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Finding

Browns Gulch Timber Sale
Section 16, Township 7S, Range 3W

INTRODUCTION

The Montana Department of Natural Resources has proposed a timber harvest in the Barton Gulch drainage located approximately 5 miles southwest of Virginia City, Montana. The proposed harvest would remove an estimated 530 MBF of Douglas fir, lodgepole pine and sub-alpine fir sawlogs from approximately 60 acres of forested school trust lands.

The state ownership in this vicinity consists of a 640 acre section surrounded by federal lands administered by the Bureau of Land Management. The existing Barton Gulch road nearly accesses the state section however a new road would need to be constructed on private land for 775 feet and on BLM land for 427 feet to access the state land An additional 1.9 miles of new road would need to be constructed on state land to access the harvest units. A Temporary Road Use Agreement is pending with the BLM and has been obtained from the private landowner. New roads constructed under this proposal are planned to be closed through a combination of partial obliteration, trashing and re-contouring and re-vegetation to prohibit vehicle use after completion of the sale.

This tract is classified grazing, valued principally for its grazing resources and is part of the land grant held by the State of Montana in trust for the support of the specific beneficiary, in this case common schools.

DECISIONS TO BE MADE

I have reviewed the Environmental Assessment prepared for the Browns Gulch Timber Sale specifically to:

1) Decide if an Environmental Assessment is the appropriate level of analysis or if an Environmental Impact Statement should be prepared.

2) Select an alternative to implement based on the information provided in the EA and a finding that an EIS is not necessary.

ALTERNATIVES UNDER CONSIDERATION

There were 2 alternatives considered in the Final EA, including the No Action Alternative. There were two additional alternatives considered early on in the process but dropped from consideration due to a variety of environmental and economic concerns. The action alternative would harvest an estimated 530 MBF of timber from approximately 60 acres within 4 harvest units ranging in size from 4 to 29 acres. The harvest would be primarily a selection and group selection type harvest with the exception of one 8 acre clearcut with reserves. Approximately 2.1 miles of new road would be constructed and 0.8 miles of existing road reconstructed. The No Action Alternative would not conduct any timber harvest, road construction or road improvement activities.

ALTERNATIVE SELECTED

After reviewing the EA, comments received on the proposal and input received from resource specialists, I have decided to proceed with Alternative B: Action Alternative and proceed with the timber harvest.

I have selected this alternative because I believe it can be implemented in a manner that is consistent with the long-term management of the tract while generating an estimated trust income of approximately $50,000. The timber harvest will treat an estimated 60 acres of forestland that is in an overstocked and under-productive due to inactive management.

I have rejected the No Action Alternative because the timber harvest can be conducted in a manner consistent with the State Forest Land Management Plan, existing uses of the tract and surrounding lands while producing trust revenue and other long term management benefits.

SIGNIFICANCE OF IMPACTS

Based on my review of the information provided in the EA, the project file and an on site review, I conclude that significant impacts would not occur as a result of implementing the selected alternative. Therefore an Environmental Impact Statement will not be prepared. I base this decision on the following considerations:

Water Quality, Water Yield and Soils: Proposed harvest units and roads have been located by design to avoid active stream channels and unstable soils. All harvest unit boundaries are located outside streamside management zones. There are no active stream channel crossings proposed during road construction. All newly constructed roads will be closed and seeded to rapidly reestablish vegetative cover. Best Management Practices for Forestry will be implemented to substantially reduce the potential for impacts to water quality and soils. A cumulative effects analysis indicates increases to water yield as a result of the proposed activities are very unlikely to occur due to the open range-like nature of the watershed, minor amount of timber harvest activity that has occurred in the past 15 years and lack of evidence of stream instability from increases in peak flows. The current and proposed harvest levels would be well below what is normally associated with detrimental water yield increases.

Impacts to Elk and Deer Winter Range; Although some winter elk and deer use of the project area occurs, it likely does not normally receive use by large numbers or for extended periods of time. The Montana Department of Fish, Wildlife and Parks has identified "key" winter areas that are used year after year or during harsh or extreme winter events. The nearest identified winter range is more than 3-4 miles from the project area.

Elk Security and Vulnerability: There is approximately 240 acres of dense forest habitat providing high quality hiding cover and an additional 205 acres of open grown mature forest providing moderate quality hiding cover on the project area. Historic fire events and terrain features likely have contributed to a naturally fragmented and patchy distribution of forested stands on the landscape in this area. The proposed harvest would harvest trees on approximately 60 acres and consequently reduce available cover by 13% on the state land and 1% within the 5760 acre wildlife analysis area. While there would be a minor reduction of cover as a result of the proposal any indirect or cumulative impacts to elk resulting from the cover removal would not be detectable and affect security at the hunting district level or affect the Department of Fish, Wildlife and Parks' ability to meet their elk management goals.

Threatened, Endangered and Sensitive Species: There is no documented use, nor is there appropriate habitat within the project area for any Threatened or Endangered Species. The DNRC maintains a list of sensitive species for which a fine filter habitat analysis is conducted on proposed forest management projects. The sensitive species list includes: flammulated owl, boreal owl, black-backed woodpecker, pileated woodpecker, northern bog lemming, harlequin duck, ferruginous hawk, mountain plover, peregrine falcon, and Townsend's big-eared bat. There is no documented use within the project area for any of the sensitive species. There is approximately 112 acres of Dry Douglas fir that is potential habitat for flammulated owls. The proposal would affect approximately 32 acres of the potential habitat and consequently have a minor adverse affect to flammulated owls. However, dry Douglas fir habitats are common in this region and suitable habitat is available on other ownerships as well.

Old growth: There are no old growth stands greater than five acres in the project area. There are however, scattered old relic trees and clumps of old Douglas fir trees on ridge tops and in areas that were protected from fires that were historically common in the area. Relic trees, snags and

downed woody debris, although uncommon, will be retained wherever a safety hazard is not a factor.

EXECUTION

Upon execution, this Finding becomes part of the Final Environmental Assessment for the Browns Gulch Timber Sale.

Signed _____ 5/24/02

Garry Williams
Area Manager
Central Land Office

BROWNS GULCH TIMBER SALE PROPOSAL
DRAFT ENVIRONMENTAL ASSESSMENT

SECTION 16 -T7S - R3W

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

DILLON UNIT OFFICE
730 NORTH MONTANA ST.
DILLON, MT. 59725

MAY 22, 2002

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CHAPTER I – PURPOSE/MANAGEMENT OBJECTIVES

A. Purpose

The Montana Department of Natural Resources and Conservation (DNRC) proposes to initiate forest management and timber harvesting on state school trust lands in the Barton Gulch area. The Browns Gulch Timber Sale proposal is located in Section 16, T7S - R3W, which is located 5 air miles southwest of Virginia City, Montana, in Madison County.

The project proposal would address the management of Douglas-fir, lodgepole pine, Engelmann spruce and Subalpine fir timber on approximately 60 total acres. The estimated harvest volume would be 530 thousand board feet contained within 4 units. Construction of 1.9 miles of minimum standard road would be needed on the State ownership. Access to the State section would require the crossing of Bureau of Land Management and private lands and involve the construction of an additional 0.2 miles of new temporary road. The proposed action would be implemented in early summer of 2002 and completed by December 2005.

B. Project Need

The lands involved in this proposed project are held by the State of Montana in the trust for the support of specific beneficiary institutions such as public schools, state colleges and universities, and other specific state institutions such as the school for the deaf and blind (Enabling Act of February 22, 1889, 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and the Department of Natural Resources and Conservation are required by law to administer these lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions (Section 77-1-202, MCA). On May 30, 1996, the Department released the Record of Decision on the State Forest Land Management Plan (SFLMP). The Land Board approved the SFLMP's implementation on June 17, 1996. The SFLMP outlines the management philosophy of the DNRC in the management of the state forested lands, as well as sets out specific Resource Management Standards (RMS) for ten resource categories.

The Department will manage the lands involved in this project according to the philosophy and standards in the SFLMP, which states:

"Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biologically diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream... In the foreseeable future, timber management will continue to be our primary source of revenue and our primary tool to achieving biodiversity objectives."

C. *Project Objectives*

In order to meet the goals of the State Forest Land Management Plan, the Department has set the following project objectives:

1. Promote a diversity of stand structures and patterns for a long-term sustainable forest.
2. Maintain a semblance of historic forest conditions.
3. Generate revenue for the school trust through the harvest of timber from the project area.

D. *Relationship to the State Forest Land Management Plan*

In June 1996, DNRC began a phased-in implementation of the SFLMP, which established the agency's philosophy for the management of forested state trust lands. The management direction provided in the SFLMP comprises the framework within which specific project planning and activities take place.

The SFLMP also defines the RMS's, which guided the planning of this proposed action. The SFLMP philosophy and appropriate RMS's have been incorporated into the design of the proposed action.

E. *Other Environmental Reviews Related to the Project*

The Moore Gulch Timber Sale EA (DNRC / Bozeman Unit) has been completed with record of decision. The project involves school trust land parcel, Section 16-T5S-R2W (Moore Gulch). The parcel is located in the Tobacco Root Mountains, approximately 14 air miles northeast of the Browns Gulch Project area. Approximately 950 MBF of Douglas-fir and lodgepole pine is scheduled for harvest treatment from approximately 75 acres of State of Montana ownership. The project includes 0.3 miles of road reconstruction and 2.8 miles of new construction.

The Granite Creek Timber Permit EAC (DNRC/Dillon Unit) has been completed with record of decision. The project involves school trust land parcel, Section 36-T5S-R3W (Granite Creek) and is located in the Tobacco Root Mountains, approximately 10 air miles north of the Browns Gulch project area. Approximately 100 MBF of Douglas-fir is scheduled for harvest treatment from approximately 17.5 acres of State of Montana ownership.

The Idaho Creek Timber Harvest EA (DNRC/Dillon Unit) has been completed with record of decision. The project involved school trust parcel, Section 36-T7S-R4W (Idaho Creek) and is located in the Gravelly Range, approximately 4 air miles southwest of the Browns Gulch project area. 854 MBF of Douglas-fir and lodgepole pine was harvested on 82 acres of State of Montana ownership. The project was completed in 2000.

F. Agencies with Jurisdiction

There are three possible access routes to the proposed project and all would require a road use permit from the BLM. The preferred access route would use 8.5 miles of existing road under BLM management and require 427 feet of new road construction on BLM ownership in Section 15, east of the State parcel. A Road Use Application was submitted to the BLM on December 12, 2001. The permit is pending the decision maker's review in this EA and approval of the permit application by the BLM.

This access will also require a temporary road use agreement for 775 feet of new road construction on private land. The private party has been contacted and a temporary agreement has been secured.

Any activity that disturbs the naturally occurring vegetation is subject to review by the local County Weed Board. The DNRC has a Revegetative and Weed Management Plan on file with the County Weed Board. If an Action alternative is selected, the DNRC would file a site specific Weed Management Plan with the Weed Board.

A Stream Preservation Act Permit (124 Permit) is required for activities conducted by any government agency in a stream. The Action alternative proposes culvert installations that would require a 124 permit. Should the Action alternative be selected, a 124 permit will be applied for and the State will abide by all requirements.

The activity of burning slash would involve two agencies. Surface vegetation in Madison County falls under County jurisdiction. Burning permits are usually required. The Department of Environmental Quality regulates air quality. DNRC is a participant in the Montana Air Shed Coordinating Group planning effort to limit particulate production.

G. *The Decision To Be Made*

There are two decisions that need to be made regarding these alternative proposals.

The first is to decide which management alternative would best meet the management objectives and the objectives of the SFLMP.

The second decision is whether this Environmental Assessment adequately identifies the potential impacts of the selected alternative and the potential for those impacts to be significant.

H. *Initial Scoping and Public Involvement*

The public involvement process began with the publication of a Legal Notice in the Dillon Tribune on January 20 and 27, 1999.

Individual scoping notices were sent on January 14, 1999. (see List of Individual Scoping Notices)

I. *Resource Concerns*

Responses were received from the following:

DNRC Specialists
Montana Fish, Wildlife and Parks
Bureau of Land Management
Skyline Sportsmen's Association
The Ecology Center
American Wildlands
MT Coalition for Appropriate Management of State Land
Norman Ashcroft
Lumber Products , Inc.
R-Y Timber, Inc.

Montana Wood Products Association
Louisiana Pacific Corp.

The following concerns and issues were compiled from scoping responses for this proposed project.

- Water Quality, Water Yield and Soils
- Big Game Winter Range, Elk Security and Vulnerability
- Threatened, Endangered and Sensitive Species

J. Issues

1. Water Quality, Water Yield and Soils

There is a concern that a reduction in timber cover, new road construction and log skidding activities may adversely affect water quantity (water yield, channel stability), water quality (physical or chemical attributes), site conditions (soil loss from erosion, soil nutrient losses) and fisheries.

Timber harvest and road construction may impact water quality primarily by accelerating sediment delivery above natural levels to local stream channels and draw bottoms. These impacts could result from erosion from road surfaces, skid trails, log landings and by the removal of vegetation along stream channels. Newly constructed and existing roads with inadequate drainage features (not meeting BMP's) could increase sediment delivery to local stream channels and draw bottoms.

Cumulative watershed effects can be characterized as impacts on water quality and quantity that result from the interaction of disturbances, both human-caused and natural. Timber harvest activities may affect the timing of runoff, increase sediment yields, increase peak flows and increase the total annual water yield of the drainages.

Equipment operations during timber harvest on wet sites or sensitive soils may result in soil impacts that may affect soil productivity. Impacts can vary depending on area and degree of physical effects, amount and distribution of coarse woody debris retained for nutrient cycling.

Timber harvest and road construction activities may impact fish habitat primarily by increasing water temperatures, accelerating sediment delivery above natural levels to local stream channels and by decreasing large woody debris and shade cover through the removal of recruitable trees near the stream channel.

2. Big Game Winter Range, Elk Security and Vulnerability

There is a concern that the harvesting of timber could reduce cover important for the survival of wintering elk and that the proposed harvest of timber and road construction may reduce elk security cover and increase hunter access. This may increase the number of bull elk harvested during the first week of the hunting season, and that may subsequently require the MDFWP to further restrict hunter opportunity in the area. Concern also centers on existing effects of low security cover associated with previous logging activities on federal and private ownerships in Hunting District 330.

3. Threatened, Endangered and Sensitive Species

There are several wildlife species identified as "sensitive" by the DNRC that may use the Gravelly Range vicinity and surrounding area. There is a concern that the proposed

actions may have unacceptable impacts to these species as well as any sensitive plant species that may be in the vicinity.

These issues and other resource concerns will be addressed in further detail in Chapters III and IV of this document.

CHAPTER II - ALTERNATIVES

A. Introduction

This chapter explains how the alternatives were developed, and describes the No-Action alternative, the Action alternative, and the alternatives that were considered but not given detailed study and dismissed.

B. Development of Alternatives

Some of the issues identified above led to the development of mitigation measures that can be incorporated into the Action Alternative.

The No Action Alternative is evaluated as the basis for comparing the Action Alternative to the option of not conducting the project.

C. Description of Alternatives

1. Mitigation Measures for Action Alternative

   a. All new road construction is designed to meet minimum standard specifications.

   b. At the end of the project, most new road construction on the State of Montana ownership is to be physically closed at designated locations so they are impassable to motorized vehicles. Partial road obliteration and logging slash and brush will be the used, where practical, to discourage foot traffic along the right-of-way, then seeded with weed free grass seed.

   c. New road construction on BLM is expected to be made impassable through obliteration/recontouring. This type of road closure will depend on the specific conditions established in the Road Use Agreements.

d. All road reconditioning would be designed to bring the existing haul routes up to BMP standards. The reconditioning would consist of minor blading, reshaping road drainage improvements where needed and construction of additional road drainage to reduce potential sedimentation problems.

e. The access route through private land would be acquired for the sole purpose of implementing this proposal and is not designated for public access purposes.

f. The timber sale agreement will require any damaged improvement to be repaired or replaced.

g. Soil scarification will be kept to a minimum to limit potential noxious weed, soil and watershed impacts and meet silvicultural goals. Scarification is expected to range from 20 to 40%.

h. Retention and distribution of at least 5 tons and up to 15 tons per acre of woody debris greater than 3" in diameter is planned for nutrient recycling and soil wood recruitment. This measure is meant to maintain soil productivity, seedling micro-climate, habitat for some species of small mammals, and old growth stand characteristics.

i. Road construction will be minimized and located on the most stable ground feasible. All proposed road construction will be reviewed by the soil scientist for site specific mitigation designed to maintain slope stability.

j. Road use and equipment operations during the harvest and post harvest activities will be limited to dry, frozen or snow covered ground conditions.

k. Road drainage features will be installed concurrent with the construction and will be maintained throughout the course of the project.

l. To minimize compaction and soil displacement, slash disposal methods would be limited to a combination of whole tree skidding, lopping and scattering, trampling, spot piling and possibly jackpot burning.

m. All newly disturbed soils on road cuts and fills and recontouring measures would be promptly seeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.

n. To discourage introduction of weeds, all road construction and logging equipment will be power washed and inspected prior to being brought on site.

o. DNRC would monitor the project area for two years after the completion of the harvest activities to identify if noxious weeds occur on the site. Money will be collected from the purchaser of the sale for the treatment of noxious weeds. If noxious weeds do occur, a weed treatment plan will be developed and implemented.

p. All current Forestry Best Management Practices (BMP's) would be implemented as they pertain to the action alternative in the Environmental Assessment.

q. All current Streamside Management Zone (SMZ) Laws and procedures would be followed as they pertain to the action alternative. No harvest is planned to occur within the SMZ's on the project area.

r. If cultural resources, sensitive species, or threatened or endangered species are found in the area, the project would be suspended, pending further analysis by the appropriate resource specialist.

s. Two snags or recruitable snags per acre, ≥ 21" dbh, will be retained where applicable.

t. Douglas-fir relic trees will be retained where applicable.

2. *Alternatives Considered In Detail*

There are 2 alternatives under consideration, including a no action alternative.

Alternative A – No Action

This No Action Alternative would not allow timber harvest, new road construction or road improvement activities. No revenue would be generated from timber harvest treatments. Revenue from licensed grazing and non-mechanized prospecting and recreational activities would continue.

Alternative B – Action Alternative Browns Gulch (Units T1, T2, C1 & C2)

Under this alternative, DNRC would harvest 4 units ranging in size from 8 to 29 acres, removing 530 MBF of sawtimber from a total of 60 acres. Harvest methods would employ traditional ground based yarding on 37 acres and skyline yarding on 23 acres. Stand treatment would be primarily a selective harvest in Douglas-fir stands removing 70-75% of the merchantable volume and clearcutting in stands composed predominately of Subalpine fir, lodgepole pine and spruce, removing up to 95% of the merchantable volume.

An estimated 2.1 miles of new road would be constructed and 0.8 miles of existing road reconstructed. Four dry crossings would require culverts, three of which would be removed at the completion of the project.

Access would be through Barton Gulch Road and require temporary road use agreements from the BLM and a private party.

Unless otherwise identified under the pending road use agreement, all new road on the BLM would require obliteration through recontouring and seeding. Road closure on the private and state ownership would consist of partial obliteration, debris and slash placement and seeding. This closure process would result in no net increase of open roads in the area.

3. *Alternatives Considered but Dismissed*

Action Alternatives

During the preliminary stages of the proposed project, two additional alternatives were considered. The first was similar to the initial proposal distributed in the scoping notice that included the State's Granite Creek parcel. This parcel was dropped and considered for a separate project.

The second alternative that was dismissed proposed additional and larger harvest units. It was dropped in response to concerns relating to elk security and management strategies.

Road Alternatives

Two additional access routes with existing road to the State Section 16 were considered (see Map II-2). Alternative 2 would have used the existing Alder Gulch/Hungry Hollow road system. Alternative 3 would have used the existing Barton Gulch road system. Both routes have sustained, excessively steep grades (20%+) prior to reaching the State section.

The preferred access route, Alternative 1, would require 0.23 miles of new road construction (427 feet on BLM lands and 775 feet on private lands) to reach the State section. No road reconstruction would be required.

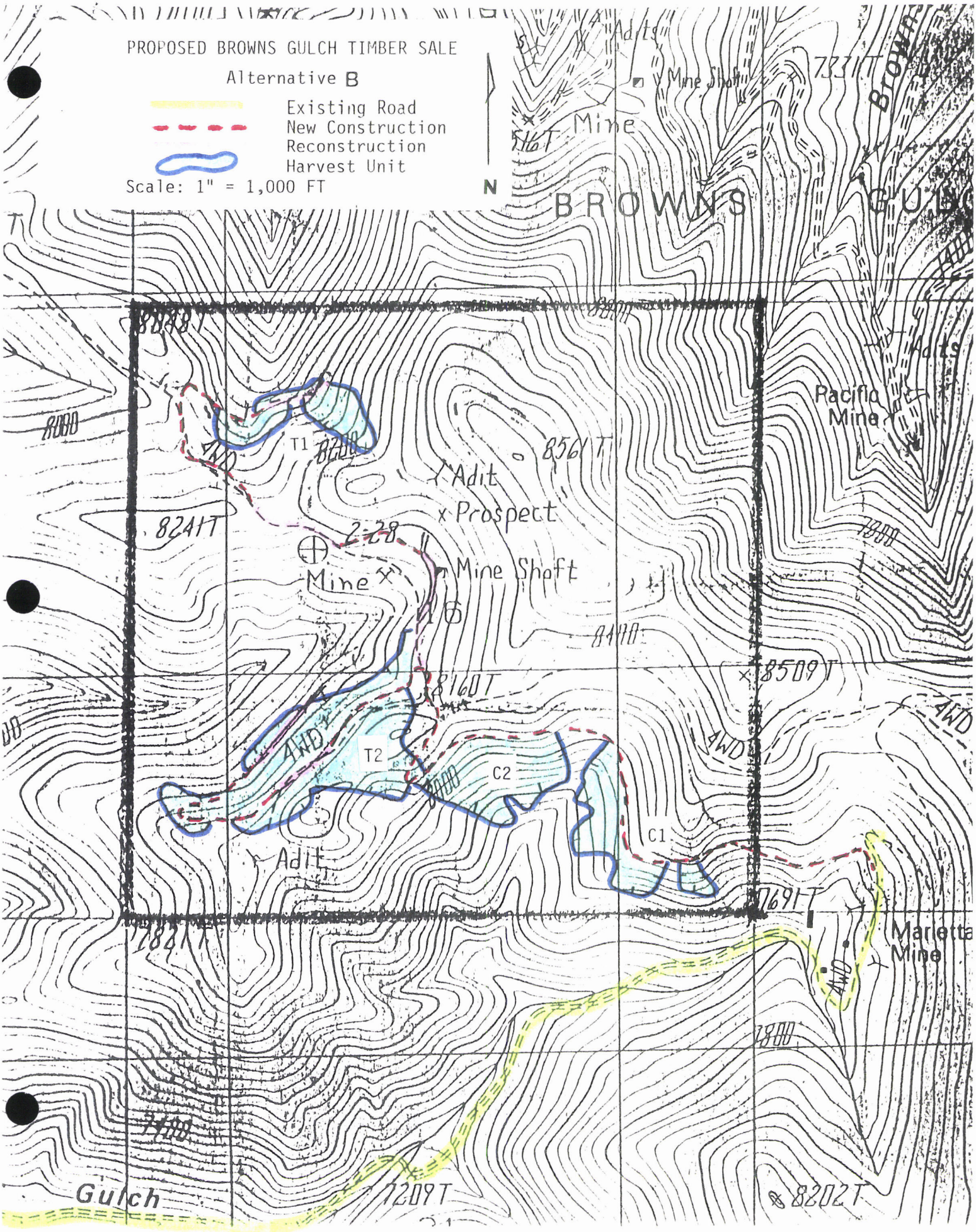
Alternative 2 would have required an estimated 2.0 miles of road reconstruction and 2.0 miles of new road construction to reach the

State section. Alternative 3 would have required an estimated 0.5 miles of reconstruction and 1.0 mile of new road construction to reach the State section.

Both Alternative 2 and Alternative 3 would have required additional new road construction to stay within Best Management Practices guidelines and reasonable safety standards for log truck hauling. The new road construction would also have required switchbacks on steep slopes in excess of 50%+.

Due to excessive soil disturbance, additional new road construction and costs, these alternate routes were found to be economically and environmentally undesirable.

MAP II – 1


PROPOSED BROWNS GULCH TIMBER SALE
Alternative B
Existing Road
New Construction
Reconstruction
Harvest Unit
Scale: 1" = 1,000 FT
N
BROWNS GULCH
Adits
Mine Shaft
Mine
Pacific Mine
Adit
Prospect
Mine Shaft
Mine
Adit
Marietta Mine
Gulch
T1
T2
C1
C2
4WD
8000
7800
7600
8241T
8561T
8509T
8160T
7691T
7821T
7209T
8202T

MAP II – 2

BROWNS GULCH PROPOSED TIMBER SALE
ROAD ALTERNATIVES

Alternative #1 – Bartons Gulch/Preferred

Alternative #2 – Alder/Hungry Hollow

Alternative #3 – Bartons Gulch

===== Exsting Road

_ _ _ _ New Construction

N

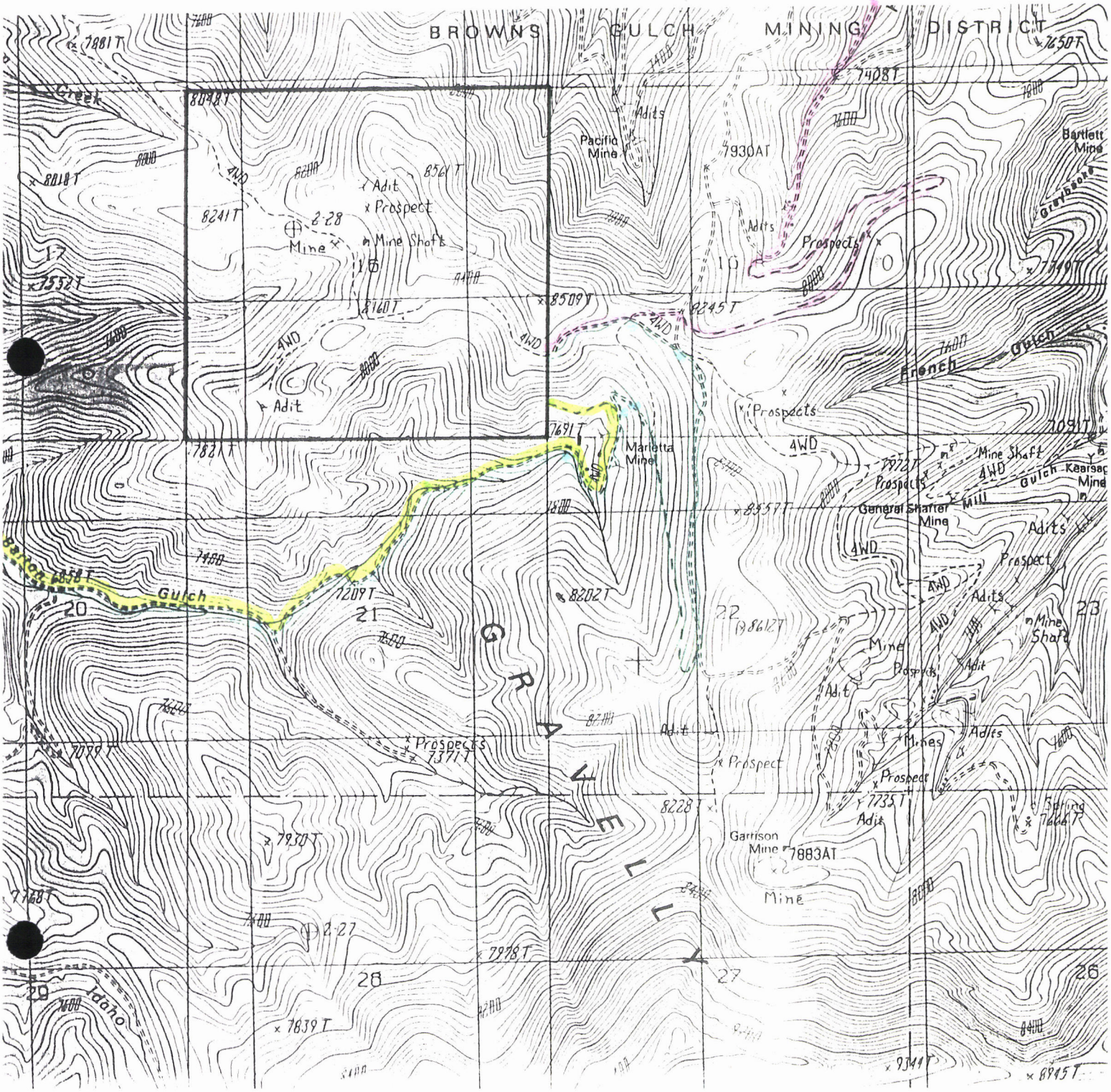


TABLE II - 1 SUMMARY OF TREATMENTS BY HARVEST UNIT

UNIT #	ACRES	NET VOLUME MBF	ESTIMATED % HARVEST VOLUME	TYPE OF HARVEST	ESTIMATED LEAVE TREE VOLUME MBF	ESTIMATED HARVEST VOLUME MBF
T1	8	80	95%	SEED TREE/ REGENERATION	5	75
T2	29	250	80%	SELECT/ REGENERATION	50	200
C1	10	120	70%	SELECT	35	85
C2	13	240	70%	SELECT	70	170
TOTALS	60 ACRES	690 MBF	AVE % HARVEST =76%		160 MBF	530 MBF

Table II-2: Summary of Alternatives and Effects

INDEX OF MEASURE	NO ACTION ALTERNATIVE	ACTION ALTERNATIVE
Estimated Harvest Acres	0 acres	60 acres
Estimated Harvest Volume	0	530 MBF
Number of Harvest Units	0	4 units
New Construction	0 miles	2.1

Proposed Activity or Environmental Component	No Action Alternative	Action Alternative Browns Gulch Units T1, T2, C1 & C2
Impacts on Vegetation		
Cover Types	Gradual increase of shade tolerant species	60 acres of Douglas-fir and lodgepole pine/ subalpine fir cover type removed – 0.3% of forested area within watershed analysis area.
Successional Stages	Slow trend toward climax. Forests remain older than would be expected	60 acres of Douglas-fir, lodgepole pine and subalpine fir converted to seedling stage.
Old Growth	No old growth stands exist within the project area.	
Insect and Disease	Potential mortality from insect and disease infestations expected to slowly increase as stands increase in age	Reduction of susceptibility to insect and disease on the treated acres by relieving competition.
Sensitive Plants	No impacts anticipated	
Noxious Weeds	Weeds may establish presence on existing 4x4 roads	Integrated Weed Management Plan to develop a prevention and monitoring plan to address potential introduction of weeds on site. Includes power washing equipment, reseeding disturbed sites and a two year monitoring period for detection and control. A minimal increase in risk to weed establishment is expected.

Impacts to Watershed and Soils		
Water Yield	No increase in water yield	No detectable increases in water yield anticipated
Sedimentation	Continued impacts due to existing conditions	Minimal impacts anticipated
Fisheries	Continued impacts due to existing conditions	Minimal impacts anticipated
Soils	Inadequate drainage only partially meet BMP's	Implementation of mitigation will minimize impacts and maintain long-term productivity.
Impacts to Wildlife		
Elk Security	No immediate change	Minimal impact to Elk Security anticipated
Elk Vulnerability		Slight increase in Elk Vulnerability anticipated
Big Game Winter Range	No Impacts	This parcel is situated between two identified wintering areas. Minimal impacts are anticipated.

Canada Lynx	No Impacts	Due to small number of acres of subalpine fir habitat type and generally marginal lynx habitat, no impacts are anticipated.
Grizzly Bear	No Impacts	Newly constructed roads could reduce existing levels of security. All new roads will be blocked following treatment to minimize access. Adverse impacts are expected to be minimal.
Flammulated Owl	No impacts	Proposed treatments in potential habitat would likely reduce the density of mature trees to levels not preferred by flammulated owls. Minor adverse indirect and cumulative effects could be expected.
Ferruginous Hawk	No impacts	No impacts to ferruginous hawks are expected to occur as a result of this project. Should any ground-nesting hawks be observed within 400 meters of the proposed haul routes or active harvest units, harvest activities would cease and the DNRC biologist would be contacted for implementation of site-specific mitigation measures.

CHAPTER III - AFFECTED ENVIRONMENT

A. Introduction

This chapter presents the aspects of the affected environment that are relevant to the issues identified in Chapter II.

B. Background

1. Forest Vegetation

Lands within the proposed project area occur in mountainous country with generally broad and gentle ridge tops. Slopes range from 30-70% with an elevation range of 7,700 feet to 8,600 feet. The area is primarily forested (~70%) with interspersed grasslands (~30%). Dense pole-sized and mature forest comprises ~240 acres, while open mature and young forest comprises ~205 acres of the state parcel.

Southerly exposures are dominated by Douglas-fir with scattered trees and patches of lodgepole pine, limber pine and juniper. These stands are Douglas-fir/elk sedge habitat type and are <150 years of age containing a few scattered old remnant trees and clumps. Regeneration is sparse with little understory vegetation or coarse woody debris present.

Northerly exposures are mixed conifer species of subalpine fir, lodgepole pine, spruce and Douglas-fir with whitebark pine at the upper most elevations. These stands are primarily a subalpine fir/arnica habitat type. General stand age is <150 years and is comprised of densely-stocked timber < 10" dbh, moderately-stocked timber >10" dbh and a few scattered old remnant trees and clumps. Little understory vegetation or coarse woody debris is present.

Older trees (>150 years) primarily occur on ridge tops, creek bottoms and gentle topographic features. Large snags (>20" dbh) are rare but recruitment trees (>30" dbh) are available.

Encroachment occurs readily along edges of mature forest into areas that were non-forested grasslands around the turn of the century.

Primary understory species include: snowberry, big sagebrush, elk sedge, bluebunch wheatgrass, Idaho fescue, aster spp. lupine spp. low larkspur and wild strawberry. These species are also commonly observed in adjacent grasslands.

2. Cumulative Impacts and Harvest History

Historic mining activity was likely responsible for much of the old logging that occurred in this area (Losensky 1997). Evidence of these past harvesting activities within State ownership is evident in Units T1 and T2. Past and ongoing management activities in the project area drainages include mining, timber harvest, grazing, fire suppression and road construction. Previous harvest activities on BLM and private ownerships is evident.

Timber harvest activities have been minimal over the last 15 years, constituting approximately 1,458 acres of small clearcuts, selective and salvage cutting (~6.6% of the total watershed analysis area). Most of this activity took place from the late 1980's through the 1990's. Grazing activities are prevalent, with the bulk of the activities concentrating in the riparian areas.

3. Fire History / Ecology

Stands within the project area fall into fire groups 4, 5 and 6 (Fischer and Clayton 1983) and have mean fire intervals ranging from 2 to 25 years on dry sites to about 40 years on cooler sites. Fuel loadings can vary dramatically within these fire groups (~4-25 tons per acre, Fischer and Clayton 1983), which likely resulted in historic fire intensities that ranged from low intensity ground fires to intense, mixed-severity events (Losensky 1997). Forest conditions within the project area tend to be cool and dry, typically resulting in lower fuel loadings (i.e., <20 tons/acre). The presence of scattered old, open-grown Douglas-fir were likely the result of frequent fires burning at lower intensities on gentle slopes (Losensky 1997). The abundance of old trees with fire scars on southerly slopes indicate that much of the project area was likely influenced by relatively frequent fire events. Thus, the presence and absence of forest and grassland patches would have been dynamic, shifting through time. Periodically, sites where conifers presently occur would have appeared more as grassland than forest. Surviving individual trees and clumps of trees in cool areas and gentle ridge tops served as

seed sources that would have promoted the periodic regeneration of trees that may or may not have survived subsequent fire events. Historic fire events likely contributed to a naturally fragmented patchy distribution of forest stands at the landscape scale.

4. Insect and Disease

Currently the forested acres within the project area do not display any serious insect or disease problems. However, high stand densities, multi-storied stand structure, and climax host species are present and elevate the risk of insect and disease outbreak.

5. Successional Stages

Within climatic sections of Montana, Losensky (1997) estimated the age structure of each forest cover type that may have existed in 1900 by backdating inventory data. The project area falls under Losensky's (1997) climatic section 13 (Section M332E), which encompasses the southwest corner of Montana and the upper Salmon and Lemhi drainages of Idaho, and includes Beaverhead and Madison Counties.

In this climatic section, forested cover types were historically found on about 39% of the area, with the remainder being grassland and shrubland. At the turn of the century, 10% of the timber in the climatic section and 19% of the Beaverhead and Madison County timber was old forest >150 years old.

Current forest inventory data on State lands in the Beaverhead and Madison Counties can be used to compare the current age structure of each forest cover type to Losensky's evaluation of conditions that existed in 1900. We do not have a complete stand level inventory of all the forested State lands in Beaverhead or Madison County. An estimate of age structure is available on approximately 67% of the forested State lands. However, the data available is on the majority of lands that have potential for timber harvest activity and therefore would tend to represent stands that have had human disturbance during the last century and consequently younger age classes are likely represented. Table III -1 displays Losensky's estimate and the current inventory estimate

of age structure on the forested State land in the Beaverhead and Madison Counties. Comparison of the data in this table indicates the current age structure of the forested State lands is substantially older than would be expected from Losensky's data. Currently approximately 59% of the forested stands on State lands are greater than 100 years of age. Also, there is currently a greater than expected percentage (39%) of old stands on State land when compared to the historic estimate of 19% on all lands in 1900. High representation of old stands is consistent with the belief that modern fire suppression policies have limited the natural disturbance role played by fire in this region and that human caused disturbances have not approached historic levels of disturbance.

TABLE III – 1: Percentage of area by cover type and age class for Beaverhead and Madison Counties. Historic figures are from Losensky (1997) and represent an estimate of conditions that existed in the year 1900 in Beaverhead and Madison Counties. Current figures are extrapolated from the DNRC inventory, which consists of stand data collected from 67% of the estimated forest area on state land in Beaverhead and Madison Counties.

COVER TYPE (STAND AGE IN YEARS)		NON-STOCKED & SEEDLING/ SAPLING (0-40)	POLE (41-100)	MATURE (101-OS)	OLD STANDS (OS)[1]
DOUGLAS-FIR	HISTORIC	33%	28%	13%	26%
	CURRENT	6%	26%	21%	47%
SPRUCE-FIR	HISTORIC	4%	41%	22%	33%
	CURRENT	2%	38%	23%	37%
LODGEPOLE	HISTORIC	50%	41%	8%	1%
	CURRENT	22%	39%	16%	23%
AVERAGE OF FOREST	HISTORIC	35%	34%	13%	19%
	CURRENT	10%	31%	20%	39%

[1] –Stands composed primarily of trees > 150 years of age.

6. Old Growth

The State Forest Land Management Plan (SFLMP) states that DNRC would seek to maintain or restore old growth forest in amounts of at least half the average proportions that would be expected to occur with natural processes on similar sites. In the SFLMP, DNRC conceptually defines old growth as: forest areas that are in the later stages of stand development. Old-growth forests are generally dominated by relatively large old trees, contain wide variation in tree sizes, exhibit some degree of multi-storied structure, have signs of decadence such as rot and spike-topped trees, and contain standing snags and large down logs.

DNRC has adopted old growth definitions described in "Old Growth Forest Types of the Northern Region" (Green, et al., 1992).

Passage of SB354 has brought into question the SFLMP commitment to retain old growth. Ongoing development of rules under the Montana Administrative Procedures Act will address retention of old growth on State trust lands.

Old growth stands >5 acres do not occur within the project area but occasional old relics and clumps of old Douglas-fir and lodgepole pine can be found. These trees typically occur on ridge tops or other protected areas where intense fires were uncommon. Fire frequencies and intensities on forested sites within the project area apparently did not allow the development of extensive old growth development during the last two centuries.

7. Noxious Weeds

Currently there has been no noxious weed infestations detected on the State tract.

8. Transportation/Roads

The Gravelly Range has a long history of mining, which has left a network of old 4x4 jeep trails and two track roads across the landscape. Most of these roads are open or have seasonal restrictions placed on them. Roads on the private ownerships are not maintained for public use, and in some cases are closed to travel by locked gates. Approximately 1.7 miles of existing road on

the State ownership is open with the remaining closed to the public.

Maintained system roads that are open to the public are under the jurisdiction of the BLM and Madison County. These roads would be identified as the Barton Gulch, Browns Gulch and Alder/Hungry Hollow roads. No system roads exist on the state ownership.

Based on a Watershed Analysis Area of 22,235 acres, the estimated current road density is 1.48 miles per square mile.

9. Recreation

Persons holding a valid State Recreational Use License may hunt and conduct other recreational activities on the State tract. Public access is provided by crossing the adjoining BLM ownership.

10. Grazing

Historically the State tract has been leased for grazing. The entire 640 acres is currently leased for 74 Animal Unit Months (AUM's). Annual income from the grazing license is $408.48.

11. Mining

Past and present mining activities have occurred on a limited basis within the State tract. Currently two land use licenses provide for non-mechanized prospecting activities. Annual income from the licenses is $3,840.00.

12. Cultural Resources

A field review was conducted in July of 1999 by the DNRC archaeologist to inventory cultural resources on the proposed project area. No cultural resources were found that would be impacted by the project and no additional archaeological investigative work was recommended.

13. Aesthetics

The remote location of the proposed project area is not visible to any populated areas.

14. Economics

Revenue producing activities associated with this tract are grazing, non-mechanized prospecting and recreational licenses, which currently produce an estimated annual gross revenue of $4,277.76.

Annually the DNRC analyzes the total costs, including general administration, of the timber sale program by land office and statewide. The following table displays the revenue-to-cost ratios for the state and Central Land Office. The revenue-to-cost ratios are a measure of economic efficiency. A ratio value less than 1.0 means that the costs are higher than revenues (deficit). A ratio greater than 1.0 means revenues are higher than costs (profit). A ratio equaling 1.0 means that cost equal revenues.

TABLE III – 2: Revenue-to-Cost Ratios State-wide and for the Central Land Office.

	FY95	FY96	FY97	FY98	FY99
CLO	1.44	1.45	3.56	2.20	2.15
State	2.07	1.68	1.89	1.72	1.36

15. Landscape Analysis Areas

Three analysis areas were developed to assist in the process of evaluating the different resources and features in the vicinity of the proposed project area (see TABLE III - 4). A Watershed Analysis Area consisting of 22,235 acres was delineated for the analysis of potential watershed impacts. The Wildlife Analysis Area consisting of 5,760 acres, developed from the core block of sections surrounding the project area. The third area is the State section where the project is proposed. The following data summary tables shows the overall statistics associated with each analysis area.

TABLE III – 3: Watershed Analysis Area By Ownership.

	Acres	% of Ownership
Private	10,935	49%
BLM	9,320	42%
USFS	1,030	5%
State of Montana	890	4%

TABLE III – 4: Analysis Areas Summary.

	Total Area (Acres)	Non-forested Area	Pre-harvest Forested Area	Area Harvested '85-'01	Existing Forested Area
Watershed Area	22,235	10,623 (48%)	11,612 (52%)	1,458 (6.6%)	10,154 (46%)
Wildlife Area	5,760	1,184 (21%)	4,576 (79%)	619 (10.7%)	3,957 (69%)
Project Area Section 16	640	195 (30%)	445 (70%)	NONE	445 (70%)

C. *Water Quality, Water Yield, and Soils*

1. Watersheds:

The proposed sale area lies within one state section surrounded by BLM and private land. Precipitation ranges from 18-30 inches annually. The State tract is drained by four watersheds: Barton Gulch (8,750 ac), Williams Creek (4,969 ac), Davey Creek (3,578 ac) and Browns Gulch (4,938 ac). All are third order tributaries, Class I perennial streams under the Montana Streamside Management Zone (SMZ) Law and Rules and contribute to the Ruby River Basin.

A DNRC Hydrologist evaluated all stream channels and ephemeral draw bottoms draining the proposed sale area. The watershed analysis area has been further divided into two unnamed tributaries of Barton Gulch and one unnamed tributary of Williams Creek to facilitate hydrologic analysis and cumulative watershed effects assessment (see Map III-3). Each unnamed tributary contributing surface flow is described below.

Tributary # 1: This is a Class I perennial stream. The headwaters of this tributary consist of seepy wet areas with several springs surfacing and ultimately contributing flow to a single channel. The remaining upper reaches of this drainage feature contain ephemeral flow.

Tributary # 2: This is a Class I perennial stream with several springs and seeps surfacing along the adjacent draw features. The remaining upper reaches of this drainage feature contain ephemeral flow.

Tributary # 3: This stream has segments of perennial and intermittent surface flow with the channel eventually becoming clearly defined, where it becomes a Class II stream. The remaining upper reaches of this drainage feature contain ephemeral flow.

2. Regulatory Framework:

This portion of the Missouri River basin, including the Ruby River drainage, is classified B-1 in the Montana Water Quality Standards. Waters classified B-1 are suitable for drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonoid fishes and associated aquatic wildlife, waterfowl and furbearers; and agricultural and industrial water supply. State water quality regulations prohibit any increase in sediment above naturally occurring concentrations in waters classified B-1 (ARM 16.20.618 2(f)).

Naturally occurring means conditions or materials 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. Reasonable land, soil and water conservation practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. The state of Montana has adopted Forestry Best Management Practices (BMP's) through its Non-point Source Management Plan as the principal means of meeting Water Quality Standards.

Existing beneficial uses within the analysis area of the proposed sale area contain water rights for groundwater sources including stock, wildlife and wetlands, domestic, mining, commercial and fire protection uses. Surface water sources include: stock, irrigation, fire protection, recreation, new sprinkler irrigation and mining uses. There are no sensitive beneficial uses in the sale area, however; downstream sensitive beneficial uses within the analysis area include aquatic life support, cold water fisheries and surface domestic uses.

Browns Gulch is a tributary to Alder Gulch. Adler Gulch (MT41C002-4) is listed as a water quality limited water body (as per the year 2000 303(d) list). Probable cause of impairment is copper, lead, mercury, metals, fish habitat degradation, riparian degradation, and other habitat alterations. Probable sources are listed as being resource extraction (placer mining, abandoned mining, acid mine drainage) and contaminated sediments. The 303(d) list is compiled by the Montana Department of Environmental Quality (DEQ) as required by Section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency (EPA) Water Quality Planning and Management Regulations (40 CFR, Part 130). Under these laws, DEQ is required to identify water bodies that do not fully meet water quality standards, or where beneficial uses are threatened or impaired. These water bodies are then characterized as "water quality limited" and

thus targeted for Total Maximum Daily Load (TMDL) development. The TMDL process is used to determine the total allowable amount of pollutants in a water body or watershed. Each contributing source is allocated a portion of the allowable limit. These allocations are designed to achieve water quality standards.

The Montana Water Quality Act (MCA 75-5-701-705) also directs the DEQ to assess the quality of state waters, ensure that sufficient and credible data exists to support a 303(d) listing and to develop TMDL's for those waters identified as threatened or impaired. Under the Montana TMDL Law, new or expanded nonpoint source activities affecting a listed water body may commence and continue provided they are conducted in accordance with all reasonable land, soil and water conservation practices. Total Maximum Daily Loads have not been completed for any of the drainages in the project area. DNRC will comply with the Law and interim guidance developed by DEQ through implementation of all reasonable soil and water conservation practices, including Best Management Practices and Resource Management Standards as directed under the State Forest Land Management Plan.

A recent federal court decision has directed Montana DEQ to develop TMDL's for all streams on the 1996 303 (d) list. Alder Creek is also on the 1996 303 (d) list, however the probable causes and sources are different that those listed for the 2000 list.

The causes of impairment in Alder Creek, according to the 1993 303 (d) list, are other habitat alterations and siltation with the probable sources being agriculture, channelization, dredge mining, flow regulation/modification, natural sources, and resource extraction. According to this report, Alder Gulch is partially supporting its aquatic life support and cold water fishery beneficial uses, while drinking water supply and recreation are threatened. Alder Gulch is currently listed as a low priority for TMDL development.

The Montana Streamside Management Zone Law (MCA 77-5-301) and Rules regulate timber harvest activities that occur adjacent to streams, lakes and other bodies of water. This law prohibits or restricts timber harvest and associated activities within a predetermined (SMZ) buffer on either side of the stream. The width of this buffer varies from 50-100 feet, depending on the steepness of the slope and the class of the stream.

The Montana Stream Protection Act (MCA 87-5-501) regulates activities conducted by government agencies that may affect the bed or banks of any stream in Montana. This law provides a mechanism to require

implementation of BMP's in association with stream bank and channel modifications carried out by governmental entities. Agencies are required to notify the Montana Department of Fish, Wildlife and Parks (MDFWP) of any construction projects that may modify the natural existing conditions of any stream.

3. Water Quality:

The proposed access route (Barton Gulch) contains approximately 8.5 miles of BLM system road. The first five miles of road have been upgraded in conjunction with recent timber sales but the remaining three miles do not meet current BMP standards. Poor road system design and location have resulted in Barton Gulch being impacted by accelerated rates of sedimentation.

The existing roads will continue to be a potential source of impacts to downstream water quality and beneficial uses unless remedial action and mitigation measures are undertaken.

4. Cumulative Watershed Effects:

Past and ongoing management activities in the four watersheds presented earlier in this document include mining, timber harvest, grazing, fire suppression and road construction. Timber harvest activities have been minimal over the past 15 years, constituting approximately 1,458 acres.

A cumulative watershed effects (CWE) analysis for the proposed sale area was completed by DNRC to determine the existing conditions of the affected watershed and the potential for cumulative effects due to increased water and sediment yields. All four watersheds were chosen as individual analysis boundaries. This analysis area was selected because it was determined to be the most appropriate scale to detect potential effects. A summary of recent research suggests detection of hydrologic cumulative effects should focus on third-to fourth-order basins (NCASI, 1999).

The CWE analysis was completed using a Level II coarse filter screening (outlined in SFLMP Watershed RMS # 7). The coarse filter approach consisted of on-site evaluation, mapping the percent forested of the watershed and documenting history of past timber management activities through the use of maps, aerial photographs and harvest records. Field reconnaissance and assessments were used to collect additional data

and to verify information obtained through aerial photo and map interpretation.

Existing cumulative watershed effects due to increases in water yield are very unlikely in any of the watersheds due to the following reasons:

- Only a moderate amount of the watershed area has been harvested in the past 15 years.
- The existing partially forested natural condition of each watershed. Open, range-like watersheds evolved under conditions with less forest crown and thus less evapotranspiration.
- Presently, there is likely more total forest cover in the watershed following forest encroachment on rangeland and fire suppression.
- Field evaluations found no evidence of channel instability or alterations resulting from increases in peak flows.

A detailed water yield analysis was not completed for the affected watersheds due to the low potential for and lack of evidence of increased water yield due to timber harvest activities.

Existing harvest levels are well below those normally associated with detrimental water yield increases. It is generally accepted that up to 20-30% of the watershed area can be harvested before detectable increases in peak flows occur (USFS, 1974). Table III - 5 summarizes the existing conditions of each watershed analyzed.

TABLE III – 5: Watershed Existing Condition Analysis.

BROWNS GULCH PROPOSED TIMBER SALE Watershed Existing Conditions Analysis					
Watershed	**Drainage Pattern**	**Total Acres**	**Existing Road Miles**	**Percent Forested**	**Percent Harvested**
Barton Gulch	Perennial	8,750	11.3	63%	7.9%
Browns Gulch	Perennial	4,938	22.0	29%	10.0%
Davey Creek	Perennial	3,578	5.0	36%	0.4%
Williams Creek	Perennial	4,969	13.0	41%	5.1%

A DNRC Hydrologist evaluated all roads within the proposed sale area. Field evaluation indicates that past timber harvest activities within the proposed sale watershed analysis area have resulted in impacts to water quality. These impacts are limited to sediment delivery and surface erosion and are restricted to stream crossings and isolated segments of existing road.

5. Cold Water Fisheries:

An automated search for Browns Gulch, Davey Creek and Williams Creek was completed using the Montana Rivers Information System (MRIS) database. No survey data for these streams was found. Fisheries surveys completed by the Montana Department of Fish Wildlife and Parks (MDFWP) and the Bureau of Land Management (BLM) for Barton Gulch found brook trout and mottled sculpin (Kampwerth, 1995). No westslope cutthroat trout were found along any of the reaches surveyed of the watersheds draining the project area.

6. Geology and Terrain:

The sale area is located on gentle and some moderate slopes with shallow to deep soils weathering from metamorphic igneous gneiss, which is more stable than granitics. There are no especially unusual or unique geologic features in the proposed harvest area. There are several small faults and bedrock mineralization zones where the rock is altered. Slopes are generally stable due to the extensive area of shallow bedrock and only small, localized sites of marginal slope stability were observed within the project area. Bedrock exposed on ridges is generally rippable and material quality is good for road construction.

7. Soils:

Soil map units were taken from the Madison County Soil Survey and modified based on field review. The sale area is located on moderate to steep slopes with high rock fragment residual soils on the mountain ridges. Moderate to deep, stony and flaggy (flagstone) sandy loams soils weathering from metamorphic gneiss bedrock occur on the mountain sideslopes. Cold climate and dry summers limit moisture and affect tree growth.

Primary soils on forested sites within the proposed harvest area are Shadow complex soils with a described slope range of 25-70% supporting lodgepole pine, subalpine fir and spruce. Shadow very channery sandy loams on forested sites typically have an inch of duff over very channery

sandy loam topsoil with coarse textured subsoils of extremely channery and stony loams of shallow to moderate depth. Rock outcrops occur on ridges and convex slopes and can limit equipment operations. Slopes up to 45%, are suitable to tractor yarding harvest methods. These soils are droughty and subject to erosion where disturbed. Erosion can be controlled by installing adequate drainage and grass seeding of trails where needed. Leaving slash can provide shade to enhance survival of seedlings.

Steeper, south slopes are Rochester stony loam-Rock outcrop complex on 45-70% slopes supporting Douglas-fir, limber pine, juniper and bunchgrass. These steeper slopes have high ratings for potential erosion and displacement. These risks can be mitigated by use of cable yarding harvest methods. These soils have a long season of use and material quality is good for road construction but can be slow to revegetate unless seeded promptly.

Soils dry out rapidly after snowmelt in most proposed harvest units and allow adequate season of use from about July through fall. Harvest operations and road use should be limited to dry, frozen or snow covered conditions. Erosion can be controlled with standard drainage in skid trails where needed.

There are extensive old trails and 4 wheel drive roads on the State tract associated with past mining activities. Flatter road grades are fairly well-drained and show minimal erosion due to the gravelly, high coarse fragment content soils. Some segments of road are on suitable grades and can be reconstructed, but most of the old roads are narrow, too steep and eroding.

D. *Big Game Winter Range, Elk Security and Vulnerability*

1. Big Game Winter Range:

This State of Montana section maintains cover usable by elk in winter. Densely stocked thickets of conifer regeneration and overstocked mature stands provide good thermal protection for elk, which can reduce energy expenditures and stress associated with cold temperatures. Areas in the section with densely stocked mature trees are also important for snow interception, which makes travel and foraging less stressful for elk during periods when snow is deep. Dense stands are currently somewhat connected and provide for animal movements across the section during adverse weather conditions. Patches of isolated forest can offer hiding cover and sheltered bedding sites for elk that utilize nearby grasslands for

foraging. This parcel receives some winter use by bulls but greatest use likely occurs during mild winters.

A winter range map (1996 DFWP data) was examined for the northerly portion of the Gravelly Range. This map indicates the project area is situated between two identified wintering areas occurring 3-4 miles distant to the east and west.

Section 16 is considered usable as winter range for elk, especially during mild winters, but is not necessarily "key" winter range (i.e., wintering areas that provide for relatively large groups of animals year after year, or are believed to provide critical cover during extreme weather events). DNRC is not aware of any winter range that would be considered "key" that lies adjacent or within 3-4 miles of the project area.

2. Elk Security and Vulnerability in the Gravelly Range:

The Gravelly Range is an isolated range that occurs in southwest Montana. The northern-most point of the Gravelly Range lies about 3-4 miles south of Virginia City, Montana. This area is part of the DFWP Gravelly Elk Management Unit (EMU) and includes Hunting District 330, which occupies ~ 320 square miles of the EMU (DFWP 1992). Habitats found within Hunting District 330 range from grassland-sagebrush along foothills at lower elevations (~6,000 feet) to those at the highest elevations (up to ~9,500 feet) characterized by rocks, scree, whitebark pine and subalpine fir. Mature Douglas-fir and lodgepole pine forests dominate vegetation communities found at mid-elevations.

Bull elk vulnerability and potential reductions in hunter opportunity are a primary concern expressed by DFWP in this hunting district and the Gravelly EMU. Achieving this goal can be hampered when available cover at the landscape level is reduced appreciably through timber harvest activities, road management, or natural disturbances, such as large scale stand-replacement wildfires. Three-year first-week bull harvest averages for Hunting District 330 calculated for 1995, 1999 and 2000 have been at ~46%; above the upper limit (45%) for DFWP bull carryover objective (B. Brannon, DFWP, pers. correspondence 1/08/02). Three-year first-week bull harvest averages for the Gravellys EMU calculated for 1995, 1999 and 2000 are 54%, 52% and 51% respectively; also above the upper limit (45%) for DFWP bull carryover objective. Data are not available for 1996, 1997, or 1998. High bull harvest during the first week of the hunting season results in lower numbers of bulls "available" to hunters for harvest for the remainder of the general 6-week hunting

season.

While existing cover is present that is important for minimizing stress and disturbance to elk during the general season, the presence of the nearby potentially active mines on sec. 9, 10 and 15, open roads in sec. 15, and the Dryden 4WD trail in DNRC Sec. 16, likely reduce the effectiveness of existing cover patches in the vicinity to provide elk security. Human activity levels associated with mines would be expected to potentially influence elk use of this area.

The majority of cover within the state tract occurs at elevations >7,800 feet. Potential cover would likely be unavailable for elk during periods when snow conditions are deep. However, cover at higher elevations probably would be available for use by bulls during the first week of the general big game season during most years. Security cover at lower elevations is likely very important for minimizing bull elk vulnerability under the broad range of weather conditions that can occur in the Gravelly Range during the fall.

Existing forested acres within the wildlife analysis area were estimated at ~3,957. Approximately 619 acres of additional forest were harvested between 1985 and 2001. These 619 acres are presently non-forested, sparsely forested or young conifer regeneration. None of the acres harvested between 1985 and 2001 are considered to provide secure elk cover at present.

Existing Condition and Value of the Project Area for Elk Security:

Approximately 240 acres of dense forest habitat currently occurs in the project area, which provides high quality hiding cover and escape cover. Moderate to high quality hiding cover is also present within about 205 acres of open-grown, mature forest that occurs on the parcel. About 2,322 acres of dense mature forest occurs within the 5,760-acre wildlife analysis area, where average patch size is about 71 acres (range ~14 to 187 acres).

Historic fire events likely contributed to a naturally fragmented patchy distribution of forest stands at the landscape scale. Past logging and mining activity within the project area and wildlife analysis area have contributed to the existing patchy distribution of dense, mature forest habitat. Existing forest cover exhibits a moderate level of habitat connectivity across multiple networks of moderate to densely forested stringers and habitat patches. No known wildlife corridors of notable importance occur within the project or analysis area.

The following terminology is used to describe elk habitat values in the context of the project area and is consistent with Lyon and Christensen (1992).

Security - The protection inherent in any situation that allows elk to remain in a defined area despite an increase in stress or disturbance associated with the hunting season or other human activities.

Hiding Cover (functional def.) – Hiding cover allows elk to use areas for bedding, foraging, thermal relief, wallowing, and other functions year-round. Hiding cover may contribute to security at any time, but it does not necessarily provide security during the hunting season.

Elk Vulnerability – A measure of elk susceptibility to being killed during the hunting season.

Criteria for security cover developed for forests in western Montana by Hillis et al. (1991) requires a minimum of 250 acres of mature timber (contiguous and non-linear) that is ≥1/2 mile from an open road during hunting season. Due to the existing number of open roads and motorized trails in the wildlife analysis area and project area, dense forest patches of size that would meet the Hillis et al. (1991) definition of security cover do not occur in the project area and are limited in number in the wildlife analysis area. However, the forested patches in the project area have value for hiding cover, which can serve to lower bull elk vulnerability. Retaining the greatest amounts of dense forest cover possible would pose the least risk of increasing elk vulnerability from present levels. The greater numbers of elk that use a particular area, the more important cover patches are as they serve to reduce vulnerability of a greater portion of animals. The specific annual home range and the seasons and amount of time elk typically use the project area are not known.

E. Threatened, Endangered, and Sensitive Species

1. Fine Filter Wildlife Issues

A fine filter analysis was conducted on the project proposal area for the following species

Threatened and Endangered Species: bald eagle, gray wolf, lynx and grizzly gear.

DNRC Sensitive Species: flammulated owl, boreal owl, black-backed woodpecker, pileated woodpecker, northern bog lemming, harlequin duck, ferruginous hawk, mountain plover, peregrine falcon and Townsend's big-eared bat.

Flammulated owls, Ferruginous hawks and Black-Backed woodpeckers have been documented within the latilong (L38) that encompasses the project area but it is unknown if they inhabit the project area.

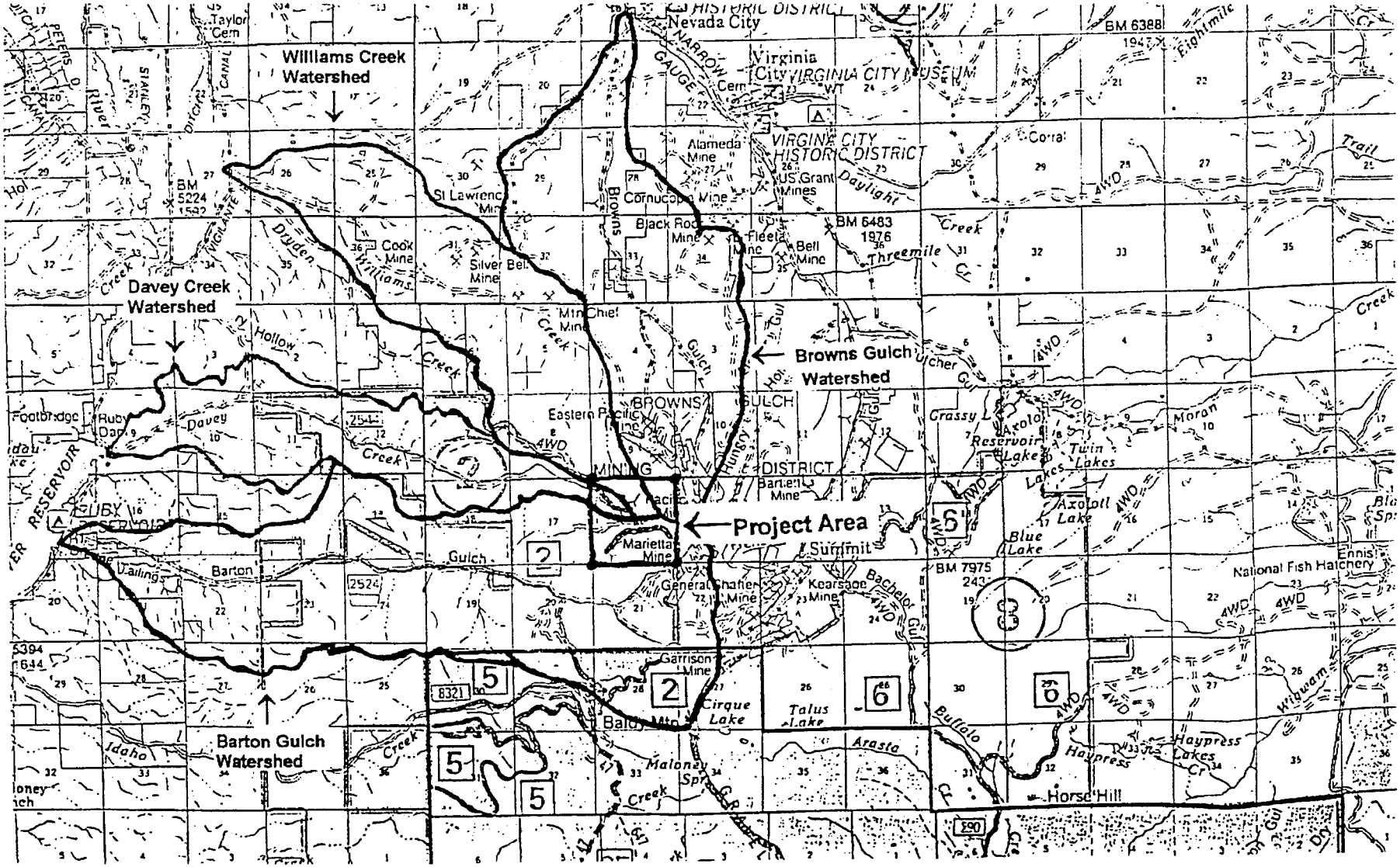
There is no documented use within the proposed project area for any of the remaining species. However there is potential for future, occasional, or incidental use by gray wolf, grizzly bear, Townsend's big-eared bat and lynx. A summary of the analysis can be found in Chapter IV "Checklist For Endangered, Threatened and Sensitive Species Central Land Office"

2. Plant Species of Special Concern:

A search of the MNHP database was conducted using the 7.5 Minute Quadrangle Distribution Search. Two species of special concern have been recorded within the Cirque Lake quadrangle area, which includes the project area, with one occurrence each. The two species recorded were Idaho Sedge (Carex idahoa) and Cut-Leaf Balsam-Root (Balsamorhiza macrophylla).

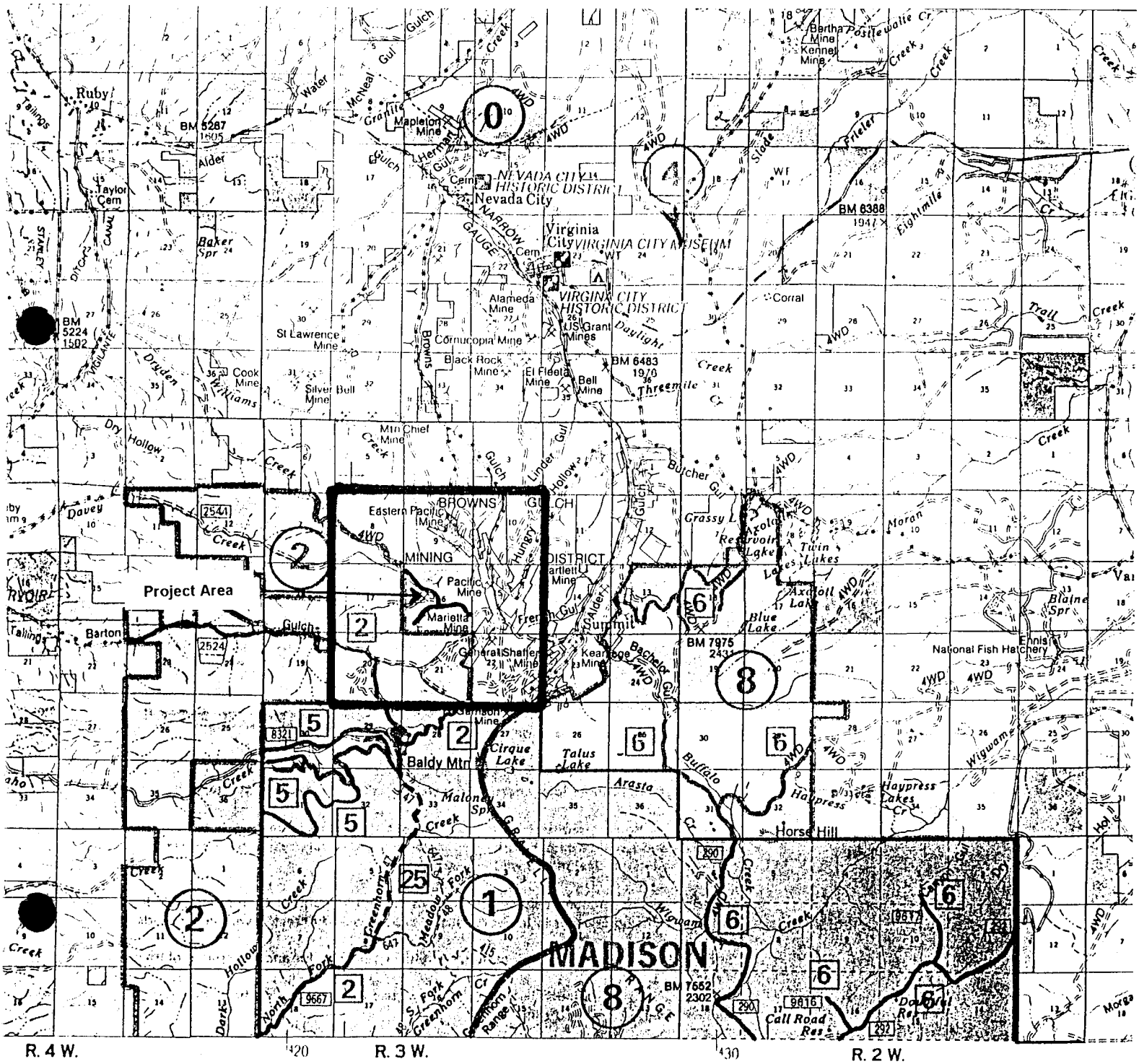
No plant species of special concern have been observed during general surveys within the State tract.

BROWNS GULCH PROPOSED TIMBER SALE
WATERSHED ANALYSIS MAP
Section 16, T7S-R3W



MAP III – 2

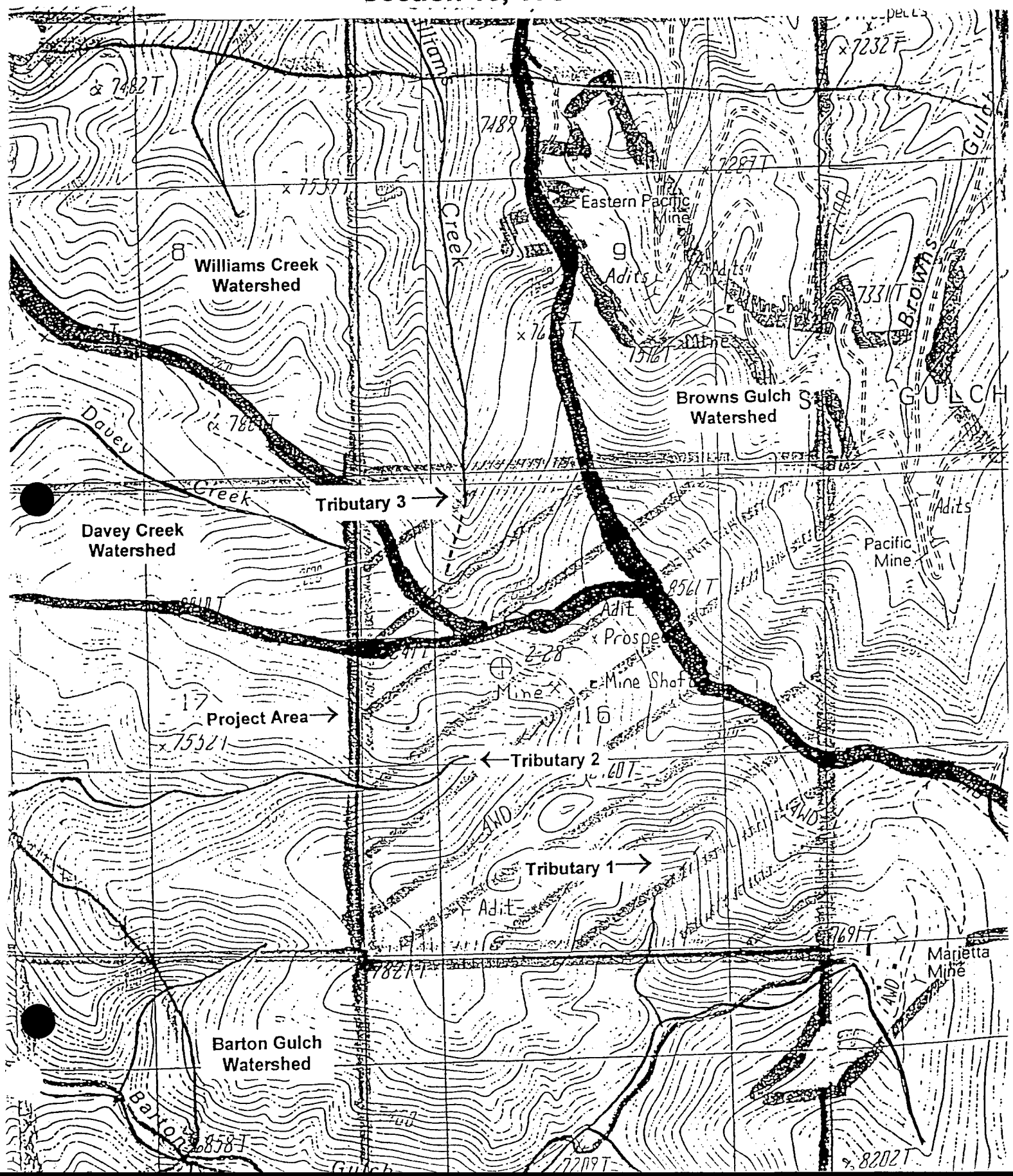
BROWNS GULCH PROPOSED TIMBER SALE
WILDLIFE ANALYSIS AREA MAP
Section 16-T7S-R3W



MAP III – 3

BROWNS GULCH PROPOSED TIMBER SALE PROJECT AREA MAP

Section 16, T7S-R3W



CHAPTER IV – ENVIRONMENTAL EFFECTS

A. INTRODUCTION

This chapter will describe the probable effects of the various aspects of the affected environment as presented in Chapter III.

B. BACKGROUND

1. Forest Vegetation

The No Action alternative would leave all vegetation undisturbed.

The Action alternative of harvesting 60 acres would alter 13.5% of the forested acres on the State tract. The new road construction associated with the action alternative would adjust this figure to 14.5%. Based on the total area of the section, the proposed alternative would alter the vegetation on an estimated 10% of the area. The few old scattered trees and clumps along the ridge tops would be retained. The areas affected would be harvested in a manner to regenerate a younger, healthy stand within 10-20 years.

2. Cumulative Impacts

There has not been any harvest activities within the State of Montana ownership that would change or convert cover types to another classification.

To evaluate the cumulative impact of the proposed timber harvest on the State of Montana ownership, Losensky's data summaries for the Beaverhead and Madison Counties was compared with the inventory of state forested lands and anticipated changes under the Action alternative. The 60 acre Action alternative would move approximately 1% of the 101-150 age class cover types to the non-stocked\seedling age class. The data comparison also indicates that for either alternative, the forested stands for all cover types on the state land post-harvest would remain older than anticipated.

About 1,458 acres of additional forest were harvested between 1985 and 2001. Following the proposed harvest, the remaining acres of forest would be reduced to ~10,094 acres (45%) and total

acres harvested would be increased to ~1,518 acres (6.8%) in the analysis area.

3. Fire History / Ecology

The No Action alternative would result in no appreciable change in the forest cover types or stand structures in the near term. Current successional patterns would continue. The stands would continue to be dominated by Douglas-fir and lodgepole pine, with a gradual trend to increase the number of more shade tolerant species, such as subalpine fir and spruce, in the understory. Tree mortality from potential insect and disease infestations would contribute to site factors that would be conducive to stand replacement fires. Such an event would likely revert the forest stands back to a grassland-sage cover type with a few scattered old remnant trees that would have survived due to micro-site conditions or location.

The Action alternative would not change the classification of forest types within the State of Montana section. Harvest treatments for units C1 and C2 would be selection harvests focusing on leaving approximately 25 to 30% of the stand as individual seed trees or small clumps of trees. Unit T1 would be an eight-acre clearcut harvest and unit T2 would have small clearcuts interspersed with residual clumps of submerchantable trees and individual seed trees. These treatments scattered across a landscape would emulate natural small-scale disturbance events. Harvest treatments would reduce the likelihood of stand replacement events from occurring by reducing stand susceptibility to insect and disease infestations and reducing fuel loads of the treated stands. Minor cumulative effects of shifts in age class distribution would be expected at the watershed level. The shifts would be towards age classes more typical of historic conditions.

4. Insect and Disease

Under the No Action alternative all stands would be susceptible to Western Spruce budworm, Douglas-fir beetle or dwarf mistletoe infestations due to overstocked and/or multi-story conditions.

The Action alternative would reduce the potential of infestation in the harvested units with post treatment stands being less susceptible since primarily healthy, open stands would remain.

Open stands where tree growth and vigor is encouraged and a variety of age classes are developed are more resistant to spruce budworm infestations (Carlson et al. 1983).

5. Successional Stages

The No Action alternative would result in continued succession toward a climax vegetation condition unless fire or other disturbance intervened to move succession back to the non-stocked and seedling/sapling stage.

The Action alternative would essentially convert 60 acres of Douglas-fir and Subalpine fir/lodgepole, distributed over 4 units, to a non-stocked/seedling stage.

6. Old Growth

Since no old growth stands occur within the proposed project area, there would be no effects on old growth. Relics, snags and coarse woody debris, which are important attributes associated with old growth and future development of old growth, would be retained where they don't present safety hazards.

7. Noxious Weeds

Under the No Action alternative, noxious weeds may become established on 4 wheel drive roads and onto dry vegetation sites by vehicle or animal use, depending on the weed control efforts of the grazing lessee.

The Action alternative would involve ground-disturbing activities that have the potential to introduce or spread noxious weeds in susceptible habitat types. An Integrated Weed Management (IWM) approach, combined with prevention and revegetation, is considered the most effective weed management treatment. To reduce the possible introduction and spread of weeds associated with this project; mitigation measures to address the management of weeds are included in Chapter II – C.1. "Mitigation Measures For Action Alternative".

8. Transportation/Roads

Under the No Action alternative, road densities for the analysis areas would remain at 1.48 miles per square mile.

The implementation of the Action alternative would increase the road density to 1.54 miles per square mile (based on watershed analysis area).

9. Recreation

Since non-motorized recreational activities are allowed on the State of Montana tract and public access is provided either by crossing the adjoining BLM or private ownership, the proposed Action alternative would not affect the recreational status of the section.

10. Grazing

The Action alternative would not affect the grazing lease that is currently established on the State tract.

11. Mining

The Action alternative would not affect the prospecting leases that are currently established on the State tract.

12. Cultural Resources

Since no cultural resource sites will be impacted and no additional investigative work is recommended there would be no effects expected from the initiation of the Action alternative as proposed.

13. Aesthetics

Since the remote location of the proposed project is not visible to any populated area, the initiation of the Action alternative would not affect the visual quality.

14. Economics

Economic Assumptions:

a) Costs and revenues are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

b) The estimated stumpage value equals the delivered log prices minus costs and an amount for profit and risk. Costs include logging costs, haul costs, forest improvement (FI) fees,

development costs, and other costs (e.g., road maintenance). Profit and risk is the return to timber buyer that accounts for actual time and effort, some profit for entrepreneurial spirit, and something to cover the expected losses on an occasional sale that is not profitable.

TABLE IV – 1: Estimated Stumpage $/MBF for Action Alternative

	Action Alternative
Delivered Log Prices	$ 460.00
*Logging Cost $/MBF	$ 184.88
Haul Cost $/MBF	$ 83.75
Development Cost $/MBF	$ 64.31
FI Fee $/MBF	$ 12.80
Profit & Risk (5% of Delivered Log Prices)	$ 21.50
**Estimated Stumpage $/MBF	$ 92.76

*Cost based on weighted average of tractor and cable harvest volumes and mobilization costs.

**These estimates of stumpage values assume that the new road construction on the BLM ground would be obliterated. If this is not required, the estimated stumpage would equal $93.97 $/MBF.

c) The estimated gross revenue to the trust is calculated by multiplying the estimated stumpage price by the estimated volume. The state also collects money for Forest Improvement (FI). The estimated total collected FI equals the FI fee rate multiplied by the estimated volume. The following table displays the estimated revenue to the state from this proposed sale.

TABLE IV – 2 Estimated Gross Revenue to the Trust and Total Collected Forest Improvement (FI) Fee for Action Alternative

	Action Alternative
Est. Total Volume (MBF)	530
*Est. Gross Revenue to the Trust	$ 49,163
Est. Total Collected FI fee	$ 6,784

*These estimates of gross revenue to the trust assume that the new road construction on the BLM ground would be obliterated. If this were not required, the gross revenue to the trust would equal $49,804.

Table IV – 3: Analysis Areas Data Summary of Affects

	Total Area (Acres)	Total Forested Area	% of Total Area Affected	% of Total Forested Area Affected
			Action Alternative	Action Alternative
Watershed Area	22,235	10,154	0.3%	0.6%
Wildlife Area	5,760	3,957	1.0%	1.5%
Project Area Section 16	640	445	9.4%	13.5%

C. *Water Quality, Water Yield and Soils*

1. Effects to Water Quality:

Harvest units can directly impact water quality if not properly located or buffered. The risk of impacts is greatest along streams, wetlands and lakes. The Streamside Management Zone (SMZ) Law regulates forest management activities that occur adjacent to streams, lakes or other bodies of water.

Under the No Action Alternative, existing substandard roads with inadequate surface drainage and buffer zones may continue to impact water quality and downstream beneficial uses unless mitigation and remedial actions are undertaken.

Under the Action Alternative, proposed harvest activities are expected to have minimal impacts to the SMZ, provided all requirements of the law are met.

Portions of the sale area are drained by ephemeral draws, swales and wet areas that lack discernable stream channels. Equipment restrictions and designated crossings would minimize impacts and help protect all wet areas and ephemeral draws.

All new roads constructed on BLM ownership would be recontoured and seeded. Extent and timing of this obliteration would be based on the conditions of the access permit. Table IV – 4 summarizes the proposed activities of the Action alternative.

TABLE IV – 4

BROWNS GULCH PROPOSED TIMBER SALE
Proposed Activities

Alternative	Proposed Harvest Acres	Total Road Reconstruction	Total New Road Construction	Temp. Road Construction*
Action	60	0.8	2.1	0.2

*All temporary roads will be recontuored and seeded at the end of the sale.

The proposed new road construction is considered to have minimal risk to water quality and beneficial uses, provided site-specific design and mitigation measures are met. Otherwise, the risk of adverse impacts and inoperable conditions may occur. Proper application of BMP's and site-specific design and mitigation measures would reduce erosion and potential water quality impacts to an acceptable level as defined by the

water quality standards. Acceptable levels are defined under the Montana Water Quality Standards as those conditions occurring where all reasonable land, soil and water conservation practices have been applied.

Some short-term impacts to water quality may occur due to sediment induced at stream crossing ephemeral draw bottoms during or shortly after new road construction activities. Risk of impacts occurring during new stream crossing installations would be minimized provided site specific design recommendations from DNRC Hydrologist, Soil Scientist and MDFWP Fisheries Biologist are met. All stream crossing sites are subject to approval from MDFWP through the 124 permitting process required under the Montana Stream Protection Act.

Approximately 4 miles of existing low standard road under BLM jurisdiction provide partial access to the proposed project area. The recommended improvements to these road segments from DNRC Hydrologist and Soil Scientist are expected to minimize impacts during the proposed activities as well as reduce long-term sediment erosion and delivery.

2. Cumulative Watershed Effects:

The No Action alternative would not contribute to cumulative watershed effects.

For the Action Alternative, results from the cumulative effects analysis show that projected harvest levels are below those levels normally associated with detrimental water yield increases and channel impacts. The proposed harvest comprises 0.3% of the total watershed analysis area, increasing the total cumulative harvested area to approximately 6.9%. It is unlikely that this level of harvest would contribute to detectable increases in water yield or have any measurable influence on downstream channel conditions (USFS, 1974).

The proposed activities have the potential to increase sediment input into the affected stream channels during the short-term. However, recommended mitigation measures aimed at recontouring and seeding new temporary roads, stabilizing existing roads, implementation of the Watershed Resource Management Standards (RMS) outlined in the State Forest Land Management Plan (SFLMP) and application of the SMZ Law and Rules would minimize long-term sediment yield impacts. The results of the analysis are summarized below in Table IV – 5.

TABLE IV – 5:

BROWNS GULCH PROPOSED TIMBER SALE Cumulative Effects Analysis (Watershed Analysis Area)				
Alternative	**Cumulative Harvest (acres)**	**Cumulative Harvest**	**Cumulative Road Miles**	**Cumulative Road Miles (Following Recontouring)**
Action	1,518	6.9%	53.4	53.2

There is little risk of cumulative watershed impacts occurring from this sale proposal due to the following reasons:

- The moderate level of existing development activity in the watershed area.
- The majority of the existing harvests are selective or partial crown removal or have good regeneration established.
- The low level of additional crown removal and potential water yield increase that would be generated by the proposed actions.
- Existing cumulative watershed impacts appear to be limited to sedimentation resulting from poor road location and design, high run-off or flood events and cattle grazing.
- The proposed improvements to the existing road system on state land will benefit long term water quality and watershed conditions.
- The stands prescribed for treatment are overstocked stands due to fire suppression and forest encroachment in rangeland.
- All new road construction would be closed through recontouring and seeding or slashed and seeded, depending on ownership.

3. Effects on Cold Water Fisheries:

The No Action alternative would continue to impact cold water fisheries habitat through increased bank instability, erosion and sedimentation due to the current grazing plan and substandard road systems.

The proposed activities have the potential to increase sediment input into the affected stream channels during the short-term. However, recommended mitigation measures aimed at recontouring and seeding new temporary roads, stabilizing existing roads, and riparian tree retention will minimize long-term impacts to water quality and fish habitat.

It is unlikely that the proposed actions will impact shade, temperature or large woody debris recruitment of fisheries streams. No harvest activities are proposed adjacent to any known fish bearing streams. No SMZ harvest is proposed for this sale.

Best management practices, Fisheries and Watershed Resource Management Standards outlined in the SFLMP and site specific design recommendations of DNRC hydrologist and soil scientist would help minimize the potential impacts of the proposed action on the cold water fisheries in the affected streams.

Operations conducted near draw features or stream channels and on steeper slopes have a higher risk of impacting water quality. Chapter II – C.1. "Mitigation Measures For Action Alternative" includes measures that would help minimize risk of impacts during the proposed activities. These mitigation measures are standard practices that may be applied to all harvest activities associated with the proposed Browns Gulch Timber Sale.

4. Effects on Soils

The No Action alternative would have some continued effects on soil resources. Segments of the existing Browns Gulch road have sources of sedimentation associated with inadequate road drainage and past high flow events. Existing roads will continue to erode without maintenance. Sedimentation is a soil-related effect, which is discussed in the hydrology section.

For the Action alternative, the primary soil concerns are potential displacement and erosion associated with road construction and harvest operations. Potential site impacts are difficulty with regeneration, reduced site productivity and increased runoff and erosion. Susceptibility to impact varies with soils type, harvest method, type of equipment and season of use.

An extensive field review was conducted across the project area. Most sensitive soils are wet sites and steep slopes which will be avoided or

protected through implementation of BMP'S and mitigation measures of Soil Scientist and Hydrologist to maintain productivity and protect soil and water resources.

For the Action alternative, existing and new roads will have adequate road drainage installed and new roads will be stabilized by grass seeding. Road obliteration or physical closures will be utilized to prevent use by vehicles on temporary roads on the State tract. The type and location of road closures on access roads across adjacent ownerships will depend on R/W permit requirements.

Cable harvesting will have negligible effects on soils. Tractor skidding would be limited to acceptable slopes of less than 45% and skid trail planning will further limit the area of disturbance and damage to the residual stand and soils.

Cumulative effects to soil productivity:

Cumulative effects could occur from repeated entries into the harvest area. There are some old harvest and skid trails in the proposed tractor harvest units associated with past mining with little cumulative effects on soils. A proportion of large woody debris will be retained to sustain nutrient cycling and long term productivity.

Planned skidding and slash disposal mitigation measures would limit the area impacted and therefore presents low risk of cumulative effects to soils, assuming future stand entries would likely use existing trails and landings.

Chapter II – C.1. "Mitigation Measures For Action Alternative" includes measures that would help minimize risk of impacts to soils during the proposed activities. These mitigation measures are standard practices that may be applied to all harvest activities associated with the proposed Browns Gulch Timber Sale. Recommended site-specific, contract design mitigation measures would be provided following the selection of an alternative.

D. *Big Game Winter Range, Elk Security and Vulnerability*

1. Effects on Big Game Winter Range:

No Action Alternative:

Under this alternative cover in the State section would not be dramatically altered over the short-term. Existing stands would continue to provide good thermal cover for elk, which would provide the greatest benefit to them in winter.

Action Alternative:

Under this alternative, ~60 acres of cover would be removed, reducing that which would be available to elk during winter. Approximately 204 acres of dense mature forest (~70% canopy closure) would remain unharvested that would provide thermal protection and hiding cover in winter and an additional 181 acres of open forest (~20-69% canopy closure) would remain untreated. Reducing ~60 acres of cover would represent a minor cumulative reduction within the wildlife analysis area. Following treatment, approximately 2,285 acres (40%) of dense, mature forest and 2,231 acres (39%) of open forest would remain within the 5,760 acre analysis area (9 sections). The remaining 21% of the analysis area is comprised of grassland habitats. Livestock grazing would continue on the project area, however, no appreciable changes in livestock use or distribution would be anticipated. Any indirect or cumulative impacts to elk that resulting from cover removal would be localized and minor and would likely not be detectable in the population at the Hunting District level. Indirect effects, such as disturbance and displacement as a result of harvest activity would not be expected, as harvest operations would generally be restricted to the summer and fall months.

2. Effects on Elk Security and Vulnerability

No Action Alternative:

Under this alternative, no immediate change from the present condition would occur. Elk hiding cover and access would remain essentially unchanged. Over time and in the absence of wildfires, conifer cover would continue to expand into non-forested grasslands, further increasing amounts of hiding cover and size of potential security blocks. Selection of

this alternative would provide the lowest risk of increasing elk vulnerability over the short term and over the long term (>20 years) in the absence of wildfires and other natural disturbance agents. Subsequently, hunter opportunity would have the least risk of being impacted under this alternative.

Action Alternative:

Under the Action alternative, ~60 acres of hiding and escape cover would be removed within four treatment areas, reducing that which would be available to elk during the general hunting season. In conjunction with harvest activities, new roads and road segments would have key portions obliterated and re-contoured to minimize the potential for increased motorized access from existing levels. Approximately 204 acres of dense, mature forest (~70% canopy closure) would remain unharvested that would provide escape and screening cover, and an additional 181 acres of open forest (~20-69% canopy closure) would remain untreated. These patches would remain connected to other adjacent stands on BLM ownership, thus maintaining greater effective size. Reducing ~60 acres of cover would represent a minor cumulative reduction within the wildlife analysis area. However, minor proportional increases in elk vulnerability could be expected (both localized and cumulative). This could result in a minor adverse cumulative effect by increasing the difficulty that DFWP would have in meeting their Elk Plan objective for maintaining 1st-week bull harvest below 40-45% during the first week of the general big game hunting season. Following treatment, approximately 2,285 acres (40%) of dense, mature forest and 2,231 acres (39%) of open forest would remain within the 5,760 acre wildlife analysis area. The remaining 21% of the analysis area is comprised of grassland habitats. Livestock grazing would continue on the project area, however, no appreciable changes in livestock use or distribution would be anticipated, nor would effects related to elk security. Any indirect or cumulative impacts to elk that resulting from cover removal associated with this proposal would be minor, and would likely not be detectable in the population at the Hunting District level. Any potential direct disturbance or displacement of elk during hunting season would be minor and of short duration (i.e., one operating season).

Quality of cover that would remain post-treatment across the 385 acres of forested habitat in section 16 would be similar to that found within the harvest units. Proposed treatments would be moderate to intensive, and most would remove ~76% of the existing timber volume. Overstory canopy closure would be removed by a similar amount. About 100% of

the existing volume would be removed in harvest unit T1, which would resemble an eight-acre clearcut following treatment. Timbered stands occurring on these and other similar sites were historically distributed in a patchy, fragmented condition (Gruell 1983). No cover capable of functioning as hiding cover would be retained within the units post-harvest and cover would likely not be represented on these sites for ~30 years. The proposed harvest would result in loss of hiding cover important for elk, which would result in a low increase in elk vulnerability in the immediate area. Loss of hiding cover would be expected to result in minor cumulative increases in vulnerability. Elk using the project area at the time of road construction and active logging would be likely be displaced to other habitats with less disturbance for the duration of the activity.

Within the 22,235 acre watershed analysis area, road density is presently ~ 1.48 miles per square mile. Road construction proposed would increase road density to ~ 1.54 miles per square mile. Should roads be obstructed and rendered unusable following use for harvest activities, the functional road density would remain at about 1.48 miles per square mile. Existing forested acres within the analysis area were estimated at ~10,154. About 1,458 acres of additional forest were harvested between 1985 and 2001. Following the proposed harvest, the remaining acres of forest would be reduced to ~10,094 acres and total acres harvested would be increased to ~1,518 acres (6.8%) in the analysis area. None of these acres would be considered to provide or contribute to secure elk cover following harvest.

The proposed harvest would occur in stands from existing edges of three relatively distinct forest patches. An increase in edge to patch area ratios would occur, effectively creating some additional edge habitat. This increase would be minor due to the size and location of the harvest in relation to existing forested patches. No known wildlife corridors of notable importance would be affected by the proposed activities.

3. Cumulative Effects:

Harvesting of timber has occurred on nearby BLM and private lands and could continue into the future. The proposed State harvest would contribute cumulatively to reductions of mature forest cover that have occurred since ~1985. While the harvested acreages proposed are

relatively small, they would cumulatively contribute to minor increases in elk vulnerability, winter range effectiveness and fragmentation. Livestock

grazing also occurs on section 16 and the surrounding parcels, however, measurable adverse effects associated with timber management and

grazing in combination are not anticipated. Harvesting in section 16 in a manner that emulates natural disturbance processes would be expected to have a minor positive cumulative influence on ecosystem integrity on these sites that were sparsely forested under natural disturbance regimes. Minimal cumulative influences on access would be anticipated following road obliteration efforts.

The access route to the proposed project area would require 2.1 miles of new road construction. Open road densities are already high and cover capable of providing security is minimal in this area. No treatments would occur in stands within the State ownership that meet the Hillis et al. (1991) definition of security cover. Consequently, security cover for elk would not be affected measurably. The access route, if left open following use, however, would increase elk vulnerability in the area. The actual extent of increase is uncertain as many factors can influence vulnerability (e.g. size, extent and juxtaposition of security areas and migration corridors; type, structure, amount and density of vegetation; road density; ease of human accessibility, hunting pressure, hunting regulations, and hunter behavior, etc.) (DFWP 1992:8). Variations in weather conditions from year to year can also influence elk vulnerability. However, elk that might use this area would likely have a greater potential for vulnerability if the route were to remain accessible. By implementing mitigation efforts such as obliterating/recontouring the road surface, scattering slash and seeding, motor vehicle and foot travel on this route would dramatically decrease. An expected "no effect" post treatment can result from such efforts if use of a newly constructed road is made as difficult or more difficult to negotiate than adjacent unroaded areas.

E. *Threatened, Endangered and Sensitive Species*

To display and address the issues of T & E and Sensitive Species the following Fine Filter Wildlife Checklist for the Central Land Office is presented.

CHECKLIST FOR ENDANGERED, THREATENED AND SENSITIVE SPEICES
CENTRAL LAND OFFICE

Threatened and Endangered Species	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Bald Eagle (*Haliaeetus leucocephalus*) Habitat: late-successional forest <1 mile from open water	[N] The nearest potential nesting and roosting habitat occurs along the Ruby River and Ruby Reservoir, which are located about 6 miles west of the Browns Gulch parcel. No nesting habitat occurs on, or within one mile of the project area, and the project area likely occurs outside of any bald eagle nesting home range. Thus, no direct, indirect or cumulative effects to bald eagles associated with this project are anticipated.
Canada Lynx (*Felis lynx*) Habitat: mosaics—dense sapling and old forest >5,000 ft. elev.	[N] Suitable lynx habitat is potentially present in the Gravelly Mountains (MNHP 2001). However, habitats high in coarse woody debris that are preferred for denning and large acreages of dense conifer regeneration at high elevations that are preferred for foraging are not present in the project area. Within the cumulative effects analysis area, lynx habitat is marginal due to natural and human induced fragmentation, and the high level of interspersion of native grassland habitat and dry forest types. Lynx could occasionally use the project and analysis areas. However, due to the small number of acres of subalpine fir type (28 acres) that would be treated and generally low suitability of habitat in the cumulative effects analysis area, direct, indirect or cumulative impacts to lynx would not be expected to occur as a result of this project.

Grizzly Bear (*Ursus arctos*) Habitat: recovery areas, security from human activity	[N] The project area lies outside of any grizzly bear recovery area. The nearest recovery area is the Yellowstone Grizzly Bear Recovery Zone (USFWS 1993) situated approximately 35 miles southeast of the project area. The project area is comprised of dry forest and mixed forest-grassland habitats that tend to be used by bears infrequently. Transient use of the Gravellys occurs occasionally (R. Wiseman USFS Bio. pers. comm. September 23, 1999), and 27 bear observations occurring within 20 miles of the project area have been documented since May 1985 (USFS unpubl. data 9/29/99). No recent, frequent sightings of bears have been documented for this area. Riparian habitats preferred by bears occur in the cumulative effects area along Barton Gulch (just south of the Brown's parcel). This creek supports low levels of hiding cover and major portions are paralleled within ~ 100 ft. by an open road rendering the habitat poorly suited for use by bears. No sightings have been documented within these drainages since 1985 and human access levels are presently high. Approximately 2 miles of new road would be constructed to low standard. All new roads would be blocked at suitable locations following treatment to minimize the potential for newly created access that could further reduce existing levels of security. Methods that would be incorporated for blocking roads would include spot obliteration and recontouring (i.e., sections of at least 150 feet) at 4 locations, culvert removal at 3 locations and slash distribution at select sites on the road surface. The potential for any measurable increases in bear-human conflicts following harvest and road construction activities under the Action Alternative are expected to be low. Adverse direct, indirect and cumulative impacts to bears as a result of this project are expected to be minimal.

Gray Wolf (*Canis lupus*) Habitat: ample big game pops., security from human activity	[N] The project area falls within the Yellowstone Nonessential Experimental Area for gray wolves. Members of the Freezeout Pack may occasionally use portions of the project area or cumulative effects analysis area, however, the majority of documented activity has occurred >5 miles to the south (J. Fontaine, USFWS Biologist Pers. Comm. 1/31/02). Due to the size and nature of the proposed harvest, activities associated with this proposal are not expected to effect wolves or recovery efforts (J. Fontaine, USFWS Biologist Pers. Comm. 1/31/02). Should a new den be located within one mile of any proposed harvest units, activities would cease and a DNRC Biologist would be contacted immediately. Mitigations would then be developed and implemented to minimize adverse impacts to wolves prior to initiating harvest activity.

DNRC Sensitive Species	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Flammulated Owl (*Otus flammeolus*) Habitat: late-successional ponderosa pine and Doug.-fir forest	[Y] Breeding flammulated owls have been documented within the latilong (L38) that the project area lies within (Skaar 1996). Dry Douglas-fir cover types and stands containing old Douglas-fir relics on southerly exposures occur in the project area and cumulative effects analysis area that could potentially be usable by flammulated owls. However, usable existing snags are in relatively low abundance (<1/ac) in stands occurring in the project area. Within the cumulative effects analysis area on private and BLM lands, other potential patches of habitat tend to be small (<100 acres) and fragmented due to natural vegetation patterns and past logging and mining activity. About 32 acres 0f potentially suitable flammulated owl habitat would be harvested under this proposal. Approximately 80 acres of potential habitat would remain untreated in the project area. Proposed treatments in the potential habitat would likely reduce the density of mature trees to levels not preferred by flammulated owls. Thus, minor adverse indirect and cumulative effects to flammulated owls as a result of this project would be anticipated

Boreal Owl (*Aegolius funereus*) Habitat: mature to late-successional forest >5,200 ft. elev.	[N] The parcel involved in this project maintains elevations that range from about 7,700-8,500 feet, which are within the elevational range frequently used by boreal owls. However, cool, structurally diverse, spruce-fir habitats at latter stages of development, which are preferred by boreal owls do not occur within the project area. Dry Douglas-fir and lodgepole stands found within the project area are too warm and limited structurally to provide adequate habitat for boreal owls. No direct, indirect or cumulative impacts to boreal owls would be expected to occur as a result of this project.
Black-Backed Woodpecker (*Picoides arcticus*) Habitat: mature to old burned or beetle-infested forest	[N] Black-backed woodpeckers have been documented within the latilong (L38) that encompasses the project area (Skaar 1996), and are known to occur in the Tobacco Root Mountains (USFS 1999). However, stands found within the project area are not presently experiencing substantial insect activity, and no recent burns (≤5 years old) occur within the section or cumulative effects analysis area. Thus, foraging and nesting opportunities are presently limited. No direct, indirect or cumulative effects to black-backed woodpeckers would be expected to occur as a result of this project.
Pileated Woodpecker (*Dryocopus pileatus*) Habitat: late-successional ponderosa pine and larch-fir forest	[N] Pileated woodpeckers have not been reported for the latilong that encompasses the project area (Skaar 1996). The project area is poorly suited for use by pileated woodpeckers. As suitable habitat is not present in the project area or cumulative effects analysis area, no impacts to pileated woodpeckers would be expected to occur as a result of this project.
Northern Bog Lemming (*Synaptomys borealis*) Habitat: sphagnum meadows, bogs, fens with thick moss mats	[N] No sphagnum meadows or bogs occur in the project area. Thus, no impacts to bog lemmings would be expected to occur as a result of this project.
Peregrine Falcon (*Falco peregrinus*) Habitat: cliff features near open foraging areas and/or wetlands	[N] No extensive cliff features or suitable foraging areas occur within 1 mile of the project area. No direct, indirect or cumulative effects associated with this project are anticipated.
Harlequin Duck (*Histrionicus histrionicus*) Habitat: white-water streams, boulder and cobble substrates	[N] Breeding harlequin ducks have been found in this latilong (Skaar 1996), however, no high gradient streams suitable for use by harlequins occur within the project area or along proposed haul routes. No impacts to harlequin ducks would be expected to occur as a result of this project.

Ferruginous Hawk (*Buteo regalis*) Habitat: prairies and badlands	[N] Breeding ferruginous hawks have been documented within the latilong that encompasses the project area. However, badland habitats and areas with small buttes and bluffs that are preferred nesting sites do not occur on or within one mile of the project area. However, ferruginous hawks may occasionally forage in the vicinity or potentially nest in grasslands found within the project area. As preferred nesting habitat does not occur on or within one mile of either parcel included in this proposal, no localized or cumulative impacts to ferruginous hawks are expected. However, should any ground-nesting hawks be observed within 400 meters of proposed haul routes or active harvest units, harvest activities would cease and a DNRC biologist would be contacted immediately by the sale administrator. Site-specific mitigations would then be designed to protect the nest site if nesting ferruginous hawks are detected
Mountain Plover (*Charadrius montanus*) Habitat: short-grass prairie, alkaline flats, prairie dog towns	[N] No short-grass prairie or prairie dog towns occur on, or within one mile of the project area. No impacts to mountain plovers are expected as a result of this project.
Townsend's Big-Eared Bat (*Plecotus townsendii*) Habitat: caves, caverns, old mines, large-hollow snags	[N] Several mines occur in the vicinity of the Browns and Granite parcels. However, DNRC is unaware of any mines on these parcels or close vicinity that would be suitable for use by Townsend's big-eared bats. Thus, impacts to Townsend's big-eared bats are not anticipated as a result of this project.

LIST OF INDIVIDUAL SCOPING NOTICES

Friends of the Wild Swan, Swan Lake, MT
Greater Yellowstone Coalition, Bozeman, MT
MT Ecology Center, Missoula, MT
Alliance for the Wild Rockies, Missoula, MT
American Wildlands, Bozeman, MT
National Wildlife Federation, Missoula, MT
Montana Audubon Council, Dillon, Helena and Condon, MT
Montana Wilderness Association, Helena, MT
Salmon Intermountain, Salmon, ID
Headwaters Sierra Club, Bozeman, MT
American Fisheries Society, Bozeman, MT
Pintlar Audubon Society, Twin Bridges, MT
MWF, Helena, MT
Beaverhead Concerned Citizens, Butte, MT
Anaconda Sportsmen, Anaconda, MT
Skyline Sportsmen's Assoc. Inc., Butte, MT
Montana Coalition for Appropriate Management of State Lands, Butte, MT
Tribal Historic Preservation Office, Pablo, MT
U S Department of Interior, BLM, Dillon and Butte, MT
USFS – Madison Ranger District, Ennis, MT
MT Dept of FW & P, Wildlife Biologist, Bozeman and Sheridan, MT
Matador Ranch, Dillon, MT
Wood Three Creek Ranches, Sheridan, MT
Easton Pacific/Sauerbier Ranches, Inc., Alder, MT
Doggett Ranches, Alder, MT
Norwest Capital Mgnt. & Trust, Great Falls, MT
Gilman I H Cattle, Lessee, Alder, MT
Max & Terri Moltich, Sheridan, MT
James & Robert Bowling, N. Miami, FL
Stuart Lewin, Great Falls, MT
Hanover Gold, Veradale, WA
Bill Armstrong, Dillon, MT
Elizabeth Brann & Dan Svoboda, Dillon, MT
Jackie Foster, Dillon, MT
Clayborn J. Anders, Missoula, MT
Graeme Mc Dougal, Dillon, MT
Don & Darrell Goodman, Dillon, MT
Allan Crail, Shelly, ID

Leonard Sargent, Bozeman, MT
Charles Boling, Dillon, MT
Glenn Hockett, Bozeman, MT
Mrs. Hans Andersen, Dillon, MT
Keith Andersen, Dillon, MT
Jim Phelps, Billings, MT
Calvin & John Erb, Dillon, MT
Doug Webber, Missoula, MT
Louise Bruce, Dillon, MT
Monty Hankinson, Dillon, MT
Bill Allen, Dillon, MT
Montana Logger Association, Kalispell, MT
Louisiana Pacific Corporation, Belgrade and Deerlodge, MT
R-Y Timber Inc., Townsend and Livingston, MT
Mt. Wood Products Association, Helena, MT
Plum Creek Timber Co., Columbia Falls, MT
F H Stoltze Land & Lbr., Columbia Falls, MT
Montana Eastside Forest Practices Committee, Bozeman, MT
Lumber Products, Dillon, MT
Weyerhauser Co., Kalispell, MT
DNRC Archaeologist, P. Rennie
DNRC Soil Scientist, J. Collins
DNRC Hydrologist, G. Mathieus
DNRC Wildlife Biologist, R. Baty
DNRC Agriculture & Grazing, K. Chappell

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LIST OF PREPARERS

Chuck Barone	Forester, DNRC Dillon
Rick Strohmyer	Unit Manager, DNRC Dillon
Ross Baty	Wildlife Biologist, DNRC Missoula
George Matheius	Hydrologist, DNRC Missoula
Jeff Collins	Soils Scientist, DNRC Missoula
Patrick Rennie	Archaeologist, DNRC Helena
Garry Williams	Forest and Lands Manager, DNRC Helena