Papa Cow Timber Sale
Environmental Assessment

EA# OR118-02-020

October 2002

Proposed agency actions: A series of projects proposed to assist in meeting the land use objectives identified in the Medford District BLM Resource Management Plan. The primary purpose for this proposal is to produce commercial timber.

Type of statement: Environmental Assessment

Lead agency: U.S. Department of Interior
Bureau of Land Management
Medford District, Glendale Resource Area

Abstract: This Environmental Assessment analyzes the effects of a proposed timber sale in the Middle Cow Creek watershed, approximately 5 miles west of the town of Glendale, in Douglas County, Oregon.

The primary purpose for this proposal is to produce commercial timber, one of the stated objectives in the RMP for General Forest Management Lands. Other purposes for aspects of this proposal are described in the "Objectives" section of this document. The primary objectives included: (1) harvest timber economically; (2) increase or maintain connectivity for species associated with late-successional habitat; (3) improve forest health through density management of overstocked stands; (4) maintain and enhance pine components and other species diversity; (5) reduce soil compaction on existing tractor skid trails; (6) reduce the risk of catastrophic fires; (7) minimize adverse effects of timber harvest on fish, wildlife, and other resources; (8) reduce stream sedimentation from roads and; (9) maintain and stabilize roads.

Three action alternatives were developed and analyzed and compared to the No Action Alternative. The three action alternatives would harvest timber, with differences in the number of proposed harvest units and road work to be performed. Alternative 1 was identified as the Preferred Alternative. Under this alternative, approximately 140 acres would be harvested, producing approximately 613,000 board feet of timber.

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Chapter 1 - Purpose and Need

1.0 Introduction

The Glendale Resource Area proposes a series of projects to assist in meeting the land use objectives identified in the Medford District BLM Resource Management Plan (RMP) dated April 14, 1995. An interdisciplinary team was convened to develop objectives, design the actions to meet the objectives, and to analyze the potential impacts to the human environment.

1.1 Purpose and Need

The primary purpose for this proposal is to produce commercial timber, one of the stated objectives in the RMP for General Forest Management Lands. Other purposes for aspects of this proposal are described in the "Objectives" section of this document.

1.2 Project Objectives

1. Harvest timber economically.
2. Increase or maintain connectivity for species associated with late-successional habitat.
3. Improve forest health through density management of overstocked stands.
4. Maintain and enhance pine components and other species diversity.
5. Reduce soil compaction on existing tractor skid trails.
6. Reduce the risk of catastrophic fires.
7. Minimize adverse effects of timber harvest on fish, wildlife, and other resources.
8. Reduce stream sedimentation from roads.
9. Maintain and stabilize roads.

1.3 Plan Conformance

This Environmental Assessment (EA) is tiered to the Medford District RMP/EIS. One of the stated objectives in the RMP for General Forest Management Lands is to produce commercial timber which states, "Produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability" (p.38).

1.4 Decisions to be Made

The Glendale Resource Area Field Manager will:

1) Select the Preferred Alternative or an alternative.
2) Determine whether the selected alternative would have significant effects and whether or not to prepare an environmental impact statement.
3) Determine whether the selected alternative is consistent with the Resource Management Plan.

1.5 Issues of Concern

Issues for the project area were identified by the interdisciplinary team with the benefit of input from the public and other agencies. This Environmental Assessment (EA) focuses on these issues, both in terms of project design features (PDFs) and under Critical Elements where these issues are described.

For the Papa Cow project area, the issues identified for this environmental assessment were:

1. <u>Roads</u>
   This proposed project could increase road densities.

2. <u>Fish/stream/riparian</u>
   The timber harvest related activities could have an effect on streams and riparian zones. Oregon Coast coho salmon (ESA threatened species) and Oregon Coast Steelhead (ESA candidate species) inhabit the project area.

3. <u>Late Successional Habitat and fragmentation</u>
   Timber harvest may fragment and remove late-successional forest, affecting several species associated with that habitat.

4. <u>Large down wood</u>
   Timber harvest may reduce large down wood and affect the species associated with that habitat feature.

5. <u>Forest health</u>
   Forest health and stand vigor appears to be declining in some areas as dense stands of Douglas fir and brush have become established.

Chapter 2 - Alternatives

2.0 Introduction

This chapter describes the alternatives under consideration. Descriptions focus on potential actions, outputs, and any related mitigation. This environmental assessment addresses activities through the time when stands are considered stocked and established.

2.1 Alternative 1: Preferred Alternative

The Glendale Field Office proposes to harvest timber in portions of: T32S, R7W, sections 15, 17, 20, and 21.

Under Alternative 1, timber harvest would occur in eight units covering 140 acres. Approximately 600,000 board feet (600 MBF) of commercial timber would be produced. There would be no permanent road construction. Summaries of the proposed harvest and treatments are presented in Tables 2-1 and 2-2. More detailed descriptions of proposed harvest and reforestation treatments can be found in the silvicultural prescription. Locations of the units are shown on the map in Appendix C. Road treatments are summarized in Table 2-3.

Timber harvested through regeneration harvest (RH) would generally leave at least 6-8 large conifers and 3 large hardwoods per acre where present, as well as snags and down logs to provide biological legacies and large structure in the regenerating stands. The number of trees, snags, or down wood would vary among harvest units to provide for coarse woody debris where it currently does not meet standards and guidelines. Regeneration Harvest units would be burned if evaluation after yarding determines that further treatment is needed to provide space for planting, control competing vegetation, or reduce fuel loads. This treatment would be followed by planting with conifer seedlings.

In Commercial Thin (CT) units, existing stands would be thinned. The objective of the CT treatment would be to concentrate growth onto residual trees left after harvest.

The Commercial Thin/Select Cut prescription for unit 13 would be similar to a commercial thin harvest, but in addition to canopy cover/spacing guidelines, larger trees displaying signs of imminent mortality would be harvested. This would include signs of severe stress from factors such as lack of moisture, insects, disease and mistletoe.

Density Management/Commercial Thin treatments would aim to release dense, conifer components of younger stands by thinning dense patches of conifers, and disposing of the resulting slash. Another purpose is to reduce competition around larger pines and Douglas firs. In most cases density management treatments would be irregular since the vegetative components are not distributed evenly on the ground. Commercial products would be removed as conifers greater than six inches dbh are thinned. This material would be removed using

tractor, helicopter, and cable systems (see table 2-1 for specific treatments by unit).

Following harvest, many of the units would receive site preparation treatments specified in Table 2-1. Regeneration harvest units would be reforested using planted nursery stock. Additional treatments, such as shade-carding, mulching, providing browse protection and controlling competing vegetation would be done as needed to ensure adequate establishment of the next forest stand.

Table 2-1. Summary of Harvest Units for Action Alternatives for the Papa Cow Timber Sale.

Unit No.	Silviculture stand number	Acres	Harvest/ Treatment System	Yarding System (2)	Fuels Mgmt/ Site Prep (3)	Estimated Vol/acre (MBF)	Estimated Vol (MBF)	Alternative 1.	Alternative 2.	Alternative 3.
4	32-7-15-6	48	DM/CT	PS/H	HP	2	96	X	X	X
5	32-7-15-7a Deferred from all alternatives due to Riparian Reserves and S&M buffers	12	DM/CT	H	HP	2	24			
6	32-7-15-7b	12	DM/CT	PS	HP	2	24	X	X	X
8B	32-7-17-12a	7	RH	PS	B	8	56	X	X	X
9A	32-7-17-12b	12	RH	PS	B	15	180	X	X	X
11	32-7-20-1a and 32-7-17-12b	13	CT	PS	HP	5	65	X	X	X
13	32-7-20-2	6	CT/SC	TR	SI(B),HP	4	24	X	X	X
16	32-7-20-3	11	CT	TR	HP	4	44	X	X	X
18B	32-7-21-7	30	CT	TR/PS 20 ac/10ac	HP	4	124	X	X	X
27	32-7-23-1-1 Defer from sale.	16	RH	PS	Sl(B), B	10	160		X	X

Unit No.	Silviculture stand number	Acres	Harvest/ Treatment System	Yarding System (2)	Fuels Mgmt/ Site Prep (3)	Estimated Vol/acre (MBF)	Estimated Vol (MBF)	Alternative 1.	Alternative 2.	Alternative 3.
28	32-7-23-52-1 Defer from sale.	31	RH/CT	PS	P	15	465		X	X
29	32-7-27-1a-1 Defer from this sale – leave tree requirements	15	RH	HP	HP	20	300			
Totals for Alternative 1, the Preferred Alternative		139					613			

Legend for Table 2-1

(1) Harvest/Treatment Systems:

RH = Regeneration Harvest CT = Commercial thinning SC = Selection Harvest DM = Density Management

(2) Yarding Systems:

PS = Partial suspension TR = Tractor H = Helicopter

(3) Fuels Management/Site Preparation:

HP = Handpile and burn Sl(BR) = Slash brush B = Broadcast burn

Table 2-2. Summary of timber harvest acres, by alternative, for the Papa Cow TS.

Harvest Type	Alternative 1 Preferred Alt.	Alternative 2	Alternative 3	Alternative 4 No Action
Regeneration Harvest	19	35	35	0
Regeneration / Commercial Thin	0	31	31	0
Commercial Thin	54	54	54	0
Commercial Thin / Density Management	60	60	60	0
Select Cut	6	6	6	0
Totals	139	186	186	0
Tractor	17	17	16	0
Cable	44	91	91	0
Helicopter	0	0	0	0
Helicopter/Cable	48	48	48	0
Tractor / Cable	30	30	30	0
Totals	139	186	186	0

Table 2-3. Road management in the Preferred Alternative, Alternative 1, Papa Cow Timber Sale.

Road Number	Road Name	Length (miles)	Surface Type	Control	Alternative 1 Preferred Alternative	Haul Season
32-7-17A	Sled Switch spur	0.34	GRR	BLM	RM	4/15-11/15
32-7-20.1A	Susan Creek 101	1.76	ASC	BLM	RM	4/15-11/15
32-7-21A	Dad's Creek	0.44	ABC	BLM	RM	4/15-11/15
32-7-21B	Dad's Creek	0.5	ABC	BLM	RM	4/15-11/15
32-7-21C	Dad's Creek	0.9	ABC	Superior —605, M-M-605A	RM	4/15-11/15
32-7-21.1	Dad's Creek "A" Spur	0.14	ABC	BLM — 605	RM	4/15-11/15
32-7-21.2A	Dad's Sled	2.01	ABC	BLM — 605	RM	4/15-11/15
32-7-21.2B	Dad's Sled	1.19	GRR	BLM — 605	Main gate	4/15-11/15
32-7-21.3	Dad's Creek "C" Spur	0.57	ABC	BLM	RM	4/15-11/15
32-7-21.4A	Dad's Creek "D" Spur	0.8	ABC	BLM	RM	4/15-11/15
32-7-21.4B	Dad's Creek "D" Spur	1.8	ABC	BLM — 605	RM	4/15-11/15
32-7-22.2	Dad's Creek "E" Spur	1.51	ABC	BLM	RM	4/15-11/15
33-7-2	Cow Creek	5.0	BST	BLM		All Year
32-8-1.1	W. Fk. Cow Cr Rd	5.0	BST	BLM	RM	All Year

Road Summary:

* All year, BST-surfaced roads 10.0 mi. (not including County rd)
* Extended season rock surfaced roads 11.96 mi.
* Summer only roads 0 mi.

Definitions:

BST	Bituminous Surface Treatment	DI	Drainage Improvement
ABC	Aggregate Base Course	RM	Road Maintenance
ASC	Aggregate Surface Course	BAR	Barricade
PRR	Pit Run Rock	TEMP	Temporary Use
GRR	Grid Rolled Rock	N/A	Not Applicable
NAT	Natural surface		

2.1.1 Project Design Features - Alternative 1 (Preferred Alternative)

Project design features (PDFs) are specific measures included in the design of the proposed action to minimize negative impacts on the human environment. The following project design features are organized based on the issues identified by the ID team and described in the introduction of Chapter 1. Project design features for projects in the Medford District are specified for in the Resource Management Plan and may not all be repeated here. These include Best Management Practices (BMP) as described in Appendix D of the RMP (pg 151).

If changes to the PDFs are needed during project implementation, they would be cleared through the ID team and the Field Manager, and such changes would be analyzed under the National Environmental Policy Act (NEPA).

Issue #1. Roads

Road renovation and log hauling would be restricted to the seasons described in Appendix A unless authorized in writing by the Field Manager. If the roads are deemed too wet (road surfaces are deforming and road damage or sediment production is likely) during a designated haul season, no hauling would be allowed unless approved by the Authorized Officer.

If extended dry weather conditions exist during the restricted log hauling season, the Field Manager may approve a provisional off-season log hauling agreement. The Purchaser would be required to request the off-season log haul from the Field Manager in writing. Log hauling outside of the dates in Appendix A would be confined to rocked roads. Log haul would be suspended:

- when water is flowing on the road surface or in ditch lines.
- when snow on the road is melting.
- when loaded log truck tire deflection exceeds 2 inches into the road surface anywhere on the entire road length.

Snow removal (blading) on any road would not be authorized to prevent the loss of rock surfacing.

Dust abatement (water or lignin) on roads used for hauling would be required during dry weather to prevent loss of fines in road surfacing, and to reduce potential for sediment to enter streams. Specific methods would be included in the contract.

Landings would be located in approved sites, and designed with adequate drainage.

Landings would not be constructed in riparian reserves.

All helicopter landings on BLM lands used under this timber sale would be subsoiled, straw mulched, and planted with conifers when logging is completed. The road ditch line at helicopter landings and the new helicopter landing on the Cook Creek road (32-7-28) would be bladed, and seeded, before October 1 to allow proper drainage and prevent sediment from moving offsite.

If needed, step landings would be re-contoured, mulched and seeded following use.

The purchaser would be required to use the helicopter landings identified in this EA. Other sites may be used after being approved in writing by the Authorized Officer.

Helicopter refueling sites would not be constructed in Riparian Reserves and would be designed and operated to comply with all applicable regulations.

Quarries to be used for this sale include:

Dad's Creek - T 32S, R 7W, sec. 21,
a private rock source in T 32S, R 7W sec. 26.

Sediment-generating activities in quarries that are located in Riparian Reserves would be prohibited between October 1 and June 1 to prevent stream sedimentation. As per the Project Design Criteria given in the Programmatic Biological Opinion (U.S.D.I. Fish and Wildlife Service. 2001. Biological Opinion 1-7-01-F-032, 12 October 2001) for timber sales on the Medford District BLM lands, a restriction would be placed on blasting in either of the above-mentioned quarries at a minimum from March 1 to June 30, as they are both within one mile of spotted owl nests. The Resource Area biologist may extend the restriction period if known nesting is occurring beyond this date.

Issue #2. Fish/Streams/Riparian Habitat

Riparian Reserves would be identified along all intermittent and perennial streams in accordance with the Medford District RMP and ROD. Reserve widths would be 180 feet on each side of non-fishery intermittent and perennial streams. Riparian Reserve width on fish streams (Dad's Creek and Cow Creek) would be at least 360 feet (units 6 and 13). Riparian reserve width on springs and seeps would be 100 feet (units 4, 6, 29).

Yarding across Riparian Reserves would not be allowed.

Directional falling away from streams and wet areas would be required within one tree length of these areas.

Trees in Riparian Reserves that are accidentally knocked over during falling or yarding operations would be retained on site as coarse woody debri for fish and wildlife habitat.

Tractor yarding would only be allowed between June 1 and October 15 (soil moisture permitting) of the same year to minimize the amount of soil disturbance and compaction. If the Authorized Officer determines that soils are too wet within this season, tractor yarding would not be allowed until approved by him/her. If soils are sufficiently dry outside this season, tractor yarding may be allowed if approved by the Field Manager. Water bar spacing on tractor skid trails would be based on existing guidelines considering slope and soil series.

Yarding tractors would not exceed nine feet in width and would be equipped with an integral arch to raise the front end of the logs in order to minimize soils disturbance and compaction.

Where tractors are used for yarding, existing skid roads would be used if present.

Tractor operations would be restricted to designated skid trails, and to slopes less than 35 percent, except where permitted by the Authorized Officer. New trails would be no closer than 150 feet apart.

Skid roads used in this timber sale would be discontinuously subsoiled and water-barred to reduce erosion. Water bars would be installed at the same time as subsoiling. Subsoiled skid roads would be mulched with weed-free straw and planted with conifers.

In order to minimize soil disturbance, tractor blades would not be used to excavate tractor trails.

Tractors would not be allowed off road within Riparian Reserves.

Units 9a and 11 would be designed to avoid active landslides and headwalls in the riparian areas. These areas would be protected when encountered in other harvest units and in road construction.

Cable yarding on all Commercial Thin, Density Management, and Selection harvest units would not be allowed between March 1 and June 1 to prevent bark slippage on residual trees.

Hand piles would be burned as early in the Fall as possible to best avoid adverse effects to plants, and animals that may hibernate or nest in them. Broadcast burns would take place in the Fall, if possible, and would be designed to:

- minimize conflicts with smoke management,
- minimize the risk of control problems,
- avoid adverse impacts to nesting and hibernating wildlife species,
- minimize consumption of soil organic matter and surface duff,
    - meet silvicultural objectives to prepare the site and reduce competition with conifer seedlings,
- minimize the loss large down wood, and
- not exceed 15% of the ground with exposed mineral soil.

There would be no intentional broadcast burning within 50' of streams.

In order to minimize soil compaction, partial suspension would be required on all cable units.

The number of cable yarding corridors would be minimized to reduce soil compaction from cable yarding. Corridors would be located at least 150 feet apart at the tail end; lateral yarding would be required in all units.

Issue #3. Late-successional Forest and Fragmentation

Identified bat roosts would be protected by retaining the adjacent dominant trees.

Consultation with the U.S. Fish and Wildlife Service was completed on 12 October 2001 and the proposed action would conform to the mandatory project design criteria detailed in Biological Opinion #1-7-01-F-032.

Spotted Owls

Spotted owl surveys have been conducted in the sale area. Additional surveys would be conducted prior to harvest to determine if owls have moved into the area, or known pairs have moved around within the area.

If an active spotted owl nest or activity center is located within or adjacent to a unit, operations would be delayed until October 1. This proximity is distinguished from the category of work "within 1/4 mile" described below, by being activity that could cause a spotted owl to flush (USDA Forest Service/USDI Bureau of Land Management and Fish and Wildlife Service 2001.)

Falling, yarding, slashing, other power equipment use, road construction and renovation, all other heavy equipment work or production of heavy smoke within 1/4 miles of any spotted owl nest would be limited to after July 1 or until two weeks after the fledging period to February 28 of the following year, unless the pair is shown to be non-nesting for that season. If an active pair is located within or immediately adjacent to a unit, this season would be October 1 to February 28, unless a Glendale Resource Area biologist recommends to the Field Manager that young have sufficiently dispersed. This same restriction would apply to blasting within one mile of a nest and to aircraft flights, associated with logging, within 1/4 mile of the nest.

Broadcast burning would not take place within 1/4 mile of known spotted owl nests between March 1 and June 30 or until two weeks after the fledging period.

Helicopter operation within 0.5 mile of a nesting northern spotted would not be permitted between March 1 and June 30.

Red Tree Voles

A 10-acre no-cut Habitat Area of the best habitat surrounding any red tree vole colony would be retained. Management that occurs within the Habitat Area would not remove or modify nest trees, the canopy structure of the stand or remove any of the dominant, codominant, or intermediate crowns. This includes activities that may isolate nest trees or alter the microclimate within the stand (USDA Forest Service/USDI Bureau of Land Management 2000).

Del Norte Salamanders

Occupied Del Norte salamander sites would be protected as follows:

- a 180 foot (one potential tree height) protection buffer would be designated around each talus site,
- within the site and the surrounding buffer, at least 40 percent canopy closure would be retained,
- in helicopter Commercial Thin units, falling and yarding within the talus sites would be allowed only between June 1 and approximately September 30 (depending on site conditions) to reduce impacts to Del Norte populations,
- in other helicopter units, and in units with cable or tractor yarding, no falling or yarding would be allowed within the talus sites to avoid disturbing the talus,
- no burning would be allowed over talus, and
- any other activities that would directly disrupt the talus layer (e.g., fire, lateral yarding over talus, yarding corridors through talus, tractor yarding and road building) would not be allowed. Helicopter yarding would be used to remove the logs.

These occupied talus sites and associated buffers would be designated as managed late-successional areas (MLSAs) as described in the Final EIS for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Leave trees required to be reserved in the sale units (for example, 6-8 trees per acre) would not be counted in the Del Norte salamander sites and buffers.

Special Status, and Survey and Manage Plants

Populations of Special Status, or Survey and Manage, vascular plants, lichens, and bryophytes would be protected with a no-cut buffer of at least 100 feet. Buffers would be enlarged to up to 200 feet radius where they occur in timber harvest units where the prescriptions calls for retaining less than 40 percent canopy cover (regeneration harvest prescriptions). Buffers would extend across existing roads and would not be harvested. Timber harvest, prescribed fire, thinning, yarding corridors or road construction would not occur within these buffers. For Special Status species, buffers would occur around Bureau Sensitive and Assessment species but not Tracking Species. For Survey and Manage Species, management guidelines for high priority (when established) and known sites of Category A, B, C, D and E species would be followed.

Issue #4. Large Down Wood

All currently down logs greater than 16" diameter would be retained on site for coarse woody material.

RH units (units 8B and 9A in this alternative) would be managed to provide for Class 1 and 2 large, down wood and for snags. Where existing down wood does not meet current standards for Class 1 and 2 logs, additional green trees would be retained after harvest operations. Current Standards for down wood and snags can be found in, "Guidelines for Snag and Down Wood Prescriptions in Southwestern Oregon" (Diane White, Umpqua National Forest).

All non-hazardous snags would be retained in all harvest units. If it is necessary to fall snags for safety reasons, they would be left on the site to provide additional down wood.

Retention and protection of green trees, snags and large down logs would be emphasized during layout, marking, timber harvest and site prep. If green reserve trees, in units other than commercial thins, are inadvertently knocked down or disturbed during logging they would be retained where they fall and would not be bucked unless it is necessary to move them for operational or safety reasons.

Trees in Riparian Reserves, owl core areas, TPCC withdrawn land that are accidentally knocked over during falling and yarding would be retained on-site for fish and wildlife habitat.

Hand piles would be stacked at least 10 feet from any large (>16 inch diameter) wood or snag, or smaller snag showing obvious use by wildlife.

Issue #5. Forest Health

The Density Management treatments would generally retain at least 35 percent canopy closure, although more open canopies would be created around large pine trees to reduce moisture stress from other stems competing for water during periods of drought, protect them from fire damage, and to promote pine regeneration.

Heavy equipment would be washed before moving into the project area to remove soil and plant parts to prevent the spread of invasive and noxious weeds and disease into the project area.

Issue #6. Cultural Resources

The old mining sites and historic ditches in units 6, 13, and 18B would be protected to the greatest extent possible.

2.2 Alternative 2: Includes Permanent Road Construction into Sections 23 and 13.

Alternative 2 would harvest timber in 10 units covering 187 acres. Under this alternative, new road construction from section 26, through section 23 and into section 13 (road #32-7-26.1) would occur. In addition, the proposed new road spur into unit 28 would be constructed. Units 27 and 28 would be logged using a skyline cable system.

Construction of the new road into sections 23 and 13 would facilitate future management options for timber harvest, administrative access, special forest product harvest, fire suppression activities and silvicultural treatments. Yarding costs and silvicultural treatment costs would be lower than using a helicopter (Alternative 3). Table 2-4 summarizes the roads used in addition to the Preferred Alternative if this alternative is implemented.

This road would be located in the most advantageous location; minimizing environmental damage and optimizing management opportunities. In the future, having this road on the ridge top may persuade private logging companies to use uphill cable systems on their lands, rather than using tractor logging which would increase erosion and reduce soil productivity. It also may avoid less desirable road locations if other parties, such as miners, want to gain access to the area.

2.3 Alternative 3. No road construction in section 23 and 13.

Under Alternative 3, timber would be harvested and non-commercial treatments would occur in 10 units covering 187 acres. Rather than building a new road in to sections 23 and 13, as would occur under Alternative 2, an existing trail would be improved to 4-feet wide to provide passage of All-Terrain Vehicles (ATVs). It would be built to provide administrative access for surveys, tree planting, and monitoring. Large trees would not be cut in the right-of-way, and the soil surface would be disturbed as little as possible.

Units 27 and 28 would be helicopter-yarded to a landing located in T 32S, R 7W, sec. 26, on road #32-7-36 (Refuge road). Units 27 and 28 would be hand piled, rather than broadcast burned. Helicopter yarding would not be allowed for unit 28 between March 1 and September 30 to avoid disturbing nesting spotted owls. Other prescriptions and project design features would remain the same as in the Preferred Alternative. Table 2-5 summarizes the roads used in addition to the Preferred Alternative if this alternative is implemented.

2.3 Alternative 4: No Action

Under this alternative, the management actions described under the Preferred Alternative or other alternatives would not take place at this time. Since these lands are designated as GFMA lands and Connectivity/Diversity Blocks in the RMP, timber harvest would likely take place on these areas in the future, but would be described in a future analysis document.

2.4 Alternatives considered but eliminated from further analysis

In developing the proposed action the interdisciplinary team began by looking at all the General Forest Management Area lands in the Papa Cow project area. After preliminary analysis, several of the remaining potential units were dropped from the proposed action for a variety of reasons. The potential units are summarized in Appendix B along with reasons for deferment. Deferring management at this time would not preclude forest management actions at a later date.

Table 2-4. Additional roads which would be used if Alternative 2 is implemented.

Road Number	Road Name	Length (miles)	Surface Type	Control	Alt. 1 - Preferred Alternative	Haul Season
32-7-34A	Low Hog	0.54	PRR	Superior M - 605	REN	4/15-11/15
32-7-34B	Low Hog	1.07	PRR	Superior M - 605	REN	4/15-11/15
32-7-34C	Low Hog	0.78	PRR	Superior M - 605	REN	4/15-11/15
32-7-35A	Hog Ranch	0.71	PRR	BLM	REN	4/15-11/15
32-7-35B	Hog Ranch	0.38	PRR	Roseburg Resources	REN	4/15-11/15
32-7-35C1	Hog Ranch	0.76	NAT	Superior M - 605	DI	6/1-10/1
32-7-35 Spur	Section 34 Heli Spur	0.43	NAT	Rsbg Res	REN	6/1-10/1
32-7-36	Refuge	3.11	PRR	Superior M - 605,899	REN	4/15-11/15
New Roads						
32-7-26.1	Panther Butte	1.33	NAT (rock)	BLM	Construct/ Barricade	6/1-10/1
Temporary Roads						
Into Unit 28		0.11				6/1-10/1

Alternative 2 Additional Road Summary:

* All year-round BST surfaced roads 10.90 miles
* Extended season rock surfaced roads 7.75 miles
* Summer only natural surfaced roads 0.00 miles
* Storm-proofing 0.00 miles
* Decommissioning existing roads 0.00 miles
* Temporary road construction 0.11 miles
* Permanent road construction 1.33 miles

Definitions:

BST	Bituminous Surface Treatment	RIP	Rip with winged rippers after use
ABC	Aggregate Base Course	DI	Drainage Improvement
ASC	Aggregate Surface Course	REN	Renovate
PRR	Pit Run Rock	BAR	Barricade
GRR	Grid Rolled Rock	TEMP	Temporary Road
NAT	Natural surface		
N/A	Not Applicable		

Table 2-5. Roads in addition to the Preferred Alternative which would be used if Alternative 3 were implemented.

Road Number	Road Name	Length (miles)	Surface type	Control	Preferred Alternative	Haul Season
32-7-34A	Low Hog	0.54	PRR	Superior M - 605	REN	4/15-11/15
32-7-34B	Low Hog	1.07	PRR	Superior M - 605	REN	4/15-11/15
32-7-34C	Low Hog	0.78	PRR	Superior M - 605	REN	4/15-11/15
32-7-35A	Hog Ranch	0.71	PRR	BLM	REN	4/15-11/15
32-7-35B	Hog Ranch	0.38	PRR	Roseburg Resources	REN	4/15-11/15
32-7-35C1	Hog Ranch	0.76	Nat	Superior M - 605	DI	6/1-10/1
32-7-35 Spur	Section 34 Heli Spur	0.43	Nat	Rsbg Res	REN	6/1-10/1
32-7-36	Refuge	3.11	PRR	Superior M - 605,899	REN	4/15-11/15
32-6-33	Robert Dollar 100 Road	0.9	PRR	Superior	REN	4/15-11/15

Alternative 3 Additional Road Summary:

* All year-round BST surfaced roads	10.90 miles
* Extended season rock surfaced roads	8.65 miles
* Summer only natural surfaced roads	0.00 miles
* Storm-proofing	0.00 miles
* Decommissioning existing roads	0.00 miles
* Temporary road construction	0.00 miles
* Permanent road construction	0.00 miles

Definitions:

BST	Bituminous Surface Treatment	RIP	Rip with winged rippers after use
ABC	Aggregate Base Course	DI	Drainage Improvement
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PRR	Pit Run Rock	BAR	Barricade
GRR	Grid Rolled Rock	TEMP	Temporary Road
NAT	Natural surface		
N/A	Not Applicable		

Chapter 3 - Affected Environment

3.0 Introduction

This section describes relevant resource components of the existing (baseline) environment.

3.1 Location

The location of the Proposed Action is:

Analytical Watershed (fifth field):	Middle Cow Creek
Project Area (sixth field watershed):	Dad's Creek
County:	Douglas

T32S, R7W, sections 13,15, 17, 20, 21, 23 and 27.

The Papa Cow project area was delineated using watershed boundaries. The Middle Cow Creek analytical watershed was described and analyzed in watershed analysis document which was completed in 1999. This watershed analysis documented existing conditions within the watershed, analyzed important ecological functions and relationships, and identified key issues, and inventory and monitoring needs. Site-specific objectives were developed and potential management actions were identified to meet those objectives. In conjunction with the development of this project area the watershed analysis document is in the process of being revised and updated to conform with "Ecosystem Analysis at the Watershed Scale; Federal Guide for Watershed Analysis" (1995) as well as to incorporate new information.

Timber harvest units are proposed for lands designated as General Forest Management Area (GFMA) in the Medford District Resource Management Plan and within Connectivity/Diversity blocks. Some units involve designated critical habitat for spotted owls. The entire project area is located within 50 miles of the coast, so is considered within the range of marbled murrelets, a federally listed Threatened Species.

Connectivity across this landscape is very poor, as it has been greatly reduced by previous and current timber harvesting on both public and private lands, and the landscape will continue to be fragmented as cutting continues in the future on these matrix lands. Intensive cutting and burning may have drastically reduced the acorn-producing capacity of the area, reducing the carrying capacity for acorn woodpeckers (*Melanerpes formicivorous*) and other species which depend on mast production.

Section 23 is one of the few in the project area which still have substantial interior late-successional habitat. Such relatively large stands have value for many species associated with late-successional habitat. This is one of only two unroaded and intact sections in the Middle Cow Creek watershed (109,000 acres). Virtually all of the potential riparian connections in the other sections of this project area have been interrupted at some point by timber harvest or road construction. As a result, dispersal through Riparian Reserves (which were, in part, designed as connections for plants and terrestrial wildlife) is disrupted over most of the lower elevation lands in the Klamath Province. Intensive management can accelerate the recovery of these connections, but this rehabilitation is limited by growth rates. Section 23 is the only Connectivity Block that has an intact system of tributaries in the project area. This un-fragmented interior habitat benefits populations of late-successional obligates, which can then colonize the riparian connections as they become fully functional.

This watershed is dominated by the major plant grouping Douglas-fir/tanoak/madrone (Tanoak series). In some areas, the Douglas fir series is also present. The area has been extensively altered by timber harvest, including clearcuts and partial cuts. Timber on virtually all private lands in the watershed have been harvested. Recent logging on private lands have created new clearcuts near the sale area.

The proposed action area has been surveyed for survey and manage and special status species. No goshawks or great grey owls were located. The area is not within the range of any listed plant species. No survey and manage mollusk species were found.

No Port Orford cedar was found within any potential harvest unit, nor along any of the gravel haul roads in the project area. There are Port Orford cedar trees along the West Fork of Cow Creek and most of these have been killed by laminated root rot. This location is below the West Fork Cow Creek road, a major arterial road which is paved and receives heavy traffic use.

Chapter 4 - Environmental Consequences

4.0 Introduction

This chapter forms the scientific and analytic basis for comparison of alternatives. Discussions include environmental impacts anticipated from implementation of the alternatives, both positive and negative. It also identifies and analyzes mitigation measures, if any, which may be taken to avoid or reduce projected impacts.

Table 4-1 Critical Elements by Alternative The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be considered in all EA's. (Y = yes, the resource is analyzed in this EA. N = the resource was considered but analysis in this EA was not considered warranted)

Resource or Issue Affected by Alternative	**Alternative (Y or N)**				**Resource Affected by Alternative**	**Alternative (Y or N)**			
	1	**2**	**3**	**4**		**1**	**2**	**3**	**4**
Air Quality	N	N	N	N	Threatened & Endangered Species	Y	Y	Y	N
Area of Critical Environmental Concern (ACEC)	N	N	N	N	Wastes, Hazardous/Solid	N	N	N	N
Cultural	Y	Y	Y	N	Water Quality	Y	Y	Y	N
Farmlands, Prime/Unique	N	N	N	N	Riparian Zones	Y	Y	Y	N
Flood plains	N	N	N	N	Wild & Scenic Rivers	N	N	N	N
Native American Religious Concerns	N	N	N	N	Wilderness	N	N	N	N
Invasive Species	Y	Y	Y	N	Environmental Justice	N	N	N	N
*Large Down Wood	Y	Y	Y	N	*Forest Health	Y	Y	Y	Y
Energy	N	N	N	N	*Survey and Manage	Y	Y	Y	N

*Non-Critical Element

4.1 Effects Considered for Each Alternative

Chapter 4 presents discussions of the environmental consequences which are additional or site specific ones not adequately addressed in the Final Supplemental Resource Management Plan/Environmental Impact Statement BLM, November, 1994 (RMP/EIS) which would result from implementation of the proposed action. In keeping with the directives of the National Environmental Policy Act (NEPA), the discussions focus on impacts considered potentially significant. The level of detail and depth of impact/analysis are generally limited to that needed to determine whether new significant environmental effects are anticipated.

Direct, indirect and cumulative effects were considered.

> **Direct effects** are site-specific and result from the immediate action, such as the harvest of a timber sale unit or the construction of a particular road. Direct effects are confined to a specific area such as a timber sale unit, a particular elk range, or a spotted owl site, and can be short term or long term.
>
> **Indirect effects** occur at a different place or time than the proposed action.
>
> **Cumulative effects** are generally not site-specific and are not readily attributable to any one action. Cumulative effects are the result of past, immediate, and reasonably foreseeable actions on a larger area, such as a watershed, regardless of ownership.

4.2 Effects on Late-successional Habitat and Threatened, Endangered, Special Status and Survey and Manage Species

Current levels of late-successional habitat in the Project Area and the Middle Cow Creek watershed are currently very low. Of the total 113,000 acres in the watershed, 45,500 (40 percent) are in federal ownership and 22,000 (19 percent) are in late-successional condition with 8,651 acres (8 percent) old growth (200+ years). All Action Alternatives would further reduce late-successional habitat and species associated with this habitat. The same would be true of riparian connectivity that depends on continuity with private lands, as the rotation age on private lands is relatively short. The overall management is tiered to the Medford District Resource Management Plan and amendments which recognize effects to General Forest Management land allocations.

Under Alternative 1, the Preferred Alternative, regeneration harvests would remove up to 19 acres of Late-successional forest habitat; commercial thin harvests would degrade up to 121 acres by opening the canopy (Table 4-2).

In addition to the direct loss of habitat, fragmentation of this habitat would be increased with the Preferred Alternative. Except for the amounts required in the Connectivity blocks, the Preferred Alternative would create landscape barriers to some species dependent on contiguous Late-Successional conditions. In the long term connectivity would eventually become re-established on federal lands as cut-over riparian areas recover. Many of these areas were cut in the 1980s or early 90s. It will be several decades before they can again function as Late-Successional connections.

Under Alternatives 2 and 3, regeneration harvests would remove 66 acres of Late-Successional forest habitat; Commercial Thin harvests would degrade 120 acres by opening the canopy. Sections 15 and 21 would also have reduction in canopy closure with density management and CT units in both alternatives, but this latter reduction would be relatively short-lived, with the development of large structure being accelerated and the recovery of the canopy in approximately 15 years.

Section 23 is one of the few in the project area that still has substantial interior late-successional habitat, which has value for many species associated with late-successional habitat. Harvest under Alternatives 2 and 3 would fragment the late-successional habitat within the section, in addition to the effects under Alternative 1.

The most serious adverse impact this road construction would have is on late-successional habitat, especially since section 23 is a Connectivity/Diversity Block. The road construction would fragment a large, unroaded area of late-successional habitat. This is the only unroaded square mile of forested habitat in an area of about 80 square miles. The road would break up the habitat, affect micro-habitats by increasing light, heat and wind, and create a barrier to movement by some species.

The road would also directly remove approximately six acres of forest habitat. There is also the potential for destroying red tree vole nests; there are three red tree vole colonies located along the proposed road location.

The impacts on late-successional habitat are particularly important because the Late-successional Reserves (LSRs) in the area are not yet fully functioning and will not be for several decades. In addition, section 23 is the only intact Connectivity/Diversity block in the Papa Cow project area. Virtually all of the potential riparian connections in the other sections of this planning area that were designated for Connectivity have been interrupted at some point in their flow by either roads or clearcutting down to the water. Alternative 2 could also increase potential fragmentation due to windthrow along the new road right-of-way.

Under the No Action Alternative, the acres of late-successional habitat would not be removed or degraded by timber harvest, so the effects on species associated with late-successional forests would not occur at this time. Since this proposal is located on General Forest Management Area Lands, it is planned that similar timber harvest would eventually occur on these lands. The effects on wildlife and plants would be postponed, but not eliminated. In the long term the effects would be similar to the Preferred Alternative.

The Connectivity Blocks in this Project Area (T 32S, R 7W, sec. 15, 21, 23 and 27) would all remain above the 25-30 percent in late-successional habitat called for in the RMP under all alternatives. However, cutting units 27 and 28 under Alternatives 2 and 3 would create a short term reduction in habitat in these connectivity blocks which would exist until the density management units in sections 15 and 21 develop late-successional characteristics.

From a cumulative effects standpoint, the watershed has already been greatly affected by past actions. Connectivity across this landscape is very poor, as it has been greatly reduced by previous and current timber harvesting on both public and private lands, and the landscape will continue to be fragmented as cutting continues in the future on these matrix lands. Following this sale, there would be approximately 21,000 acres of late-successional habitat on federal lands in the Middle Cow Creek watershed. This represents 46 percent of the federal forest lands, still above the 15 percent called for in the RMP.

The patchy distribution and low dispersal capability of species such as red tree voles (Huff et al. 1992) and molluscs within forest habitats leave these low-mobility species vulnerable to cumulative effects within a watershed. The cumulative effects of removing habitat on both public and private lands within the Middle Fork Cow Creek watershed may lead to reduced or locally extirpated populations within the watershed

Table 4-2. Late-Successional Forest Habitat Acreage - Papa Cow timber sale.

	Area In/Potentially In Late-Successional Habitat			
	Potential	**Current**	**After Preferred Alternative**	**After Alt. 2 and Alt. 3**
Late-successional Area In the Project Area *	6,469 ac. or 86%	1,560 or 21%	1,420 or 19%	1,373 or 18%
Portion of Federal Lands in the Project Area in Late-Successional*	2,890 ac. or 84%	1,560 ac. or 45%	1,420 ac. or 41%	1,373 ac. or 40%

* There are 7,520 acres in the Project Area. There are 3,430 acres of federal lands in the Project Area (47 percent of the Project Area).

4.2.1 Spotted Owls

Habitat Modification.

Alternative 1, the Preferred Alternative (and the other action alternatives) would adversely affect spotted owls. Because reproduction by the resident owls in recent years has been poor, it is of interest to know the amounts of nesting habitat separate from roosting/foraging habitat. About two thirds of the units are currently nesting habitat, albeit much fragmented. Some of these acres would be converted to non-nesting habitat through commercial thins and regeneration harvests.

The Preferred Alternative would remove 19 acres of suitable habitat (units 8B and 9A). This alternative would degrade an additional 121 acres from Nesting/Roosting/Foraging to only Roosting/Foraging habitat (units 4, 6, 11, 13, 16 and 18b).

Alternatives 2 and 3 would remove 66 acres of suitable habitat and degrade 121 acres of Nesting/Roosting/Foraging habitat.

Most of the area that would be degraded to roosting/foraging habitat would meet minimum standards of relatively poor quality nesting habitat in approximately 30 years, however, some harsher sites that currently have very few large trees would probably require 50 years or more to recover to that minimum level. Depending on the site conditions, regeneration harvest units would probably require approximately 80 years or more to recover to a condition that provides roosting/foraging habitat.

Effects on Specific Spotted Owl Sites within the Project Area.

Four active spotted owl sites would be adversely affected by timber harvest under the Action Alternatives by removing or degrading habitat within 1.3 miles (the approximate home range) of their centers of activity (Table 4-3) The proposed harvest would further reduce the amount of suitable habitat within the home range of all the pairs, well below the level that the site would have been defined as being a "take" under the Endangered Species Act of 1973, as amended. This is because the sites currently have less than 1,360 acres or 40 percent suitable (nesting, roosting and foraging) habitat within 1.3 miles of the center of activity and all of the action alternatives would reduce it further.

Construction of the road in Section 23, under Alternative 2, along one edge of a nest stand would increase the potential for wind damage and other fragmentation effects along this edge. It is also more likely that the remainder of the nesting habitat in this section would be removed or degraded more quickly than otherwise would be the case.

Impacts of Alternative 3 would be similar to but less than those under Alternative 2 due to the lack of road construction.

Table 4-3. Effects of the Papa Cow Timber Sale Preferred Alternative (Alt. 1) on acreage of suitable in Spotted Owl Habitat within 1.3 miles of active owl sites.

		Spotted Owl Site				
		Dad's Creek #0895	Sled Creek #0906	Cooked Hog #2212	Ping Gulch #3271	Rat Skull #4579
Nesting Habitat	Before	*280*	*544*	*445*	*390*	*930*
	After	*280*	*519*	*445*	*390*	*924*
Roosting/ Foraging Habitat	Before	*455*	*616*	*315*	*610*	*300*
	After	*384*	*621*	*315*	*598*	*300*
Total Suitable	Before	*735*	*1,160*	*760*	*1,000*	*1,230*
	After	*664*	*1,141*	*760*	*988*	*1,224*

Table 4-4. Effects of the Papa Cow Timber Sale Alternative 2 on acreage of suitable in Spotted Owl Habitat within 1.3 miles of active owl sites.

		Spotted Owl Site				
		Dad's Creek #0895	Sled Creek #0906	Cooked Hog #2212	Ping Gulch #3271	Rat Skull #4579
Nesting Habitat	Before	*280*	*544*	*445*	*390*	*930*
	After	*280*	*519*	*393*	*341*	*924*
Roosting/ Foraging Habitat	Before	*455*	*616*	*315*	*610*	*300*
	After	*384*	*621*	*300*	*596*	*300*
Total Suitable	Before	*735*	*1,160*	*760*	*1,000*	*1,230*
	After	*664*	*1,141*	*693*	*937*	*1,224*

Table 4-5. Effects of the Papa Cow Timber Sale Alternative 3 on acreage of suitable in Spotted Owl Habitat within 1.3 miles of active owl sites.

		Spotted Owl Site				
		Dad's Creek #0895	Sled Creek #0906	Cooked Hog #2212	Ping Gulch #3271	Rat Skull #4579
Nesting Habitat	Before	*280*	*544*	*445*	*390*	*930*
	After	*280*	*519*	*393*	*343*	*924*
Roosting/ Foraging Habitat	Before	*455*	*616*	*315*	*610*	*300*
	After	*384*	*621*	*300*	*598*	*300*
Total Suitable	Before	*735*	*1,160*	*760*	*1,000*	*1,230*
	After	*664*	*1,141*	*693*	*941*	*1,224*

Disturbance to Nesting Spotted Owls.

Disturbance during the nesting season would be minimized by implementing the guidelines of the USFWS Biological Opinion. Disturbance by yarding with helicopters was not specifically addressed in the most recent Biological Opinion. However, such action is substantially louder than felling and conventional yarding, for which a 1/4 mile buffer/seasonal restriction is required. It also originates from above, a direction which most birds of prey perceive as a much greater threat than would otherwise be the case. Though not contained in a formal consultation document, the U.S.D.I. Fish and Wildlife Service has advised that a buffer of 0.5 miles around nesting spotted owls may be appropriate (David Leal, pers. comm.). Because aircraft overhead

may disturb or flush birds, such a buffer extends vertically, and may be thought of, as a hemispherical zone, with a radius extending 0.5 miles from the nest site in all directions. As a result, some disturbance from helicopters may occur under all alternatives.

Designated Critical Habitat.

Designation of Critical Habitat serves to identify lands which may be necessary for the conservation and recovery of listed species. Hence, Critical Habitat's functional value is to preserve options for the species eventual recovery" (p. 16, U.S.D.I. Fish and Wildlife Service. 2001. Biological Opinion 1-7-01-F-032, 12 October 2001).

All units are within designated Critical Habitat Unit (CHU) OR-62. In Alternative 1, 139 acres of suitable habitat within the CHU would be removed or degraded. Alternatives 2 and 3 would remove or degrade 187 acres.

The road construction proposed in Alternative 2 is located within spotted owl Critical Habitat. Construction would increase the fragmentation of spotted owl habitat compared with helicopter logging. This may be particularly important since there is a pair of spotted owls in the vicinity.

Of the 758,000 acres of critical habitat in SW Oregon, 48 percent is currently suitable habitat. Since 1994, under 2 percent of the suitable Critical Habitat has been or will be adversely affected. In CHU OR-62 this biological opinion accounted for the removal or downgrading of 690 acres of suitable habitat (ibid.)

<u>Cumulative Effects on spotted owls</u>

The spotted owl sites in the project area are all below the acreage level within 1.3 miles which constitute a "Take" situation under the Endangered Species Act. Little suitable habitat remains on private lands. In addition to the habitat loss under this Preferred Alternative and alternatives, the Cotton Snake timber sale would also remove an additional 30 acres within 1.3 miles of the Ping Gulch owl site, further reducing the viability of this site.

The Cooked Hog owl site produced young in 1990 and another in 1991, but extensive clearcutting on adjacent private lands has reduced the amount of suitable habitat. Surveyors have had difficulty locating spotted owls in most of their visits to all four of these sites since the early 1990s. This may have resulted from the reduction of suitable habitat in the surrounding landscape, which may not be adequate for nesting. Which, in turn, makes the birds less likely to be detected by surveyors. This situation may occur for numerous reasons. Among the reasons are the tendency for owls to range farther from their former center of activity in order to find adequate prey, they may not be as defensive of the territory, the area may have an increase in the density of predators (e.g., great horned owls), and so on. In addition, the microclimate may no longer be favorable due to edge effects, the stability of the pair may be reduced or competition for the site from neighboring owls (which probably also have reduced suitable habitat) may be greater.

In summary, there is no evidence to show the project area can support nesting or persistence in the long term by the number of owls identified within it. It may only be able to serve as dispersal habitat.

The LSRs in southern Oregon are not fully functioning and may not be for several decades. Because of the time frames needed for suitable habitat conditions to recover, combined with the low dispersal capability of many species, their persistence within this watershed would be negatively affected for at least several decades. As fragmentation continues, isolated, resident populations of low mobility species would likely be concentrated within the larger remnant late-successional habitat stands within the connectivity blocks in T. 32 S, R. 7 W., sections 15, 21 and 23; T. 33 S., R. 7 W., section 1; and T. 32 S., R. 6 W., section 5. Since private holdings are expected to never support late-successional habitat, it is expected that local sub-populations of species associated with the habitat would decline with the loss and fragmentation of habitat on federal lands.

4.2.2 Marbled Murrelets

All proposed units are between 35 and 50 miles from the coast. In seven years of surveys, no murrelets have been observed in the Glendale Resource Area. It is suspected that the range of the species does not extend this far inland (more than 12 miles) in southern Oregon. The project area was surveyed to protocol in 1998 and 1999 and no murrelets were detected. It is highly unlikely that the project would affect marbled murrelets.

4.2.3 Riparian Species

The Action Alternatives would have no effect on Southern Oregon/Northern California coho salmon (ESA threatened) or Oregon coast steelhead (ESA candidate) because the sale is upstream of a barrier to anadromous fish migration on Dads Creek, there is minimal road renovation, no stream culvert replacement, no new permanent road construction, and no commercial harvest or burning in riparian reserves. Activities associated with this project would also have no effect on spawning or rearing for Southern Oregon/Northern California Oregon coho salmon and chinook salmon in Essential Fish Habitat (Magnuson-Stevens Act).

Road renovation, maintenance and drainage improvement on the 32-6-33 road could contribute sediment to streams that flow into Totten Creek during the first major rainstorms of the wet season. Totten Creek supports coho, steelhead and cutthroat trout. Sedimentation effects could adversely affect aquatic species, but effects would be short term, negligible and would not impede recovery of the streams' historic sediment regimes. Implementation of Best Management Practices and Project Design Features listed in this EA would minimize any sediment increases. Road renovation, maintenance, and drainage improvement would reduce current and future erosion, as well as reduce the potential for road prism failure, thereby substantially reducing stream sedimentation that would degrade aquatic habitat. Other streams directly affected by renovation of the 32-6-33 and 32-7-36 roads are not coho habitat. Nearest coho habitat other than Totten Creek is Cow Creek where stream flow several magnitudes higher than in the small tributaries would quickly dilute any sediment input. Sediment deposition in the small, non-fish-bearing streams is expected to return to pre-project levels within one year.

4.2.4 Effects on Survey and Manage Species

Red Tree Vole

While habitat would be degraded or removed, and dispersal may be hindered by timber harvest in the Action Alternatives, it is unknown what effects on the local population or the species as a whole would ultimately result. However, the surveys and proposed buffers should contribute to our knowledge and ability to manage for red tree voles.

Construction of road 32-7-26.1 in Alternative 2 (in its proposed location) would likely destroy three known red tree vole colonies. This would not occur under the other alternatives.

Vascular Plants

No effects to threatened or endangered plants, including *Fritillaria gentneri* is listed endangered under the Endangered Species Act. It has been found in the Glendale Resource Area, but the planning area is not within its range, as determined by the USFWS. It was not found in the surveys.

Buffers would provide protection to plant populations which could be directly impacted by timber harvest, pile burning and ground disturbance, and would protect interior forest microclimate. In general, no-cut buffers will be about 100 feet around plant sites, except that, for old-growth associated species that appear to require an interior forest microclimate (Survey and Manage species), buffers should be about 200 feet in units that will retain less than 40 percent canopy cover. These buffer widths are intended to retain interior forest microclimate, with their widths being suggested by literature review. Microclimate measurements show that interior conditions may not be found until 100 to over 790 feet from clearcuts or agricultural fields, depending on site conditions and weather, and the variable measured (Chen 1991, Rodrigues 1998). Some of the smaller microclimate differences appear to be irrelevant to biological systems, as edge effects on biological variables, such as plant regeneration and species composition, generally average around 200 to 250 feet, with a range of 50 to 450 feet, adjacent to cleared areas (Chen 1991, Rodrigues 1998, Jules 1997). Also, clearcuts are not proposed in this sale; the most intensive prescriptions would retain about 10-15 percent canopy cover, probably lessening the depth of edge effects. Thinning prescriptions would retain greater canopy cover. Based on the numbers in the literature, modified by consideration of the prescriptions, plant sites in regeneration cuts or similar cuts that retain less than 40 percent canopy should have 200 foot buffers, and others should be 100 feet. These are no-entry buffers, as thinning, yarding corridors or road construction would lessen the protection of microclimate and possibly disrupt mycorrhizal connections. Buffers may extend across roads, as trees across roads provide shading. Burning would generally not be done in buffers, as some plants would be killed by direct heat.

Under Alternative 1, the Preferred Alternative, no effects are anticipated to known populations of those Special Status, or Survey and Manage plants that require protection. Some populations of species that do not require protection (Tracking species, S&M category F species) may be extirpated, although others will not, as they fall within areas protected for other resources. The fuels treatments in the action alternatives may have an indirect beneficial effect in that the chance of catastrophic wildfire could be lessened. Any possible losses should be minimal, however, and would not contribute to listing under the ESA, as surveys are underway for these species on newer projects. For the Special Status species that are Bureau Tracking, surveys and mitigation measures are discretionary (BLM Manual 6840).

Alternatives 2 and 3 would involve greater amounts of ground disturbance, and would be more likely to affect plant species that are not protected, such as tracking species, and those species for

which surveys are not yet required.
There would be a long term, cumulative negative effect for old growth associated species due to reduction of late-successional interior forest habitat in the area as a consequence of timber harvest adjacent to the sites and buffers. Isolated populations may eventually become extinct, and habitat fragmentation could prevent recolonization. This long-term negative effect would not occur under the no action alternative. Retention of riparian reserves and areas protected for other resources should mitigate this effect. Alternatives with less intensive timber harvest would provide more time for the reserve areas to become late-successional before all late-successional stands are removed from matrix lands.

No known effects would occur to Special Status or Survey and Manage Plants under the No Action Alternative.

Non-vascular Plants - Lichens, Bryophytes and Fungi

Several Survey and Manage and Special Status lichens and bryophytes were listed in 2001, after the surveys were completed for the timber sale units. Surveys on the Glendale RA for lichens and bryophytes after January 1, 2001 included these species, and species that had not been found before on the Glendale RA were discovered. Repetition of lichen and bryophyte surveys is not considered for this timber sale, however. Surveys for the newly listed Survey and Manage species are not required unless a decision notice is signed after September 30, 2003 (Record of Decision and Standard and Guidelines for Amendments to the Survey & Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines, page 23). BLM Manual 6840 requires that actions on BLM lands do not contribute to the need to list Special Status species under the Endangered Species Act. Some sites of the newly listed Special Status species may have been missed in the older surveys, and some of these sites may be affected in this project.

Management recommendations for the Survey and Manage species require the maintenance of late-successional forest structure, soil conditions, and microclimate around known sites, and, for some species, the prevention of snag and stump loss through prescribed fire, (USDA-USDI 1996, Castellano and O'Dell 1997).

All timber sale units were surveyed for survey and manage strategy 2 and protection buffer lichens, bryophytes and fungi in the fall of 1998 and spring of 1999, using existing protocols for lichens and bryophytes (BLM IM OR-98-38, OR-98-51). Additional surveys would be required for added fuels units or new road construction.

Pre-disturbance surveys are required for some lichens and bryophytes, but are no longer required for any fungi suspected in the project area, under the Record of Decision for Amendment to the Survey & Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2001). The Oregon BLM list of Special Status Species also includes lichens, bryophytes and fungi. All of the Special Status fungi are Tracking species; surveys are encouraged but discretionary for tracking species (BLM Manual 6840).

Ulota megalospora, a moss, was found in 20 of 27 survey units in this sale. It is widely scattered on larger tanoak. This bryophyte has been removed from Survey and Manage in the Record of Decision for Amendment to the Survey & Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2001). *Buxbaumia viridis* is a moss that grows on down logs in an advanced state of decay. It is currently a category D species, and protection is required.

4.3 Effects on Water Quality and Quantity

Under the Action Alternatives, the greatest potential for increasing peak flows and destabilizing streambanks during timber harvest is through regeneration harvest. Less from commercial thin and density management treatments. It is unlikely that any harvest in this sale would increase streamflow because:

(a) units are dispersed across several small frontal watersheds on Cow Creek;
(b) ground in adjoining acres is well vegetated and old enough to be functioning properly hydrologically;
(c) soil depth is adequate to allow precipitation to percolate into forest soils during storm events;
(d) compacted ground resulting from tractor yarding would be sub-soiled and waterbarred to largely restore soil permeability;
(e) riparian reserves would tend to utilize excess groundwater from up-slope where vegetation has been removed through timber harvest;
(f) with the exception of unit #8B, there are no roads immediately downslope of RH units. Roads can intercept excess groundwater from harvest units and route it to stream channels via road ditch lines. RH unit #8B, which is nearly surrounded by roads, is on a ridge and therefore is not of concern;
(g) peak flows would also not increase in main stem Dads Creek because percent open canopy (currently at 10 percent), an indicator of watershed hydrologic functioning, would increase by only one percent because all harvest acres are DM/CT and CT; and
(h) there is no new permanent road construction

Base (summer stream flows) are not expected to decrease as a result of timber harvest because harvest would be no closer than one site potential tree height from streams and therefore would not stimulate growth of alder, maple or other riparian hardwoods that consume large amounts of water.

Soil disturbance would occur on cable yarding and tractor yarding corridors and in ditch lines and streams at culvert inlet openings. Sediment transport to streams during rainstorms would be minimized or prevented by restricting all activities to the dry season (Table 2-2). Retaining functioning well-vegetated riparian reserves on streams and wet areas would also help to reduce or prevent sediment from entering streams. Most roads in the timber sale area have been renovated within the last five years so little maintenance remains to be done under the Preferred

Alternative. Additionally, federal Jobs-In-The Woods funding replaced two culverts in main stem Dads Creek, and renovated 4.4 miles of road in Riparian Reserve, during summer of FY2002. Maintenance would be limited to cleaning culvert inlets and outlets where necessary, brushing overhanging vegetation along roads, and re-establishing three water dips.

All units were field inspected for indications of current or potential slope instability. Problem areas were deleted from further consideration. Log yarding would cause varying amounts of soil compaction, depending on the method used. Helicopter yarding would cause the least site disturbance, compaction and soil movement and tractor yarding the most. Subsoiling with winged rippers in tractor units would reduce compaction by about 80 percent. Subsoiling compacted ground would allow surface water to percolate subsurface, restoring natural hydrologic flow to the area, prevent soil from entering streams, and improve soil productivity. Although compaction in the project area would be reduced by subsoiling selected skid trails, landings and spur roads, there would no measurable change in the percentage of the watershed that is compacted because treated acreage would be small compared to total acres.

Hand piling and burning would not measurably reduce site productivity. While broadcast burning is proposed to be done under cool, moist conditions, there is a possibility that the fire could be more intense than desired. If so, there would be a short term loss of soil productivity. Prescribed burning would improve planting access. The Medford District RMP Volume I pp. 4-10 to 4-14 provides a thorough discussion of the potential effects of timber harvest activities on soils. PDFs to minimize these effects are found in Volume II, Appendix 2 of the District RMP and in this EA.

Dad's Creek is currently identified by the Oregon Department of Environmental Quality as being limited in water quality by temperature. No activities are proposed in Riparian Reserves in any alternative that would increase stream temperature.

Residual impacts of logging activities that cannot be fully mitigated include compaction from cable and tractor logging and short-term loss of site productivity from broadcast burning. Adverse effects of these residual impacts on aquatic life and watershed functioning after full implementation of applicable Standards and Guides and BMPs would be minimal.

The proposed project is consistent with watershed analysis recommendations and findings, applicable Northwest Forest Plan Standards and Guidelines, NEPA and applicable aspects of NMFS' March 18, 1997 Biological Opinion. Additionally, the proposed project does not hinder or prevent attainment of Aquatic Conservation Strategy Objectives at the 5th Field (HUC) watershed scale over the long term.

In Alternative 2, constructing 1.33 miles of ridge-top road, which largely follows a well-vegetated primitive road from Sec 26 through 23, 24 and into 13, would also necessitate using and renovating 3.8 miles of roads 32-6-33 and 32-7-36, the haul route between units 27 and 28 and the Cow Creek county road (Table 2-4). The new ridge road would have no effect whatsoever on aquatic habitat because it is several hundred yards from any stream channel.

Harvesting units 27 and 28 (RH and RH/CT), would not increase peak flows in Dads Creek because percentage of the watershed with open canopy (generally representing vegetation less than 30 years of age), would only increase about 2 percent from its current 10 percent. Nor would harvesting increase peak flows in Ping Gulch because less than 17 percent of the transient snow zone (generally lands above 2500 feet elevation) would be in open condition following timber harvest, below the level of concern (Middle Cow Creek WA).

Potential for disturbed soil from cable yarding units 27 and 28 to reach Ping Gulch is low because properly functioning riparian reserves on streams adjacent to units would effectively trap any sediment that may leave yarding corridors during storm events.

Many of the cumulative effects associated with this watershed have been addressed in the preliminary Watershed Analysis for the Middle Cow Creek watershed located in the Medford District BLM office. More site specific effects for the Papa Cow project area are discussed here. There are other management actions occurring which also affect the cumulative effects on this watershed. For cumulative effects analysis purposes, those projects include:

- Cotton Snake timber sale - being planned - scheduled for sale in 2003.
- Soukow timber sale - sold November 2002.
- Bonnie and Slyde timber sale - sold May, 1998, not awarded.
- McCollum Creek timber sale - logging completed in 1998.
- Timber sale on Oregon State lands in McCullough Creek - logging completed in 2000
- McLawson timber sale - logging completed in 2000.
- High 5 timber sale - logging completed in 1998.
- Pointless Fir timber sale - logging completed in 1999.
- Lost Fortune timber sale - logging completed in 1997
- Road renovation in the Papa Cow project area by Superior Lumber Company in 2001.
- BLM Jobs-in-the-Woods funds replaced 2 culverts in main stem Dad's Creek and renovated 4.4 miles of roads in riparian reserves adjacent to Dad's Creek during summer 2002.

Based on the analysis in the Watershed Analysis for the Middle Cow Creek watershed, this project area currently has potential problems with high soil compaction from past logging activities and relatively high road densities. Since this analysis was done, additional logging and road construction has occurred in the watershed. Table 4-5 summarizes the road construction and decommissioning in the Middle Cow Creek watershed done on BLM timber sales.

Logging and other ground disturbing activity continues at a rapid rate on private lands in and around the planning area. Some of the logging occurs with tractors. As a result sediment is generated from private timber harvest, and log hauling during wet weather. There are several large farms in the Middle Cow Creek HUC 5 where tillage contributes to the bare ground and subsequent runoff of sediments. Glendale sewage treatment plant and numerous septic tanks contribute pollutants to main stem Cow Creek and larger tributaries. Most of the riparian zones along the low lying valleys are controlled by private land owners and do not support the vegetation that is needed for stream and riparian integrity as described for federal lands in the Northwest Forest plan. It is expected that high stream temperatures, ground disturbance and sedimentation would continue from private lands.

Quality of aquatic habitat is not expected to improve in the project area in the near future because watershed condition (primarily eroding roads and poor quality riparian habitat) and forest practices on adjacent private lands are considered inadequate to protect or restore watershed values, based on standards contained in the Northwest Forest Plan and the RMP.

Table 4-5. Miles of road construction and decommissioning on recent BLM timber sales in the Middle Cow Creek watershed.

Timber Sale	Temporary Roads Constructed	Permanent Roads Constructed	Roads Decommissioned	Net gain or loss of roads
Lost Fortune	0.4	0	0	0
Pointless Fir	0.3	0.6	1.0	-0.4
High 5	0.2	0	0	0
McLawson	0.2	0.5	0	+0.5
McCollum Cr.	0.2	0	0	0
Bonnie and Slyde	0.2	0	0	0
Cotton Snake*	0.5	1.4	1.7	-0.3
Papa Cow*	0	0	0	0
Soukow	0.5	0	0.5	-0.5
Totals	2.56	2.5	3.2	-0.7

* In the planning stages.

4.5 Effects associated with Issue #4 - Large Down Wood

Direct and Indirect Effects

Density management with associated fuels treatment at this time would change the rate and size of large down wood entering the system. Without the treatments, larger pines and Douglas firs would generally die first, become snags, and fall over. The replacement of trees of this size (particularly pines) would be greatly reduced. There would then be mortality within the smaller diameter Douglas firs followed by snag formation and creation of smaller diameter down logs which have a shorter retention period than larger logs. The average diameter of down wood would decline over time. With the proposed treatments, the total amount of large down wood that would enter the system in the near future would be reduced. However, the larger pines and Douglas fir would live longer, would gradually become snags, and then down logs. Large pines and large pine logs would remain in the system. Broadcast burning would pose a risk for Class 1 and 2 large down wood in the immediate vicinity of substantial fuels.

4.6 Effects associated with Issue #5 - Forest Health

Density management /Commercial thin (DM/CT) treatments in units 4, and 6 would treat 60 acres. These acres would be treated primarily to improve forest health in the long term. Treatments would reduce stand densities. Competition to large pines and Douglas-firs would be reduced. Stand vigor would increase. Resistance to insect and disease attack would increase particularly in larger trees.

Openings created around large pines and Douglas-firs would help to maintain this forest component and would promote the regeneration of pine within the stands.

Fuels would be treated within DM/CT and CT units. Ladder fuels would be reduced. Total live fuel loadings would be reduced. While in the short term the potential for wildfire would increase slightly, over the long term the potential for stand replacement fire and associated habitat loss would be reduced.

Prescribed burning would improve planting access but carry a risk that fall broadcast burning could be more intense than desired. There would be a short term loss of soil productivity. Hand piling would not reduce site productivity to the same degree as broadcast burning.

Commercial thinning (CT) in units 16 and 18B, and Commercial Thin/Select (CT/Select) in unit 13, would treat an estimated 41 acres. While treatments would not be specifically for forest health, results similar to DM/CT units are expected.

New road construction would be located in the most advantageous location; minimizing environmental damage and optimizing management opportunities. In the future, having this road on the ridge top may persuade private logging companies to use uphill cable systems on their lands, rather than using tractor logging which would increase erosion and reduce soil productivity. It may also avoid less desirable road locations if other parties, such as miners, want to gain access to the area.

Construction of the new road into sections 23 and 13 would facilitate future management options for timber harvest, administrative access, special forest product harvest, fire suppression activities and silvicultural treatments. Yarding costs and silvicultural treatment costs would be lower than using a helicopter (Alternative 3).

Within Density Management and Commercial Thinning units, characteristics of late-successional habitat would be likely to appear sooner under the three Action Alternatives than with the No Action alternative because of increased growth rates of retained trees and the maintenance of large conifers. In these units, large conifers and especially pines are at risk of loss through competition with from smaller trees for nutrients and water, potential disease, insects and other agents of change, and lack of recruitment for pines. The Action Alternatives would also maintain pine within stands better than the No Action alternative.

Under the No Action Alternative, not treating the CT and DM/CT units would eliminate the beneficial effects of improving stand vigor and yield in these units. There is a window of time in which thinning is most effective in promoting increased growth in the residual trees. If this treatment is postponed for 10 or more years, its effectiveness would be reduced, although the amount will vary by site and depending on how long the thinning is postponed. Eventually, in 20-30 years, DM/CT and CT treatments would be less viable options compared with a regeneration harvest, and the opportunity for improving vigor and growth will have been lost.

Given the overstocked conditions of the stands in sections 15 and 21, this alternative would allow forest health (stand resiliency, vigor, stability, ability to withstand insects and disease) to continue to decline. The potential for wildfire would increase.

There would be no effect on the Port Orford cedar along the West Fork Cow Creek or elsewhere. No Port Orford cedar exists in the project area to either provide spores of laminated root rot to be transported off-site or to be infected by spores potentially brought into the project area on equipment.

Invasive Species

Ground disturbance associated with logging, road work and other activities may allow noxious and invasive species to spread and to become established in the Project Area under the Action Alternatives. Species known to be in the area include bull thistle (*Cersium vulgare*), scotch broom (*Cytisus scoparius)* and meadow knapweed (*Centaurea pratensis*). Bull thistle dominates clearcuts and other disturbed, sunny areas. It essentially eliminates use by grazers and most

medium-to-large mammals in any area it colonizes. In the Papa Cow Project Area, recent clearcuts on private lands are dominated by planted conifers and contain bull thistle within 3 years of cutting. Thus, clearcuts and other disturbed lands are much less useable by elk. All three species are not believed to affect the ability of the newly planted conifer stand to survive. In addition they have the potential to disrupt native plant and animal communities.

Washing vehicles before moving onto the project area would reduce the chance of bringing in new species of noxious and invasive weeds, and would help reduce the rate of spread of those species already present. The net effect of any of the Action Alternatives would likely be the increase in abundance and distribution of several noxious and invasive species.

4.7 Effects on Cultural Resources

The protective measures described in the Project Design Features would adequately protect the historic mining site and ditches located within the proposed units. This area is unlikely to contain other significant cultural sites, so the risk of damage to unknown sites is small.

4.8 Effects on Roads

The Preferred Alternative would offer an opportunity to maintain the roads that would be used for timber hauling, as current road maintenance funding is inadequate to maintain all BLM roads and bring them up to Bureau standards. There would be no new rocking of roads, so costs of road maintenance would be relatively low. The timber sale would directly affect 10.0 miles of existing paved roads and 12 miles of rocked roads (Table 2-3). Spot rocking of soft areas would reduce road surface sediment production and correct driving conditions in some areas. Culvert inlets and outlets would be cleared of debris where needed. Roads would be brushed of overhanging vegetation posing a safety hazard.

Under Alternative 2 the new road construction (32-7-26.1) in section 23 would be done and units 27 and 28 would be skyline cable yarded.

Waste areas, designated or created, in stable, non-sensitive locations, would give future road maintenance activities locations to which excess material could be hauled.

The road would also promote future disturbance from miners, special forest product users, hunters, salvage activities and other users.

Under Alternative 3 the new road in section 23 would not be constructed. Not building the road would limit future management options for harvesting, administrative access, and fire suppression, although it would be possible to build the road in the future. This proposed road would access approximately 220 acres of cable yarding in sections 13 and 23. Yarding costs and silvicultural treatment costs would he higher than if the road were built. It would be more difficult to achieve adequate site preparation for reforestation efforts. Hand piles are not as effective in controlling brush as are broadcast burns. In addition, this construction would locate

the road in the most environmentally favorable location.

This alternative is also likely to promote uphill skyline yarding on private land. It is likely the private land would be tractor yarded in the future if this new road is not constructed, which would have an adverse effect on soil productivity and stream habitat. Although there is no guarantee private companies would use the road for uphill cable yarding, it would be an option.

Not constructing the road would also avoid the increase in road density in the area. This effect is fairly small, since most of the road would be low impact, ridge-top road. However, it would avoid improving access to an unroaded area which may eliminate the potential for additional disturbance (mining, harvesting special forest products, hunting, salvage logging, and other activities).

In the short term, the potential addition of sedimentation as a result of road work and hauling would not occur. On the other hand, the beneficial long term effects of improving roads and ripping roads and skid trails would also not occur. The net effect would be to allow the present levels of erosion and sedimentation to occur and increase over time; an overall adverse effect on streams and fish habitat.

4.9 Possible mitigating measures

No aircraft flights associated with logging would be allowed within ½ mile of spotted owl sites during the nesting season. This mitigating measure would increase the protection from the 1/4 mile Project Design Feature to mitigate the potential for disturbing nesting owls.

4.10 Monitoring

This timber sale would be subject to the standard monitoring called for in the RMP. In addition, the following specific monitoring actions would be taken:

1. Roads where spot rock is applied would be monitored for the first two years to determine if noxious weeds have been introduced. If necessary, the sites would be treated to prevent plants from becoming established.

2. Roads that are maintained would be monitored for a minimum of two winters to determine effectiveness of the treatment for correcting drainage problems.

Chapter 5 - Consultation

5.0 Agencies and Persons Consulted

Landowners within 1/4 mile of the proposed action have been notified that this management action is being considered and asking for their opinions, concerns and suggestions.

A legal advertisement will be placed in local newspapers to announce to the public that the Glendale Resource Area is requesting public comments on the proposed management action. In addition, notification of this proposal will be sent to the Oregon Department of Fish and Wildlife, the Oregon Dept. of Forestry, county commissioners for the affected county, several environmental groups, and representatives of the timber industry to request their comments. These announcements will be made following completion of this environmental assessment and before a decision is made.

All public input was considered by the ID team in developing the timber sale proposal and analyzing the environmental effects of this action. Changes in the preliminary plan as well as the proposed project design features may be based, in part, on information received from the public. The Field Manager will also consider all input before making a final decision concerning this proposal.

5.1 List of Interdisciplinary Preparers

Name	Title	Primary Responsibility
Marylou Schnoes	Wildlife Biologist	Wildlife, T/E Animals, Survey & Manage
Deston Russell	Engineer	Roads, quarries
Bob Bessey	Fisheries Biologist	Soils, Watershed, Riparian, Fish
Dave Caulfield	Forester	Logging systems, layout, contract prep.
Jim Brimble	Forester	Silviculture, vegetation, site preparation, forest health
Natalie Simrell	Fuels Technician	Fuels
Douglas Goldenberg	Botanist	Botany
Rachel Showalter	Botanist	Botany
Vince Randall	Forest Manager	Logging systems, IDT Lead
Sherwood Tubman	Ecosystem Planner	NEPA

Reviewed By:

_____ _____

Sherwood Tubman
Glendale RA Ecosystem Planner Date
for format and adequacy

Glossary

AIR QUALITY: A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

ALTERNATIVE: One of at least two proposed means of accomplishing planning objectives.

ANALYSIS: The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.

ASSESSMENT: A form of evaluation based on the standards of rangeland health, conducted by an interdisciplinary team at the appropriate landscape scale(pasture, allotment, sub-watershed, watershed, etc.) To determine conditions relative to standards.

AQUATIC: Living or growing in or on the water.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC): An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life/provide safety from natural hazards.

BRYOPHYTES: Plants of the phylum Bryophyta, including mosses, liverworts, and hornworts, characterized by the lack of true roots, stems and leaves.

CANDIDATE SPECIES: Those plants and animals included in the Federal Register "Notices of Review" that are being considered by the U.S. Fish and Wildlife Service for listing as threatened or endangered. Two categories that are of primary concern: Category 1 - Taxa for which there is substantial information to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work. Category 2 - Taxa information indicates that listing is possibly appropriate. Additional information is being collected.

CONNECTIVITY: A measure of the extent to which conditions among late-successional/old-growth (LS/OG) forest areas provide habitat for breeding, feeding, dispersal, and movement of LS/OG associated wildlife and fish species.

CONSULTATION: Formal consultation is a process that occurs between the U.S. Fish and Wildlife Service(USFWS) or the National Marine Fisheries Service(NMFS) and a federal agency that commences with the federal agency's written request for consultation under Section 7(a)(2) of the Endangered Species Act regarding a federal action which may affect a listed species or its critical habitat. It concludes with the issuance of the biological opinion under Section 7(b)(3) of the Act. Informal consultation is an optional process that includes all discussions, correspondence, etc., between the USFWS or NMFS and the federal agency, or the designated non-federal representative, prior to formal consultation, if required. If the listing agency determines that there is no likely adverse affect to the listed species, it may concur with the action agency that formal consultation is unnecessary.

CULTURAL RESOURCES: Those resources of historical and archaeological significance.

CUMULATIVE EFFECTS: Those effects on the environment that result from the incremental effect of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person(s) undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

DECOMMISSION: To remove those elements of a road that reroute slope drainage and present slope stability hazards. This usually involves removing the culverts, ripping the road prism, installing drainage facilities (i.e. waterbars, water dips, etc.), and replanting the road surface with grasses, legumes, shrubs, and trees.

DEFER: To drop from the proposed action potential harvest units. This is a short term action, involving this entry only. It does not preclude considering these units for harvest in the future.

DISPERSAL HABITAT: Habitat that supports the life needs of an individual animal during dispersal. Generally satisfies needs for foraging, roosting, and protection from predators.

DIVERSITY: The aggregate of species assemblages (communities), individual species, and the genetic variation within species and the processes by which these components interact within and among themselves. The elements of diversity are: 1. Community diversity (habitat, ecosystem), 2. Species diversity and 3. Genetic diversity within a species; all three of which change over time.

ENDANGERED SPECIES: Any animal or plant species in danger of extinction throughout all of a significant portion of its range. These species are listed by the U. S. Fish and Wildlife Service.

FLOOD PLAIN: A plain along a stream or river onto which the flow spreads at flood stage.

FOREST HEALTH: The ability of forest ecosystems to remain productive, resilient and stable over time and to withstand the effects of periodic natural or human-caused stresses such as drought, insect attack, disease, climatic changes, resource management practices and resource demands.

GUIDELINE: Practices, methods, techniques and considerations used to ensure that progress is made in a way and at a rate that achieves the standard(s).

HABITAT: A specific set of physical conditions in a geographic area(s) that surrounds a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

HABITAT FRAGMENTATION: The breakup of extensive habitats into small, isolated patches that are too limited to maintain their species stocks into the indefinite future.

IMPACT: Synonymous with effects. Includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions which may have both beneficial and detrimental (adverse) effects. Impacts may be considered as direct, indirect, or cumulative:

- •Direct: Impacts caused by an action an occurring at the same time and place.
- •Indirect: Impacts caused by the proposed action and occurring later in time or farther removed in distance, but are still reasonably foreseeable.
- •Cumulative: Those which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

LATE-SUCCESSIONAL FOREST: Forest seral stages which include mature and old-growth age class.

MAST: nuts accumulated on the forest floor and often serving as food for animals

MITIGATING MEASURES: Constraints, requirements, or conditions imposed to reduce the significance of or eliminate an anticipated impact to environmental, socioeconomic, or other resource value from a proposed land use. Committed mitigating measures are those measures BLM is committed to enforce (i.e., all applicable laws and their implementing regulations).

MONITORING: A process of collecting information to evaluate if objective and anticipated or assumed results of a management activity or plan are being realized or if implementation is proceeding as planned.

NOXIOUS WEEDS: Those plants which are injurious to public health, agriculture, recreation, wildlife, or any public or private property.

ORGANIC MATTER: Plant and animal residues accumulated or deposited at the soil surface; the organic fraction of the soil that includes plant and animal residues at various stages of decomposition; cells and tissues of soil organisms, and the substances synthesized by the soil population.

PERENNIAL STREAM: A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

PERMEABILITY: The ease with which gases, liquids or plant roots penetrate or pass through bulk mass of soil or a layer of soil.

PRESCRIBED FIRE: Controlled application of fire to fuels under conditions of weather, fuel moisture, and soil moisture that will allow confinement of the fire to a predetermined area and, at the same time, will produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives to wildlife, livestock, and watershed values. The overall objectives are to employ fire scientifically to realize maximum net benefits at minimum environmental damage and acceptable cost.

RIGHT-OF-WAY: Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a R-O-W authorization.

RIPARIAN HABITAT: Riparian habitat is defined as an area of land directly influenced by permanent (surface or subsurface) water. They have visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and stream-banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

RIPARIAN VEGETATION: Plants adapted to moist growing conditions along streams, waterways, ponds, etc.

ROUTE: A path, way, trail, road, or other established travel corridor.

SOIL MOISTURE: Water contained in the soil; commonly used to describe water in the soil above the water table.

SPECIAL STATUS SPECIES: Wildlife and plant species either Federally listed or proposed for listing as endangered or threatened; state-listed or BLM determined priority species.

THREATENED SPECIES: Any animal or plant species likely to become endangered within the foreseeable future throughout all of a significant portion of its range. These species are listed by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service in accordance with the 1973 Endangered Species Act and published in the Federal Register.

TRAIL: A created or evolved "transportation facility" administratively designated for certain types of use. Examples include hiking, equestrian, snowmobile, cross country skiing, motorcycles, off-highway vehicles.

WATERSHED: All land and water within the confines of a drainage divide.

WATERSHED ANALYSIS: A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis provides a basis for ecosystem management planning.

WATERSHED FUNCTION: The principle functions of a watershed include the capture of moisture contributed by precipitation; the storage of moisture within the soil profile, and the release of moisture through subsurface flow, deep percolation to groundwater, evaporation from the soil, and transpiration by live vegetation.

WAY: A path, trail, or other established travel corridor.

WILDFIRE: Any wildland fire that does not meet management objectives, thus requiring a fire suppression response. Once declared a wildfire, the fire can no longer be declared a prescribed fire.

WIND THROW: A tree or trees uprooted or felled by the wind.

Appendix A. Summary of seasonal operating restrictions - Papa Cow timber sale. These are the time periods when activities are allowed.

RESTRICTIONS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Log hauling - paved roads												
Log hauling - gravel roads												
Log hauling - natural surface roads												
Road Construction												
Road Decommissioning												
Quarry activities in Riparian Reserves												
Cable yarding in CT												
Tractor Yarding												
Logging and road work within 1/4 mile of spotted owl sites												
Blasting without restrictions												
Falling and yarding in occupied talus in helicopter units												

This table is intended as an aid in summarizing seasonal restrictions. If there is a conflict between the table and the text, the text should be considered correct.

Appendix B. Areas which were considered in the Papa Cow project area, for the Papa Cow Timber Sale, Glendale Resource Area.

Area	Acres	Original analysis and comments.
32-7- 15-1	49	Deferred - Connectivity Block
32-7- 15-2A	11	Deferred - Connectivity Block
32-7- 15-2B	64	Deferred - Connectivity Block
32-7- 15-4	22	Connectivity Block -defer to maintain connectivity to section 23
32-7- 15-5	24	Connectivity Block - defer to maintain connectivity to section 23
32-7- 15-6	31	Connectivity Block
32-7- 15-7A	35	Connectivity Block
32-7- 15-7B	27	Connectivity Block
32-7- 15-15	11	Connectivity Block
32-7- 17-08	10	Defer to avoid connecting two adjacent clearcuts
32-7- 17-12A	11	
32-7- 17-12B	60	
32-7- 19-2	36	Deferred
32-7- 19-6	67	
32-7- 19-10	9	
32-7- 20-1A	33	
32-7- 20-1B	8	Deferred
32-7- 20-1C	30	
32-7- 20-2	12	
32-7- 20-3	18	
32-7- 20-12A	7	
32-7- 20-12B	16	
32-7- 20-14	4	Deferred
32-7- 21-1	8	Deferred - Connectivity Block
32-7- 21-3	25	Connectivity Block
32-7- 21-5A	21	Deferred - high impacts from recent cutting on adjacent private lands - Connectivity Block
32-7- 21-5B	30	Deferred - high impacts from recent cutting on adjacent private lands - Connectivity Block
32-7- 21-6	19	Deferred - Connectivity Block
32-7- 21-7	30	Connectivity Block
32-7- 21-9	8	Deferred - Connectivity Block

Area	Acres	Original analysis and comments.
32-7- 21-10	24	Deferred - Connectivity Block
32-7- 21-11	42	Deferred - high impacts from recent cutting on adjacent private lands - Connectivity Block
32-7- 21-12	15	Connectivity Block
32-7- 21-16	4	Deferred - Connectivity Block
32-7- 21-20	8	Deferred - Connectivity Block
32-7- 21-21	16	Deferred - Connectivity Block
32-7- 21-90	14	Deferred - Connectivity Block
32-7- 21-98	18	Deferred - Connectivity Block
32-7- 23-1	61	Deferred - Connectivity Block
32-7- 23-2A	67	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-2B	23	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-2C	32	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-2D	61	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-3	21	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-5A	98	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-5B	11	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-51	27	Connectivity Block - deferred; current entry in section elsewhere
32-7- 23-52	10	Connectivity Block
32-7- 27-1A	115	Connectivity Block
32-7- 27-1B	7	Connectivity Block
32-7- 27-2A	9	Connectivity Block - deferred, poor access, uneconomical to manage
32-7- 27-2B	9	Connectivity Block - - deferred, poor access, uneconomical to manage
32-7- 27-3	32	Connectivity Block
32-7- 27-6	29	Deferred - Connectivity Block
32-7- 28-3	4	Deferred
32-7- 29-1	24	
32-7- 29-2	38	
32-7- 29-3A	54	
32-7- 29-3B	51	
32-7- 29-7A	8	
32-7- 29-7B	32	
32-7- 29-9	34	

Area	Acres	Original analysis and comments.
32-7- 29-10	14	
32-7- 29-14	19	
32-7- 30-10	26	
32-7- 31-1	73	Connectivity Block
32-7- 31-2	45	Connectivity Block
32-7- 31-7	35	Connectivity Block
32-7- 33-3A	14	
32-7- 33-3B	15	
32-7- 33-3C	4	
32-7- 33-3D	7	
32-7- 33-5	16	
32-7- 33-9	42	
32-7- 35-1A	4	Defer - recent adjacent harvest in Hog Ranch timber sale
32-7- 35-1B	31	Deferred
32-7- 35-2	5	Defer - recent adjacent harvest in Hog Ranch timber sale
32-7- 35-3A	21	Defer - recent adjacent harvest in Hog Ranch timber sale
32-7- 35-3B	11	Defer - recent adjacent harvest in Hog Ranch timber sale
32-7- 35-4	3	Defer - recent adjacent harvest in Hog Ranch timber sale
32-8- 25-2A	34	
32-8- 25-2B	10	
32-8- 25-3	22	
33-7- 3-2A	15	
33-7- 3-2B	47	
33-7- 3-2C	92	
33-7- 3-7	13	
33-7- 9-3A	16	
33-7- 9-3B	12	
33-7- 9-3C	16	
33-7- 9-3D	4	
33-7- 9-4	61	

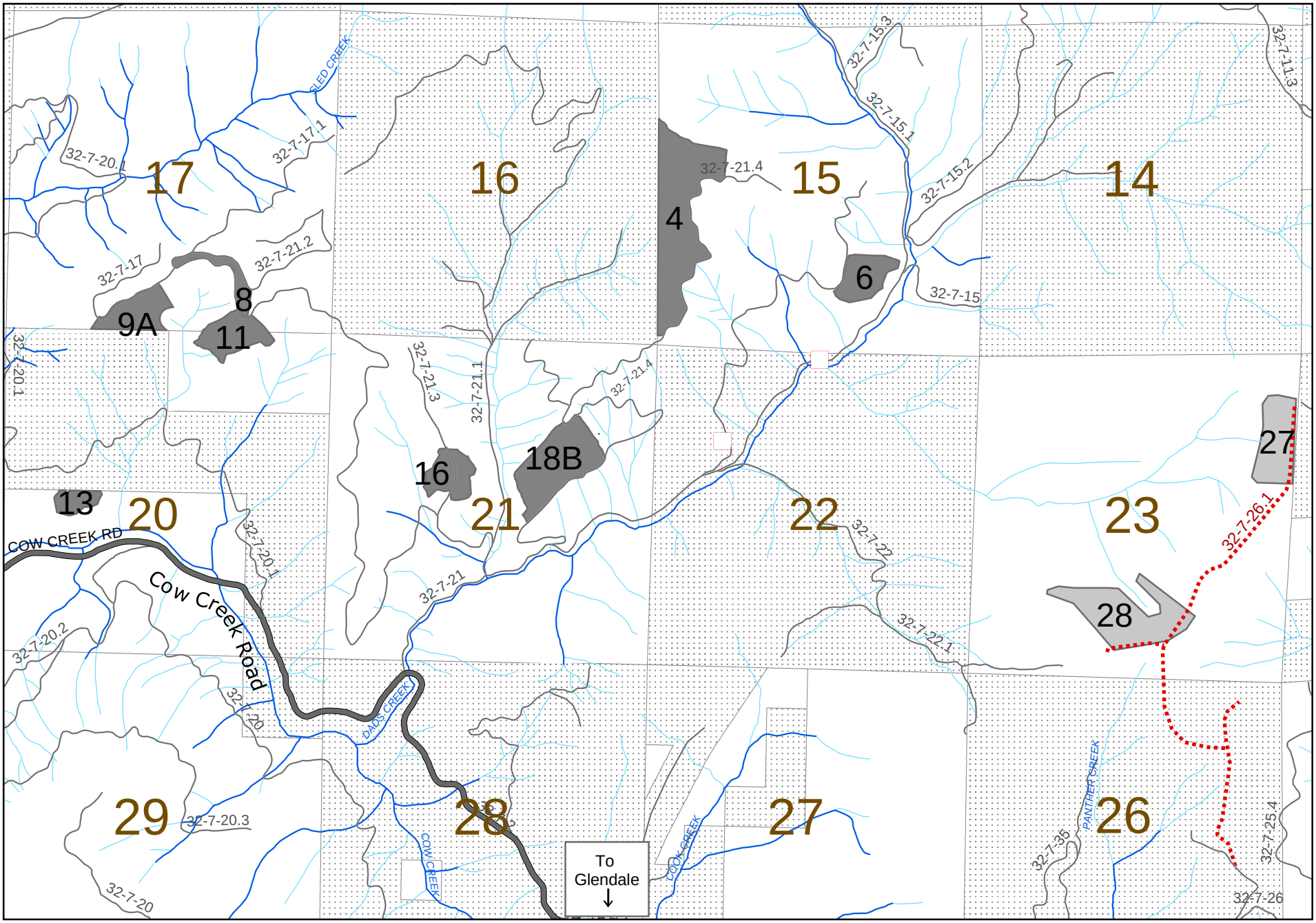
Area	Acres	Original analysis and comments.
33-7- 9-9	31	
33-7- 9-17	38	
33-8- 1-1	25	
Total	2,555	

***In this table, "deferred" means deferred from this proposal.**

PAPA COW Timber Sale

Overview Map

T32S R7W



Helicopter Landings

New Road (Alt. 2)

Proposed Units (Alt. 1)

Other Units (Alt. 2 - 3)

Miles

0 0.25 0.5 0.75 1

1:25,555

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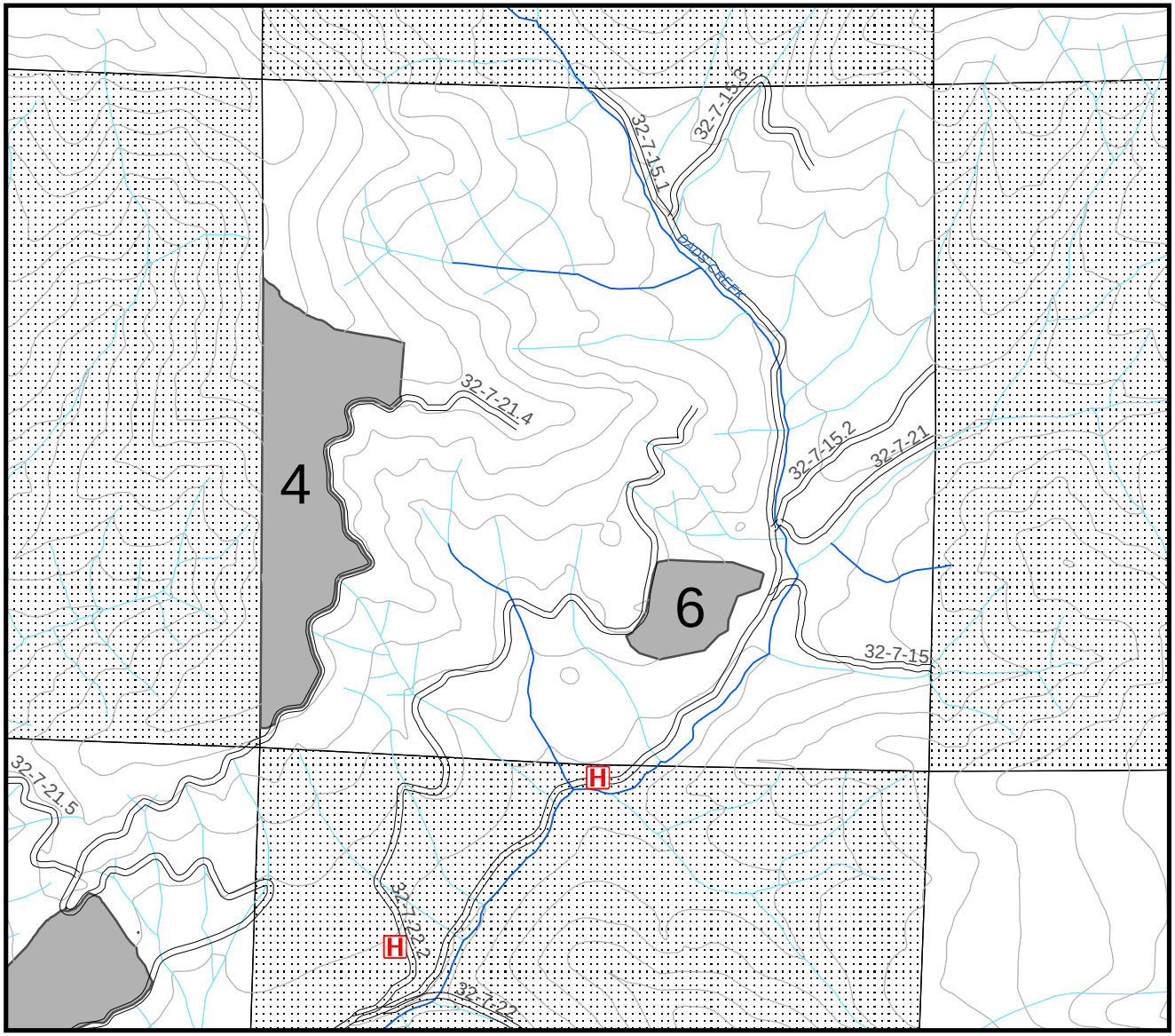
PAPA COW Timber Sale
Map 1
T32S R7W Section 15



Helicopter Landing

Timber Sale Units

Proposed Units (Alt. 1)

Other Units (Alt. 2 - 3)

Perennial Stream

Intermittent Stream

100 ft. Contours

Roads

BLM

NON-BLM

Miles

0 0.1 0.2 0.3 0.4

1:15,840

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PAPA COW Timber Sale
Map 2
T32S R7W Sections 17, 20

Helicopter Landing

Timber Sale Units

Proposed Units (Alt. 1)

Other Units (Alt. 2 - 3)

Perennial Stream

Intermittent Stream

100 ft. Contours

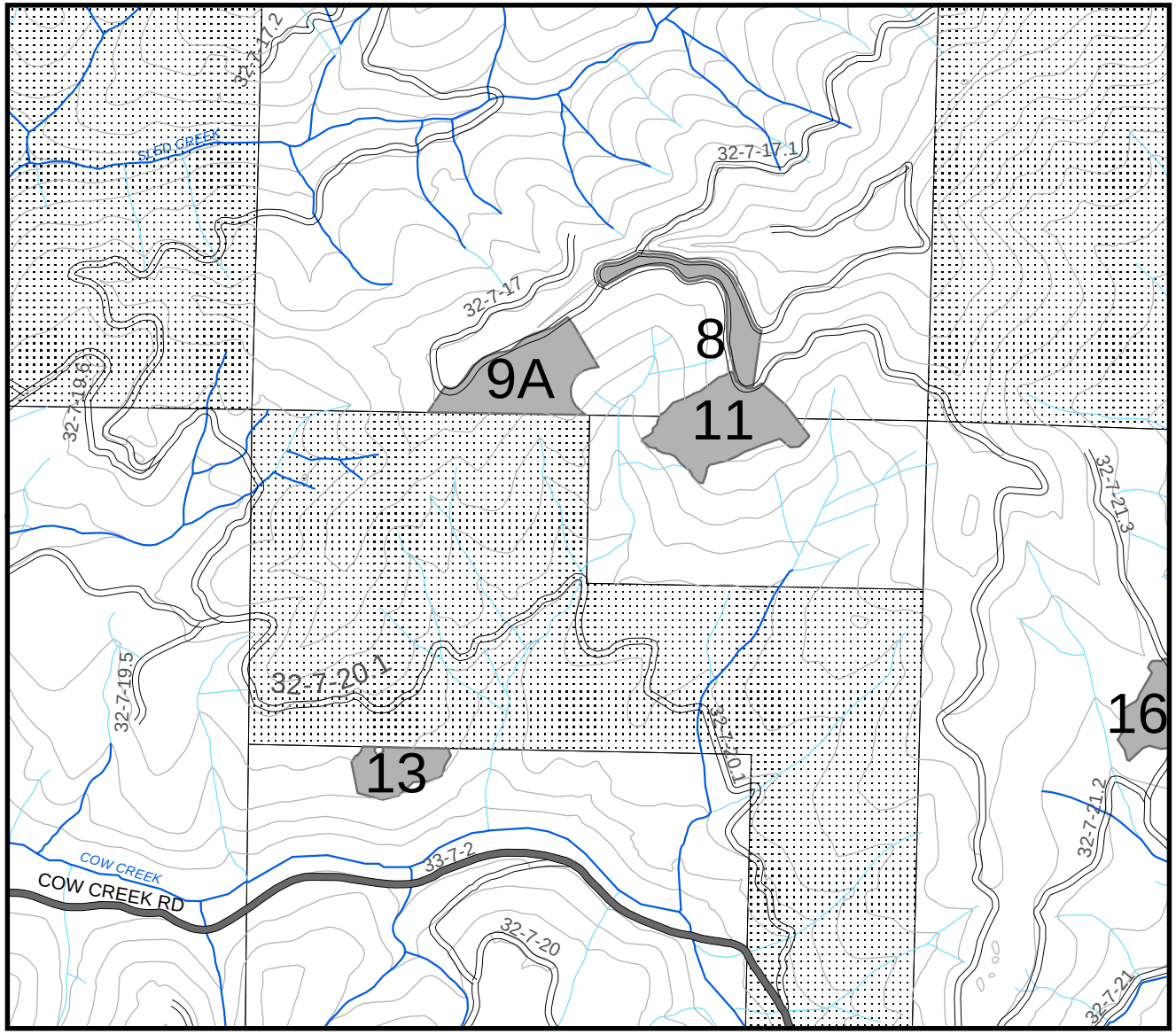
Roads

BLM

NON-BLM

0 0.1 0.2 0.3 0.4 Miles

1:15,840



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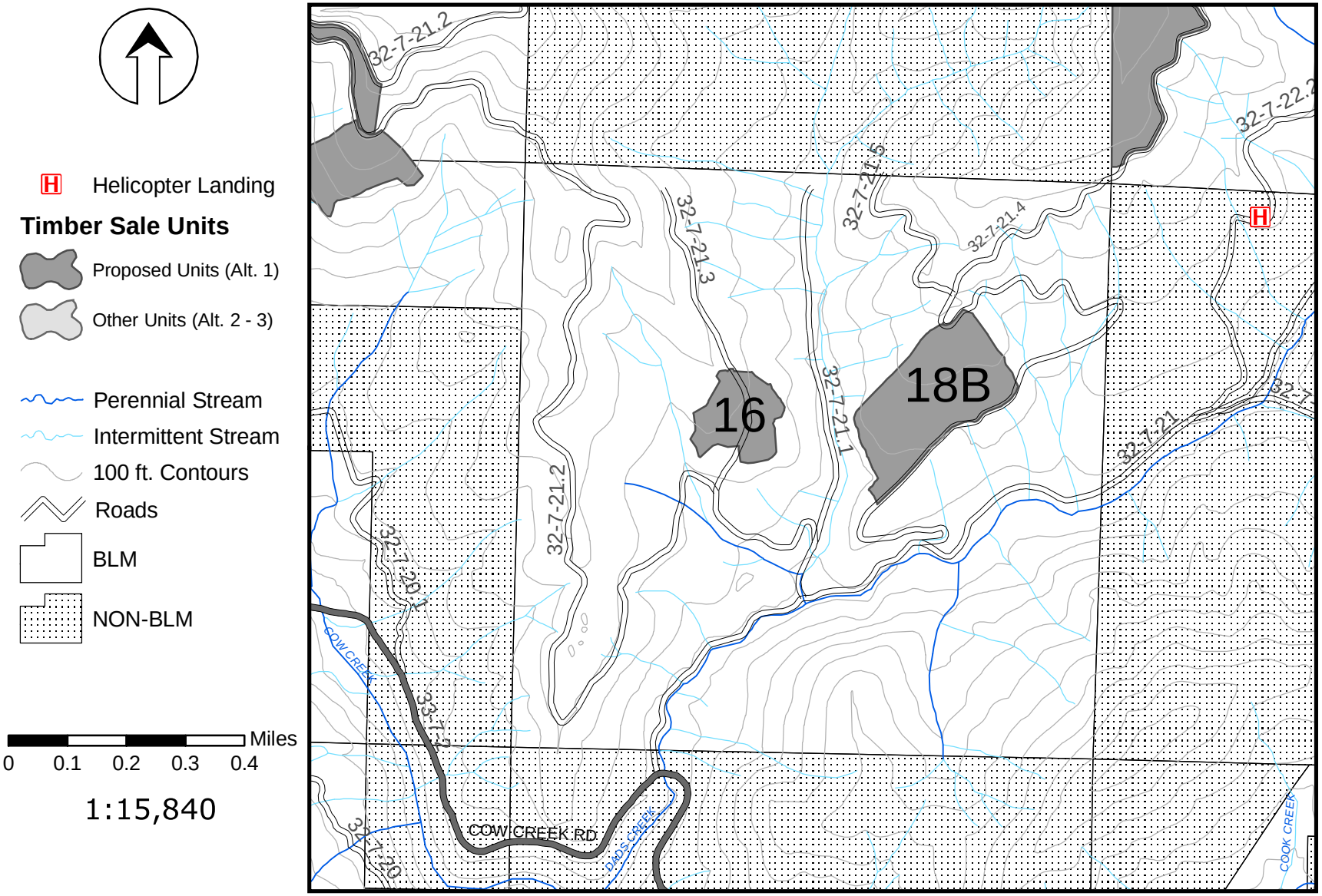
PAPA COW Timber Sale
Map 3
T32S R7W Section 21



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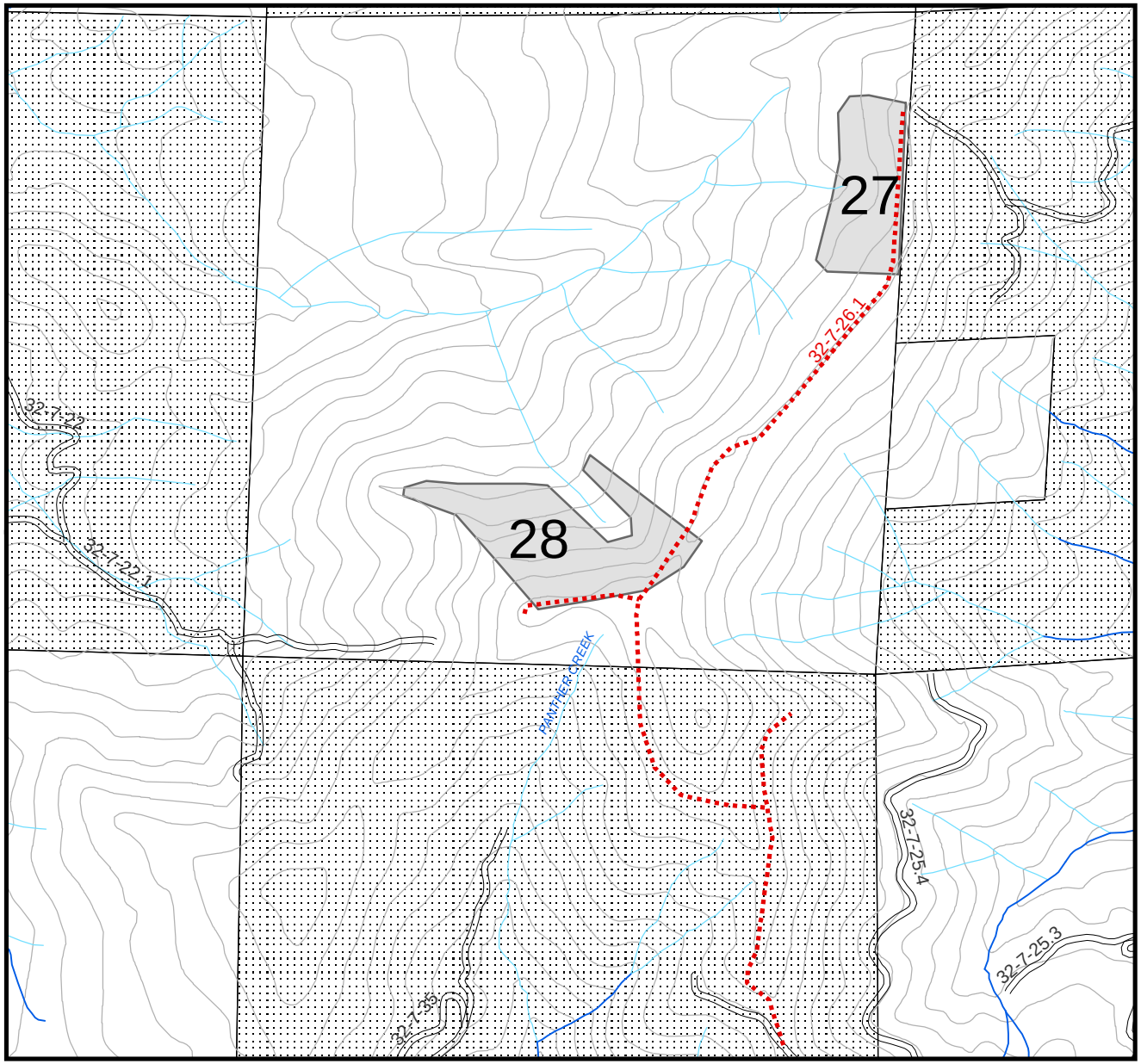
PAPA COW Timber Sale
Map 4
T32S R7W Section 23



Helicopter Landing

New Road (Alt. 2)

Timber Sale Units

Proposed Units (Alt. 1)

Other Units (Alt. 2 - 3)

Perennial Stream

Intermittent Stream

100 ft. Contours

Roads

BLM

NON-BLM

Miles

0 0.1 0.2 0.3 0.4

1:15,840

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