



Cultural Resources

Key Point

Cultural and paleontological sites are not evenly distributed across the districts, but natural features and historic resource use is used to predict the majority of site locations prior to ground disturbance.

Cultural and paleontological resources are nonrenewable and typically consist of physical remains. Some traditional use sites and some historic sites may only be identified through written historic records or oral traditional sources and may not have physical remains. Collectively, these resources can be called heritage resources. See *Table 3-84 (Heritage resources by district)*.

Cultural resource locations are identified as:

- sites (locations of a significant event, a prehistoric or historic occupation or activity, or a building or structure); or
- isolated finds (locations with fewer than 10 artifacts).

Cultural sites may be prehistoric, historic, or both. Sites may be entirely buried, consist of above-ground or built features only (particularly historic sites), include archeological remains, or consist of features that are not native or natural to the specific environment. For example, non-native features such as domestic fruit trees and a clearing may be the only remaining evidence of a homestead site.

Types of Cultural Resource Sites

The types of cultural resource sites include lithic scatters and other prehistoric sites, historic sites, paleontological sites, and traditional use sites.

- Lithic scatters account for at least 80% of the prehistoric sites within the planning area. Lithic scatters are sites that consist primarily of flakes and chipped stone tools.

TABLE 3-84. HERITAGE RESOURCES BY DISTRICT

| Heritage Resources | BLM Districts | | | | | |
|---|---------------|--------|----------|----------|---------|-----------------------|
| | Salem | Eugene | Roseburg | Coos Bay | Medford | Klamath Falls |
| Archaeological sites ^a | 58 | 89 | 223 | 47 | 357 | 1131 ^c |
| Historic sites ^b | 142 | 7 | 23 | 45 | 711 | 10 ^c |
| National Register of Historic Places (eligible) | 7 | 2 | 45 | 5 | 130 | 0 ^d |
| National Register of Historic Places (listed) | 4 | 0 | 2 | 1 | 26 | 0 ^d |
| Percent of district inventoried | 25 | 4 | 15 | 10 | 7 | 50 |
| Paleontological sites | 6 | 1 | 18 | 19 | 2 | Isolated ^e |

^aSites that contain either or both prehistoric and historic surface and subsurface deposits.

^bSites with historic structural remains.

^c207 sites incorrectly included in Draft EIS as historic; corrected to archaeological on this table.

^dNo formal determinations have been conducted.

^eA location of fewer than 10 fossilized pieces.



- Other categories of prehistoric sites recorded within the planning area include rock shelters, middens, middens with structural features, rock art, rock features, lithic quarries, house pits, and peeled trees. Human burial sites may occur either as individual sites or as features within larger sites (e.g., middens and housepit villages). Stacked rock hunting blinds and rock ring villages are contained in the Klamath Falls Resource Area of the Lakeview District. Stacked rock cairns in the Klamath Falls Resource Area are often associated with Native American vision quests.
- Historic sites within the planning area are predominantly associated with the following activities:
 - homesteading, ranching, and settlement
 - logging
 - fire suppression
 - mining
 - subsistence living
 - government management of the land
- Paleontological sites consist of the physical remains of past animal or plant life in the form of fossils. Paleontological sites are uncommon within the planning area. With the exception of fish, the known sites do not include vertebrate fossil remains but consist of invertebrate marine and plant species.
- Traditional use sites play a current role in a living community's historically rooted beliefs, customs, and practices. Traditional use sites within the planning area include areas where traditional resources (food resources, basket making resources, and other traditional material sites) are collected, spiritual locations, and sacred sites. Two of the federally recognized Indian tribes within the planning area (the Confederated Tribes of the Warm Springs Reservation of Oregon and the Klamath Tribes, Oregon) have off-reservation treaty rights. The Klamath Tribes, Oregon rights, apply to their former reservation boundaries of which 185 acres lie in the wetlands of the Wood River in Klamath Falls Resource Area. Members of the Confederated Tribes of the Warm Springs Reservation of Oregon exercise their off-reservation rights within the planning area (west of the Cascade crest into the Portland basin and extending south into the northeast reaches of the Eugene District). Trust responsibility directly applies to proposed agency actions that could pose an effect on tribal lands and resources (e.g., water quality, air quality, or fire control).

Locations of Cultural Sites

Prehistoric Sites

West Slopes of the Cascade Mountains – Willamette Province

The majority of prehistoric archaeological sites on property administered by the BLM on the west slopes of the Cascades are situated in predictable locations. Sites are situated along the crests of major ridge systems, often within saddles. Sites occur on river and stream terraces and on upland slump benches and meadows. Sites are also commonly situated on lower reaches of east, south and west aspect slopes within 400 to 500 feet upslope from the boundary between the hill slope and the valley floor of larger secondary streams such as the Mohawk River, the Molalla River, or Fall Creek. Quarry sites occur on slopes.

Ridgeline sites are the most scattered because their locations are strongly associated with saddles that are limited in number and distribution. Not all ridgeline saddles contain archaeological sites. Sites within this location category have a density of one or two per linear mile of ridgeline. Valley margin sites have much higher densities with as many as 14 sites recorded within a single 500-acre tract, for an average density of approximately one site per 37 acres. However, site distribution in this setting is often much more concentrated with as many as six discrete artifact clusters in a 40-acre tract.



Properties administered by the BLM Salem and Eugene Districts, with some notable exceptions, are absent from valley floors of all but the most minor streams. The Roseburg District manages a larger number of acres on river and stream terraces than either Salem or Eugene Districts.

Coast Range

There are only 12 recorded prehistoric archaeological sites located on land administered by the BLM in the Coast Range. The paucity of prehistoric archaeological sites in the Coast Range is attested to by numerous pre-project cultural resource surveys conducted between 1975 and 1992, and by post-project surveys completed between 1992 and the present. The few known sites do not provide enough information to identify high probability topographic settings for site occurrence. Two sites are along a high bald ridgeline, two others are on terraces adjacent to a mountain spring, one is on a grassy bald, and four are on terraces adjacent to major rivers. Sites found on private ownerships indicate that sites occur on terraces along major rivers such as the Alsea and Siuslaw.

The scarcity of known prehistoric sites on BLM-administered land in the Coast Range is at least in part due to the history of BLM land tenure in the Coast Range. Most of the land administered by the BLM is revested O&C Railroad (and Coos Bay Wagon Road) parcels. The steep mid-slope locations of these lands largely preclude habitation areas. In contrast, early homesteading focused on largely flat valley floor and river/stream terrace areas, places where prehistoric habitation is much more likely. Today, these flat areas where prehistoric sites may occur in larger numbers largely remain in private ownership.

Siskiyou Mountains

Known prehistoric sites are located in the vicinity of permanent springs, as well as along river/stream terraces. The underlying serpentine bedrock includes pockets of high quality rock that was used prehistorically for tool production. At least one excavated site on BLM-administered land is located on a small mid-slope terrace with access to tool-making raw materials. Other prehistoric sites on BLM-administered land are found along ridge tops. Availability of water was a greater factor in choosing prehistoric habitation site locations in the Siskiyou Mountains than in either the Coast Range or West Cascades, particularly during the fall acorn harvest.

Known prehistoric site density appears higher in this region than in the Coast Range, although the scattered nature of BLM parcels and surveyed areas limits meaningful quantitative measurement.

Medford

Slope is a prominent factor in the location of prehistoric sites in the Medford District. Slope greater than 35% is associated with a low incidence of prehistoric site occurrence. Other factors include proximity to water and presence of culturally important geologic resources such as tool stone.

Coastal Shelf

The BLM manages scattered parcels within the Oregon Coastal Shelf, which is the area between the Pacific Ocean and Coast Range and the Siskiyou Mountain foothills. This north-south corridor has seen substantial historic settlement and infrastructure development, second only to the central valley (Willamette, Umpqua and Rogue River valleys), and this development has adversely affected preservation of prehistoric cultural resources. Prehistoric resources are most obvious in the form of shell middens. However, many coastal prehistoric sites also contain a non-shell component. Shell middens are associated with stable camps and villages, as well as resource acquisition locations. Prehistoric residents of the coastal shelf also ventured far inland to acquire resources, so “coastal-type” prehistoric sites can be found relatively far upstream along major rivers and at other resource acquisition locations. Several BLM-managed prehistoric sites on the Coastal Shelf have been determined eligible for listing on the National Register of Historic Places.



Klamath Falls Resource Area

Prehistoric cultural resource occurrence reflects a mix of two physiographic provinces—Basin and Range and High Cascades. Cultural influences from California, the Plateau, and the Great Basin are manifest in the assemblages found within sites. Sites tend to be near water sources, within areas affording unobstructed views to prominent landscape features (Mt. Shasta, Mt. McLoughlin, Yainax Butte, Bryant Mountain, etc.), along ridgelines, and adjacent to rock outcrops.

The Klamath River Canyon contains some of the oldest and most significant prehistoric sites known for the Klamath Falls Resource Area. Historic era ranch/homestead sites and logging-related sites are also present throughout the canyon. Many of these sites are on private property, although nearly 30 sites are known to exist on BLM-administered land. This area appears to have been a transition area between the Klamath Indians to the north and the Shasta Indians to the south. Both groups are known to have utilized abundant resources of the canyon over the last several millennia.

The Gerber Block, located in the eastern portion of the Klamath Falls Resource Area, contains the vast majority of known archaeological sites in the resource area. The Modoc Indians were known to utilize this area for hunting as well as gathering. Numerous village sites, lithic and groundstone artifact scatters, and rock cairn sites have been documented in this area.

Historic Sites

Historic site distribution differs from that of prehistoric sites. The majority of historic sites consist of the remains of features constructed as temporary or permanent residences or transportation features for: homesteading or to obtain timber, minerals and other commodity resources; early fire protection activities; or government resource management purposes. Historic sites often contain significant prehistoric cultural resources as well. Homesteading and settlement, logging, and transportation-related sites are found generally in the Cascades, Coast Range, and Siskiyou Mountains. Mining-related sites occur very specifically in relation to economically valuable mineral deposits.

Historic sites occur in various locations including alongside drainages, along ridgelines and on peaks, in and around meadows and wetlands, and along stream terraces. Slope is not a reliable predictor for historic site occurrence, particularly those associated with logging or mining. The presence of geologic resources such as precious metal, however, is a reliable predictor for mining sites. Historic access features (e.g., roads, trails and railroad grades) have often been built over into the current transportation network. A few remnants of historic transportation routes do remain, often as short sections that were not used when more modern transportation roads were constructed.

Few historic structures from the first settlement activities (mid-19th through the early-20th century) can still be found standing. Historic sites representing early settlement activities appear to be more frequent in the Cascades and Siskiyou Mountains than in the Coast Range for several reasons. The Willamette Valley was the destination of Oregon's earliest settlers and, in historic times, was always the most densely populated area in the state relative to other regions. Early settlement of the most agriculturally productive land in the Willamette Valley resulted in later-arriving settlers seeking homesteads along Willamette Valley margins and tributaries and claiming lands that often could not be successfully farmed. Repeated efforts following economic boom and bust cycles in the Willamette Valley led to short-term homesteading or to subsistence living attempts in the Willamette uplands, which have left some cultural remains visible today. Historic site frequency probably was higher in the Siskiyou Mountains, as farming and ranching activities were more easily undertaken in this more open environment. Weather in this more southern environment preserves structural remains longer than in the northern areas and in the Coast Range. To some extent in the Cascade Range and to a greater extent in the Siskiyou Mountains, remaining sites are more visible than in the Coast Range, due to the open vegetation.



Across the historically timbered western regions of Oregon, remnants of early logging activity can still be seen (e.g., logging sleds and springboard cuts in remaining stumps), although these are usually badly deteriorated. Remnants of post-World War II logging are most common and include abandoned machinery, cables, campsites, and garbage dumps. These historic cultural remains can be found wherever previous logging took place and are not limited to flat areas or to locations near modern roads.

Early historic settlement activities focused on portions of the coastal shelf, and although BLM-administered parcels compose a relatively small fraction of this area, important historic sites are located on BLM land. These include several on the National Register of Historic Places. Throughout historic times, the U.S. Government made improvements on coastal headlands for military purposes and shipping safety. Many parcels that were withdrawn by the government for these missions may revert to the BLM after their required use is completed.

Paleontological Sites

Although rare within the planning area, paleontological resources have been found in the sedimentary rock that exists on all districts.

Traditional Use Sites

Identification of traditional use sites cannot be effectively accomplished without the help of recognized tribal governments and other traditional groups who currently use the sites for traditional practices.

The Confederated Tribes of the Warm Springs Reservation of Oregon and Klamath Tribes, Oregon have reserved treaty rights within specific and defined portions of the planning area. Other recognized tribes also have traditional areas and resources of concern within the planning area. A list of tribes with interests within the planning area is included in *Appendix O - Federally Recognized Indian Tribes With Interests in the Planning Area*.

Cultural Resource Significance and Management Category Criteria

After being identified, cultural sites are evaluated and managed according to two different sets of criteria:

- **Eligibility criteria of the National Register of Historic Places.** Eligibility for listing on the National Register of Historic Places is assessed using criteria that addresses site integrity and considers factors that include uniqueness, research potential in the study of history or prehistory, and association with important events or persons that have made contributions to the broad patterns of history. The first element addressed in the National Register of Historic Places significance criteria is site integrity.
- **Criteria of the management use categories of the BLM** (BLM Manual Section 8110.42). Six BLM management use categories (scientific use, conservation for future use, traditional use, public use, experimental use, and discharged from management) are employed to provide for site protection and use standards. Although some scientific and experimental uses result in physical alteration of resources, the uses generally do not imply consumptive use. Managed use of cultural resources can be fully compatible with long-term preservation and also provide the means by which preservation is achieved.

The importance of identified traditional use sites and resources is determined in consultation with federally recognized tribal governments.



Lands, Realty, Access, and Transportation

Key Points

- There has been limited activity in acquisition of lands by purchase under Zone 1. The majority of BLM-administered lands within the plan area is Zone 2 (suitable for exchange), and approximately 55,000 acres are in Zone 3 (suitable for disposal).
- There are 70 communication sites on BLM lands in the planning area.
- The BLM lands are generally available for rights-of-way. The majority of rights-of-way in western Oregon are for logging roads. Some rights-of-way are for access and utilities to private lands due to the checkerboard ownership pattern of BLM lands intermingled with private lands.
- Most legal access to federal and nonfederal timberlands is provided through long-term or perpetual reciprocal right-of-way agreements. An estimated 80% of public land within the planning area is available for road construction and use under reciprocal right-of-way agreements.
- The BLM controls about 14,000 miles of road within the planning area.

Lands and Realty

Land use plans use land tenure zones to identify lands that are available for retention, proposed disposal, or acquisition. The factors considered in evaluating opportunities for the disposal or acquisition of lands can be found in *Appendix P - Lands, Realty, Access, and Transportation*.

The three land tenure zones identify lands as follows:

- Zone 1 - retention and acquisition
- Zone 2 - exchange and consolidation
- Zone 3 - disposal

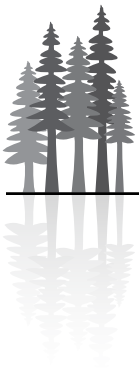
For the acreage of the land tenure zones under the current Resource Management Plans for the six districts within the planning area, see *Table 3-85 (Acres of existing land tenure zones by district)*. Existing Resource Management Plans contain detailed lists of the parcels.

There has been limited activity in the acquisition of lands by purchase under Zone 1. Ongoing land acquisition projects include the Sandy River/Oregon National Historical Trail (Salem District) and the Susan Creek Recreation Area (Roseburg District).

TABLE 3-85. ACRES OF EXISTING LAND TENURE ZONES BY DISTRICT

| BLM District | Zone 1 | Zone 2 | Zone 3 |
|--|----------------|------------------|---------------|
| Salem | 160,200 | 228,000 | 9,900 |
| Eugene | 78,175 | 238,398 | 36 |
| Roseburg | 35,930 | 380,989 | 13,352 |
| Coos Bay | 4,600 | 324,000 | 1,100 |
| Medford | 292,100 | 558,600 | 7,600 |
| Klamath Falls Resource Area (Lakeview District) | 186,000 | 3,000 | 23,000 |
| Total acres per zone | 757,005 | 1,732,987 | 54,988 |

Source: Current RMPs for the six BLM districts within the planning area (USDI BLM 1994a, b, c, d, e, and f)



The majority of BLM-administered land within the planning area is identified as Zone 2 (suitable for exchange). Land exchanges, as a method of adjusting land tenure, have had limited use in the support of resource management programs. Land exchanges have become extremely controversial and difficult to complete. Most land exchanges and transfer activities within the planning area were directed by federal legislation rather than by a discretionary agency action. Ongoing land exchange projects include the Berry Rock Land Exchange (Medford District).

There are 54,988 acres of BLM-administered land within the planning area that are designated as Zone 3 (suitable for disposal). There have been 2,186 acres sold to date since implementation of the 1994 district RMPs. These lands were sold primarily to resolve unintentional occupancy trespass cases. Lands identified for sale are not sold if project-level reviews show conflicts with the land tenure adjustment criteria.

Section 3 of the Oregon Public Lands Transfer and Protection Act (Public Law 105-321, dated October 23, 1998) established a “no net loss” requirement for lands administered by the BLM in western Oregon. The Act requires that, when selling, purchasing, or exchanging land, the BLM may not:

- reduce the total acres of the Oregon and California Railroad Grant (O&C) lands or the Coos Bay Wagon Road (CBWR) lands.
- reduce the number of acres of O&C, CBWR, and public domain lands that are available for timber harvesting.

The Act requires the BLM to ensure a no net loss of acres on a 10-year basis beginning on the date of enactment and each 10-year period thereafter. To date, the BLM in western Oregon shows a surplus of 50 acres of O&C land and a deficit of 63 acres of harvestable timber land. There has been a general decline in the use of land sales or land exchanges in western Oregon as methods of adjusting land tenure since the enactment of this law.

Withdrawals generally segregate land from operations under the nondiscretionary general land laws, mining laws, and sometimes the mineral leasing laws, but do not always affect BLM surface management. Classifications generally segregate the lands from all forms of appropriation under the public land laws, including the mining laws, but not the mineral leasing laws.

There are 70 communication sites on BLM-administered land within the planning area. Several sites have multiple authorized users or uses, including two-way, microwave, and low power relay. These uses are generally compatible on the same site. Mass media users with associated high power transmissions are generally not compatible with existing low power uses on these developed sites.

Access

The BLM-administered land is generally available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in resource management plans. Numerous types of rights-of-way have been authorized by the BLM, including:

- state highways
- county roads
- private access roads
- trails
- power transmission lines
- electric distribution and service lines
- telephone and cable television lines
- railroads
- water pipelines and reservoirs
- canals
- federal highway material sites
- communication sites
- oil and gas pipelines
- bicycle paths



The checkerboard land ownership pattern of the O&C lands generates most of the need to cross public lands in order to provide access and utilities to intermingled private lands. New right-of-way proposals across public lands are likely to continue in the future. The location and nature of such proposals is generally not known until an application is received by the BLM.

Major existing right-of-way corridors within the planning area are shown in *Map 2-6 (Utility corridors)* in *Chapter 2*. Existing facilities located within right-of-way corridors include Bonneville Power Administration and private electric transmission lines, pipelines, fiber-optic lines, and transportation infrastructure.

A programmatic environmental impact statement to designate corridors for oil, gas, and hydrogen pipelines, and electricity transmission and distribution facilities on federal lands in 11 western states is currently underway by the Department of Energy. After the environmental impact statement is completed, the BLM will amend relevant land use plans, as necessary, to implement any new energy transmission and distribution corridor designations. The project currently includes the Salem, Eugene, Roseburg, Medford, and Lakeview Districts.

The proposed Jordan Cove Energy Liquid Natural Gas Terminal and Pacific Connector Gas Pipeline project would include an approximately 223-mile-long, 36-inch-diameter natural gas pipeline extending from a new terminal in Coos Bay south-eastward across Coos, Douglas, Jackson, and Klamath Counties in Oregon to an interconnection with an existing pipeline near Malin, Oregon. The proposed route extends across 40 miles of BLM-administered land in the Roseburg, Coos Bay, Medford, and Lakeview Districts. The Federal Energy Regulatory Commission will prepare an environmental impact statement to address the environmental consequences of the project. The final environmental impact statement is scheduled to be completed in 2008.

The proposed Palomar Gas Pipeline project would include an approximately 220-mile-long, 36-inch-diameter natural gas pipeline extending from an existing mainline in Wasco County, Oregon to a delivery point near Molalla, Oregon in Clackamas County, and from there to a proposed Liquefied Natural Gas terminal near Bradwood in Clatsop County, Oregon. The proposed route extends across less than 2 miles of BLM-administered land in the Salem District. The Federal Energy Regulatory Commission will prepare an environmental impact statement to address the environmental consequences of the project. The final environmental impact statement is scheduled to be completed in 2009.

The proposed Ruby Pipeline project would include an approximately 680-mile-long, 42-inch-diameter high pressure natural gas pipeline between the Opal Hub in Lincoln County, Wyoming to the existing mainlines near Malin, Oregon, crossing through the states of Utah, Idaho, and Nevada. The proposed route extends across BLM-administered land in the Lakeview District. The Federal Energy Regulatory Commission will prepare an environmental impact statement to address the environmental consequences of the project. The final environmental impact statement is scheduled to be completed in 2010.

The majority of rights-of-way granted over BLM-administered land in western Oregon are for logging roads. In most cases, other rights-of-way (for such uses as domestic or irrigation waterlines, or utility lines for servicing residences) are authorized within or adjacent to existing road-clearing limits. In addition, there are numerous temporary use permits in effect that authorize other activities on public lands, including:

- apiary (beehive) sites
- agricultural cultivation of small areas
- residential encroachments or other structures pending their removal or long-term authorization
- national guard or military reserve training
- other miscellaneous short-term activities

Leases are issued for land uses involving substantial construction, development, or land improvement. No new permits or leases (under any authority) are allowed for landfills and other waste disposal facilities.



The BLM-administered land within the planning area is predominantly intermingled in a checkerboard pattern with private land. Intermingled nonfederal lands are owned primarily by private timber companies and are managed for commercial timber production. Most of the legal access to the federal and nonfederal timberlands is provided through long-term or perpetual reciprocal right-of-way agreements between the United States and the private timberland owners. Reciprocal right-of-way agreements do not include public access. It is estimated that 80% of the public lands within the planning area are available for road construction and use under reciprocal right-of-way agreements. A reciprocal right-of-way agreement provides the United States and the private landowner with the right to use and construct logging roads on each other's property for forest management and timber removal.

Transportation

The BLM controls approximately 14,000 miles of road within the planning area. Approximately 13,000 miles (about 93%) of BLM roads have some form of surfacing (bituminous, aggregate, or pit run). The primary purpose for development and use of the BLM road system is the transportation of timber. The majority of the BLM road system is authorized for use by intermingled private timberland owners through reciprocal right-of-way agreements and used for transportation of timber harvested from their lands.

Although most BLM roads are not public roads, the BLM road system serves as a means for the public to access public lands for recreational activities where public access rights have been obtained or to provide ingress and egress to residences. The roads of the BLM road system are described by the following functional classifications. For a quantitative comparison of the road types, see *Figure 3-152 (Distribution of functional classifications for BLM roads)*.

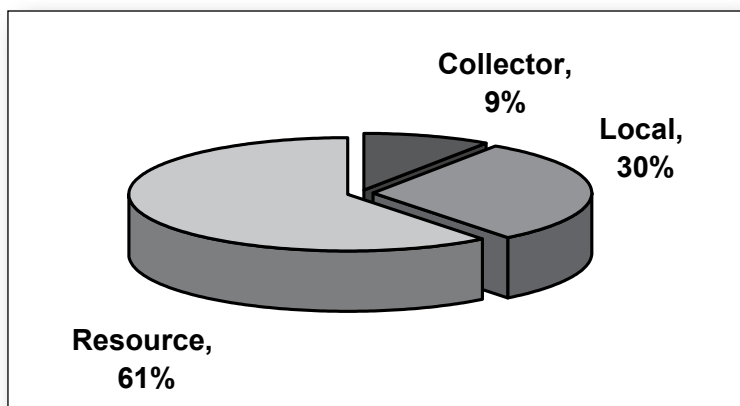
Functional Road Classifications

- **Collector roads.** Those roads that normally provide access to large blocks of public land and connect to state and county road systems.
- **Local roads.** Those roads that primarily provide access to lands that are adjacent to the collector network and serve travel over relatively short distances.
- **Resource roads.** Those roads that are primarily spur roads and provide access for only one or two types of resource management and carry very low traffic volumes.

Road construction standards and maintenance intensity are generally highest on collector roads and lowest on resource roads.

Transportation management includes development of a transportation management plan, reduction of road density, and maintenance of the road system to meet the needs of resource programs. A transportation management plan for western Oregon was developed in 1996 and updated in 2002 (USDI BLM 2002). The BLM has decommissioned approximately 590 miles of road over the past 10 years. Additional miles

FIGURE 3-152. DISTRIBUTION OF FUNCTIONAL CLASSIFICATIONS FOR BLM ROADS





of BLM roads are identified for potential road closure. It is assumed an additional 200 miles would be decommissioned over the next 10 years. The BLM’s contractual obligations in reciprocal right-of-way agreements preclude a substantial reduction in road mileage within fifth-field watersheds.

Maintenance of the BLM road system within the planning area follows guidance in the Western Oregon Transportation Management Plan of 2002 (USDI BLM 2002). Each district develops an annual maintenance operating plan that lists the roads scheduled to be maintained in the current year. Approximately 25% of the BLM road system (3,800 miles) is scheduled to be maintained in any given year. See *Figure 3-153 (Miles of road maintenance)*.

Road maintenance activities include:

- roadside brush removal
- road surface grading and replacement
- pavement maintenance and replacement
- ditch cleaning
- culvert cleaning and replacement
- slough and slide removal

Drainage facilities currently under assessment include:

- 350 bridges
- 500 major culverts (greater than 80 inches in diameter)
- 40,000 minor culverts

Maintenance levels (for the intensity of maintenance) are assigned to BLM roads using a progressive five-level system (1 through 5). Higher maintenance intensity (level 4 or 5) is typically assigned to bituminous or aggregate surface collector roads. Natural surface resource roads receive at least level 1 or 2 maintenance to ensure resource protection. Roads at levels 3, 4 and 5 are maintained on a scheduled basis and may receive more extensive maintenance during periods of short-term increased use for timber hauling.

Table 3-86 (Road functional classification by BLM district within the planning area), Table 3-87 (Road standards by BLM district within the planning area), and Table 3-88 (Road surface type by BLM district) provide information about the current inventory of transportation development on, and to, BLM-administered land within the planning area.

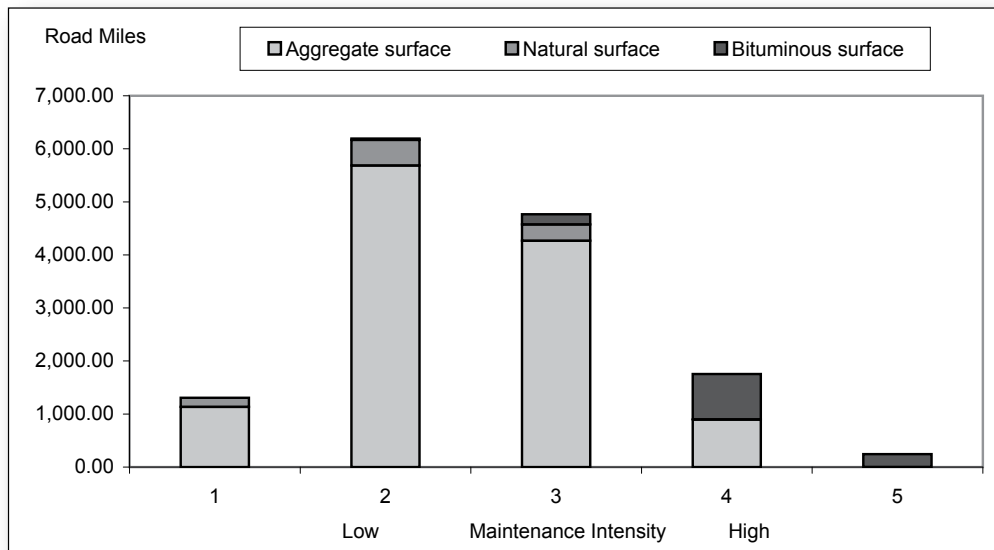


FIGURE 3-153. MILES OF ROAD MAINTENANCE



TABLE 3-86. ROAD FUNCTIONAL CLASSIFICATIONS BY BLM DISTRICT WITHIN THE PLANNING AREA

| Land Control Category | Functional Classifications of Roads (miles) | | | | | Road Totals |
|--|---|--------------|--------------|--------------|--------------|---------------|
| | Arterial | Collector | Local | Resource | Unknown | |
| Salem District | | | | | | |
| BLM controlled | 0 | 219 | 847 | 1,434 | 27 | 2,527 |
| BLM land, no control | 15 | 17 | 75 | 67 | 199 | 373 |
| Salem Totals | 15 | 236 | 922 | 1,501 | 226 | 2,900 |
| Eugene District | | | | | | |
| BLM controlled | 0 | 138 | 1,553 | 350 | 4 | 2,045 |
| BLM land, no control | 34 | 20 | 145 | 45 | 41 | 285 |
| Eugene Totals | 34 | 158 | 1,698 | 395 | 45 | 2,330 |
| Roseburg District | | | | | | |
| BLM controlled | 0 | 372 | 775 | 1,637 | 47 | 2,831 |
| BLM land, no control | 15 | 12 | 109 | 191 | 45 | 372 |
| Roseburg Totals | 15 | 384 | 884 | 1,828 | 92 | 3,203 |
| Coos Bay District | | | | | | |
| BLM controlled | 0 | 227 | 408 | 1,257 | 3 | 1,895 |
| BLM land, no control | 17 | 27 | 59 | 109 | 162 | 374 |
| Coos Bay Totals | 17 | 254 | 467 | 1,366 | 165 | 2,269 |
| Medford District | | | | | | |
| BLM controlled | 0 | 390 | 1,091 | 3,128 | 102 | 4,711 |
| BLM land, no control | 32 | 36 | 72 | 106 | 443 | 689 |
| Medford Totals | 32 | 426 | 1,163 | 3,234 | 545 | 5,400 |
| Klamath Falls Resource Area (Lakeview District) | | | | | | |
| BLM controlled | 2 | 87 | 133 | 143 | 0 | 365 |
| BLM land, no control | 3 | 8 | 150 | 1 | 188 | 350 |
| Klamath Falls Totals | 5 | 95 | 283 | 144 | 188 | 715 |
| Totals (All) | 118 | 1,553 | 5,417 | 8,468 | 1,261 | 16,817 |

TABLE 3-87. ROAD STANDARDS BY BLM DISTRICT WITHIN THE PLANNING AREA

| Land Control Category | Width of Roads (miles) | | | | Road Totals |
|--|------------------------|---------------|---------------|--------------|---------------|
| | Double-Lane | Multiple-Lane | Single-Lane | Unknown | |
| Salem District | | | | | |
| BLM controlled | 23 | 0 | 2,407 | 97 | 2,527 |
| BLM land, no control | 16 | 0 | 136 | 221 | 373 |
| Salem Totals | 39 | 0 | 2,543 | 318 | 2,900 |
| Eugene District | | | | | |
| BLM controlled | 18 | 0 | 1,945 | 82 | 2,045 |
| BLM land, no control | 21 | 0 | 214 | 50 | 285 |
| Eugene Totals | 39 | 0 | 2,159 | 132 | 2,330 |
| Roseburg District | | | | | |
| BLM controlled | 31 | 0 | 2,746 | 54 | 2,831 |
| BLM land, no control | 20 | 1 | 300 | 51 | 372 |
| Roseburg Totals | 51 | 1 | 3,046 | 105 | 3,203 |
| Coos Bay District | | | | | |
| BLM controlled | 60 | 0 | 1,792 | 43 | 1,895 |
| BLM land, no control | 5 | 17 | 182 | 170 | 374 |
| Coos Bay Totals | 65 | 17 | 1,974 | 213 | 2,269 |
| Medford District | | | | | |
| BLM controlled | 25 | 0 | 4,557 | 129 | 4,711 |
| BLM land, no control | 47 | 2 | 192 | 448 | 689 |
| Medford Totals | 72 | 2 | 4,749 | 577 | 5,400 |
| Klamath Falls Resource Area (Lakeview District) | | | | | |
| BLM controlled | 8 | 0 | 312 | 45 | 365 |
| BLM land, no control | 2 | 0 | 26 | 322 | 350 |
| Klamath Falls Totals | 10 | 0 | 338 | 367 | 715 |
| Total (All) | 276 | 20 | 14,809 | 1,712 | 16,817 |



TABLE 3-88. ROAD SURFACE TYPE BY BLM DISTRICT

| Land Control Category | Surface Type of Roads (miles) | | | Road Totals |
|--|-------------------------------|--------------|--------------------|---------------|
| | Aggregate | Bituminous | Natural or Unknown | |
| Salem District | | | | |
| BLM controlled | 2,145 | 139 | 243 | 2,527 |
| BLM land, no control | 134 | 25 | 214 | 373 |
| Salem Totals | 2,279 | 164 | 457 | 2,900 |
| Eugene District | | | | |
| BLM controlled | 1,494 | 224 | 327 | 2,045 |
| BLM land, no control | 174 | 25 | 86 | 285 |
| Eugene Totals | 1,668 | 249 | 413 | 2,330 |
| Roseburg District | | | | |
| BLM controlled | 2,057 | 176 | 598 | 2,831 |
| BLM land, no control | 183 | 8 | 181 | 372 |
| Roseburg Totals | 2,240 | 184 | 779 | 3,203 |
| Coos Bay District | | | | |
| BLM controlled | 1,139 | 414 | 342 | 1,895 |
| BLM land, no control | 111 | 10 | 253 | 374 |
| Coos Bay Totals | 1,250 | 424 | 595 | 2,269 |
| Medford District | | | | |
| BLM controlled | 3,005 | 300 | 1,406 | 4,711 |
| BLM land, no control | 97 | 39 | 553 | 689 |
| Medford Totals | 3,102 | 339 | 1,959 | 5,400 |
| Klamath Falls Resource Area (Lakeview District) | | | | |
| BLM controlled | 150 | 34 | 181 | 365 |
| BLM land, no control | 13 | 3 | 334 | 350 |
| Klamath Falls Totals | 163 | 37 | 515 | 715 |
| Totals (All) | 10,702 | 1,397 | 4,718 | 16,817 |



Energy and Minerals

Key Points

- Most of the lands within the planning area are open to the exploration and development of energy and minerals.
- Fault and trap structures near Mist and the coal-bearing sandstones and siltstones of the Coos Bay Basin contain methane (natural) gas.
- Coastal and ridgeline areas within the planning unit have outstanding potential for wind-driven power generation.
- Approximately 3 to 5% of all mineral materials produced in Oregon come from public lands. Within the planning area, there are about 250 sites that each has the potential to produce between 1,000 and 25,000 tons per year.

Geologic Terrains

The planning area is divided into five geologic terrains including from west to east: Coast Range, Willamette Valley, Cascade Mountains, Klamath, and the Basin and Range. See *Figure 3-154 (Geologic Terrains)*. The unique geologic origin and morphology of each geologic terrain controls their potential for mineral occurrence.

The heavily vegetated Coast Range consists of a long, narrow belt of moderately high mountains and coastal headlands that extend southward from the Columbia River to the Middle Fork of the Coquille River, and westward from the continental shelf inland to the western edge of the Willamette Valley. This area is approximately 200 miles long and 30 to 60 miles wide. The shoreline depositional basins and fault block structures of this terrain (including the southwest coastal coal beds) hold potential for the accumulation of natural gas.

The Willamette Valley geologic terrain extends southward for 130 miles from the Columbia River to about Cottage Grove. This terrain comprises a low land sedimentary catch basin, from 30 to 40 miles wide, with

sub-petroleum structures that lie between the Coast Range and the West Cascades. The valley dips gently from about 400 feet in elevation at its southern end, to near sea level at Portland. It is drained throughout by the northward flowing Willamette River and its tributary systems. Catastrophic melt-water floods during close of the last Ice Age laid down thick deposits of gravels and fine sediments throughout the valley.

Extending from the Columbia River south to California, the complex uplifted and volcanic western and high Cascades separate western Oregon from the High Lava Plains of the Columbia Plateau, and from

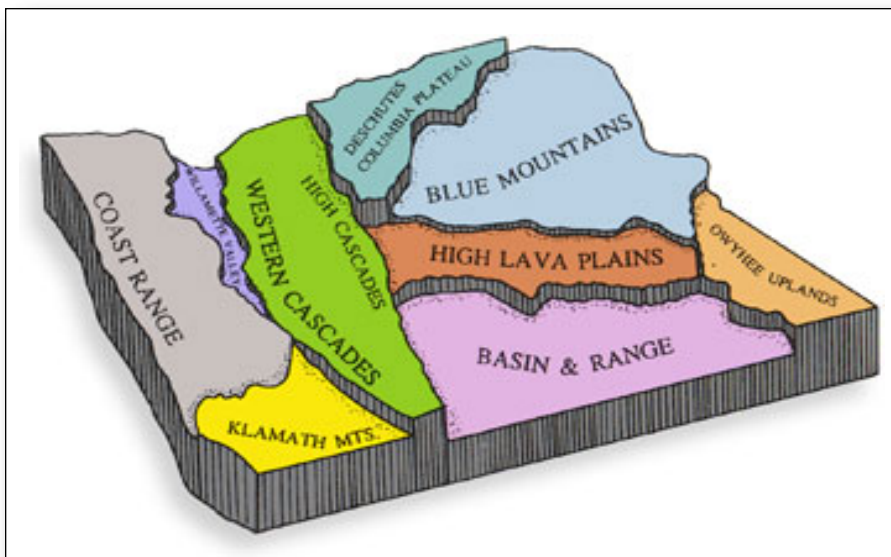


FIGURE 3-154. GEOLOGIC TERRAINS



the Basin and Range geologic terrains to the east. The older, broader, and deeply eroded West Cascades vary in heights from 1,700 feet along the western edge, to 5,800 feet on the eastern margin with the younger snow-capped volcanic peaks of the High Cascades (11,000 feet). The sporadic violence of this terrain is demonstrated by the remains of Mount Mazama, which was destroyed by a catastrophic eruption about 6,800 years ago that left a deep water-filled caldera known as Crater Lake. The uplifted and intruded structures of this terrain have a moderate to high potential for both hydrothermal metallic deposits and geothermal energy.

The southwestern 12,000 square miles of the planning area is dominated by the Klamath Mountains. This terrain has deep, narrow valleys and peaks averaging 7,000 feet in elevation. This area is bounded on the west by a narrow coastal plain with steep headlands and the Cascades Mountains to the east. The complexly folded and faulted accreted metamorphic belt terrains, welded together by subsequent volcanic activity and granitic intrusions, have a high potential for accumulation of hydrothermal metallic deposits and secondary enrichment zones. These are primarily in metamorphosed Jurassic, volcanic, sedimentary, and ophiolite formations containing precious metal ore bodies that give rise to downstream placer deposits.

The Basin and Range geologic terrain of south-central Oregon is dominated by narrow, north-south trending fault-block mountains and alternating broad basins. This area borders the Cascade Mountains to the west and the High Lava Plains of central Oregon to the north. The Basin and Range geologic terrain may contain potential for natural gas in filled lake basins. Its volcanic past has created a high potential for geothermal resources.

Regulation and Availability of Mineral and Energy Resources

Throughout Oregon, the BLM administers the mineral estate on nearly 40 million acres of BLM, U.S. Forest Service, and other federally administered and Indian lands. In addition to the approximately 2.6 million BLM-managed surface acres within the planning unit, there are an additional 68,600 acres of federal subsurface mineral estate beneath private surface. Known and inferred information indicates that about half of this area has a low potential for mineralization of interest, with 40% at a moderate potential and 5% with a higher likelihood. Aside from restrictions imposed by law, regulation, executive and/or secretarial order, more than 90% of the BLM-administered public lands, including O&C lands, are currently available for mineral and energy exploration and development subject to stipulations.

Mineral and energy resource potentials and development guidance are described in greater detail in *Appendix Q – Energy and Minerals*.

Mineral and energy resources on federal lands are managed under the authorities enacted by Congress in the following laws:

- Mining Law of 1872, as amended (locatable, such as metallic minerals)
- Mineral Leasing Act of 1920 (e.g., energy resources and source minerals for industrial chemicals)
- Mineral Materials Sales Act of 1947 (salable materials, such as common variety construction materials)
- Mining and Materials Policy Act of 1970
- Federal Land Policy and Management Act of 1976
- National Materials and Minerals Policy, Research and Development Act of 1980
- Energy Act of 2005

The cornerstone of BLM's minerals management policy is the understanding that public lands will remain open for exploration and development, unless it is clearly in the national interest to withdraw them in whole



or in part from mineral entry. Furthermore, the BLM encourages environmentally sound practices for mineral exploration and development on the open public lands by individuals and industry in a manner that satisfies both National and local needs.

Known and Inferred Mineral/Energy Occurrence Potential

Summarized below is the approximate aerial extent of the BLM-administered mineral estate, current acreage open or closed to mineral entry, and the likely potential for the occurrence of economic mineralization for each district within the planning area.

Salem District

Geologic Terrains and Mineral/Energy Potential Within the Salem District

Geologic Terrains (west to east)

- Coast Range
- Willamette Valley
- Cascade Mountains

Mineral Potential

- ferruginous bauxite throughout Willamette Valley
- porphyritic copper and gold in headwater area of Santiam River
- high potential for lode metallics near St. Helens
- scattered low to moderate potential for beach placers
- silica beach sands
- igneous rock, colluvium, and alluvium aggregate is abundant throughout the district

Energy Potential

- high potential for gas near Mist with moderate potential throughout the western portion of the district
- scattered low grade coal deposits east of Salem and Newport

Known Production

- natural gas (Mist Field)
- coal (Columbia County)
- clays (Portland area)

Eugene District

Geologic Terrains and Mineral/Energy Potential Within the Eugene District

Geologic Terrains (west to east)

- Coast Range
- Willamette Valley
- Cascade Mountains



TABLE 3-89. KNOWN AND INFERRED MINERAL AND ENERGY OCCURRENCE POTENTIAL FOR THE SALEM BLM DISTRICT

| Category | Acres | Remarks |
|--|--------------|------------------------------------|
| Federal surface and mineral estate | 398,100 | |
| Federal minerals and private surface | 27,800 | |
| Locatable (e.g., metallics and gemstones) | | |
| Closed | 5,900 | Nondiscretionary |
| Closed | 16,200 | Discretionary |
| Open | 49,200 | Standard restrictions/stipulations |
| Open | 326,800 | Additional restrictions |
| Mineral Occurrence Potential for Locatable | | |
| Unknown or low | 321,900 | |
| Moderate | 18,000 | |
| High | 58,200 | |
| Salable (e.g., sand, gravel, stone, clays, pumice) | | |
| Closed | 5,900 | Nondiscretionary |
| Closed | 220,400 | Discretionary |
| Open | 49,200 | Standard restrictions/stipulations |
| Open | 122,600 | Additional restrictions |
| Mineral Occurrence Potential for Salable | | |
| Unknown or low | 387,600 | |
| Moderate | 5,000 | |
| High | 1,000 | |
| Leasable^a (e.g., oil, gas, geothermal, coal, chemical minerals) | | |
| Closed | 100 | Nondiscretionary |
| Open | 108,600 | Standard restrictions/stipulations |
| Open | 266,200 | Additional restrictions |
| Open | 27,700 | No surface occupancy |
| Mineral Occurrence Potential and Development Potential for Leasable | | |
| Unknown or low | 378,700 | |
| Moderate potential for occurrence/ moderate potential for development | 8,600 | |
| High potential for occurrence/ high potential for development | 10,800 | |

^aAcres for leasable were estimated using the Geographical Information System (GIS) and not BLM land records, which results in total acres of leasable being different from total acres of surface and mineral estate.



TABLE 3-90. KNOWN AND INFERRED MINERAL AND ENERGY OCCURRENCE POTENTIAL FOR THE EUGENE BLM DISTRICT

| Category | Acres | Remarks |
|--|--------------|------------------------------------|
| Federal surface and mineral estate | 318,000 | |
| Federal minerals and private surface | 1,300 | |
| Locatable (e.g., metallics and gemstones) | | |
| Closed | 400 | Nondiscretionary |
| Closed | 15,300 | Discretionary |
| Open | 290,600 | Standard restrictions/stipulations |
| Open | 10,000 | Additional restrictions |
| Mineral Occurrence Potential for Locatable | | |
| Unknown or low | 299,900 | |
| Moderate | 13,500 | |
| High | 2,900 | |
| Salable (e.g., sand, gravel, stone, clays, pumice) | | |
| Closed | 100 | Nondiscretionary |
| Closed | 9,100 | Discretionary |
| Open | 200 | Standard restrictions/stipulations |
| Open | 307,000 | Additional restrictions |
| Mineral Occurrence Potential for Salable | | |
| Unknown or low | 300,100 | |
| Moderate | 12,500 | |
| High | 3,800 | |
| Leasable^a (e.g., oil, gas, geothermal, coal, chemical minerals) | | |
| Closed | 100 | Nondiscretionary |
| Open | 140,000 | Standard restrictions/stipulations |
| Open | 169,500 | Additional restrictions |
| Open | 2,800 | No surface occupancy |
| Mineral Occurrence Potential and Development Potential for Leasable | | |
| Unknown or low | 246,000 | |
| Moderate potential for occurrence/low potential for development | 72,000 | |
| High potential for occurrence/high potential for development | 0 | |

^aAcres for leasable were estimated using the Geographical Information System (GIS) and not BLM land records, which results in total acres of leasable being different from total acres of surface and mineral estate.



Mineral Potential

- gold placers in the headwaters of the McKenzie and Middle Fork of the Willamette Rivers, the Dorena Lake area, and the Quartzville District
- metallic placer potential around Eugene
- igneous rock, colluvium, and alluvium aggregate is abundant throughout the district
- clays at Hobart Butte

Energy Potential

- speculative to moderate potential for gas identified in projected plays and petroleum systems in the Willamette Valley and coastal areas

Known Production

- gold

Roseburg District

Geologic Terrains and Mineral/Energy Potential Within the Roseburg District:

Geologic Terrains

- Coast Range
- West Cascades
- Klamath Mountains

Mineral Potential

- nickel laterites east of Riddle
- mercury in the headwaters of the Calapooya and North Umpqua River
- disseminated copper and gold throughout the pre- to late Jurassic rocks along the Umpqua River and its tributaries
- placer metallics east of Drain and Sutherlin
- igneous rock, metamorphic rock, colluvium, and alluvium aggregate is abundant throughout the district

Energy Potential

- scattered low grade coal deposits near Glide, Melrose, and Carson Valley
- moderate potential for gas identified in projected plays and petroleum systems in the Coast Range and Cascade Range margin

Known Production

- nickel (Riddle)

Coos Bay District

Geologic Terrains and Mineral/Energy Potential Within the Coos Bay District:

Geologic Terrains

- Coast Range
- Klamath Mountains



TABLE 3-91. KNOWN AND INFERRED MINERAL AND ENERGY OCCURRENCE POTENTIAL FOR THE ROSEBURG BLM DISTRICT

| Category | Acres | Remarks |
|--|---------|------------------------------------|
| Federal surface and mineral estate | 425,600 | |
| Federal minerals and private surface | 1,700 | |
| Locatable (e.g., metallics and gemstones) | | |
| Closed | 300 | Nondiscretionary |
| Closed | 4,800 | Discretionary |
| Open | 366,200 | Standard restrictions/stipulations |
| Open | 20,800 | Additional restrictions |
| Mineral Occurrence Potential for Locatable | | |
| Unknown or low | 307,600 | |
| Moderate | 88,000 | |
| High | 24,400 | |
| Salable (e.g., sand, gravel, stone, clays, pumice) | | |
| Closed | 30 | Nondiscretionary |
| Closed | 8,400 | Discretionary |
| Open | 381,700 | Standard restrictions/stipulations |
| Open | 29,200 | Additional restrictions |
| Mineral Occurrence Potential for Salable | | |
| Unknown or low | 5,000 | |
| Moderate | 418,700 | |
| High | 1,900 | |
| Leasable^a (e.g., oil, gas, geothermal, coal, chemical minerals) | | |
| Closed | 30 | Nondiscretionary |
| Open | 98,300 | Standard restrictions/stipulations |
| Open | 315,700 | Additional restrictions |
| Open | 9,700 | No surface occupancy |
| Mineral Occurrence Potential and Development Potential for Leasable | | |
| Unknown or low | 264,600 | |
| Moderate potential for occurrence/ potential for development | 124,000 | |
| Moderate potential for occurrence/ moderate potential for development | 37,000 | |
| High potential for occurrence/ potential for development | 0 | |

^a Acres for leasable were estimated using the Geographical Information System (GIS) and not BLM land records, which results in total acres of leasable being different from total acres of surface and mineral estate.



TABLE 3-92. KNOWN AND INFERRED MINERAL AND ENERGY OCCURRENCE POTENTIAL FOR THE COOS BAY BLM DISTRICT

| Category | Acres | Remarks |
|--|---------|------------------------------------|
| Federal surface and mineral estate | 329,600 | |
| Federal minerals and private surface | 12,200 | |
| Locatable (e.g., metallics and gemstones) | | |
| Closed | 1,000 | Nondiscretionary |
| Closed | 11,500 | Discretionary |
| Open | 99,500 | Standard restrictions/stipulations |
| Open | 217,600 | Additional restrictions |
| Mineral Occurrence Potential for Locatable | | |
| Unknown or low | 208,800 | |
| Moderate | 120,300 | |
| High | 500 | |
| Salable (e.g., sand, gravel, stone, clays, pumice) | | |
| Closed | 600 | Nondiscretionary |
| Closed | 14,700 | Discretionary |
| Open | 84,600 | Standard restrictions/stipulations |
| Open | 229,700 | Additional restrictions |
| Mineral Occurrence Potential for Salable | | |
| Unknown or low | 303,900 | |
| Moderate | 4,600 | |
| High | 900 | |
| Leasable^a (e.g., oil, gas, geothermal, coal, chemical minerals) | | |
| Closed | 0 | Nondiscretionary |
| Open | 94,300 | Standard restrictions/stipulations |
| Open | 212,000 | Additional restrictions |
| Open | 15,000 | No surface occupancy |
| Mineral Occurrence Potential and Development Potential for Leasable | | |
| Unknown or low | 233,500 | |
| Moderate potential for occurrence/moderate potential for development | 83,000 | |
| High potential for occurrence/high potential for development | 12,300 | |

^aAcres for leasable were estimated using the Geographical Information System (GIS) and not BLM land records, which results in total acres of leasable being different from total acres of surface and mineral estate.



Mineral Potential

- gold, platinum, and chromite in coastal black beach sands
- disseminated lode and placer copper, chromite, and gold with scattered nickel laterite deposits throughout prelate Jurassic rocks along the Rogue River and its tributaries, and in the Kalmiopsis Wilderness
- silica beach sands
- sandstone and fine alluvium aggregate is abundant throughout the district. Metamorphic rock aggregate is probable in the southern portion of the district. Igneous rock aggregate is limited.

Energy Potential

- moderate to high potential for coal in early Tertiary basins surrounding Coos Bay with associated coal bed methane
- moderate potential for gas identified in projected plays and petroleum systems in the coast range

Known Production

- subbituminous coal (Coos County)
- silica sands
- gold

Medford District

Geologic Terrains and Mineral/Energy Potential Within the Medford District:

Geologic Terrains

- Klamath Mountains
- Cascade Mountains

Mineral Potential

- disseminated lode and placer copper, chromite, and gold with scattered nickel laterite deposits throughout prelate Jurassic rocks throughout the area of the middle Rogue River and tributaries with major mining regions and pocket deposits along contacts of fine-grained slate, argillite, and carbonaceous rock
- igneous rock, metamorphic rock, colluvium, and alluvium aggregate is abundant throughout district

Energy Potential

- low grade coal deposits associated with the Rogue River Coal Field near Medford and Ashland
- geothermal potential throughout West Cascades

Known Production

- gold and precious metals (along Galice, Josephine, Sucker, and Althouse Creeks and the Illinois River)
- talc
- subbituminous coal (Jackson County)
- gold
- nickel



TABLE 3-93. KNOWN AND INFERRED MINERAL AND ENERGY OCCURRENCE POTENTIAL FOR THE MEDFORD BLM DISTRICT

| Category | Acres | Remarks |
|--|----------|------------------------------------|
| Federal surface and mineral estate | 866,-300 | |
| Federal minerals and private surface | 4,700 | |
| Locatable (e.g., metallics and gemstones) | | |
| Closed | 16,800 | Nondiscretionary |
| Closed | 20,800 | Discretionary |
| Open | 536,500 | Standard restrictions/stipulations |
| Open | 293,400 | Additional restrictions |
| Mineral Occurrence Potential for Locatable | | |
| Unknown or low | 473,100 | |
| Moderate | 388,700 | |
| High | 10,100 | |
| Salable (e.g., sand, gravel, stone, clays, pumice) | | |
| Closed | 24,600 | Nondiscretionary |
| Closed | 20,800 | Discretionary |
| Open | 17,,200 | Standard restrictions/stipulations |
| Open | 803,700 | Additional restrictions |
| Mineral Occurrence Potential for Salable | | |
| Unknown or low | 2,000 | |
| Moderate | 864,800 | |
| High | -- | |
| Leasable^a (e.g., oil, gas, geothermal, coal, chemical minerals) | | |
| Closed | 80 | Nondiscretionary |
| Open | 250,200 | Standard restrictions/stipulations |
| Open | 562,100 | Additional restrictions |
| Open | 55,000 | No surface occupancy |
| Mineral Occurrence Potential for Leasable | | |
| Unknown or low | 833,300 | |
| Moderate potential for occurrence/low potential for development | 33,000 | |
| High potential for occurrence/high potential for development | 0 | |

^aAcres for leasable were estimated using the Geographical Information System (GIS) and not BLM land records, which results in total acres of leasable being different from total acres of surface and mineral estate.



Klamath Falls Resource Area (Lakeview District)

Geologic Terrains and Mineral/Energy Potential Within the Klamath Falls Resource Area:

Geologic Terrains

- Cascade Mountains
- Western Basin and Range

Mineral Potential

- diatomite along Sprague River
- igneous rock, pumice, colluvium, and alluvium aggregate is abundant throughout the district

Energy Potential

- moderately favorable potential for geothermal from Klamath Falls and southward

Known Production

- diatomite

TABLE 3-94. KNOWN AND INFERRED MINERAL AND ENERGY OCCURRENCE POTENTIAL FOR THE KLAMATH FALLS RESOURCE AREAS OF THE LAKEVIEW BLM DISTRICT

| Category | Acres | Remarks |
|---|---------|------------------------------------|
| Federal surface and mineral estate | 212,000 | |
| Federal minerals and private surface | 21,000 | |
| Locatable (e.g., metallics and gemstones) | | |
| Closed | 4,700 | Nondiscretionary |
| Closed | 700 | Discretionary |
| Open | 191,600 | Standard restrictions/stipulations |
| Open | 37,900 | Additional restrictions |
| Mineral Occurrence Potential for Locatable | | |
| Unknown or low | 99,000 | |
| Moderate | 128,000 | |
| High | 900 | |
| Salable (e.g., sand, gravel, stone, clays, pumice) | | |
| Closed | 300 | Nondiscretionary |
| Closed | 14,500 | Discretionary |
| Open | 0 | Standard restrictions/stipulations |
| Open | 197,200 | Additional restrictions |
| Mineral Occurrence Potential for Salable | | |
| Unknown or low | 10,700 | |
| Moderate | 200,000 | |
| High | 1,300 | |
| Leasable^a (e.g., oil, gas, geothermal, coal, chemical minerals) | | |
| Closed | 300 | Nondiscretionary |
| Open | 75,900 | Standard restrictions/stipulations |
| Open | 139,400 | Additional restrictions |
| Open | 8,700 | No surface occupancy |
| Mineral Occurrence Potential and Development Potential for Leasable | | |
| Unknown or low | 212,000 | |
| Moderate potential for occurrence/moderate potential for development | 0 | |
| High potential for occurrence/high potential for development | 0 | |

^aAcres for leasable were estimated using the Geographical Information System (GIS) and not BLM land records, which results in total acres of leasable being different from total acres of surface and mineral estate.



Energy Resources

Current and historic exploration and development of in-ground energy resources within the planning area are focused on the hydrocarbon potential (i.e., coal and natural gas) that is generally associated with Cenozoic marine sediments. Small quantities of low-grade coal have been mined in both the Salem and Coos Bay Districts. There is a potential for occurrence elsewhere in the Coast Range and Willamette Valley geologic terrains. The potential for renewable wind energy has yet to be tapped, but is generally rated at good to excellent over most of the planning area.

Natural Gas

Conventional natural gas has been produced since the 1970s near the community of Mist in west-central Columbia County. Since its discovery in 1979, the Mist Gas Field has produced more than 65 billion cubic feet of gas with a value of about \$125 million. Modern seismic technology is being used to guide discovery of new pools at the field. Nonfederal leasing and applications for drilling permits are currently focused in the Mist Gas Field, which has 16 current production wells and 8 pending applications for production permits (Houston 2007). The Mist Gas Field now includes two commercial underground natural gas storage projects. There are no currently producing “conventional” federally leased gas wells. However, the potential exists for gas deposits in many coastal and Coast Range areas of western Oregon, based on past leasing of nearly 6 million acres from federal, state, and local agencies and the permitting of more than 500 wells in the 1980s.

In western Oregon, there are up to 100,000 onshore acres prospective for natural gas production. Interest in these lands is enhanced by excellent year-round access via logging and fire control roads and the availability of already constructed timber recovery staging areas (landings) for drilling sites. There are currently no producing conventional gas wells on federal leases.

To date, the state of Oregon’s Department of Geology and Mineral Industries has formally designated only one gas field encompassing the area at Mist. The designation is required to accomplish state requirements for well-spacing designations, mineral rights, and the control of drainage. Field designation also increases interest and competition among development companies. Another gas field designation by the state of Oregon is expected for the Coos Basin.

Coal Bed Methane (Coal Bed Natural Gas)

Existence of coal bed methane was recently proved up along Oregon’s southwest coast with the likelihood of commercial development in the Coos Bay BLM District. In the Coos Basin, there are over 115,000 non-federal acres leased. Foreseeable development of coal bed methane plays could result in around 25,000 acres of BLM-managed resources being offered for lease. To develop this resource, the industry estimates a near-term build-out of between 300 and 719 wells may be needed. Approximately 37 to 77 of these wells could be on BLM-administered lands.

The coal-bearing sandstones and siltstones of the Coos Bay Basin are estimated to form a cumulative multi-seam stratigraphic section up to 6,600 feet thick containing over 1.2 trillion cubic feet of methane gas (approximately 10 billion cubic feet per section). A commercial drilling program is underway near the Coos County natural gas line and within a few miles of unleased federal coal.

Geothermal

Oregon has the distinction of being a state where geothermal resources are available in many areas. These resources are suitable for several different types of uses, including the current dominant production for direct heat applications.



Although Oregon has yet to achieve commercial generation of electricity from geothermal energy, the potential is there. A U.S. Interior Department report identifies 7 sites as being among the 35 highest potential geothermal regions in the country (DOI and DOE 2003). These sites include the Newberry Crater near Bend (a location of past geothermal exploration), as well as sites near Klamath Falls, Lakeview, Crump Lake, Summer Lake, and along the Malheur River and near Vale in southern and eastern Oregon.

Wind

Nationally, about 20% of installed wind energy capacity is on federal lands. Currently, about 500 megawatts (MW) of installed wind capacity occurs under right-of-way (ROW) authorizations administered by BLM in accordance with requirements of the Federal Land Policy and Management Act of 1976 (FLMPA) (*United States Code*, Title 43, Section 1701 [43 USC 1701]) and BLM's Interim Wind Energy Development Policy (BLM 2002). The policy is consistent with requirements of Executive Order (E.O.) 13212, "Actions to Expedite Energy-Related Projects," issued May 2001, which calls for federal agencies to take appropriate actions, consistent with applicable laws, to expedite projects that increase the production, transmission, or conservation of energy. Policies and best management practices will be developed for all wind energy projects on BLM-administered lands in accordance with the findings of the *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Land in the Western United States* (June 2005 [FES 05-11]). Site-specific and species-specific concerns, and the development of additional mitigation measures, would be addressed in project-level reviews, including NEPA analyses, as required.

In Oregon, coastal areas, river corridors, and ridge lines within the planning area are rated as having good to excellent potential for wind-driven power generation—the better portion of the statewide 7,991 megawatt potential. Oregon currently has some 435 megawatts of installed wind power generating capacity with another 140 megawatts proposed (American Wind Energy Association 2007). By 2025, some 196 megawatts are projected to originate from BLM-administered lands.

Notable areas with a good to excellent potential include the Columbia River corridor and the Oregon coast. Although the Columbia River gorge is generally an area of high wind resource, the complex terrain causes considerable local variability. The annual average wind resource at exposed areas ranges from Class 3 to Class 6. Spring and summer are the seasons of maximum wind power for most of the planning area. Wind power potential for most of western Oregon is Class 4. In western Oregon, winter is the season of maximum power potential at sites well exposed to the prevailing south and southeasterly winds. During the summer, wind power potential is high along the central and southern Oregon coast at sites well exposed to northerly winds. The wind power potential along those coastal areas is associated with the strong surface pressure gradients created by the cold Pacific Ocean water and the relatively warm interior (Wind Energy Resource Atlas of the United States 2007).

Energy Transmission

The proposed 223-mile long Pacific Connector Gas Pipeline (with an estimated capacity of 1 billion cubic feet per day) is being jointly developed by Williams' Northwest Pipeline, Pacific Gas and Electric Company, and Fort Chicago Energy Partners L.P.(Fort Chicago). The Pacific Connector Gas Pipeline will join the proposed Jordan Cove liquefied natural gas terminal being developed by Fort Chicago near Coos Bay, Oregon, to the Williams' Northwest pipeline system near Myrtle Creek, Oregon, and then to Pacific Gas and Electric Company's backbone gas transmission system near Malin, Oregon. A federal right-of-way will be required, as about 56 miles of the proposed pipeline route cross federal lands managed by the BLM and the Forest Service. Environmental reviews and public participation are underway as part of the Federal Energy Regulatory Commission pre-filing process.



National Energy Policy

Within the planning area, implementation of the National Energy Policy is a priority for modernizing the energy infrastructure; increasing supplies of renewable and nonrenewable energy; and accelerating conservation, protection, and improvement of the environment.

Oregon's contribution to this effort is focused on:

- Acting in a timely manner on requests for rights-of-way and easements for energy exploration and development (e.g., geophysical surveys and infrastructure to develop and transport renewable and nonrenewable energy, and emphasizing parallel use of existing rights-of-way wherever possible).
- Being receptive to alternative energy proposals and the completion of an environmental impact statement relating to authorization of wind energy projects. (Nevada, Idaho, Oregon, Arizona, and Utah are principal areas identified for development.)
- Being prepared for increased interest in oil and gas drilling in the southwest Oregon coastal area and northwest Oregon coastal mountain area, based on promising exploration taking place on private lands.
- Emphasizing adjudication of lands nominated for oil, gas, and geothermal leasing; timely processing of drilling permits; development of wind and geothermal resources; hydropower relicensing; monitoring to ensure environmentally sound practices; and integrating study findings of the Energy Policy Act study findings into BLM land use plans.

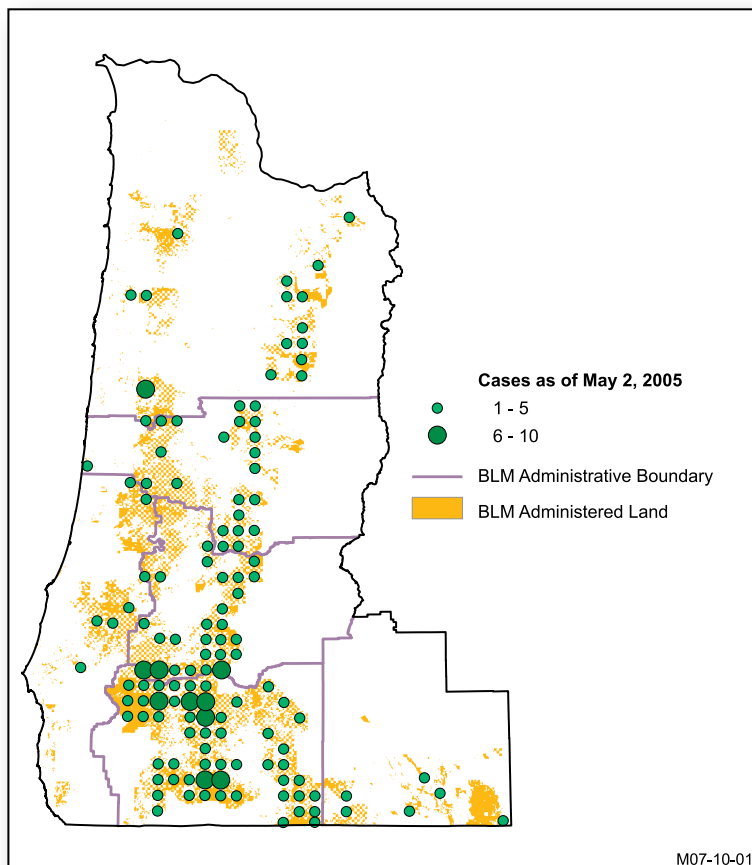


FIGURE 3-155. ACTIVE MINERAL MATERIALS CASES ON BLM-ADMINISTERED LANDS BY TOWNSHIP

- Facilitating National Energy Policy goals for modernizing energy infrastructure, increasing energy supplies, accelerating protection and improvement of the environment, and providing opportunities for environmentally sound commercial development.
- Supporting land use plan decisions for renewable and nonrenewable energy exploration, development, and transportation of energy sources.
- Reducing impediments that are limiting access across public lands.
- Issuing right-of-way authorizations for necessary infrastructure to develop and transport renewable and nonrenewable energy (e.g., oil or gas from producing areas or electricity generated from a variety of sources, such as hydropower, coal or gas-fired generators, and geothermal).

Summary of Mineral/ Energy Occurrence Potential

Currently, none of the types of mineral entry (i.e., locatable, salable, or leasable) contribute significantly to the economic base of communities within the planning area.



Salable Mineral Materials

Within the planning area, the BLM's principal mineral material (common sand, gravel, rock, volcanic cinders, and clay) program functions are related to designation of sites (community pits and common use areas), issuing sale contracts and free use permits, and conducting compliance inspections. Mineral materials are the most commonly mined mineral commodities in Oregon. See *Figure 3-155 (Active mineral materials cases on BLM-administered lands by township)* for the spatial distribution of material sites to the nearest township.

Production from BLM material (community) pits and quarries has declined since the 1980s due to the decrease in logging road construction. Approximately 3% to 5% of all mineral materials produced in Oregon comes from public lands, including some 250 sites within the planning area that each could yield between 1,000 and 25,000 tons per year. This trend is expected to continue with an average annual growth rate of approximately 1% requiring significant quantities of crushed stone, sand, and gravel to come from yet to be delineated resources. Despite its low unit value, the aggregate and crushed stone industry is a major contributor to the regional economics (USDI USGS 2007).

Currently, mineral material production is limited primarily to small sales and the use of larger volumes by other federal, state, and local agencies. In many portions of the planning area, rock sources are becoming

scarce or are encumbered by restrictions that limit the availability of rip-rap, large boulders, and surfacing material required for restoration projects or timber harvesting activities. In the rapidly developing urban areas, expensive mineral materials are being purchased from private sources and transported to BLM projects, at times by-passing potential BLM-administered sources.

Salable mineral availability is considered to have a moderate to high potential across the planning area.

Locatable Minerals

Locatable minerals include metallic minerals (e.g., gold, silver, lead, and zinc) and some nonmetallic minerals (e.g., fluorspar, asbestos, mica, gemstones, and uncommon varieties of sand, gravel, and stone). Large areas of southwestern Oregon are within historic mining districts. Most claim sites within the planning area are situated in the Klamath Mountains and the West Cascades.

Sporadic small-scale placer gold mining is the main type of locatable production occurring on BLM-administered lands within the planning area, particularly in the southern districts. The number

Mining district
A mining district is a section of country that is usually designated by name and described or understood as being confined within certain natural boundaries in which gold, silver, or other minerals may be found in paying quantities.

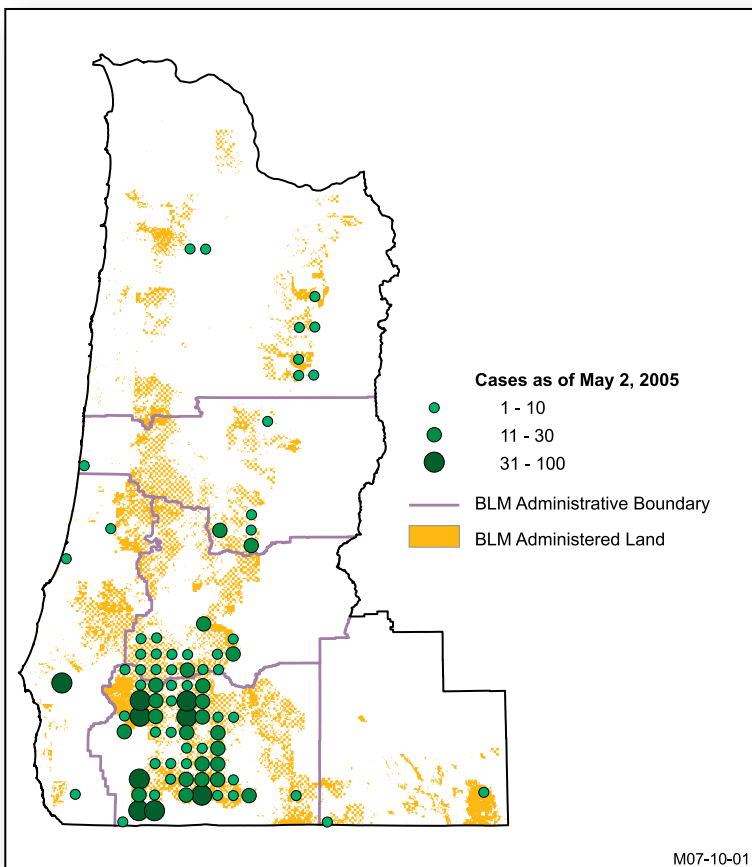


FIGURE 3-156. ACTIVE MINING CLAIM CASES ON BLM-ADMINISTERED LANDS BY TOWNSHIP



of active mining claims in western Oregon has generally declined due to changes in federal regulations that have resulted in increased fees for recording and maintaining claims.

All BLM districts within the planning area carry out actions related to the administration of some 2,500 mining claims of active record. See *Figure 3-156 (Active mining claim cases on BLM-administered lands by township)* for the spatial distribution of claim sites to the nearest township.

Occurrence for locatable metallic deposits is moderate to highly favorable throughout southwestern Oregon and in the vicinity of St. Helens in Columbia County. Production has been reported for gold in Jackson, Lane, Coos, Josephine, and Curry counties, and for nickel in Douglas and Josephine counties.

Related actions include:

- processing of mining notices and plans of operations
- inspection of mining claims and mill sites for surface management compliance
- determination of mining claim validity
- processing of patents that are not otherwise precluded by moratorium
- mitigation of trespass and unauthorized occupancy cases

Leasable Minerals

For western Oregon, the mineral occurrence potential for leasables can generally be described as follows:

- **Natural gas.** Sub-marginal to moderately favorable for natural gas from Coos County northward to the Columbia River with areas of high potential surrounding Coos Bay and in the vicinity of Mist in Columbia County. Conventional oil and gas potential exist as identified speculative petroleum systems (Ryu et al. 1990) within a structural sedimentary basin system that extends on- and off-shore from the Klamath Terrains beginning near the Middle Fork of the Coquille River and extending north to the Columbia River and beyond into Washington state, and from the continental shelf east to the Willamette Valley.
- **Coal bed natural gas (methane).** Coalbed natural gas potential is focused mainly on the Coaledo Formations of the onshore portion of the Coos Basin (an area of approximately 250 square miles located on the western edge of the Coos Bay BLM District). Federally managed mineral rights encompass approximately 12.3% of the Coos Basin, with nearly 7.6% under direct BLM administration.
- **Coal.** Occurrence is highly favorable in the Coos Bay Field and Eden Ridge Field in southern Coos County, although of generally poor quality with interstratified non-carbonaceous shale. Coal occurs in the Rogue River Coal Field of Jackson County. Smaller amounts of coal are associated with all of the marine basins throughout western Oregon.

See *Table 3-95 (Summary of the mineral occurrence potential within the planning area by resource type)*.

Restrictions

Restrictions that could affect the exploration and development of energy and mineral resources can be divided into five categories:

- nondiscretionary closures
- discretionary closures
- no surface occupancy stipulations
- standard stipulations
- additional restrictions

See *Table 3-96 (Acres of the restrictions that could affect the exploration and development of energy and mineral resources)* for the acres of the existing restrictions.



TABLE 3-95. SUMMARY OF THE MINERAL AND ENERGY OCCURRENCE POTENTIAL WITHIN THE PLANNING AREA BY RESOURCE TYPE

| Resource Type | Unknown or Low Potential ^a | Moderate Potential ^b | High Potential ^c |
|---------------|---|--------------------------------------|---|
| | Acres (rounded to nearest 1,000) ^d | | |
| Locatable | 1, 710,300 | 756,500 | 97,000 |
| Salable | 1,000, 300 | 1,505, 600 | 8,900 |
| Leasable | 2,186,700 | 292,800 | 23,100 |
| Wind | 20% of planning area in Wind Class 1 – 2 ^e | 75% of planning area in Wind Class 4 | 5% of planning area in Wind Class 5 – 6 |

^aGeological formations and processes are not favorable for accumulation of mineral resources, or there is insufficient information to make a determination of the mineral potential.

^bGeological formations and processes are favorable for accumulation of mineral resources. For example, there may be additional mineral resources in old mines and prospects or new resources in areas with a high level of mining notice filing.

^cGeological formation and processes are favorable for accumulation of mineral resources. These are areas of known active mines or active exploration and development activities, indicating high potential for accumulation of mineral resources.

^dSince areas may have more than one resource type, the acreages may also overlap.

^eWind class: According to the Wind Energy Resource Atlas of the United States, wind classes are as follows, with W/m² representing the wind density: Class 1 (<200 W/m²), Class 2 (200 to 300 W/m²), Class 4 (400 to 500 W/m²), Class 5 (500 to 600 W/m²), and Class 6 (600 to 800 W/m²).

TABLE 3-96. ACRES OF THE RESTRICTIONS THAT COULD AFFECT THE EXPLORATION AND DEVELOPMENT OF ENERGY AND MINERAL RESOURCES

| Restrictions | Unknown/low Potential | Moderate Potential | High potential |
|-----------------------------------|--------------------------------|--------------------|----------------|
| | Acres rounded to nearest 1,000 | | |
| Non-discretionary closures | 389,000 | 128,000 | 59,000 |
| Discretionary closures | 25,000 | 8,000 | 1,000 |
| No surface occupancy stipulations | 56,000 | 121,000 | 0 |
| Standard stipulations | 2,629,000 | 2,397,000 | 255,000 |
| Additional restrictions | 354,000 | 286,000 | 5,000 |

Note: The sum of acres for each resource type (locatable, salable, leasable) includes overlapping acres.

