Appendix E

Energy and Minerals

This appendix provides detailed background on mineral and energy developments.

In this appendix:

Reasonably Foreseeable Mineral and Energy Developments in the Eugene, Roseburg, and Medford Districts and the Klamath Falls Resource Area of the Lakeview District E-3

Restrictions and Requirements on Mineral and Energy Exploration and Development Activity E-33

Reasonably Foreseeable Mineral and Energy Developments Summary

Table E-1. Fluid Mineral Development Potential

	Eugene	Roseburg	Medford	Klamath Falls
Conventional Oil/Gas	N/A	Zero to 114 wells	N/A	N/A
Seismic notices of intent		Expected to be confined to existing road systems; negligible effects.		
Road construction		7 miles new road = 39 acres.		
Well pad		Nested wells and services = 114 acres.		
Collection pipe:		Collection piping will utilize road prism.		
Plug & abandon wells		No additional effect.		
Coal bed natural gas	N/A	N/A	N/A	N/A
Seismic notices of intent				
Road construction				
Well pad				
Collection pipe:				
Plug & abandon wells				
Geothermal	N/A	N/A	N/A	See below.

For Klamath Falls Resource Area:

Geophysical Exploration (includes seismic reflection and gravity/magnetic field surveys):

- Notices of Intent: 2; Very small acres disturbed
- Exploratory Wells: 1-2: 0.1 acre per site; .25 acre per well for roads. 0.35-0.7 acres total disturbance

Geothermal Operations:

-Notices of Intent:

Surface Geophysical Surveys: 6: very limited surface disturbance

Temperature Gradient Holes: 5: 0.1 acre per site; .25 acre per well for roads. 2.25 acres total disturbance

Exploration wells: 5 wells; One acre per well pad; 40 ft. wide ROW @ 0.5 mile per well = 17 acres total disturbance

Geothermal Power Plant Development:

1 possible in the life of the plan; if proposed, evaluate separately in cooperation with the State.

Direct Use of Geothermal Energy for space heat:

2 possible; evaluate separately if proposed

Table E-2. Salable Mineral Development Scenario Summary For 2008-2018

	Roseburg	Salem	Eugene	Coos Bay	Medford	Klamath Falls
New quarries	1	5	2	5	3	1 to 2
Acres disturbed	2 acres per quarry, plus ½ acre for access.					2 to 3 acres per quarry, plus ½ acre for access.
Existing quarries	60 6 quarries expanded @ 2 acres per quarry	38 8 quarries expanded. Less than 2 acres per quarry.	71 4 quarries expanded at approximately 1 acre each.	32 6 quarries expanded. Less than 2 acres each quarry.	188 10% of quarries expanded at less than1 acre per quarry, plus 1/10 acre per quarry for new access.	18 quarry & cinder sites used Intermittently.
Depletions	10 quarries	2 quarries	2 quarries	1 quarry	5 quarries	Up to 4 quarries
Decorative stone		3 to 6 sales per year	1 to 2 sales per year		750 sales over the 10-year period	1 to 2 sales per year

Table E-3. Locatable Mineral Development Scenario

	Roseburg	Salem	Eugene[a]	Coos Bay	Medford	Klamath Falls
Bench Placer notices	2	10	6	6	80	0
Roads	0.3 acres per	0.3 acres per	0.3 acres per	0.3 acres per	Of 80 estimated, 10 would have roads at ½ acre per notice.	0
Test pits, support facility	1 acre per notice	1 acre per notice	1 acre per notice	1 acre per notice	1 acre per notice on average.	
Notice to plan	1	1	0	1	0	0
Vein notices	2	4	4	one	100 notices; surface disturbance 1 to 5 acres per notice.	4
Roads	3 per notice 40x200 = ½ acre per notice	3 per notice 40X200=1/2 acre per notice	3 per notice 40x200= ½ acre per notice	3 per notice 40x200= ½ acre per notice	Mostly existing roads; minimal temporary roads; estimate 0.50-acre for half of the notices; and zero acres for the other half of the notices.	Mostly existing roads; minimal temporary roads.
Support facilities	1 acre per notice	1 acre per notice	1 acre per notice	1 acre per notice	1 acre for half of the notices (many current notices take ore off-site for processing).	
Sample sites	½ acre per notice	0.50-acre per notice	0.50-acre per notice	0.50-acre per notice	Ten holes per notice; 0.1 acre per hole; estimate 1/5 of the notices will drill a hole.	Ten holes per notice; 0.1 acre per hole.
Plans of Operation	1	1	1	1	15 (lode & placer)	0
Exploratory holes	5; 0.1 acre per hole; roads 40x300= 0.75 acre	Ten; 0.1 acre per hole; roads 40x300= 0.75 acre	Ten; 0.1 acre per hole; roads 40x300= 0.75 acre	Ten; 0.1 acre per hole; roads 40x300= 0.75 acre	Ten; 0.1 acre per hole; roads 40x300= 0.75 acre. Estimate ½ of the plans will be lodes and have exploratory holes.	
Support facility	1 acre	1 acre	1 acre	1 acre	1 acre per plan	
Second Phase Exploration						
Roads	5 (standard as above)= 2.5 acres	10 (standard as above)= 2.5 acres	10 (standard as above)= 2.5 acres	10 (standard as above)= 2.5 acres	Mostly existing roads; minimal temporary roads; estimate ½ acre for ½ of the plans;zero acres for the other half of the plans.	

	Roseburg	Salem	Eugene[a]	Coos Bay	Medford	Klamath Falls
Drill pads		10 holes, 0.1 acre per hole	10 holes, 0.1 acre per hole	10 holes, 0.1 acre per hole	10 holes, 0.1 acre per hole; on ¼ of the plans.	
Mine Development						
Bench placer	One; 1 acre	One, 7.5 acres	one; 7.5 acres		Eight of the plans are estimated to be bench placers at five acres per plan.	
Lode	One	one	None		Seven of the plans are estimated to be lodes with one requiring a 25 acre heap leach.	
Surface excavation	1 acre	10 acres			5 acres per plan.	
Stockpile topsoil	1 acre	2acres			1 acre per plan.	
Support facility	1 acre	2acres			1 acre per plan.	
Roads	1 acre	2 acres			Less than 1 acre per plan.	
Mineral Processing	Done offsite	Done offsite			One acre for half of the plans.	
Silica sand deposit		One	*See footnote	one		0
Mine site		21 acres		20 acres		
Stockpile heavy minerals		One acre		2 acres		
vegetation stockpile		One acre		½ acre		
Office & magnetic separation		One acre		One acre		
Laterite placer plan of operation				One plan		0
Exploratory Holes drilled				10 @ 0.1 acre per hole		
New temporary Roads				0.75 acres total		
Support facility				One acre		
Second Phase Expansion						
Temporary roads				2.5 acres total		
Ten additional drill holes				One acre total		
Recreational mining	5 notices; 2 Acres total	30 notices; 7.5 acres total	30 notices; 7.5 acres total	30 notices; 7.5 acres total	800 Estimate 300 acres, this is disturbance only under the water level.	See suction dredging above.

[a] Eugene footnote: Locatable minerals with silica sand potential withdrawn from mineral entry in the Florence area. However, sand is excavated and removed from BLM property near Florence, Oregon, on an easement granted to the adjacent landowner.

Foreseeable Development of Oil and Gas Resources Scenario for the BLM Eugene, Roseburg, and Medford Districts and the Klamath Falls Resource Area of the Lakeview District

Summary

This report estimates the potential for occurrence of oil and gas activity on Federal acreage managed by the BLM in the Eugene, Roseburg, and Medford Districts, and in the Klamath Falls Resource Area of the Lakeview District during the next 10 years. The analysis is based on current developments within and outside of these Districts, including historical Oil and Gas investigations that began with the first exploration well drilled near Newberg in 1902. This analysis compliments the similar discussion for the Coos Bay and Salem Districts where proven hydrocarbon resources exist.

It is expected that, with a few exceptions, most public domain and revested Oregon and California Railroad Grant lands will be available for leasing of hydrocarbon energy resources subject to management by guiding stipulations. A review of oil and gas occurrence Potential, oil and gas system and play analysis, oil and gas production activities, potential for resource occurrence and development, and leasing was made to establish the oil and gas potential presented here. This information was used to project activity through 2018. Given the current incipient nature of petroleum development in Oregon in 2007 (i.e., current coalbed natural gas development and new exploration of the Mist Gas Field), completely new assumptions and information that could impact Reasonably Foreseeable Development scenarios for each district may occur during the course of the next 10 years and beyond.

The districts are in western Oregon and encompass lands within all or parts of eight counties: Linn, Lane, Douglas, Jackson, Josephine, Curry, Coos, and Klamath. The potential for occurrence of conventional petroleum in the districts has been the focus of numerous studies. These investigations have resulted in one developed field in the Salem District (Mist Gas Field), beginning with a discovery well in 1979. A prospect for coalbed natural gas is being developed in the Coos Bay District. However, small amounts of conventional and unconventional oil and gas have been found throughout western Oregon, based on the projected sedimentary basins.

Research has identified sedimentary basins, petroleum systems, and coal basins. Based on these petroleum systems, five plays and associated prospects have been identified. The research cited within this report projects that these plays have low to moderate potentials for development.

Based on BLM protocol for mineral potentials, it is further projected that the Eugene and Medford Districts, and the Klamath Falls Resource Area have low to moderate potential for petroleum occurrence and low potential for development. Therefore, it is unlikely that petroleum will be developed in these BLM administrative areas within the 10-year Reasonably Foreseeable Development scenario for the planning area. The Roseburg District contains plays, prospects, and an area of focused petroleum shows that project a moderate potential for petroleum occurrence and a moderate potential for development. The BLM-administered acreage with this moderate potential is approximately 37,000 acres.

It is anticipated that the Roseburg BLM-administered lands could have a development of up to 114 wells, with total disturbed acreage up to approximately 153 acres within the 10-year Reasonably Foreseeable Development scenario.

Introduction

This Reasonably Foreseeable Development (RFD) describes scenarios for leasable oil and gas commodities within lands managed by the BLM's Eugene, Roseburg, and Medford Districts and the Klamath Falls Resource Area of the Lakeview District (collectively referred to as districts). The purpose of this RFD scenario is to provide models that anticipate the level and type of future petroleum development activity in the planning area, and to serve as the basis for analyzing cumulative impacts. The RFD first describes historic and current development. Future trends and assumptions for hypothetical exploration and extraction operations are then described. All projections are estimates based on available information presented in the Historic and Current Development section.

Methodology

Extensive review of existing literature was completed, as well as acquisition of unpublished information. Resulting information, such as prospects, plays, basins, exploration wells, seeps, coal exposures, and petroleum encounters in water wells, were crafted into Geographic Information Systems (GIS) map layers. These layers were then incorporated into GIS maps of BLM-administered lands and geologic mapping. The results provided quantifiable locations and acreages estimates of petroleum potentials, or lack of, for BLM-administered lands within each district boundary (USDI BLM 2008).

Scope

This RFD is based on the known and inferred mineral resource capabilities of the lands involved, and applies to conditions and assumptions discussed under Historic and Current Development, as well as Future Trends and Assumptions. Changes in geologic data, interpretation, and/or economic conditions that alter the RFD may result in deviation of these projections over time.

Impacts caused by oil and gas development, as well as impacts to oil and gas development, cannot be assessed without estimating future oil and gas activity. Such estimates of future activity incorporate:

- oil and gas occurrence potential, as documented by historic research and papers
- oil and gas system and play analysis (including existing plays currently developed and the potential development for new plays such as identified sediment basins and Coalbed Natural Gas
- oil and gas production, including economics and technology
- potential for resource occurrence and development
- leasing and development, including Federal and non-Federal activities

The above factors cannot be predicted with certainty, but some generalizations are possible. The estimates presented here are based on past and present activities as well as on trends within and without the Districts, including future price deviations. These estimates may be lower than what may actually happen if price and play developments are more positive than anticipated. Likewise, if expansion of existing plays is not successful, if new plays are not developed, and/or if commodity prices are less than anticipated, these estimates may be exaggerated.

Historic and Current Development

Oil and Gas Occurrence Potential

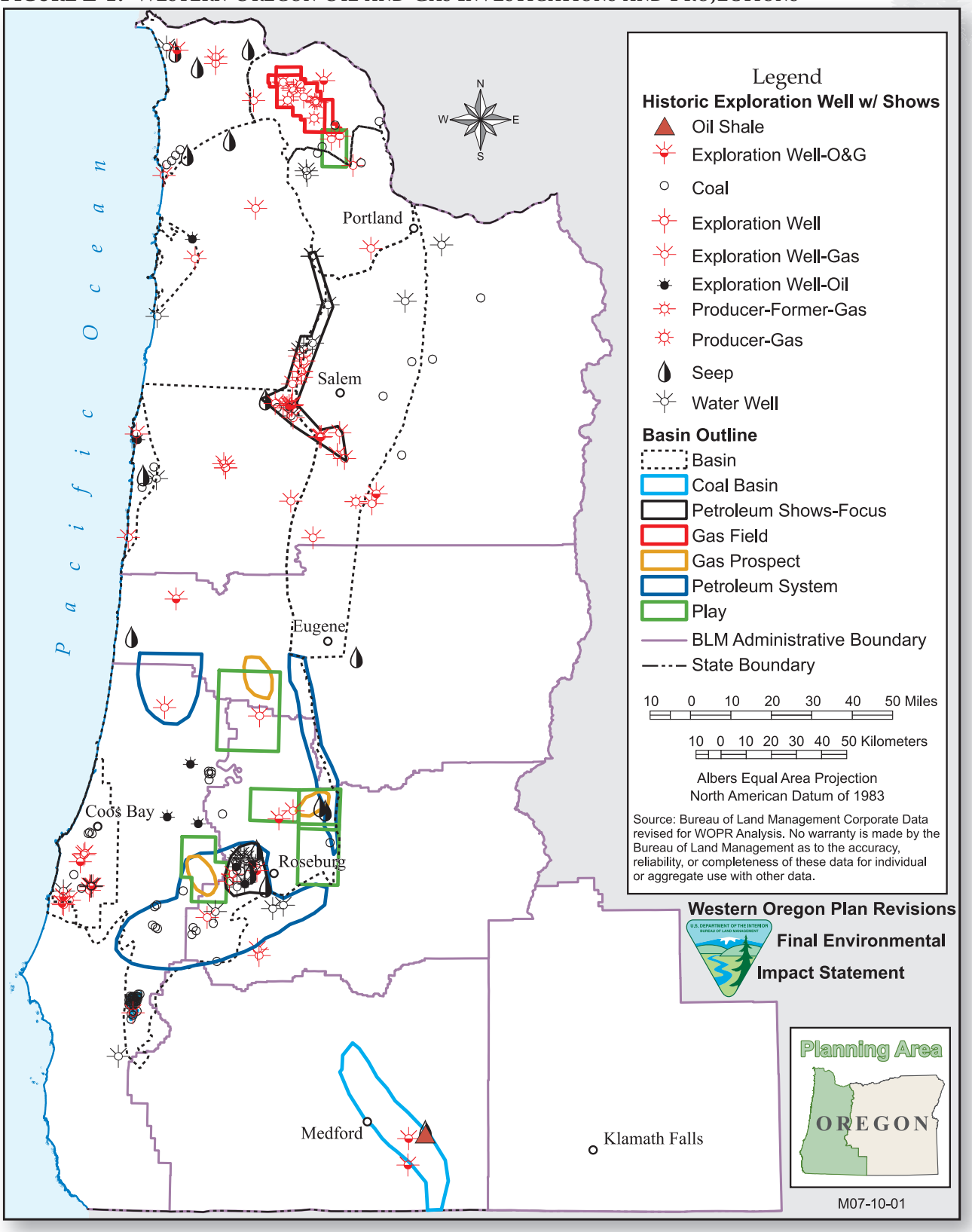
The districts encompass lands in eight counties, including Linn, Lane, Douglas, Jackson, Josephine, Curry, Coos, and Klamath counties. The districts are located in western, southwestern, and southern Oregon. The BLM-management extends to both Public Domain (PD) and revested Oregon and California Railroad (O&C) lands. It is expected that most of these lands will be available for mineral leasing.

Petroleum development in the districts has been the focus of numerous studies such as Dillar (1909, 1914, as found in Weissenborn 1969 and others), Washburne (1914 as found in Olmstead et al. 1989), Stewart and Newton (1954), Newton (1969), Newton (1980), Olmstead et al. (1989), Niem and Niem (1990), and Ryu et al. (1996). The districts have also been the focus of numerous industry explorations and investigations, by such companies as Northwest Natural (Oregon Natural Gas Development), Mobil Oil Corporation, Methane Energy Corporation, Standard Oil Company of California, Guarantee Oil Company, Sinclair Oil & Gas Company, Amoco, as well as numerous others (Olmstead et al. 1989, Niem and Niem 1990, Stewart and Newton 1954, Meyer 2007).

Although exploration of Western Oregon has been more or less continuous since 1902, three major peaks of petroleum exploration have occurred. The first took place between 1920 and 1940. This peak of exploration was very wide-spread, as there was little geologic information guiding the exploration. The second peak occurred between 1940 and 1960, and investigated the deeper Oligocene and Eocene marine sediments. This phase culminated in the discovery of the Mist Gas Field in 1979 (Olmstead et al. 1989, Olmstead and Alger 1985, Houston 1997). The third occurred in the 1980s, with the placement of deep wells up to 13,177 feet total depth (Niem and Niem 1990). This third peak has continued into the search and development of unconventional petroleum resources such as Coalbed Natural Gas, with a play being developed in the Coos Bay Basin.

Little oil and gas exploration has been conducted in the Medford District and Klamath Resource Area (Niewendorp 2008, Wiley 2008, Wells 2008). Oil and gas exploration wells have been drilled, with at least two shows (see *Figure E-1*). A potential oil shale deposit was also been identified. These are located in or near a delineated coalfield, identified as the Rogue River Coalfield (Olmstead et al. 1989, Stewart 1954, Sidle 1981; Jackson County 1989, 2004, 2006). Most energy investigations have focused on geothermal explorations (Niewendorp 2008).

Figure E-1. Western Oregon Oil and Gas Investigations and Projections



Source: USDI BLM 2008, Olmstead et al. 1989, Niem and Niem 1990, Newton et al. 1980, Stewart and Newton 1954, Sidle 1981, Newton 1969, Kvenvolden et al.1995, Mason and Erwin 1955

Oil and Gas System and Plays

The Eugene and Roseburg Districts are part of a structural sedimentary basin system that extends onshore and offshore from the Klamath Terrains boundary north to the Columbia River (extending into Washington as the Puget-Willamette Trough); from the continental shelf east to the Cascade Mountain/Willamette Valley interface. This is known as the Western Tertiary Basin Province (Olmstead et al. 1989). This province has been of interest for petroleum exploration since the 1880s (Newton 1969, Orr and Orr 2000), with exploratory oil and gas drilling beginning in 1902 near Newberg (Stewart and Newton 1954, Olmstead et al. 1989).

The northern portion of the Western Tertiary Basin Province possesses at least six identified basins or sub-basins (Newton 1969, Orr and Orr 2000, Olmstead et al. 1989). These basins include:

- Tualatin Basin (a sub-basin of the Willamette Valley)
- Willamette Valley
- Newport Basin (a sub-basin of the larger off-shore Newport Basin)
- Tillamook Basin (a sub-basin of the larger off-shore Newport Basin)
- Astoria Basin
- Nehalem Basin (or arch)

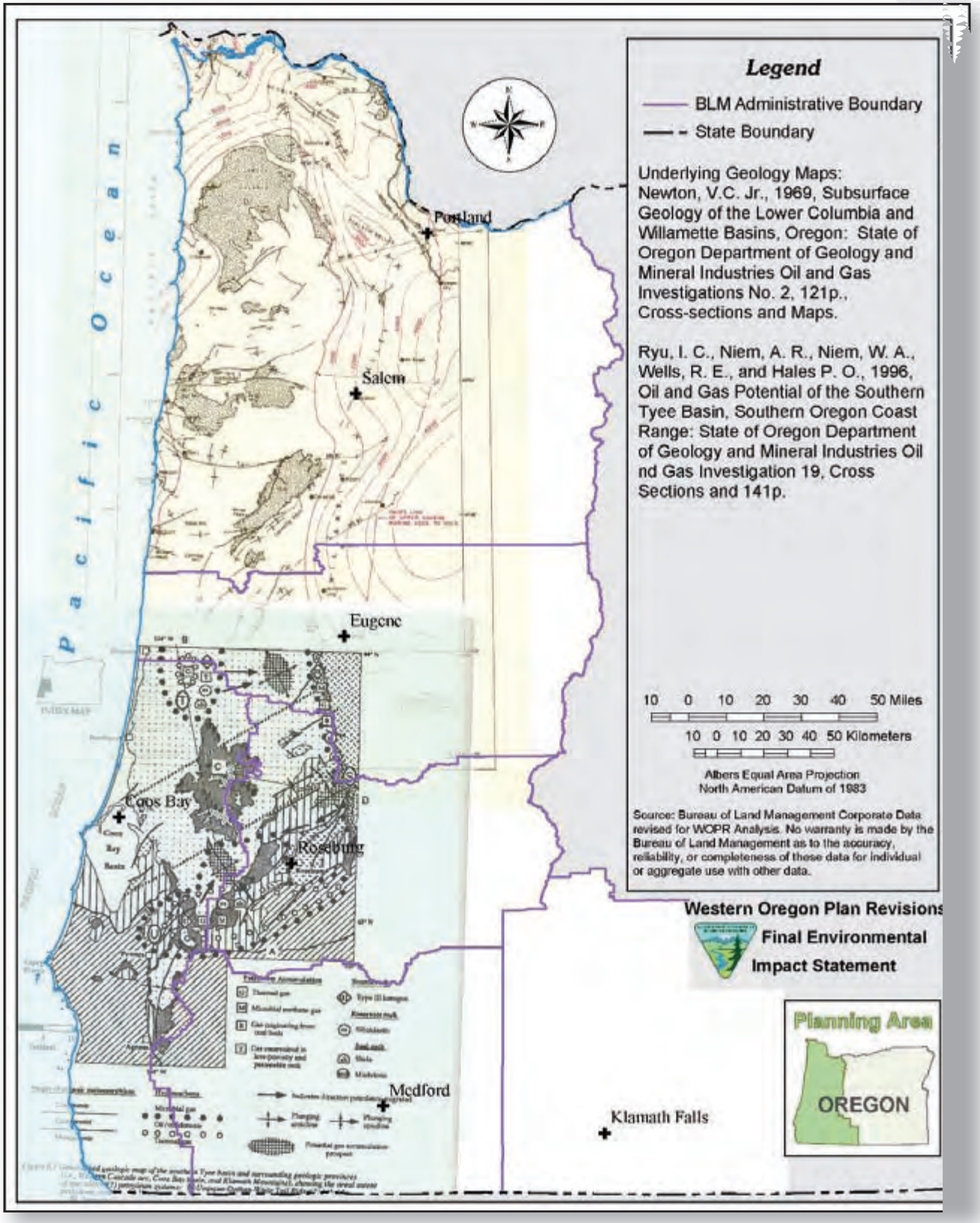
Of these, the Willamette Basin extends into the Eugene District (see *Figure E-2*).

The Willamette Valley basin extends from the southern end of the Puget Sound Trough at the Columbia River south into the Eugene District. This basin is mapped adjacent to the Tyee Basin through parts of the Salem District and the Eugene District (see *Figure E-2* and *Figure E-3*) (Newton 1969, Ryu et al. 1996). The lower rock, or basement rock, is the Eocene Siletz River Volcanics or Kings Valley Siltstone. Overlying these are sandstones and siltstones to the Eocene Nonconformity. This nonconformity is covered by volcanics, overlain by sandstone, limestone, and coal beds. The assemblage is capped by the Columbia River Basalts, which are covered by tuff and silt. The petroleum potential boundary in the Eocene rock is defined to the east by the change from marine sediment to volcanic sediment (facies change) (Newton 1969) (see *Figure E-2*). Numerous wells with gas shows have been drilled within the valley. The eastern edge of the valley provides numerous possibilities for structural traps, with the marine beds providing source rock for petroleum accumulations. Even though numerous holes have been drilled and source and structure is present, true potential has not been clearly defined. The Eocene Nonconformity (marine facies) is at maximum the mapped depth of 5,000 feet below sea level (Newton, 1969).

The southern portion of the Western Tertiary Basin Province is identified as the Tyee Basin. This basin extends north from the Klamath Terrains to approximately the Lincoln City-Salem Latitude (Ryu *et al*, 1996). The Tyee Basin is actually composed of two basins: the NE-SW oriented Umpqua basin of early Eocene age and the north-south oriented Tyee Forearc Basin of middle Eocene age. The Umpqua Basin is divided by the Umpqua Arch, composed of a volcanic high. The two sub-basins include the Smith River Sub-Basin, located east of Florence and Reedsport, and the Myrtle Point-Sutherlin Sub-Basin along the southern boundary (Ryu et al. 1992, 1996). The Yaquina Sub-Basin of the Salem District could be considered as part of the Tyee Basin, as well as the southern portion of the Willamette Valley Sub-Basin (Ryu et al. 1996; Newton 1969). The Coos Basin overlies and bounds by mapping, the Tyee Basin to the west (Ryu et al. 1996) (refer to *Figure E-2*).

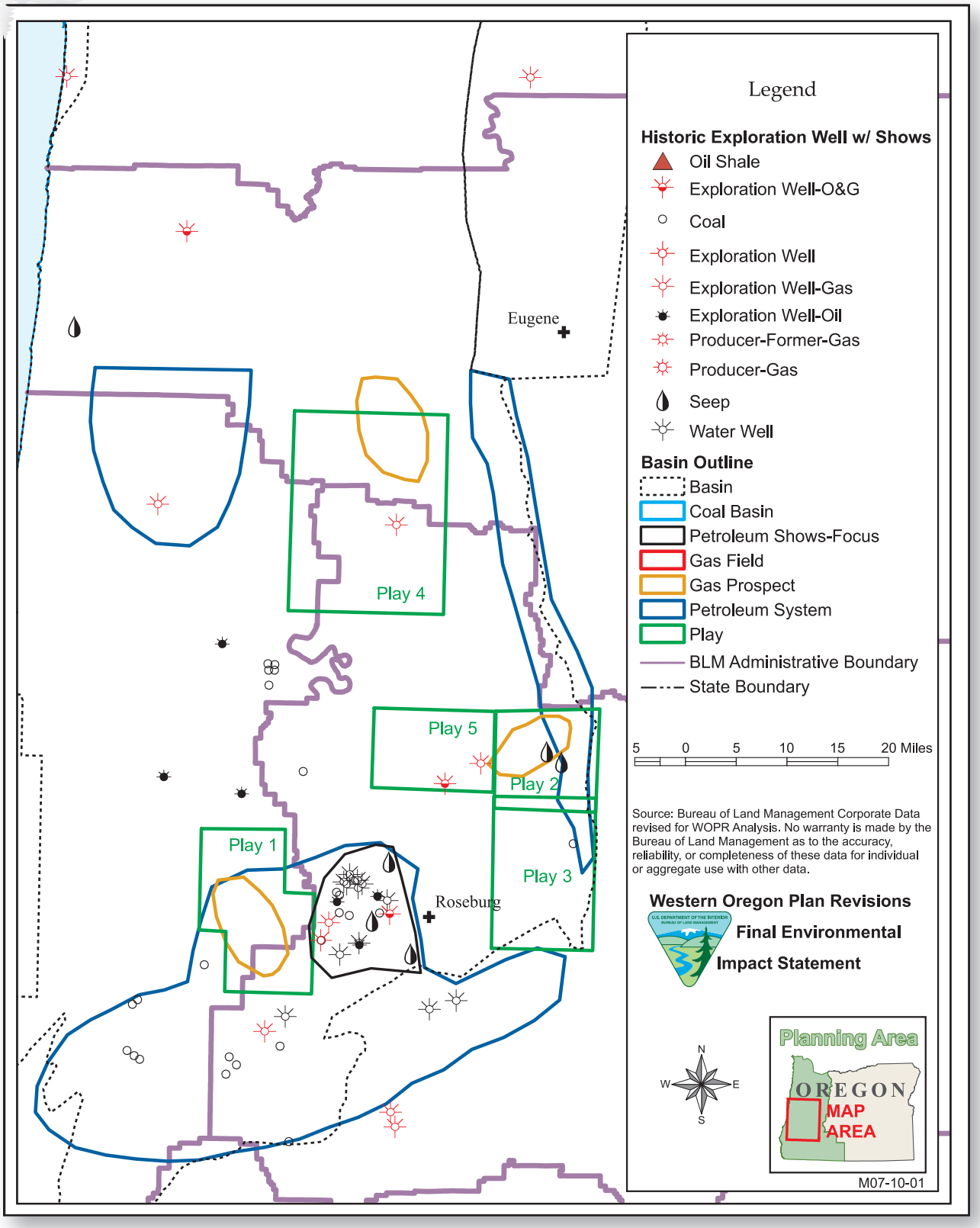
The basin structure is controlled by compression resulting from the subducting easterly moving Juan de Fuca plate in relation to the overriding westerly moving North American Plate. The fold axes are oriented north-south (Orr and Orr 2000). The northern basins are defined by the contact between the Miocene or Oligocene rock and Eocene rock. This is a point of erosion of the Eocene rock, which was covered by Miocene or Oligocene rock, defined as a nonconformity (unconformity if covered by Miocene or Oligocene

Figure E-2. Basic Underlying Geology



Source: Newton 1969, Ryu et al. 1996

Figure E-3. Basin, Petroleum Systems, Plays, and Prospects



Sources: USDI BLM 2008, Olmstead et al. 1989, Niem and Niem 1990, Newton et al. 1980, Stewart and Newton 1954, Sidle 1981, Newton 1969, Kvenvolden et al. 1995, Mason and Erwin 1955

sedimentary rock). This break in the geologic column is considered the Eocene nonconformity and a focus of petroleum exploration. The Eocene rocks consist of marine sediments, with latter sedimentation creating coal beds in many areas (Newton 1969) (refer to *Figure E-2*).

The Tyee Basin structure is a result of compressional tectonics. However, rotation of tectonic forces produced differing orientations for the Umpqua Basin and the Tyee Forearc Basin (Ryu et al. 1996, Wells et al. 2000). In general, the projected conventional oil and gas systems result from organic rich source rock and coal from the Umpqua Basins being trapped by the rock of the overlying Tyee Forearc Basin (Ryu et al. 1996). The coal seams of the Coos Basin (Coos Bay District) are currently being investigated for coal bed natural gas. However, deeper source rocks may exist and contribute to the coal bed natural gas resource. These source rocks would be part of the underlying Tyee Basin (Pappajohn 2007, Newton et al. 1980).

Based on geologic interpretation and petroleum exploration, Ryu et al. (1996) identified petroleum systems, plays, and prospects within the Tyee Basin. An oil and/or gas play is an area, geologic formation, or geologic trend that has good potential for oil and/or gas development, or is generating a large amount of interest in leasing and drilling (USDI BLM 2001). As defined by Magoon (1988 as found in Ryu et al. 1996):

- A **Petroleum System** is a relationship of source rock and the resulting petroleum accumulation. This relationship contains a source rock for petroleum; migration paths; reservoir rock; seal; trap; and the appropriate geologic processes that form these hydrocarbon materials. The extent of the Petroleum System can be delineated as an area that contains both the mature source rock and oil or gas accumulations. The name of the Petroleum System would consist of the name of the source rocks, followed by the name of the reservoir rock, followed by the level of certainty for its occurrence.

There are three levels of certainty: known, hypothetical, and speculative. Known systems have a strong geochemical match between the source rocks and an existing petroleum accumulation. These are identified in the name by an exclamation point in parentheses: (!). Hypothetical systems have geochemical data that identify a source rock, but do not link the source rock to a known petroleum accumulation. These are identified in the name by a period in parentheses: (.). An example is the Mist Gas Field. The Speculative system has geological or geophysical evidence used to project the existence of a link between source rocks and potential petroleum accumulations. These are identified in the name by a question mark in parentheses: (?).

- A **Play** is the existence of a trap (a geologic structure that allows petroleum to accumulate) that is detectable with geological, geophysical, or geochemical technology. A play does not need all of the elements of a petroleum system.
- A **Prospect** is a drillable trap that is located within a play.

Ryu et al. (1996) identified three distinct speculative petroleum systems, five distinct plays, and three distinct gas prospects within the Tyee Basin (refer to *Figure E-3*). The identified petroleum systems include:

- *The Umpqua-Dothan-White Tail Ridge (?) Hybrid Petroleum System*: There is a potential of dry gas (methane) from buried coals and carbonaceous mudstone of the White Tail Ridge Formations, with migrations to traps of the Tyee Sandstones. Because there is no known connection between the potential source of petroleum and the potential traps and because there is no known commercial accumulations of natural gas, the system is considered speculative. According to BLM GIS-based estimates, the total acreage of this petroleum system is approximately 574,000 acres. Of this, approximately 215,000 acres are within the Coos Bay District, approximately 352,000 acres are within the Roseburg District, and approximately 8,000 acres are within the Medford District.

- The Umpqua-lower Tyee Mountain (?) Petroleum System; Basin Center Gas (?): This system may contain a tight-gas sandstone reservoir, collecting thermogenic (temperature-induced conversion to petroleum) wet-gas and oil derived from mudstone of the Umpqua Group. The model projects natural gas migrating along fractures to accumulate in Tyee Mountain turbidite sandstones. An unconventional mudstone reservoir is possible in the Umpqua Group. According to BLM GIS, the total acreage of this petroleum system is approximately 145,000 acres. Of this, approximately 116,000 are within the Coos Bay District and approximately 29,000 acres are within the Eugene District.

- The Spencer-White Tail Ridge-Western Cascade Arc (?) Petroleum System: The petroleum sources of this system are the coals and carbonaceous mudstone and sandstones of the Spencer Formation and White Tail Ridge Formation, generated by the deep burial and heating by the Western Cascades arc plutons. The reservoir rock would be the overlying sandstones and delta facies. According to BLM GIS, the approximate total acreage of this petroleum system is 119,000 acres. Of this, approximately 69,000 acres are within the Eugene District and approximately 50,000 acres are within the Roseburg District.

All of these systems are considered speculative. Additional drilling and exploration may alter that qualifier (or completely remove the potential). As an example, the Mist Gas Field was considered a speculative field until the discovery well was drilled in 1979, which lead to its designation as a gas field (Ryu et al. 1996).

In addition to the three petroleum systems, Ryu et al. (1996) have identified five different plays described below in the *order of their potential to produce hydrocarbons,* as shown in *Figure E-3*:

1. The Williams River-Burnt Ridge anticlinal Plays: This is a complex domal structure in the Tyee Formation (Play 1 of 5). Natural gas might be found in the lower Umpqua strata in the footwall beneath Siltez River Volcanics. The White Tail Ridge sandstone could also serve as a trap. Isolated faults and thrust faults, as well as pinchouts and unconformities, also provide potential traps. A gas prospect may exist within this play. According to BLM GIS, the total acreage of this play is approximately 94,000 acres. Of this, approximately 20,000 acres are within the Roseburg District and approximately 74,000 acres are within the Coos Bay District.
2. Western Cascades plays and Bonanza thrust near Nonpareil: This system incorporates anticlines and faults, including the extension of the Bonanza Fault, at the contact of the Tyee Basin and the Western Cascades (Play 2 of 5). The potential reservoir rocks include the Spence and White Tail Ridge formations. Source rock includes several one- to six-foot thick coal beds, carbonaceous sandstone, and mudstone. Other plays may exist in the foothills of the Western Cascades, with the buried Spencer Formation being the structural or stratigraphic play. The Spencer Formation is exposed from Glide to Cottage Grove. A gas prospect is projected within the play. According to BLM GIS, the total approximate acreage of this play is 64,000 acres, all of which is contained within the Roseburg District.
3. Klamath Mountains sub-thrust play, Glide area: It is interpreted that the Klamath Mountains (Klamath Terrains) are thrust over the Coast Range rocks, burying parts of the Southern Tyee Basin. Possible plays may exist in the underlying Tyee Basin stratigraphy in the areas of the Wildlife Safari fault and southeast and southwest of Glide (Play 3 of 5). The White Tail Ridge Formation is the potential reservoir unit with source being derived from the Remote Member and Tenmile Formations. However, it is debated whether the Tyee stratigraphy (Siletz River Basalts) formed in place through an abandoned rift zone. This would mean that there is no overthrusting of the Klamath Terrains over the Tyee Basin, and therefore no associated traps or plays (Ryu et al. 1996). However, more recent geology mapping has indicated that the overthrusting does exist (Well et al. 2000, DuRoss et al. 2002, Wells 2008). Therefore, while unexplored, potential for petroleum traps along the Klamath Terrains/Tyee Basin boundaries may exist. According to BLM GIS, the total approximate acreage of this play is 96,000 acres, all of which is contained within the Roseburg District.

4. Tyee Mountain anticlinal plays: Several untested anticlines exist in the Tyee Mountain and Baughman members of the Tyee Formation beyond the Williams River-Burnt Ridge anticlinal plays (Play 4 of 5). Stratigraphic traps could exist along the flanks of the Siletz River Volcanics in the Umpqua Arch. A specific untested anticlinal structure exists at Stony Point. While these untested structures exist, the potential of the northern anticlines is low when compared to the southern anticline systems, due to the lack of maturation, organic-rich source rock, and reservoir rocks. However, a gas prospect may exist in the northern portion of the play. According to BLM GIS, the total approximate acreage of the play and prospect is 203,000 acres. Of this, approximately 25,000 acres are located within the Coos Bay District, approximately 91,000 acres are located within the Eugene District, and approximately 87,000 acres are located within the Roseburg District.
5. Anticlinal and subthrust plays in the Myrtle Point-Sutherlin Sub-Basin: These plays consist of thrust faults and anticlinal and synclinal folds of rock of the Umpqua Group, Bushnell, and White Tail Ridge formation in the Myrtle Point-Sutherlin Sub-Basins. The area of the play is the Roseburg-Sutherlin-Glide area (Play 5 of 5). Gas shows have been encountered in tight sandstones and methane emanations from water wells. However, there has been no commercial production. According to BLM GIS, the total approximate acreage of the play is 60,000 acres, all of which is contained within the Roseburg District.

Additionally, numerous exploration wells, seeps, and petroleum producing water wells exist within the districts. As shown in *Figure E-6*, an area of concentration of petroleum shows is located within the Umpqua-Dothan-White Tail Ridge (?) hybrid petroleum system. Although shows are found throughout the four districts, this concentration provides a concentrated area of petroleum shows. According to BLM GIS, the total acreage of this focus of petroleum shows is approximately 68,000 acres, of which all is contained within the Roseburg District.

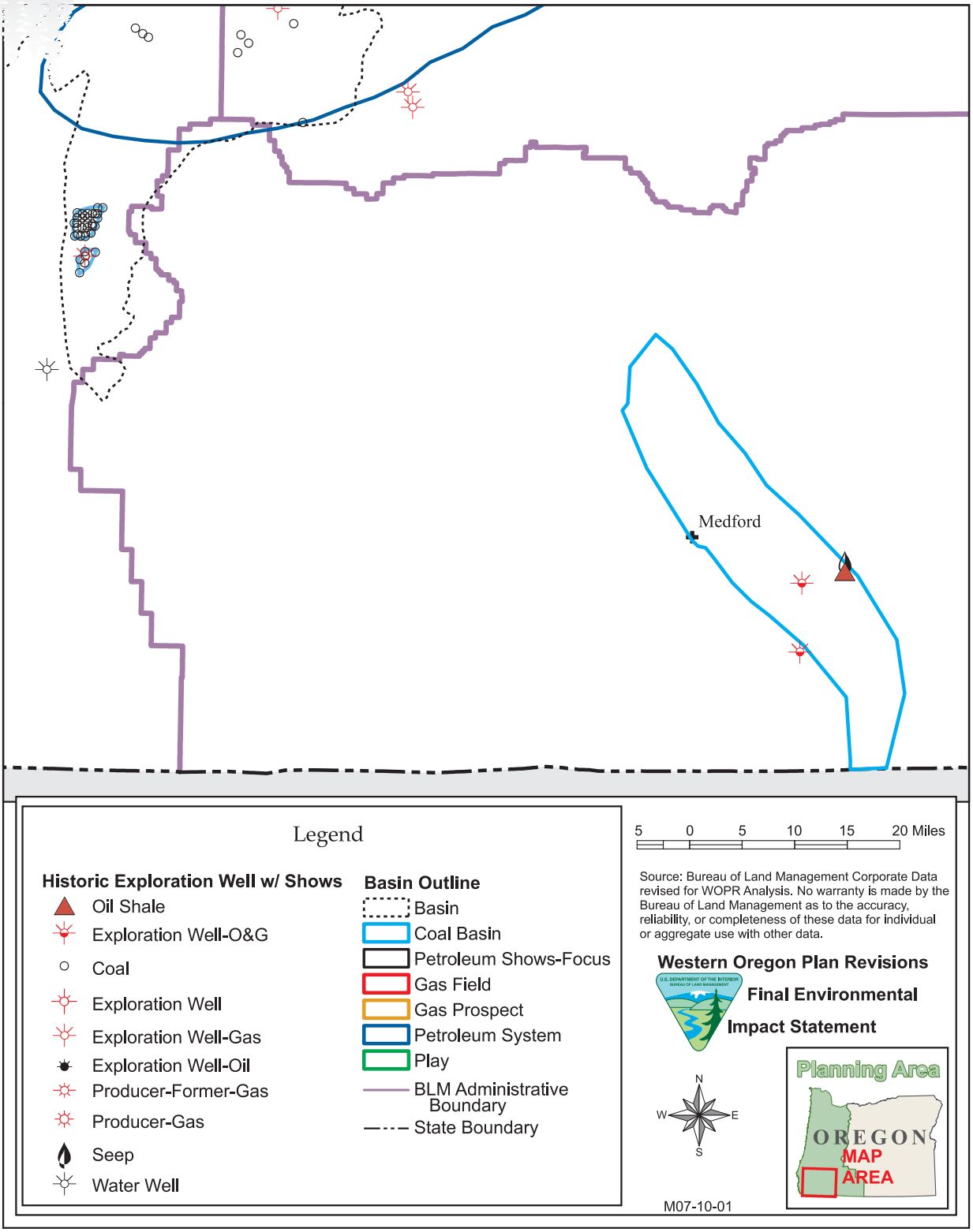
All of these structures and systems completely or in part underlay the Eugene and Roseburg Districts. Areas of gas and oil exploration and shows also exist throughout the Districts (Olmstead et al. 1989, Niem and Niem 1990, Newton et al. 1980, Stewart and Newton 1954, Newton 1969, Sidle 1981, Kvenvolden et al. 1995) (refer to *Figure E-3*).

The Medford District is south and east of the Tertiary Basin System/Tyee Basin, incorporating Klamath accreted terrains in the west and the Cascade Volcanics and Basin and Range structures to the East. The Klamath Resource Area of the Lakeview District lies east of the Medford District and incorporates "Basin and Range" structures. The accreted Klamath terrains are bound by the Tyee Basin (The Tyee Basin is the southern portion of the Western Tertiary Basin System) to the North. They extend into northern California and are variously bounded on the east by Cascade Volcanics and rocks within the Basin and Range province. The Oregon portion of the Basin and Range province is a northern projection of the crustal extension that extends through the southwestern United States.

Coal exposures and basins exist throughout western Oregon (Mason and Erwin 1955) (refer to *Figure E-1*). One major coal basin has been identified in the Medford District within Jackson County (Sidle 1981; Jackson County, 1989, 2004, 2006; Weissenborn 1969). This coal field is known as the Rouge River Coal Field. The field extends southward from Evans Creek to a point about 10 miles south of the Oregon-California border (Weissenborn 1969) (see *Figure E-4*). According to BLM GIS, the total approximate acreage of the Rogue River Coal Field is 221,000 acres, all of which is contained within the Medford District boundaries (the portion in California is not analyzed).

All coal seams in western Oregon could produce coal bed natural gas. However, the true potential is unknown, as investigations for coal bed natural gas potential for these seams are just beginning (Wiley 2006, Pappajohn 2007, Meyer 2007). Potential could exist within the coal seams of the Umpqua Group, as well as with coeval formations north throughout the coast range. If coal bed natural gas is producible in the Coos Basin, exploration may extend to other speculative formations (May 2005, Pappajohn 2007).

Figure E-4. Coal Basins



Sources: USDI BLM 2008,Olmstead et al. 1989; Niem and Niem 1990, Newton et al. 1980, Stewart and Newton 1954, Sidle 1981, Newton 1969, Kvenvolden et al. 1995, Mason and Erwin 1955

Current development of the coal bed natural gas resource is being conducted by the Methane Energy Corporation within the Coos Bay District. The company has completed numerous exploratory and production wells within the Coos Basin. Based on this exploration, the company has projected a defined area for coal bed natural gas development, described as an "Area of Mutual Interest" (AMI). This incorporates the Coos Basin (Torrent Energy Corporation 2008).

The following descriptions of oil and gas occurrence potential are projected for BLM-administered mineral rights within the western Oregon Districts. Prospects, Plays, Basins and other potentials overlap district boundaries. Therefore, a total system potential may incorporate more than one district.

Eugene District

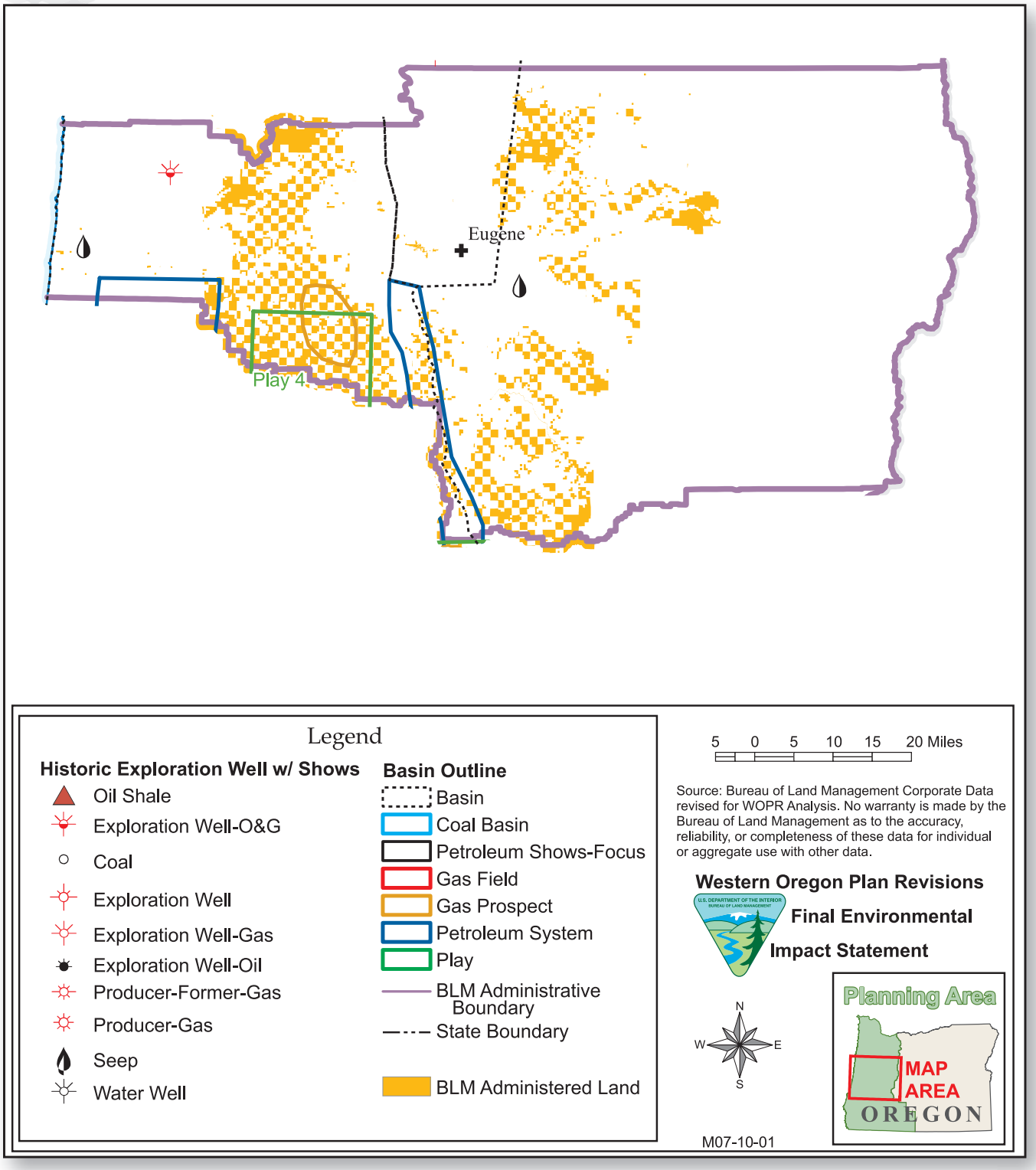
The Eugene District incorporates portions or all of Linn, Lane, and Douglas counties. At least one exploration well with shows of oil and gas (Fed-Mapleton 1) and two petroleum seeps are within the Eugene District boundary. Sedimentary basins underlying the Eugene District include both the Tyee Basin and the Willamette Valley Basin. Two Petroleum Systems extend into the district, as well as the Tyee Mountain anticlinal play and its associated Gas Prospect (see *Figure E-5*)

Table E-4 represents the approximate acreage of the basins, systems, plays, and prospects located within the Eugene District:

Table E-4. Eugene District Acreages

System	Total Acreage Within the Eugene District	**Total BLM-Managed Surface** Acreage	**Total BLM-Managed Sub-Surface Split-Estate Acreage**
Tyee Basin	794,000	160,000	500
Willamette Sedimentary Basin	252,000	5,000	12,000
Spencer-White Tail Ridge-Western Cascade Arc (?) Petroleum System	69,000	13,000	100
Umpqua-lower Tyee Mountain (?) Petroleum System	29,000	4,000	0
Tyee Mountain anticlinal play and associated gas prospect (Play 4 of 5)	91,000	55,000	0

Figure E-5. Eugene District



Sources: USDI BLM 2008, Olmstead et al. 1989; Niem and Niem 1990, Newton et al. 1980, Stewart and Newton 1954, Sidle 1981, Newton 1969, Kvenvolden et al. 1995, Mason and Erwin 1955

Roseburg District

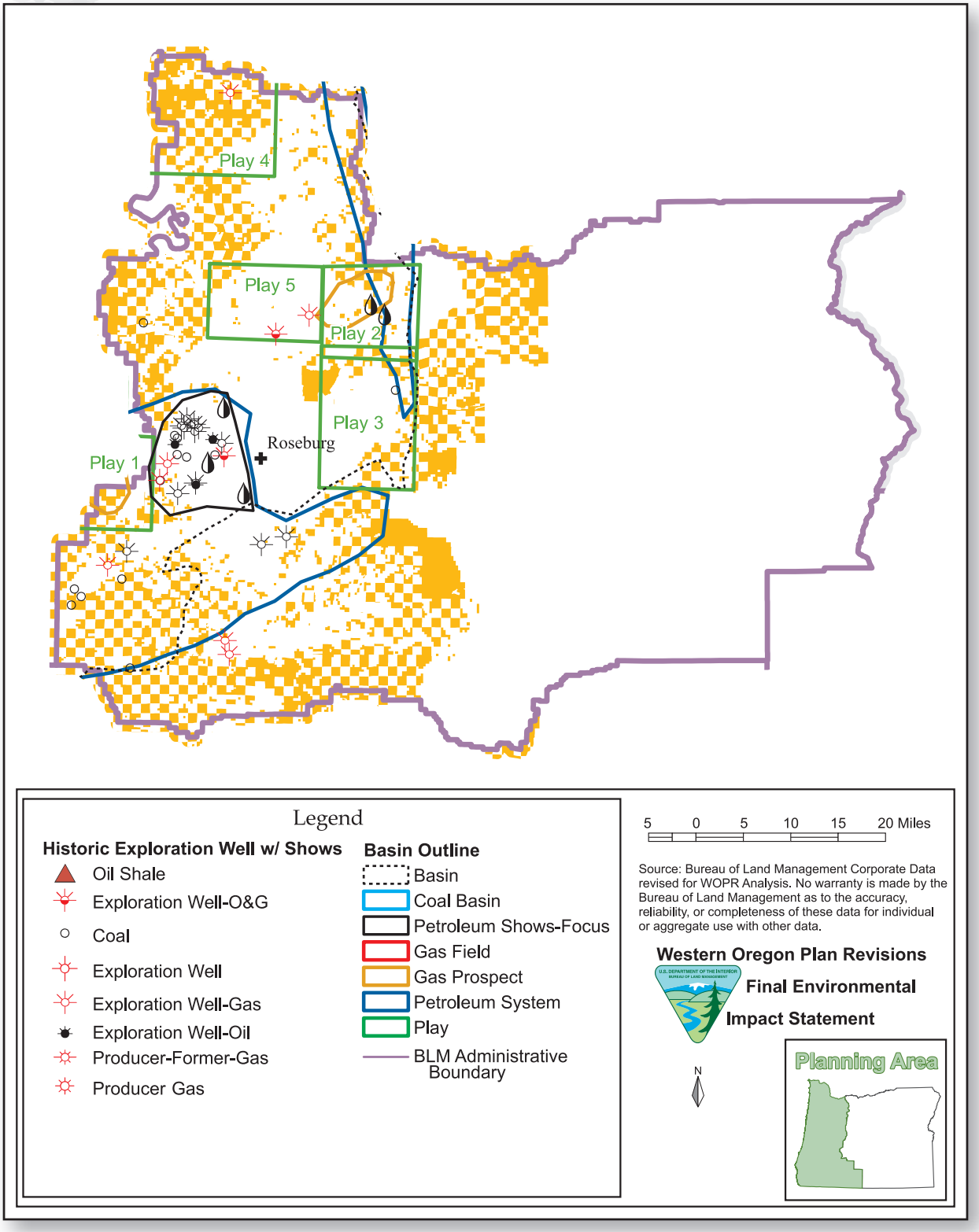
The Roseburg District incorporates the major portion of Douglas County, with minor portions of Linn and Jackson Counties. The district has been the focus of historical exploration with at least 2 oil and gas exploration well shows, 7 exploration gas well shows, 3 exploration oil well shows, 5 petroleum seeps, 12 petroleum shows in water wells, and 12 coal exposures. Sedimentary basins underlying the Roseburg District include the Tyee Basin. Two petroleum systems extend into the Roseburg District, as well as five projected plays. One complete gas prospect and another partial gas prospect associated with two plays exist, as well as one focused area of petroleum exploration (see *Figure E-6*).

Table E-5 represents the approximate acreage of the basins, systems, plays, and prospects within the Roseburg District:

Table E-5. Roseburg District Acreages

System	Total Acreage Within the Roseburg District	**Total BLM-Managed** Surface Acreage	**Total BLM-Managed Sub-Surface Split-Estate Acreage**
Tyee Basin	889,000	207,000	300
Spencer-White Tail Ridge-Western Cascade Arc (?) Petroleum System	50,000	11,000	0
Umpqua-Dothan-White Tail Ridge (?) hybrid Petroleum System.	352,000	83, 000	0
Williams River-Burnt Ridge Anticlinal Play and associated Gas Prospect (Play 1 of 5)	20,000	7,000	0
Western Cascades Plays and Bonanza Thrust near Nonpareil and associated Gas Prospect (Play 2 of 5)	64,000	10,000	0
Klamath Mountains Subthrust Play, Glide Area (Play 3 of 5)	96,000	18,000	0
Tyee Mountain Anticlinal play (Play 4 of 5)	87,000	41,000	0
Anticlinal and Subthrust Plays in the Myrtle Point-Sutherlin Subbasin (Play 5 of 5)	60,000	3,000	0
Area of Focused Petroleum Shows	68,000	2,000	0

Figure E-6. Roseburg District



Sources: USDI BLM 2008, Olmstead et al. 1989, Niem and Niem 1990, Newton et al. 1980, Stewart and Newton 1954, Sidle 1981, Newton 1969, Kvenvolden et al.1995, Mason and Erwin 1955)

Medford District

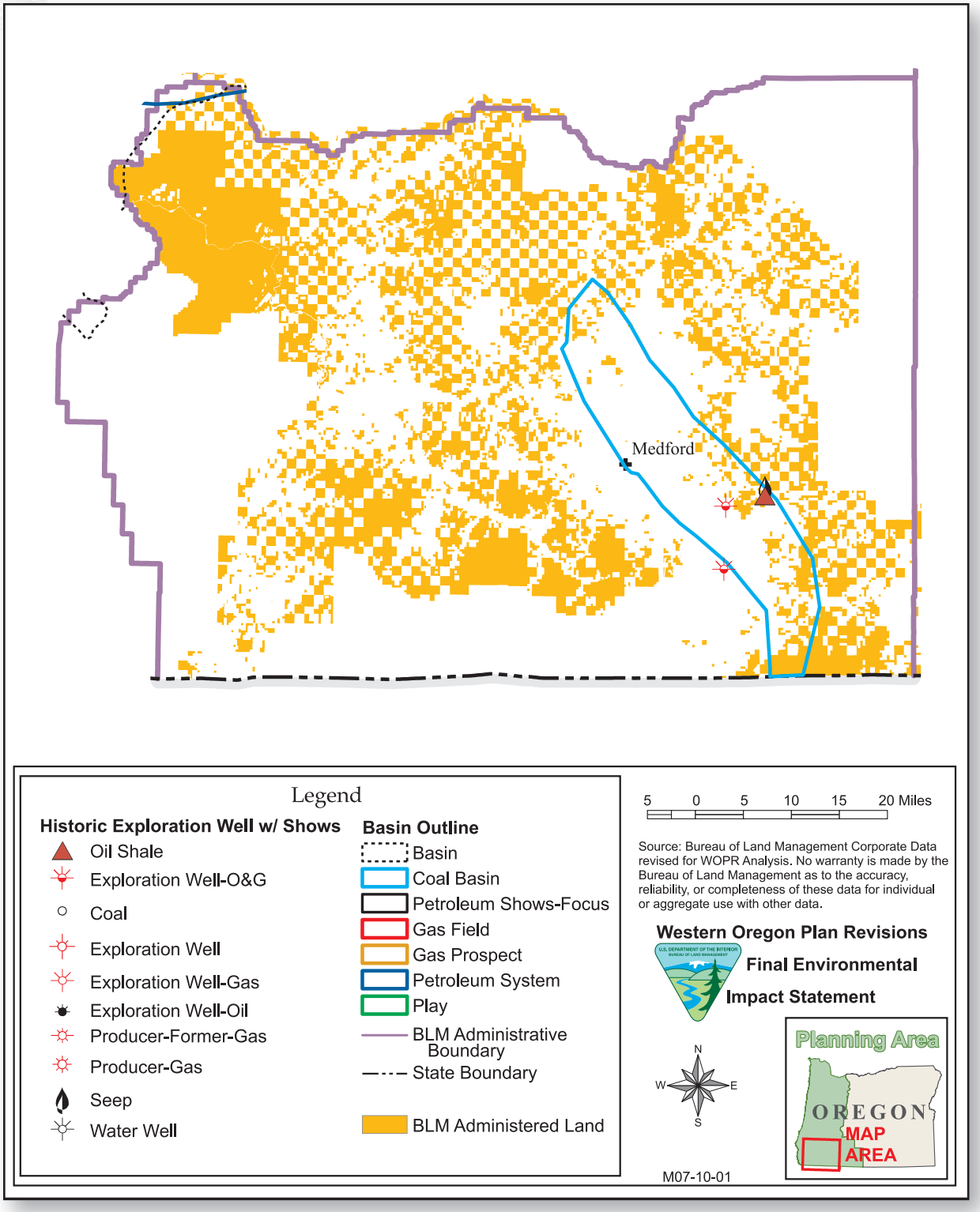
The Medford District incorporates portions or all of Jackson, Josephine, Douglas, Curry and Coos Counties. At least two oil and gas exploration wells with shows, one petroleum seep, one oil shale prospect, and one coal field exist within the Medford District boundary. A small portion of the Tyee Basin sedimentary basin and a petroleum system underlies the northwest part of the district. No plays or prospects have been mapped within the District (see *Figure E-7*).

Table E-6 represents the approximate acreages of basins, petroleum systems, and coalfields located within the Medford District.

Table E-6. Medford District Acreages

System	Total Acreage Within the Medford District	**Total BLM-Managed** Surface Acreage	**Total BLM-Managed Sub-Surface Split-Estate Acreage**
Tyee Basin	20,000	4,000	0
Umpqua-Dothan-White Tail Ridge (?) Hybrid Petroleum System	8,000	2,000	0
Rogue River Coal Field	221,000	33,000	3,000

Figure E-7. Medford District

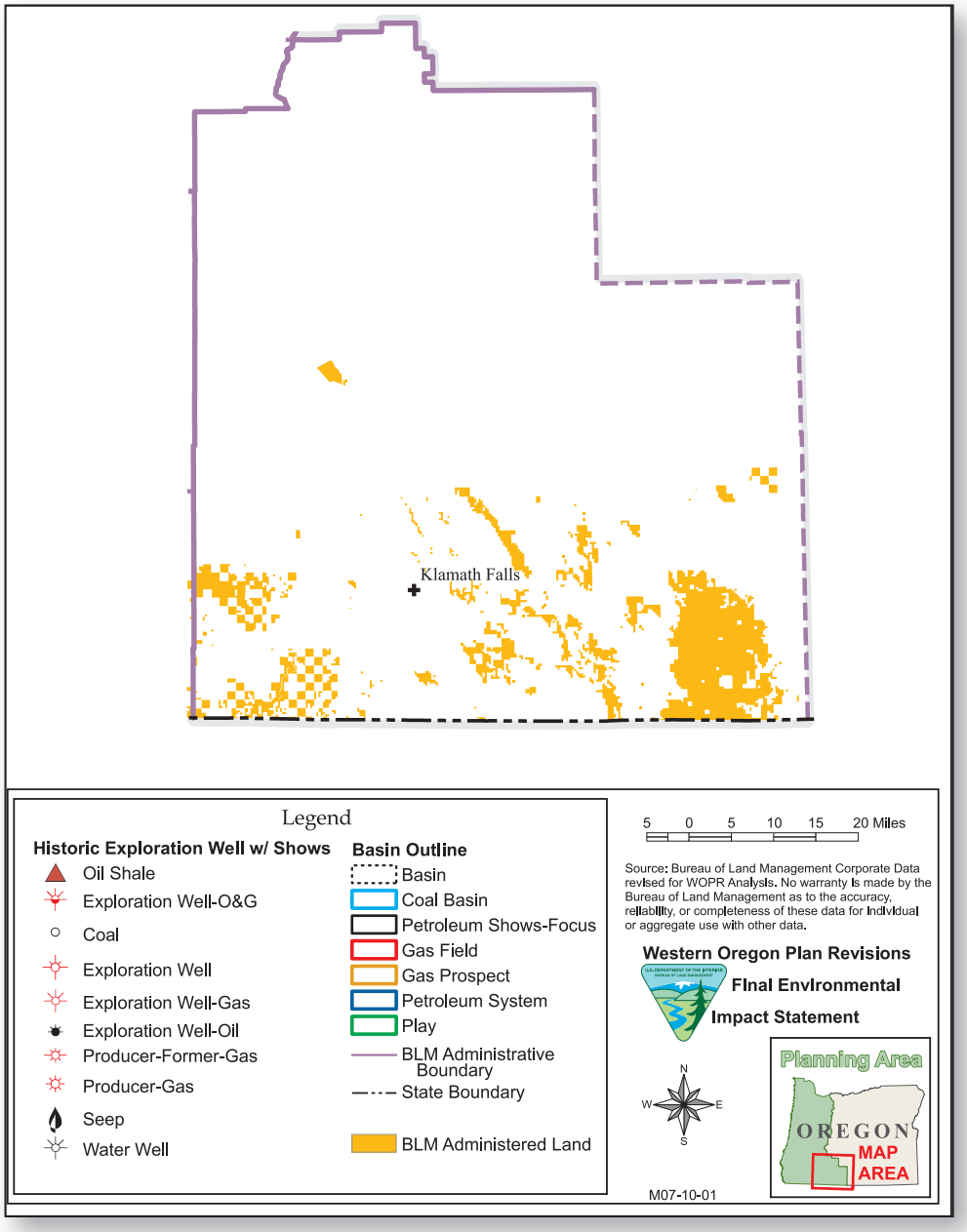


Sources: USDI BLM 2008, Olmstead et al. 1989, Niem and Niem 1990, Newton et al. 1980, Stewart and Newton 1954, Sidle 1981, Newton 1969, Kvenvolden et al.1995, Mason and Erwin 1955

Klamath Falls Resource Area of the Lakeview District

The Klamath Falls Resource Area of the Lakeview District incorporates Klamath County. No recorded exploration wells with shows, seeps, water wells with petroleum shows, or coal were found in the literature search or in agency communications (see *Figure E-8*). Most energy wells drilled have been in the search and delineation of geothermal energy. It should be noted that the lack of exploration does not indicate a lack of petroleum potential, but simply a lack of information. Therefore, future potential cannot be analyzed. Gas and oil production has been located in similar basin and range provinces, such as in the state of Nevada (Hess 2001).

Figure E-8. Klamath Falls Resource Area



Sources: BLM 2008, Olmstead et al. 1989, Niem and Niem 1990, Newton et al. 1980; Stewart and Newton 1954, Sidle 1981, Newton, 1969, Kvenvolden et al. 1995; Mason and Erwin 1955

Oil and Gas Production

Conventional Oil & Gas Resources

There is no current petroleum production within the Eugene, Roseburg, or Medford Districts or the Klamath Falls Resource Area of the Lakeview District. The only commercial production within Western Oregon occurs in the Mist Gas Field, located within the Salem District.

The Mist Gas Field Designation (see *Figure E-9*) was initiated with the discovery of natural gas in 1979. The main target zone is the reservoir rock of the Clark and Wilson Sandstone (Olmstead and Alger 1985). As of 2007, there have been over 45 separate pools identified (Meyer 2007) with two gas storage reservoirs (DOGAMI 2003). Locations of additional pools are expected with the use of 3-D Survey (Meyer 2007). Current exploration is focused to the northwest of the Mist Gas Field (Houston 2007). However, this is due to economics as opposed to existence of resource. All areas north of Vernonia, Oregon could be considered possible extensions of the Mist Gas Field (Meyer 2007).

Annual production for 2005 from the Mist Gas Field was 305 million cubic feet (MMcf), with a total field production to date of 70 billion cubic feet (Bcf) (DOGAMI 2007). As of 2006, the Mist Field had produced approximately 68 Bcf, with a value of about $140 million (DOGAMI 2007). The State of Oregon applies a severance tax of 6% on production, which goes to the common school fund. In total, over 500 oil and gas wells have been permitted in the field by 2003 (DOGAMI 2003). There are currently 18 actively producing wells, one water disposal well, 21 observation wells, and 20 gas injection and/or withdrawal wells operating on the site (DOGAMI 2007). Eight new Applications for Permit to Drill (APD) are being submitted to DOGAMI for additional exploration and production wells (Houston 2007).

An annual production history of the Mist Gas Field for the past 10 years is shown on *Table E-4* earlier in this appendix (DOGAMI 2003 and 2007).

Non-Conventional Petroleum (Coal Bed Natural Gas):

There is currently no coal bed natural gas production in Oregon. However, the Coos Basin, located in Coos County, is being developed as a production resource. The current development of the coal bed natural gas resource is being conducted by the Methane Energy Corporation. The company has completed numerous exploratory and production wells within the Coos Basin. The Methane Energy Corporation has also received National Pollutant Discharge Elimination System permits for surface disposal of production water.

The DOGAMI has initiated a public meeting process to establish a Gas Field Designation for the Coos Basin. The first public meeting was conducted on January 29, 2007. There is only one other Gas Field Designation in Oregon, which is the Mist Gas Field. The Gas Field Designation is required to fulfill state requirements regarding well spacing designations, mineral rights, and control drainage.

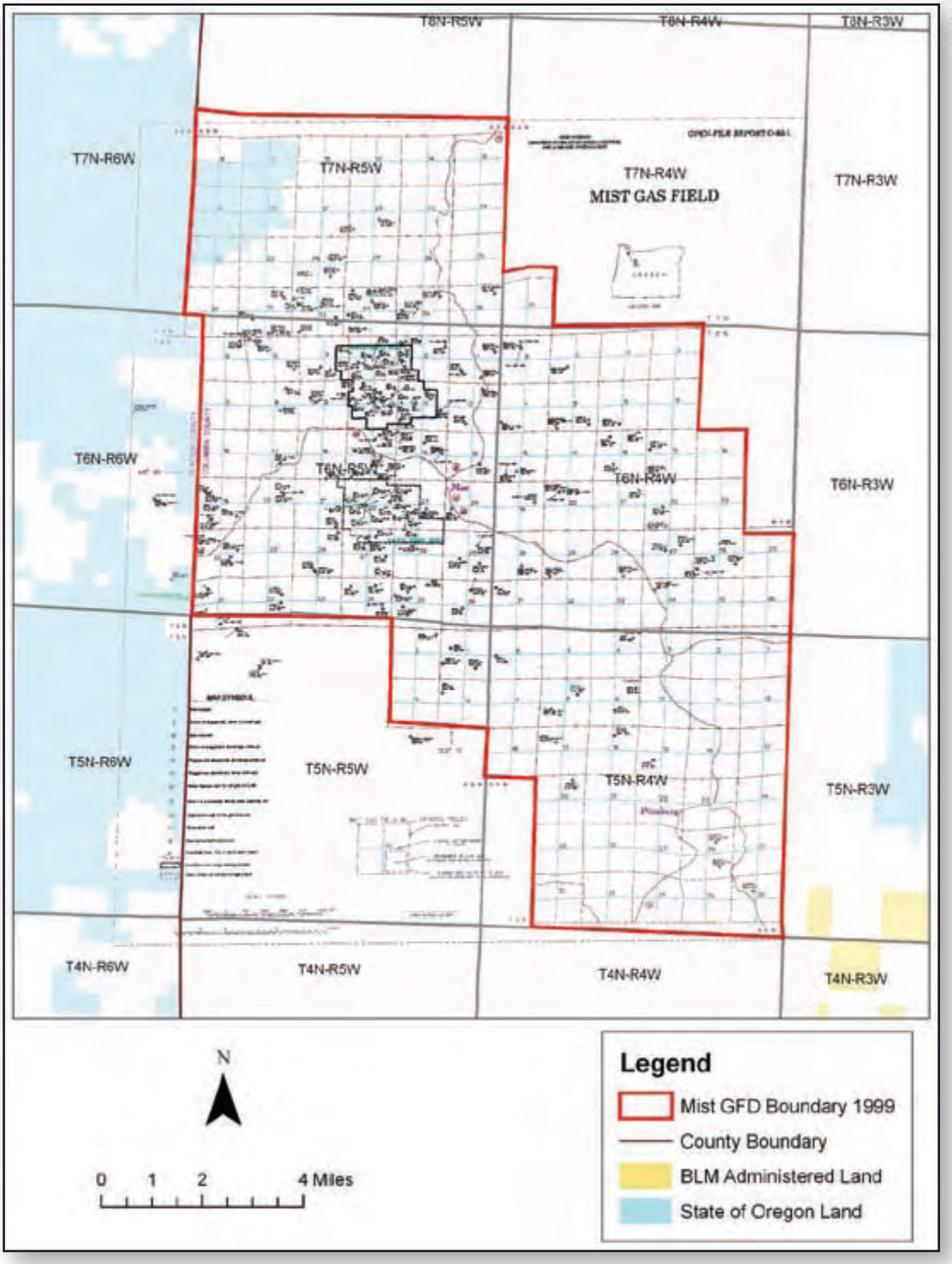
Coal bed natural gas development is also beginning in southwest Washington, approximately 20 miles north of the Salem District. Exploration is being completed by the Methane Energy Corporation's sister company (a subsidiary of Torrent Energy Corporation), Cascade Energy Corporation (Torrent Energy Corporation 2008). There is also interest in the southwest Washington coal fields from Comet Ridge Limited (Meyer 2007).

Potential for Resource Occurrence and Development

Potentials for resource occurrence and potentials for resource development (USDI BLM 1985) have been estimated for the districts. Definitions for potential for resource occurrence include:

- Low Potential - Hydrocarbon occurrence is unlikely.
- Moderate Potential - Conditions exist for hydrocarbons to occur.
- High Potential - Hydrocarbon shows have been documented or production has been established.

Figure E-9. Mist Gas Field, 1999 Boundary



Source: DOGAMI 2003

Definitions for potential for resource development include:

- Low Potential - Economic or other conditions would likely preclude development.
- Moderate Potential - It is reasonable to conclude that development could occur.
- High Potential - Development is likely to occur within the life of the plan.

The districts contain two identified sediment basins, three petroleum systems, five plays, three prospects, one focused area of petroleum shows, and one identified coal field. However, according to Ryu et al.(1996), the southern Tyee Basin (which incorporates the Eugene and Roseburg Districts) has a low to moderate petroleum potential. Yet, as shown by the potential systems, plays, and prospects, there are several areas that have not been investigated.

Ryu et al. (1996) have ranked the five plays in order of potential to produce hydrocarbons, with "1" being the greatest potential and "5" having the least potential. This is based on the size and closure of the structures; position of source, reservoir, and seals; and the timing of the play formation in relation to the timing of potential hydrocarbon migration to the play.

There has been little exploration of portions of the districts outside the Tyee Basin (i.e., Medford District and Klamath Falls Resource Area). Therefore, future potential cannot be analyzed. However, gas and oil production has been located in similar basin and range provinces, such as in the State of Nevada (Hess 2001).

Eugene District: **Moderate Potential for Occurrence**
Low Potential for Development

Two sedimentary basins, two petroleum systems, one play, and one prospect have been projected for the Eugene District. The sedimentary basins have a low to moderate petroleum potential. The identified play is ranked as fourth of five plays in potential. The petroleum systems, plays, and prospect have potential for the existence of hydrocarbons (Ryu et al. 1996). Wells and seeps have confirmed the presence of hydrocarbons within the district. However, because production has not been established and the play has a low potential in its ranking compared to the five identified plays, the potential for occurrence is *moderate*.

There is no additional public record that indicates petroleum investigation of lands within the Eugene District has occurred since 1996 (Ryu et al. 1996). The last petroleum exploration well was drilled in 1955 (refer to *Figure E-17*) (Olmstead et al. 1989). There has been no commercial development of the systems. The identified play is ranked fourth of five. Petroleum accumulations would need to be confirmed and the petroleum system move to "known" status for resource development to occur. Therefore, the potential for development within the plan's 10-year forecast is *low*.

The potential acreage of BLM-administered lands to have *moderate potential for occurrence* and *low potential for development* is approximately 72,000 acres.

Roseburg District: **Moderate Potential for Occurrence**
Moderate Potential for Development/Low Potential for Development

One sedimentary basin, two petroleum systems, five plays, two prospects, and one concentration of petroleum shows have been projected for the Roseburg District. The sedimentary basin has a low to moderate petroleum potential. The identified plays rank from highest to lowest (1 to 5) in potential out of five plays. The petroleum systems, plays, and prospects have potential for existence of hydrocarbons (Ryu et al. 1996). Numerous wells and seeps have confirmed the presence of hydrocarbons within the district. However, because production has not been established, the petroleum systems are speculative, and the plays have not been confirmed, the potential for occurrence is moderate.

There is no additional public record that indicates petroleum investigation of the lands within the Roseburg District has occurred since before 1996 (Ryu et al. 1996). The last petroleum exploration well was drilled in 1990 (refer to *Figure E-18)* (Niem and Niem 1990). There has been no commercial development of the systems. However, the projected plays range in a ranking of one to five for potential and there has been a definable area of exploration and petroleum shows. Therefore, based on the ranking of the plays and their associated petroleum systems, the potential for development within the Plan's 10-year forecast is *low* to *moderate*.

The potential acreage of BLM-administered lands to have *moderate potential for occurrence* and *moderate potential for development* (Plays 1, 2, and 3 and the area of exploration and petroleum shows) is approximately 37,000 acres.

The potential acreage of BLM-administered lands to have *moderate potential for occurrence* and *low potential for development* (Plays 4 and 5 and petroleum systems outside of Plays 1, 2, and 3) is approximately 124,000 acres.

Medford District: **Low Potential for Occurrence**
Low Potential for Development

Non-Conventional: **Moderate Potential for Occurrence**
Low/Moderate Potential for Development

The Medford District contains petroleum shows, an oil shale prospect, a small portion of a petroleum system boundary, and an identified coal field. However, for conventional petroleum systems, there is insufficient information for the occurrence of commercial quantities of hydrocarbons. Therefore, the potential for occurrence is *low*.

Due to the lack of evidence for commercial petroleum accumulations, the potential for development within the plan's 10-year forecast is *low*.

Non-conventional petroleum development in the form of coal bed natural gas is occurring within the Coos Basin of Oregon and within southwest Washington. The Rogue River Coal Field exists within the Medford District. It is known by the nature of coal that methane is associated with the beds. Investigations of known coal exposures are currently being done. If coal bed natural gas becomes commercial in the developing fields, industry may look at the potential of developing other coal fields (Pappajohn 2007). In addition, a single identified Oil Shale prospect also exists. Therefore, the potential for nonconventional oil and gas resource occurrence in the Medford District is *moderate*.

Currently there is a lack of an existing commercial coal bed natural gas project. If coal bed natural gas becomes commercially successful in other districts, development potential of other coal systems could occur within the 10-year scenario (Pappajohn 2007). Resource development potential is dependent on the future of current enterprises. Although the Medford District does have an oil shale potential and the Energy Policy Act of 2005 (U.S. 109th Congress 2005) emphasizes the development of oil shale, any potential for future development will be many years away, and the focus of development is on larger prospects within the United States. Therefore, the potential for nonconventional development within the plan's 10-year forecast is extremely *low*.

The potential acreage of BLM-administered lands to have *moderate potential for occurrence* and *low potential for development* is approximately 33,000 acres.

Klamath Falls Resource Area: **Low Potential for Occurrence**
Low Potential for Development

There are no petroleum seeps or exploration shows, identified sedimentary basins with petroleum potentials, petroleum systems, plays, or prospects located within the Klamath Falls Resource Area of the Lakeview District. While oil and gas potentials do exist in similar geologic provinces (Basin and Range), little to no investigation has been performed within this Resource Area. Energy exploration that has been conducted has focused on geothermal potential. Therefore, largely due to the lack of information, the potential for occurrence is *low*.

Likewise, due to the lack of information, the potential for development within the plan's 10-year forecast is *low*.

Leasing

After initial field work, research, and subsurface mapping (which may include the acquisition of seismic data), leasing is often the next step in oil and gas development. Leasing may be based on speculation, with the riskiest leases usually purchased for the lowest prices.

Leases on lands where the Federal Government manages the oil and gas rights are offered via oral auction. Auctions typically occur at least quarterly. The maximum lease size is 2,560 acres, and the minimum bid is $2.00 per acre. An administrative fee of $75 per parcel is charged and each successful bidder must meet citizenship and legal requirements. Leases are issued for a 10-year term, and a 12.5% royalty rate on production is required to be paid. Federal Regulations pertaining to oil and gas leasing are located at 43 CFR 3100. All monies from lease and royalty receipts are payable to the Mineral Management Service. Leases which become productive are "held by production," and typically do not terminate until all wells on the lease have ceased production, with all of the wells plugged and abandoned, and the surface reclaimed to an acceptable condition.

The Oregon-Washington BLM lease sales are generally held on a quarterly basis, offering nominated and internally selected lands. Federal oil and gas leases sold within the Oregon/Washington BLM for 2006 have ranged from a high of 227,392 acres in the March sale, to a low of 20,919 acres in September. The total lease acreage sold from March to December (four sales) was approximately 308,610 acres. From those sales, the Oregon/Washington BLM received approximately $5,467,720 in oil and gas lease revenues.

Non-federal leasing and APDs for production in the State of Oregon are currently focused in the vicinity of the Mist Gas Field, the Coos Basin, and Eastern Oregon. The Mist Gas Field currently maintains 16 production wells. The DOGAMI has recently (2006-2007) received eight APDs submitted for production (Houston, 2007). The Coos Basin currently has 115,000 acres of leased land, with three multi-well/single pad and single pad/single well production systems. Foreseeable development of the Mist Gas Field in the Salem District could result in potentially an additional 10,800 acres of BLM-administered lease offerings. If these offerings were sold for the 2006 average of $17.71 per acre, the net receipts would be nearly $191,268.

At this time, there has been no expressed interest in oil and gas leases in Western Oregon outside of the Salem and Coos Bay Districts.

Future Trends and Assumptions

Based on history of past exploration; historic, current, and projected development of oil and gas in other BLM Districts; mapped geology; and foreseeable development potential in the planning area, activity over the next decade may be stable to increasing. Current petroleum developments and interest in other BLM Districts in Oregon, and the increasing value of petroleum products (Energy Information Administration 2007), indicates potential interest within the districts. The supply of natural gas in the region may be augmented by one or more proposed Liquefied Natural Gas terminals that may be sited within the districts' boundaries. Oil and gas activity on BLM-administered mineral rights within the Districts is expected to consist of competitive and over-the-counter leases, geophysical surveys, and processing of Applications for Permit to Drill.

Some exploration for coal bed natural gas in the form of coal seam investigation and mapping is also predicted, especially of the Rouge River Coal Field. However, development of coal bed natural gas in the district is not expected within the next 10 years. This is due to the length of research time needed to delineate a field and the current rate of advancement of the Coos Basins field. It should be noted that if commercial coal bed natural gas developments do occur within the State, other coal bed natural gas prospects could develop rapidly.

Of the districts analyzed, the Roseburg District maintains the highest potential, although moderate in classification. Three identified plays and area of exploration have a *moderate potential for occurrence* and a *moderate potential for development*. Therefore, it is projected that the acreages managed by the Roseburg BLM within these plays and area of exploration would have the greatest probability for exploration and development within the next 10 years. All of the other Districts analyzed in this study would have a *low probability* for development within the next 10 years. Therefore, acreages of impacts will only be analyzed for those BLM-administered *moderate potential* lands located within the Roseburg District.

Because the lands in the Roseburg District are considered *moderate in potential* (USDI BLM 1985) and due to the classification of low to moderate potential by Ryu et al. (1996), development of these lands could range from none to the maximum. Therefore, while there is no indication of eminent development, the following analysis will utilize the maximum potential. That potential is based on development of *moderate potential* lands at one well per 160-acre spacing (spacing currently employed at the Mist Gas Field). The total BLM-administered and non-BLM-administered acreage of this defined *moderate potential* is approximately 247,000 acres The total acreage of BLM-administered *moderate potential* lands in the Roseburg District is approximately 37,000 acres or 15% of the area. Total well development of both BLM and non-BLM managed area would be 1,555 wells. Maximum development on BLM-administered lands would be 228 wells. However, as these are unproven potentials, and the reservoir will not be uniform, it is unlikely that more than 50% of total development will occur within the 10-year scenario. Therefore, given the *moderate potential* of the area, the range of development for BLM lands in the 10-year scenario is 0 to 114 wells.

Geophysical Exploration

Geophysical exploration is conducted to try to determine the subsurface geologic structure of an area. The three geophysical survey techniques generally used to define subsurface characteristics are measurements of the gravitational field, magnetic field, and seismic reflections.

Gravity and magnetic field surveys usually involve the use of aerial surveillance, utilizing aircraft. There are usually no ground disturbing activities to the project areas associated with this analysis.

Seismic reflection surveys, which are the most common of the geophysical methods, produce the most detailed subsurface information. Seismic surveys are accomplished by sending shock waves, generally by a small explosion or mechanically vibrating the ground surface. Instruments measure the time and intensity with which the waves reflect off stratigraphic layers. This information can be used to depict the subsurface structure of the rock. Vibroseis (Thumper) methods vibrate the ground surface to create a shock wave. “Thumper” trucks are quite large and are equipped with “pads” that cover about four-feet square. The pads are lowered to the ground, and the vibrators are electronically triggered in close coordination with the technicians operating the recording equipment. After the signal is recorded, the trucks move forward a short distance and the process is repeated. Up to 50 square feet (five square meters) of surface area is required to operate the equipment at each recording site.

The small explosive method requires that charges be detonated on the surface or in a drill hole. Holes for the charges are drilled utilizing truck-mounted portable drills to create small-diameter (two or six-inch) holes, which are typically drilled to depths of between 50 and 100 feet. Generally 4 to 12 holes are drilled per mile of line and a 5 to 50-pound charge of explosives is placed in the hole, covered, and detonated. The created shock wave is recorded by geophones placed in a linear fashion on the surface. In rugged terrain, a portable

drill carried by helicopter can sometimes be used. A typical drilling seismic operation may utilize 10 to 15 men operating five to seven trucks, although portable "buggies" that can be hauled behind smaller four-wheel drive All Terrain Vehicles are also commonly used in more sensitive areas.

Advanced Three Dimensional Survey (3-D Survey) is utilized within the Mist Gas Field. This process analyzes five to six miles using lines with 1,700 shot holes at 70-foot spacing. The lines are spaced at 400 feet apart. The lines are hand brushed (no surface disturbance) for survey. The survey crews utilize an Inertial Survey System that allows for accurate surveying without the need to maintain a line of sight. This allows flexibility in brushing paths. The shot hole pad is three feet by four feet (3x4) in size. The pad is hand cleared to mineral soil with hand tools. The drill rig is then placed on the pad. If existing access to the pad is limited, the drill rig is placed and removed by helicopter. The holes are drilled to 15-foot depths. The charge is exploded subsurface, leaving no surface expression. Where there is surface expression, the damaged is mitigated with hand tools. In open valleys and areas with access, thumper rigs are used, as they disturb even less ground. These requirements are in place because the Mist Gas Field is located in Commercial Forest land and is required by the land manager to minimize disturbance to near non-existent (Meyer 2007).

Surface Impacts of Geophysical Explorations

It is anticipated that the foreseeable geophysical activity in the identified Moderate Potential lands within the Roseburg District would consist of the currently used 3-D Seismic process. The total area of the identified BLM-administered potential expansion area is approximately 57 square miles (approximately 37,000 acres). Using the 3-D spacing of shots, it is anticipated that complete investigation of the area could utilize 16,150 shots. With pad ground disturbance of 12 square feet, the total disturbance on BLM-administered lands could be up to 4.5 acres. This disturbance is created using hand tools, no power tools other than those needed for brushing, and, based on experience in the Mist Gas Field, is completely reclaimed within five years or less (Meyer 2007). Disturbance will be less where pre-existing roads and/or landings can be used. Therefore, estimates to disturbance on non-BLM managed lands are indeterminate.

Drilling and Production Phase

Notices of Staking may occur during the plan period. Companies usually submit an Application for Permit to Drill after the Notice of Staking is accepted. Private surface owner input, if a split estate is involved, would be actively solicited during this stage. After the Application for Permit to Drill is approved, the operator initiates construction activities in accordance with stipulations and Conditions of Approval (COAs). Access road lengths vary, but usually the shortest feasible route is selected to reduce the haul distance and construction costs. In some cases, environmental factors or landowner's wishes may dictate a longer route. Drilling activity in the planning area is predicted to be done using existing roads and constructing short roads to access each drill site location. The district will utilize currently developed and utilized forest management Best Management Practices, in addition to the BLM's "Gold Book" (USDI/USDA 2007), for surface disturbance in road construction and pad development similar to timber harvest landings.

Based on past oil and gas drilling in Oregon, it is projected that three conventional petroleum exploratory "wildcat" wells could be drilled within the Roseburg District. The estimated success rate of finding hydrocarbons is predicted to be no greater than 10 percent, based on the average U.S. wildcat well success rate. Future identification of additional structures would likely increase this estimate. Development within the identified *moderate potential* area would be directed by 3-D Survey as opposed to wildcatting (Meyer 2007).

Based on spacing units established within the Mist Gas Field, full production development of the projected approximate 37,000 acres of BLM-administered *moderate potential* lands within the Roseburg District would require a total of 228 wells. However, as these are unproven potentials, and the reservoir will not be uniform, it is unlikely that more than 50% of total development will occur within the 10-year scenario. Therefore, given the Moderate Potential of the area, the range of development for BLM-administered lands in the 10-year scenario is 0 to 114 wells.

Surface Impacts of Drilling and Production

There are currently no production or exploration wells or pads within any of the districts' boundaries. Development of the *moderate potential* lands identified within the Roseburg District could require up to 114 wells on BLM-administered lands within the 10-year scenario. It is anticipated that all gas production would be carried by collector pipelines placed within road rights-of-way.

The identified plays range from 5 miles to 22 miles from the north-south Northwest Pipeline System that runs within the I-5 Corridor. A review of existing private and public roadways between the plays and the pipeline indicates an adequate transportation system of road rights-of-way to accommodate collector pipelines (USDI BLM 2008). The only additional pipeline right-of-way that would be required would be to connect new wells to existing roadways. These lines would be placed along rights-of-way for new road construction. Therefore, it is not anticipated that pipeline rights-of-way would create an additional disturbance beyond existing and new road rights-of-way.

Initially operators would move construction equipment over existing roads to the point where the new drill site access road begins. Based on existing road systems and access, the use of 3-D Survey, and directional drilling, it is anticipated that most well development will utilize existing road infrastructure to develop the resource. However, it may be necessary to construct up to a quarter mile of access for each pad to remove the facility from the active roadway. Based on the ability to cluster wells (assumed to be four wells per pad), it is estimated that no more than 97 miles total of new road construction would be required on both BLM-administered and non-BLM lands. No more than 7.0 miles of new road construction on BLM-administered lands would be needed in full development of 114 wells. Most would be moderate duty access roads with a travel surface 18 to 20 feet wide. The total surface disturbance width would average 40 feet including ditches, utilities, pipelines, cuts, and fills. The total acreage impacted by new road building for both BLM and non-BLM managed lands would be 470 acres. Total disturbance for new roads on BLM-administered land would be approximately 34 acres. Roads not subsequently needed for other resource management would be reclaimed at the end of the project (USDI/USDA 2007).

In the second part of the drilling phase, the operator would construct the drilling pad or platform, anticipated to involve approximately two acres per well site. Support facilities are anticipated to disturb about two acres per well site. Total disturbance could be up to four acres per pad, with each pad containing four or more wells. The likely duration of well development and testing is predicted to be approximately six months to one year for each drill site. Total disturbance to BLM-administered and non-BLM lands in the *moderate potential* area is estimated to not exceed 1,555 acres. Disturbance of BLM-administered lands within the Moderate Potential area is not to exceed 114 acres.

Total disturbance of both BLM-administered lands and other lands for wells, support services, pipeline and new road construction within the District is expected to be approximately 2,025 acres (1% of the total Roseburg District Moderate Potential acreage). Total disturbance for just BLM-administered land with development of 114 wells is expected to be approximately 153 acres (0.5% of projected BLM-administered within the Roseburg District Moderate Potential acreage).

Surface disturbance would be restricted, as much as possible, to previously disturbed areas such as logging roads and landings. Industry is currently utilizing a multi-well to single pad approach which minimizes impact.

Interim reclamation would reduce initial disturbance. After initial construction, unused portions of well site areas would be reclaimed while the wells are in production. Disturbance will be limited to areas within overwork foundation structures and necessary infrastructure, such as well heads, pipelines, and access roads, as described in federal reclamation guidance (USDI/USDA 2007).

Therefore, the maximum development disturbance for the *moderate potential* lands managed by the BLM assumed in this 10-year scenario would range from zero to the maximum disturbance of approximately 153 acres.

Plugging and Abandonment

Wells that are completed as dry holes are plugged according to a plan designed specifically for the down-hole conditions of each well. Plugging is usually accomplished by placing cement plugs at strategic locations from the bottom of the well to the surface. Drilling mud is used as a spacer between plugs to prevent communication between fluid-bearing zones. The casing is cut off at least three feet below ground level and capped by welding a steel plate on the casing stub. Wells will be plugged and abandoned at the end of their production life, with the pad, support facilities, and road fully reclaimed.

Surface Impacts of Plugging and Abandonment

After plugging, all equipment and debris would be removed and the drill site would be restored as near as reasonably possible to its original condition. If new roads constructed for drilling are not needed for future access to the area, the road would be reclaimed using Best Management Practices established for the District, with the road prism revegetated as required by the Authorized Officer. Pipelines will be removed or plugged and abandoned in place to minimize new surface disturbance (USDI/USDA 2007).

Limitations

The acreage estimates used for BLM-administered surface estate are based upon current GIS layers, with acreage approximations to the nearest thousand. The accuracy of this information has not been verified against the Master Title Plats. The GIS coverage for subsurface estate within the district is incomplete. Therefore, the existence and location of BLM-administered subsurface estate within the district is not fully known.

A brief review of the Master Title Plats was completed within and near the Mist Gas Field, 1985 boundaries. Federal subsurface estate identified on the Master Title Plats was not recorded on the GIS layers. Most of the Mater Title Plats that identified federal subsurface parcels were outside the Mist Gas Field boundaries. One parcel was identified within the Mist Gas Field boundary. Due to the incompleteness of the GIS layers, BLM-administered acreage of the surface and subsurface will need to be verified through review of Mater Title Plats prior to exploration and development.

Restrictions and Requirements on Mineral and Energy Exploration and Development Activity

Introduction

This appendix discusses the leasing stipulations as they will be applied to BLM-administered lands in the Medford District. Operating standards pertinent to the locatable and salable minerals program are also described. Mineral exploration and development on Federal lands must also comply with laws and regulations administered by several agencies of the State of Oregon; however, these requirements are not discussed in this document.

Leasable Mineral Resources

Oil and Gas Leasing

The Mineral Leasing Act of 1920 (as amended) provides that all publicly owned oil and gas resources be open to leasing, unless a specific land order has been issued to close the area. Through the land use planning process, the availability of these resources for leasing is analyzed, taking into consideration development potential and surface resources. Constraints on oil and gas operations are identified and placed in the leases as notices and stipulations. Oil and gas leases are then issued from the BLM Oregon State Office in Portland. Specific proposed notices and stipulations are listed later in this appendix.

The issuance of a lease conveys to the lessee an authorization to actively explore and/or develop the lease, in accordance with the attached stipulations and the standard terms outlined in the Federal Onshore Oil and Gas Leasing Reform Act (FOOGLRA). Restrictions on oil and gas activities in the planning area will take the form of timing limitations, controlled surface use, or no surface occupancy stipulations used at the discretion of the Authorized Officer to protect identified surface resources of special concern.

The field office which reviews the lease tract will attach stipulations to each lease before it is offered for bid. The review will be conducted by consulting the direction given in this Resource Management Plan. In addition, all lands administered by BLM within the planning area will be subject to the lease notices as shown on the following pages. All Federal lessees or operators are required to follow procedures set forth by: Onshore Oil and Gas Orders, Notices to Lessee (NTL), the Federal Oil and Gas Royalty Management Act (as amended), the Federal Onshore Oil and Gas Leasing Reform Act, and Title 43 Code of Federal Regulations, Part 3100.

Oil and Gas Operations

Geophysical Exploration

Geophysical operations may be conducted regardless of whether the land is leased or not. Notices to conduct geophysical operations on BLM surface are received by the resource area. Administration and surface protection are accomplished through close cooperation of the operator and the BLM. Seasonal restrictions may be imposed to reduce fire hazards, conflicts with wildlife, watershed damage, etc. An operator is required to file a “Notice of Intent to Conduct Oil and Gas Exploration Operations” for all geophysical activities on public land administered by the BLM. The notice should adequately show the location and access routes, anticipated surface damages, and time frame. The operator is required to comply with written instructions and orders given by the Authorized Officer, and must be bonded. Signing of the

Notice of Intent by the operator signifies agreement to comply with the terms and conditions of the notice, regulations, and other requirements prescribed by the Authorized Officer. A pre-work conference and/ or site inspection may be required. Periodic checks during and upon completion of the operations will be conducted to ensure compliance with the terms of Notice of Intent, including reclamation.

Drilling Permit Process

The federal lessee or operating company selects a drill site based on spacing requirements, subsurface and surface geology, geophysics, topography, and economic considerations. Well spacing is determined by topography, reservoir characteristics, protection of correlative rights, potential for well interference, interference with multiple-use of lands, and protection of the surface and subsurface environments. Close coordination with the State would take place. Written field spacing orders are issued for each field. Exceptions to spacing requirements involving Federal lands may be granted after joint State and BLM review.

Notice of Staking

After the company makes the decision to drill, it must decide whether to submit a Notice of Staking or apply directly for a permit to drill. The Notice of Staking is an outline of what the company intends to do, including a location map and sketched site plan. The Notice of Staking is used to review any conflicts with known critical resource values and to identify the need for associated rights-of-way and special use permits. The BLM utilizes information contained in the Notice of Staking and obtained from the on-site inspection to develop conditions of approval to be incorporated into the application for permit to drill. Upon receipt of the Notice of Staking, the BLM posts the document and pertinent information about the proposed well in the District Office for a minimum of 30 days prior to approval, for review and comment by the public.

Application for Permit to Drill (APD)

The operator may or may not choose to submit a Notice of Staking; in either case, an Application for Permit to Drill must be submitted prior to drilling. An Application for Permit to Drill consists of two main parts: a 12-point surface plan that describes any surface disturbances and is reviewed by resource specialists for adequacy with regard to lease stipulations designed to mitigate impacts to identified resource conflicts with the specific proposal, and an 8-point subsurface plan that details the drilling program and is reviewed by the staff petroleum engineer and geologist. This plan includes provisions for casing, cementing, well control, and other safety requirements. For the Application for Permit to Drill option, the onsite inspection is used to assess possible impacts and develop provisions to minimize these impacts.

Geothermal Leasing

The Geothermal Steam Act of 1970 (as amended) provides for the issuance of leases for the development and utilization of geothermal steam and associated geothermal resources. Geothermal leasing and operational regulations are contained in Title 43 Code of Federal Regulations, Part 3200. Through the land use planning process the availability of the geothermal resources for leasing is analyzed, taking into consideration development potential and surface and subsurface resources. Constraints on geothermal operations are identified and placed in the leases as stipulations. Geothermal leases are then issued by the BLM Oregon State Office in Portland.

Geothermal resources are first offered by competitive sale. Prior to a competitive lease sale, or the issuance of a noncompetitive lease, each tract will be reviewed, and appropriate lease stipulations will be included. The review will be conducted by consulting the direction given in this resource management plan. The issuance of a lease conveys to the lessee authorization to actively explore and/ or develop the lease in accordance with regulations and lease terms and attached stipulations. Subsequent lease operations must be conducted in accordance with the regulations, Geothermal Resources Operational Orders, and any Conditions

of Approval developed as a result of site-specific NEPA analysis. In the planning area, restrictions in some areas will include timing limitations, controlled surface use, or no surface occupancy stipulations used at the discretion of the Authorized Officer to protect identified surface resources of special concern.

In addition to restrictions related to the protection of surface resources, the various stipulations and conditions could contain requirements related to protection of subsurface resources. These may involve drainage protection of geothermal zones, protection of aquifers from contamination, or assumption of responsibility for any unplugged wells on the lease. Development of geothermal resources can be done only on approved leases. Orderly development of a geothermal resource, from exploration to production, involves several major phases that must be approved separately. Each phase must undergo the appropriate level of NEPA compliance before it is approved and subsequent authorizations are issued.

Leasing Notice and Stipulation Summary

The mineral leasing notices and stipulations below are considered to be the minimum necessary to issue leases in the operating area. the standard and the special status species leasing stipulations will be utilized on most lands. The powersite stipulation (USDI BLM Form 3730-1, Powersite Stipulation) will be utilized on lands within powersite reservations.

Stipulations also include waiver, exception, and modification criteria. If the Authorized Officer determines that a stipulation involves an issue of major concern, waivers, exceptions, or modifications of the stipulation will be subject to at least a 30-day advance public review. Waiver, exception, and modification are defined as follows:

- *Waiver* - The lifting of a stipulation from a lease that constitutes a permanent revocation of the stipulation from that time forward. The stipulation no longer applies anywhere within the leasehold.
- *Exception* - This is a one time lifting of the stipulation to allow an activity for a specific proposal. This is a case-by-case exemption. The stipulation continues to apply to all other sites within the leasehold to which the restrictive criteria apply. It has no permanent effect on the lease stipulation.
- *Modification* - This is a change to a stipulation that either temporarily suspends the stipulation requirement or permanently lifts the application of the stipulation on a given portion of the lease. Depending on the specific modification, the stipulation mayor may not apply to all other sites within the leasehold to which the restrictive criteria apply.

Whenever a special stipulation, such as No Surface Occupancy (NSO), Timing, or Controlled Surface Use (CSU) is used, the need for the special stipulation is described in the "Objective" that follows the stipulation. By imposing these special stipulations, it has been concluded that less restrictive stipulations would not be adequate to meet the stated objective.

Leasing Notices

The following Notices are to be included in each lease for all lands administered by BLM within the planning area where the pertinent resource potential exists. Lease notices are attached to leases in the same manner as stipulations; however, there is an important distinction between lease notices and stipulations: lease notices do not involve new restrictions or requirements. Any requirements contained in a lease notice must be fully supported by either laws, regulations, policy, onshore oil and gas orders, or geothermal resources operational orders.

Resource-Specific Leasing Notices

Notice

Special Status Species Stipulation

Resources: Botany and Wildlife

Stipulation: (All the)/(Certain) lands within this lease are within the suitable habitat of the (identify all Federal Threatened (FT), Endangered (FE) or Proposed Threatened (PT) and Proposed Endangered (PE) species, including scientific names), (an officially listed)/(a proposed for listing) Threatened or Endangered species. The Authorized Officer, through an environmental review process, has determined that because of the habitat characteristics of this species, all future post-lease operations must be analyzed and subjected to a U.S. Fish and Wildlife Service (FWS) Section 7 consultation or conference to ensure the action is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of critical habitat.

(All the)/(Certain) lands within this lease are known to bear the species listed (Insert list of species) which has (have) protected status as (State Threatened (ST); State Endangered (SE); Federal Candidate (FC); Bureau Sensitive (BS)); or are within the suitable habitat of (identify all State Threatened, State Endangered, Federal Candidate, or Bureau Sensitive species, including scientific names). These species are protected by BLM policy as described in Manual 6840. All future post-lease operations must be analyzed, utilizing recent field data collected at the proper time of year, to identify the presence of such species. If the field examination indicates that the proposed activity may adversely impact FC species, technical assistance will be obtained from FWS to ensure that actions will not contribute to the need to list a federal candidate as a federal threatened or endangered species. Technical assistance may be obtained from FWS to insure that actions will not contribute to the need to list a ST, SE, or BS species as a federal threatened or endangered species. Therefore, prior to any surface disturbing activities or the use of vehicles off existing roads on (this lease)/(the lands legally described as: _____. BLM approval is required. This restriction also applies to geophysical activities for which a permit is required. The approval is contingent upon the results of site specific inventories for any of the above mentioned species. The timing of these inventories is critical. They must be conducted at a time of year appropriate to determine the presence of the species or its habitat. The lessee is hereby notified that the process will take longer than the normal 30 days and that surface activity approval will be delayed.

If no FT, FE, PT, or PE species, or suitable habitat, are found during the inventories, then no formal Section 7 consultation with the USFWS will be necessary and the action will be processed using the procedures found in the applicable oil and gas Onshore Orders or geothermal resources operational orders. However, the lessee is hereby notified that, if any FT, FE, PT, PE, ST, SE, FC, or BS species are found during the inventories, or if the actions are proposed in designated or proposed critical habitat, then surface disturbing activities may be prohibited on portions of, or even all of the lease, unless an alternative is available that meets all of the following criteria: (a) The proposed action is not likely to jeopardize the continued existence of a threatened or endangered species; (b) the proposed action is not likely to destroy or adversely modify critical habitat for a threatened or endangered species; (c) the proposed action is consistent with the recovery needs in approved Fish and Wildlife Service recovery plans or BLM Habitat Management Plans for the threatened or endangered species; and (d) the proposed action will not contribute to the need to list species as federal threatened or endangered.

Objective: To protect officially listed or proposed threatened or endangered plant or wildlife species; and to insure that post leasing oil and gas or geothermal operations will not likely contribute to the need to list other special status species as threatened or endangered.

Exception: An exception may be granted by the Authorized Officer, if review of the proposed plan submitted by the operator indicates that the proposed action will have no effect on the (common name of species).

Modification: The boundaries of the stipulated area may be modified, by the Authorized Officer, if it is determined that portions of the area do no have any officially listed or proposed threatened or endangered species, federal candidate, state threatened or endangered species, or Bureau sensitive species, or their habitat.

Waiver: This stipulation may be waived if the (common name) is declared recovered and is no longer protected under the Endangered Species Act, or if other species found within the lease are no longer considered to be in the federal candidate, state threatened or endangered, or Bureau sensitive categories.

Notice

Cultural Resources: An inventory of the leased lands may be required prior to surface disturbance to determine if cultural resources are present and to identify needed mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator shall:

1. Contact the Bureau of Land Management (BLM) to determine if a cultural resource inventory is required. If an inventory is required, then;
2. The BLM will complete the required inventory; or the lessee or operator, at their option, may engage the services of a cultural resource consultant acceptable to the BLM to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard 10-acre minimum to cover possible site relocation, which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the BLM for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.
3. Implement mitigation measures required by the BLM. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the BLM any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the BLM.

Authorities: Compliance with Section 106 of the National Historic Preservation Act is required for all actions that may affect cultural properties eligible to the National Register of Historic Places. Section 6 of the Oil and Gas Lease Terms (DOI BLM Form 3100-11, Offer to Lease and Lease for Oil and Gas) requires that operations be conducted in a manner that minimizes adverse impacts to cultural and other resources.

Special Leasing Stipulations

The following special stipulations will be utilized on specifically designated tracts of land as described in the resource management plan.

Leasing Stipulations

No Surface Occupancy

Resource: Land Use Authorizations

Stipulation: Surface occupancy and use is prohibited on Recreation and Public Purposes (R&PP) and FLPMA leases.

Objective: To protect uses on existing R&PP and FLPMA leases.

Exception: An exception to this stipulation may be granted by the Authorized Officer, if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this stipulation may be modified by the Authorized Officer, if the land use authorization boundaries are modified.

Waiver: This stipulation may be waived by the Authorized Officer, if all land use authorizations within the leasehold have been terminated, canceled, or relinquished.

No Surface Occupancy

Resource: Recreation Sites

Stipulation: Surface occupancy and use are prohibited within developed recreation areas.

Objective: To protect developed recreation areas.

Exception: An exception to this stipulation may be granted by the Authorized Officer, if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified by the Authorized Officer, if the recreation area boundaries are changed.

Waiver: This stipulation may be waived, if the Authorized Officer determines that the entire leasehold no longer contains developed recreation areas.

No Surface Occupancy

A 30-day public notice period will be required prior to modification or waiver of this stipulation.

Resource: Special Areas Stipulation: Surface occupancy and use are prohibited within Areas of Critical Environmental Concern (ACEC).

Objective: To protect important historic, cultural, scenic values, natural resources, natural systems or processes, threatened and endangered plant species, and/or natural hazard areas of the ACEC.

Exception: An exception to this stipulation may be granted by the Authorized Officer, if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified by the Authorized Officer, if the ACEC or Environmental Education Area (EEA) boundaries are changed.

Waiver: This stipulation may be waived, if the Authorized Officer determines that the entire leasehold no longer contains designated ACECs or EEAs.

No Surface Occupancy

Resource: Progeny test sites.

Stipulation: Surface occupancy and use are prohibited within progeny test sites.

Objective: To protect progeny test sites.

Exception: None.

Modification: The boundaries of the stipulated area may be modified by the Authorized Officer, if the progeny test site boundaries are changed.

Waiver: This stipulation may be waived, if the Authorized Officer determines that the entire leasehold no longer contains progeny test sites.

No Surface Occupancy

A 30-day public notice period will be required prior to modification or waiver of this stipulation.

Resource: Visual Resource Management (VRM) Class I

Stipulation: Surface occupancy and use are prohibited in VRM Class I areas.

Objective: To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, and to avoid areas subject to slope failure, mass wasting, piping, or having excessive reclamation problems.

Objective: To preserve the existing character of the landscape. Exception: An exception to this stipulation may be granted by the Authorized Officer, if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified by the Authorized Officer, if the boundaries of the VRM Class I area are changed.

Waiver: This stipulation may be waived by the Authorized Officer, if all VRM Class I areas within the leasehold are reduced to a lower VRM class. Areas reduced to VRM Class II will be subject to the Controlled Surface Use stipulation for visual resources, and areas reduced to VRM Class III will be subject to standard lease stipulations.

Controlled Surface Use

Resource: Soils

Stipulation: Prior to disturbance of any suspected unstable slopes or slopes over 60 percent, an engineering/reclamation plan must be approved by the Authorized Officer. Such plan must demonstrate how the following will be accomplished:

- Site productivity will be restored.
- Surface runoff will be adequately controlled.
- Off-site areas will be protected from accelerated erosion, such as rilling, gullying, piping, and mass wasting.
- Water quality and quantity will be in conformance with state and federal water quality laws.
- Surface-disturbing activities will not be conducted during extended wet periods.
- Construction will not be allowed when soils are frozen.

Exception: An exception to this stipulation may be granted by the Authorized Officer if the operator submits a plan, which demonstrates that the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this stipulation may be modified by the Authorized Officer, if it is determined that portions of the area do not include suspected unstable slopes or slopes over 60 percent.

Waiver: This stipulation may be waived by the Authorized Officer if it is determined that the entire leasehold does not include any suspected unstable slopes or slopes over 60 percent.

Controlled Surface Use

A 30-day public notice period will be required prior to modification or waiver of this stipulation.

Resource: Visual Resource Management (VRM) Class II.

Stipulation: All surface-disturbing activities, semi-permanent and permanent facilities in VRM Class II areas may require special design including location, painting and camouflage to blend with the natural surroundings and meet the visual quality objectives for the area.

Objective: To control the visual impacts of activities and facilities within acceptable levels.

Exception: None. Modification: None.

Waiver: This stipulation may be waived, if the Authorized Officer determines that there are no longer any VRM Class II areas in the leasehold.

Controlled Surface Use

Resource: Deferred Timber Management Areas

Stipulation: Unless otherwise authorized, drill site construction and access through Deferred Timber Management Areas within this leasehold will be limited to established roadways.

Objective: To substantially maintain the existing level of older and multi-layered conifer forest through year 2023.

Exception: An exception to this stipulation may be granted by the Authorized Officer if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this stipulation may be modified by the Authorized Officer if it is determined that portions of the area do not include Deferred Timber Management Areas.

Waiver: This stipulation may be waived by the Authorized Officer if it is determined that the entire leasehold does not include Deferred Timber Management Areas.

Controlled Surface Use

Resource: Riparian Management Areas.

Stipulation: Unless otherwise authorized, drill site construction and access through Riparian Management Areas within this leasehold will be limited to established roadways.

Objective: To protect riparian vegetation and reduce sedimentation.

Exception: An exception to this stipulation may be granted by the Authorized Officer, if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this stipulation may be modified by the Authorized Officer, if it is determined that portions of the area do not include riparian areas, floodplains, or water bodies.

Waiver: This stipulation may be waived by the Authorized Officer, if it is determined that the entire leasehold no longer includes Riparian Management Areas.

Controlled Surface Use

Resource: Late-Successional Management Areas

Stipulation: Unless otherwise authorized, drill site construction and access through Late-Successional Management Areas (LSMAs) within this leasehold will be limited to established roadways.

Objective: To protect vegetation and to retain and/or restore old-growth forest characteristics.

Exception: An exception to this stipulation may be granted by the Authorized Officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The area affected by this stipulation may be modified by the Authorized Officer if it is determined that portions of the area do not include LSMAs.

Waiver: This stipulation may be waived by the Authorized Officer if it is determined that the entire leasehold does not include LSMAs.

Locatable Minerals Surface Management Standards for Exploration, Mining, and Reclamation

The following operational standards for mining activities have been compiled to facilitate compliance with the 43 Code of Federal Regulations (CFR) 3809 surface management regulations, which apply to all operations on mining claims located on BLM administered lands. It is the mining claimant's and operator's responsibility to avoid "unnecessary or undue degradation," and to perform all the necessary reclamation work.

All operators proposing occupancy, timber removal, road or trail construction, installation of structures of any kind, use of mechanized earth moving equipment, or suction dredges having hoses with an inside diameter greater than 4 inches must provide written notice to the District Office prior to the commencement of any mining related disturbance of the surface. If the mining or operation is in sensitive areas (not exploration work) a Plan of Operations will be required. Operations are not to proceed until the operator's bond or financial guarantee is accepted. Surface management performance standards include compliance with all pertinent State laws.

Operations ordinarily resulting in only negligible disturbance as defined in 43 CFR 3809.5(1) are considered to be casual use and no notification to or approval by the BLM is required. Likewise, use of a suction dredge in a stream having an intake nozzle of less than 4 inches in diameter, will not generally require the filing of a Notice or Plan of Operations. Such activity is generally considered casual use.

Vegetation/Timber Removal

An application must be submitted to the Authorized Officer pursuant to 43 CFR 3821.4 describing the proposed use of timber from O&C lands for mining purposes. No trees may be cut until the application is approved and the trees are marked.

Firewood

Merchantable timber may not be used for firewood. Firewood permits may be issued to the operator for use in conjunction with the mining operation but no wood may be used until a permit is obtained from the

BLM. Firewood authorized for use in conjunction with a mining operation is not to be removed from the mining claim.

Topsoil

All excavations should have all the productive topsoil (usually the top 12 to 18 inches) first stripped, stockpiled, and protected from erosion for use in future reclamation. This also includes removal of topsoil before the establishment of mining waste dumps and tailings ponds, if the waste material will be left in place during reclamation.

Roads

Existing roads and trails should be used as much as possible. Temporary roads are to be constructed to a minimum width and with minimum cuts and fills. All roads shall be constructed so as to minimize negative impacts to slope stability.

Water Quality

All operations, including casual use, shall be conducted in a manner so as to prevent unnecessary or undue degradation of surface and subsurface water resources and shall comply with all pertinent Federal and State water quality laws.

Claim Monuments

State law prohibits the use of plastic pipe for claim staking in Oregon. The BLM policy requires all existing plastic pipe monuments to have all openings permanently closed. Upon loss or abandonment of the claim, all plastic pipe must be removed from the public lands. When old markers are replaced during normal claim maintenance, they shall be either wood posts or stone or earth mounds, constructed in accordance with the requirements of State law.

Drill Sites

Exploratory drill sites should be located next to or within existing roads when possible without blocking public access. When drill sites must be constructed, the size of the disturbance shall be as small as possible.

Dust and Erosion Control

While in operation, and during periods of shut-down, exposed ground surfaces susceptible to erosion will need to be protected. This can be accomplished with seeding, mulching, installation of water diversions, and routine watering of dust-producing surfaces.

Fire Safety

All State fire regulations must be followed, including obtaining a campfire permit or blasting permit, if needed. All internal gas combustion engines must be equipped with approved spark arresters.

Safety and Public Access

Mining claimants shall not exclude the public from mining claims with force, intimidation, or "no trespassing" signs. In the interest of safety, the general public may be restricted only from specific dangerous areas (e.g., underground mines, open pits, and heavy equipment operating and storage areas) by erecting fences, gates and warning signs, if they are included in the Mining Notice or Mining Plan and authorized by the BLM. It is the operator's responsibility to protect the public from mining hazards. Gates, signs or road blocks may be installed only with BLM approval.

Sewage

Self-contained or chemical toilets are generally to be used at exploration or mining operations and their contents shall be disposed of at approved dump stations.

Equipment

The claimant must maintain the claim site, including structures and equipment, in a safe and orderly condition. Only equipment and supplies that are appropriate, reasonable, and regularly used for exploration or mining will be allowed on the claim.

Tailings Ponds

Settling ponds must be used to contain sediment, and any discharge must meet state standards.

Solid and Hazardous Waste

Trash, garbage, used oil, etc. must be removed from public land and disposed of properly. Trash, garbage or hazardous wastes must not be buried on public lands. The accumulation of trash, debris, or inoperable equipment on public lands is viewed as unnecessary degradation and will not be tolerated. Operators conducting illegal disposals shall be held financially responsible for the clean-up of such disposals.

Cultural and Paleontological Resources

Operators shall not knowingly alter, injure, or destroy any scientifically important paleontological (fossil) remains or any historical or archaeological site, structure, or object on federal lands or any identified traditional use areas. The operator shall immediately bring to the attention of the Authorized Officer, any paleontological (fossil) remains or any historical or archaeological site, identified traditional cultural properties, structure, or object that might be altered or destroyed by exploration or mining operations, and shall leave such discovery intact until told to proceed by the Authorized Officer. The Authorized Officer shall evaluate the discovery, take action to protect or remove the resource, and allow operations to proceed.

Threatened and Endangered Species of Plants and Animals

Operators shall take such action as may be needed to prevent adverse impacts to threatened or endangered species of plants and animals and their habitat that may be affected by operations, as stipulated in guidelines developed through consultation with the U.S. Fish and Wildlife Service.

Occupancy at Mining Sites

Occupancy means full or part-time residence on the public lands. It also pertains to barriers to access, fences, tents, trailers and the storage of equipment or materials. Living on the public land in excess of 14 days must be reasonably incident to and required for actual continuous mining or diligent exploration operations, and will require concurrence by the BLM. In general, operations at the casual use level are not sufficient to warrant occupancy. Occupancy may be allowed for mining operations if it is deemed reasonably incident to conducting the operations. To be reasonably incident, activities must constitute substantially regular work, lead to the extraction of minerals, involve observable on-the-ground activity that BLM may verify, and use appropriate equipment that is presently operable. Proposed occupancy or use must conform to the provisions in 43 CFR 3715 and such occupancy or use cannot commence until BLM has completed a review of the proposal. At the conclusion of the review BLM will make a written determination to be sent to the claimant/operator.

Security Guard

In some cases, it may be reasonably incident for a security guard to live onsite to protect valuable property, equipment, or workings that are necessary for the mining operation, or to protect the public from site hazards.

Reclamation

As per the 43 CFR 3809 regulations all Notices and Plans of Operation will have an approved reclamation bond.

Reclamation of all disturbed areas must be performed concurrently or as soon as possible after exploration or mining ceases and shall conform to the guidelines described in surface management regulations found in 43 CFR 3809.
Reclamation shall include, but shall not be limited to:

1) saving topsoil for final application after reshaping disturbed areas;
2) measures to control erosion, landslides, and water runoff;
3) measures to isolate, remove or control toxic materials;
4) reshaping the area disturbed, applying topsoil, and revegetating disturbed areas where reasonably practicable; and
5) rehabilitation of fisheries and wildlife habitat.

Equipment and Debris

All mining equipment, vehicles, and structures must be removed from the public lands during extended periods of non-operation and/or at the conclusion of mining, unless authorization from the BLM is given to the operator or claimant in writing. Accumulations of debris and trash on mining claims are considered unnecessary and undue degradation and must be removed immediately regardless of the status of the operation. Failure to do so will result in the issuance of a notice of noncompliance.

Seeding

The BLM approved seeding prescription must be used to provide adequate re-vegetation for erosion control, wildlife habitat, and productive secondary uses of public lands.

Mulch

As directed by the BLM, during review of the Notice or Plan of Operations, the disturbed area may require mulching during interim or final reclamation procedures. Depending on site conditions, the mulch may need to be punched, netted, or blown on with a tackifier to hold it in place.

Roads

After mining is completed, all new roads shall be reclaimed, per the claimants or operators reclamation plan.

Tailings Ponds

The ponds should be allowed to dry out and the sediments removed and spread with the topsoil, unless the sediments contain toxic materials. If the ponds contain toxic materials, a plan will be developed to identify, dispose, and mitigate effects of the toxic materials. If necessary, a monitoring plan will also be implemented. The ponds should then be backfilled and reclaimed.

Guidelines for Development of Salable Mineral Resources

Proposed Operations

All salable mineral exploration and development, that involves surface disturbance, must have an operation and reclamation plan approved by the Authorized Officer. Extraction of mineral materials must be in accordance with a contract of sale or free use permit issued to qualifying organization by the Authorized Officer. All proposals will undergo the appropriate level of review and compliance with the National Environmental Policy Act.

Quarry Design

In steep terrain, quarry developments may require a series of benches to effectively maximize the amount of mineral materials to be removed in a safe manner. In all cases, bench height shall not exceed 40 feet. If the bench would be used by bulldozers to access other parts of the quarry, the width of the bench should be at least 25 feet. If the bench won't be used by equipment, then this width can be reduced to approximately 10 feet.

Clearing of timber and brush should be planned at least 10 feet beyond the edge of the excavation limit. Most often the brush would be piled and burned at the site, or scattered nearby.

- All topsoil and overburden should be stockpiled and saved for eventual quarry site reclamation. These piles may need to be stabilized by mulching or seeding in order to minimize erosion during the winter months.

As a standard procedure, the excavation of the quarry floor should be designed with an outslope of approximately two percent to provide for adequate drainage.

Operating Procedures

Where practicable, the following requirements will be made a part of every contract or permit providing for the use of mineral material:

- Oversize shall be treated according to the site specific plan.
- The operator shall comply with local and State safety codes covering quarry operations, warning signs and traffic control. All necessary permits must be obtained from State and County agencies.
- Use of the site for equipment storage and stockpiling rock material is allowed for the duration of the contract or permit. Use of the site beyond that time will be authorized, if warranted, under a temporary use permit.
- All topsoil shall be stockpiled or windrowed as appropriate, for use in reclamation.
- Prior to abandonment, all material sites will be graded to conform with the surrounding topography. Topsoil will be utilized to create a medium for re-vegetation. Reseeding and tree planting, if necessary, will be done as prescribed by the Authorized Officer. Access roads no longer needed by the BLM will be abandoned and reclaimed as directed by the Authorized Officer.

Appendix F
Lands

This appendix provides detailed data about lands, realty, and access inf mation fo e Me rd District Resource Management Plan.

In this appendix:

Land Tenure Adjustment Criteria F-3

Land Withdrawals and Land Tenure Zone 3 Lands F-4

Inventory of Communication Sites F-15

Land Tenure Adjustment Criteria

In accordance with the Federal Land Policy and Management Act of 1976 (FLPMA) and other laws, Executive Orders, and Departmental and Bureau policy, the following factors will be considered in evaluating opportunities for disposal or acquisition of lands or interests in lands. This list is not considered all inclusive, but represents the major factors to be considered.

General Land Tenure Adjustment Evaluation Factors

- Improves manageability of specific areas.
- Maintains or enhances important public values and uses.
- Consolidates Federal mineral estate and/or reuniting split surface and mineral estates.
- Facilitates development of energy and mineral potential.
- Reduces difficulty or cost of public land administration.
- Provides accessibility to land for public recreation and other uses.
- Amount of public investments in facilities or improvements and the potential for recovering those investments.
- Suitability of land for management by another Federal agency.
- Significance of decision in stabilizing or enhancing business, social, and economic conditions, and/or lifestyles.
- Meets long-term public management goals as opposed to short term.
- Facilitates National, State, and local BLM priorities or mission statement needs.
- Consistency with cooperative agreements and plans or policies of other agencies.
- Facilitates implementation of other aspects of the approved resource management plans.

Acquisition Criteria

- Facilitates access to public land and resources retained for long-term public use.
- Secures Threatened or Endangered or Sensitive plant and animal species habitat.
- Protects riparian areas and wetlands.
- Contributes to biodiversity.
- Protects high-quality scenery.
- Enhances the opportunity for new or emerging public land uses or values.
- Facilitates management practices, uses, scales of operation, or degrees of management intensity that are viable under economic program efficiency standards.
- Secure lands adjacent to other existing Zone 1 lands.
- Protects significant cultural resources and sites eligible for inclusion on the National Register of Historic Places
- Whether private sites exist for the proposed use.

Disposal Criteria

The following criteria will be used to identify parcels in Land Tenure Zones 2 or 3 suitable for disposal:

- Suitability for purposes including but not limited to community expansion or economic development, such as industrial, residential, or agricultural development.
- Lands of limited public value.

- Lands that are difficult for the BLM to manage and unsuitable for transfer to other federal agencies or State and local governments.
- Lands that would aid in aggregating or repositioning other public lands or public land resource values where the public values to be acquired outweigh the values to be exchanged.

O&C Land Exchange Criteria

An O&C land exchange is an exchange within the O&C area as delineated in Public Law 105-321. Forest management and related factors to consider when evaluating the feasibility of an O&C land exchange include the following:

- Land exchanges which maintain the existing balance between the various land use allocations will be considered favorably.
- Offered lands that are primarily suitable for agriculture, business, or home sites, or which would require extensive post-acquisition management, will not be favorably considered. The O&C lands designated for timber production will generally not be exchanged for lands that will be managed solely for a single use, such as species protection.
- Generally, where cutting rights are reserved on existing and future timber stands by the proponent, the proposed exchange will not be considered favorably.
- Proposals which result in a material reduction in the number of acres of O&C or Coos Bay Wagon Road (CBWR) land or acres of harvestable timber should not be considered favorably. See I.M. No. OR-99-081, dated August 4, 1999, for an interpretation of Section 3 of Public Law 105-321, which established a requirement of "No Net Loss" of O&C and CBWR lands in western Oregon.
- The exchange of O&C and CBWR lands specifically for lands located outside of the 18 O&C counties is prohibited by regulations in 43 CFR 2200.0-6(e). This restriction applies to timber and other interests in lands as well.

Land Withdrawals and Land Tenure Zone 3 Lands

Table F-1 and *Table F-2* contain detailed information about existing and proposed land withdrawals in the Medford BLM District. Zone 3 lands are available for disposal.

Table F-1. Existing Land Withdrawals And Recommendations For Continuance In The Medford District

Serial Number	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Recommendation (C/R)
ORE 016674	PLO 5105	T 33 S, R 1 E, Secs. 11,13, 14,23,24,27,35		Lost Creek Reservoir	COE	B	
ORE 016674	*PLO 5105*	*T 33 S, R 2 E, Secs. 11,15,19*	*Total acres 2,483.48*	Lost Creek Reservoir	COE.	B	R (716.88 acres)
ORE 016753	PLO 6373	T 32 S, R 1 E Sec. 33		Elk Creek Reservoir			C
ORE 016753	PLO 6373	T 33 S, R 1 E, Secs. 5,9,21, 29	840.59	Elk Creek Reservoir	COE	B	C
OR 49	PLO 4132	T 35 S, R 6 W, Sec. 9	200	Sprague Orchard	BLM	B	C
OR 10729	PLO 5481	T 36 S, R 6 W, Sec. 3	160	Sprague Orchard	BLM	B	C
OR 04135	PLO 1726	T 35 S, R 6 W, Sec.		Recreation area	BLM	B	R (519.8 acres)
OR 04135	PLO 1726	T 33 S, R 10 W, Secs.9,10,16		Recreation area	BLM	B	
OR 04135	PLO 1726	T 33 S, R 9 W, Secs. 8,16-18, 22,23,26,35,36		Recreation area	BLM	B	
OR 04135	PLO 1726	T 33 S, R 8 W, Secs. 32-35		Recreation area	BLM	B	
OR 04135	PLO 1726	T 33 S, R 7 W, Sec. 31		Recreation area	BLM	B	
OR 04135	PLO 1726	T 33 S, R 1 E, Secs. 23,24,32		Recreation area	BLM	B	
OR 04135	PLO 1726	T 33 S, R 2 E, Secs 11,19		Recreation area	BLM	B	
OR 04135	PLO 1726	T 34 S, R 9 W, Sec. 1,2		Recreation area	BLM	B	
OR 04135	PLO 1726	T 34 S, R 8 W, Secs. 1,5,6, 12,13,24,25		Recreation area	BLM	B	
OR 04135	PLO 1726	T 34 S, R 7 W, Secs. 6,19, 30,31		Recreation area	BLM	B	
OR 04135	PLO 1726	T 34 S, R 1 W, Secs. 2,3,10		Recreation area	BLM	B	
OR 04135	PLO 1726	T 35 S, R 8 W, Sec. 1		Recreation area	BLM	B	
OR 04135	PLO 1726	T 35 S, R 7 W, Secs. 3-6,9, 10,24		Recreation area	BLM	B	
OR 04135	PLO 1726	T 36 S, R 7 W, Secs. 2,3,11, 12		Recreation area	BLM	B	
OR 04135	PLO 1726	T 36 S, R 3 W, Secs. 11-13		Recreation area	BLM	B	
OR 04135	PLO 1726	T 36 S, R 2 W, Sec. 13		Recreation area	BLM	B	
OR 04135	*PLO 1726*	*T 39 S, R 2 W, Secs.19,23*	*15,481.14*	Recreation area	BLM	B	
OR 12261	PLO 3165	T 33 S, R 8 W, Sec. 33		Recreation area	BLM	B	
OR 12261	PLO 3165	T 34 S, R 8 W, Secs. 2,3,13, 25		Recreation area	BLM	B	Needs review
OR 12261	*PLO 3165*	*T 35 S, R 8 W, Sec 1*	*174.21*	Recreation area	BLM	B	
ORE 016183D	PLO 3869	T 32 S, R 9 W, Sec. 16		Recreation area	BLM	B	R
ORE 016183D	PLO 3869	T 35 S, R 9 W, Sec. 11		Recreation area	BLM	B	R
ORE 016183D	PLO 3869	T 38 S, R 7 W, Sec. 1		Recreation area	BLM	B	R
ORE 016183D	PLO 3869	T 39 S, R 2 W, Sec. 25		Recreation area	BLM	B	R
ORE 016183D	*PLO 3869*	*T 39 S, R 3 E, Secs. 21,22*	*444.35*	Recreation area	BLM	B	R
OR 19008	SO of 1/19/1917	T 38 S, R 3 E, Sec. 25***		Water power Potential/ WPD 3	BLM	D	R
OR 19008	SO of 1/19/1917	T 38 S, R 4 E, Secs. 31***,33		Water power Potential/ WPD 3	BLM	D	R
OR 19008	SO of 1/19/1917	T 39 S, R 3 E, Secs. 3***,11***, 15***,		Water power Potential/ WPD 3	BLM	D	R
OR 19008	*SO of 1/19/1917*	*T 39 S, R 4 E, Secs. 5***,9,15, 21****,27****	*5,631.54*	Water power Potential/ WPD 3	BLM	D	R
OR 19010	SO of 4/27/1917	T 33 S, R 1 E, Secs. 23,27, 32, 33****		Water power Potential/ WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 33 S, R 2 E, Sec. 1***, 11***,15,17***,19****		Water power Potential/ WPD 10	BLM	D	Needs review

Serial Number	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Recommendation (C/R)
OR 19010	SO of 4/27/1917	T 33 S, R 3 E, Sec. 7***		Water power Potential/ WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 34 S, R 1 W, Sec. 3****,15, 21***,29***		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 34 S, R 1 E, Secs. 3****, 11***,13,23***,25****,35		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 34 S, R 2 E, Sec.7,33****		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 35 S, R 7 W, Secs. 3-5 9-11, 13,25***,35***		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 35 S, R 6 W, Sec 19		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 35 S, R 6 W, Secs. 5***,9***, 13****		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 35 S, R 1 E, Secs. 1, 3, 5,17		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 35 S, R 2 E, Sec. 13		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 35 S, R 3 E, Sec. 7		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 36 S, R 7 W, Sec. 11		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 36 S, R 6 W, Sec. 21		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 36 S, R 5 W, Secs. 21***, 23***		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 36 S, R 7 W, Secs. 19, 21****,25****,29***		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 36 S, R 3 W, Secs. 11,13, 17***, 21***		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 36 S, R 2 W, Secs. 1***, 13***, 15***		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	SO of 4/27/1917	T 38 S, R 8 W, Sec 27,35		Water power Potential WPD 10	BLM	D	Needs review
OR 19010	*SO of 4/27/1917*	*T 39 S, R 8 W, Secs. 3, 5****, 9****, 17, 20***, 27***, 29*	*12228.88*	Water power Potential WPD 10	BLM	D	Needs review
OR 19013	SO of 4/27/1917	T 32 S, R 6 W, Sec 23		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 4/27/1917	T 33 S, R 6 W, Sec 15		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 4/27/1917	T 33 S, R 1 E, Secs. 13,32,33		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 4/27/1917	T 33 S, R 2 E, Secs. 17-19		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 4/27/1917	T 34 S, R 5 W, Secs. 17,29		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 34 S, R 1 W, Sec 21		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 34 S, R 1 W, Secs. 9,21, 29,31		Transmission Line/ WPD 13	BLM	D	R

Serial Number	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Recommendation (C/R)
OR 19013	SO of 7/20/1917	T 35 S, R 5 W, Sec 19		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 36 S, R 5 W, Secs. 5,23		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 36 S, R 4 W, Sec. 21		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 36 S, R 2 W, Sec. 1		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 39 S, R 2 E, Sec. 17,35		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 40 S, R 3 E, Secs. 7,17,21, 27,35		Transmission Line/ WPD 13	BLM	D	R
OR 19013	SO of 7/20/1917	T 41 S, R 3 E, Sec. 1		Transmission Line/ WPD 13	BLM	D	R
OR 19013	*SO of 7/20/1917*	*T 41 S, R 4 E, Secs. 7,17*	*127.27*	Transmission Line/ WPD 13	BLM	D	R
OR 19018	SO of 4/13/1942	T 33 S, R 4 W, Sec 31		Water power Potential/ WPD 18	BLM		Needs review
OR 19018	SO of 4/13/1942	T 34 S, R 5 W, Sec .31		Water power Potential/ WPD 18	BLM	D	Needs review
OR 19018	SO of 4/13/1942	T 34 S, R 4 W, Sec. 5		Water power Potential/ WPD 18	BLM	D	Needs review
OR 19018	*SO of 4/13/1942*	*T 34 S, R 3 W, Secs. 23,25,35*	*872.35*	Water power Potential/ WPD 18	BLM	D	Needs review
OR 19047	EO of 12/1/1910	T 33 S, R 1 E, Secs. 24,32, 31****		Power site Potential/ PSR 161	BLM	D	Needs review
OR 19047	*EO of 12/1/1910*	*T 34 S, R 1 W, Secs. 2,3,10*	*157.49*	Power site Potential/ PSR 161	BLM	D	Needs review
OR 19048	EO of 12/19/1910	T 35 S, R 7 W, Secs. 4,6,10,26		Power site Potential/ PSR 167	BLM	D	Needs review
OR 19048	EO of 12/19/1910	T 36 S, R 7 W, Secs. 2***,12		Power site Potential/ PSR 167	BLM	D	Needs review
OR 19048	*EO of 12/19/1910*	*T 36 S, R 3 W, Secs. 11,12****	*495.38*	Power site Potential/ PSR 167	BLM	D	Needs review
OR 19078	EO of 3/28/1916	T 36 S, R 4 W, Secs. 22,24***	2.17	Power site Potential/ PSR 528	BLM	D	Needs review
OR 19088	EO of 1/19/1917	T 38 S, R 3 E, Sec. 25****		Power site Potential/ PSR 583	BLM	D	R
OR 19088	EO of 1/19/1917	T 38 S, R 4 E, Sec 31,33		Power site Potential/ PSR 583	BLM	D	R
OR 19088	*EO of 1/19/1917*	*T 39 S, R 4 E, Secs. 5****, 9, 15,21,27*	*1799.03*	Power site Potential/ PSR 583	BLM	D	R
OR 19089	EO of 1/19/1917	T 39 S, R 3 E, Secs. 3,11,15	160	Power site Potential/ PSR 584	BLM	D	R
OR 19094	EO of 4/30/1917	T 34 S, R 1 E, Secs. 3****, 11, 13,23,25,35		Power site Potential/ PSR 619	BLM	D	Needs review
OR 19094	EO of 4/30/1917	T 34 S, R 2 E, Sec. 7		Power site Potential/ PSR 619	BLM	D	Needs review
OR 19094	EO of 4/30/1917	T 35 S, R 1 W, Sec. 13		Power site Potential/ PSR 619	BLM	D	Needs review
OR 19094	EO of 4/30/1917	T 35 S, R 1 E, Secs. 1,3,5,17		Power site Potential/ PSR 619	BLM	D	Needs review

[illegible]	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Recommendation (C/R)
OR 19094	EO of 4/30/1917	T 35 S, R 2 E, Secs. 3,13		Power site Potential/ PSR 619	BLM	D	Needs review
OR 19094	*EO of 4/30/1917*	*T 35 S, R 3 E, Sec. 7*	*3360.34*	Power site Potential/ PSR 619	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 33 S, R 1 E, Secs. 23****, 27****,33****		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 33 S, R 2 E, Secs. 1,11***, 15***,17***,19****		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 33 S, R 3 E, Sec 7***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 34 S, R 1 W, Secs. 3****, 15***,21***,29***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 35 S, R 7 W, Secs. 3,5****, 9,11,13****,25***,35***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 35 S, R 6 W, Secs. 19		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 35 S, R 1 W, Secs. 5***,9***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 36 S, R 7 W, Sec. 11***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 36 S, R 6 W, Sec. 21		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 36 S, R 5 W, Secs. 21***, 23***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 36 S, R 4 W, Secs. 19***, 21*** 25,29***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	EO of 4/28/1917	T 36 S, R 3 W, Secs. 11****, 13,17***,21***		Power site Potential/ PSR 621	BLM	D	Needs review
OR 19096	*EO of 4/28/1917*	*T 36 S, R 2 W, Secs. 1***, 13***,15****	*5,379.4*	Power site Potential/ PSR 621	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 33 S, R 10 W, Secs. 3,9,10, 12-14		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 33 S, R 9 W, Secs. 8,16-18, 23,26,36		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 33 S, R 8 W, Secs. 32,34,35		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 33 S, R 7 W, Secs. 31****, 32****		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 33 S, R 1 E, Secs. 13,14***, 23		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 33 S, R 2 E, Sec. 3***		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 34 S, R 9 W, Sec. 2		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 34 S, R 8 W, Secs. 2,6,12, 13,24,25,35		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 34 S, R 7 W, Secs. 5,6,18, 19****,30,31		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 34 S, R 1 E, Secs. 15,23		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 34 S, R 2 E, Sec. 33		Power site Potential/ PSC 143	BLM	D	Needs review

Serial Number	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Recommendation (C/R)
OR 19139	SO of 5/8/1926	T 35 S, R 8 W, Sec. 1,2		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 35 S, R 7 W, Secs. 5-7		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 36 S, R 7 W, Sec. 2***		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 36 S, R 2 W, Sec. 18		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	SO of 5/8/1926	T 37 S, R 6 W, Secs.13, 15****,23,24		Power site Potential/ PSC 143	BLM	D	Needs review
OR 19139	*SO of 5/8/1926*	*T 37 S, R 5 W, Secs.17, 19****	*22948.95*	Power site Potential/ PSC 143	BLM	D	Needs review
OR 19143	SO of 12/10/1926	T 35 S, R 7 W, Sec. 5		Power site Potential/ PSC 158			
OR 19143	*SO of 12/10/1926*	*T 36 S, R 7 W, Sec. 15****	*71.8*	Power site Potential/ PSC 158	BLM	D	Needs review
OR 19154	SO of 2/27/1929	T 38 S, R 4 E, Sec. 32		Power site Potential/ PSC 218	BLM	D	R
OR 19154	SO of 2/27/1929	T 39 S, R 2 E, Secs. 26,35		Power site Potential/ PSC 218	BLM	D	R
OR 19154	SO of 2/27/1929	T 39 S, R 3 E, Secs. 11,19,20		Power site Potential/ PSC 218	BLM	D	R
OR 19154	*SO of 2/27/1929*	*T 39 S, R 4 E, Secs. 5***,15*	*1482.21*	Power site Potential/ PSC 218	BLM	D	R
OR 19173	SO of 4/11/1942	T 33 S, R 4 W, Sec. 31		Power site Potential/ PSC 330	BLM	D	Needs review
OR 19173	SO of 4/11/1942	T 34S, R 5 W, Sec. 31		Power site Potential/ PSC 330	BLM	D	Needs review
OR 19173	SO of 4/11/1942	T 34S, R 4 W, Sec. 5		Power site Potential/ PSC 330	BLM	D	Needs review
OR 19173	*SO of 4/11/1942*	*T 34 S, R 3 W, Secs. 23,25, 26,35*	*1151.73*	Power site Potential/ PSC 330	BLM	D	Needs review
OR 19174	SO of 4/27/1943	T 33 S, R 1 W, Secs. 29,33,35		Power site Potential/ PSC 340	BLM	D	Needs review
OR 19174	SO of 4/27/1943	T 33 S, R 1 E, Secs. 13,17,18, 23,27,31		Power site Potential/ PSC 340	BLM	D	Needs review
OR 19174	SO of 4/27/1943	T 33 S, R 2 E, Secs. 16,17,19		Power site Potential/ PSC 340	BLM	D	Needs review
OR 19174	SO of 4/27/1943	T 34 S, R 1 W, Secs. 9,15,23, 27,29,31		Power site Potential/ PSC 340	BLM	D	Needs review
OR 19174	SO of 4/27/1943	T 33 S, R 2 E, Secs. 3,11,15, 23		Power site Potential/ PSC 340	BLM	D	Needs review
OR 19174	*SO of 4/27/1943*	*T 35 S, R 1 W, Sec. 7*	*5207.45*	Power site Potential/ PSC 340	BLM	D	Needs review
OR 19291	PLO 3530	T 39 S, R 6 W, Secs. 5,6	210.36	Brewer Spr. RNA	BLM	B	C
ORE 03644	B.O. of 1-24-1956	T 34 S, R 1 W, Sec. 10		Rogue R. Basin Project	BOR	B	Needs review
ORE 03644	B.O. of 1-24-1956	T 34 S, R 2 W, Sec 20		Rogue R. Basin Project	BOR	B	Needs review
ORE 03644	B.O. of 1-24-1956	T 34 S, R 3 E, Sec. 24		Rogue R. Basin Project	BOR	B	Needs review
ORE 03644	B.O. of 1-24-1956	T 34 S, R 4 E, Sec 32		Rogue R. Basin Project	BOR	B	Needs review
ORE 03644	*B.O. of 1-24-1956*	*T 39 S, R 4 E, Sec. 6*	*875.93*	Rogue R. Basin Project	BOR	B	Needs review
ORE 011495	PLO 4289	T 40 S, R 7 W, Sec. 1****	1132.39	Rogue R. Basin Project	BOR	C	C
ORE 017844	PLO 4037	T 39 S, R 4 E, Sec. 6	162.5	Rogue R. Basin Project	BOR	B	C
OR 20519	S.O. of 2-20-1943	T 33 S, R 1 E, Sec. 32		Medford\SV Project	BOR	B	R

[illegible]	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Recommendation (C/R)
OR[illegible]9	S.O. of 2-20-1943	T 34 S, R 1 W, Sec. 2	84.64	Medford\SV Project	BOR	B	R
OR 20572	B.O. of 8-18-1950	T 35 S, R 2 W, Secs. 34,35	80	Air Nav. Site	FAA	A	C
ORE 03801	PLO 1189	T 34 S, R 8 W, Sec. 2	395.5	Recreation area	USFS	B	R
OR-19110	EO of 7/23/1917	T 32 S, R 6 W, Sec. 23		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 33 S, R 6 W, Sec. 15		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 33 S, R 1 E, Sec. 13		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 33 S, R 2 E, Secs. 9,17-19		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 34 S, R 5 W, Secs. 17,29		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 34 S, R 1 W, Sec. 21		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 35 S, R 5 W, Secs. 9,21,27, 29,31		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 36 S, R 5 W, Secs. 5,23		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 36 S, R 4 W, Sec. 21		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 36 S, R 2 W, Sec. 1		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 39 S, R 2 E, Secs. 17,35		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 40 S, R 3 E, Secs. 7,17,21, 27,35		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 41 S, R 3 E, Sec. 1		Transmission Line/ PSR 649	BLM	D	Needs review
OR-19110	EO of 7/23/1917	T 41 S, R 4 E, Secs. 7, 17		Transmission Line/ PSR 649	BLM	D	Needs review
OR-37299	FO of 1/19/1983	T 31 S, R 4 W, Secs. 27,28, 34,35		Water Power Project/ PP-7161	FERC	D	Needs review
OR-37299	FO of 1/19/1983	T 32 S, R 4 W, Sec. 3		Water Power Project/ PP-7161	FERC	D	Needs review
OR-19014	SO of 12/12/1917	T 33 S, R 10 W, Secs. 9****, 10,11,13		Water power Potential/ WPD 14	FERC	D	Needs review
OR-19014	SO of 12/12/1917	T 33 S, R 9 W, Secs.17,21, 23,35		Water power Potential/ WPD 14	FERC	D	Needs review
OR-19014	SO of 12/12/1917	T 33 S, R 8 W, Secs. 33****,35		Water power Potential/ WPD 14	FERC	D	Needs review
OR-19014	SO of 12/12/1917	T 34 S, R 9 W, Sec. 1		Water power Potential/ WPD 14	FERC	D	Needs review
OR-19014	SO of 12/12/1917	T 34 S, R 8 W, Secs. 1,3,5		Water power Potential/ WPD 14	FERC	D	Needs review
OR-19125	EO of 12/27/1919	T 33 S, R 10 W, Secs. 9****, 10, 11, 13		Power site Potential/ PSR 728	FERC	D	Needs review
OR-19125	EO of 12/27/1919	T 33 S, R 9 W, Secs. 17,21, 23,35		Power site Potential/ PSR 728	FERC	D	Needs review
OR-19125	EO of 12/27/1919	T 33 S, R 8 W, Secs. 33****,35		Power site Potential/ PSR 728	FERC	D	Needs review
OR-19125	EO of 12/27/1919	T 34 S, R 9 W, Sec. 1		Power site Potential/ PSR 728	FERC	D	Needs review

Serial Number	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Rec (C/R,
OR-19125	EO of 12/27/1919	T 34 S, R 8 W, Secs. 1,3,5		Power site Potential/ PSR 728	FERC	D	Needs review
OR-4337	PL 90-542	T 33 S, R 10 W, Secs. 9-14		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 33 S, R 9 W, Secs. 8,15-18, 21-23,26,27,35,36		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 33 S, R 8 W, Secs. 31-36		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 33 S, R 7 W, Sec. 31		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 34 S, R 9 W, Sec 1,2		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 34 S, R 8 W, Secs. 1-3, 5, 6, 12, 13, 24, 25, 36		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 34 S, R 7 W, Secs. 6,18,19, 30,31		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 35 S, R 8 W, Sec. 1		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 35 S, R 7 W, Secs. 3-11,14, 15, 23-26, 35,36		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 36 S, R 7 W, Sec 1,2, 11-14,24		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-4337	PL 90-542	T 36 S, R 6 W, Secs. 18,19		Protection of Wild and Scenic River values/ Rogue W&SR	BLM		C
OR-57512	FO of 6/6/2002	T 36 S, R 6 W, Secs. 19,20, 29-31		Water Power Project/ PP-12205	FERC	B	R
OR-19098	EO of 5/7/1917	T 33 S, R 2 E, Sec. 1***		Power site Potential/ PSR 623	BLM	D	Needs review
OR-19098	EO of 5/7/1917	T 35 S, R 7 W, Secs. 6****,10		Power site Potential/ PSR 623	BLM	D	Needs review
OR-19098	EO of 5/7/1917	T 36 S, R 7 W, Sec. 12		Power site Potential/ PSR 623	BLM	D	Needs review
OR-49212	PLO 7136	T 34 S, R 8 W, Sec. 35		Protect Recreation Values/ Galice Creek Recreation Area	BLM	B	Needs review
OR-49212	*PLO 7136*	*T 35 S, R 8 W, Secs. 2,3*	*290*	Protect Recreation Values/ Galice Creek Recreation Area	BLM	B	Needs review
ORE-0-12261	PLO 3259	T 36 S, R 3 W, Sec. 11	79.73	Protection of R&PP/ Recreation Area	BLM	B	Needs review
OR-49218	PLO 7103	T 37 S, R 7 W, Sec. 36		Protection of Scenic, Fisheries, Wildlife, and Recreation Values/	BLM	B	Needs review

[illegible]	Order Number	Legal Description	Acres	Purpose/Name	Managing Agency	Segregation Effect	Recommendation (C/R)
OR-49218	PLO 7103	T 37 S, R 6 W, Sec. 31		Limestone Caves and Crook Creek	BLM	B	Needs review
OR-49218	*PLO 7103*	*T 39 S, R 8 W, Sec. 11*	*758.46*	Fisheries Area	BLM	B	Needs review
OR-19138	SO of 1/7/1926	T 38 S, R 8 W, Secs. 9,26***, 27,28,34,35		Power site Potential/ PSC 123	BLM	D	Needs review
OR-19138	SO of 1/7/1926	T 39 S, R 8 W, Secs. 5****, 15, 27****,29,33,34****,35		Power site Potential/ PSC 123	BLM	D	Needs review
OR-19138	EO of 1/7/1926	T 40 S, R 8 W, Secs. 5****,9		Power site Potential/ PSC 123	BLM	D	Needs review
OR-19093	EO of 4/28/1917	T 38 S, R 8 W, Secs. 27,35		Power site Potential/ PSR 618	BLM	D	Needs review
OR-19093	EO of 4/28/1917	T 39 S, R 8 W, Secs. 3, 4***,5, 9****, 17****, 21****,27***, 29***		Power site Potential/ PSR 618	BLM	D	Needs review
OR-19092	*EO of 4/28/1917*	*T 38 S, R 8 W, Sec. 28*	*27.9*	Power site Potential/ PSR 617	BLM	D	Needs review
OR-56726	FO of 5/21/2001	T 39 S, R 2 E, Secs. 34,35		Water Power Project/ PP-12022	FERC	D	FERC Vacation
OR-56726	FO of 5/21/2001	T 40 S, R 2 E, Sec. 2		Water Power Project/ PP-12022	FERC	D	FERC Vacation
OR-18974	FPC Orders OF 4/22/1959, 2/25/1975	T 39 S, R 2 E, Secs. 28,35 T 40 S, R 2 E, Sec. 1 T 40 S, R 3 E, Secs. 6,17		Transmission Line/ PP-2082	FERC	D	
OR-18974	FPC Orders OF 4/22/1959, 2/25/1975	T 41 S, R 3 E, Sec. 1 T 41 S, R 4 E, Secs. 6-9,12,17		Transmission Line/ PP-2082	FERC	D	
Not Serialized	Act Of 12/30/1982	T 40 S, R 2 E, Secs. 31,32 T 41 S, R 3 E, Secs. 5,6		Protection of Wilderness Potential/ BLM Wilderness Study Area	BLM		Needs Review

DO: Director Order
EO: Executive Order
SO: Secretarial Order
BO: Bureau Order
DO: Director Order
PL: Public Law
PLO: Public Land Order
PSR: Power Site Reserve
PSC: Power Site Classification
R&PP: Recreation and Public Purposes
WPD: Water Power Designation
FPCO: Federal Power Commission
FO: Federal Energy Regulatory Commission Order

Segregation Effect:
A: Withdrawn from operation of the general land laws, the Mining law, and the Mineral Leasing Act
B: Withdrawn from operations of the General Land and Mining Laws
C: Withdrawn from operation of the General Land Law
D: Withdrawn from operation of the General Land Law; open to mining subject to Public Law 359
E: Withdrawn from operation of the General Land Law; withdrawn from mining except metalliferous

Recommendation:
C - Continue R - Revoke

*** Opened to entry subject to Sec. 24 of the Federal Power Act.
**** Opened to entry in part subject to Sec. 24 of the Federal Power Act.

Note: Location description indicates sections within which withdrawn lands are located. Information on which portions of the cited sections are withdrawn is available at the District Office. Table does not include lands that have been completely transferred out of Federal ownership subsequent to withdrawal or lands within National Forest boundaries.

Table F-2. Land Tenure Zone 3 Lands In The Medford District

Township	Range	Section	Subdivision	Acres	Status	Location # on
34 S	6 W	22	NW¼SE¼;	40.00	PD	185
		33	SW¼SW¼; E½SW¼;	120.00	OC	186
		35	NW¼NE¼;	40.00	OC	187
35 S	1 W	15	NW¼SE¼;	40.00	OC	188
35 S	5 W	31	SE¼NW¼, SW¼, W½SE¼;	280.00	OC	189
		32	SW¼NE¼; W½SE¼, NE¼SE¼;	160.00	PD	190
35 S	6 W	5	S½NE¼, SE¼SW¼, SE¼;	280.00	OC	191
		7	NE¼NE¼, N½NW¼, SW¼NW¼, SE¼NE¼;	200.00	OC	192
		11	E½NE¼, SW¼NE¼, NE¼SE¼;	160.00	OC	193
		14	NW¼SE¼;	40.00	PD	194
		17	NE¼NE¼, NW¼NW¼;	80.00	OC	195
		19	NE¼, N½NW¼;	240.00	OC	196
		21	NE¼NE¼;	40.00	OC	197
		29	NW¼NW¼;	40.00	OC	198
		30	S½S¼;	80.00	PD	199
		31	SW¼NE¼, W½, NW¼SE¼;	400.00	OC	200
		33	E½NE¼, E½NW¼, NW¼NW¼, SE¼SE¼;	240.00	OC	201
36 S	3 W	21	NE¼SW¼;	40.00	OC	202
		33	SW¼SW¼,	40.00	OC	203
			NW¼SE¼SW¼;	10.00	PD	
		35	NE¼NE¼;	40.00	OC	204
36 S	4 W	25	SE¼SW¼, S½SW¼SE¼;	60.00	OC	205
		35	Lot 5, W½SW¼;	112.40	OC	206
36 S	5 W	4	E½NW¼, N½SW¼;	160.00	PD	207
		5	SE¼NE¼, E¼SE¼;	80.00	OC	208
		9	W½E½, E½W½, E½NW¼SW¼;	340.00	OC	209
		29	S½SW¼;	80.00	OC	210
36 S	6 W	1	Lots 2,3,4, S½NE¼, N½SW¼, SE¼NW¼, W½SE¼, SE¼SE¼;	440.00	OC	211
		3	SW¼, S½SE¼	240.00	OC	212
		4	W½W½	160.00	PD	213
		5	E½SE¼, SW¼NW¼, W½SW¼;	200.00	OC	214
		8	W½SE¼, SE¼SE¼;	120.00	PD	215
		9	N½NW¼, SW¼NW¼, E½SE¼;	200.00	OC	216
		11	NW¼NE¼;	40.00	OC	217
		17	N½N½;	160.00	OC	218
		30	NW¼SW¼;	40.00	PD	219
		31	NW¼NW¼;	40.00	OC	220
		33	SE¼NE¼;	40.00	OC	221
37 S	3 W	1	Lot 8	13.82	*PD	222
		4	Lot 2	4.28	PD	223

Township	Range	Section	Subdivision	Acres	Status	Location # on Map 2A/2B
			Lot 7	39.69	PD/OC	
		5	Lot 8	30.72	PD/OC	224
			Lot 9	4.87	PD	
37 S	5 W	5	NE¼NW¼, SW¼NW¼, NW¼SW¼;	120.00	OC	225
		7	W½SW¼;	80.00	OC	226
		18	W½SW¼;	80.00	PD	227
37 S	6 W	3	SE¼NE¼, NE¼SE¼;	80.00	OC	228
		8	NE¼NE¼;	40.00	PD	229
		9	NE¼, N½SW¼, SE¼SW¼, W½SE¼, NE¼SE¼;	400.00	OC	230
		11	N½NW¼;	80.00	OC	231
		13	SW¼SE¼, E½SE¼;	120.00	OC	232
		15	NE¼NE¼, SW¼NE¼, SE¼NW¼;	120.00	OC	233
		24	NW¼NE¼;	40.00	PD	234
38 S	1 W	21	Lot 1, NE¼SW¼, S1/2SW¼	147.04	OC	235
38 S	2 W	10	NE¼NW¼;	40.00	PD	236
		28	Lot 1	5.00	*PD	237
38 S	4 W	17	NE¼NE¼;	40.00	OC	238
		25	Lot 7	9.26	*PD	239
39 S	1 W	1	NE¼NE¼;	40.00	OC	240
39 S	2 W	18	NW¼NE¼SW¼;	10.00	*PD	241
40 S	8 W	1	Lots 7, 8;	11.53	OC	242
		5	Lots 6, 7;	21.21	OC	243
		7	Lots 1,2, E½SW¼, W½SE¼;	202.34	OC	244
32 S	2 E	17	NW¼SW¼SW¼SW¼;	2.50	*PD	245
33 S	2 E	1	SE¼SW¼;	40.00	PD	246
36 S	1 E	6	SE¼SE¼;	40.00	*PD	247
36 S	2 E	34	SE¼SW¼, SW¼SE¼;	80.00	PD	248
37 S	1 E	15	SE¼NW¼;	40.00	OC	249
38 S	1 E	3	SW¼NW¼;	40.00	OC	250
		5	SE¼NE¼;	40.00	OC	251
38 S	2 E	34	SW¼NW¼, NW¼SW¼;	80.00	PD	252
			Total Zone 3 Lands	7264.66		

E = East
N = North
S = South
W = West
UN = Unnumbered
PD = Public Domain Land
OC = Oregon and California Railroad Land
Ot = Other

Sources: Western Oregon Digital Base and District realty records

* Land added by amendment and not subject to FLTFA funds

Inventory of Communication Sites

Table F-3 contains information on existing communication sites in the Medford BLM District.

Table F-3. Inventory Of Communication Sites For The Medford District

49	Mt. Bluie	42.2256	123.1629
50	Beacon Hill	42.2706	123.1750
51	Mt. Sexton	42.3700	123.2200
52	Mt. Baldy	42.1944	123.1117
53	Gilbert Peak	42.2932	123.1842
54	Chestnut Mountain	42.1397	122.4408
55	Mt. Isabelle	42.3034	123.1036
56	Soda Mountain	42.0648	122.4780
57	Squires Peak	42.2190	123.0330
58	Tallowbox	42.1966	123.1504
59	King Mountain	42.6920	123.2294
60	Flounce Rock	42.4360	122.3650
61	Wolf Ridge	42.4582	122.5113
62	Fielder Mountain	42.2688	123.1273
63	Tin Pan Peak	42.2558	123.0899
64	Elk Mountain	42.3240	123.1498
65	Nuggett Butte	42.2700	123.0333

[a] Map numbers start at 49 because communication sites are numbered consecutively across the planning area on Figure 6 in the RMP.

Appendix G

Recreation

This appendix provides supplemental material for the recreational section of the Medford District Resource Management Plan.

In this appendix:

Interim Off-Highway Vehicle Management Guidelines G-3

Planning Frameworks for Special Recreation Management Areas G-6

Interim Off-Highway Vehicle Management Guidelines

This section provides interim off-highway vehicle (OHV) management guidelines that would be implemented until a transportation management plan is completed. These interim guidelines have been developed for OHV emphasis areas.

Maps associated with these interim OHV management guidelines are available at the Medford BLM District Office. These maps show OHV area designations, a preliminary road and trail network, and BLM-administered lands that have secured legal public access. See tables in the resource management plan: *Table 25* for a list of individual closed areas, *Table 26* for OHV area designations, and *Table 27* for OHV emphasis areas.

The BLM road maintenance levels that pertain to limitations on types of OHV use are described below.

- **Level 1** – This level is assigned to roads where minimum maintenance is required to protect adjacent lands and resource values. Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless roadbed drainage is being adversely affected, causing erosion. Closure and traffic restrictive devices are maintained as needed.
- **Level 2** – This level is assigned to roads that are passable by high clearance vehicles. Drainage structures are to be inspected within a 3-year period and maintained as needed. Grading is conducted as necessary to correct drainage problems. Brushing is conducted as needed to allow access. These are typically low standard, low volume, single lane, natural and aggregate surfaced, and are functionally classified as a resource road.
- **Level 3** – This level is assigned to roads where management objectives require the road to be open seasonally or year-round for commercial, recreational, or administrative access. Typically, these roads are natural or aggregate surfaced, but may include low use bituminous surfaced road. These roads have a defined cross section with drainage structures (e.g., rolling dips, culverts, or ditches). These roads may be negotiated by passenger cars traveling at prudent speeds. User comfort and convenience are not considered a high priority. Drainage structures are to be inspected at least annually and maintained as needed. Grading is conducted to provide a reasonable level of riding comfort at prudent speeds for the road conditions. Brushing is conducted as needed to improve sight distance.
- **Level 4** – This level is assigned to roads where management objectives require the road to be open all year (except may be closed or have limited access due to snow conditions) and which connect major administrative features (recreational sites, local road systems, administrative sites, etc.) to County, State, or Federal roads. Typically these roads are single or double lane, aggregate, or bituminous surface, with a higher volume of commercial and recreational traffic than administrative traffic.

Medford District

OHV Designations:

Limited to designated roads and trails: 825,843 acres

Closed: 60,508 acres

Description:

Includes all BLM-administered lands within the Medford District. See additional interim guidelines that apply to all OHV emphasis areas within the district.

Limited Area Management Guidelines

- Limited OHV areas are managed in accordance with all applicable federal and state off-highway vehicle regulations.
- Paved roads are limited to licensed, street-legal vehicles only.
- Level 1 and 2 routes are open to Class I (ATVs), Class II (4WDs) and Class III (motorcycles) vehicles. Trails less than 50 inches in width are restricted to ATVs and motorcycles.
- Roads on private property that do not have a secured public right-of-way are not necessarily open to public or recreational vehicle traffic, even if they are a "continuation" of the BLM road system or a road shown on the preliminary maps.
- Until road and trail designations are complete, all motorized vehicles will be limited to the interim road and trail network as mapped unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
- Routes may be closed or limited under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, to protect cultural resources, or for public safety.
- In the Butte Falls Resource Area, the Jackson Access and Cooperative Travel Management Area closure (32,822 acres) is in effect from mid-October through April 30. Only those roads shown in green on ODFW maps or posted with green reflectors are open to motorized vehicles during the period of the restriction.
- Vehicles may pull off roads or trails to park or allow others to pass, the minimum distance needed to allow for safe passage.
- Limitations apply to all Class I (ATVs), Class II (4WDs) and Class III (motorcycles) vehicle use and to all activity types (recreational, commercial, etc.) unless authorized by the BLM for administrative purposes.
- Non-motorized travel is allowed on all access routes (e.g. horseback riding, hiking, and mountain biking).

Closed Area Management Guidelines

All motorized vehicles are prohibited from entering closed OHV areas unless authorized by the BLM for administrative purposes.

Process for Ongoing Public Collaboration/Outreach

- The principal venue for public collaboration is through public outreach and scoping during future travel management planning efforts, special projects, and local partnership.
- Press releases will be sent out as needed informing the public of OHV opportunities and restrictions. Signs will be posted where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, describing specific restrictions, and defining opportunities.

Process for Selecting a Final Road and Trail Network

Final route designations for the district will be accomplished in a comprehensive, interdisciplinary travel and transportation management plan scheduled to be complete no later than five years after completion of the RMP revision.

The BLM's geo-database will provide information for identifying roads and trails for both motorized and non-motorized activities. On-the-ground inventories will be conducted if a reasonable determination can not be made using remote-sensing techniques. Proposed designations will be analyzed through public scoping and a NEPA analysis. Amendments to the designated system will be considered during the transportation management planning process.

Road and Trail Construction and Maintenance Standards

Construction and maintenance will be done in accordance with the standards in BLM Manual H-9114-1 and other professional sources.

Medford District OHV Emphasis Areas

The OHV emphasis areas in the Medford District will be managed as Special Recreation Management Areas with an off-highway vehicle focus. The following interim management guidelines apply to these areas on the Medford District:

- Anderson Butte: 11,482 acres
- Coyote Creek: 14,597 acres
- Elderberry Flats: 3,393 acres
- Elliot Creek: 3,931 acres
- Quartz Creek: 8,734 acres
- Spencer Creek: 11,922 acres
- Timber Mountain: 15,114 acres

Niche: These areas offer a multiple-use trail riding experience for users of Class I all-terrain vehicles (ATVs), Class II 4-wheel drive (4WD) vehicles, and Class III (motorcycles) vehicles. The transportation system of these areas also supports commercial and administrative access.

Management Guidelines

- Level 1 and 2 routes are open to Class I (ATVs), Class II (4WDs) and Class III (motorcycles) vehicles. Trails less than 50 inches wide are restricted to ATVs and motorcycles.
- ATVs and motorcycles must have valid Oregon ATV permits.
- Non-motorized travel is allowed on all access routes (e.g. horseback riding, hiking, and mountain biking).
- Motorized use on the road and trail system may be restricted during the summer due to fire hazard conditions.

Process for Ongoing Public Collaboration/Outreach

The principal venue for public collaboration within these areas is through local partnership relationships with local motorcycle and 4X4 associations.

Process for Selecting a Final Road and Trail Network

Criteria shall be established for future route designations**.** No route designations were made in the planning effort for the previous resource management plan.

Road and Trail Construction and Maintenance Standards

Trail maintenance would be a priority within these areas to ensure a quality riding experience for trail users, to minimize user conflicts, promote safety for users, and conserve natural resource values.

Planning Frameworks for Special Recreation Management Areas

This section presents management guidelines for special recreation management areas in the Medford BLM District.

Hyatt Lake-Howard Prairie Lake

Primary Market Strategy: Destination

Niche: Sub-alpine plateau featuring two lakes adjacent to the Cascade/ Siskiyou National Monument.

Management Objectives: Address Special Recreation Management Area issues and prioritize projects in watershed analyses or separate recreation area management plans as appropriate. Prepare project plans as needed. Provide for water-based recreation opportunities, winter sports, hiking, camping, equestrian use, fishing, and sightseeing.

Targeted Outcomes

Activities: Camping, fishing, swimming, hiking, winter sports, equestrian use, wildlife observation, and nature interpretation.

Experiences: Escape personal or social pressures. Relaxation in a forested mountain setting. Enjoy the company of family and friends, the use of recreation equipment, and exercising.

Benefits: Restored mind from unwanted stress; improved mental well being; improved skills for outdoor enjoyment; stronger ties to family and friends.

Prescribed Setting Character

Physical: Sub-alpine forested plateau featuring two lakes with excellent fisheries, boating opportunities, hiking opportunities, and scenic vistas. The area is of a semi-developed rural character and is accessible by county roads, state highways, and BLM roads.

Social: Moderate to high visitor density during peak use periods. Off-season periods offer opportunities for solitude, especially in undeveloped areas suitable for dispersed recreation. Campgrounds are generally full on weekends with much interaction between camping groups and BLM personnel.

Administrative: Most campgrounds have controlled access entrance stations with no reservations. County, state, and BLM law enforcement patrol periodically. Campground hosts provide visitor services.

Land ownership is mixed between county, state, private, and BLM.

Activity Planning Framework

Management: Provide the widest array of recreation opportunities available in a forest, lake, mountain, and trail environment. Provide for winter sports opportunities. Emphasize camping and water based recreation.

Marketing: This special recreation management area markets itself and is a perennial favorite destination for the local population of the Rogue Basin and Klamath Basin. The BLM and Jackson County distribute brochures and literature describing the attractions of the area.

Monitoring: During peak use periods, agency staff perform daily monitoring in high-use density areas, providing visitor services and noting and mitigating any resource damage. Periodic customer satisfaction surveys are conducted.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with county and private landowners to preserve and maintain the natural character of the area.

Pacific Crest National Scenic Trail

Primary Market Strategy: National strategy for long-distance hikers, local strategy for short-distance hikers and equestrian users.

Niche: This 40-mile portion of the trail offers high elevation hiking and outstanding opportunities for solitude and primitive camping along the Cascade-Siskiyou Mountains.

Management Objectives: Protect and preserve the physical, aesthetic, social and biological environments characteristic within the trail corridor. Provide interpretive information at all access points. Maintain trail conditions as prescribed by BLM standards. Cooperate with trail groups, other agencies, and private landowners in the overall management of the trail.

Targeted Outcomes

Activities: Long distance and day hiking, equestrian use, photography, wildlife observation, sightseeing, camping, hunting, and cross-country jogging.

Experiences: Solitude and self reliance. Escape stress and pressure of the outside world. Enjoy physical exercise, challenge, and adventure of long distance wilderness hiking.

Benefits: Development of improved physical endurance. A restored mind from unwanted stress. Enhanced awareness of nature and natural processes.

Prescribed Setting Character

Physical: The trail corridor is generally within a short distance of the ridge crest and proceeds below timberline through coniferous forest stands, abbreviated by occasional meadows. Water sources are generally uncommon. Frequent encounters with grazing livestock.

Social: Encounters with other hikers and equestrian riders are nominal away from trailheads.

Administrative: The trail passes through federal, state, county, and private lands. The BLM's dominant management role is apparent to hikers as all signage is BLM produced. Law enforcement presence is negligible with the exception of very infrequent patrols.

Activity Planning Framework

Management: Continue to monitor use patterns to detect trends and predict changes. Practice adaptive management techniques to react to changing conditions and user needs.

Marketing: Information provided at trailheads, road crossings, or at agency offices provides the user with a description of features along the trail, adjacent recreation opportunities, and information on the differing types of uses a hiker may encounter. Maintain an updated agency webpage covering trail conditions, attractions, available resources and their location. Cooperate with trail groups, managing agencies, and landowners to promote proper use.

Monitoring: Use passive electronic trail counters for visitor use information. Provide comment and message journals at trailheads. Through the trail website, encourage and request users to contact BLM and offer assessments as to trail conditions or other observations. When possible, utilize BLM staff, or volunteers to conduct foot patrols.

Administrative: Assume a proactive role in trail management, obviating any problems or conditions before any degradation of the recreation resource occurs. Use appropriate signage to alert hikers of land ownership, jurisdictional boundaries, use regulations, and emergency services.

Rogue National Wild and Scenic River

Primary Market Strategy: Employ a nationally based destination marketing strategy.

Niche: The Rogue River is renowned for its broad array of outstandingly remarkable values: superior fisheries, outstanding scenery, challenging white water, and historical significance all combine to make the Rogue stand out as a nationally significant component of the National Wild and Scenic Rivers System.

Management Objectives: Manage the designated portion of the Rogue River to protect its outstandingly remarkable values.

Targeted Outcomes

Activities: Motorized and non-motorized white water boating, camping, fishing, swimming, hiking, photography, wildlife observation, and tributary exploration.

Experiences: Family and group affiliation; physical rest; escape from personal and social pressures; experience a risk activity; develop outdoor skills; develop nautical skills; appreciate natural wonders; and enjoyment of a relatively natural and undisturbed environment.

Benefits: Better mental health, restored mind from unwanted stress, greater self reliance, improve skills for outdoor enjoyment, and enhanced awareness and understanding of nature.

Prescribed Setting Character

Physical: Within the designated "Wild" section of the river, visitors experience a primitive and relatively undeveloped coastal confluence river corridor with challenging rapids requiring advanced boating skills. Within the designated "Recreation" section, visitors experience a semi- developed shoreline with adjacent roads and dwellings, flatter terrain, and slow water.

Social: Within the designated "Wild" river classification, visitors encounter mostly non-motorized boating groups and shore-side campers. Encounters with others are sporadic with long time periods between contacts. Within the designated "Recreation" section, motorized tour boats are common and the dominant conveyance for visitors.

Administrative: The BLM, state, and county jurisdictions overlap along the entire river stretch. The BLM has the dominant role in administrative presence. Regular river maintenance and permit compliance trips are performed by BLM staff. County marine deputies provide the majority of law enforcement services. The BLM manages 47 miles of the river's 84-mile long designated length. The 33-mile "Wild" section is under a limited entry permit system, allowing approximately 120 people per day to proceed down river from Grave Creek to Watson Creek. Private party permits are obtained through a lottery conducted yearly. Commercial parties are allocated approximately half of these spaces based on historic use levels.

Activity Planning Framework

Management: Manage the entire designated BLM portion according to management plans.

Marketing: The Rogue enjoys a national reputation for its outstanding qualities. An active website is maintained to educate potential visitors regarding the opportunities.

Monitoring: Visitor numbers; types of uses; and physical, and social and biological resource conditions are monitored according to the prescriptive measures outlined in the river's management plan.

Administrative: Adaptive management is applied as necessary to ensure that the river's outstandingly remarkable values are either maintained or enhanced.

Anderson Butte

Primary Market Strategy: Focused motorized vehicle recreation use.

Niche: This area offers a quality riding experience for users of Class I (ATVs) and Class III (motorcycles) vehicles in an area with long views and challenging terrain. While limited Class II (4WDs) opportunities currently exist, there is potential to offer quality Class II opportunities. Site-specific analysis will further determine each class's opportunities.

Management Objective: Address SRMA issues associated with off-highway vehicle recreation use in designating a road and trail system and facilities, including loop routes, signage, informational opportunities, noise mitigation, road and trail construction and/ or maintenance, terrain variety, visual resource management, and prevention of user conflicts or natural resource damage.

Targeted Outcomes

Activities: OHV riding on designated roads and trails.

Experiences: Use of OHV recreation equipment, enjoyment of family and friends.

Benefits: Improved skill in operation of OHV recreation equipment; stronger ties to family and friends; improved mental well being.

Prescribed Setting Character

Physical: Forested area of low to mid elevation uplands with some longer views of the Rogue Valley view shed. The area is of a semi-developed rural character and is accessible by county roads, state highways, and BLM roads.

Social: Moderate to high visitor density during peak use periods. This area is close to the urbanized Rogue Valley; therefore, there are no overnight camping facilities.

Administrative: Land ownership is blocked BLM-administered land surrounded by a mixed ownership of county, state, and private individuals. Areas adjacent to the focus area include a hiking trail, and existing and proposed research natural areas/Areas of Critical Environmental Concern with elements of threatened and endangered species, historical features and natural processes that are relevant and important.

Activity Planning Framework

Management: Provide a recreation opportunity available in a forest, mountain, and trail environment that is close to an urban area.

Marketing: This special recreation management area markets itself and is a perennial favorite destination for the local population of the Rogue Valley.

Monitoring: During peak use periods, agency staff perform occasional monitoring in high-use density areas, provide law enforcement activities, and mitigate any resource damage.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with county and private landowners to preserve and maintain the character of the area.

Coyote Creek

Primary Market Strategy: Focused motorized vehicle recreation use.

Niche: This area could potentially offer a quality riding experience for users of Class I (ATVs) and Class III (motorcycles) vehicles in an area with long views and challenging terrain. It will have limited opportunities for Class II vehicles. Site specific analysis will further determine each class's opportunities.

Management Objective: Address SRMA issues associated with off-highway vehicle recreation use in designating a road and trail system and facilities, including loop routes, signage, informational opportunities, noise mitigation, road and trail construction and/ or maintenance, terrain variety, visual resource management, and prevention of user conflicts or natural resource damage. There may be an opportunity to connect this area with the Elderberry Flat focus area for a longer ride or more dispersed recreational opportunity.

Targeted Outcomes

Activities: OHV riding on designated roads and trails.

Experiences: Use of OHV recreation equipment, enjoyment of family and friends.

Benefits: Improved skill in operation of OHV recreation equipment, stronger ties to family and friends, improved mental well being.

Prescribed Setting Character

Physical: Forested area of low to mid elevation uplands with some longer views of the Cow Creek and Grave Creek view shed. The area is of a semi-developed rural character and is accessible by county roads, state highways, and BLM roads.

Social: Low to moderate visitor density during peak use periods. This area is located between the communities of Grants Pass and Roseburg. There are no overnight camping facilities.

Administrative: Land ownership is checkerboard BLM-administered land surrounded by a singular ownership of industrial timberland.

Activity Planning Framework

Management: Provide a recreation opportunity available in a forest, mountain, and trail environment that is between two urban areas.

Marketing: This SRMA is further from the local population of the Rogue Valley and may serve local area riders in the north part of the Medford District.

Monitoring: During peak use periods, agency staff perform occasional monitoring in high-use density areas, provide law enforcement activities, and mitigate any resource damage.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with private landowners to preserve and maintain the character of the area.

Elderberry Flats

Primary Market Strategy: Focused motorized vehicle recreation use.

Niche: This area offers a quality riding experience for users of Class I (ATVs), Class II (4WDs) and Class III (motorcycles) vehicles in a forested area with paved access and camping facilities.

Management Objective: Address SRMA issues associated with OHV recreation use in designating a road and trail system and facilities, including loop routes, signage, informational opportunities, noise mitigation, road and trail construction and/ or maintenance, terrain variety, visual resource management, and prevention of user conflicts or natural resource damage. There may be an opportunity to connect this area with the Coyote Creek focus area for a longer ride or more dispersed recreational opportunity.

Targeted Outcomes

Activities: OHV riding on designated roads and trails.

Experiences: Use of OHV recreation equipment; enjoyment of family and friends.

Benefits: Improved skill in operation of OHV recreation equipment; stronger ties to family and friends; improved mental well being.

Prescribed Setting Character

Physical: Forested area of low to mid elevation valleys. The area is of rural character and is accessible by county roads, state highways, and BLM roads.

Social: Moderate to high visitor density during peak use periods. This area is further from the urbanized Rogue Valley, and camping facilities are available.

Administrative: Land ownership is checkerboard BLM-administered land surrounded by a singular ownership of industrial timberland. A 500-kV electrical transmission corridor transects the area.

Activity Planning Framework

Management: Provide a recreation opportunity available in a forest, mountain, and trail environment that is in a mostly rural area.

Marketing: Work with surrounding industrial landowners to promote responsible OHV use of the area. Use different medias to increase visitor awareness of soils and riparian habitat.

Monitoring: During peak use periods, agency staff perform occasional monitoring in high-use density areas, provide law enforcement activities, and mitigate any resource damage.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with private landowners to preserve and maintain the character of the area.

Elliot Creek

Primary Market Strategy: Focused motorized vehicle recreation use.

Niche: This area could potentially offer a quality riding experience for users of Class I (ATVs) and Class III (motorcycles) vehicles in an area with long views and challenging terrain. It will have limited opportunities for Class II (4WDs) vehicles. Site specific analysis will further determine each class's opportunities.

Management Objective: Address issues of the special recreation management area that are associated with OHV recreation use in designating a road and trail system and facilities, including loop routes, signage, informational opportunities, noise mitigation, road and trail construction and/ or maintenance, terrain variety, visual resource management, and prevention of user conflicts or natural resource damage.

Targeted Outcomes

Activities: OHV riding on designated roads and trails.

Experiences: Use of OHV recreation equipment, and enjoyment of family and friends.

Benefits: Improved skill in operation of OHV recreation equipment; stronger ties to family and friends; and improved mental well-being.

Prescribed Setting Character

Physical: Forested area of low to mid elevation uplands with some longer views of the Rogue Valley view shed. The area is of a semi-developed rural character and is accessible by county roads, state highways, and BLM roads.

Social: Moderate to high visitor density during peak use periods. This area is close to the urbanized Rogue Valley; therefore, there are no overnight camping facilities.

Administrative: Land ownership is blocked BLM-administered land surrounded by a mixed ownership of county, state, and private individuals.

Activity Planning Framework

Management: Provide a recreation opportunity available in a forest, mountain, and trail environment that is close to an urban area.

Marketing: This special recreation management area markets itself and is a perennial favorite destination for the local population of the Rogue Valley.

Monitoring: During peak use periods, agency staff perform occasional monitoring in high-use density areas, provide law enforcement activities, and mitigate any resource damage.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with county and private landowners to preserve and maintain the character of the area.

Quartz Creek

Primary Market Strategy: Focused motorized vehicle recreation use.

Niche: This area could potentially offer a quality riding experience for users of Class I (ATVs) and Class III (motorcycles) vehicles in an area with long views and challenging terrain. It will have limited opportunities for Class II (4WDs) vehicles. Site-specific analysis will further determine each class's opportunities.

Management Objective: Address issues of the special recreation management area that are associated with OHV recreation use in designating a road and trail system and facilities, including loop routes, signage, informational opportunities, noise mitigation, road and trail construction and/ or maintenance, terrain variety, visual resource management, and prevention of user conflicts or natural resource damage.

Targeted Outcomes

Activities: OHV riding on designated roads and trails.

Experiences: Use of OHV recreation equipment, enjoyment of family and friends.

Benefits: Improved skill in operation of OHV recreation equipment; stronger ties to family and friends; improved mental well being.

Prescribed Setting Character

Physical: Forested area of low to mid elevation uplands with some longer views of the Rogue Valley view shed. The area is of a semi-developed rural character and is accessible by county roads and BLM roads.

Social: Moderate to high visitor density during peak use periods. This area is close to the urbanized Rogue Valley; therefore, there are no overnight camping facilities.

Administrative: Land ownership is blocked BLM-administered land surrounded by a mixed ownership of county, state, and private industry.

Activity Planning Framework

Management: Provide a recreation opportunity available in a forest, mountain, and trail environment that is close to an urban area.

Marketing: This special recreation management area markets itself and is a perennial favorite destination for the local population of the Rogue Valley.

Monitoring: During peak use periods, agency staff perform occasional monitoring in high-use density areas, provide law enforcement activities, and mitigate any resource damage.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with county and private landowners to preserve and maintain the character of the area.

Spencer Creek

Primary Market Strategy: Focused motorized vehicle recreation use.

Niche: This area could potentially offer a quality riding experience for users of Class I (ATVs) and Class III (motorcycles) vehicles in an area with long views and challenging terrain. Site-specific analysis will further determine each class's opportunities.

Management Objective: Address issues of the special recreation management area that are associated with OHV recreation use in designating a road and trail system and facilities, including: loop routes, signage, informational opportunities, noise mitigation, road and trail construction and/ or maintenance, terrain variety, visual resource management, and prevention of user conflicts or natural resource damage.

Targeted Outcomes

Activities: OHV riding on designated roads and trails.

Experiences: Use of OHV recreation equipment, and enjoyment of family and friends.

Benefits: Improved skill in operation of OHV recreation equipment; stronger ties to family and friends; and improved mental well-being.

Prescribed Setting Character

Physical: Forested area of low to mid elevation uplands with some longer views of the Illinois Valley viewshed. The area is of a semi-developed rural character and is accessible by county roads, state highways, and BLM roads.

Social: Moderate to high visitor density during peak use periods. This area is close to the urbanized Rogue Valley; therefore, there are no overnight camping facilities.

Administrative: Land ownership is blocked BLM-administered land surrounded by a mixed ownership of county, state, and private individuals.

Activity Planning Framework

Management: Provide a recreation opportunity available in a forest, mountain, and trail environment that is close to an urban area.

Marketing: This special recreation management area markets itself and is a perennial favorite destination for the local population of the Rogue Valley.

Monitoring: During peak use periods, agency staff perform occasional monitoring in high-use density areas, provide law enforcement activities, and mitigate any resource damage.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with county and private landowners to preserve and maintain the character of the area.

Timber Mountain

Primary Market Strategy: Focused motorized vehicle recreation use.

Niche: This area offers a quality riding experience for users of Class I (ATVs), Class II (4WDs) and Class III (motorcycles) vehicles in an area with varying terrain and long views. This area has an extensive system of existing trails that, with modification, would provide a superior OHV experience for all ATV classes.

Management Objective: Address the issues of special recreation management areas that are associated with OHV recreation use in designating a road and trail system and facilities, including: loop routes, signage, informational opportunities, noise mitigation, road and trail construction and/ or maintenance, terrain variety, visual resource management, and prevention of user conflicts or natural resource damage.

Targeted Outcomes

Activities: OHV riding on designated roads and trails.

Experiences: Use of OHV recreation equipment; enjoyment of family and friends.

Benefits: Improved skill in operation of OHV recreation equipment, stronger ties to family and friends, improved mental well being.

Prescribed Setting Character

Physical: Forested area of low to mid elevation uplands with some longer views of the Rogue Valley view shed and Siskiyou Mountains. The area is of a semi-developed rural character and is accessible by county roads, state highways, and BLM roads.

Social: Moderate to high visitor density during peak use periods. This area is close to the urbanized Rogue Valley; therefore, there are no overnight camping facilities.

Administrative: Land ownership is blocked BLM-administered land surrounded by a mixed ownership of county, state, and private individuals, including a local OHV club with developed OHV facilities and trails.

Activity Planning Framework

Management: Provide a recreation opportunity available in a forest, mountain, and trail environment that is close to an urban area.

Marketing: This special recreation management area markets itself and is a perennial favorite destination for the local population of the Rogue Valley. Work with surrounding industrial landowners to promote responsible OHV use of the area and connectivity of trails. Use different medias to increase visitor awareness of soils and riparian habitat.

Monitoring: During peak use periods, agency staff perform occasional monitoring in high-use density areas, provide law enforcement activities, and mitigate any resource damage.

Administrative: On BLM-administered lands, provide visitor information to ensure proper use of public lands, employ law enforcement measures as appropriate, and cooperate with county and private landowners to preserve and maintain the character of the area.

Appendix H
Grazing

In this appendix:

Standard Procedures and Design Elements for Range Improvements within the Medford District H-3

Grazing Allotments in the Medford District H-8

Standards for Rangeland Health H-13

Standard Procedures and Design Elements for Range Improvements within the Medford BLM District

The following standard procedures and design elements would be adhered to in implementation of the proposed construction of range improvements within the Medford BLM District:

- Inventories and surveys for cultural resources, threatened and endangered species, and special status species would be conducted prior to authorization of any project construction, and appropriate mitigation implemented to reduce or eliminate potential effects.
- Surface disturbance at all project sites would be held to a minimum. Disturbed soil would be rehabilitated to blend into surrounding soil surface and reseeded as needed with a mixture of native grasses, forbs, shrubs, and trees as applicable to replace ground cover, reduce soil loss from wind and water erosion, and discourage the potential establishment of any invasive, non-native plant species.
- Where possible, existing roads and trails would provide access for range improvement construction. If needed, unimproved trails and tracks would be created to reach construction sites and provide access for future maintenance of the improvements. Locate unimproved trails or tracks outside Riparian Management Areas where workable.

All range improvements would be constructed in accordance with USDI BLM Manual 1741-1 (Fencing), USDI BLM Manual 1741-2 (Water Developments) and Oregon Water Resources Department for water developments.

Additional design features specific to the individual types of improvements are described below.

Reservoirs

- Development of reservoirs would involve the construction of pits and dams to impound water for livestock and wildlife use as shown in *Figure H-1*.
- Pits would be in dry lake beds or other natural depressions. Dams would be constructed in drainages; or to one side of a drainage, with a diversion ditch constructed into the impoundment area.
- Water right applications would be coordinated as needed with applicable agencies, irrigation districts, and other interested parties.
- A water right permit would be obtained from the Oregon Water Resources Department prior to construction.
- Water storage capacity would not exceed 3.0 acre-feet.
- Dams would be located, if possible, to take advantage of natural spillway sites; otherwise a spillway would be constructed around the dam for the reservoir. The slopes of the dam must be a minimum 3 to 1 on the upstream face and minimum of 2 to 1 on the downstream face. Minimum width of the top of all dams would be 12 feet.
- The spillway would be designed to withstand the 50-year flood flow without overtopping the dam. It should also direct the pass flow downstream to prevent erosion of the embankment.
- Fill material, if needed, would come from the impoundment area and/or a borrow area for dams.
- Excavated material from pits would be piled adjacent to the pit. The potential for erosion of the excavated material into the pit would be eliminated. Topsoil would be stockpiled and used to rehabilitate the borrow areas.
- All brush, stumps, roots, and organic matter would be cleared from the borrow area and beneath the dam. Only fill materials consisting of non-organic and cohesive soils adjusted in moisture to optimum water content would be used for construction of the dam. Individual layers would not exceed 8 inches in thickness and would be compacted with a sheepsfoot roller or similar equipment. Fill material should be placed in thin layers parallel with the long axis of the dam.

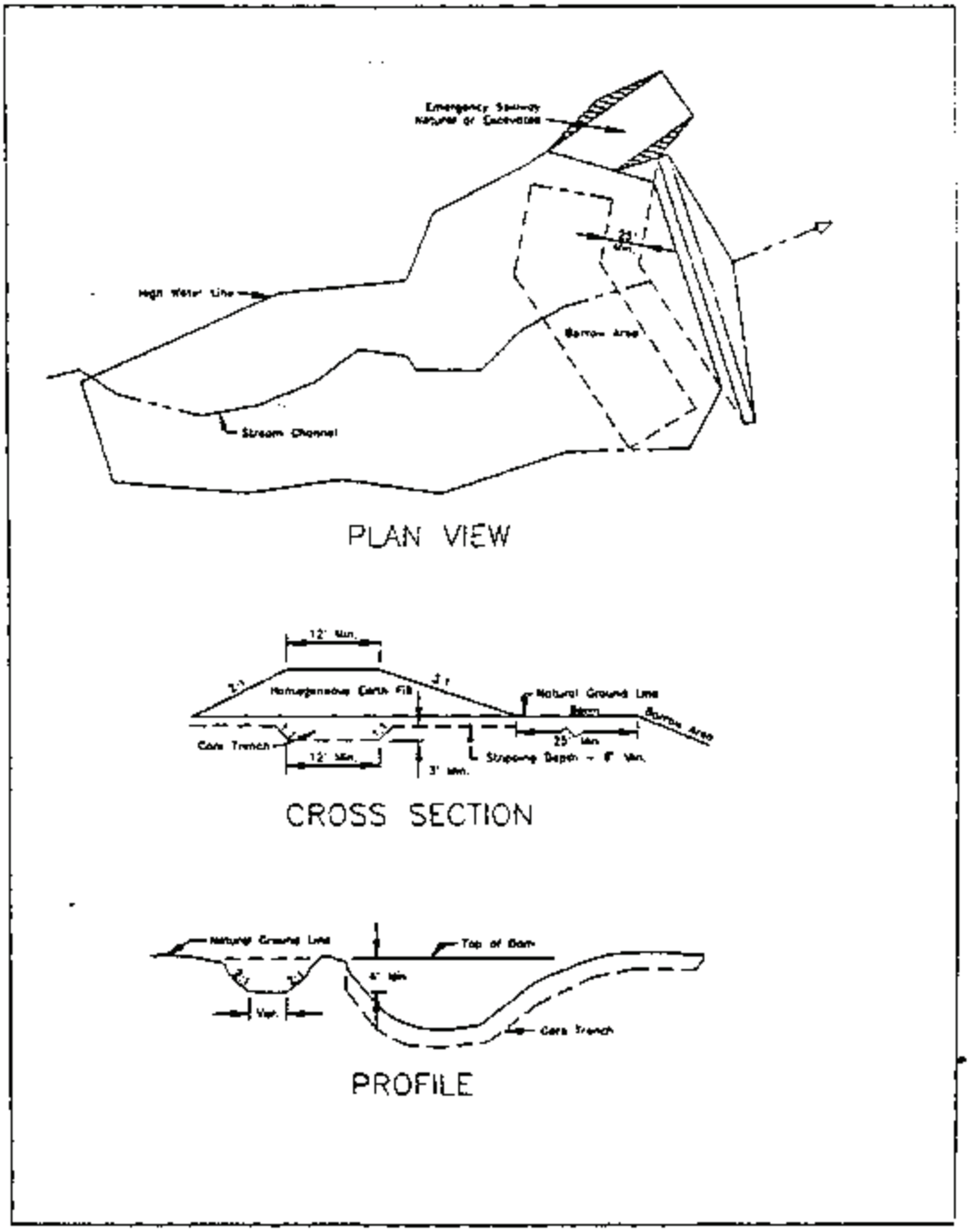
Figure H-1. Reservoir Standards

Illustration 2

H-1741-2 - WATER DEVELOPMENTS

Chapter V

Stockwater Reservoir



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Spring Developments

- The spring source would be fenced to prevent livestock grazing and trampling.
- Escape ramps would be installed in all water troughs to allow wildlife to escape.
- Overflow from troughs would be piped away from the developed source area.

Fencing

- Fences would be designed to prevent the passage of livestock without stopping the movement of wildlife as shown in *Figure H-2*.
- Wire spacing would follow the specifications found in *Figure H-3*. The majority of fences would be constructed as follows: four wire with the bottom wire 16-18 inches off the ground with the sequence of the remaining three wires above this being 6 inches, 6 inches, and 12 inches; the maximum height of the fence (ground to top wire) would be 42 inches.
- The bottom wire on all fencing would be two-strand smooth wire, not barbed, to facilitate antelope crossings.
- Steel "t-post" spacing would be between 16 feet and 24 feet, depending on local conditions.
- Brace posts, tree scabs, and/or rock jacks (rock cribs) would be constructed to enhance fence integrity with one at least every 0.25 mile.
- No woven wire "sheep" fences would be constructed on public lands.
- Brushing and tree limb removal will be limited to only that necessary for surveying, placement, and construction of a fence.
- Where fences cross existing roads, either gates or cattleguards would be installed.
- Where workable, fence construction would be located outside Riparian Management Areas.

Figure H-2. Fence Standards

H-1741-1 - FENCING

BLM Fence Standards for Livestock and Wildlife

Kinds of Fen Combinations

Kinds of Livestock and Wild Burros	Predominant Big Game Wildlife Species	Number Wires	Max. Fence Height in Inches	Wire Spacing (From Ground Up, in Inches)	Wire Type	No. Stays Between Line Posts w/Spacing of 16.5' - 30'
STANDARD BUREAU FENCES:						
Cattle	None	4	42	16, 6, 8, 12	Barbed.	1 to 4
Sheep	None	-	36	2, 24 (Woven) 2, 8	Woven, barbed.	
STANDARD BUREAU MODIFICATIONS TO MEET MULTIPLE-USE NEEDS:						
Cattle (only)	Antelope, Javelina, or Deer and Antelope.	3	38	16, 10, 12	Bottom strand smooth, others barbed.	One w/post spacing of 16.5' — 1 or 2 w/post spacing of 30'.
Sheep (only)	Antelope, Javelina or Deer	4	35	12, 4, 4, 8 16.5' — 1 or 2	Bottom strand smooth, others barbed.	One w/post spacing of 16.5' — 1 to 3 w/post spacing of 30'.
Cattle and Sheep (Use only where sheep control is necessary.)	Antelope Javelina or Deer	4	38	15, 7, 8, 8	Bottom strand smooth, others barbed.	One w/post spacing of 16.5' — 1 to 3 w/post spacing of 30'.
Cattle and Sheep (normal conditions)	Deer, Elk Moose, or Antelope.	3	38	18, 10, 12	Bottom strand smooth, others barbed.	1 to 4
Cattle and sheep (Requires greater restriction of livestock movements.)	Deer, Elk, Moose, or Antelope.	4	40	16, 6, 6, 12	Barbed.	1 to 4
Cattle	Bighorn Sheep*	3	39	20, 15, 4	Barbed.	1 to 4
Cattle, Wild Burros	Bighorn Sheep* (Use around watering area)	-	42	15 to bottom rail: 36 and 42 to top of middle and top rails.	Rails 2"-3" diameter.	Line Post spacing 20 feet
Cattle, Wild Burros	Bighorn Sheep*	4	38	18, 4, 4, 4 4, 4	Bottom strand smooth, others barbed.	1 to 2

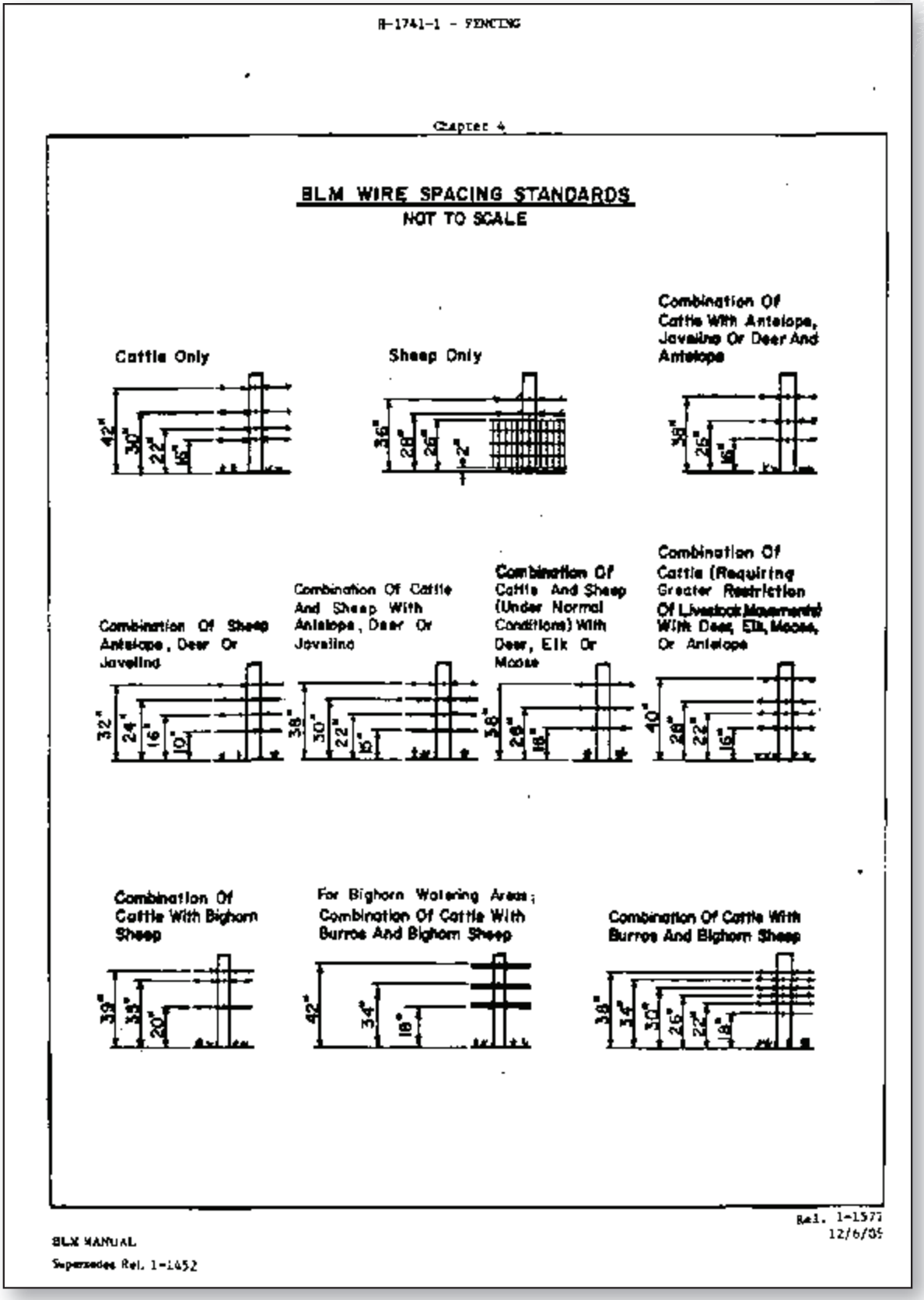
*Where Bighorn also meet antelope, and deer standards.

BLM MANUAL

Supersedes Rel. 1-1652

Rel. 1-1572
12/6/89

Figure H-3. Wire Spacing



Grazing Allotments in the Medford BLM District

The resource management plan provides a summary of the number and acres of grazing allotments for the Medford BLM District. See *Table H-1* for detailed information about the grazing allotments that will be available for grazing. See *Table H-2* for a list of allotments that will not be available for livestock grazing under the Taylor Grazing Act.

Table H-1. Medford District Grazing Allotments

Allotment Name	Allotment Number	BLM Acres	Active **Grazing** Preference **(AUMs)**[2]	Suspended **Grazing** Preference **(AUMs)**	**Season-of-Use**	Selective Management Category[3]	Rangeland **Health** Assessment Completed	Rangeland **Health** Assessment Finding	**Grazing** System	Other Information
Lost Creek	10001	11,518	382	0	04/01-10/31	I	2001	Not Meeting Standards, Grazing is not a factor	Yearly	Common Allotment
Flat Creek	10002	12,421	328	0	05/01-10/15	C	2000	Not Meeting Standards, Grazing is not a factor	Yearly	None
Longbranch	10004	320	22	0	04/16-05/15	C	2002	Meeting All Standards	Yearly	Portion Proposed for Closure
Meadows	10007	1,564	92	0	04/01-06/30	I	2003	Meeting All Standards	Yearly	None
Neil-Tarbell	10008	552	56	0	04/16-05/31	C	2003	Meeting All Standards	Yearly	None
North Sams Valley	10009	120	8	0	06/16-07/31	C	2002	Not Meeting Standards, Grazing is not a factor	Yearly	None
Upper Table Rock	10012	1,240	66	0	05/01-05/30	I	2003	Not Meeting Standards, Grazing is not a factor	Yearly	None
Clear Creek	10013	3,790	45	0	05/16-10/31	C	2002	Meeting All Standards	Yearly	None
Lick Creek	10015	202	15	0	04/16-05/15	C	2003	Meeting All Standards	Yearly	None
Brownsboro Park	10016	381	68	0	04/16-05/31	I	2002	Not Meeting Standards, Grazing is not a factor	Yearly	None
Kanutchan Fields	10017	2,419	177	0	04/16-05/31	I	2002	Not Meeting Standards, Grazing is not a factor	Yearly	None
Sugarloaf	10019	1,566	15	0	04/16-06/30	C	2002	Meeting All Standards	Yearly	None
Section 9	10021	404	25	0	04/16-06/30	C	2003	Meeting All Standards	Yearly	None
Section 7	10022	371	11	0	04/16-05/31	C	2003	Not Meeting Standards, Grazing is not a factor	Yearly	None
Bull Run	10023	40	5	0	06/01-06/30	C	2003	Meeting All Standards	Yearly	None
Big Butte	10024	22,118	1,663	0	04/16-06/30	I	2000	Not Meeting Standards, Grazing is not a factor	Deferred-Rotation	Common Allotment
Reese Creek	10027	40	7	0	05/01-06/30	C	1999	Meeting All Standards	Yearly	Common Allotment

Allotment Name	Allotment Number	BLM Acres	Active **Grazing** Preference **(AUMs)**[2]	Suspended **Grazing** Preference **(AUMs)**	**Season-of-Use**	Selective Management Category[3]	Rangeland **Health** Assessment Completed	Rangeland **Health** Assessment Finding	**Grazing** System	[illegible]
Derby Road Sawmill	10029	521	45	0	04/16-07/15	C	2003	Meeting All Standards	Yearly	None
Summit Prairie	10031	30,743	1,165	0	04/16-10/30	I	2000	Not Meeting Standards, Grazing is not a factor	Deferred-Rotation	Common Allotment
Vestal Butte	10035	2,240	120	0	04/16-06/15	I	2003	Not Meeting Standards, Grazing is not a factor	Yearly	None
Bear Mountain	10037	1,008	81	0	04/16-05/31	I	2002	Meeting All Standards	Yearly	None
Crowfoot	10038	7,393	365	0	05/01-07/15	I	2003	Meeting All Standards	Yearly	None
Crowfoot Creek	10039	521	70	0	04/16-06/30	C	1999	Meeting All Standards	Yearly	None
Cobleigh Road	10040	80	7	0	06/01-07/15	C	2003	Meeting All Standards	Yearly	None
Moser Mountain	10041	40	3	0	04/01-04/30	C	2003	Meeting All Standards	Yearly	None
Devon South	10043	402	33	0	04/16-06/30	C	1999	Meeting All Standards	Yearly	None
Salt Creek	10044	462	85	0	04/16-06/30	I	2002	Meeting All Standards	Yearly	None
Jenny Creek[1]	10108	1,417	115	0	05/16-09/10	I	Not Completed	Not Completed	Deferred-Rotation	
Agate[1]	10109	82	9	0	05/01-09/15	C	Not Completed	Not Completed	Yearly	
Soda Mountain[1]	10110	35,619	1,794	0	05/01-10/15	I	Not Completed	Not Completed	Deferred-Rotation	Common Allotment
Cove Creek	10112	1,207	75	0	05/01-06/15	I	Not Completed	Not Completed	Yearly	None
Buckpoint	10114	3,835	150	0	05/01-06/15	C	Not Completed	Not Completed	Yearly	None
Keene Creek[1]	10115	23,643	1,612	0	05/01-10/15	I	Not Completed	Not Completed	Yearly	Common Allotment
Howard Prairie	10116	320	60	0	10/16-11/15	M	Not Completed	Not Completed	Yearly	None
Siskiyou[1]	10118	2,163	200	0	05/01-09/15	I	Not Completed	Not Completed	Yearly	
Grizzly	10119	5,167	378	0	06/01-10/15	I	1999	Not Meeting Standards, Grazing is not a factor	Yearly	Common Allotment
Lake Creek Spring	10121	4,679	447	0	05/16-07/15	I	Not Completed	Not Completed	Yearly	None
Lake Creek Summer	10122	5,561	550	0	07/16-10/15	I	Not Completed	Not Completed	Yearly	None
Deer Creek-Reno Lease	10124	4,025	314	0	05/01-09/30	C	Not Completed	Not Completed	Yearly	None
Heppsie Mountain	10126	4,076	294	0	05/01-10/15	I	2007	Not Meeting Standards, Grazing is not a factor	Yearly	None
Antelope Road	10132	200	19	0	04/16-06/30	C	2003	Not Meeting Standards, Grazing is not a factor	Yearly	None
Brownsboro	10133	80	7	0	04/01-06/15	C	2003	Not Meeting Standards, Grazing is a factor	Yearly	None
Yankee Reservoir	10134	120	15	0	05/01-06/15	I	2003	Not Meeting Standards, Grazing is a factor	Yearly	None

Allotment Name	Allotment Number	BLM Acres	Active **Grazing** Preference **(AUMs)**[2]	Suspended **Grazing** Preference **(AUMs)**	**Season-of-Use**	Selective Management Category[3]	Rangeland **Health** Assessment Completed	Rangeland **Health** Assessment Finding	**Grazing** System	Other Information
Canal	10136	440	58	0	05/01-06/15	C	2003	Not Meeting Standards, Grazing is a factor	Yearly	None
Box R Ranch[1]	10137	88	5	0	10/01-02/28	C	Not Completed	Not Completed	Yearly	None
Cove Ranch	10143	80	20	0	07/01-11/30	C	Not Completed	Not Completed	Yearly	None
North Cove Creek	10148	281	20	0	07/16-09/15	C	Not Completed	Not Completed	Yearly	None
Deadwood[1]	20106	8,004	788	0	06/16-08/15	I	Not Completed	Not Completed	Yearly	Common Allotment
Poole Hill	20113	1,760	25	0	10/01-10/15	C	2007	Not Meeting Standards, Grazing is not a factor	Yearly	None
Conde Creek	20117	5,346	591	0	06/16-09/30	I	Not Completed	Not Completed	Yearly	Common Allotment
Billy Mountain	20203	4,758	175	0	04/16-06/30	I	1999	Not Meeting Standards, Grazing is not a factor	Yearly	None
Lower Big Applegate	20206	11,712	258	0	04/16-06/15	I	Not Completed	Not Completed	Yearly	None
Foots Creek	20219	115	12	0	05/01-06/30	C	1999	Meeting All Standards	Yearly	None
Ferns Lease	20224	246	28	0	05/01-06/15	C	Not Completed	Not Completed	Yearly	None
Deer Creek	20308	887	77	0	04/01-12/15	C	2003	Not Meeting Standards, Grazing is not a factor	Yearly	Portion Proposed for Closure
		228,387	13,055	0						

[1]All or a portion of the allotment is located within the Cascade-Siskiyou National Monument.

[2]Active Preference is cattle AUMs.

[3]Selective Management Categories: Improve (I)-managed to resolve a high level of resource conflicts and concerns and receive the highest priority for funding and management actions; Maintain (M)-managed to maintain satisfactory resource conditions and will be actively managed to ensure that resource values do not decline; Custodial (C)-managed custodially to protect resource conditions and values.

Table H-2. Allotments Not Available For Livestock Grazing Under Section 4 Of The O&C Act Or The Taylor Grazing Act In The Medford District

Allotment Name	Allotment Number	Acres	Forage Allocation (AUMs)[a]
Trail Creek	10003	12,868	113
Longbranch[b]	10004	10,844	71
Antioch Road	10005	40	4
Roundtop Evans	10006	27,086	110
West Perry Road	10010	75	10
East Perry Road	10011	40	7
Obenchain Mountain	10014	120	12
Nichols Gap	10018	280	18
Eagle Point Canal	10020	465	55
Shady Branch	10025	320	32
Derby Station	10030	540	36
West Derby	10034	1,120	89
Emigrant Creek	10111	40	7
Baldy	10120	798	87
Lost Creek	10123	80	6
Cartwright	10127	40	4
Bybee Peak	10144	321	36
Stiehl	10210	175	18
Fielder Creek	10211	40	5
Del Rio	10216	40	5
Sugarloaf/Greensprings	20158	2,926	210
Applegate	20201	25,518	294
Tunnel Ridge	20202	2,183	14
Timber Mountain	20204	1,720	70
Sardine and Galls Creek	20205	3,765	158
Sterling Creek	20207	29,209	190
Spencer Gulch	20208	1,935	150
Quartz Gulch	20209	680	9
Burton Butte	20212	5	2
Chapman Creek	20213	3,309	81
Ecker	20217	40	6
Stage Road	20218	40	4
Lomas Road	20222	635	50
Star	20223	118	24
Pickett Mountain	20302	820	30
Jump Off Joe	20303	80	8
Deer Creek[b]	20308	278	0
Reeves Creek	20309	1,672	95
Q Bar X	20310	15	3
Esterly Lake	20312	4,457	152
Glade Creek	20315	560	17
Cherry Gulch	20316	40	6
Totals		135,337	2,298

[a] AUM (Animal Unit Month) - Amount of forage necessary to sustain one cow (or its equivalent) for one month.
[b] These portions of the Longbranch and Deer Creek Allotments would be closed to grazing. The remainder of the allotments would be available for grazing as described in *Table H-1*, in this appendix.

Standards for Rangeland Health

The following section contains the *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands in Oregon and Washington.* These standards and guidelines are referenced in the resource management plan. Livestock grazing will be managed in accordance with these standards and guidelines.

STANDARDS FOR RANGELAND HEALTH

AND

GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT

FOR

PUBLIC LANDS ADMINISTERED BY THE BUREAU OF LAND MANAGEMENT IN THE STATES OF OREGON AND

WASHINGTON

AUGUST 12, 1997

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Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands in Oregon and Washington

Introduction

These Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands in Oregon and Washington were developed in consultation with Resource Advisory Councils and Provincial Advisory Committees, tribes and others. These standards and guidelines meet the requirements and intent of 43 Code of Federal Regulations, Subpart 4180 (Rangeland Health) and are to be used as presented, in their entirety. These standards and guidelines are intended to provide a clear statement of agency policy and direction for those who use public lands for livestock grazing, and for those who are responsible for their management and accountable for their condition. Nothing in this document should be interpreted as an abrogation of Federal trust responsibilities in protection of treaty rights of Indian tribes or any other statutory responsibilities including, but not limited to, the Taylor Grazing Act, the Clean Water Act, and the Endangered Species Act.

Fundamentals of Rangeland Health

The objectives of the rangeland health regulations referred to above are: "to promote healthy sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions; . . . and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands."

Standards for Rangeland Health (Continued)

To help meet these objectives, the regulations on rangeland health identify fundamental principles providing direction to the States, districts, and on-the-ground public land managers and users in the management and use of rangeland ecosystems.

A hierarchy, or order, of ecological function and process exists within each ecosystem. The rangeland ecosystem consists of four primary, interactive components: a physical component, a biological component, a social component, and an economic component. This perspective implies that the physical function of an ecosystem supports the biological health, diversity and productivity of that system. In turn, the interaction of the physical and biological components of the ecosystem provides the basic needs of society and supports economic use and potential.

The Fundamentals of Rangeland Health stated in 43 CFR 4180 are:

1.Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity and the timing and duration of flow.

2.Ecological processes, including the hydrologic cycle, nutrient cycle and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

3.Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established Bureau of Land Management objectives such as meeting wildlife needs.

4.Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

The fundamentals of rangeland health combine the basic precepts of physical function and biological health with elements of law relating to water quality, and plant and animal populations and communities. They provide direction in the development and implementation of the standards for rangeland health.

Standards for Rangeland Health

The standards for rangeland health (standards), based on the above fundamentals, are expressions of the physical and biological condition or degree of function necessary to sustain healthy rangeland ecosystems. Although the focus of these standards is on domestic livestock grazing on Bureau of Land Management lands, on-the-ground decisions must consider the effects and impacts of all uses.

Standards that address the physical components of rangeland ecosystems focus on the roles and interactions of geology and landform, soil, climate and water as they govern watershed function

and soil stability. The biological components addressed in the standards focus on the roles and interactions of plants, animals and microbes (producers, consumers and decomposers), and their habitats in the ecosystem. The biological component of rangeland ecosystems is supported by physical function of the system, and it is recognized that biological activity also influences and supports many of the ecosystem's physical functions.

Guidance contained in 43 CFR 4180 of the regulations directs management toward the maintenance or restoration of the physical function and biological health of rangeland ecosystems. Focusing on the basic ecological health and function of rangelands is expected to provide for the maintenance, enhancement, or creation of future social and economic options.

The standards are based upon the ecological potential and capability of each site. In assessing a site's condition or degree of function, it must be understood that the evaluation compares each site to its own potential or capability. Potential and capability are defined as follows:

Potential-The highest level of condition or degree of function a site can attain given no political, social or economic constraints.

Capability-The highest level of condition or degree of function a site can attain given certain political, social or economic constraints. For example, these constraints might include riparian areas permanently occupied by a highway or railroad bed that prevent the stream's full access to its original flood plain. If such constraints are removed, the site may be able to move toward its potential.

In designing and implementing management strategies to meet the standards of rangeland health, the potential of the site must be identified, and any constraints recognized, in order that plan goals and objectives are realistic and physically and economically achievable.

Standards and Guidelines in Relation to the Planning Process

The standards apply to the goals of land use plans, activity plans, and project plans (Allotment Management Plans, Annual Operating Plans, Habitat Management Plans, etc.). They establish the physical and biological conditions or degree of function toward which management of publicly-owned rangeland is to be directed. In the development of a plan, direction provided by the standards and the social and economic needs expressed by local communities and individuals are brought together in formulating the goal(s) of that plan.

When the standards and the social and economic goals of the planning participants are woven together in the plan goal(s), the quantifiable, time specific objective(s) of the plan are then developed. Objectives describe and quantify the desired future conditions to be achieved within a specified timeframe. Each plan objective should address the physical, biological, social and economic elements identified in the plan goal.

Standards for Rangeland Health (Continued)

Standards apply to all ecological sites and land forms on public rangelands throughout Oregon and Washington. The standards require site-specific information for full on-ground usability. For each standard, a set of indicators is identified for use in tailoring the standards to site-specific situations. These indicators are used for rangeland ecosystem assessments and monitoring and for developing terms and conditions for permits and leases that achieve the plan goal.

Guidelines for livestock grazing management offer guidance in achieving the plan goal and objectives. The guidelines outline practices, methods, techniques and considerations used to ensure that progress is achieved in a way, and at a rate, that meets the plan goal and objectives.

Indicators of Rangeland Health

The condition or degree of function of a site in relation to the standards and its trend toward or away from any standard is determined through the use of reliable and scientifically sound indicators. The consistent application of such indicators can provide an objective view of the condition and trend of a site when used by trained observers.

For example, the amount and distribution of ground cover can be used to indicate that infiltration at the soil surface can take place as described in the standard relating to upland watershed function. In applying this indicator, the specific levels of plant cover necessary to support infiltration in a particular soil should be identified using currently available information from reference areas, if they exist; from technical sources like soil survey reports, Ecological Site Inventories, and Ecological Site Descriptions, or from other existing reference materials. Reference areas are lands that best represent the potential of a specific ecological site in both physical function and biological health. In many instances potential reference areas are identified in Ecological Site Descriptions and are referred to as "type locations." In the absence of suitable reference areas, the selection of indicators to be used in measuring or judging condition or function should be made by an interdisciplinary team of experienced professionals and other trained individuals.

Not all indicators identified for each standard are expected to be employed in every situation. Criteria for selecting appropriate indicators and methods of measurement and observation include, but are not limited to: 1. the relationship between the attribute(s) being measured or observed and the desired outcome; 2. the relationship between the activity (e.g., livestock grazing) and the attribute(s) being measured or observed; and 3. funds and workforce available to conduct the measurements or observations.

Assessments and Monitoring

The standards are the basis for assessing and monitoring rangeland condition and trend. Carrying out well-designed assessment and monitoring is critical to restoring or maintaining healthy rangelands and determining trends and conditions.

Assessments are a cursory form of evaluation based on the standards that can be used at different landscape scales. Assessments, conducted by qualified interdisciplinary teams (which may

include but are not limited to physical, biological and social specialists, and interagency personnel) with participation from permittees and other interested parties, are appropriate at the watershed and sub-watershed levels, at the allotment and pasture levels and on individual ecological sites or groups of sites. Assessments identify the condition or degree of function within the rangeland ecosystem and indicate resource problems and issues that should be monitored or studied in more detail. The results of assessments are a valuable tool for managers in assigning priorities within an administrative area and the subsequent allocation of personnel, money and time in resource monitoring and treatment. The results of assessments may also be used in making management decisions where an obvious problem exists.

Monitoring, which is the well documented and orderly collection, analysis and interpretation of resource data, serves as the basis for determining trends in the condition or degree of function of rangeland resources and for making management decisions. Monitoring should be designed and carried out to identify trends in resource conditions, to point out resource problems, to help indicate the cause of such problems, to point out solutions, and/or to contribute to adaptive management decisions. In cases where monitoring data do not exist, professional judgment, supported by interdisciplinary team recommendation, may be relied upon by the authorized officer in order to take necessary action. Review and evaluation of new information must be an ongoing activity.

To be effective, monitoring must be consistent over time, throughout administrative areas, and in the methods of measurement and observation of selected indicators. Those doing the monitoring must have the knowledge and skill required by the level or intensity of the monitoring being done, as well as the experience to properly interpret the results. Technical support for training must be made available.

Measurability

It is recognized that not every area will immediately meet the standards and that it will sometimes be a long-term process to restore some rangelands to properly functioning condition. It is intended that in cases where standards are not being met, measurable progress should be made toward achieving those standards, and significant progress should be made toward fulfilling the fundamentals of rangeland health. Measurability is defined on a case-specific basis based upon the stated planning objectives (i.e., quantifiable, time specific), taking into account economic and social goals along with the biological and ecological capability of the area. To the extent that a rate of recovery conforms with the planning objectives, the area is allowed the time to meet the standard under the selected management regime.

Implementation

The material contained in this document will be incorporated into existing Land Use Plans and used in the development of new Land Use Plans. According to 43 CFR 4130.3-1, permits and leases shall incorporate terms and conditions that ensure conformance with 43 CFR 4180. Terms and conditions of existing permits and leases will be modified to reflect standards and guidelines at the earliest possible date with priority for modification being at the discretion of the authorized

officer. Terms and conditions of new permits and leases will reflect standards and guidelines in their development.

Indicators identified in this document will serve as a focus of interpretation of existing monitoring data and will provide the basis of design for monitoring and assessment techniques, and in the development of monitoring and assessment plans.

The authorized officer shall take appropriate action as soon as practicable but not later than the start of the next grazing year upon determining, through assessment or monitoring by experienced professionals and interdisciplinary teams, that a standard is not being achieved and that livestock are a significant contributing factor to the failure to achieve the standards and conform with the guidelines.

Standards for Rangeland Health

Standard 1 Watershed Function – Uplands

Upland soils exhibit infiltration and permeability rates, moisture storage and stability that are appropriate to soil, climate and landform.

Rationale and Intent

This standard focuses on the basic physical functions of upland soils that support plant growth, the maintenance or development of plant populations and communities, and promote dependable flows of quality water from the watershed.

To achieve and sustain rangeland health, watersheds must function properly. Watersheds consist of three principle components: the uplands, riparian/wetland areas and the aquatic zone. This standard addresses the upland component of the watershed. When functioning properly, within its potential, a watershed captures, stores and safely releases the moisture associated with normal precipitation events (equal to or less than the 25 year, 5 hour event) that falls within its boundaries. Uplands make up the largest part of the watershed and are where most of the moisture received during precipitation events is captured and stored.

While all watersheds consist of similar components and processes, each is unique in its individual makeup. Each watershed displays its own pattern of landform and soil, its unique climate and weather patterns, and its own history of use and current condition. In directing management toward achieving this standard, it is essential to treat each unit of the landscape (soil, ecological site, and watershed) according to its own capability and how it fits with both smaller and larger units of the landscape.

A set of potential indicators has been identified for which site-specific criteria will be used to determine if this standard is being met. The appropriate indicators to be used in determining attainment of the standard should be drawn from the following list.

Potential Indicators

Protection of the soil surface from raindrop impact; detention of overland flow; maintenance of infiltration and permeability, and protection of the soil surface from erosion, consistent with the potential/capability of the site, as evidenced by the:

° amount and distribution of plant cover (including forest canopy cover);
° amount and distribution of plant litter;
° accumulation/incorporation of organic matter;
° amount and distribution of bare ground;
° amount and distribution of rock, stone, and gravel;
° plant composition and community structure;
° thickness and continuity of A horizon;
° character of micro-relief;
° presence and integrity of biotic crusts;
° root occupancy of the soil profile;
° biological activity (plant, animal, and insect); and
° absence of accelerated erosion and overland flow.

Soil and plant conditions promote moisture storage as evidenced by:

° amount and distribution of plant cover (including forest canopy cover);
° amount and distribution of plant litter;
° plant composition and community structure; and
° accumulation/incorporation of organic matter.

Standard 2 Watershed Function - Riparian/Wetland Areas

Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform.

Rationale and Intent

Riparian-wetland areas are grouped into two major categories: 1. lentic, or standing water systems such as lakes, ponds, seeps, bogs, and meadows; and 2. lotic, or moving water systems such as rivers, streams, and springs. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Riparian areas commonly occupy the transition zone between the uplands and surface water bodies (the aquatic zone) or permanently saturated wetlands.

Standards for Rangeland Health (Continued)

Properly functioning condition of riparian and wetland areas describes the degree of physical function of these components of the watershed. Their functionality is important to water quality in the capture and retention of sediment and debris, the detention and detoxification of pollutants, and in moderating seasonal extremes of water temperature. Properly functioning riparian areas and wetlands enhance the timing and duration of streamflow through dissipation of flood energy, improved bank storage, and ground water recharge. Properly functioning condition should not be confused with the Desired Plant Community (DPC) or the Desired Future Condition (DFC) since, in most cases, it is the precursor to these levels of resource condition and is required for their attainment.

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met. The criteria are based upon the potential (or upon the capability where potential cannot be achieved) of individual sites or land forms.

Potential Indicators

Hydrologic, vegetative, and erosional/depositional processes interact in supporting physical function, consistent with the potential or capability of the site, as evidenced by:

° frequency of floodplain/wetland inundation;
° plant composition, age class distribution, and community structure;
° root mass;
° point bars revegetating;
° streambank/shoreline stability;
° riparian area width;
° sediment deposition;
° active/stable beaver dams;
° coarse/large woody debris;
° upland watershed conditions;
° frequency/duration of soil saturation; and
° water table fluctuation.

Stream channel characteristics are appropriate for landscape position as evidenced by:

° channel width/depth ratio;
° channel sinuosity;
° gradient;
° rocks and coarse and/or large woody debris;
° overhanging banks;
° pool/riffle ratio;
° pool size and frequency; and
° stream embeddedness.

Standard 3 Ecological Processes

Healthy, productive and diverse plant and animal populations and communities appropriate to soil, climate and landform are supported by ecological processes of nutrient cycling, energy flow and the hydrologic cycle.

Rationale and Intent

This standard addresses the ecological processes of energy flow and nutrient cycling as influenced by existing and desired plant and animal communities without establishing the kinds, amounts or proportions of plant and animal community compositions. While emphasis may be on native species, an ecological site may be capable of supporting a number of different native and introduced plant and animal populations and communities while meeting this standard. This standard also addresses the hydrologic cycle which is essential for plant growth and appropriate levels of energy flow and nutrient cycling. Standards 1 and 2 address the watershed aspects of the hydrologic cycle.

With few exceptions, all life on earth is supported by the energy supplied by the sun and captured by plants in the process of photosynthesis. This energy enters the food chain when plants are consumed by insects and herbivores and passes upward through the food chain to the carnivores. Eventually, the energy reaches the decomposers and is released as the thermal output of decomposition or through oxidation.

The ability of plants to capture sunlight energy, to grow and develop, to play a role in soil development and watershed function, to provide habitat for wildlife and to support economic uses depends on the availability of nutrients and moisture. Nutrients necessary for plant growth are made available to plants through the decomposition and metabolization of organic matter by insects, bacteria and fungi, the weathering of rocks and extraction from the atmosphere. Nutrients are transported through the soil by plant uptake, leaching and by rodent, insect and microbial activity. They follow cyclical patterns as they are used and reused by living organisms.

The ability of rangelands to supply resources and satisfy social and economic needs depends on the buildup and cycling of nutrients over time. Interrupting or slowing nutrient cycling can lead to site degradation, as these lands become increasingly deficient in the nutrients plants require.

Some plant communities, because of past use, frequent fire or other histories of extreme or continued disturbance, are incapable of meeting this standard. For example, shallow-rooted winter-annual grasses that completely dominate some sites do not fully occupy the potential rooting depth of some soils, thereby reducing nutrient cycling well below optimum levels. In addition, these plants have a relatively short growth period and thus capture less sunlight than more diverse plant communities. Plant communities like those cited in this example are considered to have crossed the threshold of recovery and often require great expense to be recovered. The cost of recovery must be weighed against the site's potential ecological/economic value in establishing treatment priorities.

The role of fire in natural ecosystems should be considered, whether it acts as a primary driver or only as one of many factors. It may play a significant role in both nutrient cycling and energy flows.

Standards for Rangeland Health (Continued)

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met.

Potential Indicators

Photosynthesis is effectively occurring throughout the potential growing season, consistent with the potential/capability of the site, as evidenced by plant composition and community structure.

Nutrient cycling is occurring effectively, consistent with the potential/capability of the site, as evidenced by:

° plant composition and community structure;
° accumulation, distribution, incorporation of plant litter and organic matter into the soil;
° animal community structure and composition;
° root occupancy in the soil profile; and
° biological activity including plant growth, herbivory, and rodent, insect and microbial activity.

Standard 4 Water Quality

Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

Rationale and Intent

The quality of the water yielded by a watershed is determined by the physical and chemical properties of the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, the uses to which the land is put and the quality of the management of those uses. Standards 1, 2 and 3 contribute to attaining this standard.

States are legally required to establish water quality standards and Federal land management agencies are to comply with those standards. In mixed ownership watersheds, agencies, like any other land owners, have limited influence on the quality of the water yielded by the watershed. The actions taken by the agency will contribute to meeting State water quality standards during the period that water crosses agency administered holdings.

Potential Indicators

Water quality meets applicable water quality standards as evidenced by:

° water temperature;
° dissolved oxygen;
° fecal coliform;
° turbidity;
° pH;

° populations of aquatic organisms; and
° effects on beneficial uses (i.e., effects of management activities on beneficial uses as defined under the Clean Water Act and State implementing regulations).

Standard 5 Native, T&E, and Locally Important Species

Habitats support healthy, productive and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate and landform.

Rationale and Intent

Federal agencies are mandated to protect threatened and endangered species and will take appropriate action to avoid the listing of any species. This standard focuses on retaining and restoring native plant and animal (including fish) species, populations and communities (including threatened, endangered and other special status species and species of local importance). In meeting the standard, native plant communities and animal habitats would be spatially distributed across the landscape with a density and frequency of species suitable to ensure reproductive capability and sustainability. Plant populations and communities would exhibit a range of age classes necessary to sustain recruitment and mortality fluctuations.

Potential Indicators

Essential habitat elements for species, populations and communities are present and available, consistent with the potential/capability of the landscape, as evidenced by:

° plant community composition, age class distribution, productivity;
° animal community composition, productivity;
° habitat elements;
° spatial distribution of habitat;
° habitat connectivity; and
° population stability/resilience

Sage-Grouse Management Guidelines

Guidelines for Livestock Grazing Management

Guidelines for livestock grazing management offer guidance in achieving plan goals, meeting standards for rangeland health and fulfilling the fundamentals of rangeland health. Guidelines are applied in accordance with the capabilities of the resource in consultation, cooperation, and coordination with permittees/lessees and the interested public. Guidelines enable managers to

Standards for Rangeland Health (Continued)

adjust grazing management on public lands to meet current and anticipated climatic and biological conditions.

General Guidelines

1. Involve diverse interests in rangeland assessment, planning and monitoring.

2. Assessment and monitoring are essential to the management of rangelands, especially in areas where resource problems exist or issues arise. Monitoring should proceed using a qualitative method of assessment to identify critical, site-specific problems or issues using interdisciplinary teams of specialists, managers, and knowledgeable land users.

Once identified, critical, site-specific problems or issues should be targeted for more intensive, quantitative monitoring or investigation. Priority for monitoring and treatment should be given to those areas that are ecologically at-risk where benefits can be maximized given existing budgets and other resources.

Livestock Grazing Management

1. The season, timing, frequency, duration and intensity of livestock grazing use should be based on the physical and biological characteristics of the site and the management unit in order to:

   a. provide adequate cover (live plants, plant litter and residue) to promote infiltration, conserve soil moisture and to maintain soil stability in upland areas;

   b. provide adequate cover and plant community structure to promote streambank stability, debris and sediment capture, and floodwater energy dissipation in riparian areas.

   c. promote soil surface conditions that support infiltration;

   d. avoid sub-surface soil compaction that retards the movement of water in the soil profile;

   e. help prevent the increase and spread of noxious weeds;

   f. maintain or restore diverse plant populations and communities that fully occupy the potential rooting volume of the soil;

   g. maintain or restore plant communities to promote photosynthesis throughout the potential growing season;

   h. promote soil and site conditions that provide the opportunity for the

establishment of desirable plants;

i. protect or restore water quality; and

j. provide for the life cycle requirements, and maintain or restore the habitat elements of native (including T&E, special status, and locally important species) and desired plants and animals.

2. Grazing management plans should be tailored to site-specific conditions and plan objectives. Livestock grazing should be coordinated with the timing of precipitation, plant growth and plant form. Soil moisture, plant growth stage and the timing of peak stream flows are key factors in determining when to graze. Response to different grazing strategies varies with differing ecological sites.

3. Grazing management systems should consider nutritional and herd health requirements of the livestock.

4. Integrate grazing management systems into the year-round management strategy and resources of the permittee(s) or lessee(s). Consider the use of collaborative approaches (e.g., Coordinated Resource Management, Working Groups) in this integration.

5. Consider competition for forage and browse among livestock, big game animals, and wild horses in designing and implementing a grazing plan.

6. Provide periodic rest from grazing for rangeland vegetation during critical growth periods to promote plant vigor, reproduction and productivity.

7. Range improvement practices should be prioritized to promote rehabilitation and resolve grazing concerns on transitory grazing land.

8. Consider the potential for conflict between grazing use on public land and adjoining land uses in the design and implementation of a grazing management plan.

Facilitating the Management of Livestock Grazing

1. The use of practices to facilitate the implementation of grazing systems should consider the kind and class of animals managed, indigenous wildlife, wild horses, the terrain and the availability of water. Practices such as fencing, herding, water development, and the placement of salt and supplements (where authorized) are used where appropriate to:

a. promote livestock distribution;

Standards for Rangeland Health (Continued)

b. encourage a uniform level of proper grazing use throughout the grazing unit;

c. avoid unwanted or damaging concentrations of livestock on streambanks, in riparian areas and other sensitive areas such as highly erodible soils, unique wildlife habitats and plant communities; and

d. protect water quality.

2. Roads and trails used to facilitate livestock grazing are constructed and maintained in a manner that minimizes the effects on landscape hydrology; concentration of overland flow, erosion and sediment transport are prevented; and subsurface flows are retained.

Accelerating Rangeland Recovery

1. Upland treatments that alter the vegetative composition of a site, like prescribed burning, juniper management and seedings or plantings must be based on the potential of the site and should:

   a. retain or promote infiltration, permeability, and soil moisture storage;

   b. contribute to nutrient cycling and energy flow;

   c. protect water quality;

   d. help prevent the increase and spread of noxious weeds;

   e. contribute to the diversity of plant communities, and plant community composition and structure;

   f. support the conservation of T&E, other special status species and species of local importance; and

   g. be followed up with grazing management and other treatments that extend the life of the treatment and address the cause of the original treatment need.

2. Seedings and plantings of non-native vegetation should only be used in those cases where native species are not available in sufficient quantities; where native species are incapable of maintaining or achieving the standards; or where non-native species are essential to the functional integrity of the site.

3. Structural and vegetative treatments and animal introductions in riparian and wetland areas must be compatible with the capability of the site, including the system's hydrologic regime, and contribute to the maintenance or restoration of

properly functioning condition.

Glossary

Appropriate action-implementing actions pursuant to subparts 4110, 4120, 4130 and 4160 of the regulations that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with the guidelines. (see **Significant progress**)

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.

Compaction layer-a layer within the soil profile in which the soil particles have been rearranged to decrease void space, thereby increasing soil bulk density and often reducing permeability.

Crust, Abiotic-(physical crust) a surface layer on soils, ranging in thickness from a few millimeters to a few centimeters, that is much more compact, hard and brittle, when dry, than the material immediately beneath it.

Crust, Biotic-(microbiotic or cryptogamic crust) a layer of living organisms (mosses, lichens, liverworts, algae, fungi, bacteria, and/or cyanobacteria) occurring on, or near the soil surface.

Degree of function-a level of physical function relative to properly functioning condition commonly expressed as: properly functioning, functioning-at-risk, or non-functional.

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.

Energy flow-the processes in which solar energy is converted to chemical energy through photosynthesis and passed through the food chain until it is eventually dispersed through respiration and decomposition.

Groundwater-water in the ground that is in the zone of saturation; water in the ground that exists at, or below the water table.

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).

Standards for Rangeland Health (Continued)

Gully-a channel resulting from erosion and caused by the concentrated but intermittent flow of water usually during and immediately following heavy rains.

Hydrologic cycle-the process in which water enters the atmosphere through evaporation, transpiration, or sublimation from the oceans, other surface water bodies, or from the land and vegetation, and through condensation and precipitation returns to the earth's surface. The precipitation then occurring as overland flow, stream flow, or percolating underground flow to the oceans or other surface water bodies or to other sites of evapo-transpiration and recirculation to the atmosphere.

Indicators-parameters of ecosystem function that are observed, assessed, measured, or monitored to directly or indirectly determine attainment of a standard(s).

Infiltration-the downward entry of water into the soil.

Infiltration rate-the rate at which water enters the soil.

Nutrient cycling-the movement of essential elements and inorganic compounds between the reservoir pool (soil, for example) and the cycling pool (organisms) in the rapid exchange (i.e., moving back and forth) between organisms and their immediate environment.

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.

Permeability-the ease with which gases, liquids or plant roots penetrate or pass through a bulk mass of soil or a layer of soil.

Properly functioning condition-Riparian-wetland: adequate vegetation, landform, or large (coarse) woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid in flood plain development; improve flood-water retention and ground water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse channel and ponding characteristics to provide the habitat and water depth, duration and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The result of interaction among geology, soil, water, and vegetation.

Uplands: soil and plant conditions support the physical processes of infiltration and moisture storage and promote soil stability (as appropriate to site potential); includes the production of plant cover and the accumulation of plant residue that protect the soil surface from raindrop impact, moderate soil temperature in minimizing frozen soil conditions (frequency, depth, and duration), and the loss of soil moisture to evaporation; root growth and development in the support of permeability and soil aeration. The result of interaction among geology, climate, landform, soil, and organisms.

Standards for Rangeland Health (Continued)

Proper grazing use-grazing that, through the control of timing, frequency, intensity and duration of use, meets the physiological needs of the desirable vegetation, provides for the establishment of desirable plants and is in accord with the physical function and stability of soil and landform (properly functioning condition).

Reference area-sites that, because of their condition and degree of function, represent the ecological potential or capability of similar sites in an area or region (ecological province); serve as a benchmark in determining the ecological potential of sites with similar soil, climatic, and landscape characteristics.

Rill-a small, intermittent water course with steep sides; usually only a few inches deep.

Riparian area-a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and stream, glacial potholes, and shores of lakes and reservoirs with stable water levels area 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. Includes, but is not limited to, jurisdictional wetlands.

Significant progress-when used in reference to achieving a standard: (actions), the necessary land treatments, practices and/or changes to management have been applied or are in effect; (rate), a rate of progress that is consistent with the anticipated recovery rate described in plan objectives, with due recognition of the effects of climatic extremes (drought, flooding, etc.), fire, and other unforeseen naturally occurring events or disturbances. Monitoring reference areas that are ungrazed and properly grazed may provide evidence of appropriate recovery rates. (See Proper Grazing Use)

Soil density-(bulk density)-the mass of dry soil per unit bulk volume.

Soil moisture-water contained in the soil; commonly used to describe water in the soil above the water table.

Special status species-species proposed for listing, officially listed (T/E), or candidates for listing as threatened or endangered by the Secretary of the Interior under the provisions of the Endangered Species Act; those listed or proposed for listing by the State in a category implying potential endangerment or extinction; those designated by each Bureau of Land Management State Director as sensitive.

Species of local importance-species of significant importance to Native American populations (e.g., medicinal and food plants).

Standard-an expression of the physical and biological condition or degree of function necessary to sustain healthy rangeland ecosystems.

Standards for Rangeland Health (Continued)

Uplands-lands that exist above the riparian/wetland area, or active flood plains of rivers and streams; those lands not influenced by the water table or by free or unbound water; commonly represented by toe slopes, alluvial fans, and side slopes, shoulders and ridges of mountains and hills.

Watershed-an area of land that contributes to the surface flow of water past a given point. The watershed dimensions are determined by the point past, or through which, runoff flows.

Watershed function-the principal 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.

Wetland-areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Glossary

3P fall, buck, and scale sampling . . . . . A sampling method that determines the volume and value of merchantable timber. The method starts with visual estimation of a stand using the 3P sampling method (i.e., PPP, or, probability proportional to prediction), which operates under the assumption that the probability of a tree being sampled is proportional to its predicted occurrence in a stand. The estimation is verified by cutting down a sampled tree (fall), cutting it into merchantable log lengths (buck), and measuring the logs (scale) noting indicators for defects and log grades. For managed second-growth stands, 3P sampling is generally used to develop volume tables from which stand volumes may be extrapolated. For uneven-aged stands, typically containing larger and often more defective timber, 3P sampling is useful in determining the net volume (recovery).

303(d) Water Quality Listing . . . . . Impaired waters that do not meet water quality standards, identified by DEQ, as required by the Clean Water Act.

acre . . . . . A measure of surface land area in U.S. customary units that is 43,560 square feet, which is 1/640 of a square mile (or approximately 0.4 hectares). If square, it is nearly 209 feet on each side.

active stream channel . . . . . The inundated area of bed and banks of a stream, from larger streamflow of one to two years.

activity fuel . . . . . Debris (wood chips, bark, branches, limbs, logs, or stumps) left on the ground after management actions, such as logging, pruning, thinning, or brush cutting, versus debris left after storms or fires.

adaptive management . . . . . A forest management methodology that continually monitors, evaluates, and adjusts decisions and management actions to improve implementation and to ensure that the goals and objectives of resource management plans are being met.

Adaptive Management Area . . . . . A Northwest Forest Plan term that denotes a land use allocation (or landscape unit) whose lands are designated for development and for testing technical and social approaches for achieving desired ecological, economic, and other social objectives.

adverse modification . . . . . An Endangered Species Act term that is not specifically defined by the act but is generally accepted to denote a direct or indirect alteration of habitat that appreciably diminishes the value of an area with respect to the survival, or in some instances the recovery, of a listed species. In most instances, this standard is considered the same as, or is nearly identical, to the jeopardy standard.

age classification . . . . . A system that categorizes trees, forests, stands, or forest types by intervals of years. Age classifications differ around the U.S. by forest type (wet, dry, evergreen, deciduous, or succulent). For this analysis, the interval is usually 10-year increments.

aggregated retention . . . . . See variable-retention harvest system.

allowable sale quantity/annual productive capacity . . . . . These terms are synonymous. The timber yield that a forest can produce continuously under the intensity of management outlined in the RMP from those lands allocated for permanent forest production.

alternative . . . . . One of several proposed management actions that have been studied and found to meet the goals and objectives of a project's purpose and need and, as a result, is suitable to aid decision-making.

anadromous fish . . . . . Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Includes species such as salmon and steelhead. Also see salmonid.

analysis . . . . . The scientific evaluation of the environmental impacts of proposed planning decisions. The BLM employs many types of analysis (e.g., surface, linear, raster, contiguity, and topological overlay) with a variety of data sets (e.g., inventory and GIS) and tools (e.g., physical, quantitative, data, and spatial modeling).

analytical assumption . . . . . A judgmental decision that is based on the science and relationships of natural systems assumed to be true and from which conclusions can be drawn to supply the missing values, relationships, or societal preferences needed for proceeding with an analysis of alternatives.

angular canopy density . . . . . A measure of shade provided by riparian vegetation. It is the density of the canopy, expressed as a percent, measured along the path of incoming solar radiation between the sun and a stream.

animal unit month (AUM). . . . . The amount of forage necessary to sustain one cow (or its equivalent) for one month.

annual productive capacity . . . . . An O&C Act term denoting the volume of timber that is determined will grow in one year in a given area. Also see allowable sale quantity (ASQ), offer, and sustained yield capacity.

Aquatic Conservation Strategy . . . . . A Northwest Forest Plan methodology designed to restore and maintain the ecological health of watersheds and aquatic ecosystems, consisting of four components: riparian reserves, key watersheds, watershed analysis, and watershed restoration.

aquatic habitat . . . . . Habitat for vertebrate and invertebrate wildlife species and vascular and non-vascular plants occurring in free water (e.g. lakes, ponds, streams, rivers, springs and seeps).

area . . . . . A generic forestry term that refers to the surface land included within specific boundaries and usually allocated for a specific purpose, such as a late-successional management area, a timber management area, a traditional use area, a recreational use area, or a wilderness area. Contrast with block.

Area of Critical Environmental Concern (ACEC) . . . . . Land where special management attention is needed to protect life, to provide safety from natural hazards, or to prevent irreparable damage to important values (historic, cultural, or scenic), resources (fish and wildlife), or processes (natural systems).

Area of Mutual Interest. . . . . A defined mapped area, identified by industry, of potential petroleum development.

assessment area . . . . . A subdivision of a sustained yield unit (BLM district) that has been divided by physiographic provinces.

at-risk species. . . . . Species that are determined by a detailed assessment to be in danger of becoming locally or completely extinct.

at-risk community. . . . . A group of homes or structures that exist within the vicinity of federal lands or a wildland/urban interface for which a significant threat to human life or property exists as a result of a wildland fire.

authority . . . . . The right and power to make decisions and give orders such as the United States Congress exerts when passing legislation (e.g. the O&C Act and the Endangered Species Act).

awarded timber sales. . . . . A sale where the government has accepted a bid from a qualified high bidder, thereby binding the government and granting specific rights to the purchaser.

backcountry byways . . . . . A road segment designated as part of the National Scenic Byway System.

basal area . . . . . The cross-sectional area of a single stem, of all stems of a species in a stand, or of all plants in a stand (including the bark) that is measured at breast height (about 4.5 feet up from the ground) for larger plants (like trees) or measured at ground level for smaller plants.

baseline . . . . . The starting point for the analysis of environmental consequences, often referred to as the Affected Environment. This starting point may be the condition at a point in time (e.g., when inventory data is collected) or the average of a set of data collected over a specified number of years. Also see analysis, environmental consequences, and inventory data.

beneficial use . . . . . In general, any reasonable use of a resource for a purpose consistent with the laws and best interests of the people of a state. In water use law, such uses include, but are not limited to: instream, out of stream, and ground water uses; domestic, municipal, and industrial water supplies; mining, irrigation, and livestock watering; fish and aquatic life; wildlife watering; fishing and water contact recreation; aesthetics and scenic attraction; hydropower; and commercial navigation.

Best Management Practices (BMPs). . . . . BMPs are defined as methods, measures, or practices selected on the basis of site-specific conditions to ensure that water quality will be maintained at its highest practicable level. BMPs include, but are not limited to, structural and nonstructural controls, operations, and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 CFR 130.2, EPA Water Quality Standards Regulation).

biological assessment . . . . . A biological assessment is a document that evaluates potential effects of a proposed action to listed and proposed species and designated and proposed critical habitat and determines whether any such species or habitats are likely to be adversely affected by the action. It is used in determining whether formal consultation or conferencing with the U.S. Fish and Wildlife Service or National Marine Fisheries Service is necessary (50 CFR 402.12[a])

biological opinion . . . . . An opinion by the U. S, Fish and Wildlife Service or the National Marine Fisheries Service as to whether or not a federal action is likely or not to jeopardize the continued existence of listed species, or would result in the destruction of or adverse modification of critical habitat. The opinion may contain reasonable and prudent alternatives, a statement of anticipated take of listed animals, and conservation recommendations for listed plants.

biomass . . . . . Unmerchantable and waste plant materials used as a source of renewable combustible fuel. Also includes non-sawlog material ground up into fiber and used in secondary wood products.

block . . . . . A term that denotes an area of land that has been approved for special management, such as a northern spotted owl reserve or a fire suppression area. Contrast with area.

board foot . . . . . A unit of measure for unfinished solid wood used by the lumber industry that is typically expressed as bf or bd. ft. and equals the volume contained in a 1-inch thick, 12-inch long, and 12-inch wide board.

Bureau Strategic Species . . . . . A special status species category established by the Oregon/Washington BLM that includes animal, plant and fungi species that are of concern in the two states. The special status species policy (BLM 6840) does not apply to these species, and no analysis of them is required in NEPA documents. Field units are required to collect occurrence field data and maintain records. Also see Bureau sensitive species.

Bureau of Land Management (BLM) . . . . . A federal agency within the U.S. Department of the Interior that is responsible for administering 261 million surface acres of federally owned lands in accordance with all applicable laws to sustain the health, diversity, and productivity of those lands. Most of the acreage is in Alaska and the western states.

Bureau Sensitive Species. . . . . A special status species category established by the BLM that includes those plant and animal species eligible for status as federally listed, federal candidate, state listed, or state candidate (plant) species; on List 1 of the Oregon Natural Heritage Database or approved for this category by the BLM state director; or included under agency species conservation policies. Also see Bureau strategic species.

candidate species . . . . . Plants and animals for which the U.S. Fish and Wildlife Service has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

canopy . . . . . The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result.

canopy closure . . . . . The ground area covered by the crowns of trees or woody vegetation as delimited by the vertical projection of crown perimeter and commonly expressed as a percent of total ground area.

catchment . . . . . An area drained by a stream. For research, a very small experimental watershed, often times less than 100 acres.

channel migration zone . . . . . The extent of lateral movement of a river across a floodplain toward the convex side of an original curve.

checkerboard land ownership pattern . . . . . A land ownership pattern in which square-mile sections of federal lands are typically intermixed, on the basis of alternating sections, with adjoining private lands. The O&C lands of western Oregon are an example of checkerboard ownership. This ownership pattern resulted from the revestment back to the federal government of lands granted by the federal government to early railroad companies. The checkerboard ownership pattern of the O&C lands creates additional access, management, and perception issues. Also see O&C Act.

clearcut . . . . . A timber harvesting method that removes essentially all trees in an area, whether merchantable or not, producing a fully exposed microclimate for development of a new age class.

coarse woody debris . . . . . That portion of trees that has naturally fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter. Also see coarse woody debris classes.

coarse woody debris classes . . . . . There are four classes used to describe coarse woody debris. The classes range from Class I (which has the least decay, intact bark, and a hard log) to Class IV (i.e., the coarse woody debris has decayed to the point of nearly being incorporated into the forest floor).

commercial forest land base. . . . . Forest lands declared suitable for producing timber and having a minimum level of productivity of 20 cubic feet/acre/year. Contrast with harvest land base.

commercial thinning . . . . . Any type of thinning producing merchantable material at least equal to the value of the direct cost of harvesting. See thinning.

Congressionally Reserved Areas (Congressional Reserves) . . . . . Areas established by an Act of Congress or Executive Order, such as national parks, wild and scenic rivers, national recreation areas, wilderness, and national monuments.

connectivity block . . . . . A Northwest Forest Plan term denoting a corridor that links areas of northern spotted owl habitat. Contrast with connectivity/diversity block.

connectivity / diversity block. . . . . A subdivision of the matrix land use allocation in the current Resource Management Plans that serves as a corridor for linking late-successional and old-growth forests to facilitate the movement, feeding, and breeding of late-successional and old-growth species. These blocks are managed to maintain between 25 and 30 percent of late-successional forest within them. Contrast with connectivity block.

conservation. . . . . Conservation, when applied to special status species, is the methods and procedures used to improve the plant and animal species biology, improve their habitat condition, and reduce threats to their continued existence.

conservation agreement . . . . . A non-binding document of agreement between agencies that outlines conservation goals necessary to reduce, eliminate, or mitigate specific threats to species at risk, and provides general guidance on species management.

conservation strategy . . . . . A management plan for a species, group of species, or ecosystem that prescribes standards and guidelines that if implemented provide a high likelihood that the species, groups of species, or ecosystem, with its full complement of species and processes, will continue to exist well-distributed throughout a planning area.

Consultation. . . . . A formal review between the U.S. Fish and Wildlife Service or National Marine fisheries Service and another federal agency when it is determined that an action by the agency may affect critical habitat or a species that has been listed as threatened or endangered to ensure that the agency's action does not jeopardize a listed species or destroy or adversely modify critical habitat.

cooperators and cooperating agencies . . . . . Those individuals and agencies that provide qualified information to a federal agency, such as the BLM, to use in formulating resource management actions and analyzing environmental consequences. The Council on Environmental Quality regulations that implement requirements of the National Environmental Policy Act define a cooperating agency as any agency that has jurisdiction by law or special expertise for proposals that are covered by the National Environmental Policy Act (40 CFR 1501.6). BLM planning regulations [43 CFR 1610.3-15(b)] further provide that eligible Federal agencies, state and local governments, and federally recognized Indian tribes may also participate as cooperating agencies.

Coos Bay Wagon Road (CBWR) lands. . . . . The public lands that were granted to the Southern Oregon Company for construction of a military road, but subsequently revested by the United States and later incorporated into the O&C Act.

corridor . . . . . A strip of land that links areas in a fragmented landscape to facilitate the passage of animals, plants, people, energy, or materials between habitat or service areas. Examples are biological, recreation, transportation, and utility corridors. Biological corridors are reserved from substantial disturbance. Also see connectivity block and connectivity/ diversity block.

critical habitat . . . . . An Endangered Species Act term denoting a specified geographic area occupied by a federally listed species, and on which the physical and biological features are found that are essential to the conservation and recovery of that species and that may require special management or protection.

crown. . . . . The upper part of a tree that has live branches and foliage.

crown bulk density . . . . . A measure of the fuel in a forest's canopy that is usually calculated by dividing the canopy volume by the weight of the needles, leaves, and smaller branches (or calculated using the height-to-crown base, tree height, and basal area values). Contrast with crown density.

crown density. . . . . A measure of the density of a tree's crown that is calculated from the amount, compactness, and depth of the foliage in the tree's crown. Contrast with crown bulk density.

crown fire . . . . . Fire that moves through the crowns of adjacent trees independent of any surface fire. Crown fires can often move faster and ahead of ground fires.

culmination of mean annual increment (CMAI) . . . . . The age in the growth cycle of a tree or stand at which the mean annual increment (MAI) for volume is at its maximum. At culmination, MAI equals the periodic annual increment (PAI).

cumulative effect . . . . . The impact on the environment that results from incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless of which agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

decompaction . . . . . Mechanical ripping and/or tillage of roadbeds, landings and other compacted areas for the purposes of increasing infiltration and aeration.

density management. . . . . The cutting or killing of trees to increase spacing for promoting the acceleration of the growth of remaining trees, improvement of stand vigor, or attainment of late-successional characteristics. Also see thinning, precommercial thinning, and commercial thinning.

determination of NEPA adequacy (DNA). . . . . An interim step in BLM's internal analysis process, which documents that a proposed action is adequately analyzed in an existing environmental impact statement [EIS] or environmental assessment [EA]. Where applicable, the determination also documents conformance with an approved land use plan. (BLM NEPA Handbook, 516 DM 11).

diameter at breast height . . . . . The diameter of the stem of a tree measured at 4.5 feet above the ground level on the uphill side of the stem. Also see quadratic mean diameter.

dispersal habitat (spotted owl). . . . . Forest habitat that allows northern spotted owls to move (disperse) across the landscape; typically characterized by forest stands with average tree diameters of greater than 11 inches, and conifer overstory trees having closed canopies (greater than 40 percent canopy closure) with open space beneath the canopy to allow owls to fly.

dispersed retention . . . . . See variable-retention harvest system.

disturbance (natural) . . . . . A force that causes significant change in structure and/or composition through natural events such as fire, flood, wind, and earthquake, or through mortality caused by insect or disease outbreaks.

disturbance, stand replacement. . . . . A force that removes most or all existing trees in a forest stand through natural events such as fire, flood, earthquake, or mortality caused by insect or disease outbreaks.

dominant use . . . . . A land use that is the primary purpose for the land use designation; for instance, wildlife habitat on National Wildlife Refuges or timber production on O&C lands. Contrast with multiple use.

effective shade . . . . . The proportion of direct beam solar radiation reaching a stream surface to total daily solar radiation.

envelope curve. . . . . A line drawn on a figure with dependent and independent variables for a collection of hydrologic studies, showing the best fit of the extent of maximum response.

environmental consequences. . . . . The direct, indirect and cumulative effects of a proposed action or alternative on existing conditions in the environment in which the action(s) would occur. Also see baseline.

environmental impact statement . . . . . A detailed document, required under the National Environmental Policy Act of 1969, of a federal project's environmental consequences, including adverse environmental effects that cannot be avoided, alternatives to the proposed action, the relationship between local short-term uses and long-term productivity, and any irreversibly or irretrievable commitment of resource.

equivalent clearcut area . . . . . Method of estimating changes in streamflow response from the amount and distribution of forest cover in a watershed.

even-aged management . . . . . A silvicultural system that creates forest stands primarily comprised of a single age or having a very narrow range of ages.

even-aged stand. . . . . A stand of trees comprised of a single age class in which the range of tree ages is usually ± 20% of rotation.

evolutionary significant unit . . . . . A population or group of populations considered "distinct," and hence a "species" for purposes of the Endangered Species Act, representing an evolutionarily significant unit (ESU) of the biological species. A population must satisfy two criteria to be considered an ESU. It must be reproductively isolated from other conspecific population units, and it must represent an important component in the evolutionary legacy of the species. Isolation does not have to be absolute, but must be strong enough to permit evolutionarily important differences to accrue in different population units. The second criterion is met if the population contributes substantially to the ecological/genetic diversity of the species as a whole. (NOAA Technical Memorandum NMFS F/NWC-194).

facies . . . . . A characteristic of a rock unit that reflects a common origin or time.

fifth-field watershed . . . . . One of the classifications of watersheds used by the United States Geological Survey that identifies some of the smallest watersheds and is useful for assessing water-related issues; generally 20 to 200 square miles in size. For details about the classification of drainage areas, see http://water.usgs.gov/GIS/huc.html. Also see watershed.

fine sediment . . . . . Fine-grained soil material, less than 2mm in size, normally deposited by water, but in some cases by wind (aeolian) or gravity (dry ravel).

fire control, direct . . . . . Any treatment applied directly to burning fuel, such as wetting, smothering, or chemically quenching the fire or by physically separating the burning from unburned fuel.

fire control, prescribed. . . . . Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met prior to ignition.

forest . . . . . An ecosystem characterized by stands of trees varying in characteristics such as species composition, structure, age class, and associated processes, and commonly including meadows, streams, fish, and wildlife.

flood . . . . . Streamflow overtopping streambanks, or rising water that covers land not normally under water.

floodplain . . . . . Level lowland bordering a stream or river onto which the flow spreads at flood stage.

forage. . . . . All browse and herbaceous matter available to grazing animals, including wildlife and domestic livestock.

Forest Ecosystem Management Assessment Team (FEMAT) . . . . . The 1993 presidentially assigned team of scientists, researchers, and technicians from seven federal agencies that created the report that was used as the basis for the Northwest Forest Plan.

forest land. . . . . Land at least 10 percent stocked by forest trees of any size, and including land that formerly had such tree cover and that will be naturally or artificially regenerated.

Forest Operations Inventory (FOI) . . . . . An intensive inventory that provides managers with information regarding the age, species, stand location, size, silvicultural needs, and recommended treatment of stands based on individual stand conditions and productivity.

fuel loading . . . . . The dry weight of all accumulated live and dead woody and herbaceous material on the forest floor that is available for combustion, and which poses a fire hazard.

genetic gain . . . . . Average improvement of a specific trait in a population of progeny over the average of the parental population (for example, height growth increase).

green tree . . . . . A live tree.

green tree retention . . . . . A stand management practice in which live trees are left within harvest units to provide a legacy of habitat components over the next management cycle.

group selection harvest . . . . . See selection cutting.

growth and yield modeling . . . . . Simulated projections of forest stand growth and development, from which timber volume estimates and other stand attributes expected to be produced per unit area under a certain set of conditions are derived. Also see modeling.

forest habitat . . . . . An area containing the forest vegetation with the age class, species composition, structure, sufficient area, and adequate food source to meet some or all of the life needs (such as foraging, roosting, nesting, breeding habitat for northern spotted owls) of specific species.

habitat-capable forests (spotted owl) . . . . . Forested stands that are capable of developing into suitable habitat specifically for the northern spotted owl.

harvesting . . . . . The process of onsite cutting and removing of merchantable trees from a forested area.

harvest land base . . . . . Those lands that are available for timber harvesting on a programmed sustained basis. Generally, a harvest land base does not include managed or other reserved lands, nonforested lands, or areas that the timber production capability classification inventory has determined are not capable of sustaining timber production. Also see timber production capability classification.

hydrophilic vegetation . . . . . Vegetation having a strong affinity for water.

hydroregion . . . . . An area of similar climate and stream runoff processes.

incidental take . . . . . An Endangered Species Act term denoting the taking of a species that is listed as threatened or endangered inadvertently, rather than purposely, while carrying out otherwise lawful activity. Also see take.

incorporated by reference . . . . . Documents referenced in the final environmental impact statement that are provided by the individual subject matter experts, are maintained as a part of the administrative record housed at a centralized location, and are available upon request.

intensively managed timber stands. . . . . Forest stands that are managed to obtain a high level of timber volume and quality per unit area by using growth-enhancing practices, such as precommercial thinning, commercial thinning, and fertilization.

intrinsic potential . . . . . A stream's inherent ability to provide high-quality habitat for salmonids.

inventory data . . . . . Information collected by the use of objective sampling methods designed to quantify the spatial distribution, composition, and rates of change of forest parameters within specified levels of precision. Note: Inventories may be made of all forest resources including trees and other vegetation, fish and wildlife, etc. Also see baseline.

jeopardy . . . . . The endangerment of the continued existence of a species that is listed as threatened or endangered under the Endangered Species Act. Also a finding made through consultation by a federal agency under the Endangered Species Act regarding an action proposed by the agency that may cause such endangerment.

key watershed. . . . . A Northwest Forest Plan term that denotes a watershed that contains habitat for potentially threatened species, stocks of anadromous salmonids, or other potentially threatened fish, or is an area of high-quality water and fish habitat. Also see watershed.

land use allocation. . . . . A designation for a use that is allowed, restricted, or prohibited for a particular area of land, such as the matrix, adaptive management, late-successional reserve, or critical habitat land use allocations.

landscape . . . . . A broad expanse of terrain, up to the watershed scale of 10,000 to 20,000 acres, which spans several ecosystems irrespective of ownership or other political boundaries.

late-successional forest . . . . . A forest that is in its mature stage and contains a diversity of structural characteristics, such as live trees, snags, woody debris, and a patchy, multi-layered canopy.

Late-Successional Management Area. . . . . A designated area outside of the harvest land base that is actively managed to protect or enhance conditions of late-successional forest base.

Late-Successional Reserve . . . . . A Northwest Forest Plan term that denotes a land use allocation and has been reserved from programmed timber harvesting and designated to maintain existing or future mature old-growth, or late-successional habitat.

load . . . . . The amount of material entering a system, such as point source and nonpoint source pollutants. Typically measured as pounds per day and significant in relation to the volume and circulation of the water or air mass in question. Also see point source and nonpoint source.

long term . . . . . A period of time used as an analytical timeframe; starts more than 10 years after implementation of a resource management plan, depending on the resource being analyzed. Also see short term.

mass wasting . . . . . The sudden or slow dislodgement and downslope movement of rock, soil, and organic materials.

Matrix . . . . . A Northwest Forest Plan term that denotes a land use allocation for federal lands located outside of reserves, withdrawn areas, and late-successional areas. For the purpose of this final environmental impact statement, this term applies only to the No Action Alternative.

mature stage . . . . . Generally begins as tree growth rates stop increasing (after culmination of mean annual increment), and as tree mortality shifts from density-dependent mortality to density-independent mortality.

mean annual increment (MAI) . . . . . The total cumulative quantity produced over time of some attribute of a tree or stand growth (for example, wood volume divided by the total age of the tree or stand).

merchantable . . . . . Trees or stands having the size, quality and condition suitable for marketing under a given economic condition, even if not immediately accessible for logging

minerals, leasable . . . . . Generally found in bedded deposits and include oil, gas, coal, chlorides, sulfates, carbonates, borates, silicates, and nitrates of potassium (potash) or sodium and related products; sulfur; phosphate and its associated and related minerals; asphalt; and gilsonite.

minerals, locatable. . . . . Includes both metallic minerals (gold, silver, lead, copper, zinc, nickel, etc.) and nonmetallic minerals (fluorspar, mica, certain limestone and gypsum, tantalum, heavy minerals in placer form and gemstones) in land belonging to the United States that are open to citizens of the United States for exploration, discovery, and location which conveys the exclusive right to extract the locatable minerals upon receiving all required authorizations in accordance with regulations at 43 CFR 3802 for lands in wilderness review and 3809 for other public lands.

minerals, salable . . . . . Include but are not limited to: petrified wood and common varieties of sand, stone, gravel, pumice, pumicite, cinder, clay, and rock.

modeling. . . . . A scientific method that operates by a structured set of rules and procedures to simulate current conditions and predict future conditions. Also see analysis.

multi-layered canopy . . . . . Forest stands with two or more distinct tree layers in the canopy.

multiple use . . . . . A Federal Land Policy and Management Act term that denotes "… the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output." (U.S. Code, Title 43, Chapter 35, Subchapter I, § 1702 (c)) Contrast with dominant use.

National Marine Fisheries Service . . . . . A federal agency under the United States Department of Commerce that is responsible for working with others to conserve, protect, and enhance anadromous fish and their habitats.

natural fire regime class . . . . . A general classification of how fire would behave over time in the absence of human intervention.

noncomformity . . . . . A physical expression of a period of time of non-deposition between rock units, usually indicated by erosion characteristics, bed tilting, or missing strata of an intervening time period.

nonpoint source pollution . . . . . Water or air pollutants where the source of the pollutant is not readily identified and is diffuse, such as the runoff from urban areas, agricultural lands, or forest lands. Also see point source.

Northwest Forest Plan . . . . . A 1994 common management approach for the 19 national forests and 7 BLM districts located in the Pacific Northwest ecological region and jointly approved by the Secretary of Agriculture and the Secretary of the Interior.

nutrient cycling . . . . . Circulation of elements (such as carbon or nitrogen) between vegetation/organic material and soil, water and air.

ordinary high water line . . . . . Fluctuations of water in a stream or waterbody, from higher runoff of one or two years, that establish a line on the shore which is typically identified by physical characteristics.

overstory . . . . . That portion of trees forming the uppermost canopy layer in a forest stand and that consists of more than one distinct layer.

partial harvest . . . . . For the purpose of defining management action in Alternative 3, partial harvest is a timber harvesting method that removes a substantial portion of the stand basal area (50-70%) on a harvest interval that mimics the historic average return interval for a moderate or mixed-severity fire.

periodic annual increment (PAI) . . . . . The difference in stand volume at two successive measurements, divided by the number of years between measurements. PAI is an approximation to current annual increment, which is not directly measurable.

petroleum shows . . . . . A visual appearance of hydrocarbon (gas, oil, asphalt, etc.) in an exploration well, water well, coal prospect, natural spring, or seep.

petroleum system . . . . . A relationship of source rock and the resulting petroleum accumulation.

physiographic province . . . . . A region of the landscape with distinctive geographical and biological features. When physiographic provinces subdivide sustained yield units (i.e., BLM districts), assessment areas are created.

plan conformance . . . . . The determination that a management action is consistent with the terms, conditions, decisions, and is within the anticipated environmental consequences, of an approved resource management plan.

plant communities. . . . . A group of populations that coexist in space and time and interact with one another (conifer and hardwood forest lands, oak woodlands, juniper woodlands and rangelands, chaparral, shrub-steppe lands, grasslands, serpentine, riparian vegetation, cliffs, rock outcrops, talus and overslopes, dune systems, meadows, wetlands, springs, fens, ponds, and vernal pools).

play . . . . . The existence of a trap that is detectable with geological, geophysical, or geochemical technology.

point source . . . . . An origin of water or air pollutants that is readily identified, such as the discharge or runoff from an individual industrial plant or cattle feedlot. Also see nonpoint source.

precommercial thinning (PCT). . . . . The practice of reducing the density of trees within a stand by manual cutting, girdling, or herbicides to promote growth increases or maintain growth rates of desirable tree species. The trees killed are generally unmerchantable and retained on the treated area.

preferred alternative . . . . . A National Environmental Policy Act term that denotes the alternative in a draft Environmental Impact Statement that is preferred by the proposing agency.

progeny test site . . . . . A test area for evaluating parent seed trees by comparing the growth of their offspring seedlings.

proper functioning condition . . . . . The state of a riparian wetland area having the vegetation, landform, and large woody debris that are necessary for the species, habitat, and natural processes of an area.

prospect . . . . . A drillable trap that is located within a play.

public domain lands . . . . . Original holdings of the United States that were never granted or conveyed to other jurisdictions or never reacquired by exchange for other public domain lands.

public land . . . . . Land that is owned and controlled by some governmental entity (federal, state, county, or other municipality).

quadratic mean diameter . . . . . The average diameter, at breast height, of the tree that is of average basal area in a stand. Also see basal area and diameter breast height.

reclamation. . . . . Land treatment to "bring back" vegetation or functions of the land that minimize water degradation, damage to aquatic life or wildlife, flooding, erosion, and other adverse effects from surface mining operations. The process may involve backfilling, grading, resoiling, revegetation, decompaction, stabilization, or other measures.

record of decision (ROD). . . . . A document required by the National Environmental Policy Act, that is separate from, but associated with, an environmental impact statement. The ROD publicly and officially discloses the responsible official's decision on which alternative assessed in the EIS will be implemented.

recovery plan . . . . . A plan for the conservation and survival of an endangered species or a threatened species listed under the Endangered Species Act for the purpose of improving the status of the species to the point where listing is no longer required.

recruitment habitat . . . . . A stand that is capable of becoming habitat for a designated species within a designated period of time.

regeneration . . . . . (n.) Tree seedlings or saplings existing in a stand. (v.) The process of re-establishing trees on a tract of forest land where harvest or some natural event has removed the existing trees.

regeneration harvesting . . . . . Any removal of trees intended to assist regeneration already present or make regeneration possible.

relative density. . . . . A means of describing the level of competition among trees or site occupancy in a stand, relative to some theoretical maximum that is based on tree size and species composition. Relative density is determined mathematically by dividing the stand basal area by the square root of the quadratic mean diameter. Also see basal area and quadratic mean diameter.

replacement habitat. . . . . A stand of equivalent habitat value to a designated species that is made available as a replacement for habitat that is lost within the same population boundary.

resource management plan (RMP). . . . . A BLM planning document, prepared in accordance with Section 202 of the Federal Land Policy and Management Act that presents systematic guidelines for making resource management decisions for a resource area. An RMP is based on an analysis of an area's resources, their existing management, and their capability for alternative uses. RMPs are issue oriented and developed by an interdisciplinary team with public participation. Also see adaptive management.

restoration . . . . . Land treatments intended to bring back a former condition or function.

riparian area . . . . . A geographic area containing an aquatic ecosystem and adjacent upland areas that directly affect it. This includes floodplains, woodlands, and all areas within a horizontal distance of approximately 100 feet from the normal line of high water of a stream channel or from the shoreline of a standing body of water.

road decommissioning . . . . . Stabilization of unneeded or low use roads. Depending on the restoration objective, the series of actions may involve one or several of the following: closure, restoring natural stream crossings and self-maintaining road surface drainage, erosion control, and vegetative treatments (planting), surface decompaction, and sidecast pullback or road obliteration.

road improvement . . . . . Activities on an existing road that improves its original design standard. A typical improvement would add culverts and/or crushed aggregate to a natural dirt surface road.

road obliteration . . . . . Removing a roadbed back from the landscape and restoring the natural topography.

road pullback . . . . . Removal of unstable fill materials placed on the outside edge of the road prism.

road stormproofing . . . . . Road surface work that upgrades drainage condition on roads that will remain open for travel, but will receive infrequent maintenance. Measures intended to prevent and control erosion and sediment delivery into stream channels, and reduce risk of road failure.

rotation . . . . . The planned number of years between establishment of a forest stand and its regeneration harvest.

salmonid . . . . . Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Includes species such as salmon and steelhead. Also see anadromous fish.

salvage cutting . . . . . Removal of dead trees or of trees damaged or dying because of injurious agents other than competition, to recover economic value that would otherwise be lost.

seed orchard . . . . . A plantation of clones or seedlings from selected trees; isolated to reduce pollination from outside sources, weeded of undesirables, and cultured for early and abundant production of seed.

sedimentary basin . . . . . A geologic structural downwarp that has been filled with eroded rock from surrounding uplands. Both marine (filled with sediment deposited in oceans) and terrestrial (filled with inflowing rivers) basins exist.

selection cutting. . . . . A method of uneven-aged management involving the harvesting of single trees from stands (single-tree selection) or in groups up to four (4) acres in size (group selection) without harvesting the entire stand at any one time.

shelterwood cutting . . . . . A regeneration method under an even-aged silvicultural system. With this method a portion of the mature stand is retained as a source of seed and/or protection during the regeneration period. The retained trees are usually removed in one or more cuttings.

short term . . . . . A period of time used as an analytical timeframe and that is within the first 10 years of the implementation of a resource management plan. Also see long term.

silvicultural prescription . . . . . A planned series of treatments designed to change current stand structure to one that meets management goals.

silvicultural system . . . . . A planned series of treatments for tending, harvesting, and re-establishing a stand. The system name is based on the number of age classes managed within a stand (e.g., even- aged, two-aged, uneven-aged).

single-tree selection harvest . . . . . See selection cutting.

site class . . . . . A classification of an area's relative productive capacity for tree growth; commonly expressed in terms of the heights of the largest trees in a stand at a common "index" age, usually 50 or 100 years-old. Site classes are numbered from 1 (most productive) to 5 (least productive).

site potential tree height . . . . . The average maximum height of the tallest dominant trees (200 years or older) for a given site class. Also see site class.

snag . . . . . Any standing (upright) dead tree.

sold timber sale . . . . . A timber sale for which a qualified purchaser has been established, through auction or negotiation, but where the BLM has yet to approve and consummate the timber sale contract. See awarded timber sales.

source water watershed . . . . . A watershed area providing untreated water, used for drinking water.

special forest products . . . . . Those plant and fungi resources that are harvested, gathered, or collected by permit, and have social, economical, or spiritual value. Common examples include mushrooms, firewood, Christmas trees, tree burls, edibles and medicinals, mosses and lichens, floral and greenery, and seeds and cones, but not soil, rocks, fossils, insects, animal parts, or any timber products of commercial value.

special status species . . . . . Those species that are listed under the Endangered Species Act as threatened or endangered (including proposed and candidate species); listed by a state as threatened, endangered or candidate species; and listed by the BLM as sensitive species. Under the BLM Special Status Species policy (BLM 6840), the BLM State Director has created an additional category called Bureau Strategic Species (see glossary Bureau strategic species).

stand . . . . . An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.

stand establishment stage . . . . . The developmental stage extending from stand initiation until stands have reached canopy closure and density-dependent tree mortality begins.

standards and guidelines . . . . . Northwest Forest Plan rules for managing the different land use allocations. For the purpose of the final environmental impact statement, this term applies only to the No Action Alternative.

stream, intermittent . . . . . Drainage feature with a dry period, normally for three months or more, where the action of flowing water forms a channel with well-defined bed and banks, supporting bed-forms showing annual scour or deposition, within a continuous channel network.

stream order . . . . . A classification system used to define stream size; based on the hierarchy of tributaries principle. Working downstream from the upper extent of stream channels in a watershed, two unbranched first-order stream channels join to from a second order, and two like second orders join to form a third order, and so on.

stream, perennial . . . . . Permanent channel drainage feature with varying but continuous year-round discharge, where the base level is at or below the water table.

structurally complex stage . . . . . Stage at which stands develop characteristics approximating "old-growth" stands described in many analyses associated with the Northwest Forest Plan.

structural legacies . . . . . The large trees, down logs, snags, and other components of a forest stand that are left after harvesting for the purpose of maintaining site productivity and providing structures and ecological functions in subsequent stands.

structural stage classifications of forests . . . . . A scheme used to define the structural stages of forests. It uses four broad classifications (stand establishment, young, mature, and structurally complex) and multiple subclassifications to distinguish differences within classifications.

stumpage . . . . . The price paid for timber on the stump. A timber purchaser pays stumpage to the BLM and then incurs the cost of logging and hauling the logs to the mill.

suitable habitat . . . . . A stand that has the structures (physical and biological features) necessary to meet the biological requirements of a particular species.

sustainability . . . . . Sustainability can be defined as using, developing, and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic and community objectives.

sustained yield . . . . . The volume of timber that a forest can produce continuously at a given intensity of management; the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources without impairment of the productivity of the land.

sustained yield capacity . . . . . The volume of timber that can be offered for sale each year from an area based upon the consistent volume of timber that a forest can produce continuously. Also see annual productive capacity.

sustained yield unit . . . . . A BLM district.

take . . . . . An Endangered Species Act term that denotes the act of or the attempt to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a species listed as threatened or endangered. Also see incidental take.

terrain . . . . . A tract or region of the earth's surface or grouping of rock considered as a separate physical feature.

thinning . . . . . A silvicultural treatment made to reduce the density of trees primarily to improve tree/stand growth and vigor, and/or recover potential mortality of trees, generally for commodity use. Also see density management, precommercial thinning, and commercial thinning.

timber . . . . . Forest crops or stands, or wood that is harvested from forests and is of a character and quality suitable for manufacture into lumber and other wood products rather than for use as fuel.

timberland . . . . . Forested land capable of producing crops of industrial wood at a rate of at least 20 cubic feet/acre per year and is not withdrawn from timber production. (Some forest lands are not classified by the FIA [U.S. Forest Service Inventory and Analysis] as timberland because they are either unproductive or by law are off limits to harvesting [e.g., national parks and wildernesses]).

timber production capability classification (TPCC) . . . . . An analytical tool that inventories and identifies sites as capable of sustaining intensive timber management without it degrading their productive capacity. This tool evaluates a site's soil depth, available moisture, slope, drainage, and stability to determine site capacity for timber management activity. Sites that prove incapable of sustaining intensive timber management are typically not included in the harvest land base. Also see harvest land base.

trap . . . . . A geologic structure that allows petroleum to accumulate and be preserved.

two-aged stand. . . . . A stand of trees comprised of two distinct age classes separated in age by more than ± 20% of rotation.

two-aged system . . . . . A silvicultural system that regenerates and maintains stands with two age classes. The resulting stand may be two-aged, or trend towards an uneven-aged condition as a consequence of both an extended period of regeneration establishment and the retention of reserve (green live) trees that may represent one or more age classes.

understory . . . . . Portion of trees or other woody vegetation that forms the lower layer in a forest stand, and that consists of more than one distinct layer.

uneven-aged management . . . . . A combination of actions that simultaneously maintains continuous tall forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes.

uneven-aged stand . . . . . A stand with three or more distinct age classes, either intimately mixed or in small groups.

United States Fish and Wildlife Service (USFWS) . . . . . A federal agency under the United States Department of the Interior that is responsible for working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats.

United States Forest Service (USFS) . . . . . A federal agency under the United States Department of Agriculture that is responsible for administration of the nation's national forests.

variable-density thinning (VDT) . . . . . A thinning method where two or more densities of retained trees are used to promote stand heterogeneity through the development of multi-layered canopies. Provision of conditions conducive to the initiation and growth of regeneration is often an objective of VDT to encourage understory development.

variable-retention harvest system . . . . . An approach to harvesting that is based on retaining structural elements or biological legacies (trees, snags, logs, etc.) from the harvested stand for integration into the new stand to achieve various ecological objectives. Note: The major variables in variable retention harvest systems are types, densities, and spatial arrangement of retained structures: 1) aggregated retention is retention of structures as (typically) small intact forest patches within the harvest unit; 2) dispersed retention is retention of structures or biological legacies in a dispersed or uniform manner.

watershed . . . . . All of the land and water within the boundaries of a drainage area that are separated by land ridges from other drainage areas. Larger watersheds can contain smaller watersheds that all ultimately flow their surface water to a common point. Also see fifth- field watershed and key watershed.

wetland (jurisdictional) . . . . . A wetland determination, using the Army Corps of Engineers current interagency rules, based on presence of defined wetland vegetation, soils and hydrology.

wetland (natural) . . . . . Unaltered land with natural presence and duration of water, sufficient to support wetland vegetation

wildfire . . . . . Any nonstructural fire, other than prescribed burns, that occurs on wildland.

wildfire, uncharacteristic . . . . . A wildfire that burns with unusual intensity and size. They are a particular concern in drier ecosystems such as sagebrush-grasslands, dry Douglas-fir, dry grand fir and ponderosa pine forests in the West where combustible fuels have accumulated.

wildland . . . . . Lands that are not dedicated to such uses as agricultural, urban, mining, or parks.

wildland/urban interface . . . . . The area in which structures and other human development and intermingle with undeveloped wildland.

windthrow . . . . . A tree or trees uprooted or felled by the wind.

young stage. . . . . Characterized by the predominance of density-dependent tree mortality and, in high density stands, a small range of tree diameters.

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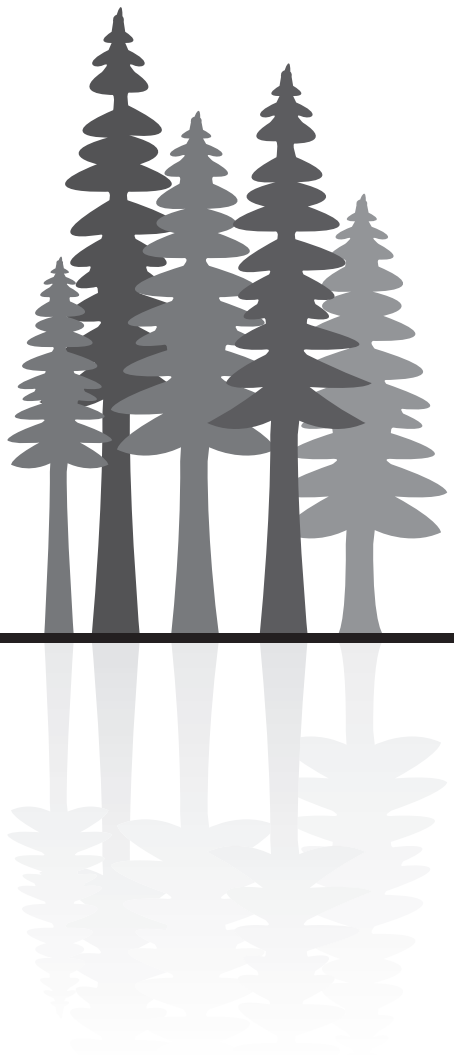

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