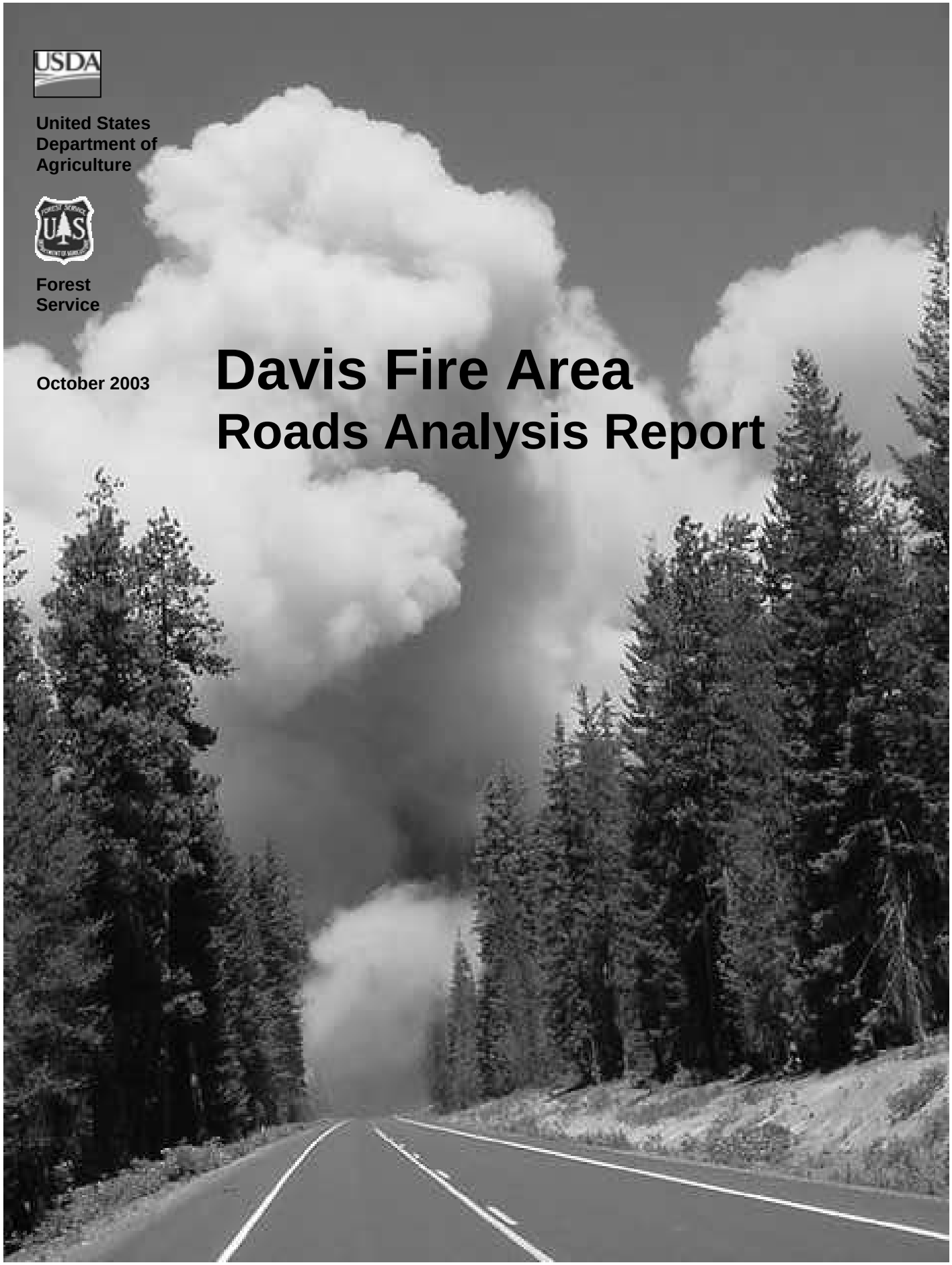

United States
Department of
Agriculture

Forest
Service

October 2003

Davis Fire Area
Roads Analysis Report

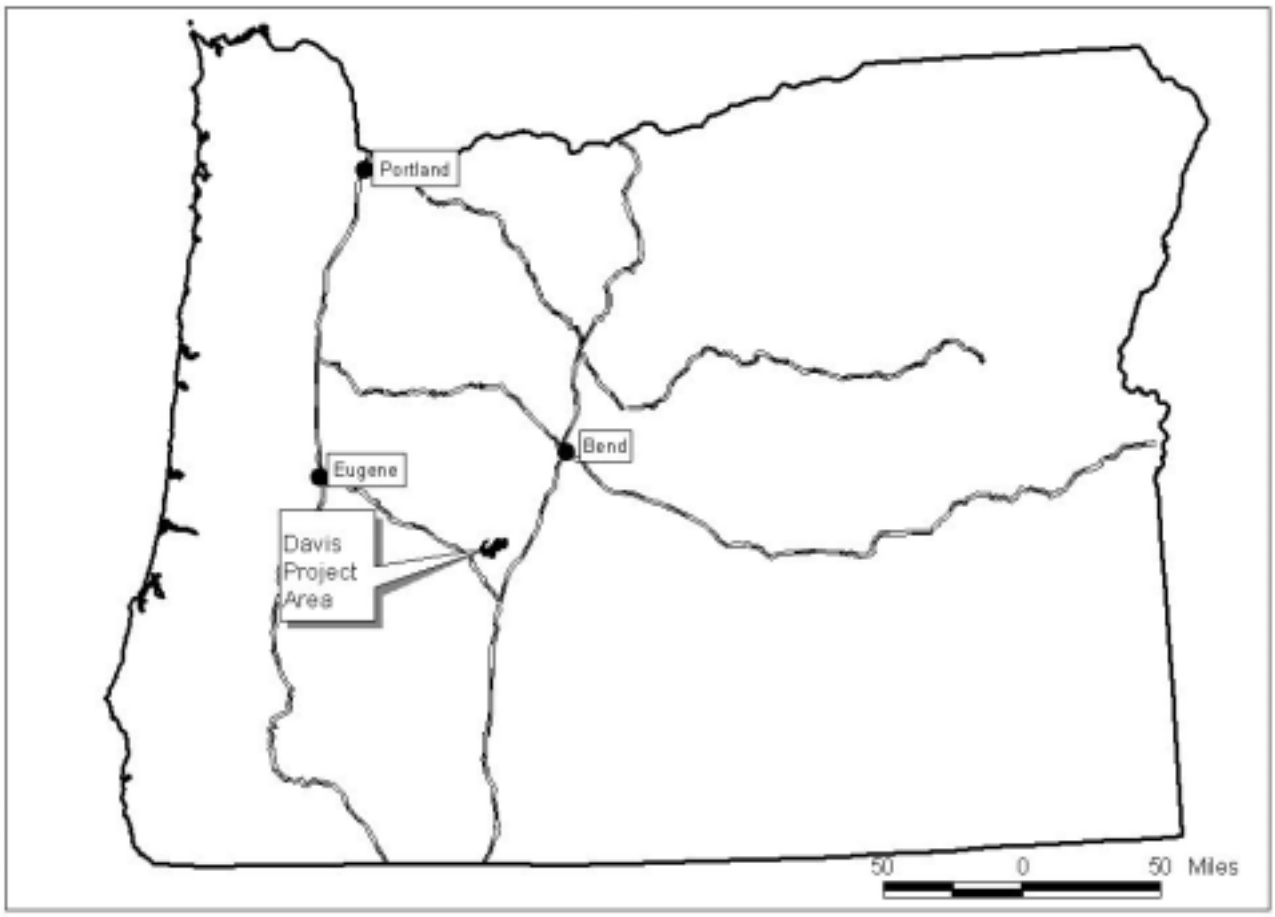

Figure 1. Project Area in Oregon

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Setting up the Analysis

Objectives of the Analysis

The objective of roads analysis is to provide decision makers with the information necessary for developing road systems that are safe and responsive to public and agency needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions.

Roads analysis is a six-step process. The steps are designed to be sequential with the understanding the process may require feedback and iteration among steps over time as an analysis develops. The amount of time and effort spent on each step differs by project based on specific situations and available information.

The product of an analysis is a report for decision makers and the public that documents the information and analyses used to identify opportunities and set priorities for future National Forest road systems. This report documents the roads analysis performed for the Davis Fire Area, which corresponds with the Davis Fire Salvage EIS project area boundary. This report is a "living document" and reflects the conditions of the analysis area at the time of writing.

Geographic Scale of Analysis

This Roads Analysis was conducted at the project level and is limited in scope to the Davis Fire Area, and the Closure Area (Figure 2). The fire area covers approximately 21,000 acres of National Forest System Lands. This Roads Analysis is intended to inform any project-level decisions that affect the transportation system in the project area according to Forest Service Road Management Policy at FSM 7712.12 and 7712.13 and focuses on maintenance level 1 and 2 roads. Current and future project-level planning in the area will include recreation, timber salvage, reforestation, and fuels reduction. These projects may involve changes to the transportation system.

Information on the transportation system at larger scales is available in the Deschutes-Ochoco Forest-wide Roads Analysis (USFS 2003), and the Odell Watershed Analysis (USFS 1999).

Interdisciplinary Team Members

District Ranger, Phil Cruz, and his staff provided oversight for this Roads Analysis. The interdisciplinary team members that completed the process and prepared this document are:

Ken Kittrell, Road Manager
Beth Peer, Writer/Editor
Ken Boucher, Fuels Technician
Carolyn Close, Botanist
Rick Cope, Hydrologist/Soils
Leslie Hickerson, Archaeologist
Paul Powers, Fisheries Biologist
Paul Miller, Wildlife Biologist
Bob Graham, Silviculture Assistant
Gary Morehead, AFMO Suppression
Joan Kittrell, Wildlife Biologist
Steve Finneran, Presale Forester
Lloyd Werner, Silviculturist
Anne Shirley, Special Uses
Ronda Bishop, Recreation Program Manager

Public Involvement

Input from the public was solicited by a letter sent to the District's regular mailing list. The list includes people who are usually interested in our project planning. About 85 individuals, agencies, and organizations were invited to provide input to the Roads Analysis. The Roads Analysis was also announced on the Deschutes National Forest's web site.

Three responses were received: One group believes the road system is sufficient, but not excessive, and administrative access and danger trees are important considerations in the planning area. Another group has a concern with hazard trees along a groomed snowmobile trail that is on the perimeter of the fire area. And an individual who responded suggests considering salvage operations and long-term uses of roads in the planning area. These topics are covered in the report, under Benefits and Problems of the Current Road System. The actual responses are on file at the Crescent Ranger District. If and when recommendations become proposed actions, the public will have the opportunity to be involved in the NEPA process.

Status of Current Data

Currently, the Crescent Ranger District has a variety of data sources. The road system is contained in the Deschutes National Forest's geographic information system (GIS). Information on each road segment is maintained in an Oracle database. This data is fairly accurate, but may be updated as a result of this analysis. Other data used in this analysis, such as campground location and the stream layer are fairly up to date and accurate; metadata is available which describes source and scale information.

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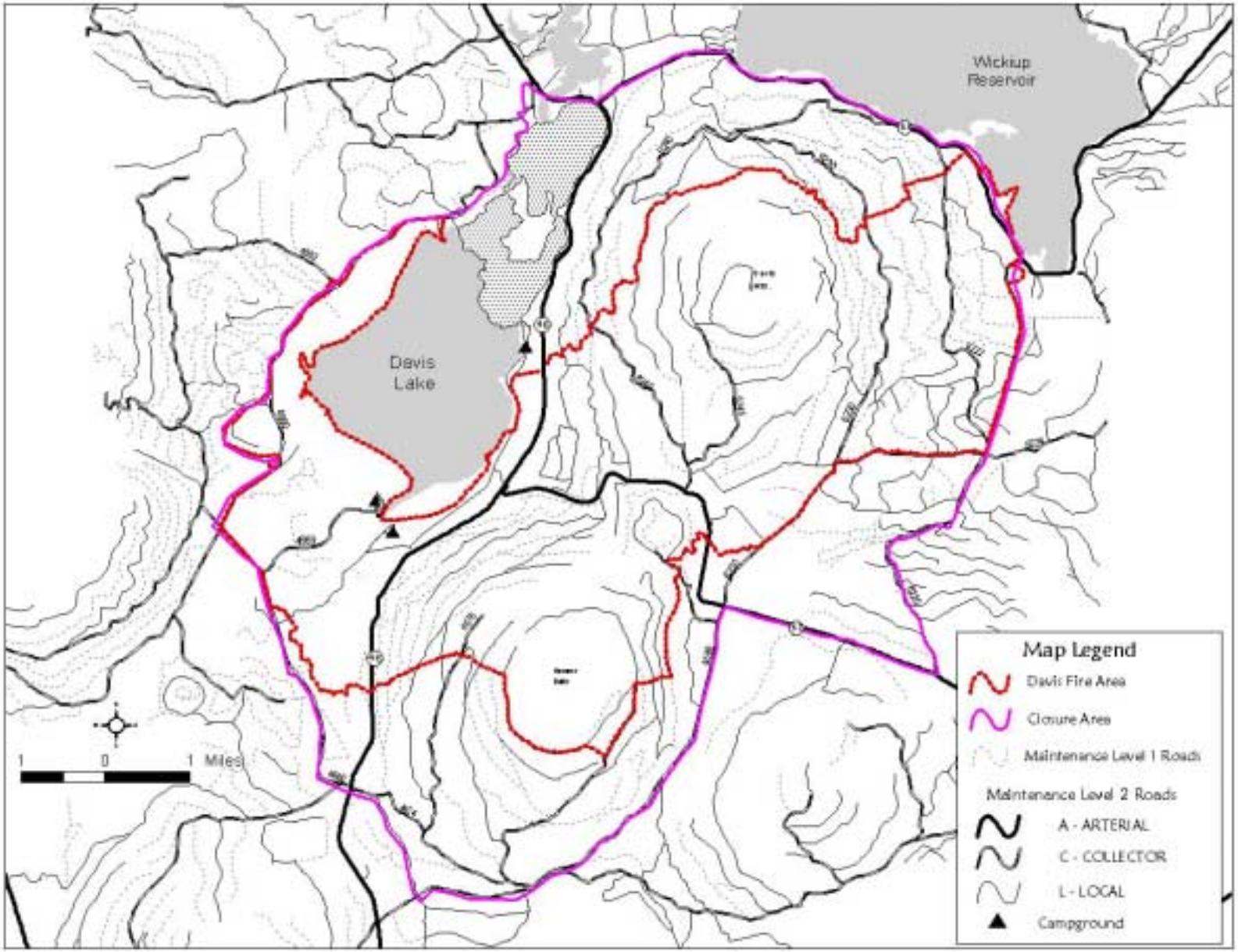
Figure 2. Current Transportation System in Davis Fire Area



Describing the Situation

This section describes the current situation of the transportation system, how it has evolved, and other key information about roads in the analysis area. The analysis area encompasses approximately 21,000 acres of National Forest System Lands. Some discussions are focused on the actual fire area, while other topics refer to the closure area which is slightly larger. The location of the project area in Oregon is shown in Figure 1, page 2. The existing transportation system is displayed in Figure 2, page 7.

Existing Road and Access System

The Location of all Roads

Within the closure area (or "analysis area"), which is bounded by Roads 44, 46, 4660, 4674, 4680, 62, and 6220, there are approximately 290 miles of roads distributed rather discontinuously. Roads are quite closely spaced on the lower to middle flanks of Davis Mountain and Hamner Butte, but tend to become less dense on the saddle between them and are quite sparse on the top and northern 1/3 of these two features. Relatively few roads are found on the lodgepole flats south and southwest of Davis Lake.

The majority of roads are located on relatively gentle to moderate side slopes between 15% and 40% on and between Davis Mountain and Hamner Butte. A few scattered roads are found on the relatively flat (0% to 10%) slopes typical to the flat valley bottom land form found south of Davis Lake.

Ages and Development Histories of Roads

The majority of roads within the analysis area have been in existence for over 30 years, and many date back to the early decades of the 20th century. A route traveling through the vicinity of Davis Lake provided a connection between the Crescent/Odell Lake area and Central Oregon in the early part of the 20th Century. Other roads along the northern edge of the analysis area were constructed in the early 1940s to remove standing trees from the pool zone during the early construction of Wickiup dam on the Deschutes River. Roads also provided access to a work center near Davis Lake and to Davis Mountain Lookout, a 40-foot L-4 installation built in 1933.

The roads within the interior of the analysis area were, by and large, constructed over the last 40 or more years to provide access for timber harvest. In the 1970's an effort was apparently undertaken to remove some of these roads from the transportation system. This effort appeared to be most intense on the east side of Davis Mountain between Road 6230 and 6220. While precise numbers are not directly available, visual observation suggests that approximately 1/3 of the road miles in the area were functionally removed from the system, although in most cases they were not physically obliterated. Another effort in 1999 physically closed a number of roads on Hamner Butte and Davis Mountain. Some of these roads were reopened during fire suppression efforts during the Davis Fire.

There is no private land that is directly served by the roads in the Davis Fire Analysis area. One small subdivision exists outside the analysis area, being found near the junction of Roads 44 and 6220. This small collection of year-round and seasonal residences, called Wickiup Acres, does not rely on Analysis area roads for general access.

Road Surface Types and Existing Maintenance Levels

The bulk of the roads within the analysis area, 69%, are native surface roads. They are variously managed as either being open to high clearance vehicles (Maintenance Level 2) or as being closed by physical barrier so that traffic is eliminated (Maintenance Level 1) but not prohibited (by Order).

The open roads in this group are not maintained on a recurring annual basis, but rather are reviewed periodically to determine any needed maintenance to protect adjacent resource values.

Another 26% of the roads are categorized as “improved native” or “aggregate” surface types. Examples of this surface type range from the cinder surfacing of Roads 6220 and 6245 to the crushed aggregate of Roads 4660 and 44. Generally speaking, the crushed aggregate-surfaced roads and even some roads with lesser quality surfacing that provide access to developed recreation sites, such as Roads 4669 or 4600855, are managed to allow passenger car traffic (Maintenance Level 3). A segment of Road 62 found within the analysis area is asphalt/bituminous surfaced and is managed to accept passenger car traffic with a certain degree of traveler comfort and convenience (Maintenance Level 4). Road 46, the Cascade Lakes Highway, is managed – primarily by Deschutes and Klamath Counties – as an arterial route where passenger car use is encouraged with primary emphasis on traveler comfort and safety (Maintenance Level 5).

Table 1. Miles of Road by Maintenance Level.

Operational Maintenance Level	Miles
M/L 1	106
M/L 2	148
M/L 3	16
M/L 4	5
M/L 5	9

Existing Road Management Objectives

The existing management objectives for roads within the Davis Roads Analysis area can be split into two definitive areas: administrative/land management access, and recreation access. The bulk of roads, primarily found on and adjacent to Davis Mountain and Hamner Butte east of Road 46, are managed primarily for administrative access and are only secondarily managed to facilitate public usage. West of Road 46, the primary focus for most roads is to facilitate recreational access, primarily to Davis Lake. Arterials and collectors, regardless of Maintenance Level, are managed to allow for a mix of commercial and private traffic, although Roads 6222, 6224, 6240, 6245, and 4674 have less recreational emphasis and more emphasis on administrative access.

With the exception of those roads providing access to developed campsites around Davis Lake, seven-digit roads are generally managed – when open – to be primarily used by high clearance vehicles. During periods of log haul, they are intended to be single user facilities, given that their narrow roadbeds and lack of frequent turnouts preclude any opportunity to safely provide for mixed commercial/private traffic during periods when heavy trucks are hauling logs.

Road Use Patterns Over Time, Now, And In The Future

Within the Davis analysis area, roads have a general pattern of use that is common to low-standard roads that are in the absence of residential enclaves or recreational developments. Little use other than administrative traffic is seen on these roads during the late spring and summer. Traffic associated with timber harvest can dramatically increase use, but this activity is usually isolated both spatially and temporally, being confined to the specific activity area and, when viewed in terms of road use patterns over time, occurring in an almost random manner. The bulk of road use not associated with timber harvest comes in the fall with the advent of various deer and elk hunting seasons. Matsutake mushroom harvesting also contributes to use on the fringes of the analysis area outside of the Davis LSR, which occupies most of the analysis area.

There are two distinct exceptions to the general road use patterns:

1) Road 46 is the primary arterial through the analysis area. Serving as a short-cut for motorists traveling from Highway 58 to Bend and the High Cascade lakes along its length, this route sees a mix of traffic ranging from sight-seers and recreationalists enjoying the Scenic Byway to commercial trucks traveling between Central Oregon and the Willamette Valley.

2) Roads 44, 4660, 4669, and the seven-digit roads on the east side of Davis Lake serve as primary recreational access roads for Wickiup Reservoir and Davis Lake. Because of this use, these roads see significantly more use during the spring and summer than the majority of roads within the analysis area.

While the above describes the past road use patterns, the future holds different use trends. In the near future much of the road system will see little of the traditional fall hunting/gathering traffic because of its location within the most severely burned areas of the Davis Fire. Administrative traffic and logging-associated traffic accruing from whatever salvage harvest is eventually performed will make up the bulk of early near-term traffic. As time passes, traffic associated with reforestation and stand management will become the primary use of these road; eventually, as vegetative recovery progresses to the point of supporting big game populations, hunting/gathering traffic will once again become a significant component of overall use.

Primary Destinations of Road System Users

The majority of roads don't have a primary destination for users as much as they provide access to areas of interest for various users, such as land managers traveling to active or proposed vegetative management areas or hunters wishing to try their opportunities on the flanks of Hamner Butte. Those roads, however, that have been identified above as being exceptions to general road use patterns do have specific destinations. Road 4660, 4669, and several seven-digit roads provide direct access to Davis Lake and the developed and dispersed recreation sites surrounding it. Road 44 provides destination access to Wickiup Reservoir recreation sites along its south shoreline. Road 46, on the other hand, doesn't possess a single identifiable primary destination, but – depending on the user – does serve as the access to such primary destinations as the multiple lakes along its length, the resorts on some of those lakes, or to various points in Central Oregon.

Connectivity Between the Road System and The Stream System

All connectivity between the road and stream systems occurs at various points along Road 4660. There is only one point of true proximity between the perennial portion of the stream system and the road system. This point of connectivity occurs at the Odell Creek crossing on Road 4660. Owing to the obtuse angle of intersection, there is no length of proximity; any stream/road interaction occurs only at this intersecting point. Connectivity with intermittent portions of the stream system can be found at Ranger Creek and Moore Creek.

Social and Cultural Values of the Area

Within the small communities adjacent to the analysis area (Gilchrist, Crescent, Chemult, Crescent Lake Junction), residents primarily earn a living from natural resource extraction (sawmill, logging, post and pole harvest, firewood cutting), from the Gilchrist School system, from natural resource management, or from the service industry (restaurants, resorts, stores, motels, gas stations). Residents of nearby subdivisions are either locally employed or are retired. There is a strong connection for many residents of the area with local National Forest land, both as a source of jobs and as a source of recreational opportunities. Some of the residents living on small parcels – and many of the owners of recreational residences) hail from larger communities and purchased these parcels not only for their own remote location but also for their readily available access to the vast expanse of surrounding wildlands. Accessibility to those wildlands is a given assumption within the local culture; unlike the adjacent private timberland, owned by a specific entity that can dictate terms of access, these National Forest lands are theirs by right as citizens. Access is generally a component of that perceived right and proposals that threaten to affect access are usually looked upon with distaste.

Local, Regional, and National Social and Economic Benefits Derived From Existing Roads

Roads within the analysis area provide direct access to fishing, hunting, and boating opportunities in the immediate area as well at to other recreational sites outside the analysis area itself, with Road 46 allowing visitors from the south to travel to the northern portion of the Cascade Lakes Highway and allowing Central Oregon travelers to gain access to Crescent and Odell Lakes. The road system provides immediate access to boating, hunting, and fishing opportunities both for residents of the local communities as well as for visitors from farther away in Deschutes and Klamath Counties and the Willamette Valley. The usage provided by this access contributes to the economies of the area communities through the purchase of vehicle fuel, food, and other supplies at local establishments.

For the extensive population of people from throughout the United States who make a significant portion of their living through harvesting and selling or buying mushrooms, the transportation system within the analysis area provides important through-routes to and from Matsutake mushroom picking areas. This accessibility provides opportunities for members of this particular community to engage in harvest activities for both commercial and cultural purposes. The annual influx of hundreds of mushroom harvesters and of the buyers to whom they sell their mushrooms brings an increase in economic activity in the local communities in the same manner as that provided by the advent of hunting season. Tens of thousands of dollars are additionally collected for the U.S. Treasury through the sale of harvesting and camping permit fees by the USDA Forest Service.

The leading reason for the creation of the majority of the existing road system was to provide access for timber harvest. The need to have access for vegetative management would have remained as an important reason for the continued existence of the road system at any rate, but the changes in vegetative composition and presence wrought by the Davis Fire renders this road system even more important than might normally be expected. The intensity of activity occurring as a result of any salvage operations that might occur and the need to engage in fairly intensive reforestation activities in some areas will dictate the need for vehicular access for many years. Access for timber sales and other silvicultural contracts provides for local employment opportunities to support local communities, and revenue generated from the sale of timber, posts and poles, and firewood for the federal government.

Road Densities within the Analysis Area

Within the boundaries of the current closure area (see Figure 2) total road density is 4.35 miles/square mile (mi./sq. mi.). This includes all classified roads on National Forest land. Unclassified roads are not included in this figure because they are either temporary roads resulting from timber sale operations or are the remnants of roads that were previously decommissioned. In either case, although they may have been visible in aerial photographs, these roads had been rendered undrivable by closure and subsequent colonizing by vegetation. While many of these unclassified roads have become visible - and some have been opened and used in fire suppression activities – they will be attended to to the degree necessary to make them remain undrivable and not a part of the official transportation system.

Within the actual fire perimeter, total road density is 5.67 mi./sq. mi. This somewhat higher overall density reflects the concentration of the majority of the fire in areas that over time have been subject to entries for harvest purposes. It also reflects exclusion of Davis Lake and the lava flow to its north.

Open road densities within the analysis area and within the fire perimeter can be expressed as either **objective** or **operational** owing to the difference between various access management decisions that have previously been made (in particular, those closure opportunities identified in the Seven Buttes Environmental Assessment) and the degree to which those decisions have been implemented over time. The objective open road density within the analysis boundary (that is, the density of open roads resulting from the planned closure of certain roads) is 2.14 mi./sq. mi. The operational road density in the analysis area (representing the open road density based on the actual closed roads) is 2.70 mi./sq. mi. Within the actual fire perimeter, objective open road density is 2.60 mi./sq. mi., while the known operational open road density is 3.50 mi./sq. mi. The actual open road density within the

fire perimeter is somewhat higher (but by what exact amount is unknown) because several previously closed classified roads and an unknown number of previously invisible closed unclassified roads were opened as a part of suppression efforts. Since the unclassified roads previously described will be closed to deny future vehicular access, no future decisions would be addressing these roads and they will not be further discussed.

The analysis area lies within all or a portion of eight separate 6th field subwatersheds. The following table displays the overall road densities within those 8 subwatersheds, include both roads inside the analysis area and outside of it. Acreage occupied by lakes and reservoirs have been subtracted from the total area of those subwatersheds where the failure to exclude such acreage would present skewed results in comparison to those subwatersheds lacking large water bodies.

Table 2. Road Density by Subwatershed

Subwatershed Name	Subwatershed Number	Total Road Density (Mi/Mi^2)	Objective Open Road Density	Operational Open Road Density
Odell Creek	170703010202	6.20	3.15	3.35
Moore Creek	170703010203	1.52	0.66	0.97
Davis Lake	170703010204	5.47	2.35	3.20
Davis Creek	170103010206	4.20	2.70	3.24
Wickiup	170703010207	5.88	3.34	4.70
Middle Crescent Cr.	170703020206	5.20	3.14	3.61
Lower Crescent Cr.	170703020207	4.74	3.94	4.25
Hamner Butte	170703020301	4.93	2.61	3.71

Desired Road System Conditions and Management Direction

The desired condition is to provide a road system that is safe, affordable, has minimal ecological impacts, and meets immediate and projected long-term public and resource management needs.

Current direction for road management is found in the 1990 Land and Resource Management Plan (LRMP) for the Deschutes National Forest. According to the LRMP the goal of the Forest's transportation system is "To plan, design, operate, and maintain a safe and economical transportation system providing efficient access for the movement of people and materials involved in the use and protection of National Forest Lands." (LRMP p. 4-71)

The Project Area is divided into the following LRMP and NWFP Management Areas:

Table 3. LRMP Management Areas

LRMP Management Area	Acres
General Forest	7,541
Scenic Views	8,423
Bald Eagle	3,466
Special Interest Area (Davis Lake)	1,029
Intensive Recreation	291
Old Growth	286

Table 4. NWFP Allocations

NWFP Allocations	Acres
Matrix	6,425
Administratively Withdrawn	1,020
Late Successional Reserve	11,820
Outside NWFP	1,735

The project lies within the area covered by the Northwest Forest Plan (NWFP), which amended the 1990 LRMP. All NWFP Land Allocations have standards and guidelines that address roads. Standards and Guidelines are requirements that must be met.

Late Successional Reserves:

- Road construction in LSRs for silviculture, salvage, and other activities generally is not recommended unless potential benefits exceed the cost of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, be routed through non late-successional habitat where possible, and be designated to minimize adverse impacts.

Key Watersheds (Odell Creek 6th field subwatershed is a Tier 1 Key Watershed):

- No new roads will be built in remaining unroaded portions of inventoried roadless areas located in key watersheds.
- Outside roadless areas reduce existing system and non-system road mileage. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in key watersheds.
- Key watersheds are the highest priority for restoration.

Riparian Reserves:

- For each existing or planned road, meet aquatic conservation strategy (ACS) objectives by:
  - Minimizing road and landing locations in riparian reserves
  - Complete watershed analysis prior to new road construction
  - Minimize disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface/subsurface flow.
  - Avoid wetlands entirely.
- Determine the influence of each road on the aquatic conservation strategy through watershed analysis. Meet ACS objectives by:
  - Reconstructing roads that pose a substantial risk.
  - Prioritize reconstruction based on risk to riparian resources.
  - Decommission roads based on the affects to ACS objectives and considering short and long-term transportation needs.
- Road crossings that pose a substantial risk to ACS objectives will be improved to accommodate at least the 100-year flood. Priority for upgrading will be based on the potential impacts to riparian resources.

- Road Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of a crossing failure.
- Minimize sediment delivery from roads. Outsloping of the roadway is preferred. Route road drainage away from potentially unstable channels, fills, and hillslopes.
- Provide and maintain passage at all road crossings of existing and potential fish-bearing streams.
- Develop and maintain a transportation management plan that meets ACS objectives and which addresses:
    - Inspection/maintenance during and after storms
    - Road maintenance that identifies and corrects drainage problems that contribute to degrading riparian resources.
    - Develop road management objectives that documents the purpose of each road.

Assessing Benefits, Problems, and Risks and Identifying the Issues

The purpose of this section is to identify the key questions and issues affecting road-related management. Issues arise when there is a point of debate or concern that cannot be resolved without some consideration of the trade-offs involved. When analyzing the road system, issues usually center on the debate over benefits of having roads versus the risk they may pose to the environment. The discussion that follows each key question focuses on the interaction of the transportation system with the ecosystem. The analysis questions lead to recommendations for improving the transportation system and reducing negative impacts to the environment.

Issue Summary

The most important road-related issues in the analysis area can be dived into two categories.

Social and Economic – roads are needed and/or desired for certain purposes; and Environmental – roads can cause problems. The interdisciplinary team identified the following issues in the project area:

- Weeds – Conditions for the establishment and spread of invasive non-native plant species have increased since the fire. Roads are a key vector in their spread.
- Safety – hazard trees
- Wildlife – The roads in the project area may have more impact on wildlife since the fire.
- OHV Access Management – The fire has created openings that OHVs may take advantage of that may cause resource damage or problems for wildlife.
- Fire Suppression/Fuels Management – Access versus escalated project costs or escaped fires
- Winter Recreation – Accessibility and safety along snowmobile routes.
- Recreation Access – What is the best way for people to reach the campsites and Davis Lake?

Key Analysis Questions

The following analysis questions were adapted from Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (FS-643). The Interdisciplinary Team answered those questions they felt were relevant to the planning area and the project scale. Some questions were modified or combined. These questions were used to assess benefits, problems, and risks, and for identifying issues. The information will also be used during project planning and to focus a project level analysis.

Ecosystem Functions and Process

1. *To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the*

potential effects of such introductions to plant and animal species and ecosystem function in the area?

Motorized vehicles and/or their cargo are the single most important vector for the introduction and spread of noxious weeds and other non-native plant species in the Davis Fire area on the Crescent Ranger District, Deschutes National Forest. Existing road systems, new roads, and conversion of existing roads to trails are currently the most vulnerable types of improvements for weed introduction and spread. As a result of the fire, conditions for the establishment and spread of invasive non-native plant species have greatly increased. In the past, timber harvest units have been vulnerable to weed introduction and spread when logging equipment was moved from infested areas, usually on other forests, to non-infested areas within the Davis Fire's perimeter. The risk from introductions of this type has been greatly reduced by the inclusion of clean equipment provisions in timber sale and other service contracts. St. Johnswort, spotted knapweed, common toadflax, Dalmation toadflax, Canada thistle, bull thistle, Scot's broom, and cheatgrass are noxious weeds that are known to occur in the Davis Fire area. Other non-native plant species that are not State listed noxious weeds exist in the area as well. All these invasive non-native plant species threaten native plant communities, increase fire hazards, reduce the quality of recreational experiences, poison livestock, and replace wildlife forage.

Aquatic, Riparian Zone, and Water Quality

2. *How and where does the road system modify the surface and subsurface hydrology of the area?*

The construction of roads on sideslopes tends to intercept and reroute downslope surface flow, especially during high-intensity precipitation events. Hillside roads tend to become, from a hydraulic standpoint, slope-contouring streambeds. This can lead to change in timing, increase in peak discharge, and shortening of the duration of flood flows, potentially leading to downstream channel-changing events. Owing to the high infiltration rates and extreme porosity of soils found within the analysis area coupled with a lack of stream channels that could receive increased flows from these side slopes, risk of these sorts of events is extremely low.

When roads are constructed on sideslopes, their cutbanks can theoretically intercept subsurface downslope flow, causing loss by surface evaporation or converting the subsurface flow to surface ditch flow that is then routed more quickly through the hydrologic system, thereby disrupting established hydrologic patterns. No direct evidence exists to suggest that this sort of subsurface interception was occurring in the analysis area prior to the fire; although groundwater supply will presumably increase over the short term because of the loss of evapo-transpirative withdrawal no longer provided by burned vegetation, no measurable increase in downslope subsurface flow interception is anticipated because of the excessively drained nature of the soil types found in the analysis area.

On flatter valley bottom topography, riparian road crossings tend to interfere with shallow subsurface flow as a result of soil damming resulting from roadbed compaction. Riparian crossings of this nature do not exist in the analysis area.

3. *How and where does the road system affect wetlands?*

Wetlands are affected along Odell Creek by Forest Service roads 4660 and 4660-600. Forest Road 4660 crosses Odell Creek at approximately river mile 2.0. Five culverts carry the flow of Odell Creek beneath the road prism. This culvert crossing was found to be "green" under the Forest Service culverts analysis. FS road 4660-600 parallels the lower 2.0 miles of Odell Creek with many spurs that lead to dispersed campsites along the streambank. Streamside vegetation is altered as the result of trampling, compaction of soils, and erosion. Odell Creek receives increased fishing and poaching pressure due to the existence of FS road 4660-600.

4. *How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?*

The migration and movement of aquatic organisms do not appear to be affected by the road system. The only stream crossing within the analysis area is FS road 4660 over Odell Creek. The culverts which pass Odell Creek through the road prism have been rated as "green" in the most recent Forest Service culvert assessment, indicating that the pipes are passable for fish at all life stages.

5. *To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity, or areas containing rare or unique aquatic species or species of interest?*

Roads 4660 and 4660400 are close to Ranger Creek and its headwater springs where *Tritomaria exsectiformis*, a rare Survey and Manage liverwort, is known to occur. Forest Road 4660 crosses Odell Creek which is inhabited by bull trout, a federally listed threatened species. These fish are unique in that they are the last remaining natural population of adfluvial bull trout in the state of Oregon. Mountain whitefish (*Prosopium williamsoni*) and redband trout (*Oncorhynchus mykiss*), a regionally sensitive species, are also found in Odell Creek. Redband trout are the most abundant fish species in Odell Creek, with a majority of these inhabiting the lower portion of the stream.

6. *How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?*

Forest Service road 4660600 parallels Odell Creek and provides access to several dispersed campsites along its banks. Fishing and poaching are facilitated by the existence of this road. Forest Service roads 4600850, 4600855, 4660, 4660096, 4660095 and 4660090 all provide access to fishing opportunities on Davis Lake.

7. *How does the road system affect shading, litterfall, and riparian plant communities?*

The road system does little to directly affect shading or riparian plant communities. However, Odell and Ranger Creeks are indirectly affected through access to streambanks. On the southwestern boundary of the fire perimeter, the 4660 road crosses Odell Creek and its floodplain. Off-road vehicles and other dispersed recreation activities affect riparian vegetation on Odell Creek and Ranger Creek. The 4660400 road is adjacent to Ranger Creek where a Survey and Manage rare liverwort is known to occur. Access via the 4660400 road to a dispersed recreation site and meadows along the shoreline of Davis Lake at the mouth of Ranger Creek have already resulted in negative impacts to riparian plant communities along Ranger Creek through trampling, driving on, and allowing recreationists access to the stream channel. The 4660-600 road which parallels Odell Creek provides access to dispersed camping along the streambanks. Riparian vegetation is altered through trampling, compaction of soils, erosion of streambanks and firewood collection.

8. *How and where does the road system facilitate the introduction of non-native aquatic species?*

The introduction of non-native aquatic species could occur anyplace along Odell Creek, Ranger Creek, or Davis Lake. FS roads 4660, 4660600, 4600850, 4600855, 4660096, 4660095, and 4660090 all provide access to these bodies of water. Non-native largemouth bass (*Micropterus salmoides*) and tui chub (*Gila bicolor*) have been introduced to Davis Lake by anglers during the past couple of decades. These two fish species have since become very well established within Davis Lake and have thriving populations.

9. *How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides, to enter surface waters?*

Potential for pollutants exists primarily at stream crossings and at those locations where roads or roadside dispersed recreation sites are in close proximity to streams. Most stream crossings in the analysis area are associated with arterial and collector roads and are therefore outside the scope of this analysis. The most likely mechanism for delivery of pollutants into surface waters would be as the result of a vehicle accident caused by improper operation on a low standard road near those surface waters that resulted in an overturned vehicle leaking fluids. The privately controlled portion of the road system offers some indirect risk for pollutants as a result of its association with private home lots that, in some cases, have direct frontage on the Little Deschutes River.

Economics

10. *How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?*

The road system directly affects agency revenues by providing existing access to locations where revenue-producing activities. Commercial post-and-pole sales, commercial firewood sales, commercial mushroom picking, and timber sales all rely on the existing tertiary road system that is the subject of this analysis.

Direct agency costs generally derive from maintenance work and administrative activity:

Maintenance: Although virtually none of the seven-digit roads not serving recreational facilities receive recurrent maintenance, the need for maintenance accrues as time passes. The cost incurred by the agency for this deferred maintenance is most commonly presented when scheduled timber sale activity requires that the road be brought to a minimum standard suitable for log haul. This cost is represented in the timber sale appraisal as an overhead cost that reduces timber sale revenue.

Administrative Activity: Road closures implemented for the enhancement of other resource values result in adding time – and, consequently, cost – to activities such as timber sale layout and planning area reconnaissance because of increased complexity in gaining access to areas behind closures. Costs are also generated by the opening and reclosing of closed roads for administrative or contract access.

The low standard of the road system also results in a revenue reduction, although it is probably a minor cost and is one that is rather difficult to quantify. This reduction occurs as a result of the increased haul times for timber sale operators over that which they might experience operating on higher standard roads.

Commodity Production and Timber Management

11. *How does road spacing and location affect logging system feasibility?*

The current road system was built to facilitate timber harvest with ground based systems. Logging systems that have been historically employed within the analysis area had – as a common theme – ground-based yarding of logs to centralized landings. This is especially reflected in a lengthy history of tractor yarding that has been used up to current times. There has also been some skyline yarding in this area and the current road system will also facilitate it. The significant outcome of this history with regard to future logging system feasibility is that roads are situated to deal with logs being skidded downhill to landings. Roads, as a result, commonly tend to be located toward the bottom of

slopes and drainages or are relatively closely spaced on the slopes, as is the case with the transportation system on Davis Mountain and Hamner Butte. Slope restriction guidelines implemented over the last decade have dictated giving strong consideration to cable yarding systems instead of tractor yarding systems that were the driving force behind establishment of the current road system. Cable systems usually call for access at the top of the stand being harvested; as a result, consideration of cable systems is complicated by the fact that the existing road system is not necessarily suitably located for the access needs of these systems.

It is important to have enough roads to make logging in this area economical since the value of burned timber is generally lower than green timber. Even if we opt to do helicopter yarding we still need an adequate road system since short flight distances are critical to making this logging system economical.

12. *How does the road system affect managing the suitable timber base and other lands?*

A good road system provides quick, easy, and economical access to the stands or areas we are trying to manage. Access routes have been established throughout the managed portion of the analysis area because of past timber harvest dating back to early in the last century. Access to the timber base is provided by this road system. Management of the timber base is enhanced by the presence of the road system in that convenient access is provided; this reduces the monetary cost and time that would otherwise be required in the absence of roads. Also, harvest activities resulting from recent environmental analysis efforts has been and will be done with greater practical and economic efficiency because little new permanent road construction was or will be required to gain access. This would be a boon to any future restoration activities, such as dead tree harvest, that might occur within the fire perimeter.

13. *How does the road system affect access to timber stands needing silvicultural treatment?*

The focus in the Davis Fire area has changed from short-term treatments, such as precommercial thinning, to longer-term treatments, such as reforestation and timber stand improvement. The long-term treatments span approximately 20 to 40 years into the future. Administrative access to treatment areas is a high priority to accomplish post fire and harvest activities.

As noted above, a well-developed transportation system has been established in the analysis area through past harvest practices. This system, when viewed without regard to whether the roads are open or closed, provides basic access to virtually every stand that may need future silvicultural treatment. Effective access through the various stages of planning and implementation can be variable because of current and proposed road closures; these closures increase the need for foot travel to certain stands during planning activities and add to the cost of implementing certain silvicultural practices such as precommercial thinning as a result of higher bid prices for “walk-in” units. Such issues can theoretically be dealt with by opening the road during periods when such administrative use is necessary, but as a practical matter funding and equipment availability or the capability of locally available equipment often results in roads being left closed during these administrative activities (except in the case of merchantable timber harvest, when capable equipment for opening and reclosing roads is readily available).

Special Forest Products

14. *How does the road system affect access for collecting special forest products?*

Reducing access to natural resource-based forest products increases the harvest and transportation costs for the low-income forest product harvester. Wages are reduced as production decreases as the result of round trip miles increasing from harvest area to buyer.

General Public Transportation

15. *How does the road system connect to public roads and provide primary access to communities?*

Road 46 passes through the middle of the analysis area and serves as not only an arterial route for the area but is also a public road in it's own right. While it does not serve as a year-round primary connector between communities, it is a popular route during snow-free months for those traveling between the Willamette Valley and Central Oregon. The road system also connects to public roads through Road 62, which connects with Highway 97 to the east of the analysis area.

16. *How does the road system address the safety of road users?*

The majority of roads being addressed in the analysis area are native-surface single-lane roads constructed to a low standards with no particular attention paid to user comfort or convenience. They are low-speed roads with few turnouts and – during the primary designed use for log haul – are intended to be single-user facilities. Traffic control devices are virtually nonexistent, except in the presence of relatively extraordinary circumstances, such as cattleguard installations or railroad crossings. These roads were not constructed for and are not maintained for passenger car use; these roads are intended for use by knowledgeable drivers with a certain amount of experience operating vehicles with appropriate consideration for conditions.

Protection

17. *How does the road system affect fuels management? How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires? How does the road system affect risk to firefighters and to public safety?*

The relationship between the road system and the fuels program is related to the ease of getting to a unit to perform fuels treatments, the type of equipment we can use, and the type of treatment we can accomplish. An obliterated road makes certain fuels treatments impossible. Closed roads require more planning to get resources to the unit for mechanical treatment, and limit the types of resources we can get to an underburn, increasing our chances of escapes and raising the complexity of burns. We will need higher qualified people and more resources to accomplish burns where there is no road access. This will increase cost per acre and in some cases limit the areas that receive prescribed fire.

The more roads we close, the more time, effort and resources it will take to control a wildfire. The inability to get an engine to the scene and the longer hike into the fire by crews will cause fires to grow larger and be more difficult to fight. There will be a greater risk of fires growing larger and causing greater resource damage. Along with using roads to get to fires they are a great control line and can speed up the containment of a wildfire, reduce fatigue of firefighters, and increase safety when used as escape routes and/or holding lines. In the wildland-urban interface the risk of fires is significantly higher. Roads were used extensively in the Davis Fire and provided holding lines and escape routes. A reduction in the amount of open roads may reduce ignition sources, but when a fire starts it will increase fire size.

18. *How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?*

The roads in the analysis area are generally far removed from population centers and on the whole receive little daily traffic. While traffic on individual roads can generate dust that creates short-term roadside visibility issues, the actual quantity of airborne dust coupled with generally fast dispersion rates results in negligible concerns for visibility or health. Timber sale-related traffic is the activity

that would generate the highest traffic volumes and presumably create the highest risk for airborne dust emissions, but dust abatement requirements during log haul mitigates this to a great degree.

There are two effects of dust emissions created by emergency vehicles heading to fires: visibility and respiratory concerns. The visibility concerns are temporary and can be mitigated with slow driving and watering roads. The health issues with dust aren't as critical as the added amount of PM2.5 and PM10 emissions created by smoke because of the larger size, and longer mop up created by the extra time needed to get to the fire.

Recreation

Unroaded Recreation

19. *Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?*

The only increase in recreation around Davis Lake will be the Met-Win trail that is expected to be rerouted and constructed in 2004. The current trail skirts the lake shore but due to resource concerns it will be rerouted to Ranger Butte area.

20. *Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?*

None of these activities is expected to cause change in the characteristics for unroaded recreation opportunities.

21. *What are the adverse effects of noise and other disturbances caused by developing, using, and maintaining roads, on the quantity, quality, and type of unroaded recreation opportunities?*

The periodic noise and other disturbances caused by road development, use and maintenance is not known to affect unroaded recreation opportunities in this area.

22. *Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads?*

Recreationists that mainly partake in dispersed activities such as camping, hunting, fishing, hiking, birding and other wildlife observation, horseback riding, cross-country skiing are those that are affected by the constructing, maintaining and decommissioning of roads.

23. *What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?*

Recreationists in this analysis area are seasonal users. Attachment and feelings for the unroaded recreation opportunities are expected to be strong. Hunters and snowmobile use is one of the high use factors. There are other alternatives available for said use. Hunters have the capability to walk into areas instead of driving.

Road-Related Recreation

24. *Is there nor or will there be in the future excess supply or excess demand for roaded recreation opportunities?*

Demand is high and is expected to increase for roaded recreation opportunities as growth and popularity of the area continues. There are several developed sites and numerous dispersed sites that exist throughout the analysis area. There is evidence of significant OHV use impacts. Camping, hunting, fishing, snowmobiling and unregulated off-road vehicle use is expected to be the most prevalent activities.

25. *Is developing new roads into unroaded areas, decommissioning of existing roads, or changing maintenance of existing roads causing substantial changes in the quantity, quality, or type of roaded recreation opportunities?*

Decommissioning of existing roads has the most substantial affect to roaded recreation opportunities, most notably to the sportsman who may wish to hunt, fish or camp in locales found in the area which may no longer be accessible except on foot or by stock. The increase use of OHVs will have a big impact on the area around the lake and measures should be taken to prevent damage to the riparian areas. Changing maintenance levels on existing roads to a lower standard may impact the recreationist, causing inconveniences and vehicle wear and tear. The development of a new road into an area not roaded may cause a negative impact by inviting recreational activities that may not be desired.

26. *What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities?*

Roaded recreation generally consists of motorized recreation opportunities. This type of user is typically used to and accepting of other road related types of activities.

27. *Who participates in roaded recreation in the areas affected by road constructing, changes in road maintenance, or road decommissioning?*

Motorized recreational activities typically include sightseeing, birding and wildlife observation, camping, hunting, fishing. These types of users are those that could be affected the most by road related activities and are generally knowledgeable about such activities occurring in the area.

28. *What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?*

Recreationists in this analysis area are seasonal users. Attachment and feelings for the roaded recreation opportunities are expected to be very strong. Alternative opportunities and locations may exist for roaded recreation and may be necessary to provide for in the future as growth and popularity of the area continues.

29. *Does the road system affect the Scenic Integrity Objective, SIO(s)? Note: Some forests are still using the Visual Management System (VMS). If that is the case, substitute Visual Quality Objective (VQO) for SIO.*

The Deschutes NF LRMP direction for Management Area 9 specific to Transportation (M9-86 through M9-89) can be used as a basis for this response, along with knowing there might be designated foreground, middleground, background attributes to recognize.....

Terrestrial Wildlife

30. *What are the direct and indirect effects of the road system on mule deer and Rocky Mountain elk?*

Direct Effects

The direct effects of road systems on mule deer and Rocky Mountain elk is a loss of habitat and a reduction in habitat effectiveness.

Loss of Habitat

The 39,100 acre road analysis area is considered deer summer range and contains an 8556 acre Davis Key Elk area. It contains a mosaic of habitats from burned and/or open forage stands, to hiding cover and thermal cover.

A direct effect of the road system is a loss of habitat. In the roads analysis area there are 284 miles of roads. Regardless of maintenance level, if the road bed is maintained there is a loss of 1-3 acres of habitat per mile of road, approximately 200 to 700 acres or 0.5% to 1.8%. In just the Key Elk area there are 11 miles of road equating to 11 to 33 acres of habitat loss again 0.5% to 1.8% of the area.

Habitat Effectiveness

Habitat effectiveness adjacent to open roads is generally reduced for some species such as elk, which tend to avoid open road systems. Research by (Rowland, Wisdom, Johnson, and Kie, 2000) within the Starkey Experimental Forest in Oregon showed that cow elk consistently select areas away from open roads during the spring and summer months. Their research also showed that the spatial distribution of roads can affect elk habitat use. Regularly spaced roads had the greatest percentage of habitat influenced by roads, and randomly spaced roads the least. They also stated that clumped patterns of roads produced comparatively larger continuous blocks of habitat unaffected by roads. Having unroaded blocks of habitat available is important to reduce vulnerability to hunters, maintain access to favored resources, and retain elk populations distributed across the landscape.

Indirect Effects

Indirect effects of the road system include loss of life or injury due to collisions with vehicles or increased vulnerability to disturbance. Inadequate cover and/or high road densities results in a lack of security from disturbances, increasing stress on the animals (L.J. Lyon and A. G. Christensen 2002).

Road Kill

The major road which contributes to big game deaths is the 46. It is paved and has heavy summer traffic. It is unknown the number of deer and elk killed on this.

Vulnerability

Repeated disturbance at calving areas due to management and recreational activities often related to road use has been shown to reduce populations over time. (Philips 2000)

More directly studies have found that unlimited vehicle access during hunting season to an area can result in to many kills to quickly (L.J. Lyon and A. G. Christensen 2002). The burn area increases visibility of elk and deer during hunting season. With full access on the roads, hunter success is most likely to increase (L.L. Irwin 2002). The main problem associated with elk vulnerability during hunting season tends to be a reduction of mature bulls. The biological consequences include reduced pregnancy rates and an increased probability of calves borne late. (L.L. Irwin 2002).

The degree of cover and density relates directly to security. Lyon et al (2002) recommend unroaded hiding cover blocks of at least 250-300 acres as a minimum needed to provide hunting season security elk. While there is little that can be done to restore hiding cover in the burn in the short term, an area closure or greatly reduced road densities can help mitigate that by reducing access by hunters.

In the Davis Key Elk Area open road densities area currently managed at 2.5 mi/mi². This is above Forest Plan standards of 0.5 – 1.5 mi/mi². Managing the roads at road objectives level would bring the area closure to standards. Closing the 4660600 rd and decommissioning 4 miles of road would bring the road densities in the Key Elk area to 1.7 mi/mi².

Table 5. Road Density in Key Elk Area

Key Elk Area = 1856 acres	Miles in Key Elk	Area as mile²	mi/mi²	Comments
Total Roads	10.7	2.9	3.7	All roads located on the Map regardless of maintenance level
Operational 2+	6.96	2.9	2.4	All roads with an operational maintenance level 2 and above
Objective 2+	5.6	2.9	1.9	All roads with an objective maintenance level 2 and above
Objectives With Recommendations	5	2.9	1.7	Obliterate: 4660400, 4660410, 4660415, 4660412, 4669070, 4669010, 4660615, Close: 4660600, 4660381, 4660383
Only 3 and 5 open	3.1	2.9	1.1	Not realistic, makes portions of the 4660 level 1 (closed)

The Davis Key Elk area is not capable of meeting Forest Plan Standards, because of the need to access the Davis Lake campgrounds, and keeping major access road 4660 open.

Mule Deer

Johnson et al (2000) in comparing resource selection between mule deer and elk found elk select for gentle slopes, areas farther from roads and westerly aspects than mule deer. Mule deer selected for steeper slopes, areas closer to roads and easterly aspects. The study found indications that mule deer were not selecting areas closer to roads for habitat but to avoid areas used by elk.

Road densities outside the key elk area greatly affect security and vulnerability of deer. The current road densities inside the roads analysis area is 2.9 mi/mi² (maintenance at operational levels). This is above the Forest Plan standard of 2.5 mi/mi² for summer range. Managing at maintenance level objectives would bring the area into compliance with Forest Plan Standards. With the 22 miles of closures and obliterations recommendations for long term access road densities fall below standards.

Table 6. Road Density in Deer Summer Range in Analysis Area

Deer Summer Range - Road Analysis Area = 39,100 acres	Miles	Area as mile²	mi/mi²	Comments
Total Roads	286	61.1	4.7	All roads located on the map regardless of maintenance level
Operational 2+	178	61.1	2.9	All roads with an operational maintenance level 2 and above
Objective 2+	139	61.1	2.3	All roads with an objective maintenance level 2 and above
Objective With Recommendations	117	61.1	1.9	Manage roads at objectives and reduces densities by closure and obliterations by 22 miles

Within the just the Davis Fire area, road densities are higher. (Road densities at the subwatershed scale are discussed in the soils and watershed portion of the roads analysis).

Table 7. Road Density in Deer Summer Range, Davis Fire Area

Deer Summer Range - Davis Fire Area = 21,112 acres	Miles	Area as mile²	mi/mi²	Comments
Total Roads	187	33	5.7	All roads located on the Map regardless of maintenance level
Operational 2+	115	33	3.5	All roads with an operational maintenance level 2 and above
Objective 2+	86	33	2.6	All roads with an objective maintenance level 2 and above
Objective With Recommendations	64	33	1.9	Manage roads at objectives and reduces densities by closure and obliterations by 22 miles

31. *Is the road system having an effect on threatened, endangered, sensitive, management indicator species, or other wildlife species of concern?*

The Davis Fire burned through a wide variety of TES and management indicator species habitats providing for northern bald eagle, black backed woodpeckers, northern spotted owl, American marten, great gray owls, osprey, and flammulated owl.

Affects vary by species but generally roads reduce habitat, reduce habitat effectiveness by introducing edge into blocks of habitat, and is the conduit for disturbances either as noise levels from traffic, as a means of access by humans into sensitive sites or introduction site for nonnative species or species that prefer edge and can better compete for resources in an edge habitat.

Northern Bald Eagles

Bald eagle responses to human activity vary from one season to another, one area to another, between pairs and even individual birds. Some pairs tolerate disturbances near the nest, others will abandon the nesting attempt, still others will abandon the nest site altogether (Stalmaster et al 1985). Anthony and Isaacs (1989) found a lowered nesting success from nests adjacent to major roads or recently logged areas. Eagles were found to be more tolerant of human activities which were partially shielded from sight by vegetation, even though they were aware of the activity (Stalmaster et al 1985).

There are 6 bald eagle territories in the roads analysis/Davis Fire area. Four around Davis lake and two associated with Wickiup Reservoir. The Wickiup Reservoir territories (Round Swamp and

Wickiup Reservoir south) are within a quarter mile of the 44 road. There are dispersed campsites, as well as ATV use in these areas. These sites have not consistently produced young in the last 7 years.

The four sites around Davis receive varying levels of disturbance. The Lava Flow site is protected with an area closure. The Davis Lake NW territory , ¼ mile off of road 4660 and Davis Lake SE is right along the 4600855 receive little disturbance from visitors until late summer. The Davis W site is also right off 4660 and has not been used consistently.

Table 8. Bald Eagle Territories within Davis Fire Area

Territory Name	Year Located	Status 95	Status 96	Status 97	Status 98	Status 99	Status 00	Status 01	Status 02
Davis Lake NW	1973	1	oF	2	F	oF	F	1	1
Davis West	1985	al	RT	RT	al	al	al	al	1
Wickiup Res S	1978	oF	F	1	2	oF	oF	oF	oF
Round Swamp	1971	oF	oF	oF	1	2	oF	F	2
Lava Flow	1993	oF	1	F	1	1	1	2	2
Davis Lake SE	1971	1	F	oF	oF	F	2	2	oF

 # = Number of young fledged **RT** = Nest used by Redtail Hawk
/c = Nest used or locations uncertain; need to determine territories
/d = Downy
F = Failure; nest with evidence of eggs, but no fledged young (active or nesting failure)
oF = Site occupied, at least one adult and a nest observed during breeding season; no evidence of eggs or young (occupied or breeding failure)

All roads are closed in the winter with snow. While the 4660 is the only designated snowmobile route portions of the 44 and 46 are also used by winter enthusiasts.

The Forest Plan has no recommended of road densities for Bald Eagle Management areas (BEMA). Restrictions are on a project basis as needed to reduce disturbance during the nesting period of January 1 through August 31st. BEMA plans also do not address road densities but focus on reduction, and avoidance of disturbance.

Spotted Owls and Davis Late Successional Reserve

The effect of roads on owls includes disturbance and fragmentation of their habitat. Roads reduce amount of habitat available, and reduce areas of habitat to non-habitat by creation of edge habitat.

The majority of the area was burned intensely and no longer contains spotted owl habitat. The remaining block of habitat occurs on the west side of Hamner Butte. The Davis LSR Assessment provides the management direction for the LSR. It called for management of roads at a minimum level needed for fire protection and administration, with a target 1 mi/mi². Current road densities in the LSR are at 3.6 mi/mi². With the additional closures and/or obliterations previously recommended densities could be as low as 2.4 mi/mi². Due to the need for somewhat intensive management (salvage, planting, thinning) to restore old growth characteristics, and provide for fire protection it would be unreasonable to go to target levels at this time.

Table 9. Road Density in Davis LSR within the Davis Fire Area

LSR in Roads Analysis Area =15,792 acres	LSR Fire roads in miles	Area as mile²	mi/mi²	Comments
Total Roads	137	24.7	5.5	All roads located on the Map regardless of maintenance level
Operational 2+	90	24.7	3.6	All roads with an operational maintenance level 2 and above
Objective 2+	74	24.7	3.0	All roads with an objective maintenance level 2 and above
Objectives With Recommendations	55	24.7	2.2	Deer and elk recommendations

The Hamner Butte territory is the only known nest site in the Roads Analysis Boundary. It is outside the Davis Fire boundary, located between 2 open roads approximately 0.25 mile from one and 0.1 miles from the other. The roads are level 2 maintenance, or maintained by high clearance vehicles. The area does not receive much traffic. It is closed in the winter by snow. Main road users would be administrative which is variable by year, and late fall use by hunters. Recommendations for elk and would change the maintenance level of the roads around the nest to a level 1, or closed but could be reopened for administrative use.

Osprey

There are three know osprey sites in the area. Two of the known osprey sites are located in the vicinity of Wickiup reservoir. The third is associated with Davis Lake. Two are more than 0.25 miles from an open road. One is located adjacent to the 44 road. This pair may be accustomed to vehicle traffic but human disturbance under the nest may be disruptive if it is occurring. Foot traffic past the nest site is assumed to be occurring but additional monitoring is needed to determine the impact to this osprey territory. Disturbance by vehicles and/or humans is not thought to be an issue at this time.

Goshawk

Although there are a number of goshawk sightings, there are no known nests for goshawks in the analysis area. General goshawk morphology and behavior are adapted for hunting in moderately dense forests. Multi-lane roads such as the 46 or a dense network of roads take away habitat as well as increase competition from predators more adept at hunting in open conditions such as the redtail hawk.

Great Gray Owl

There are two sightings of great gray owls in the analysis area, in the open flat nest to Davis Lake. There are no known nests. Great gray owls hunt in openings and nest in adjacent stands.

Carnivores

Carnivores such as wolverine, fisher and marten utilize a mixture of habitats and can travel long distances. There have been sightings of fisher and marten in the analysis area. Roads reduce habitat for these species as well as making them vulnerable to increased mortality from encounters with motorized vehicles. Dispersal and movement is believed to be inhibited by high rates of traffic on highways, but this would be a seasonal condition as the roads area closed throughout the winter. (Hermann et al 2001).

Dead Wood Habitat

Species can take advantage of various dead wood habitat, include woodpeckers, nuthatches or secondary cavity users. The greatest effect is loss of snags along roadsides. Roads maintained for passenger car use (level 3, 4, and 5), routinely have hazard trees removed. Dead trees leaning

toward the road are felled, if there is sufficient down wood the felled snags are removed. Roads also facilitate firewood cutting, legal and otherwise. Those closest to the roads are easiest to remove quickly.

Passive Use Value

32. *Do areas planned for road construction, closure, or decommissioning have unique physical or biological characteristics, such as unique features and threatened or endangered species?*

Yes. Along certain routes the remains of an abandoned communications system are evident. Alteration of this historic archaeological site will occur when the burned trees with ceramic insulators fall. For safety reasons, open roads may have trees felled to prevent road hazards. Either of these methods will remove more evidence of this site. Should a road segment containing the site be closed and or decommissioned, there is the additional loss of road context for the communications system; the telephone lines of this era were placed along roads and trails for ease of maintenance. Road decommissioning has the additional effect of perhaps unearthing a fallen insulator or shards. Documentation of each insulator tree will prevent the loss of this transient resource; the life span of the insulator trees was nearing its end, even before the fire catastrophe of July 2003.

33. *Do areas planned for road construction, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance?*

Presently, the Heritage Program has no knowledge of any places of potentially unique cultural, traditional, symbolic, sacred, spiritual, or religious significance where road construction, closure, or decommissioning is planned. During consultation with American Indian tribes with an interest in the project area, we will solicit comments and input on this and other matters. It is presumed that, the possibility of some areas where roads currently exist and where other roads are proposed might have unique significance.

34. *What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for areas planned for road entry or road closure?*

Portions of the area are within the boundaries of land claimed by the Klamath Indians under the Treaty of October 14, 1864 (16 Stat., 707). Based on analysis of archaeological materials from nearby, there is the suggestion that other groups also used the area on an occasional or even regular basis. These would be the Molalla peoples of the western slopes of the central Cascades and the Paiute peoples of the northern Great Basin to the east.

35. *Will constructing, closing, or decommissioning roads substantially affect passive-use value?*

Possibly, yes. Until such areas are clearly identified, however, this question cannot be adequately addressed. In general, it is presumed that loss of access would affect such values, in that a person would learn that in the future, they would have to find another way to access a particular area.

Social Issues

36. *How does the road system affect access to paleontological, archaeological, and historical sites?*

In many instances roads give good access to such sites. In others, access is less direct. And in other cases, access is too good, leading to site vandalism and damage.

37. *How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?*

Presently, there is little information available with which to address this question. It is presumed that for those American Indians who exercise their treaty rights, the road system likely facilitates such practices as much as it hinders these same practices. This is because the better the access to hunting grounds or places were special plants are found, the better the ability of these persons to reach and make use of them. The flip side of this ready access is that non-Indians have an equal level of access to the same places.

38. *How are roads that constitute historic sites affected by road management?*

Historic roads are affected in various ways by road management, depending on whether the new routes make use of the old routes, or whether the new routes cross over old ones only in a few spots. Effects on historic roads depend on what the actual road management activity entails. In most cases where the modern route is in the same corridor as the earlier routes, there is little original physical integrity remaining with which to evaluate the changes. Many times the only evidence of an historic route lies not on the ground, but in the historic record and on old maps. In other cases, however, where there is an intersection of the two routes, damage to the historic route is less severe. It could be argued in these latter cases that, even though the old route was compromised a modern route crossing it, the rest of the earlier route remains intact.

39. *What are the traditional uses of animal and plant species in the area of analysis?*

Presently, there is inadequate information available with which to answer this question. It is presumed, based on the archaeological and historic record, that traditional prehistoric uses include hunting large and small game animals and gathering economic plant species that would supplement a protein diet. Prehistoric archaeological evidence in the area suggests that early inhabitants hunted with bow and arrow, using mainly volcanic glass (obsidian) arrowheads in more recent times. In earlier times, there is evidence of the use of somewhat larger dart-sized projectile points. The darts would have been hafted to long shafts and propelled with an atlatl, or spear thrower.

Traditional historic uses of animals are presumed to be the same, for food, as well as for their furs in some cases. Plant species were much more systematically exploited in the early historic period and continuing to the present. This is mainly the harvest of coniferous tree species for lumber, pulp, or other such uses. Some areas may have been exploited for grazing sheep and cattle as well, although not for the past decade or so.

40. *How are community social and economic health affected by road management (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)?*

The local communities of Crescent, Gilchrist, and Crescent Lake have been dependent in part on the National Forest for their economic well being. Forest products, including timber, firewood, wild mushrooms, as well as tourism, contribute to the local and regional economy.

The Davis Fire Recovery planning area is not a major destination area for recreation users. There are three developed campgrounds and several dispersed camping areas. The opportunities for recreation include hunting, camping, and fishing. The area has provided local residents with an area of traditional dispersed uses that is readily accessible. The area closure and damage caused to campgrounds will reduce the amount of people heading to the area. Depending on where these people choose to recreate, it may slightly impact local businesses.

Civil Rights and Environmental Justice

41. *Is the road system used or valued differently by minority, low-income, or disabled populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations?*

Executive Order 12898, Environmental Justice, directs agencies to asses whether projects will have a disproportionately higher and adverse effect on minority and low-income groups.

A primary purpose of road management is to provide for the health and safety in road use for all members of the public. The road system is available for use by the general population and any management activities would affect all populations.

Most of the various uses of the planning area cannot be attributed to any particular subset of the population. For example, hunting is a popular activity and local people of various income levels, as well as people from out of the area come to hunt big game.

Some activities may involve minority groups at a larger proportion. For example, a large proportion of matsutake harvesters are recent immigrants from Cambodia, Laos, Thailand, and Vietnam. Many of these people have limited job prospects because of language barriers, and mushroom harvesting gives families a way to support themselves (Pilz 1999). Matsutake harvesting is not permitted in most of the planning area, however. Where it is allowed (outside the LSR), the road system allows mushroom harvesters to more easily access picking areas. Road closures may affect harvesters by making them walk farther to reach picking areas, although there is no specific data on where important picking areas may be. Information currently being gathered about matsutake habitat and growth will help address this issue.

Road closure decision should factor in the importance of an area to fuelwood gatherers.

During project planning, it is recommended that ID teams follow the *CEQ Guidance for Environmental Justice under NEPA* (December 10, 1997). When analyzing effects of alternatives, include an analysis of the extent to which minority and/or low income populations might be disproportionately affected. The analysis should include potential impacts to subsistence consumption and human health, as well as the related economic and social effects of each alternative.

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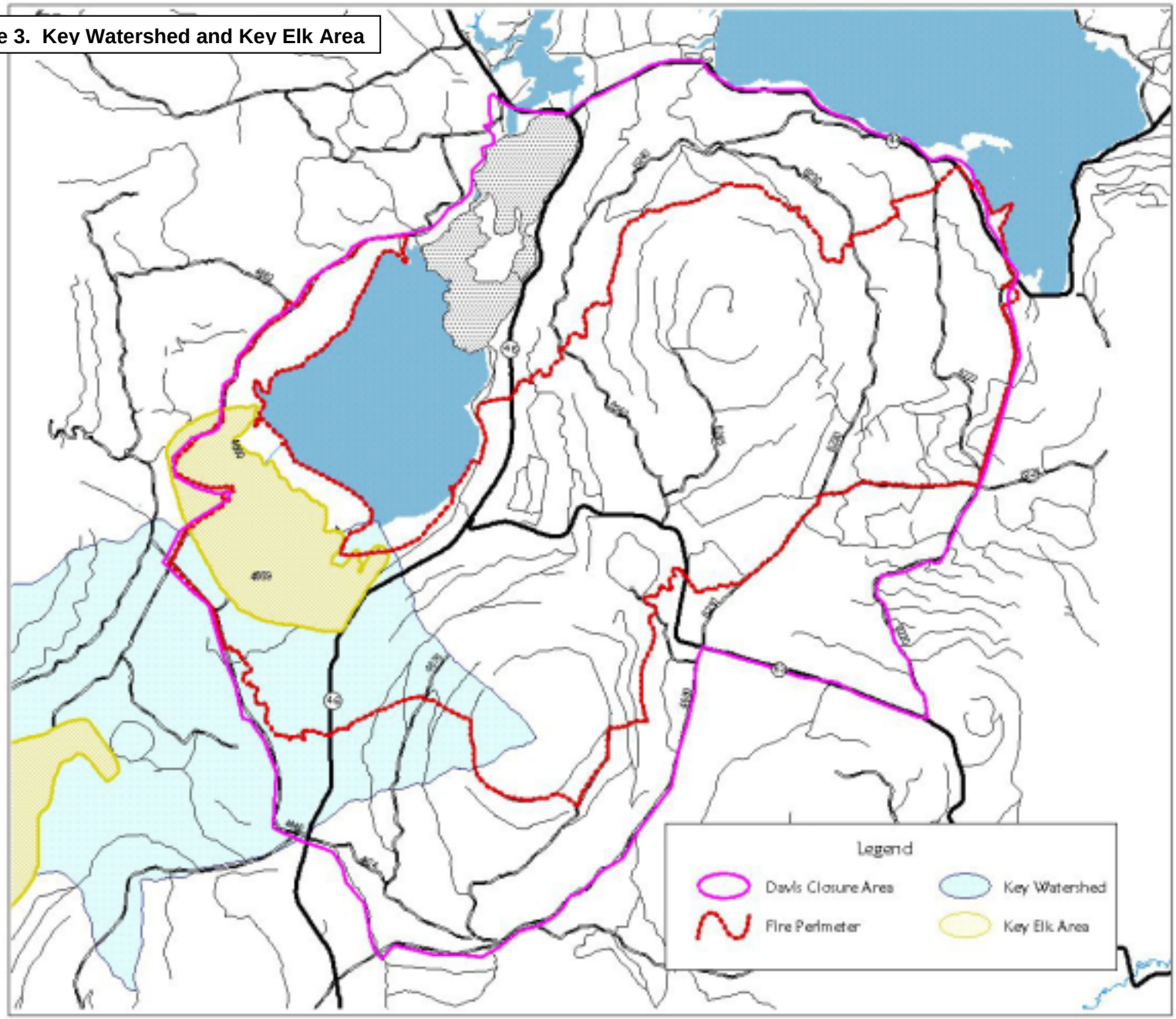
Figure 3. Key Watershed and Key Elk Area



Benefits and Problems of the Current Road System

With the “Key Analysis Questions”, many of the benefits and problems of the road system are identified and discussed. The general themes can be divided into benefits (access and uses) and problems (where roads negatively interact with ecosystems). The following discussion is, for the most part, a summarization of information contained in the responses to the Key Analysis Questions.

Access and Uses

Recreational Driving and Access

Recreational driving is a popular past time on National Forest System Lands. The Crescent and Odell Watershed Analyses note increases in recreation on the Forest and greater demand for access to public lands. Roads in the Analysis area lead to campgrounds, dispersed campsites, fishing, hunting, and wildlife viewing areas.

Administrative Access

There is a need to access areas of the forest for management purposes, such as fuels reduction. Because of the interface conditions, it is important that roads facilitate fire suppression efforts as well. Vegetation management, including timber sales and plantation thinning, is ongoing throughout the planning area and is expected to continue.

When roads are closed for resource protection, or otherwise not available, an indirect effect is the increased cost to access areas for administrative purposes or where contracts are being administered.

Fire Suppression

The ability of fire fighters and engines to reach a fire is dependent on the existence of roads. More time and effort are required to control a wildfire if engines cannot reach it. This can create a greater risk of a fire growing larger and causing greater resource damage. Roads also provide control lines and increase safety when used as escape routes or holding lines. Fuels reduction activities are also facilitated by the transportation system. Road access can make mechanized treatments possible and reduce the cost of treating fuels.

Roads and Ecosystem Interactions

Invasive Plants

Motorized vehicles and/or their cargo are the single most important vector for the introduction and spread of noxious weeds and other non-native plant species. Several types of noxious weeds are known to exist in the project area. All roads in the project area are primary areas for invasion by noxious weeds, with vehicles, equipment, and people that use the roads acting as vectors for dispersal. Roads that get the most traffic are the most likely for noxious weed invasion and spread. Users traveling from and through weed-infested areas have the potential to pick up and transport seeds and propagules to uninfested areas along roads and into project activity units in the Davis Fire area.

The road system, road crossings, and dispersed recreation sites can provide dispersal sites for non-native riparian and aquatic plant species from seeds or vegetative propagules on vehicles, equipment, clothing, or animals (pet fur, for example).

Aquatic/Riparian Habitat

Localized impacts from the transportation system occur within the project area. Where roads parallel Odell Creek and Ranger Creek, negative impacts from poaching, trampling of riparian vegetation,

compaction of soils, and erosion of streambanks are evident. Direction contained in the Northwest Forest Plan for key watersheds calls for reducing road mileage and puts key watersheds as the highest priority for restoration.

Terrestrial Wildlife

The road system causes direct and indirect effects to wildlife including loss of habitat, reduction in habitat effectiveness, road kill, and vulnerability. The Davis Fire made the area more open which will increase some of these effects. In some areas, Forest Plan standards and guidelines for road density are not being met.

Describing Opportunities and Setting Priorities

This section describes options for modifying the road system that would help to achieve desirable or acceptable conditions. Table A-1 in Appendix A includes a recommended maintenance level for each segment of road in the analysis area. Refer to Appendix B for a map of the long-term transportation system recommendations.

Forest-Wide Roads Analysis

The Deschutes and Ochoco National Forests completed a Forest-wide Roads Analysis in January 2003. At such a large scale, it was limited to the two and four-digit roads (arterial and collector). No recommendations were made for local roads. The recommendations made in that analysis for collector and arterial roads that are located in the Davis Fire area include:

- Begin or continue noxious weed treatments along Roads 42, 4260, 4285, 4370, 4380, 44, 46, 4662, 58, and 5810.
- Install an adequate number of culverts on Road 4280 to ensure adequate flow to wetlands.
- Replace undersize culverts or install bridges along Road 4660 to ensure sufficient water flow to maintain wetlands at both Ranger and Odell Creeks.
- Road 58 and 5810 are constricting floodplains. Consider installing culverts.

Previous Assessments

The project area is covered by the Odell Watershed Analysis, which was completed in 1999. General recommendations for roads and access can be found in this report, as well as recommendations specific to the Landscape Areas. In addition, a Rapid Assessment was completed for the Davis Fire Area shortly after the fire, which includes information and recommendations for the transportation system. The information and recommendations from these assessments were considered during this roads analysis process

Recommendations from the Odell Watershed Analysis

- Obliterate roads in meadows that are not presently major travel corridors
- Eliminate or obliterate roads and trails that are parallel to Odell Creek when they are not appropriate or necessary for access. The road to East Davis Lake Campground should be considered for obliteration if problems with camping and access to the riparian area become an issue. No new parallel trails, roads, etc. to the creek should be constructed, if access to the creek would be encouraged.
- Consider alternative access to East and West Davis Campgrounds. Roads not identified as necessary for transportation should be obliterated and rehabilitated to consolidate access to the Davis Lake area.
- Close user-created roads and trails around Davis Lake when warranted.
- Sign areas in regards to OHV restrictions; consider barriers to control access. Design through-trail traffic to avoid impacting the ecology of the area; this includes bike or snowmobile traffic, and the Met-Win horse trail.
- Decrease motorized vehicle access throughout the Central Conifer Association to reduce disturbance to wildlife, and rehabilitate suitable roads to reduce fragmentation and as well as the opportunity for

wildlife poaching. Close or obliterate roads based on slope and skid trail/road density maps, the need to reduce fragmentation, and overall access plans. Assess the impacts to areas where trails ad/or roads extend the stream/runoff network. Establish priority for rehabilitation and standards for maintenance.

- Where feasible, convert roads to trails.

Recommendations from the Davis Fire Rapid Assessment:

- Assure that adequate drainage is installed or reinstalled in M/L 2 road that received significant use during suppression activities
- Close M/L 1 roads that were opened to facilitate suppression access and reinstall surface drainage to maintain their self-maintaining capability.
- Close unclassified roads that have become open as a result of vegetative removal.

Recommendations for the Davis Fire Recovery Project Area

Because of the need to address transportation and access in the context of the Davis Fire Recovery Project as well as identify a transportation system that is responsive to future needs and has minimal negative ecological effects on the land, the following recommendations recognize the need to consider access in the short term and the long term.

Interim Open Road System and All-Terrain Vehicle Management Plan

During an interim period of vegetative recovery and rehabilitation efforts within the area of the Davis Fire, the Team recommends that an open road system be established to provide basic administrative and public access within the analysis area. This road system, shown in Figure 4, would provide for primary through-access on the arterial and major collector routes within the fire perimeter and analysis area, as well as providing routes to East Davis and Lava Flow Campgrounds. Other roads within the analysis area would be closed to motorized vehicles.

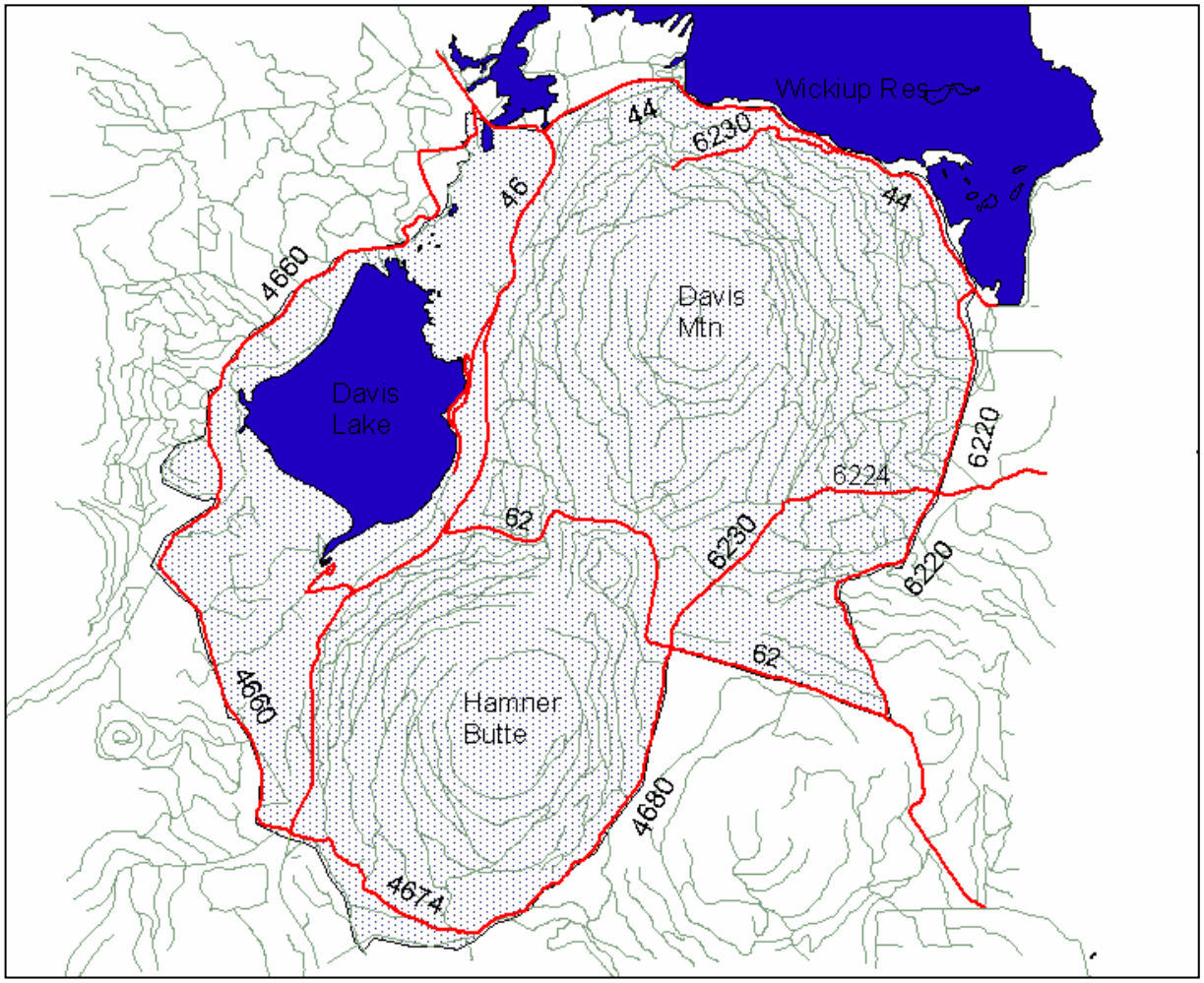
As vegetation within the Davis Fire perimeter is reestablished over time, big game species will begin to reenter the burned areas to taking advantage of increased forage. Until such time as vegetation has grown to the point where it can also provide effective hiding cover, these species will be relatively vulnerable to hunting depredation because of the longer than normal views across the landscape from the existing roads. By maintaining a limited number of open routes and managing the majority of roads within the fire area as being closed by order, excessive hunter mortality would be avoided during the recover period.

As an additional mitigation to potential impacts during this interim recovery period, ATV use would be managed by confining such use to a portion – but not all - of the identified open roads. Within the more intensely burned portions of the fire, the total consumption of ground cover, coupled with relatively gentle slopes, has rendered vast areas available to off-road ATV use that would otherwise not have been accessible because of vegetation. By excluding ATV's from many of these areas, problems associated with development of user-defined trails, soil compaction and displacement, and erosion would be minimized.

State law, specifically Oregon Revised Statute 821.020 as revised in 1995, allows the use of ATV's on roads within the state that are not maintained for passenger car use. This is reinforced by R6/PNW Interim Directive 7700-2003-1, which amends FSM 7731 by establishing a policy that ATV use may be allowed on Maintenance Level 1 and 2 roads if not otherwise prohibited by an order but will not be allowed on Maintenance Level 3-5 roads or any road with an asphalt surface unless specifically authorized by an order. In implementation of this policy, ATV use would be allowed on portions of Road 4660 (Rd. 4669 north to Rd. 46) and on Roads 4674, 4680, 6220, 6224, and 6230. Use would be prohibited on the other open roads using 36 CFR 261.54. All on-road or off-road ATV

use within the analysis area, aside from that specifically allowed on the above-mentioned open roads, would be prohibited within the interior of the analysis area.

Figure 4. Interim Open Road System



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Long-Term Transportation System Recommendations

To provide a transportation system that meets the needs of the Forest Service and the public, while having minimal negative ecological effects on the land, the following recommendations are provided by the interdisciplinary team. See Appendix B for a display of specific road recommendations.

One of the following management strategies was applied to each road:

A. **Maintain on Regular "annual" maintenance cycle:** Some maintenance items may be done once or more per year and some may be done every other year. The key is that maintenance items are done on a regular recurring cycle.

B. **Maintain on "as needed" basis:** These roads are maintained "as needed" to correct safety issues related to project use and environmental deficiencies. They will generally only receive a review of maintenance needs once every 5 to 10 years and generally receive maintenance work as project needs require.

C. **Requires major improvement or deferred maintenance project work:** Work may include items such as surfacing, realignment, relocation, installing bridges or major culverts, etc.

D. **Requires minor improvement or deferred maintenance project work:** Work may include items such as brushing, blading, spot rocking, adding or enhancing drainage structures like drivable dips, water bars, ditches, ditch relief culverts, etc.)

E. **No maintenance required:** Road has been placed in a state of self-maintenance and entrances are closed to eliminate full-sized vehicles.

Table 10. Management Strategy for Roads within Analysis Area

Management Strategy	Recommended Maintenance Level	Total (Miles)
A – maintain as is	1	97
A – maintain as is	2	114
A – maintain as is	3	14
A – maintain as is	4	5
A – maintain as is	5	9
B – increase maint. level	2	9
C – decrease maint. level	1	33
F - decommission	N/A	6

Discussion of Recommendations

Within the Key Elk Area (Davis, Forest Plan Standards and Guidelines WL-42 thru WL-50) the objective is to move closer to Forest Plan standards and guidelines. Recommendations include road decommissioning on approximately 6 miles. The risks the 600 road currently poses to various resources outweigh the benefits of early season access to East Davis Campground. Short-term needs for the 600 include possible reforestation and fuels reduction activities. Other road closures are directed at reducing the open road density and its impacts to wildlife.

A decision to close the 4660400 to motor vehicles was made in the Seven Buttes Return EA Decision Notice. This road parallels Ranger Creek and leads to a dispersed camp site on the edge of the Davis Lake meadow. The recommendation is to decommission the 4660400.

The Metolius-Windigo National Recreation Trail is planned for relocation in 2004. The new location is proposed to follow the 4660383 road part of the way around Ranger Butte. Therefore, this road will become maintenance level 1.

Noxious Weeds **-** Prevent the introduction and spread of noxious weeds and invasive non-native plants in the project area by following guidelines in the Guide to Noxious Weed Prevention Practices (USFS 2001) and the Integrated Weed management Plant (Supplement to the Deschutes National Forest Noxious Weed Control Environmental Assessment 1998).

Cultural Resources – Eligible or potentially eligible cultural resource sites will be protected. Some sites exist within and near right-of-way situations where protection from ground-disturbing activities is needed.

The recommendations meet the objectives of the Odell Watershed Analysis, and the Northwest Forest Plan, and move this part of the Forest closer to Forest Plan standards and guidelines.

Table 11. Changes in Objective Open Road Density by Subwatershed

Subwatershed Name	Subwatershed Number	Total Road Density (Mi/Mi^2)	Open Road Density *Before*	Open Road Density *After*
Odell Creek	170703010202	6.20	3.15	2.75
Moore Creek	170703010203	1.52	0.66	0.66
Davis Lake	170703010204	5.47	2.35	2.12
Davis Creek	170103010206	4.20	2.70	1.97
Wickiup	170703010207	5.88	3.34	3.34
Middle Crescent Cr.	170703020206	5.20	3.14	3.04
Lower Crescent Cr.	170703020207	4.74	3.94	3.90
Hamner Butte	170703020301	4.93	2.61	2.35

Priorities for Implementing Recommended Transportation System

Setting priorities for implementing the road recommendations is based on the geographic location. Based on direction in the Northwest Forest Plan ROD, Tier 1 Key Watersheds are the highest priority for restoration. Therefore, changes to the road system that address watershed concerns are priority number 1. Road closures and decommissioning recommended for the Key Elk Area are priority 2. All other activities would be priority 3.

Road Maintenance Needs

According to the Forest-wide Roads Analysis, funding for road maintenance has declined substantially over the past decade. For the Deschutes National Forest, we need to spend approximately 33 million dollars to bring the Forest's **arterial and collector** road system back up to standard, followed by an additional 2.1 million dollars annually to keep it maintained in a safe and environmentally sound condition.

Roads in the analysis area that are under Forest Service jurisdiction are primarily classified as Maintenance Level 1 (closed) or 2 (intended for high clearance vehicles). Roads in these maintenance classifications generally receive the minimum amount of maintenance necessary to prevent impacts to adjacent resource values and, in the case of M.L. 2 roads, provide for minimum passage, although Road 6015, because of its proximity to Crescent Lake and associated recreation venues, does receive greater maintenance attention. These roads, when open for use, are intended for use primarily by administrative traffic or public travelers adequately experienced at operating motor vehicles on primitive roads and driving vehicles suitable for use on such roads. Road maintenance has been sufficient over the last several years to accomplish this limited mission in the analysis area, especially given the number of roads that are Maintenance Level 1 (physically closed) status. No changes in maintenance level or open/closed status are proposed related to maintenance funding levels or capabilities.

NEPA Analysis Needs

This roads analysis is being completed prior to preparation of the Davis Fire Recovery Project EIS. Opportunities identified can be incorporated into the EIS process where they are connected to the purpose and need or proposed actions identified for that project. If there are opportunities that will not be analyzed in the EIS, they will require a site-specific NEPA analysis in the future when the decision is made to implement them (other than maintenance and administrative decisions).

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Appendix A

Table A-1. Road Recommendations

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
4400000	3.09	3 - SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	IMP - IMPROVED NATIVE MATERIAL
4400000	0.12	3 SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	NAT - NATIVE MATERIAL
4400700	**1.55**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
4400710	0.74	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4400770	0.46	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4400790	1.56	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4400800	1.98	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4400810	2.09	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4400890	0.48	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4600000	3.02	5 HIGH DEGREE OF USER COMFORT	5 HIGH DEGREE OF USER COMFORT	BST - BITUMINOUS SURFACE TREATMENT
4600000	8.69	5 HIGH DEGREE OF USER COMFORT	5 HIGH DEGREE OF USER COMFORT	AC - ASPHALT
4600830	**0.07**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
4600830	0.49	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4600850	1.95	3 SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	IMP - IMPROVED NATIVE MATERIAL
4600850	0.27	4 MODERATE DEGREE OF USER COMFORT	4 MODERATE DEGREE OF USER COMFORT	AC - ASPHALT
4600850	**0.96**	**3 SUITABLE FOR PASSENGER CARS**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**IMP - IMPROVED NATIVE MATERIAL**

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
4600855	0.34	3 SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	IMP - IMPROVED NATIVE MATERIAL
4600855	0.31	3 SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	IMP - IMPROVED NATIVE MATERIAL
4600855	**1.89**	**3 SUITABLE FOR PASSENGER CARS**	**0 DECOMMISSION**	**IMP - IMPROVED NATIVE MATERIAL**
4600880	0.98	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4600881	0.47	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4654000	0.21	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
4660000	6.62	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	AGG - CRUSHED AGGREGATE OR GRAVEL
4660000	3.01	3 SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	AGG - CRUSHED AGGREGATE OR GRAVEL
4660010	0.17	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4660070	1.61	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660080	0.54	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4660081	0.23	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660090	0.23	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4660095	0.27	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4660096	**0.14**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
4660100	0.12	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
4660290	0.36	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660340	0.11	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660380	0.23	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4660381	0.46	1 BASIC CUSTODIAL CARE (CLOSED)	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4660381	0.52	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660383	0.99	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660400	**0.35**	**2 HIGH CLEARANCE VEHICLES**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**
4660410	**1.64**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**
4660412	**0.18**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**
4660415	**0.21**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**
4660600	1.50	2 HIGH CLEARANCE VEHICLES	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660615	**0.21**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**
4660890	0.41	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4660900	1.10	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4669000	2.30	3 SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	IMP - IMPROVED NATIVE MATERIAL
4669010	**0.61**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
4669070	**0.52**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**
4669100	**0.56**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**0 DECOMMISSION**	**NAT - NATIVE MATERIAL**
4670000	0.13	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4670130	0.02	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4674000	2.65	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4674050	0.01	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4674100	2.03	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4674140	1.84	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4674145	1.10	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4676000	**0.59**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
4676000	**0.42**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**AGG - CRUSHED AGGREGATE OR GRAVEL**
4676000	1.90	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	AGG - CRUSHED AGGREGATE OR GRAVEL
4676100	**2.49**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
4676180	1.27	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4676400	**0.78**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
4678000	3.26	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
4678042	1.35	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4678100	0.85	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4678100	2.19	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4678130	0.82	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4678200	1.91	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4678300	0.87	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4678300	**0.26**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
4678300	0.89	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4678330	1.32	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4678350	**1.38**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)1 - BAS**	**NAT - NATIVE MATERIAL**
4678353	0.70	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4678440	0.33	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4678440	**0.78**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
4678445	**0.78**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
4678450	2.05	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4678500	2.95	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
4678520	0.78	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4680000	4.44	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
4680000	**1.29**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**IMP - IMPROVED NATIVE MATERIAL**
4680100	**1.35**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
4680120	0.68	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4680400	**2.00**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
4680400	0.80	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
4680410	1.17	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4680420	2.12	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4680500	**2.11**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**IMP - IMPROVED NATIVE MATERIAL**
4685000	**0.05**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**IMP - IMPROVED NATIVE MATERIAL**
4685000	1.26	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
4685870	0.65	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4685872	0.28	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4685900	**1.15**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**IMP - IMPROVED NATIVE MATERIAL**
4685900	0.69	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
4685900	0.04	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	IMP - IMPROVED NATIVE MATERIAL
4685950	0.99	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
4685960	1.19	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200000	2.34	3 SUITABLE FOR PASSENGER CARS	3 SUITABLE FOR PASSENGER CARS	IMP - IMPROVED NATIVE MATERIAL
6200000	4.55	4 MODERATE DEGREE OF USER COMFORT	4 MODERATE DEGREE OF USER COMFORT	AC - ASPHALT
6200680	1.51	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200690	0.79	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	IMP - IMPROVED NATIVE MATERIAL
6200700	1.19	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200700	**1.04**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6200700	1.09	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6200700	0.75	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200720	1.20	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200730	0.73	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6200733	0.56	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200735	0.77	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200744	**0.82**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6200749	2.25	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200750	0.74	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200790	0.53	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200800	3.39	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6200810	3.13	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200811	0.10	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200812	0.23	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200820	**3.6**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6200830	0.27	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200840	0.93	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200850	0.64	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200860	2.21	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200870	**0.82**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6200880	1.20	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200900	2.82	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200901	0.47	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6200910	0.16	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200940	0.38	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6200980	0.24	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220000	5.95	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6220010	1.68	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	IMP - IMPROVED NATIVE MATERIAL
6220030	0.90	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6220030	0.62	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6220090	0.16	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220120	0.33	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220160	1.48	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220165	0.10	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220166	0.23	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220170	0.64	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220175	0.14	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220190	0.56	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220300	0.60	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6220300	**1.26**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6220310	0.56	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220330	0.23	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220340	0.30	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220370	1.27	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220400	0.17	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6220500	0.78	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220730	0.26	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220730	0.62	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220750	1.37	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220770	0.86	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220800	0.93	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220820	0.56	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220900	1.27	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220910	0.45	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220920	0.76	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6220930	0.28	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6220940	0.43	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222000	4.09	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6222200	0.63	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222300	0.75	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222400	0.81	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222600	0.99	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222700	0.62	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222710	1.04	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222850	1.76	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6222855	0.87	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222900	2.01	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6222970	1.53	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224000	1.82	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	AGG – CRUSHED AGGREGATE OR GRAVEL
6224040	0.70	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224070	**0.69**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6224100	3.76	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224100	**1.32**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
6224130	0.32	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224160	0.15	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224170	1.31	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224180	0.42	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224190	0.94	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6224195	0.63	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230000	9.9	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6230020	0.77	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230020	**0.65**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6230020	0.77	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230026	0.51	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230027	0.13	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230070	**1.04**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6230080	0.31	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6230090	0.61	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230200	1.11	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6230200	2.10	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230210	1.45	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230230	0.27	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6230250	0.77	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230290	0.22	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230300	1.06	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230320	0.80	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230340	0.65	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230400	1.50	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230410	0.49	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230420	0.87	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230421	0.23	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230430	0.41	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230500	1.31	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6230700	1.0	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230730	0.61	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230960	1.32	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230967	0.63	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230970	0.84	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6230977	0.23	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240000	4.71	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6240000	1.98	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6240010	0.63	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240100	**1.95**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6240110	**1.7**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6240115	0.19	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240130	0.94	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240139	0.20	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240160	0.41	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6240160	**0.14**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6240160	1.20	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240180	1.14	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240200	**1.05**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**IMP - IMPROVED NATIVE MATERIAL**
6240200	**2.43**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**
6240200	0.34	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240200	**0.73**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
6240230	**2.16**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
6240230	**0.25**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**IMP - IMPROVED NATIVE MATERIAL**
6240280	1.01	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240400	1.22	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	IMP - IMPROVED NATIVE MATERIAL
6240450	1.48	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240550	0.16	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6240600	0.72	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245000	0.09	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6245000	0.11	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6245000	0.33	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6245000	0.07	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6245000	1.61	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	IMP - IMPROVED NATIVE MATERIAL
6245080	0.51	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245200	0.27	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245200	0.26	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245200	**0.52**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**2 HIGH CLEARANCE VEHICLES**	**NAT - NATIVE MATERIAL**
6245200	0.54	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245200	**1.00**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**IMP - IMPROVED NATIVE MATERIAL**
6245205	1.04	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6245210	0.43	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245240	0.63	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245250	1.33	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245270	1.36	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245300	1.00	1 BASIC CUSTODIAL CARE (CLOSED)	1 BASIC CUSTODIAL CARE (CLOSED)	NAT - NATIVE MATERIAL
6245400	0.22	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6245400	**0.86**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**

ROAD	MILES	CURRENT MAINTENANCE LEVEL	PROPOSED MAINTENANCE LEVEL	SURFACE TYPE
6245412	0.17	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6245412	1.19	2 HIGH CLEARANCE VEHICLES	2 HIGH CLEARANCE VEHICLES	NAT - NATIVE MATERIAL
6245500	**1.08**	**2 HIGH CLEARANCE VEHICLES**	**1 BASIC CUSTODIAL CARE (CLOSED)**	**NAT - NATIVE MATERIAL**

Appendix B

Map of Recommended Transportation SYstem