Lewistown at the Collar Peak Trail which would be promoted as an alternative to the popular Limekiln Trail.

Social and Economic: *Affected Environment:* Lewistown is a community of approximately 6,000 year round residences. Whether or not the proposed treatment is awarded to a local resident it is expected that the contractor would conduct a significant amount of business in the local community. The adjacent landowner(s) would see a decrease in potential losses from a wildfire along with insect and disease damage starting and spreading from the treatment area.

Environmental Consequences: The No Action alternative has the potential to affect the adjacent landowner(s) when stand-replacement losses due to fire and/or insect and disease occurs, either through direct loss of property or through smoke effects on human health, private property, or quality of life. Current conditions are conducive to stand replacement losses, which creates a direct threat to adjacent private property. The amount and density of smoke and the amount of particulates in the air would also be greater under the No Action Alternative, with the amount of existing fuels available in the crown, the understory, and on the ground.
Under the Vegetation Treatment Alternative, the potential for stand replacement losses would be reduced and the threats to public safety, homes, businesses, and public buildings would be less hazardous than with the No Action alternative. The social impacts of the treatment itself may involve truck traffic along with localized noise and dust.

Soils: *Affected Environment:* Soils were identified from the Natural Resources Conservation Service's (NRCS) Soil Survey Geographic (SSURGO) dataset and the Soil Data Mart (SDM) website (http://soildatamart.nrcs.usda.gov/). Soil surveys were performed by the NRCS according to National Cooperative Soil Survey (NCSS) standards. Pertinent information for review and analysis is from the SDM and the National Soils Information System (NASIS) database for the area. Field examinations were conducted in the fall of 2008, by the BLM Central Zone Soil Scientist, to confirm soil map units and to evaluate anticipated impacts from the proposed project on soil resources.

The soils within the project area are derived from igneous or sedimentary rock. The soils have developed mostly under forest vegetation and are shallow to very deep on mountain slopes. Surface textures are commonly loam or silt loam with coarse fragments ranging from 10 to 55 percent gravels, cobbles, channers, and/or flagstones. There are areas of exposed bedrock.

The primary soil map units within the project area are Map unit: 81 – Elve-Arcette complex, 15 to 60 percent slopes; Map unit: 124 – Hughesville-Skaggs flaggy loams, 15 to 60 percent slopes; Map unit: 168 – Mocmont very gravelly loam, 15 to 60 percent slopes; Map unit: 262 – Whitecow-Hughesville complex, 20 to 60 percent slopes; and, Map unit: 265

– Widen-Hughesville-Lipke complex, 15 to 60 percent slopes. Table 3.3 provides a summary of project relevant Map Unit Ratings and Interpretations (USDA-NRCS, 1998). The risk and limitations are based on the use of ground based harvest systems.

Map unit: 81 – Elve-Arcette complex, 15 to 60 percent slopes (9% of Project Area)
The Elve component makes up 65 percent of the map unit. Slopes are 15 to 60 percent. This component is on mountain slopes. The parent material consists of alluvium and/or colluviums derived from igneous rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Organic matter content in the surface horizon is about 1 percent.

The Arcette component makes up 30 percent of the map unit. Slopes are 15 to 60 percent. This component is on mountains. The parent material consists of residuum over fragmental acid igneous rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Organic matter content in the surface horizon is about 1 percent.

Map unit: 124 – Hughesville-Skaggs flaggy loams, 15 to 60 percent slopes
(24% of Project Area)
The Hughesville component makes up 55 percent of the map unit. Slopes are 15 to 60 percent. This component is on foothills, mountain slopes. The parent material consists of colluviums and/or residuum over fractured hard limestone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Organic matter content in the surface horizon is about 3 percent.

The Skaggs component makes up 20 percent of the map unit. Slopes are 15 to 60 percent. This component is on hills. The parent material consists of residuum over fractured hard limestone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Organic matter content in the surface horizon is about 4 percent.

Map unit: 168 – Mocmont very gravelly loam, 15 to 60 percent slopes
(54% of Project Area)
The Mocmont component makes up 85 percent of the map unit. Slopes are 15 to 60 percent. This component is on mountain slopes. The parent material consists of alluvium and/or colluviums and/or residuum weathered from igneous and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Organic matter content in the surface horizon is about 2 percent.

Map unit: 262 – Whitecow-Hughesville complex, 20 to 60 percent slopes
(5% of Project Area)
The Whitecow component makes up 65 percent of the map unit. Slopes are 20 to 60 percent. This component is on mountain slopes. The parent material consists of alluvium and/or colluviums derived from limestone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Organic matter content in the surface horizon is about 1 percent.

The Hughesville component makes up 25 percent of the map unit. Slopes are 20 to 60 percent. This component is on foothills, mountain slopes. The parent material consists of colluviums and/or residuum over fractured hard limestone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Organic matter content in the surface horizon is about 3 percent.

Map unit: 265 – Widen-Hughesville-Lipke complex, 15 to 60 percent slopes
(8% of Project Area)
The Hughesville component makes up 30 percent of the map unit. Slopes are 15 to 60 percent. This component is on foothills, mountain slopes. The parent material consists of colluviums and/or residuum over fractured hard limestone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Organic matter content in the surface horizon is about 3 percent.

The Widen component makes up 30 percent of the map unit. Slopes are 15 to 60 percent. This component is on hills, mountain slopes. The parent material consists of residuum over semi consolidated siltstone. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Organic matter content in the surface horizon is about 2 percent.

The Lipke component makes up 25 percent of the map unit. Slopes are 15 to 60 percent. The parent material consists of clayey alluvium and/or residuum weathered from shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is high. Organic matter content in the surface horizon is about 4 percent.

Table 3.3. Summary of Map Unit Ratings and Interpretations (USDA-NRCS, 1998).

Soil Map Unit	Water Erosion Hazard (1)	Soil Rutting Hazard (2)		Limitations Affecting Construction of Roads and Log Landings (3)		Suitability for Use of Harvesting Equipment (4)	
		Rating Class	Limiting Feature(s)	Rating Class	Limiting Feature(s)	Rating Class	Limiting Feature(s)
81	Moderate to Severe	Slight		Poorly suited	Slope	Poorly suited	Slope
124	Moderate to Severe	Severe	Low strength	Poorly suited	Slope Low strength	Poorly suited	Slope
168	Moderate to Severe	Slight		Poorly suited	Slope	Poorly suited	Slope
262	Moderate to Severe	Slight to Severe	Low strength	Poorly suited	Slope Low strength	Poorly suited	Slope
265	Moderate to Severe	Moderate to Severe	Low strength	Poorly suited	Slope Low strength	Poorly suited	Slope Low strength

(1) The water erosion hazard for bare, non-compacted, soil is estimated by using the formula: Water Erosion Hazard = Kw factor x Slope. The soil erodibility factor (Kw) quantifies soil detachment by runoff and raindrop impact. This erodibility factor is an index used to predict the long-term average soil loss, from sheet and rill erosion. The Kw factor applies to the whole soil, which includes rock fragments. Kw is based primarily on percentage of silt, sand, and organic matter, soil structure, saturated hydraulic conductivity, and rock fragments (USDA-NRCS, 2007).

(2) Ratings in the column "soil rutting hazard" are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forestland equipment. The hazard is described as slight, moderate, or severe. A rating of "slight" indicates that the soil is subject to little or no rutting, "moderate" indicates that rutting is likely, and "severe" indicates that ruts form readily (USDA-NRCS, 1998).

(3) For "limitations affecting construction of haul roads and log landings," the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of "slight" indicates that no significant limitations affect construction activities, "moderate" indicates that one or more limitations can cause some difficulty in construction, and "severe" indicates that one or more limitations can make construction very difficult or very costly (USDA-NRCS, 1998)

(4) Ratings in the column "suitability for use of harvesting equipment" are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use (USDA-NRCS, 1998).

Environmental Consequences: With the No Action Alternative salvage and related treatments would not occur; therefore, soil compaction, displacement, rutting, and erosion would not occur within the proposed treatment units. The existing two tracked trail up Burnette Creek would continue to erode and contribute sediment to the creek.

If the proposed treatment units and other portions of the project area were to be burned by wildfire in the future, a mix of burn severities is anticipated depending on topography, fuels and climatic conditions. High and moderate soil burn severities would likely result where there is blowdown and other fuel build-up. This would result in an increased amount of bare soil, accelerated erosion, slow recovery of effective vegetative cover and loss of soil nutrients and soil microbes. Areas of low soil burn severity may benefit from a short term release of nutrients available to plant growth and a change in the kinds and amounts of vegetation. See Table 3.4 for estimated erosion amounts after a wildfire using Forest Service Water Erosion Prediction Project

(FSWEPP) Erosion Risk Management Tool (ERMiT) (see discussion below on erosion modeling using FSWEPP).

With Alternative 2 most ground-based operations, cable yarding, landings, pile/landings burning, and road construction would expose mineral soil and have the potential to compact, rut and displace soil; remove litter/duff; alter chemical and biological properties; and, disrupt nutrient cycles. These impact overall soil quality. Exposed and/or compacted soils would be susceptible to erosion. Soil compaction and erosion impact soil quality by reducing water infiltration/permeability; reducing exchange of gases; reducing or eliminating the most productive and highly biologically active layer of soil; and, limiting plant growth and health. Implementing and adhering to the Water Quality BMPs for Montana Forests (MSU Extension, 2001) would mitigate the amount of soil disturbances, the potential for prolonged compaction and erosion, and long-term effects to soil quality. In time, organic matter would gradually re-accumulate from litter, woody debris, forbs and grasses. Nutrients would gradually accumulate due to inputs (in precipitation, dry deposition, weather of parent material, and nitrogen fixation) and retention. Erosion would return to natural rates overtime except on the trail.

Approximately 135 acres would be cable yarded. Direct effects of cable yarding would be displacement of surface soil and organic matter, and discontinuous localized compaction within yarding corridors. Soil displacement and discontinuous compaction would be confined to narrow strips less than 4 feet wide.

Ground-based equipment operations are only planned where suitable soils occur and on slopes 40 percent or less. Approximately 281 acres of the project area is suitable tractor-ground. These operations have the potential for greater soil impacts than cable yarding because of heavy equipment operation. Tractor operations would decrease existing vegetative cover and organic matter, exposing soil to erosion, as harvesting and skidding occurs; however, slash material would be ground into the soil through skidding process. This slash would act as mulch protecting the soil from erosion processes and could serve as a base to distribute weight and lessen compaction from ground-based equipment. Skidding causes compaction with as few as 1 or 2 passes. Severe compaction could remain as long as 20 to 30 years, if not remediated.

Erosion modeling using the Forest Service Water Erosion Prediction Project (FSWEPP) Interface (Disturbed WEPP, WEPP:Road, and ERMiT) was used to predict estimated erosion for the specified treatments, road, and wildfire. Disturbed WEPP is an interface to the WEPP soil erosion model to allow users to easily describe numerous disturbed forest erosion conditions. Disturbed WEPP allows the user to specify the characteristics of the site in terms of climate; soil texture, local topography (slope gradient and length), plant community, and surface residue cover (Elliot and others, 2000). WEPP:Road is an interface to the WEPP soil erosion model that allows users to easily describe numerous road erosion conditions (Elliot and others, 1999). ERMiT is a web-based application that uses WEPP technology to estimate erosion, in probabilistic terms, on burned and recovering forest, range, and chaparral lands with and without the application of erosion mitigation treatments. User inputs for ERMiT are: climate, soil texture, soil rock content, vegetation type, hillslope gradient and horizontal length, and soil burn severity class (Robichaud and other, 2007).

At best, any predicted runoff or erosion value, by any model, will be within only plus or minus 50 percent of the true value. Erosion rates are highly variable, and most models can predict only a single value. Replicated research has shown that observed values vary widely for identical plots, or the same plot from year to year (Elliot and others, 1994; Elliot and others, 1995; Tysdal and others, 1999). Also, spatial variability and variability of soil properties add to the complexity of erosion prediction (Robichaud, 1996).

The inputs entered into the Disturbed WEPP and ERMiT erosion models included the following parameters: Climate data modified from the Roy 8 NE MT site. The dominant texture observed in the field was loam; therefore, loam was used with rock percentage of 50%. Slopes of 30% were chosen for tractor-ground units and 50% for line ground units with a slope length of 500 feet for both treatment unit types. Baseline (natural) erosion was modeled using a "Twenty year old forest" cover type with 100% cover. Tractor-ground and line-ground erosion was modeled using a "Five year old forest" cover type with 90% (tractor-ground) and 92% (line-ground) cover. Cover selections for the two treatment unit types were based on observation from similar type treatments from the North Moccasins Forest Health and Salvage Project.

Estimated post treatment erosion for years 1 to 5 for each treatment unit are shown in Table 3.4 and compared to baseline erosion. Tractor-ground erosion

includes both simulated treatment effects and skid trails. Wildfire erosion values for year 1 after a fire are also shown in Table 3.4. Erosion potential is greatest during treatment and 1 year after treatment. The amount of erosion would decrease as vegetation recovers. It was assumed that after a fire 5% percent of the landscape would have low soil burn severity, 85% moderate soil burn severity, and 10% high soil burn severity; therefore, the values shown are a weighted average of the three burn severities.

Table 3.4 WEPP results for each treatment unit.

Unit-Method (1)	Acres	Mean Average Annual		
		Baseline Erosion tons* yr^{-1}	Treatment Erosion tons* yr^{-1}	Wildfire Erosion tons* yr^{-1}
T1	3	0	0.06	24.93
T2	8	0	0.35	66.48
T3	19	0	0.82	157.89
T4	15	0	0.65	124.65
T5	4	0	0.17	33.24
T6	3	0	0.13	24.93
T7	4	0	0.17	33.24
T8	4	0	0.17	33.24
T9	10	0	0.43	83.10
T10	28	0	1.22	232.68
T11	12	0	0.52	99.72
T12	11	0	0.48	91.41
T13	31	0	1.35	257.61
T14	12	0	0.52	99.72
T15	6	0	0.26	49.86
T16	25	0	1.09	207.75
T17	27	0	1.17	224.37
T18	2	0	0.09	16.62
T19	8	0	0.35	66.48
T20	12	0	0.52	99.72
T21	24	0	1.04	199.44
T22	13	0	0.56	108.03
L1	6	0	0.32	65.52
L2	12	0	0.64	131.04
L3	3	0	0.16	32.76
L4	14	0	0.74	152.88
L5	25	0	1.33	273.00
L6	11	0	0.58	120.12
L7	15	0	0.80	163.80
L8	11	0	0.58	120.12
L9	11	0	0.58	120.12
L10	7	0	0.37	76.44
L11	3	0	0.16	32.76
L12	3	0	0.16	32.76
L13	3	0	0.16	32.76
L14	5	0	0.27	54.60
L15	6	0	0.32	65.52

(1) T = Tractor Ground L = Line Ground

Soil productivity would be severely restricted within the road disturbance corridor for as long as the road is in use. Soils would be loosened, compacted, and subject to accelerated erosion. Severity of compaction would be directly related to soil moisture, frequency and weight (lbs. /sq. inch) of vehicles/equipment. Once the road is stabilized and rehabilitated or reclaimed to the extent possible soil productivity would return to pre-disturbance condition overtime. Some reduction in site productivity can be anticipated.

WEPP:Road was used to model erosion from the road. It is estimated that there would be 20 tons/yr or 2.9 tons/mile/yr of road prism erosion for the life of the road. Erosion potential is the greatest during and immediately after construction. Where the road would be obliterated, erosion rates overtime would return to natural rates. Generally, soil erosion rates are greater on recently rehabilitated areas and decrease to natural rates within 3 to 5 years. There would be approximately 1 ton/yr of erosion or 0.2 ton/mile/yr where the road would be pulled back to a trail. Implementing BMPs that establish effective

road and trail drainage systems and stabilize cut and fill slopes would effectively reduce erosion (Seyedbagheri, 1996).

The section of the two tracked road up Burnette Creek would be stabilized and rehabilitated; therefore, soil erosion and sedimentation would be eliminated on this section of road.

Mitigation: The Water Quality BMPs for Montana Forests (MSU Extension, 2001) would be implemented during and after activities to reduce the amount of soil disturbances, the potential for prolonged compaction and erosion, and long-term effects to soil quality. Mitigation measures, in addition to mitigations in the Water Quality BMS for Montana Forests (MSU Extension, 2001) and those listed in other sections of the document would be to: 1) Leave a 5 to 10 tons per acre of downed coarse woody greater than 4 inches in diameter following slash reduction on all treatment areas to help re-establish soil productivity (Graham and others, 1994); and, 2) Limit burning of slash/landing piles to winter conditions to minimize detrimental burning of soils.

Visual Resources: ***Affected Environment:*** BLM uses a Visual Resource Management (VRM) system to inventory and manage visual resources on public land. The primary objective is to minimize visual impacts from proposed projects and activities regardless of the "Class" in which they occur. The VRM system uses four classes to describe the different degrees of modification allowed to the landscape. Class I and II being of the highest scenic value, Class III representing a moderate value and Class IV the least or lowest scenic value.

The Judith Mountains are located in a VRM Class II area. The VRM inventory process examines distance criteria (foreground/middleground, background, and seldom seen landscapes), determines scenic quality rating (A, B, or C), and incorporates the public's sensitivity level about an area to determine the management class for the VRM process.
The Class II rating for the Judith Mountains basically means that for any management action, retention of the existing character of the landscape is assured by incorporating and repeating the natural elements of form, line, color, and texture when mitigating surface disturbing activities. The goal of VRM is to minimize the visual impacts of surface disturbing activities to the casual observer, making contrasting effects of the action substantially unnoticeable-regardless of the "class" in which they occur.

The Judith Mountains are a panoramic island range, as are the Moccasin and Snowy Mountains. All are completely surrounded by prairie-grasslands. Indeed, these mountains are the dominant feature on the landscape in Central Montana. It is a location that is becoming a tourist destination simply because of its natural beauty. For whatever reason they come to look at it, this landscape exemplifies all of the characteristics which make for a beautiful and interesting viewshed. The Judiths provide a striking vista, appreciated by all who live or visit here. The mountain backdrop is also famous for being on a national television advertisement with the Clydesdale horses at one time!

The existing vegetative characteristic of the proposed project area consists of a densely stocked mixed conifer stand of timber along with native grasses, shrubs and forbs. The exception is the New Year Peak area and the surrounding ridges in and around Limekiln Canyon, which were burnt bare during a wildfire in 1991. From many locations in and out of the canyon the burn is a focal feature of the landscape. Areas within the burn are beginning to regenerate with Lodgepole pine, but much is still open, and devoid of vegetation, creating a strong contrast (especially during the winter season) with the remaining thickly forested mountainsides that escaped the 1991inferno.

Natural, open "park like" stands of timber (common in the early 1900's) are not prevalent today. Some openings and parks have been created by wildfires while a few natural openings along the peaks and ridges remain. These open areas help to break the mountain skyline's rolling, homogenous appearance.

When the first visual resource inventories were conducted for the 1978 Management Framework Plan (MFP), at the time, management designated the western half of the Judith Mountains a Class III area with a very high Scenic Quality Rating of B. Class III being nearly the least restrictive of the management classifications caused concern, and the distance zone data was re-evaluated during the 1994 JVP-RMP. The maximum 3-5 mile foreground/middleground criteria was re-calculated from Lewistown to the mountain face, and as previously discussed, the area was designated a Class II, Scenic ACEC.

Environmental Consequences: VRM uses a rating system to analyze the potential visual impacts of proposed activities and projects (H-8431-1). A visual contrast rating (VCR) form (8400-4) is used to identify a project's effects on the basic elements of

form, line, color, and texture of the existing landscape; when it is complete, it rates the degree to which a proposal affects the existing visual quality elements of the landscape.

Twelve VCRs were initially proposed for the Key Observation Points (KOPs), eleven of which were along Limekiln Trail. The twelfth KOP is the Lewistown KOP which was selected in the JVP for the ACEC nomination process. Due to similar views and contrasts that will be seen from the proposed action, the interdisciplinary team reduced the number of KOPs to four, where the VCRs were conducted. The VCRs are identified as the Lewistown (Main Street Hill KOP), Limekiln Trailhead (KOP 1), and Limekiln Trail (KOPs 9&10), and on the trail looking south directly upon the blowdown area (KOP 11). The completed VCRs and reference map are located in the administrative record.

The VCR worksheet, when completed, describes the characteristic landscape, what changes or impacts would look like from the proposed action on the landscape, whether they are long or short term changes, all of which gives the team the ability to rate contrasts as strong, moderate, weak, or none at all for the purpose of ensuring that the proposed action meets Class II visual quality objectives.

Lewistown, as a key observation point (KOP), is a logical starting point. In Lewistown, the casual observer's focus becomes Limekiln Canyon. Perhaps this is because of the dominance of the burned area, or the contrast between it and the heavily forested, rolling mountain tops in the foreground.

It is not until the observer is on the trail, however, that the scale of the project can be understood, primarily, because the observer is above, looking down on most of the proposed activities. The seven miles of haul road would wind around the canyon and several hundred acres of previous thinning (on private land) and blowdown salvage operations cover much of the canyon.
The construction of the 14-foot wide road across the heavily forested mountainside is necessary to get to the top of the ridge and into Ruby Gulch where additional blowdown occurred. The road would be constructed at the least gradient possible for erosion prevention purposes, but a gentle rise and fall along with utilizing natural vegetation for screening will help reduce the features unnatural appearance across the slope.

From town, approximately 500 feet of newly constructed road along with about 10 acres of treatment, would be visible. This small portion of the project is over five miles distant from town and the visual contrasts from the thinning and road construction would be mostly unnoticeable to the casual observer. For someone driving down the Main Street hill, they may only view it for several seconds; or for a longer period of time from their porch. As distance increases, color value decreases toward uniformity, essentially enabling the blending of colors in the thinning area through vegetative manipulation. Additionally, atmospheric and light conditions, as well as the angle of view, all affect what is seen, or not seen, from any of the KOPs.

However, from the selected KOPs along the trail, the angle of view, short distance to the project, combined with differing light conditions throughout the four seasons, the road would produce moderate to strong linear contrasts over the long term; even with complete or partial rehabilitation, the road will be visible from somewhere along the trail from a higher or lower point off the trail. The weaker contrasts could be expected to be from the trail for the elements of form and texture from the thinning/salvage operation over the short term, because this is where the KOP are located.

Color contrasts would be weak for vegetation even at the close distances (foreground) to the project work because project design and contract stipulations. However, the reddish-brown soil exposed from the road cut would continue to produce a moderate to strong degree of contrast over the next several years. The significant amount of timber proposed to be left standing along with environmentally sound removal of logs will provide an opportunity for new growth.

Mitigation:

1. Complete obliteration and rehabilitation of the temporary road will occur when incorporation into the trail system is unnecessary.

2. Where treatments take place leave, trees and "islands of trees" along with "feathered edges" to help reduce the abrupt edge effect along treatment boundaries.

3. The road would be designed following the mountain's contours and would come into and out of view numerous times, breaking up the single, continuous line.

4. Since the haul road cannot be relocated, screening will be required, with the exception of those areas where no timber exists. Full screening for a road is no

different than full screening for a stream or power line in a forest setting. Trees will be left on both the top and bottom of the road cut, and should be of different sizes and lengths, and then only a (weak) unnoticeable linear contrast to the mountain ridgeline would be seen much of the time.

5. Where the road cut and fills are seen from the trail, reseeding with native grasses and natural tree regeneration will help the recovery process. Hand planting may be considered for stabilization and screening if natural regeneration does not occur in a timely manner.

6. Within treatment units, small and irregularly shaped clearings along with feathered edges and scattered trees will help to lower contrasts to form (shape) and help make them appear natural.

7. Adjusting the unit boundaries to lessen the amount and degree of visual impacts are necessary for all of the KOPs.

These enhancement or re-establishment efforts will reduce the amount of time needed for recovery by immediately weakening the contrasting effects or impacts of the project activity. The greatest contrasts to form, line, color, and texture, if not mitigated, would be in the zone between the treated or salvaged acreages and the heavily timbered slopes adjacent to them and the road in the KOPs 9&10 focal zone. The objective is for a short term visual recovery. This will occur in the project area if the impact zone is returned to Class II status in five to ten years. The sooner this is accomplished, the better it will be for Lewistown and many people that visit the area for its natural beauty.

Environmental Consequences: Under the No Action alternative, the forest visual character of the area would be maintained. Users who enjoy the densely stocked forest would not see any change. Potential visual effects associated with a severe wildland fire may include complete loss of living timber, severe blackening of the landscape and a large amount of blackened deadfall. If the proposed treatment were completed, short-term adverse visual impacts would exist until slash piles are burned and burned spots are seeded in. The proposed project would blend into the surrounding visual resources in the area by mimicking already existing meadows and add to the hardwoods and forest diversity. In addition, there would be a decrease to the potential negative visual impacts associated with a stand-replacement fire. The new road may be visible as a straight line for small segments.

Mitigation: Silvicultural prescriptions specify leave tree retention and are designed to maximize conifer as well as hardwood and shrub growth. Leave tree patches will be required to break up the straight-line appearance of the new road construction.

Wildlife: *Affected Environment*: The most significant mammals in the Judith Mountains are elk, mule deer, whitetail deer and black bear. Mountain lions and coyotes are well adapted and populations are well established. Smaller predators such as foxes, skunks and raccoons are relatively abundant in some areas of the Judiths. Tree squirrels, ground squirrels, chipmunks, marmots, mice and moles are also common in the area. The hoary bat, big brown bat, little brown bat, long-eared bat and long-legged bat may occur in the area.

Rocky mountain elk are doing very well in the Judith Mountains. During the winter months most of the elk are in the eastern portion of the mountain range near Black Butte. In the spring and on into the summer months many of the elk have moved down into the central portions of the range. Small bunches of elk have been documented in the western portion of the Judith Mountains near the Lime/Ruby project area primarily during late summer and fall. Elk were observed in the project area in 2004 during the construction of the Limekiln Canyon trail and in the fall 2008 by BLM ID team members working on inventories for the Lime/Ruby project. The BLM's objective is to provide quality habitat on the BLM parcels to help maintain the identified objective number of elk for each hunting district. Hunt area 412 has been at or above objective levels for several years now.

The mule deer population is currently at desirable levels. Either sex hunting was allowed with a general deer tag or several hundred additional antlerless B tags were issued in 2008. Habitat characteristics of broken topography, abundant cover, browse availability and adjacent cropland make the Judith Mountain area very productive for mule deer. Mule deer use the open slopes of the Burnette Peak wildfire to forage and retreat to the timber in the Limekiln drainage for cover. Much of the timber in the Limekiln drainage has been wind thrown so any live trees between the fire and current treatment area will be very important to maintain.

Whitetail deer are abundant in the Judith Mountains. Whitetails prefer the riparian areas and other deciduous shrub and aspen types but can also be found in the conifer habitat types. Hunting for both whitetail and mule deer is popular in central Montana

Three species of upland game birds can be found in the Lime/Ruby area; blue grouse, ruffed grouse, and Merriam's turkeys. The ruffed grouse prefer the aspen and other deciduous habitats while the blue grouse use the forest edge in the spring, summer and fall and the high elevation Douglas-fir in the winter. Merriam's turkeys prefer ponderosa pine habitat but also use Douglas-fir, aspen and open meadow areas.

There is a minimal amount of riparian habitat in the headwaters of Burnette Creek and Ruby Gulch that provides nesting and brooding habitat for neo-tropical migrant species during the summer. . Migratory species that prefer coniferous forest have abundant habitat throughout the Judith Mountains. There are a few moist draws that support a brush community of serviceberry, hawthorn, chokecherry, russet buffaloberry and sometimes mixed with aspen that provide a very important habitat for migratory birds and the grouse species.

Environmental Consequences:

Alternative 1: No Action - Some of the larger mammals such as deer and elk would have limited access to some habitat from impassable windfall. Some mammals with paws and claws such as black bears, mountain lions, wolverines, and weasels would be able to maneuver easily on the downed logs and take advantage of the windfall as cover and foraging areas. The possibility of high intensity wildfire increases as the decaying fallen trees compact against each other in a tighter fuel load. Vegetation that animals depend on for forage and cover would take much longer to recover after extreme heat and long duration type fires.

Alternative 2: Vegetative Treatment - Unlimited vehicular access to the project area would negatively impact wildlife. Closing and obliterating some of the old jeep trails and restricting vehicular access on the new roads after the completion of the treatment would benefit wildlife. Wildlife, particularly the hunted species, would be disrupted during treatment activities through increased public use and hunter access on the new road. However, in the long-term wildlife habitat is expected to improve due to increased browse production, increased edge effect along the cutting units and a more diverse forest structure. Public use of the area is likely to increase due to public familiarity with the new trail system and awareness of the vegetation treatment activity. Wildlife security from vehicular disturbance will be more important as the use level increases.

Mitigation: 1) Close and obliterate many of the existing jeep trails that provide access to the same area as the new road to provide wildlife security areas away from motorized traffic. 2) Provide a buffer strip of un-harvested timber between the Burnette Peak fire and the Lime/Ruby blow down treatment area. 3) Increase mechanical and prescribed burning activities around existing aspen patches to encourage aspen regeneration. 4) Leave periodic snag trees for wood peckers and other cavity nesting species. 5) Leave periodic large logs and stumps on the ground for small mammal cover and foraging area for black bears.

3.3 Cumulative Impacts

Related BLM Activities and Anticipated Cumulative Impacts

All past, present and reasonably foreseeable future impacts have been addressed and discussed throughout this document by resource. However, the following describes a short summary of anticipated cumulative impacts by alternative.

Under the No-Action alternative there would be no cumulative impacts related to timber harvesting and road building. However, the cumulative impacts associated with a stand replacing wildfire and/or insect and disease outbreak could be devastating. The loss of vegetation would most likely result in excessive soil erosion, soil sterilization, intrusion of non-native plant species, increased decline in Forest Health and displacement of wildlife due to loss of habitat. In addition the threat of loss of private property due to uncontrolled wildfire and/or loss of forest habitat immediately adjacent to the project area is inevitable.

Under the proposed action (alternative 2) there will be a short term displacement of wildlife due to increased logging and road construction activity. There would also be localized impacts to soils such as compaction and erosion. These impacts would diminish overtime as vegetation recovers. BMPs and project design would minimize soil impacts. Scenic and recreational values may be degraded until re-contouring and stabilization of cut and fill slopes occur and native grasses, forbs and shrubs re-establish themselves. Short term shut downs of portions of the recreational trail system will impact users. There will be some minimal fire scaring associated with the prescribed fire treatments. There are no anticipated long term cumulative impacts associated with the project.

Chapter 4.0
Consultation and Coordination

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Dave Litke	Forester	R-Y Timber, Inc.
Resource Advisory Council (RAC) Travel Plan RAC	Citizens Advisory Group Sub-group	Central Montana Zone
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Chapter 5.0
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Appendix A1 **DATE 12 / 30 /2008 PREPARED BY: R. Byron**

SILVICULTURAL PRESCRIPTION

TWP 16N RNG 19E SEC 20 FORVIS OR STAND # West Limekiln FIELD OFFICE Lewistown

AVG ELEV. & RANGE 5000'-5200' ASPECT East, Southeast SLOPE 10-30%

HABITAT TYPE PSME/LIBO/CARU ACRES 143 PRODUCTIVITY Moderate

PRIMARY OBJECTIVE Forest Health

SECONDARY OBJECTIVE(S) Fuels Reduction and Wildlife Habitat Enhancement

DESCRIPTION OF EXISTING STAND:
The area consists primarily of mature Lodgepole pine, Doug-fir, and Ponderosa pine. In addition, a healthy component of Doug-fir advanced regen can be found throughout. Ponderosa pine is found primarily on the dry, south aspects while the Doug-fir and Lodgepole pine can be found all through the area. Basal area varies significantly and ranges from 60-200 square feet. Ground cover is mostly native grasses and shrubs consisting of Pinegrass, Oregon-grape, Kinnikinnick, Twinflower, and arrowleaf balsamroot on the drier sites.

CONSTRAINTS TO MEETING OBJECTIVES:
Future forest health and fuels reduction projects lying outside the proposed commercial thinning unit may be difficult due to access issues.

TARGET STAND: STRUCTURE Uneven-aged % SPP MIX 60% DF, 30% PP, 10% LPP

DESIRED STOCKING LEVELS: BASAL AREA 40-60 square feet per acre.

DESCRIPTION OF TARGET STAND:
Overstory consists of healthy Douglas-fir with a strong component of Ponderosa pine. Minor amounts of Lodgepole pine will also be present. The opening of the forest canopy will result in more abundant native grasses and forbs dispersed throughout the area.

CONSTRAINTS TO MEETING TARGETS:
The area will require multiple entries in order to thin overstocked Doug-fir regen. Preferred site prep would be prescribed fire in order to regenerate Ponderosa pine. However, mechanical scarification during treatment should facilitate regeneration and future pre-commercial thinning will create vigorous stands.

NARRATIVE PRESCRIBED TREATMENT:
Mark healthy Douglas-fir and Ponderosa pine to leave with residual basal area targets of approximately 40-60 square feet. Designate suitable areas of Doug-fir regeneration to save for future pre-commercial thinning. Pile logging slash in preparation for burning after two curing seasons. Monitor for weeds for up to two years following pile burning and hand treatments.

Treatment (See Appendix C1)	Acres	Est. Date
Commercial Thinning and Wind Salvage associated with Road Construction Unit(s) T-2	8	Summer 09'
Pile logging slash in preparation for burning in conjunction with logging	8	Summer 09'
Burn landing piles	8	Winter 2012
Pre-commercial thinning/fuels reduction	135	Fall 2010-2014

Appendix A2 **DATE 12 / 31 / 2008 PREPARED BY: R. Byron**

SILVICULTURAL PRESCRIPTION

TWP 16N RNG 19E SEC 17 FORVIS OR STAND # Limekiln FIELD OFFICE Lewistown

AVG ELEV. & RANGE 5200'-5500' ASPECT East, Southeast, West SLOPE 20-70%

HABITAT TYPE PSME/SYAL ACRES 181 PRODUCTIVITY Moderate

PRIMARY OBJECTIVE Salvage blowdown Lodgepole pine and Doug-fir

SECONDARY OBJECTIVE(S) Forest Health

DESCRIPTION OF EXISTING STAND:
Area consists primarily of Lodgepole pine and Doug-fir with scattered Ponderosa pine throughout. Blowdown occurred almost exclusively on the eastern aspects within the treatment area. Areas not affected by the blowdown can be described as being overstocked with basal areas at or exceeding 140 square feet per acre and in the 8-12" diameter class. Large patches of unmerchantable, doghair lodgepole pine can be found in the eastern portion of the treatment area.

CONSTRAINTS TO MEETING OBJECTIVES:
Large areas of extensive blowdown will create small clearcuts and cause timber extraction to be more difficult.

TARGET STAND: STRUCTURE Uneven-aged % SPP MIX 60%DF, 30%PP, 10% LPP

DESIRED STOCKING LEVELS: BASAL AREA 60-80 square feet per acre

DESCRIPTION OF TARGET STAND:
Overstory consisting primarily of Doug-fir and Ponderosa pine. Lodgepole pine would occur in a mosaic of age classes creating uneven-age structure throughout the stand. The area would have overall stocking levels of approximately 80 square feet of basal area per acre with residual trees being in the 12"+ diameter class. Overall amounts of understory shrubs, forbs and grasses would be increased.

CONSTRAINTS TO MEETING TARGETS:
In areas currently affected by blowdown, both Lodgepole pine and Doug-fir will likely regenerate in dense clumps that may require an additional entry in order to reduce stocking levels.

NARRATIVE PRESCRIBED TREATMENT:
Remove all merchantable Lodgepole pine throughout the treatment area. Reserve all of the healthy Ponderosa pine. Well-formed, healthy Doug-fir will be reserved to the desired stocking level of approximately 80 square feet of basal area per acre. Machine pile logging debris and cure for two seasons prior to burning. Grass seed skid trails and continue monitoring for weeds, spray as required.

Treatment (See Appendix C1)	Acres	Est. Date
Salvage wind-damaged Lodgepole pine and Doug-fir, Units(s) L1, T3,L2,T5,L3,T7, L5	73	Summer, Fall 2009
Commercial thinning in adjacent stands Unit(s) T1,T4,T6, L4	35	Fall, Winter Summer 2009/2010
Burn Landing Piles	108	Winter 2012
Pre-Commercial Thinning	73	Fall 2010 – 2014

Appendix A3 **DATE 1 / 6 / 2009 PREPARED BY: R. Byron**

SILVICULTURAL PRESCRIPTION

TWP 16N RNG 19E SEC 20, 21 FORVIS OR STAND # Ruby FIELD OFFICE Lewistown

AVG ELEV. & RANGE 5200-5700 ASPECT East, Southeast, West SLOPE 15-60%

HABITAT TYPE PSME/SYAL, PSME/LIBO ACRES 246 PRODUCTIVITY Moderate

PRIMARY OBJECTIVE Salvage blowdown Lodgepole pine and Doug-fir

SECONDARY OBJECTIVE(S) Forest Health

DESCRIPTION OF EXISTING STAND:

Area consists primarily of Lodgepole pine and Doug-fir with Ponderosa pine found primarily in Treatment Units 7 and 8. Blowdown occurred almost exclusively on the eastern aspects within the treatment area. Areas not affected by the blowdown can be described as being overstocked with basal areas ranging 80-230 square feet per acre with a majority of the area having basal areas between 120-180 square feet. Large patches of unmerchantable, doghair lodgepole pine can be found in Units 6 and 7.

CONSTRAINTS TO MEETING OBJECTIVES:
Large areas of extensive blowdown will create small clearcuts and cause timber extraction to be more difficult.

TARGET STAND: STRUCTURE Uneven-aged % SPP MIX 40%DF, 40% PP, 20%LPP

DESIRED STOCKING LEVELS: BASAL AREA 60-80 square feet per acre

DESCRIPTION OF TARGET STAND:
Overstory consisting primarily of Doug-fir and Ponderosa pine. Lodgepole pine would occur in a mosaic of age classes creating uneven-age structure throughout the stand. The area would have overall stocking levels of approximately 80 square feet of basal area per acre with a majority of the residual trees being in the 12"+ diameter class. Overall amounts of understory shrubs, forbs and grasses would be increased.

CONSTRAINTS TO MEETING TARGETS:
In areas currently affected by blowdown, both Lodgepole pine and Doug-fir will likely regenerate in dense clumps that may require an additional entry in order to reduce stocking levels.

NARRATIVE PRESCRIBED TREATMENT:
Remove all merchantable Lodgepole pine throughout the treatment area. Reserve all of the healthy Ponderosa pine. Well-formed, healthy Doug-fir will be reserved to the desired stocking level of approximately 80 square feet of basal area per acre. Within areas affected by blowdown, reserve Doug-fir advanced regen for future stocking. Machine pile logging debris and cure for two seasons prior to burning. Grass seed skid trails and continue monitoring for weeds, spray as required.

Treatment (See Appendix C2)	Acres	Est. Date
Salvage wind-damaged Lodgepole pine and Doug-fir Unit(s) T10, T11, L9, T12, T13, L10, L11, T14	115	Fall, Winter 2009/2010
Commercial Thinning in adjacent stands Unit(s) T8, L6, T9, L7, L8	51	Winter, Summer 2009/2010
Burn Landing Piles	166	Winter 2012
Pre-Commercial Thinning	80	Fall 2010-2014

Appendix A4 **DATE 12/31/08 PREPARED BY: Ron Buck**

SILVICULTURAL PRESCRIPTION

TWP 16N RNG 19E SEC 16 FORVIS OR STAND # State FIELD OFFICE: DNRC-NELO-LEW

AVG ELEV. & RANGE 5000'-5400' ASPECT South SLOPE 10% - 40%

HABITAT TYPE PSME/SYAL ACRES 128 PRODUCTIVITY Low to Moderate

PRIMARY OBJECTIVE Removal of Lodge pole pine blow down

SECONDARY OBJECTIVE(S) Reduction in fuel loads

DESCRIPTION OF EXISTING STAND:

Stand of 100 year old mature Lodge pole pine trees intermixed with patches and scattered trees of Douglas fir and Ponderosa pine.

CONSTRAINTS TO MEETING OBJECTIVES:

Areas of extensive blow down from a wind event in the spring of 2008 will make harvest difficult and will result in small clear cuts

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TARGET STAND STRUCTURE: Uneven-age/Seed Tree % SPP MIX 50-50 Douglas fir and Ponderosa pine

DESIRED STOCKING LEVELS: BASAL AREA 40-50 DBH 10"-14"

DESCRIPTION OF TARGET STAND:

Removal of all Lodge pole pine leaving scattered patches of Douglas fir and Ponderosa pine.

CONSTRAINTS TO MEETING TARGETS:

Approximately 20% (25 acres) have slopes of 40% and will have to be line skidded

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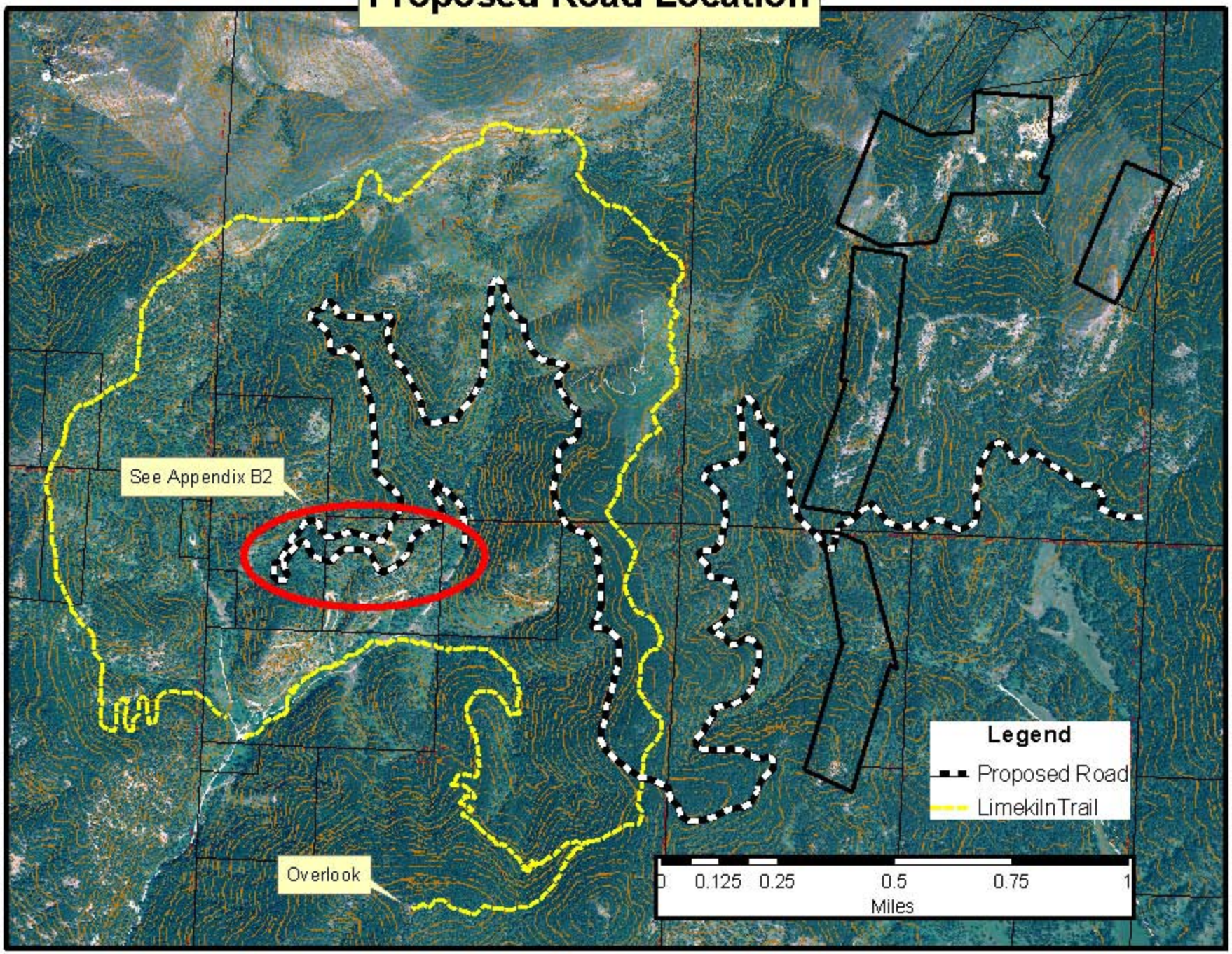
NARRATIVE PRESCRIBED TREATMENT:

Treatment	Acres	Est. Date
Clear cut of blow down Lodge pole pine	30	Summer 2009
Seed Tree cut with removal of mature Lodge pole trees	98	Fall 2009

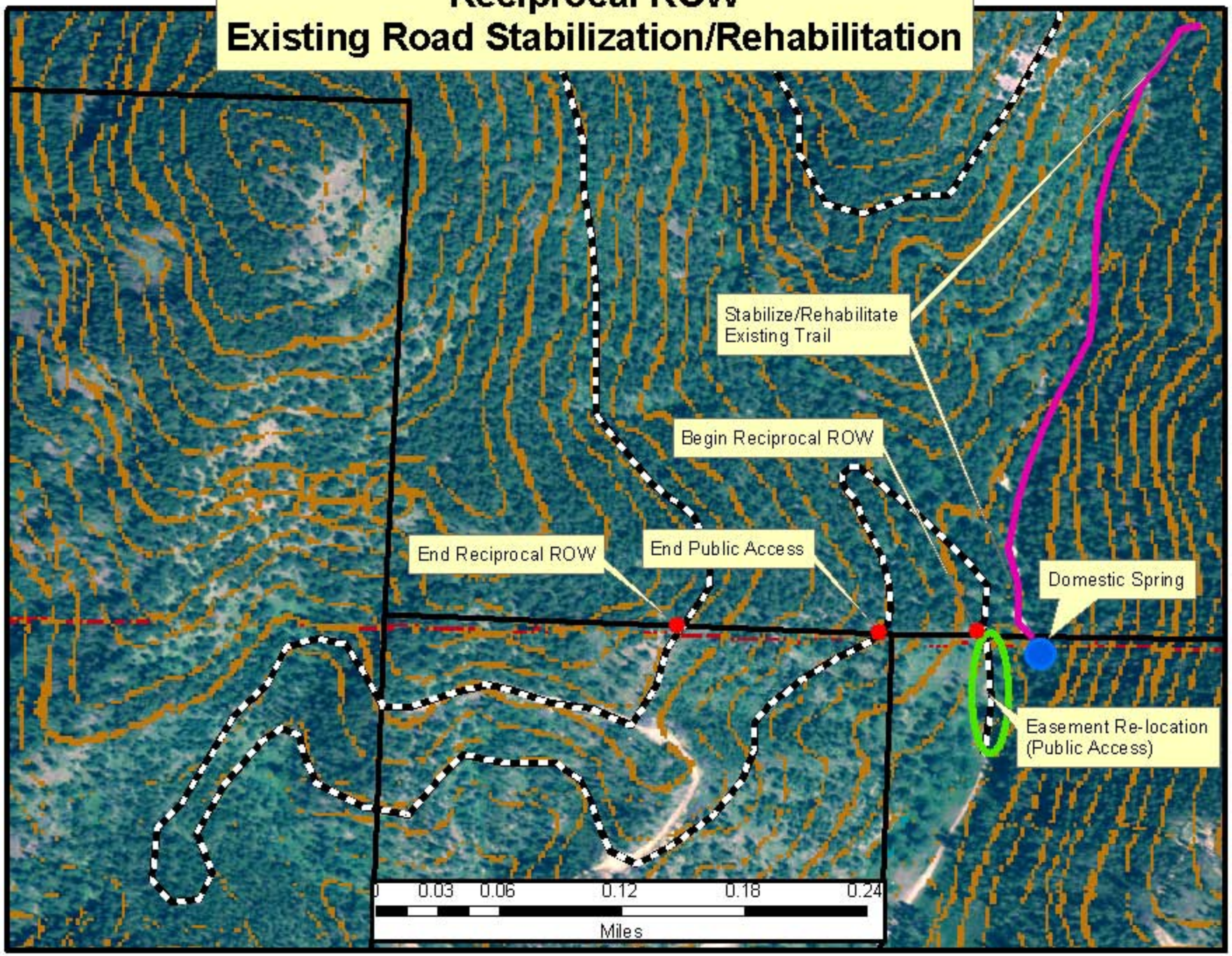
Appendix B1

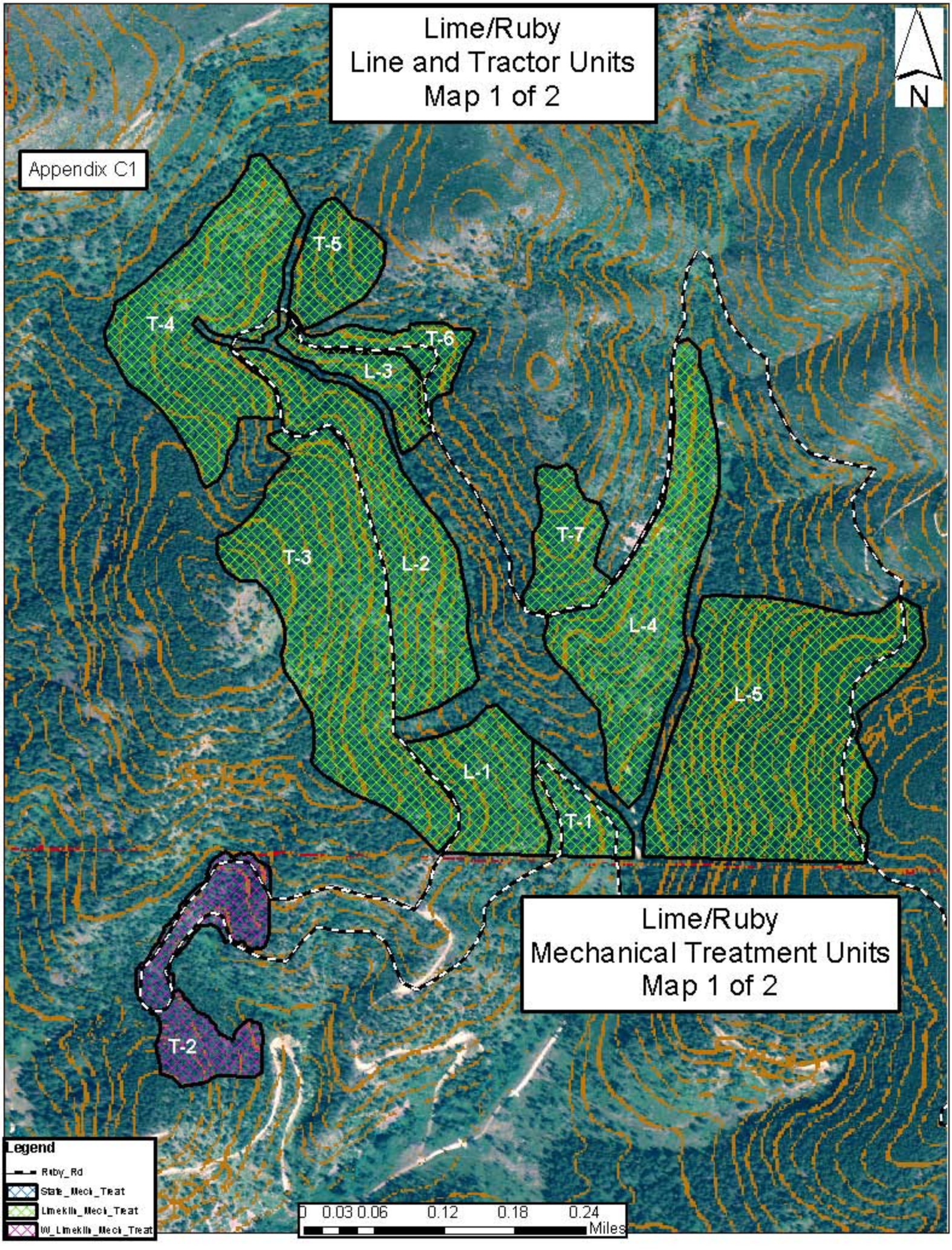
Lime/Ruby Salvage Proposed Road Location

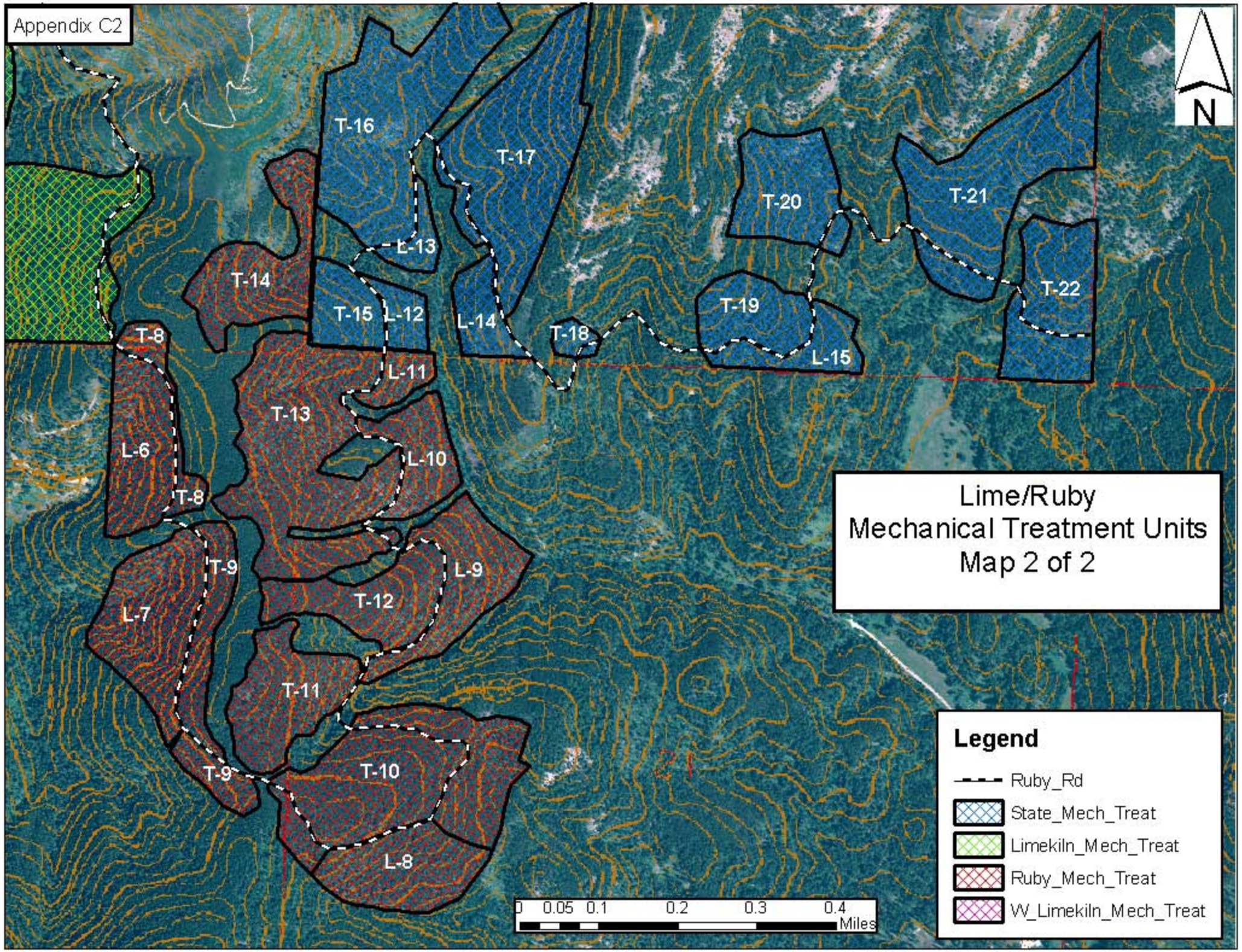


Appendix B2

Lime/Ruby Salvage
Easement Re-Location
Reciprocal ROW
Existing Road Stabilization/Rehabilitation




Lime/Ruby
Line and Tractor Units
Map 1 of 2
N
Appendix C1
T-5
T-4
T-6
L-3
T-7
T-3
L-2
L-4
L-5
L-1
T-1
T-2
Lime/Ruby
Mechanical Treatment Units
Map 1 of 2
Legend
Ruby_Rd
State_Mech_Treat
Limekiln_Mech_Treat
W_Limekiln_Mech_Treat
0 0.03 0.06 0.12 0.18 0.24
Miles


Appendix C2
N
T-16
T-17
T-20
T-21
T-22
T-19
T-18
T-14
T-15
L-12
L-13
L-14
L-15
T-8
L-11
T-13
L-6
L-10
T-8
T-9
L-9
T-12
L-7
T-11
T-9
T-10
L-8
Lime/Ruby
Mechanical Treatment Units
Map 2 of 2
Legend
Ruby_Rd
State_Mech_Treat
Limekiln_Mech_Treat
Ruby_Mech_Treat
W_Limekiln_Mech_Treat
0 0.05 0.1 0.2 0.3 0.4
Miles

Appendix D1

Northern Goshawk Survey Report 2008

Survey of: Limekiln Canyon Blow-down Treatment Area

Northern Goshawk (NOGO) survey was conducted by Dana Harty, Wildlife Technician, and Rebecca Smith in the Limekiln Blow-down Treatment Area on July 2, 2008. **The goals of the survey were to determine the presence or absence of nesting Northern Goshawks on BLM land.** The treatment area which was surveyed is approximately 850 acres located in T 16 N, R 19 E, Sec 16, 17, 18, 19, 20, and 21. An 800 meter survey buffer was placed around the project area. Private and state land was not included in the survey, only BLM land was surveyed (see map of survey area).

Surveys were conducted using the guidelines and methods of the Northern Goshawk Inventory and Monitoring Technical Guide by Brian Woodbridge and Christina Hargis. Approved and published by the USDA, revised 2006 version. The US Forest Service Goshawk coordinator Victor Murphy of the Lewis and Clark Forest provided guidance and training on survey methods, survey techniques, criteria for suitable goshawk habitat, and goshawk behavior.

The Intensive Search survey method and the Broadcast Acoustical method were used. The survey was conducted during the nestling and fledging stages and between the hours of 700 and 1900. The alarm-calls and beg-calls were used predominately. Calls were broadcasted for 5-15 second with a 30 second listening period between calls. Calls were repeated 6 times at each call station at 120 degree angle and concluded with a 1 ½ minute listening period. A computer generated, random point stratified grid was used to determine call stations. Call stations were 200 meter x 250 meters apart. All call stations were within 150 meters of suitable habitat. Suitable habitat was determined using knowledge of goshawk nesting habitat and territory habitat type using variables of topography, aspect, percent canopy cover, percent slope, forest type, local historical nest and territory data, and aerial photography of the landscape.

<u>RESULTS</u>

No NOGO acoustical or visual detections were made during the survey. No signs of NOGO were found during the survey such as nests, feathers or white wash (scat). There is no evidence that Goshawks are using the area for nesting habitat. Based on one survey event probability of detection for nesting territory is 90%, occupied non-nesting territory 64%, and unoccupied–old nest territory 36%.

The habitat surveyed consisted of dense Lodgepole pine and Douglas fir. Small grassy meadows and drainage bottoms were also found within the surveyed area. The survey area had large to small pockets of blown down trees. Aspect for the surveyed area was mainly SW and NW and slopes were 10 to > 45%. Suitable NOGO nesting habitat was minimal within in the project area. Habitat within the survey area appeared to have understory vegetation too dense (with blown down trees) and slopes to extreme for NOGO nesting habitat. Most of the treatment area was not surveyed due to > 40 %

slopes, land status, and the trees being blown down. During the survey call stations located inside the blow down area were not surveyed for surveyor's safety and the unlikelihood of a NOGO being present. The most ideal NOGO nesting habitat looked like it would be on adjacent private lands.

During the survey 2 eagles were spotted at a distance. The eagles did not respond to the NOGO calls. One Flicker respond to the NOGO calls.

Past NOGO surveys were reviewed. No historical NOGO surveys were found for the treatment area. There were several unofficial sightings of one NOGO in Limekiln canyon during the construction of the Limekiln Canyon Trail in 2004. Pictures of the NOGO were taken by the BLM Recreation Specialist. The sightings were within the 800 meter buffer zone. The area the NOGO was detected was surveyed as part of the July 7th survey and extra time observing and extra calls were made in this area.

Notes: It was decide by Fred Roberts, Wildlife Biologist that one survey day was sufficient for detection based on the topography of the project area (steep slopes and Victor Murphy's opinion that much of the area was not very good Goshawk habitat) and the condition of the forest from the blow down event. Many BLM employees have also been to the project area on numerous occasions this summer and they have not reported any Goshawk sittings.

Prepared by: Dana Harty, Wildlife Technician

Appendix E1

Lime/Ruby Salvage
Limekiln Trail System