III. The Siskiyou Mountains Area

The Siskiyou Mountain area of this analysis is the remaining portion of the Rogue River National Forest that was not analyzed in the Cascade Mountain area. The Siskiyou Mountain area of the Rogue River National Forest runs approximately from Mt. Ashland west along the crest of the Siskiyou Mountains, and includes areas to the north to the divide between the Applegate River and Illinois River watersheds near Oregon Caves National Monument. This covers the Applegate Ranger District and the southwestern portion of the Ashland Ranger District.

This is a logical analysis area due to the break at Ashland from the Cascade Mountain area and the lack of road connections across the Illinois and Applegate drainages on Forest Service managed lands (see Map III-1).

A. Background and Historical Content

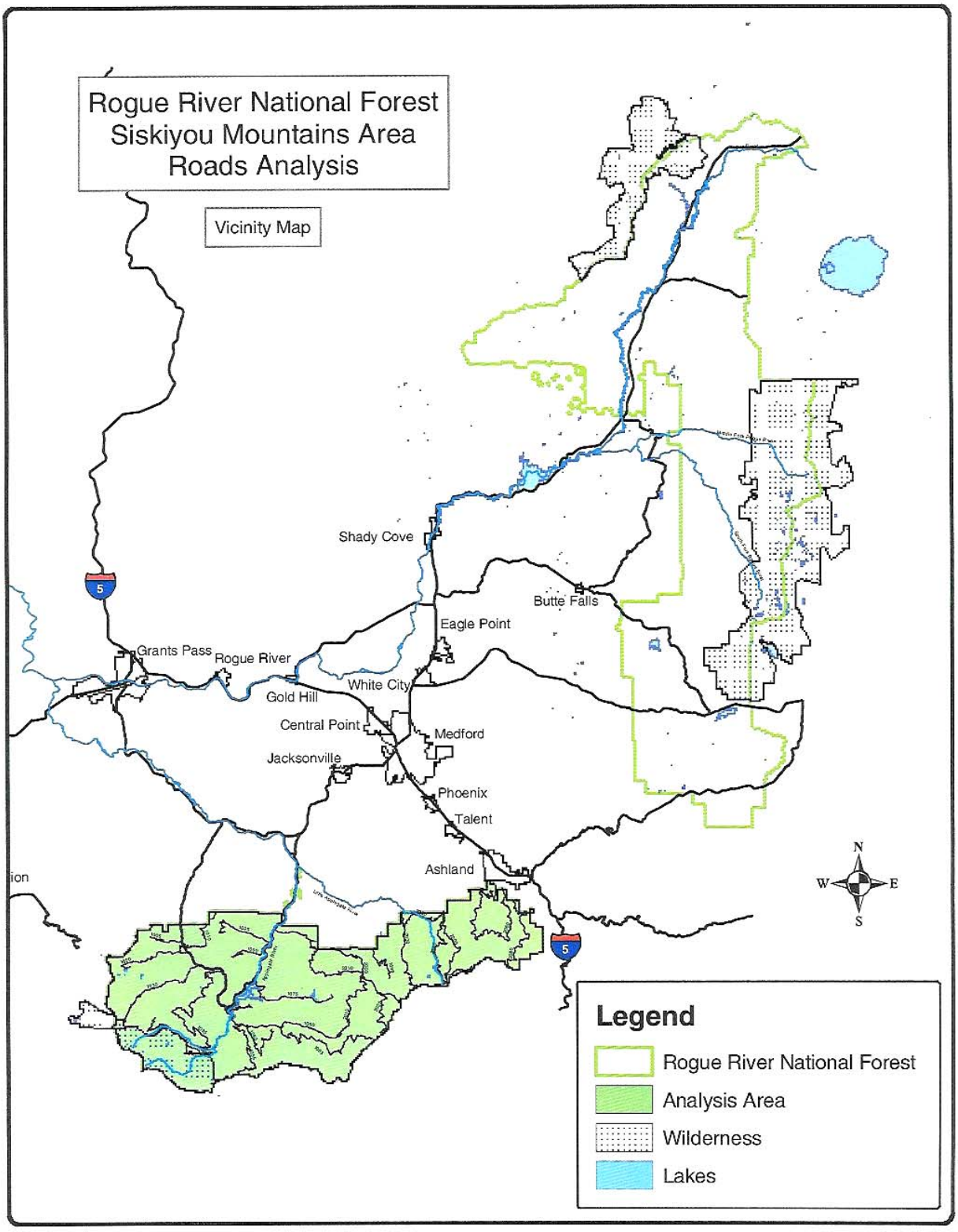
In the centuries before the arrival of the first Euro-Americans into the eastern Siskiyou Mountains of what is now the Rogue River National Forest, native people established trails into and across the mountainous drainages of the Applegate River, Ashland Creek, and Neil Creek. The exact locations of these trails are unknown, however, it is likely that they closely followed the Applegate River and the lower sections of certain major tributaries.

Between 1827 and 1850, Euro-Americans who passed through the Siskiyou Mountain Area sought the easiest route between northern California and southwestern Oregon, so developed the main route through the Rogue's gentle Bear Creek Valley, crossing the divide at Siskiyou Pass and avoiding the rugged topographic "cul-de-sac" of the upper Applegate River drainage and the adjacent section of the Siskiyou Crest. The so-called Applegate Trail (a southern branch of the Oregon Trail), laid out in 1846 through the Bear Creek Valley and along the middle section of the Rogue River, at no point was located within the Applegate River watershed.

Soon after the 1851-52 discovery of gold at Rich Gulch (present-day Jacksonville), prospectors developed trails to paying placer gold deposits in other sections of the eastern Siskiyous. By 1856 crude wagon roads extended over the hill from Jacksonville to the vicinities of upper Sterling Creek and the confluence of Forest Creek with the Applegate River. The following year, an important wagon road connected the coastal supply center of Crescent City, California with Jacksonville via the lower Applegate River and Forest Creek. However, throughout the 1850s and 1860s, only miner and stockman trails penetrated into the rugged country south of the mouth of the Little Applegate River, and beyond the lowest stretch of Ashland Creek.

Sometime during the 1880-90s, a pack trail developed from the present Ruch area over the Crest to Cinnabar Springs. The exact route of the summer-only "Cinnabar Trail" is uncertain, but it apparently ascended from the river up around the summit of Cinnabar Peak, and then followed the ridge system past Beaver Ranch southeast to Deadman Point and on to Jacksonville.

MAP III-1. Siskiyou Mountains Area - Vicinity Map



As farming and ranching families settled on the alluvial terraces of the upper Applegate River during the late-nineteenth century, a wagon road extended south from Ruch to beyond the mouth of Squaw Creek. This market road (which connected to Jacksonville) followed essentially the same route of much of the present county-owned Upper Applegate Road #859. Roads branched off of this "arterial" to ascend the lowermost portions of tributaries such as Star Gulch, Palmer Creek, and French Gulch.

By the 1890s, the wagon road up French Gulch crossed the divide to upper Squaw Creek's Dividend Bar, thereby providing better access to Squaw Lakes, a favorite summer camping spot for Jacksonville and Applegate Valley residents. Well to the north, a much longer road passed up into the Little Applegate River's drainage. During the same decade, a wagon road from the hamlet of Applegate ascended south up Thompson Creek to the little community of Steamboat on upper Carberry Creek. (*Note*: The steep-walled canyon of lower Carberry Creek made construction of a road connecting Steamboat to the upper Applegate River impossible until the 1920s.)

Between about 1907 and 1917, development of the Blue Ledge copper mine in the rugged headwaters of the Applegate River resulted in extension of a wagon road (with regular stage service) from the upper Applegate up Elliott Creek to Joe Bar, and then up the east slope of Joe Creek to as far as the mine itself. (The historic covered McKee Bridge dates to this period.) From Joe Bar, the Elliott Creek Road went upstream another mile or so to the east, where its terminus remained until the 1940s. The first Squaw Creek Road, built from the mouth of the creek to past Stringtown Gulch, dates between 1910 and 1920, the French Gulch/Dividend Bar Road was also extended to Squaw Lakes during this time. A ca.1890-1910 wagon road followed up Ashland Creek to the forks, at first accessing a sawmill and later the town's East Fork and West Fork reservoirs. In about 1908, an Ashland storekeeper named Lamb built a ridge-top wagon road to his gold mining operation on the divide between Bear Creek and Ashland Creek. Traces of the old Lamb Wagon Road can still be found parallel to the lower section of FS Road 2060.

The U.S.D.A. Forest Service arrived on the scene in 1905. At first, the Forest Service only built or improved trails within the Siskiyou area. However, in 1923-24, Forest Service crews located and constructed the Carberry Road, connecting the remote Steamboat area with the Upper Applegate Road, near the tiny hamlet of Copper. During the same period, the agency extended the Ashland Creek Road up the West Fork and across Winburn Saddle for improved fire-fighting access within the city's municipal watershed. The Forest Service's road system in the Siskiyou area then remained essentially unchanged until the mid-1930s.

During the Great Depression, the agency utilized Civilian Conservation Corps crews to develop additional transportation routes into the eastern Siskiyou Mountains. By far the three most ambitious C.C.C. road projects of this 1934-1937 period were (a) the connector road from the upper Little Applegate River over Rush Creek divide towards the town of Talent; (b) a road from Wagner Gap (where an existing road descended Wagner Creek to Talent) that paralleled the Talent Irrigation District's 1919 McDonald Canal into the headwaters of the Little Applegate River; and (c) the Ashland/Beaver Creek "Loop Road" (present-day FS Roads 2060, 200, and 20 between Ashland and the Applegate River near McKee Bridge). The Loop Road involved several years of construction along the Siskiyou Crest between Mt. Ashland and Jackson Gap/Dutchman Peak, and when completed offered access to a very remote section of country.

Other 1930s Forest Service low-standard road projects included approximately six miles along the lower Middle Fork of the Applegate, short spurs up lower Steve Fork and Sturgis Fork, a lengthy ridge-top tie road (present FS Road 1010) from upper Star Gulch to upper Carberry Creek, a ridge-top road east from Palmer Peak to Flumet Gulch (long since abandoned), and five-miles of road extended from the Loop Road's Silver Fork Gap to Perk's Pasture Guard Station via Maple Dell Gap. By 1940, significant portions of the Siskiyou area had become accessible for vehicles, but much of it still remained unroaded.

In 1943-45, U. S. Army Corps of Engineers crews from Medford's Camp White army base designed and built a number of stout log-stringer bridges in the Applegate Ranger District for training purposes; these structures became part of the Forest Service transportation system, providing stream crossings for logging trucks during and after the war.

The post-war lumber boom brought extensive road development throughout the eastern Siskiyou Mountains. As timber harvest expanded and accelerated in the Siskiyou area during the late 1940s through the early 1950s, one road was pushed south up Glade Creek, another followed along the Siskiyou Crest southwest from Jackson Gap (located mostly on the Klamath NF side of the crest) to Condrey Mountain, and a third looped into upper McDonald Basin.

During the late 1950s and on through the 1960s, timber purchasers and others built many additional miles of Forest Service road; among these were the upper Elliott Creek Road (FS Road 1050) to Dog Fork, a tie-through road from the upper Little Applegate near Brickpile Ranch east to Wagner Gap (FS Road 2250), the Yellowjacket Mountain Road (FS Road 2015), the road south from Silver Fork Gap to Donomore Meadows (FS Road 2025) the Middle Fork-Applegate Road (FS Road 1040) to Knox Gulch, the Kinney Creek Road (FS Road 1090), the Hanley Gulch Road (lower section of FS Road 2010), the southeastern section of the Whisky Ridge Road (FS Road 1035), and timber-haul roads up into the headwaters of Steve Fork (FS Road 1030), Sturgis Fork (FS Road 1020), and O'Brien Creek (FS Road 1005). (Many of these roads obliterated earlier Forest Service trails, which were not replaced.) To the east, in the Ashland Ranger District, the 1959 Ashland Fire brought roads south from town up to the Horn Gap vicinity. Also in the early 1960s, upper Tolman Creek and Neil Creek were accessed by much of present FS Road 2080 up to Bull Gap; later in the 1960s the "watershed road" (upper section of FS Road 2060) looped around the entire upper Ashland Creek drainage. The 1964 flood caused significant road damage throughout the area, which was repaired later in the decade.

Major additions to the area's transportation system during the 1970s included the Scraggy Mountain Road (FS Road 1065), the Sutton Gulch Road to Whisky Peak (FS Road 1035), the Squaw Ridge Road (FS Road 2010) between Hanley Gulch and Deadman Point, the upper Palmer Creek Road (FS Road 1095), and the post-1974-flood reconstruction of the Squaw Creek Road (FS Road 1075, which featured experimental use of 15'-high "stacked-sack" walls along very steep sections). Advanced logging systems permitted timber harvest on ever higher and steeper slopes, and road systems such as those of Low Gap Creek (FS Road 400) and the road from Hutton Gulch up Joe Creek to Cook-and-Green Pass (FS Road 1055) resulted. During the 1960s and 1970s, timber companies that owned parcels of land built roads from existing Forest Service roads in order to access their timber holdings.

During the 1980s the pace and added mileage of new construction lessened significantly. However, major "tie-through" or extension roads of that decade did include Low Gap, Thompson Creek Divide to Sturgis Fork, Whisky Creek, Duncan Gap, and Woodpecker Springs/Shump Gulch, and Swan Valley.

Currently the Siskiyou area of the Rogue River National Forest contains approximately 720 miles of Forest Service system roads.

(The information in this section is drawn largely from the following sources: *Prehistory and History of the Rogue River National Forest: A Cultural Resource Overview* [LaLande 1980], *History of the Rogue River National Forest*, Vol. I and II [Brown 1960 and 1971], and various *Crater/Rogue River National Forest maps*, 1910-1987.)

B. Current Situation

1. Road Density

Road density, as displayed in Map III-2, shows the approximate number of miles of classified road per square mile of land area. Classified roads are those roads needed for long-term motor vehicle access including State roads, county roads, private roads, National Forest System roads, and other roads authorized by the Forest Service. This map does not include non-Forest Service roads in density scales.

Unclassified roads (such as an unplanned road, an abandoned travel way, an off-road vehicle track not designated and managed as a trail, or roads that were once under permit or other authorization, but not decommissioned at the end of the authorization) are not managed as part of the forest transportation system. The unmapped unclassified roads may or may not have associated environmental concerns. Management decisions for unclassified roads are addressed in project planning, or when specific concerns are brought to the attention of the decision maker.

As of November 11, 2002, forest transportation managers have field inventoried 735 unclassified roads throughout the Forest, totaling 77 miles. This represents approximately 80 percent of the potential unclassified roads that may exist through the Forest.

2. Road Statistics

There are currently 2,550 miles of Forest Service classified roads in the Rogue River National Forest transportation system. The Siskiyou Mountains Analysis area encompasses 724 miles of Forest Service classified roads, or 28 percent of the entire Forest transportation system. Within the Analysis Area, 85 percent of the Forest Service Roads are currently open to vehicle traffic.

Table III-1. Total Miles of Roads By Maintenance Levels and Surfacing Types Within the Siskiyou Mountains Analysis Area

Maintenance Level	Surfacing Type	Miles	% of Total Miles
1. Closed Road	Native	90	
	Improved	3	
	Aggregate	14	
Totals		107	15
2. High Clearance Vehicle	Native	248	
	Improved	35	
	Aggregate	143	
	Asphalt	0	
Totals		426	59
3. Passenger Car, Low	Native	37	
User Comfort	Improved	15	
	Aggregate	128	
	Asphalt	3	
Totals		183	25
4. Passenger Car, Moderate	Native	0	
User Comfort	Improved	0	
	Aggregate	0	
	Asphalt	8	
	Bituminous	0	
Totals		8	100
Surfacing Totals		724	100

MAP III-2. Road Density - Siskiyou Mountains Area

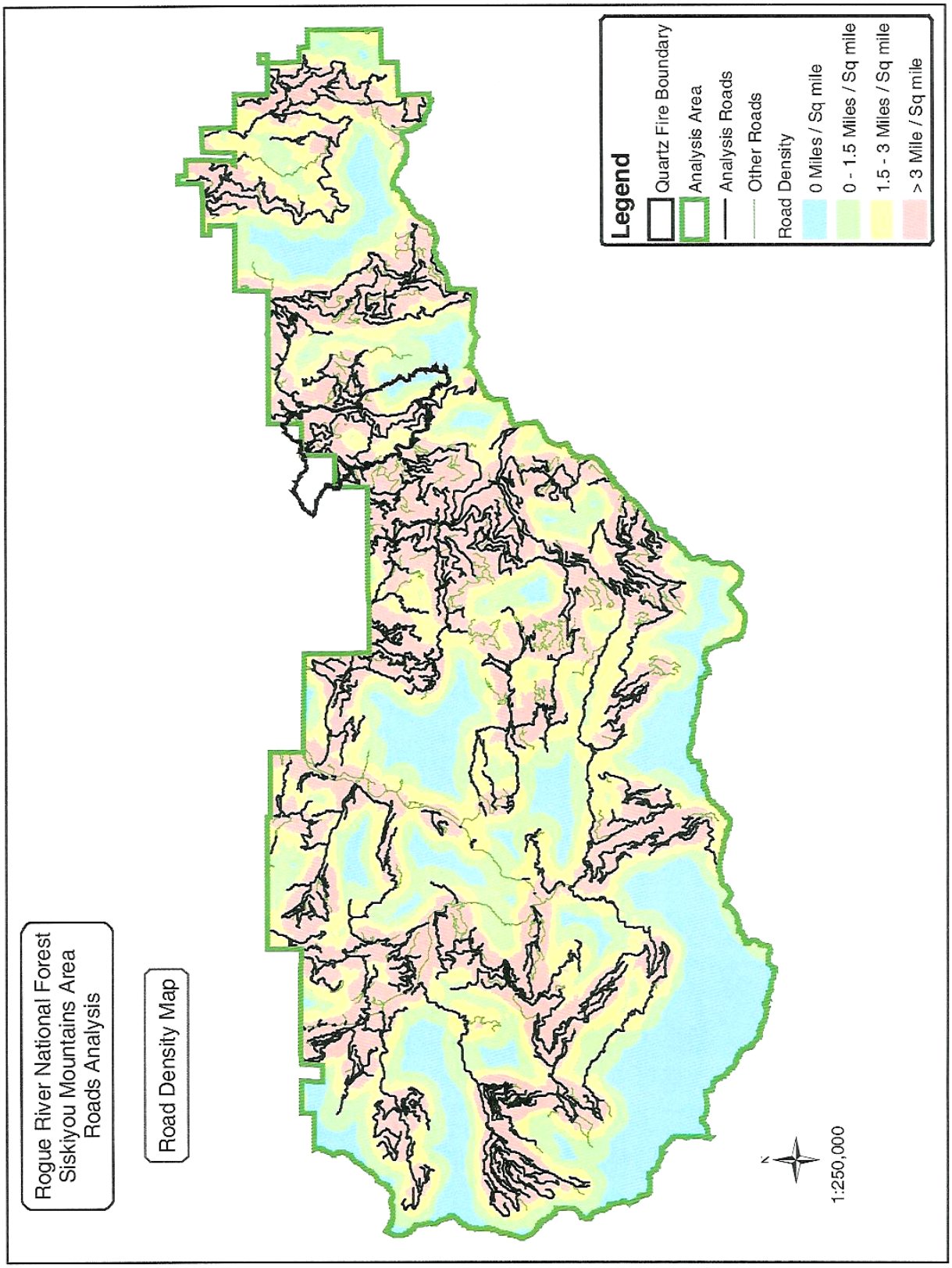


Table III-2. Surfacing Summary Within the Siskiyou Mountains Analysis Area

Surfacing Type	Total Miles
Native	375
Improved	53
Aggregate	285
Asphalt	11
Bituminous	0
Total Miles	724

3. Existing Uses

The current road uses in the Siskiyou Mountains Area fall under four general categories:

- Commercial – Usually non-Forest Service employees conducting commerce activities, such as delivering goods and services in, adjacent to, or out of the National Forest
- Recreation – Typically people who use Forest Service roads to access and visit trails, campsites, picnic sites, interpretive sites, heritage sites, waterways, special features, etc
- Administrative –Forest Service and other agency employees acting in official capacity while conducting day-to-day work activities
- Private Residential –Residential property owners who access their homes using Forest Service roads.

Commercial - A dramatic reduction in the National Forest timber harvest program created by the change in land allocations associated with the Northwest Forest Plan has reduced timber-associated traffic; however other commercial ventures associated with the forest resources exist in the gathering of special forest products. These ventures include but are not limited to firewood cutting, herb gathering, mushroom gathering, and Christmas tree and bough harvesting.

Long-standing range permits between the Forest Service and local cattlemen allow for the release of cattle to the forest open range in the spring, and gathering in the fall. Cattlemen use Forest Service roads to move cattle herds and access strays.

Commercial mining ventures occur within the Siskiyou Mountains Area. Patented claims for hard rock mining, dredging and sluicing, and surface rock are accessed over Forest Service roads within the Analysis Area.

Private land inholdings such as those owned by Fruit Growers and Boise Cascade Corporation use Forest Service roads to access their commercial timberlands through road use agreements.

The communities of Ashland, Talent, Jacksonville, Ruch, Applegate, and McKee Bridge, although not directly related to commercial use of forest roads, rely on the revenue from people stopping to eat or purchase supplies before entering The Siskiyou National Forest for work or play.

Recreation - Trails and trailheads within the Siskiyou Roads Analysis Area are widely used. Active trailhead access areas include the Ashland Watershed and Interface, Siskiyou Crest Zone, Red Buttes Wilderness, Applegate Lake Recreation Area, Squaw Lakes Recreation Area, Upper Applegate River, and the Grayback/Craggy Crest Zone. Some of the highest trail use in the Analysis Area occurs around Mt. Ashland, within the Ashland Watershed, and in the Ashland Interface. Trail use is also high around Applegate Lake and along the Siskiyou Crest Zone.

Trail user groups include hikers, equestrians, mountain bikers, and off-highway vehicle riders (OHV). Winter trail use is mostly by Nordic skiers with limited opportunities for snowmobile and OHV. Vehicles used to access trailheads can range from passenger sedans to one-ton pick-ups with stock trailers.

Sno-parks are located in the Mt. Ashland area providing access to Nordic and Alpine skiing, snowboarding, and snow play.

Camping in developed campsites is a popular recreation activity and campgrounds are often at peak use levels during the summer. There are also several developed picnic areas available for day-use activities that are used heavily in the summer. Applegate Lake and Squaw Lakes developed recreation sites are the highest used sites in the Siskiyou Roads Analysis Area.

There are many dispersed campsites available. Dispersed campsites are undeveloped areas that attract users because of nearby attractions such as water features, popular hunting grounds, or outstanding views. Vehicle access is desirable at these types of sites. The highest concentration of dispersed camps occurs along the Middle Fork of the Applegate River. Other notable areas include Steve Fork of Carberry Creek and Siskiyou Crest Zone.

Two informal auto tours exist within the analysis area. The Siskiyou Loop route is known for its outstanding views from Forest Service Road 20. The Upper Applegate/Thompson Creek discovery loop is a proposed route that is accessed via Highway. 238.

Other casual uses of the Siskiyou Roads Analysis Area of a recreational nature include mushroom picking, berry picking, firewood gathering, mining, hunting, and fishing.

Administrative - The agencies responsible for administration of lands and resources within the Siskiyou Roads Analysis Area include but may not be limited to:

USDA Forest Service
USDI Bureau of Land Management
Talent Irrigation District
City of Ashland
Oregon Department of Forestry

There are myriad responsibilities associated with managing land, water, fish, and wildlife. Each job requirement at the field level requires various degrees of access to the transportation system. Administrative access in most cases is by some form of high clearance vehicle, however in some cases, access is extended from the end of roads through other forms of transportation such as hiking, walking, quads, motorcycles, helicopters, mountain bikes, or on horseback. Closed or decommissioned roads, designated helispots, and system trails often provide the routes needed for management access.

Private Residential - Several residents within the Siskiyou Mountains Area Roads Analysis depend on Forest Service roads to gain access to state and county highways. Most of these roads allow for passenger vehicle access. Primary areas of residential in holdings include Carberry Creek, Elliott Creek, Lower Beaver Creek, Yale Creek, Dog Fork, and Little Applegate.

C. Issues and Factors

Issues regarding management of the Forest road system are divided between those relating to potential or actual environmental harm (environmental costs), and those issues relating to the ways roads are utilized (road benefits). Issues were identified by Forest employees and from comments received from the public. These issues and their subparts (factors) are described here.

Several example map products (Maps VI- 1, 2, 3, 4, 5, 6 in the Recommendations chapter) are included in this document, which show the results of intersecting the factors associated with Environmental Costs and Road Benefits. Road Benefits, as represented in the Geographic Information System (GIS), with the classified road system. Using ARCVIEW (software for Desk Top GIS, and mapping), factors intersecting roads may be seen individually or in a variety of combinations that best meet the needs of the project interdisciplinary team. Road segments are analyzed within sub-watersheds (6^{th} field Hydrological Unit Code (HUC), and are identified by road number. A road that leaves one sub-watershed and enters an adjacent sub-watershed is considered a new road segment. Example results are also available in Tables VI-1 and 2 (Recommendations chapter) and are located immediately after the example maps. Maps and Tables for all roads are available in GIS, but are too bulky to include in this report.

Sub-watershed ratings are shown for aquatic issues. These are included to provide a sub-watershed rating for aquatic environmental costs relative to the road system. The Sub-watershed Environmental Rating map (Figure 9), shows the results of the cumulative score for aquatic, terrestrial wildlife, and botanical environmental cost ratings by sub-watershed (6^{th} field HUC).

1. Environmental Costs

a. Aquatic Environment

The aquatic environment factors identified for the Siskiyou Mountains Area Roads Analysis are:

- Sediment Delivery
- Large Wood Delivery
- Listed and Sensitive Fish Passage through Road Crossings
- Key or Municipal Watershed Status

1) Sediment Delivery

Geologic Background- The Siskiyou Mountains Area of the Rogue River National Forest has a complex geologic history. Ancient sedimentary and igneous rocks of the Klamath geologic province underlie most of the Applegate and the western portion of the Ashland Ranger District.

The Klamath province is made up of 'exotic' terrains that were once oceanic crust and volcanic island arcs. These were carried eastward by the movement of tectonic plates, and subjected to extreme pressures as the pieces were accreted to the existing continental edge. The terrains were then intruded by granitic magmas, adding heat to the metamorphic process.

In the Analysis Area, one result of these processes can be seen in wide shear zones between different types of rock. These shear zones can be recognized by folds or fractures in the rock, or by bands of serpentine. Faults and shear zones are typically areas of concentrated groundwater, more deeply weathered bedrock, and deeper soils. They are often related to the large, ancient, inactive or only periodically active landslide forms.

Slope Stability- Erosion and sedimentation are natural and on-going processes that involve both mass-wasting (landslides) and surface erosion. These processes can be influenced and often accelerated by roads. Roads produce fine sediments from both the road surface and entire road prism (cut slopes and fills), and deliver that sediment to drainages through ditches and culverts. The amount of sediment produced is related to factors such as maintenance and traffic levels, road grade and surfacing material as well as soil and parent material. Landslides can be initiated or the failure rate accelerated by road construction, which destabilizes slopes by undercutting and/or loading the slope with fill material.

Midslope roads divert ground or surface water and concentrate flow to unstable slopes, both natural and engineered, initiating slope and fill failures. Failures at stream crossings often produce debris flows. Debris flows are failures in saturated sediments that scour slopes and stream channels for long distances from the initial landslide. Indirectly, increased rates of sedimentation can change channel morphology and function, for example, by diverting stream flow and undercutting the toe of a landslide deposit, causing stream bank failures downstream. Road networks in sub-watersheds can change the rate of response to rain and snowmelt and alter flow duration and extent. An overall measure of the impacts of the road network to a sub-watershed is the road density within the sub-watershed.

The road system may directly affect large wood and sediment delivery processes, and alter fish habitat, fish migration patterns, and aquatic habitat conditions. Roads and stream crossings may change the mechanism by which wood and sediment reach streams, and change fish migration patterns. Roads paralleling or bisecting stream channels and adjacent riparian zones occupy space where vegetation once grew, and increase the likelihood of increased sediment delivery to stream channels. Most large wood is delivered to the stream network by directly falling in to a stream channel, debris flow degradation down channels, or by transport along with sediment by a landslide.

The contribution zone for trees is principally within one site tree height (150 feet for the sake of this analysis) of a stream channel, or from an area prone to instability that delivers large wood to a stream channel. In a forested environment, large wood delivered by tributary channel transport, direct entry from riparian zones, and side-slope landslides, influences fish habitat. The large wood begins to sort diverse stream substrate sizes, creates habitat units (pools, riffles), forms depositional bars, builds floodplains with diverse topography, and causes other influences on aquatic and riparian habitat. Sediment delivery from roads usually contains little or no wood.

The loss of stream channel roughness and the increase in fine and coarse sediment will simplify aquatic insect and fish habitat, cause channel widening, and have other negative influences on aquatic habitat.

Cumulative effects and exponential increases in sediment delivery can occur where roads impact a single stream channel in several locations along the stream profile. The aquatic risk to sub-watersheds within the analysis area was rated. Stream miles in the sub-watershed were divided by the miles of road within one site tree height. Stream crossings per mile of stream channel were also used to rate the risk of roads within the sub-watershed.

The streams used for this broad-scale analysis are those in the GIS system, which are all of the perennial streams, and a small percentage of intermittent streams.

For the Sediment Delivery Factor, the rating systems used to assess the environmental cost of excess sediment entering the stream system are:

Percent of Sub- watershed Stream Network with Roads Within One Site Tree Height
(150 Feet)

Sub-watershed Ratings
Low - <7% of the stream system has roads located in the riparian reserve
Medium - 7 % – 15% of the stream system has roads located in the riparian reserve
High - >15% of the stream system has roads located in the riparian reserve

Stream Crossing Frequency Within the Sub-watershed

Individual Road Segment Ratings:
Low - <2 stream crossings per mile of road
Medium - 2 – 4 stream crossings per mile of road
High - > 4 stream crossings per mile of road

Sub-watershed Ratings
Low - <1 crossing per mile of stream within sub-watershed
Medium - 1-3 crossings per mile of stream within sub-watershed
High - >3 crossings per mile of stream within sub-watershed

Road Density Within the Sub-watershed

Sub-watershed Ratings
Low – < 1.5-miles/square mile
Medium – 1.5 to 3-miles/square mile
High - > 3-miles/square mile

Erosion Potential Analysis - The erosion potential analysis was done using existing information, with limited field verification. A soil erosion layer in GIS was used to determine areas of severe erosion potential.

The Erosion Potential mapping used for this analysis is based on generalized descriptions and groupings of soil complexes and parent material. The maps and reports derived from the analysis are useful for broad comparisons of erosion potential between sub-watersheds and for hazard assessment, but not for site-specific planning. Individual soil polygons, geologic maps, and field verification of rock and soil type are necessary to assign stability and erosion potential at the project planning scale.

The Number of Miles of Road in High Erosion Potential by Sub-watershed

Ratings by Sub-watershed
Low - < 1 miles in areas with High Erosion Potential or High Landslide Potential Areas.
Medium – 1 - 2 miles in areas with High Erosion Potential or High Landslide Potential Areas.
High - > 2 miles in areas with High Erosion Potential or High Landslide Potential Areas.

Erosion Rating of Individual Road Segments

Low - < 5% of the road segment is located within high erosion or high landslide potential area.
Medium – 5%-10% of the road segment is within high erosion or high landslide potential area.
High - >10% of the road segment is within high erosion or high landslide potential area.

2) Large Wood Delivery

For the Large Wood Delivery factor, as with the Sediment Delivery factor, the portion of each road segment that is within one site tree height of the stream was calculated using the Geographical Information System (GIS). Some of the factors used to assess effects of roads on sediment delivery apply to assessing the effects of roads on the large wood delivery, e.g. percent of the stream system with roads within one site tree of the stream.

Percent of Road Segment Within One Site Tree Height
(150 Feet)

Individual Road Segments
Low - <5% of road segment within one site tree of a stream channel
Medium – 5% - 10% of the road segment within one site tree of a stream channel
High - > 10% of the road segment within one site tree of a stream channel

3) Endangered Species Act (ESA) Listed and Sensitive Fish Passage Through Road Crossings

Fish passage and migration are affected by stream crossing structures in the road system. Bridges and natural bottom structures have little or no effect on the migration of fish upstream and downstream, however culverts or other structures used to support the road facility over the stream can interrupt fish movement in a watershed by introducing prohibitive jump heights into the pipe, long swimming distances without adequate light, and water velocities within the pipe that are too high for fish to successfully swim. These situations present impediments to juvenile and adult migrating fish moving upstream.

Connectivity of aquatic habitat is paramount for fish to retain the ability to migrate to: stream habitat with more favorable spawning conditions, areas with optimum water temperatures, and stream reaches with preferred aquatic habitat features, (e.g. deep pools and adequate hiding cover).

Listed and sensitive fish species are fish species of concern that are listed under the Endangered Species Act (ESA) or identified on the Pacific Northwest Region (Region 6) Sensitive Species List. Coho salmon (*Oncorhynchus kisutch*) and occupied and historic coho salmon habitat (Critical Habitat) are listed as threatened under the ESA.

Coastal cutthroat trout (*Oncorhynchus clarki*), chinook salmon (*Oncorhynchus tshawytscha)* and steelhead trout (*Oncorhynchus mykiss)* are on the Region 6, Regional Forester's Sensitive Species List. Within this analysis, all road crossings on fish-bearing streams will affect a listed or sensitive fish species because cutthroat trout generally occupy the uppermost stream habitats in the Siskiyou Area.

The presence of road crossings in streams containing coho salmon, coho salmon critical habitat, steelhead trout, chinook salmon or coastal cutthroat trout within a sub-watershed

Individual Road Segments
Low - <1 road crossings per mile of road in fish bearing streams
Medium - 1-2 road crossings per mile of road in fish bearing streams
High - >2 road crossings per mile of road in fish bearing streams

4) Key or Municipal Watershed

The Key Watershed designation is part of the Aquatic Conservation Strategy in the Northwest Forest Plan (NWFP). These watersheds or sub-watersheds were designated by scientists as core areas of aquatic/riparian habitat integral to recovering depressed anadromous fish populations.

The road system within a Key Watershed is of special concern. Within the Aquatic Conservation Strategy of the Northwest Forest Plan, there is a guideline for no net increase in the total miles of road inside these watersheds, with an emphasis placed on reducing the miles of road in areas with high erosion and high sediment delivery potential.

Four Key Watersheds are designated within the Siskiyou Zone Roads Analysis Area. They are identified as: Beaver Creek, Palmer Creek, Upper Little Applegate River and Yale Creek.

Ashland Creek Sub-watershed is a municipal watershed for the City of Ashland.

The rating system applied to Road Segments within Key or Ashland Municipal Watershed

Low – A watershed or sub-watershed is not designated as a Key Watershed in the NWFP
High - A Key Watershed, or Ashland Creek Municipal Watershed
There is no "Medium" rating for this factor.

b. Terrestrial Wildlife

The factors identified as wildlife environmental costs within the Siskiyou Roads Analysis area are:

- Late Successional Fragmentation
- Travel Corridors
- Threatened, Endangered and Sensitive Species
- Wildlife Harassment

These factors describe where and how the road system may directly affect wildlife and wildlife habitat.

1) Late Successional Fragmentation

Over 1,100 terrestrial species have been determined to be closely associated with late-successional and old growth forests, including the northern spotted owl, red tree vole, bats, salamanders, and numerous mollusk and botanical species. These natural populations are affected by habitat fragmentation caused by the presence of roads, which change the landscape structure. Roads fragment habitat by dissecting vegetation patches and increasing the edge-affected area, thereby decreasing interior habitat. Forest fragmentation eliminates blocks of continuous habitat, or degrades the quality of remaining habitat for those species sensitive to an increase in the amount of forest edge. During the daytime, forest edges typically have lower humidity, higher air temperatures, higher soil temperatures and lower soil moisture, increased solar radiation, and higher wind speeds than interior forests.

Edge-effects manifest themselves in several ways. Birds' nests show an increase of parasites and nest depredation. Amphibian distributions change, as well as plant distributions and abundance. Noise from vehicle traffic degrades habitat for birds, and big game such as deer and elk. Snag removal along Forest Service roads to ensure safety for the public and employees, has an effect on bats and cavity nester species that require dead trees for forage and nesting.

Physical edge effects from general forest roads commonly extend up to 120 meters (131.2 yards). To measure the fragmentation costs, Mature Habitat and Old Growth stands (MH and OG from the GIS vegetation layer) were buffered 120 meters inside the perimeter of each stand. They were then intersected with the road layer.

To measure the fragmentation cost, Mature Habitat and Old Growth stands were buffered 120 meters inside the perimeter of each stand. They were then intersected with the road layer.

Fragmentation cost ratings

Low - Road segment did not fall within the buffered area or the interior habitat section
Medium - Road segment fell within the 120 meter buffered area
High - Road segment passed through the interior habitat section

2) Travel Corridors

Riparian reserves serve as key travel corridors for many species because the three essential survival elements are found there: food, water, and shelter. The riparian corridors are generally intact, and offer continuous canopy cover, which moderates the extremes in conditions found outside the reserves.

This connected habitat between late successional stands is used to travel between summer and winter ranges, and between feeding, breeding, brooding, and rearing habitats. Intersection of reserves by roads dissects the travel corridors and may have adverse affects on many species. As deer and elk migrate from their summer range to the wintering grounds, well-defined migration trails intersect forest roads and increased road kills occur, especially on paved high-speed roads.

This factor intersected the road layer with the Riparian Reserve layer.

Travel Corridor cost ratings

Low – Road segment did not enter the Riparian Reserve
Medium – Road segment ran parallel to a stream within the Riparian Reserve, but did not cross the stream
High – Road segment dissected the Riparian Reserve and crossed the stream, fragmenting the travel corridor.

3) Threatened, Endangered and Sensitive Species

Peregrine falcons, northern spotted owls, and bald eagles can be negatively affected by disturbance due to road presence.

Peregrine falcons are particularly sensitive to their surroundings during the nesting season, and due to disturbance, they will sometimes abandon the nest (eggs or young). Disturbance can allow predator access to a nest, with a resultant nest failure. Within the typical 3 mile-radius protection zones for peregrine nests, management activities within ½ mile of the nest site have the highest potential to disturb peregrines. Northern spotted owls may be disturbed from activities on roads within ¼ mile of nest sites. Bald eagles may be impacted by road activities within ½ mile of an active nest site.

The following rates impacts to peregrine falcon, northern spotted owl, and bald eagles from habitat that may be associated with disturbance due to road presence.

For the peregrine falcon, the road layer was intersected with the primary, secondary, and tertiary nest protection zones. Environmental costs were determined as follows:

Low - Road segment fell outside of primary and secondary zones or within the tertiary nest protection zone (>1.5 to 3.0 miles radius).
Medium - Road segment fell within the secondary nest protection zone (>0.5 to 1.5 miles radius)
High - Road segment fell within the primary nest protection zone (0.0 to .05 miles radius from the nest site)

For the northern spotted owl, the road layer was intersected with a ¼ mile buffer around known activity centers for spotted owl. Environmental costs were determined as follows:

Low – Road segment fell more than ¼ mile from the activity center
Medium – Road segment fell more than 1/8 mile, up to ¼ mile of the activity center
High - Road segment fell within 1/8 mile of the activity center

Currently, three bald eagle nests are identified on the Siskiyou Roads Analysis Area, two on the Ashland Ranger District, and one on the Applegate Ranger District. Management Plans have been written for the Fish Lake site and a draft Management Plan was completed in 1993 for the Applegate Lake site. The Neil Creek site is located on a recently acquired land parcel, and a Bald Eagle Management Area has not yet been designated.

Low - Road segment fell outside the BEMA (or outside of ½ mile)
High – Road segment fell inside the BEMA (or within ½ mile or less)

4) Wildlife Harassment

Big game species such as deer and elk as well as many other species are sensitive to harassment or human presence, which is facilitated when roads are introduced in to a closed forest environment. Reductions in productivity, increases in energy expenditures, and displacements in population distribution or habitat use can occur. An example is avoidance by elk of large areas near roads open to traffic, with avoidance increasing as rate of traffic increases. Increases of energy expenditures in late fall and winter can lead to potential reductions in productivity. Also, a higher density of open roads correlates with an increased level of poaching activity. Thus, open road density in big game wintering grounds is a direct affect on big game populations.

Open road density may directly impact many animal species besides big game. Birds are attracted to roads to hunt for small mammals, or to feed on grains and seeds along roadsides, resulting in mortality from vehicle collisions. Reptiles seek roads for thermal cooling and heating, which also increases mortality rate from vehicles. Forest carnivores such as coyote, bobcat and cougar, are vulnerable to road mortality because they have large home ranges that often include road crossings.

Many species avoid roads. When this happens, animals remain at some distance from roads and rarely or never attempt to cross. For example, species such as fisher will avoid entering open areas like roads.

Standards and Guidelines from the RRNF Forest Plan, calling for limiting the number of open roads to approximately 1.5 miles per square mile of land, were used to determine wildlife harassment costs (LRMP 4-178 – November 1 to April 30 – Big Game Winter Range). This 1.5-mile threshold was applied by intersecting a Section grid (Township/Range) with the road layer across all land allocations, to represent the effects of road density on wildlife in general.

Wildlife Harassment cost ratings

Low – Road densities range from 0 to 1.5 miles per square mile of land
Medium – Road densities are >1.5 to 3.0 miles per square mile of land
High – Road densities are > 3.0 mile per square mile of land

c. Botanical Environment

The Siskiyou Mountain portion of the Rogue River National Forest is located within the Klamath-Siskiyou Ecoregion, an area well known for its high number of endemic plant species. The diversity of plants in this region deserves careful consideration regarding management of the Forest road system.

1) Botanical Areas

Botanical Area Cost Ratings

Low – all roads not rated High
High – roads intersecting or within 150' of designated Botanical Areas

2) Threatened, Endangered, or Sensitive Populations (TES)

The following rates the costs to TES plant populations that are associated with disturbance due to road presence

Low – all roads not rated High
High – roads intersecting or within 150' of known TES plant populations

3) Survey and Manage Plant Populations

The following rates the costs to Survey and Manage plant populations that are associated with disturbance due to road presence

Low – all roads not rated Medium or High
Medium – roads intersecting Late Successional Reserves
High – roads intersecting or within 150' of known Survey and Manage plant populations

4) Noxious Weeds

The following rates the costs associated with the presence of roads enabling the spread of noxious weeds

Low – all roads not rated High
High – roads within 150' of known noxious weed plants

2. Road Benefits

a. Recreation

Access to recreation sites is a critical component in providing a "quality" recreation experience for forest visitors. This roads analysis will address the access needs for recreation based on roads that access developed recreation sites, trailheads, dispersed recreation sites, and other opportunities as described below.

The following factors are rated **low or high**.

- Developed Recreation Sites
- Trailheads
- Dispersed Recreation Sites
- Other Recreation Opportunities

1) Developed Recreation Sites

A developed recreation site is one that contains facilities (toilets, tables, etc.), and in turn, results in the concentrated use of an area. There are twenty-five developed recreation sites that have been identified within the Siskiyou Roads Analysis Area. This includes, one lake access area, eleven campgrounds, three boat ramps, three viewpoints, two sno-parks, and five picnic areas.

The level of use for developed recreation sites to rate access benefit is defined as:

Low – Roads that do not access any developed site.
High – Roads that access a developed recreation site.

2) Trailheads

A trailhead is a facility designed primarily for parking and provides access to a trail for purposes of travel by foot, horseback, mountain bike, or motorized trail vehicle (less than 50" in width). There are fifty-two trailheads within the Siskiyou Roads Analysis Area.

The level of use for trailheads to rate access benefits is defined as:

Low – Roads that do not access any trailhead.
High – Roads that access trailheads.

3) Dispersed Recreation Sites

A dispersed recreation site is one found within the general forest area and does not have any facilities associated with it. There are numerous dispersed recreation sites within the Siskiyou Roads Analysis Area. Some are more well-known than others. These sites include traditional vehicle camping sites, and features that are points of interest like falls, springs, or rock outcroppings.

The level of use for dispersed recreation sites to rate access benefit is defined as:

Low – Roads that do not access any dispersed recreation site.
High – Roads that access known dispersed recreation sites.

4) Other Recreation Opportunities

Roads provide other recreation opportunities such as driving for pleasure and viewing scenery, mountain biking, OHV access, and winter recreation for Nordic skiing and snowmobiling. There are three undesignated scenic loops, two informal snowmobile routes, two mountain bike routes, two OHV routes, and future opportunities for additional recreation access within the Siskiyou Roads Analysis Area.

*Scenic loops include the Siskiyou Crest Route (FDR 2000), which straddles the Siskiyou Crest and is located on both the Rogue River N.F. and the Klamath N.F. (FDR 2000 also provides access to two developed recreation sites located on the south side of Mt. Ashland in the Klamath N.F.); the Upper Applegate/Thompson Creek Route (FDR 10), which follows Upper Applegate River, Carberry Creek, and Thompson Creek; and Whisky Peak/Low Gap Routes (FDR's 1035, 1040, 1030, and 1030400), which access Whisky Peak and Low Gap.

These roads have not yet been entered into the GIS, however interdisciplinary teams evaluating the road system need to consider this factor.

The level of use for other recreation opportunities to rate access benefit is defined as:

Low – Roads not identified above.
High – Roads identified above.

b. Fire Protection and Suppression

District personnel digitized all of the factors listed below into one rating in GIS. As an example, in the Recommendations chapter an example map (Map VI-6), shows roads rated high, medium, and low for fire access benefits. This rating is a summation of all the factors below.

1) Fire Facilities

The forest transportation system is used to provide access to fire facilities such as lookouts, trailheads, pump chances and constructed and maintained fuel breaks. Access is also required at times to unimproved facilities such as traditional detection viewpoints.

The access benefit ratings for fire facilities are:

Low – All roads not mentioned in Medium or High ratings
Medium – Roads that access unimproved fire facilities
High - Roads that access improved fire facilities

2) Fire Occurrence

Most fires on the Siskiyou Roads Analysis Area are lightning caused, and are spread fairly evenly across the zone (there is a somewhat higher occurrence in the higher elevations). Human caused fires occur mainly around recreation and woods related operations sites, and are closely related to access. Where there are no roads, the occurrence of human caused fires is low.

The access benefits ratings for fire occurrence are:

Low – All roads not mentioned in High rating
High – The primary transportation system

3) Fire Suppression

To provide access for firefighters and equipment during fire suppression operations, there are characteristics that make one road more valuable than another. The target vehicle for fire suppression access would be a high clearance vehicle such as pick-ups, crew carriers, and wildland fire engines, all of which correspond to a road maintenance level 2 (see glossary). Some roads are more important because of obvious safety reasons to do with the lay of the land, such as ridge tops vs. mid slope, and fire behavior. All roads do have potential value from a fire suppression standpoint.

The factors for prioritizing the roads for fire suppression access are as follows.

Low – All roads not mentioned in Medium or High ratings
Medium - Secondary roads that provide access to a section of land (1 square mile)
High - The primary transportation system, as well as roads that provide access into major drainages, loop roads, and roads that access the bottom of the slope

c. Vegetation Management

Roads within the Siskiyou Mountains Area provide access to those who facilitate the implementation of silviculture prescriptions and vegetation management treatments. For the sake of this analysis, the following strategy was developed to prioritize the access needs to accomplish that work based on categories of land identified in the Northwest Forest Plan.

The Siskiyou Mountains Area of the Rogue River National Forest consists of two land categories identified in the Northwest Forest Plan, Adaptive Management Area (AMA) and Late-Successional Reserve (LSR). The defining land category for most of this area, about 160,000 acres, is AMA. The east portion, including the Ashland Municipal Watershed and Tolman/Upper Neil Creek is LSR. In addition, the Siskiyou Area shares an LSR (Johnny Oneil-354) with the Klamath NF.

1) Adaptive Management Areas

AMA lands are similar to Matrix in that they are capable of supplying programmed timber harvest. The land management strategies (MS) that supply programmed timber harvest in the Land and Resource Management Plan (LRMP) of the Rogue River National Forest, and are considered a higher priority for road access include:

MS 6 - Foreground Retention
MS 7 - Foreground Partial Retention
MS 8 - Middleground Retention
MS 9 - Middleground Partial Retention
MS 14- Big Game Winter Range
MS 20- Timber Suitable I
MS 21- Timber Suitable 2
MS 23- Managed Watershed

Satellite Vegetation Mapping (Geographical Resource Systems 1993) provided the following vegetation classes:

SHRUB
EARLY < 11" dbh (diameter breast height) with varying crown closure
OPEN SCATTERED CANOPY > 11" dbh & < 60 % canopy
MATURE 11-16.9" dbh & > 60 % canopy closure
MATURE 17-20.9" dbh & > 60 % canopy closure
LATE 21-27.9" dbh & > 60 % canopy closure
LATE 28 +dbh & > 60 % canopy closure

The following ratings reveal the priorities for treatment of vegetation condition classes in the Siskiyou Area AMA land:

Low - SHRUB, EARLY, OPEN SCATTERED and LATE 28" + dbh
Medium - LATE 21-27.9" dbh
High - MATURE 11-16.9" dbh, MATURE 17-20.9" dbh, Existing Plantations, and Current, Planned and Sold Timber Sales

2) Late-Successional Reserve Lands (LSR)

Silviculture activities in LSR's are allowed for fire risk reduction and enhancing Late Successional habitat. The priorities are as follows:

Low - LSR-354 (Johnny Oneil)
Medium - Mt. Ashland LSR-248, above 2060 Road
High - Mt. Ashland LSR-248, below 2060 Road and Lower Tolman area

d. Cost Share Roads

Within the Analysis Area there are several roads that are covered by cost share easements. These roads are a major part of a high value transportation system mutually needed by the Forest Service and private timber companies. The parties jointly share in the capital investment for the construction, reconstruction and maintenance of the road.

The Forest Service has granted to the Cooperator a private interest right in the use of the Forest roads they share. Cost share Cooperators retain the rights to use these roads for access to their land, however the Forest Service retains jurisdictional control of the roads.

Access priorities for roads or segments of roads where we share easements are:

Low - A share easement does not exist
High - A share easement does exist

e. Range Facilities

There are a number of existing improvements on the Siskiyou Mountains Area of the Rogue River National Forest that facilitate the management of the Range Program. These facilities include cabins, corrals, and livestock water improvements called "guzzlers". Permittees need direct and regular road access to the cabins and corrals. Access to the guzzlers by road is needed for occasional maintenance work.

Range Improvement Access Benefit Rating

Low – All roads not rated Medium or High
Medium – Roads accessing guzzlers
High – Roads accessing cabins and corrals