



United States
Department of
Agriculture

Forest
Service
Humboldt-Toiyabe
National Forest

Humboldt County,
Nevada

December 2007



Santa Rosa Ranger District Travel Management Project Environmental Assessment



Buckskin Mountain, Jose Noriega

James Winfrey
2035 Last Chance Road
Elko, Nevada, 89801
775-778-6129

<http://www.fs.fed.us/r4/htnf/projects/>

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Summary

The Santa Rosa Ranger District (District) of the Humboldt-Toiyabe National Forest (Forest) proposes to add 28 user-created routes to the Forest transportation system to facilitate dispersed recreation and management activities. The District also proposes to remove 17 existing National Forest System (NFS) roads from the road system and restrict use on two other system roads. Motor vehicle use on the District would be restricted to designated routes. Changes to the Forest transportation system are needed to provide sustainable motorized access to meet recreation and management objectives across the District. By restricting motor vehicles to designated routes, the Proposed Action would ensure that motor vehicle use remains sustainable, and reduce disturbance and resource impacts.

In addition to the Proposed Action, the Forest Service also evaluated the following alternatives:

- *The No Action Alternative, which would not restrict motor vehicles to designated routes.*
- *The Current System Alternative which would restrict motor vehicles to existing NFS roads and NFS trails on the Santa Rosa Ranger District.*

Based on the effects of the alternatives, the Santa Rosa District Ranger will decide whether to 1) restrict motor vehicles to designated routes, 2) remove NFS routes from the transportation system that are impassable, 3) restrict use on Forest transportation system routes that are impassable, and 4) add user-created routes to the forest transportation system.

Contents

Summary..... i

Chapter 1. Introduction..... 1

1.1 Document Structure 1

1.2. Background..... 1

1.3. Purpose and Need for Action..... 2

1.4. Proposed Action..... 3

1.5. Decision Framework..... 6

1.6. Public Involvement..... 7

1.7. Issues..... 7

Chapter 2. Alternatives, Including the Proposed Action 8

2.1. Alternatives..... 8

2.1.1. Alternative 1: No Action 8

2.1.2. Alternative 2: The Proposed Action 8

2.1.3. Alternative 3: Current System Alternative 9

2.2. Design Elements Common to All Action Alternatives..... 13

2.3. Comparison of Alternatives 13

Chapter 3. Environmental Consequences 20

3.1. Affected Environment: Public Safety..... 20

3.2. Affected Environment: Watershed 20

3.3. Affected Environment: Air Resources 25

3.4. Affected Environment: Vegetation..... 26

3.5. Affected Environment Invasive, Non-Native Species..... 28

3.6. Wildlife..... 32

3.7. Affected Environment: Sagebrush-Dependent Species..... 32

3.8. Affected Environment Northern Goshawk..... 36

3.9. Affect Environment: Bighorn Sheep 38

3.10. Affected Environment: Migratory Birds 40

3.11. Affected Environment: Special Status Plant Species 43

3.12. Affected Environment: Aquatic Species 44

3.13. Affected Environment: Heritage Resources 48

3.14. Affected Environment: Native American Traditional Values 50

3.15. Affected Environment: Visual Resources 50

3.16. Affected Environment: Recreation..... 52

3.17. Affected Environment: Roadless..... 54

3.18. Affected Environment: Socioeconomic..... 56

3.19. Affected Environment: Environmental Justice..... 57

3.20. Affected Environment: Livestock Management..... 58

3.21. Affected Environment: Road Management..... 59

Chapter 4. Consultation and Coordination..... 59

Works Cited 61

Chapter 1. Introduction

1.1 Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the Proposed Action and alternatives. The document is organized into four parts:

- *Introduction:* The section includes information about the history of the project proposal, the purpose of and need for the project, and the Forest Service's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the Proposed Action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes design elements common to all action alternatives. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the Proposed Action and other alternatives. This analysis is organized according to the resources of concern. In each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Santa Rosa Ranger District Office in Winnemucca, Nevada.

1.2. Background

An established network of National Forest System (NFS) routes provides access to the Santa Rosa Ranger District (District). Some of these are the primary access routes that lead into and across the District. Road 50084, which travels north out of Paradise Valley, over Hinkey Summit, past Martin Creek, and through Windy Gap is the primary access road. This road is maintained by the Forest Service to provide a safe and reliable travel route for standard passenger vehicles and provides for moderate user comfort. Two roads on the District are managed to this standard: Road 50084 and Road 50087. Road 50087 provides access into the Lye Creek Campground.

The following four roads are also maintained as suitable for passenger vehicles.

- Road 50531 enters the District from the east at the Forks Ranch and travels west till it intersects with Road 50084.
- Road 50082 travels along Goosey Lake Creek until it reaches the Quinn River where it stops.
- Road 50083, travels across the northern portion of the district along the East Fork of the Quinn River.

All other NFS roads on the District, approximately 250 miles, are managed to provide access for high-clearance vehicles into the backcountry of the District. These roads provide access for anglers, hunters, other recreation users and permittees. They provide opportunities for off-highway vehicle (OHV) drivers to explore the District and drive on challenging high-clearance four-wheel drive roads. They are also access routes for people who want to enjoy the Forest. In all, the NFS roads provide a road density of approximately 1 mile per square mile of the District. Most areas on the District, except for those in the Paradise Peak Wilderness, can be accessed by this system of roads.

Existing NFS roads are shown in gold on Map 1. Map 1 is also available on a disk (CD) accompanying this Environmental Assessment (EA), and on the Humboldt-Toiyabe Web site at <http://www.fs.fed.us/r4/htnf/projects/>.

Outside the Santa Rosa-Paradise Peak Wilderness, the District is currently open to cross-country motor vehicle use. As a result, informal, user-created routes have developed. These user-created routes have never been formally evaluated, adopted, or managed as a part of the Forest transportation system. However, some of them are well-situated and provide access into areas of the District that are not accessible from NFS routes. They also provide access to campsites and other recreation sites. Altogether, there may be as many as 153 user-created routes. Most of these are less than half a mile in length.

The intent of this EA is to assess the environmental impacts of the Proposed Action, which is to restrict motor vehicles to designated routes, to add certain user-created routes to the Forest transportation system, to remove certain routes from the transportation system, and to restrict use on other routes on the transportation system.

1.3. Purpose and Need for Action

The number of user-created routes across the District has increased over the last several years. Restricting motor vehicles to designated roads and trails would reduce the effects to natural resources caused by cross country travel. This action responds to the goals and objectives outlined in the Humboldt Forest Plan (USFS 1986), and helps move the project area towards desired conditions described in the Plan by allowing motor vehicle use where it will not unacceptably impact forest resources or unnecessarily impact other forest users.

The purpose of the Proposed Action is to provide the convenience, speed, and enjoyment of motorized access to meet recreation and management objectives, while

limiting environmental impacts and ensuring a sustainable transportation system across the District. The number of user-created routes across the District has increased over the last several years. These routes are sometimes established where there is potential for resource damage. Restricting motor vehicles to designated roads and trails would reduce the effects to natural resources caused by cross-country travel. This action responds to the goals and objectives outlined in the Humboldt National Forest Land and Resource Management Plan (U.S.D.A. Forest Service 1986). The action helps move the project area towards desired conditions described in that plan by allowing motor vehicle use where forest resources will not be unacceptably impacted and other forest users will not be unnecessarily impacted (Goal 8). It also establishes a road management program to develop and maintain a safe, economical, functional and environmentally sound transportation system that serves the resource elements (Goal 48).

After completion of the Travel Analysis Process (TAP) for the Santa Rosa Ranger District (2007), the District believes the proposed user-created routes are needed to provide public and management access to forest resources and dispersed recreation opportunities. To reduce resource impacts and restore native plant communities, the District also identified several NFS roads to remove from the road system.

1.4. Proposed Action

The District proposes to add 28 existing user-created routes (17.0 miles) to the Forest transportation system. These routes would be open to all motor vehicles. The Forest Service proposes to remove 17 existing NFS roads (12.7 miles) from the transportation system because these routes have either been washed out and are no longer passable or are no longer needed for the purposes for which they were created.

The Forest Service also proposes to restrict motor vehicle use to designated routes, in accordance with 36 Code of Federal Regulations (CFR) 261.13. The District would continue to be open to other forms of cross-country travel, such as by hiking, horseback riding, cross-country skiing, and (outside the designated Wilderness) mountain biking and over-snow vehicle use.

Map 1 shows the current forest transportation system and proposed additions and removals.

In all, the Proposed Action would include:

- 23 motorized trails (16.06 miles) added to the system and open to all vehicles. Motorized trails receive little maintenance and can be very rough and difficult to travel (see Table 1).
- 5 high-clearance four-wheel drive roads (0.94 miles) added to the system and open to all vehicles (see Table 1).
- One current NFS road (Route 10002, 0.48 miles) reclassified as a motorized trail
- 17 current NFS roads (12.7 miles) removed from the Forest transportation system because they are either physically impassable (13 routes) or no longer needed (4 routes) (see Table 2).

- 2 current NFS roads (2.0 miles) which are overgrown and impassable and on which motor vehicle use would be prohibited, but which would remain on the system for potential future use (see Table 3).

Designated NFS roads and NFS trails would remain open to both highway-legal and non-highway-legal vehicles (for example, ATVs) year round.

With the proposed changes, the Forest transportation system on the District would encompass approximately 327 miles NFS of roads and NFS motorized trails that would be open to motor vehicle use miles of NFS roads and NFS motorized trails. There would be an additional 13.15 miles of NFS road that would remain on the NFS system but not be open for use. There would also be 66.11 miles of NFS non-motorized trails on the Santa Rosa Ranger District. Proposed additions to the forest transportation system are identified in Table 1.

Table 1: Proposed Additions to the Forest Transportation System on the Santa Rosa Ranger District

Temporary Route Number ¹	Mileage	Purpose
S012	0.20	Access to dispersed campsite in Lye Creek drainage
S013	0.15	Access to dispersed campsite in Lye Creek drainage
S018	0.48	Access for resource management above Road Creek
S019	0.52	Access to uplands for recreation and resource management in the Antelope Creek drainage
S028	0.07	Access to dispersed campsite in Indian Creek Drainage
S034	0.39	Hunting access to ridge for resource management and recreation above Buttermilk Meadows
S036	0.38	Access to dispersed campsite in the headwaters of Round Corral Creek
S041	0.10	Access to dispersed campsite along Dutch John Creek
S043	0.18	Access to dispersed campsite along Dutch John Creek
S045	0.66	Access for resource management in uplands above Martin Creek
S057	0.40	Access to private property/mining claim in the Charleston Hill Area
S059	0.79	Access for resource management and recreation in the headwaters of the North Fork of the Little Humboldt River
S060	0.18	Access off the forest onto Fort McDermitt Indian Reservation
S077	0.38	Access for resource management and recreation above Klondike Creek
S085	0.21	Access for resource management and recreation in uplands above Groundhog Creek
S092	0.40	Hunting access onto ridge above Martin Creek
S098	0.54	Access to private property, resource management, and recreation on the south side of Stocks Creek

Temporary Route Number ¹	Mileage	Purpose
S099	0.33	Access for resource management, hunting, and recreation on the ridge west of Long Creek
U50043B	0.84	Access to private property, resource management, and recreation on the north side of Stocks Creek
U50090	1.45	Access for resource management and recreation in Big Cottonwood Creek uplands
U50095C	1.07	Access on Santa Rosa Crest for resource management and recreation
U50095D	0.28	Access to spring development for resource management in the headwaters of Willow Creek
U500095E	0.67	Access in the Solid Silver drainage for resource management, hunting, and recreation
U50106A	0.18	Access in the Provo Canyon drainage for resource management, hunting and recreation
U50535A	0.37	Access to non-motorized trail above Alkali Creek
U50535B	0.09	Access to private property and dispersed campsite
U50654	2.18	Access into the Stone House Creek drainage for resource management and recreation
U50694	3.51	Access to private property/mining claims.
<p><i>1: These temporary route numbers were assigned during two different inventory processes. One process started temporary numbers with an “S” and the other process started temporary numbers with a “U.” If added to the forest transportation system, a new route number would be assigned, consistent with the Forest transportation system numbering protocols.</i></p>		
<p> </p>		

Table 2 lists the current NFS routes on the District that are proposed for removal from the road system because they are either no longer needed, as indicated by lack of use, or are impassable as a result of lack of use and/or flooding. For the most part these routes were user-created rather than constructed. No maintenance funds have been used to develop or maintain these routes for many years.

Table 2: Proposed Removals from the Forest Transportation System

Route number	Map number	Mileage	Reason for adjustment
50805A	22	1.43	Created for fence repair. The fence is no longer used and the route is no longer needed.
50091A	23	0.21	Was washed out and is no longer safe for passage.
50681	19	0.16	No longer passable.
50689	16	1.70	Follows a ridge burned in 2002. The track is no longer visible on the ground and poses a safety hazard.
50130E	15	0.15	No longer passable.
50531B	14	1.21	Overgrown and no longer exists.
50096B	14	0.17	No longer passable.
50097B	13	1.30	Impassable as a result of washouts above the corral.
50802A	5	0.37	No longer locatable and is no longer needed.
50130C	20	0.37	Overgrown and no longer passable.
50530A	11	0.88	No longer passable and not needed.
50661	24	0.55	No longer passable for most vehicles.
50661A	24	1.19	Parallels an existing road and is overgrown.
50087B	17	0.38	Overgrown and very rough.
50806A	4	0.86	Not passable and no longer needed.
50696	9	1.42	Need and condition for road is questionable.
50532C	12	.38	Duplicate access to Buckskin Communication site.

Table 3 lists current NFS routes which are to remain as part of the system for long-term future use but on which motor vehicle use is proposed to be restricted until they can be reconstructed or re-evaluated.

Table 3: Proposed Restrictions on Motor Vehicle Use on NFS Routes

Route Number	Map Number	Mileage	Reason for Adjustment
50098A	26	0.4	The road is overgrown and impassable. There is a potential for future need for the road in this area.
50083C	4	1.7	The road is currently impassable but there is a potential future need up to the beaver pond area.

1.5. Decision Framework

Based on the environmental analysis and disclosure documented in this EA, the District Ranger will decide whether to restrict motor vehicles to designated routes, and whether or not to make adjustments in the forest transportation system.

1.6. Public Involvement

The proposal was listed in the Schedule of Proposed Actions on July 1, 2006. The proposal was provided to the public and other agencies for comment during scoping on June 23, 2006. In addition, as part of the public involvement process, the Forest conducted an open house at the Santa Rosa Ranger District in Winnemucca in 2005. Forest maps showed system and user-created routes. Attendees gave input on which routes they felt were needed for recreation and access. The Forest also made three presentations regarding the project at Humboldt County Commissioner meetings. Comments received during these contacts with the public were used to develop the Proposed Action.

On December 8, 2006, the Forest published the Notice of Proposed Action legal notice in the *Elko Daily Free Press*. A second notice was published in the *Humboldt Sun* on December 15, 2006. Corresponding to the publication of the legal notice, the Notice of Proposed Action document was mailed to approximately 135 individuals, government agencies, tribes, and non-government organizations and published on the Forest web site at <http://www.fs.fed.us/r4/htnf/projects/>.

1.7. Issues

Two significant issues were identified from scoping comments. The environmental consequences associated with these issues are addressed for each alternative:

Inventoried Roadless Areas: Seventeen (5.4 miles) of the proposed additions to the forest transportation system are located in seven inventoried roadless areas (IRAs) identified in the 2001 Roadless Area Conservation Rule. Many IRAs on the Forest contain user-created routes. The Roadless Rule does not restrict motor vehicle use in IRAs, and the Forest Plan permits motor vehicle use where it does not affect Forest resources or unnecessarily affect other Forest users (USFS 1986, IV-3). No construction or reconstruction is proposed, and no motor vehicle is to be authorized that is not already legal. However, adding these routes to the Forest transportation system could affect the roadless character of the IRAs. Roadless characteristics described in the 2001 Roadless Area Conservation Rule include: soil, water, and air; source of public drinking water; plant and animal diversity; threatened endangered and sensitive (TES) species habitat; large undisturbed habitats; classes of recreation; reference landscapes; landscape character; traditional cultural properties; and local unique characteristics.

The Forest used the following units of measure to assess the potential impact of adding existing user-created routes within IRAs to the Forest transportation system: *effects of permitting continued use on a road or motorized trail on roadless characteristics*.

Recreation Access: The Proposed Action has the potential to change current use patterns by restricting motorized travel to designated routes. Forest visitors would no longer be allowed to drive cross-country to hunt, retrieve game, create dispersed camp sites, or engage in other motorized off-road recreation activities. This could result in reduced use of the District and discontent among some users. On the other hand, by

prohibiting cross-country motor vehicle use, the occurrence of human-caused fires and the spread of noxious and invasive weeds may be reduced.

The Forest used the following unit of measure to assess the potential impact of prohibiting motor vehicle use off designated routes: *changes to the Recreation Opportunity Spectrum (ROS)*.

Chapter 2. Alternatives, Including the Proposed Action

This chapter describes and compares the alternatives considered for the Santa Rosa Ranger District Travel Management Project. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based on the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

2.1. Alternatives

2.1.1. Alternative 1: No Action

Under the No Action alternative, current travel management direction would continue. The No Action Alternative makes no change to the Forest transportation system and does not restrict motor vehicles to designated routes.

This alternative serves as the baseline for the analysis and addresses the recreation access issue. Under this alternative, the recreation users of motor vehicles would be allowed to travel on and off routes in pursuit of their recreation activity.

2.1.2. Alternative 2: The Proposed Action

The Proposed Action is described in detail on previous pages in Section 1.4. In this analysis it is referred to as either “the Proposed Action” or as “Alternative 2”. This alternative would also adjust the current Forest transportation system by adding 28 user-created routes. These routes total approximately 17 miles and are described above in Table 1. It would also remove 17 routes that have been washed out or are no longer needed and restricting use on two routes that are currently impassable but may be needed in the future. These routes total approximately 14.7 miles and are described above Tables 2 and 3. Following the decision, designated routes would be identified on a Motor Vehicle Use Map. Motor vehicles would be restricted to designated routes under 36 CFR 261.13.

This alternative addresses the recreation access issue by designating several user-created routes that are popular with recreation drivers. It also adds routes to popular hunting areas and dispersed campsites.

The Proposed Action is consistent with the Forest Plan. Following the decision, designated routes will be identified on a Motor Vehicle Use Map. Motor vehicle use would be restricted to designated routes under 36 CFR 261.13. Exemptions to the prohibition, listed in 36 CFR 212.51a, include:

- Aircraft;
- Watercraft;
- Over-snow vehicles;
- Limited administrative use by the Forest Service;
- Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes;
- Authorized use of any combat or combat support vehicle for national defense purposes;
- Law enforcement response to violations of law, including pursuit; and
- Motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulation (e.g., woodcutting permits, term grazing permits, approved plans of operations).

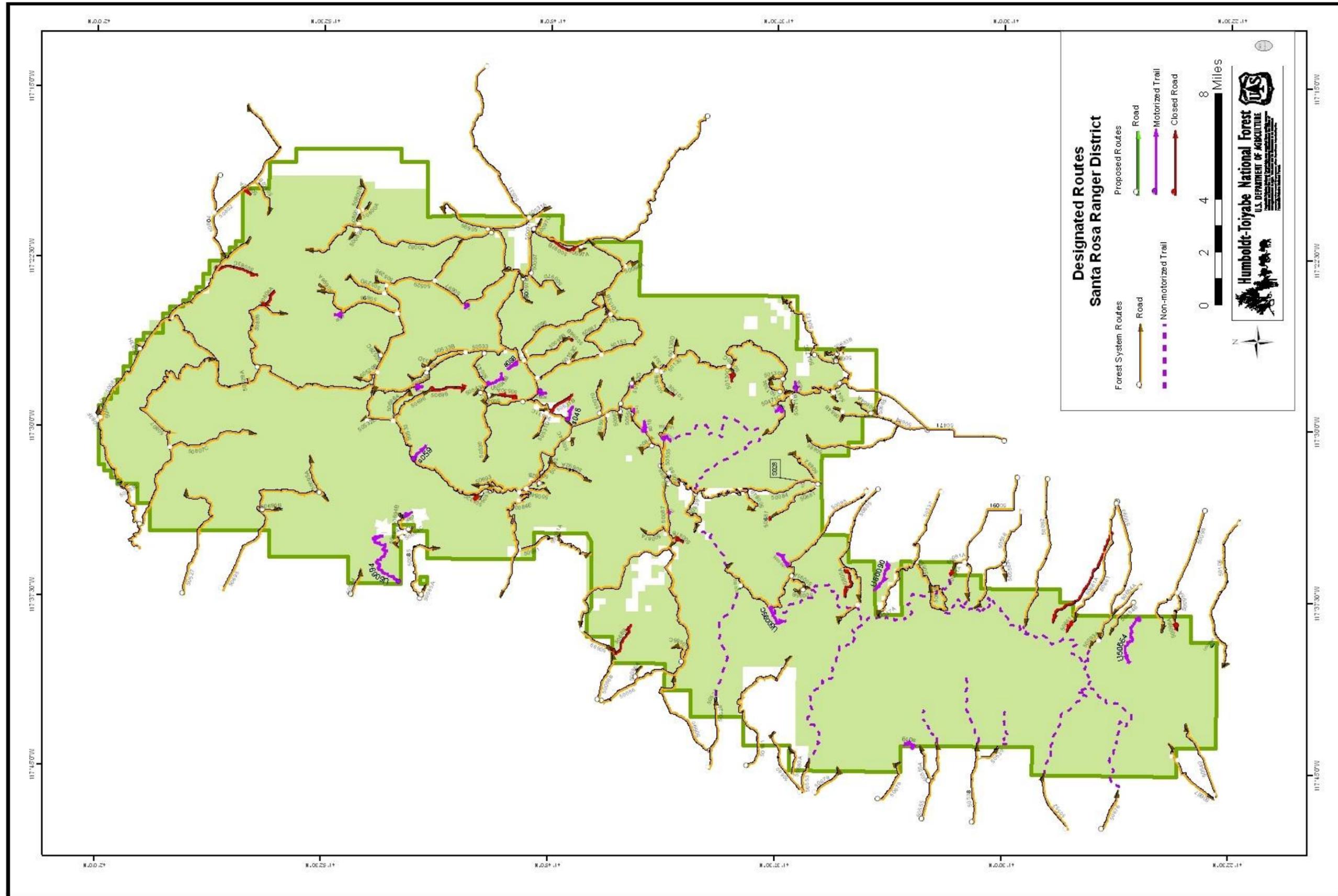
Authorization to allow motor vehicle use under any of these exemptions would be specifically identified in wood cutting permits, term grazing permits, and other applicable documents.

2.1.3. Alternative 3: Current System Alternative

Under this alternative, no user-created routes would be added to the Forest transportation system. The current 158 designated routes open to motor vehicle use, totaling approximately 310 miles, would serve as the motorized access routes into and across the District. Map 1 shows the current road system as it is open to the public (gold routes).

This alternative would also adjust the current Forest transportation system by removing 17 routes that have been washed out or are no longer needed and restricting use on two routes that are currently impassable but may be needed in the future. These routes total approximately 14.7 miles and are described as part of the Proposed Action above in Tables 2 and 3. Following the decision, designated routes would be identified on a Motor Vehicle Use Map. Motor vehicles would be restricted to designated routes under 36 CFR 261.13, as in the Proposed Action.

This alternative addresses the potential impacts of designating routes in IRAs. Under this alternative no routes would be added in IRAs and nine existing roads in IRAs would be removed from the Forest transportation system.



2.2. Design Elements Common to All Action Alternatives

In response to public comments on the proposal, design elements were developed to ease some of the potential impacts that may be caused by the three alternatives. Design elements are components of both of the action alternatives.

Noxious Weeds: Noxious weed sites near proposed additions to the Forest transportation system would be prioritized for treatment.

Goshawks: Goshawks are extremely sensitive to human disturbance. A user-created route near Alkali Creek lies very close to goshawk nesting territories. It is unknown how much vehicle or dispersed camping use takes place in this area. Monitoring to determine the level of use of this route in the goshawk nesting territories would be conducted for two seasons following designation of the route in the Proposed Action. If monitoring suggests that use of this route or the associated dispersed campsites results in reproductive failure of goshawk using these nest sites, this route would be seasonally closed from the beginning of the nesting period March 15 to the end of the fledging period September 15 and the Motor Vehicle Use Map would be revised to reflect this.

2.3. Comparison of Alternatives

This section summarizes the effects of implementing each alternative. Table 4 displays how the Forest transportation system would be configured under the three alternatives. Information in Table 5 focuses on activities and effects in which different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 4: Comparison of National Forest System Roads and Trails by Alternative

Forest Transportation System	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Current System
Total Number of Roads Open to Motor Vehicles	267	162	158
Total Number of Roads with Restriction on Motor Vehicle Use	20	22	22
Total Number of Roads Removed from System	0	17	17
Total Number of Motorized Trails Open to Motor Vehicle Use	23	24	0
Total Number of Non-motorized Trails	13	13	13
Total Miles of Roads Open to Motor Vehicles	335.88	310.9	310
Total Miles of Roads with Restriction on Motor Vehicle Use	11.15	13.15	13.15
Total Miles of Roads Removed from System	0	12.7	12.7
Total Miles of Motorized Trails Open to Motor Vehicles	55.67	16.1	0
Total Miles of Non-motorized Trails	66.11	66.11	66.11

Table 5: Comparison of Alternatives

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Current System
Number of road miles added to road system	55.67 miles of user-created routes remain open, but would not be added to the system. Cross-country motorized travel permitted (as long as there are no resource or user conflicts).	17 miles of user-created routes added as system roads and motorized trails. Cross-country travel would be prohibited. 12.7 miles of system roads would be removed from the system. Motor vehicles would be restricted on 2 miles of system roads.	No user-created routes would be added to the system. Cross-country travel would be prohibited. 12.7 miles of roads would be removed from the system. Motor vehicles would be restricted on 2 miles of system roads. Motor vehicles are currently restricted on 11.2 miles of the NFS road system.
Riparian areas: Miles of route added to system within 300 feet of Riparian Areas	Use on approximately 5.2 miles of user-created road and cross-country travel would continue.	Approximately 3.3 miles of user-created road would be added and 1.9 miles would not be added. Cross-country travel would be prohibited. Motor vehicles would be restricted on 2.9 miles of system road.	No additional routes would be added. Cross-country travel would be prohibited. Motor vehicles would be restricted on 2.9 miles of system road.
Watershed	No significant effects to Water Quality. Potential for future effects because of no prohibition of cross-country travel	No significant effects to Water Quality.	No significant effects to Water Quality.
Air Quality	Due to the relatively minor and short-term nature of use on these routes, there would be no significant impacts to air resources as a result of any of the alternatives.		

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Current System
Vegetation	Differences between alternatives amount to less than one percent disturbance per vegetation community.		
Noxious weeds	Four roads crossing high risk areas (0.14 miles) remain open for use.	One user-created road which is near high risk area added as system road. Area prioritized for treatment. 0.01 miles added in high risk areas.	No additional routes added in high risk areas.
Sagebrush dependent wildlife species	Entire district including all user-created routes crossing sagebrush habitat would remain open to motorized cross-country travel.	Adds 7.2 miles of user-created route in sage grouse habitat, 0.7 miles in pygmy rabbit habitat and 6.1 in mule deer habitat. Prohibits use on approximately 20 miles of user-created routes. 11.5 miles in sage grouse habitat and 8.5 miles in mule deer habitat would be removed from the road system.	Prohibits use on approximately 28 miles of user-created routes, in sage grouse and mule deer habitat. Prohibits use on approximately 2.3 miles of user-created routes in pygmy rabbit habitat. Prohibits cross-country travel.
Goshawk habitat	Allows use to continue on 1.2 miles of user-created routes in or near goshawk nesting habitat.	Adds 0.6 miles of user-created road in or near goshawk nesting habitat. Prohibits cross-country travel and restricts motor vehicles use on approximately 12.2 miles of NFS roads in goshawk nesting habitat.	Prohibits motorized use on all user-created routes. Restricts use on approximately 12.2 miles of NFS roads in or near goshawk nesting habitat.

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Current System
Bighorn sheep habitat	Allows continued cross-country use, including 42 miles of user-created routes in bighorn sheep habitat.	Adds 11.3 miles of user-created route in bighorn sheep habitat. Prohibits cross-country travel and prohibits motor vehicles use on 31 miles of user-created route in bighorn sheep habitat.	Prohibits cross-country motor vehicle use and motor vehicle use on user-created routes.
Neotropical migratory birds	The effects from the Proposed Action and alternatives is relatively low because of the low road density in the project area.		
Special Status Plants	No effect from the Proposed Action or alternatives.		
Aquatic Species	Allows use to continue on 3.2 miles of user-created route near Lahontan cutthroat trout (<i>Oncorhynchus clarki henshawi</i>) streams.	Adds 0.74 miles of user-created route near perennial streams (0.07) and intermittent streams (0.67) used by Lahontan cutthroat trout (<i>Oncorhynchus clarki henshawi</i>). Prohibits cross-country use. Prohibits use on 2.5 miles of user-created route near Lahontan cutthroat trout streams.	Prohibits use on 3.2 miles of user-created route within 300 of Lahontan cutthroat trout (<i>Oncorhynchus clarki henshawi</i>) streams. Prohibits cross-country use.
Heritage Resource	Continued use of user-created routes crossing heritage resource sites.	No adverse effect on heritage resource adjacent to proposed routes.	No adverse effect on heritage resources

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Current System
Native American Values	Continued cross-country travel with potential to adversely affect sites.	Prohibiting cross-country travel would minimize the potential risk to areas with potential Native American values.	No impacts from existing roads.
Visual Resources	Continued degradation of visual quality as new user-created routes are pioneered across unroaded viewsheds.	Adds 17 miles of user-created routes to road system. Prohibiting cross-country motorized travel will promote gradual revegetation.	Use on all user-created routes prohibited. Gradual improvement as vegetation recovers on prohibited routes.
Recreation	Use of user-created routes and cross-country motorized use allowed to continue. Potential conflict between OHV users and non-motorized users could increase.	Cross-country motor vehicle use prohibited. Access to popular dispersed campsites maintained, along with access to popular big game and upland bird hunting areas. Designated motorized trails provide OHV experience.	Motorized access to some dispersed campsites and hunting areas restricted. Reduced opportunities for OHV riding. No change to non-motorized recreation opportunities.
Effects on Inventoried Roadless Areas	24.9 miles of user-created routes remain open in IRAs. Cross-country motor vehicle use in IRAs continues.	Adds 5.5 miles of user-created routes leading to dispersed campsites and range improvements in IRAs as motorized trails. 19.4 miles of user-created routes would not be added. Motor vehicle use would be restricted on 4.3 miles of NFS system roads and another 4.2 miles would be removed from the road system.	No routes added in IRAs. Motor vehicle use would be restricted on 4.3 miles of NFS system roads and another 4.2 miles would be removed from the road system.

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Current System
Socio-economics	There would be little positive or negative effect on local economies that would result in increase or decreases in populations or employment.		
Environmental Justice	No effect to on either minority or low income populations.		
Livestock management	Livestock management would continue under current management under all alternatives. Appropriate motor vehicle use by permittees would be authorized under grazing permits.		

Chapter 3. Environmental Consequences

This section summarizes the physical, biological, social, and economic environment of the affected project area and the potential changes to the environment due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above.

3.1. Affected Environment: Public Safety

Safe travel for all users on routes that cross the District is a concern that the District addressed when developing the Proposed Action. Consideration was given to the types of routes being proposed, the types of vehicles traveling on the routes, the speeds at which vehicles can safely travel and the times of year the routes would be open. At present all routes on the Santa Rosa Ranger District are open to both highway-legal and non-highway-legal vehicles. Route conditions off the main routes are generally rough and require slow speeds (<10 MPH) in high-clearance vehicles. Main routes generally receive only light use through most of the year with the highest use period being during the hunting season in September and October. Other high clearance routes on the District receive almost no use other than during the hunting season.

Effects Common to All Alternatives

Because of the amount of use and travel speeds on most of the roads and trails and with the addition of signing to warn users of the potential for meeting vehicles of different types on the primary roads, there will be no increased risk of accident under any of the alternatives. The inherent risk of traveling on National Forest System routes would not increase.

Effects Common to All Action Alternatives

Prohibiting cross-country travel under the Proposed Action and the Current System Alternative will reduce the risk of accidents associated with traveling across steep terrain and uneven ground.

3.2. Affected Environment: Watershed

Drainage on the Santa Rosa Ranger District is controlled by the north-south trending Santa Rosa Mountain Range, which rises from 5,000 to 9,700 feet in elevation. The west side of the District flows into the Quinn River watershed. The Quinn River flows southwest from the Forest and terminates in the Black Rock Desert. Most of the District's east side flows east into the Little Humboldt River watershed. The Little Humboldt River then redirects the flow to the southwest, and joins into the Humboldt River, which then terminates at the Humboldt Sink in the Humboldt Wildlife Management Area. A small portion of three sub-watersheds on the northeast corner of the District flows north into the Snake River Basin, the Columbia River, and ultimately the Pacific Ocean.

Because travel management affects the entire District, the analysis area includes all 37 sub-watersheds (6th order hydrologic unit codes [HUCs]) originating on the District. Nineteen of these 37 sub-watersheds contain proposed additions to the forest

transportation system. These nineteen are part of either the Quinn River or Little Humboldt River watersheds.

In a synthesis of published literature, Elliot (2000) noted that, “on most forested watersheds, sediment is the most troublesome pollutant and roads are a major source of that sediment.” Sediment runoff rates from watersheds with roads and other soil disturbances tend to be significantly higher than those from watersheds with intact natural cover of vegetation (Elliot and Hall 1997).

The effect on water quality depends greatly on the location of roads within a watershed. Most sediment from roads enters streams where roads cross streams, or where roads are close to streams (Elliot 2000). Within the project area National Forest System and user-created routes together currently have 251 crossings on intermittent streams and 107 crossings on perennial streams. Currently, 44.6 miles of system and user-created routes are near intermittent drainages and 82.5 miles near perennial drainages as defined by buffers of riparian habitat bordering drainages (150-foot buffers for intermittent drainages and 300-foot buffers for perennial drainages). There are 58.4 miles of routes located on steep (>30%) slopes.

The rate of surface erosion is not constant throughout the life of a travel route. As vegetation regrows, disturbed soils stabilize and surface erosion decreases. Most surface erosion occurs within the first two years of construction, and tends to drop off significantly when a route is closed (Elliot 2000). However, routes with high traffic and maintenance that prevent revegetation will continue to be a source of sediment (Elliot and others 1996; Swift 1984). All of the system routes and most of the 71 miles of current user-created routes have been in place for much longer than two years. The user-created routes proposed for addition to the forest transportation system have likely been in existence for much more than 10 years. None of the user-created routes are currently maintained. The maintenance frequency of system routes varies, depending on their maintenance level designation. The primary travel corridors, the Hinkey Summit road, the North Fork of the Humboldt River road, and the Quinn River road tend to get the most use and maintenance. The more rugged routes into the remote areas of the District tend to have much lower use, and consequently much less maintenance. Given their age, low use, and lack of maintenance, soils underlying most routes and all the user-created routes proposed for designation have likely achieved an adequate level of stability. However, there are likely exceptions. New routes created by users in recent years may not have had enough time to achieve stabilization.

Environmental Consequences

Environmental impacts of an alternative would be significant if an alternative allowed use on user-created routes that presented:

- *A high risk for sediment runoff into drainages, leading to degraded surface water quality.*

The No Action Alternative

Under the No Action Alternative, cross-country motorized travel would not be restricted. This would inevitably lead to more user-created routes in the future. Because user-created routes are not projects and do not go through the NEPA planning process, there is a risk that future routes would be created in locations susceptible to

sediment runoff. There would also be continued use of the existing 61.3 miles of user-created travel routes (routes not considered for inclusion in the Proposed Action) that are poorly located, on steep erosive slopes, or in critical riparian areas. The No Action Alternative would, therefore, present the highest risk for sediment runoff and degraded water quality. However, the level of risk would not reach the significance threshold of “high risk for sediment runoff leading to degraded surface water quality.”

The Proposed Action

Under the Proposed Action Alternative, 28 routes would be added and motorized use would be restricted to designated routes. The Proposed Action would decrease route mileage within the boundaries of the District by approximately 38.7 miles; route mileage along intermittent drainage buffers would be reduced by 5.9 miles; and mileage along perennial drainage buffers would be reduced by 3.6 miles. In addition, 33 drainage crossings would be eliminated. The amount of sediment runoff from a road depends greatly on the erodibility of the soils that make up the road surface. In general, silty soils on steep slopes tend to be more erodible than gravely and cobbly soils. Most of the user-created routes proposed for addition to the forest transportation system are on loams with significant amounts of gravel and cobbles. Even though some sections of the proposed routes either have or cross steep grades (>30% slope), the underlying soils tend to be erosion resistant. Four of the 28 analysis routes (U50535A, U50654, S012, and S013) are located partly or entirely on loams with a high silt component. Because these soils are not located on steep sections of the analysis routes they are not likely to be an erosion concern.

Table 6 lists the number of channel crossings by drainage type for each user-created route proposed for addition to the system as well as the number of miles within a buffer of riparian vegetation bordering the drainage.

Only six of the 28 proposed routes cross drainages, and most of those have only one or two crossings. The exception is U50694, which has seven crossings. However, the crossings on U50694 are high in the watershed on intermittent streams. Site conditions (see Table 7) for the six routes with crossings suggest that none of the crossings are susceptible to significant sediment runoff. Most proposed routes have little (less than 0.5 miles), if any, of their length within the riparian buffers, which reduces the risk of sediment runoff into surface waters. Only two Proposed Action routes (U50677A and U50694) contain more than one half mile in a riparian buffer, but in these areas they overlie rocky soils that are resistant to surface erosion.

The addition of the proposed routes to the current forest transportation system is not likely to present a high risk of sediment runoff. The analysis (described above) of soil type and road gradient shows that none of the proposed routes are likely to be highly erodible. Most soil surfaces on the proposed routes have achieved an adequate level of stabilization, and are likely to generate much less sediment runoff than a newly-constructed engineered road or a new user-created route. Also, the few drainage crossings on the analysis routes occur under conditions that are not likely to generate much sediment runoff, and only short segments of most analysis routes are located within riparian buffers. Furthermore, because the Proposed Action Alternative would limit motorized travel off designated routes, the risk would be reduced for new route related erosion-causing disturbance in these areas.

Table 6: Proposed Routes and Water Crossings

Route number	Total length (miles)	Miles in riparian buffer (perennial)	Miles in riparian buffer (intermittent)	No. of perennial crossings	No. of intermittent crossings	Crossing conditions
s018	0.48	0.00	0.00			
s019	0.52	0.23	0.00	1		soil erodibility low, limited use
s034	0.39	0.08	0.00			
s036	0.38	0.17	0.00	1		soil erodibility low, limited use
s041	0.10	0.10	0.00			
s043	0.18	0.18	0.00			
s045	0.66	0.05	0.00			
s057	0.40	0.00	0.00			
s059	0.79	0.00	0.00			
s060	0.18	0.00	0.00			
s77	0.38	0.00	0.00			
s085	0.21	0.11	0.00			
s92	0.40	0.00	0.00			
s98	0.54	0.00	0.00			
s99	0.33	0.00	0.00			
U50043B	0.83	0.08	0.00			
U50090	1.45	0.08	0.15		2	soil erodibility low, limited use
U50095D	0.28	0.08	0.00			
U50106A	0.18	0.18	0.00			
U50535A	0.37	0.00	0.00			
U50535B	0.09	0.05	0.00			
U50654	2.18	0.27	0.13			
s012	0.20	0.04	0.00			very short route with gentle slope (not much surface runoff), limited use
s013	0.15	0.10	0.00	2		very short route with gentle slope (not much surface runoff), limited

Route number	Total length (miles)	Miles in riparian buffer (perennial)	Miles in riparian buffer (intermittent)	No. of perennial crossings	No. of intermittent crossings	Crossing conditions
						use
s028	0.23	0.18	0.00	2		very short route with gentle slope (not much surface runoff), limited use
U50095C	1.07	0.07	0.09			
U50095E	0.67	0.26	0.00			
U50694	3.51	0.80	0.99		7	soil erodibility low, limited use, not much surface runoff (intermittent channel high in drainage)

The Current System Alternative

Under the Current System Alternative, no routes would be added and motorized use would be restricted to designated routes. The elimination of all user-created routes would decrease route mileage within the boundaries of the District by approximately 55.67 miles; route mileage along intermittent drainage buffers would be reduced by 5.9 miles; and mileage along perennial drainage buffers would be reduced by 5.0 miles. In addition, 38 drainage crossings would be eliminated. Because no new routes would be added and use of unauthorized routes prohibited, the risk of sediment runoff from routes would not increase beyond that of the current system. Over time, the user-created routes currently in existence would revegetate and stabilize due to nonuse. By implementing restrictions on cross-country travel, the potential for erosion-causing disturbance in areas outside the system routes would be reduced. The Current System Alternative would, therefore, present the lowest risk for sediment runoff and degraded water quality.

Cumulative Effects

Within the District, watershed integrity can be jeopardized by disturbances, such as roads, off-road travel, fire, livestock grazing, and mineral exploration. Watershed disturbances that create large areas of bare ground intercept and concentrate precipitation runoff that would otherwise pass at a slower rate through vegetated surfaces. When these disturbances occur together in a watershed, they can have the cumulative effect of increasing sedimentation in surface waters (Menning and others 1996; McGurk and Fong 1995).

To analyze the cumulative watershed effects for this project, a model called Equivalent Roaded Area (ERA) was used to quantify watershed disturbance in each sub-watershed

(6th order HUC). Because all disturbances in a sub-watershed can potentially act cumulatively, the cumulative effects area included all land within the sub-watershed regardless of ownership. The methodology for calculating ERA has been described in detail by Berg and others (1996), McGurk and Fong (1995), Menning and others (1996), and the U.S. Forest Service (1988). The ERA model is typically used by the U.S. Forest Service in Region 5; the State of California has established it as a valid method for analyzing the cumulative effects of watershed disturbances. Although the ERA model was developed in California, the method can be modified for use in other regions (McGurk and Fong 1995). A watershed specialist's report in the project record contains a complete description of the modified version of the ERA model used in this analysis as well as generated data.

Based on the ERA model, combined levels of soil disturbance for both authorized and user-created routes do not exceed 0.3% of the total area or 1% of the riparian areas in any sub-watershed. The soil disturbance from the proposed additions to the forest transportation system amounts to no more than 0.03% in any sub-watershed of the entire area. For areas identified as riparian with each watershed, soil disturbance from the proposed routes amounts to less than 0.1%.

Cumulatively, the total for all types of disturbance is less than 2% for either riparian areas or entire sub-watersheds. In general, the cumulative soil disturbance is not likely to be a concern on the district until it is much higher—about 5% for riparian areas (McGurk and Fong 1995) and 10–12% for the entire watershed (Menning and others 1996).

3.3. Affected Environment: Air Resources

The District's climate is characterized by warm, dry summers and moderately cold, dry winters. Sunshine is abundant and evaporation is typically high. Temperature data compiled at the Paradise Valley Ranch Weather Station on the southeast side of the project area indicate that minimum temperatures range from 16 to 48 degrees Fahrenheit (F) and maximum temperatures around 90 degrees F at approximately 4,650 feet above mean sea level (amsl). The average precipitation is 10 inches at the 4,650 amsl, the majority of which falls as snow. This weather station is in a valley on the east side of the Santa Rosa Range. Weather conditions in the Santa Rosa Range can be more extreme, with lower average temperatures and higher levels of precipitation. Prevailing winds over the project area are predominately from the west; however, the significant local topography and heating and cooling cycles could have noticeable effects on wind direction and speed.

The project area is not located in an Air Quality Control Region as designated by the EPA in 40 CFR part 81. The Nevada Division of Environmental Protection did not identify any specific air quality requirements for this portion of the state nor do they define any ambient air quality standards in this portion of Humboldt County.

Environmental Consequences

Environmental effects of an alternative would be significant if they resulted in any of the following:

- A violation of any regulatory requirements of the Air Quality Control Region; or
- A violation of any state or federal ambient air quality standard.

Effects Common to All Alternatives

Vehicles traveling on unpaved surfaces create fugitive dust, causing short-term and localized temporary impacts to air resources. These impacts are expected to be of short duration and locally isolated given the low traffic volume and slow travel speeds on the routes. Due to the relatively minor and short-term nature of use of these routes, there would be no significant direct, indirect, or cumulative impacts to air resources as a result of any of the alternatives.

3.4. Affected Environment: Vegetation

The District has a diversity of upland mountain brush species, expansive stands of aspen, and perennial and intermittent streams that are lined with willows and other riparian species. Wet and dry meadows occur in most of the valley bottoms and although they are limited in size they are very important for wildlife and livestock forage. Elevations on the District range from 5,200 feet at the forest boundary to 9,701 feet at the mountain tops. Vegetation varies across the District by elevation.

In 2003, vegetation types were mapped from satellite imagery and ground verified through a series of plots to assess the accuracy of the map. This information has been used to define the vegetation and wildlife habitat in this analysis. The vegetation data is about 80% accurate. Table 7 shows the vegetation types found on the Santa Rosa District, the total acres of the vegetation type, and the number of miles of road/acres within each type.

Dominant vegetative types include aspen, (*Populus tremuloides*), mountain big sagebrush (*Artemisia tridentata spp vaseyana*), Wyoming big sagebrush (*Artemisia tridentata spp. wyomingensis*), low sagebrush (*Artemisia arbuscula*), mountain brush community (species include antelope bitterbrush (*Purshia tridentata*), serviceberry (*Amelanchier alnifolia*), wax currant (*Ribes cereum*), gooseberry currant (*Ribes montigenum*), snowbrush, chokecherry, wild rose), cottonwood (*Populus spp.*), and wet and dry meadows.

Environmental Consequences

Environmental impacts of an alternative would be significant if they resulted in either of the following:

- Elimination of a natural plant community from the project area; or
- Violation of the Executive Order 11990-Protection of Wetlands.

Table 7: Number of road and trail miles in each vegetation type and acres impacted by each alternative

Vegetation type	Acres of vegetation type	No. of miles in each vegetation community, by alternative*		
		No action alternative	Proposed Action	Current system alternative
Aspen	16,567	6.0	5.0	4.4
Barren	6,477	4.1	1.9	1.7
Conifer	15	0		
Meadows	21,527	19.6	15.8	15.0
Mountain brush	35,848	23.1	18.2	16.8
Mountain mahogany	8,784	5.8	3.0	2.9
Riparian	4,575	9.44	7.7	7.5
Sagebrush	205,650	323.5	301.29	287.6
Miles		391.6	352.9	335.9
*(1 Mile=1 Acre) of existing roads within in each Vegetation Type(Authorized & User-created)				

Effects Common to All Action Alternatives

None of the action alternatives would result in the loss of natural plant communities in the project area or violation of Executive Order 11990 because disturbance within all vegetation types is very small compared to the overall acreage in the project area. Furthermore, impacts to vegetation occurred many years ago when the routes were established.

The No Action Alternative

Overall this alternative would have the most impact to vegetation because the alternative does not prohibit cross-country travel. Motor vehicle use could occur on any open road or the surrounding National Forest System lands except those areas that are in designated wilderness. Current land management planning direction and National Forest regulation prohibit vehicle use that causes resource damage, such as impacts to riparian areas, springs, or wet meadows. Allowing continued cross-country motorized use would result in additional direct, indirect, or cumulative impacts through establishment of new, unmanaged routes.

The Proposed Action

This alternative would limit vehicle use to National Forest System roads and trails, including those listed above. This alternative would reduce the establishment of new user-created roads and prohibit cross-country travel. By restricting vehicles to designated roads and trails, future impacts to vegetation would be reduced. In addition, approximately 61.3 miles of user-created routes and 12.7 miles of Forest transportation system roads that are no longer needed would be removed from the road system. Vehicular travel would be prohibited off of designated routes and the unauthorized routes would eventually revegetate.

The Current System Alternative

This alternative would limit vehicle use to current National Forest System roads and trails. The establishment of new user-created roads and cross-country travel would be prohibited. By enforcing the prohibition of motor vehicle use of designated routes, future impacts to vegetation would be reduced. In addition, approximately 55.67 miles of user-created and 12.7 miles of Forest transportation system roads that are no longer needed would be removed from the road system. Vehicular travel would be prohibited off of designated routes and the unauthorized routes would eventually revegetate.

Cumulative Effects of the Action Alternatives

Because the Proposed Action and the Current System Alternatives have minor impacts to the vegetation communities that they pass through and because there are no ground-disturbing activities associated with this action, the two action alternatives do not contribute to the incremental impacts to vegetation communities that result from past, present, or reasonably foreseeable actions occurring on the District.

However, these two alternatives do have the potential to positively affect the vegetation communities. Both alternatives would prohibit motor vehicle use off designated routes on the District and both alternatives remove 17 system roads and restrict use on two system roads. These actions can have a positive cumulative effect to vegetation communities across the District by reducing the development of user-created routes, and allowing native vegetation to regrow in existing user-created routes and routes removed from the road system.

On some routes, preventing use may require physical closures in the form of gates, fences, road blocks, or reclamation, which would involve additional NEPA analysis as appropriate.

3.5. Affected Environment Invasive, Non-Native Species

Noxious weeds are highly invasive plants that generally possess poisonous, toxic, parasitic, invasive, and aggressive characteristics. The presence of noxious weeds signifies an area that is at risk in terms of ecological health and sustainability, whether the landscape is disturbed or pristine (USFS 2003). The District has several known locations of noxious plant species on the Nevada State Noxious Weeds list in addition to invasive species such as cheatgrass.

By providing a conduit for their expansion, roads are believed to be a major contributing factor in the proliferation of invasive plants into natural areas in the arid and semiarid landscapes of the American West, Gelbard and Belnap (2003). Noxious weed seed is easily transported and dispersed by wind, livestock, wildlife, recreation, and off-road motor vehicles. Once established, the plants spread quickly after major disturbances, such as fire. Noxious weeds can produce seeds that can persist in the soil for several decades.

Duncan and Clark (2005) estimated the rate of spread for noxious weeds if they are left untreated. The rate of spread depends upon their reproduction mechanism or the amount of disturbance to a site. Table 8 shows the estimates of the potential rate of spread for each species.

Table 8: Annual Rate of Spread for Selected Noxious Weeds

Common name	Scientific name	Max. annual rate of spread
Canada thistle	<i>Cirsium arvense</i>	10–12%
Hoary crest/Whitetop	<i>Cardaria draba</i>	Not known
Leafy spurge	<i>Euphorbia esula</i>	12–16%
Medusahead	<i>Taeniatherum caput-medusae</i>	12%
Musk thistle	<i>Carduus nutans</i>	12–22%
Russian knapweed	<i>Acroptilon repen</i>	8–14%
Scotch thistle	<i>Onoropordum acanthium</i>	12–20%

Table 9 lists the seven different weed species that are known to occur on the District. The Humboldt-Toiyabe National Forest utilizes an integrated pest management program that includes inventory and mapping of weed locations. If weeds are found, treatment may include mechanical, biological, and or herbicide applications. The majority of weed species on the District are treated with herbicides. Some experimental goat use was tested in the Flat Creek area in 2003.

Areas which present a high risk for the spread of noxious and invasive weed species occur along the current NFS routes. Weeds are known to occur along 6.7 miles of NFS routes. All of these occurrences are mapped and included in the Forest Integrated Weed Management Plan for treatment to reduce the spread of weeds. The weeds that occur on the Forest, the extent of their occurrence, and their locations are listed in Table 9.

Table 9: Noxious and Invasive Weed Species on the Santa Rosa Ranger District

Species	Location (nearest road)
Canada thistle (<i>Cirsium arvense</i>)	East Fork Quinn River (50083), South Fork Quinn River Road (50807), Eight Mile Canyon (50524, u50694), Hinkey Summit (50084) Provo Canyon Road (50106)
Hoary crest/Whitetop (<i>Cardaria draba</i>)	Scattered Throughout the District.
Leafy spurge (<i>Euphorbia esula</i>)	Dry Creek Road (50056), Hinkey Summit (50084, 50084c) Also located on BLM and private land southeast of Granite peak.
Medusahead (<i>Taeniatherum caput-medusae</i>)	Forest boundary east of the Santa Rosa-Paradise Peak Wilderness Area.
Musk thistle (<i>Carduus nutans</i>)	Abel Creek (5050093a)
Russian knapweed	Buttermilk Meadow (50471), Granite Peak (50057) Also

Species	Location (nearest road)
<i>(Acroptilon repen)</i>	located on private land
Scotch thistle <i>(Onorpardum acanthium)</i>	Willow Creek, South Fork Willow Creek Road (50528). South and East Fork Quinn River (50807c), McConnel Peak (50695b), Indian Creek (50084), Dog Creek (50538), Flat Creek and South Fork Flat Creek (50086b), Three Mile Creek (50085), Falls Canyon (50539), Martin Creek Guard Station (50084), South Fork Indian Creek (50681), Abel Creek (50093a), (50802b), (50696a).

The District also has extensive patches of cheatgrass in its lower elevation areas. Cheatgrass can be spread by animals and vehicles moving through the grass and picking up seeds. Roads entering the district from low elevation areas have risk of spreading cheatgrass seeds onto the District along these roads.

To predict the risk of noxious weed spread from roads, the Forest overlaid all routes with known weed infestations on the District. A buffer of 25% of the infestation area was mapped around the infestation based on the estimated spread of infestation sites and the tendency for people to park off the main track of a road. These areas were mapped as “high risk” for weed infestation as related to travel routes. A buffer of five miles was mapped around each infestation point to identify the area that is at “medium risk” for spread of weeds.

Environmental Consequences

Environmental impacts of an alternative would be significant if they resulted in:

- *A greater than 10% increase over current weed occurrences along user-created routes.*

Effects Common to All Alternatives

As indicated in Table 10, all alternatives have equal miles of road that occur in “high risk” areas. These areas are associated with existing system roads and common to all alternatives. Noxious weeds and invasive species can cause substantial resource damage by disrupting plant communities and replacing valuable wildlife forage. Transportation routes are the most significant corridors for the spread of weeds. Non-system and user-created routes have the potential to spread weeds into adjacent areas. However, none of the current user-created routes pass through “high risk” areas. Accordingly, the addition of any of these routes to the Forest transportation system should not result in a measurable increase of weed occurrences over current conditions. Federal and state laws direct the Forest to minimize the potential for spreading noxious weeds when planning projects (Federal Noxious Weed Act 1974, National Strategy and Implementation Plan of Invasive Species Management 1998, Executive Order on Invasive Species 1999, Forest Service Manual 2080, Nevada Revised Statutes Section 555, Nevada Administrative Code Section 555).

Table 10: Distribution, number of miles of roads and trails in high-risk noxious weed areas, by alternative

Alternative	No. of miles of route in high-risk areas	No. of miles of route in medium-risk areas	No. of user-created routes with known weed infestations where motor vehicle use would continue
No Action Alternative	2.2	310.	4
Proposed Action	2.1	282.03	1
Current System Alternative	2.1	266.14	0

The No Action Alternative

This alternative has the highest potential to spread weeds across the District through motorized travel because motor vehicles would be permitted to travel cross country which could move seed into un-infested areas. All of the user-created routes would remain open and weeds could become established in those areas. The District would continue to treat weed infestations with herbicides and other methods as permitted under current management direction. Weed treatments focus on the primary system routes that provide a corridor for weeds to establish and feather out from those routes.

The Proposed Action

This alternative would not allow use of motorized vehicles off designated routes, and so would reduce a major vector that spreads weeds onto the District. This alternative also prohibits motor vehicles on approximately 43 miles of routes that occur in the “medium” risk areas that lie within five miles of known weed infestations. This is a significant improvement over current management in working to control the spread of noxious weeds.

The District would continue to treat weed infestations with herbicides and other methods as permitted under current management direction. By prohibiting cross-country travel, this alternative would prevent infestations from occurring in unknown locations. Weed treatments focus on the primary system routes that provide a corridor for weeds to establish and feather out from those routes. Noxious weed sites near proposed additions to the Forest transportation system would be prioritized for treatment.

The Current System Alternative

This alternative would not allow use of motorized vehicles off designated routes, and so would reduce a major vector that spreads weeds onto the District. This alternative also prohibits motor vehicles on approximately 53 miles of routes that occur in the “medium” risk areas that lie within five miles of known weed infestations. This is a significant improvement over current management in working to control the spread of noxious weeds.

The District would continue to treat weed infestations with herbicides and other methods as permitted under current management direction. By prohibiting cross-country travel, this alternative would prevent infestations from occurring in unknown

locations. Weed treatments focus on the primary system routes that provide a corridor for weeds to establish and feather out from those routes.

Cumulative Effects

The No Action Alternative would incrementally add to the current potential for the spread of noxious weeds. Unrestricted cross-country travel would make new areas susceptible to the spread of noxious weeds. Due to the nature of unrestricted cross-country travel, it is very difficult to predict the rate at which cross-country travel will add to the current potential for the spread of noxious weeds. Because motor vehicle use could occur anywhere, detecting new infestations of noxious weeds would be very difficult.

The Proposed Action and the Current System Alternatives would not incrementally add to the current potential for the spread of noxious weeds. Both alternatives prohibit the use of motor vehicles off designated routes which would in turn reduce the opportunity for the establishment of new areas susceptible to the spread of noxious weeds. They both also restrict motor vehicle use on some current system routes, again reducing the opportunity for the spread of weeds. While the Proposed Action adds some user-created routes to the current system, there is no construction or other ground disturbing activity associated with this designation. Because the routes already exist on the ground, designation is an administrative action completed so that Forest users can continue to travel on the routes and so the routes can be managed and maintained as appropriate for their use objectives.

3.6. Wildlife

Federally listed Threatened, Endangered, and Forest Service Sensitive (TES) species were addressed in a separate Biological Assessment/Evaluation on file in the project record. The Biological Assessment/Evaluation did not identify any significant effects to TES species. The species addressed included: flammulated owl, mountain quail, great gray owl, bald eagle, peregrine falcon, northern goshawk, sage grouse, Townsend's big-eared and spotted bats, and pygmy rabbit.

The following subsections address multiple species by habitat type.

3.7. Affected Environment: Sagebrush-Dependent Species

Sage Grouse

Sage grouse is a primary species of upland game bird present in the project area. They occur primarily in the sagebrush and adjoining vegetative community located throughout the analysis area. There are 228,124 acres of sagebrush habitat within the project area (Jeffers, pers. comm., 2003) (see Table 11). Sage grouse leks occur throughout much of the district. Leks are, however, concentrated on the northern half of the district. In Nevada, sage grouse populations have been monitored through lek counts during the spring (Stiver, person comm., 2003). Population estimates for the Santa Rosa Mountains have increased in recent years because more areas are being surveyed and more leks have been discovered. Sage grouse populations within the state of Nevada are currently estimated at approximately 65,000 adult birds

(Governor’s Strategy, 2001). Table 11 provides sage grouse habitat characteristics by sage brush species on the District.

Table 11: Sage Grouse Habitat on the Santa Rosa Ranger District

Canopy cover by sagebrush species	Sage grouse nesting and brooding habitat (acres)				
	Less than 10% shrub cover	10 – 20% shrub cover	21 – 30% shrub cover	31%+ shrub cover	Total by sage species
Basin big sage		100	4,358	301	4,759
Wyoming big sage		1,588	39,881	5,544	47,013
Low sage		768	54,744	4,246	59,758
Mountain big sage		6,765	63,800	23,446	94,011
Mixed sage/Bitterbrush		23	81	4	108
Grasslands	22,475				22,475
Total (Acres)	22,475	9,244	162,864	33,541	228,124

Leks and nesting habitats within the project area are most common within the Martin Creek, East Fork Quinn River, and North Fork Little Humboldt River Watersheds on the northern portions of the District. Leks and nesting habitats also occur on or near the Granite Peak and West Side Flat Creek Allotments. Table 12 shows the spring and fall population estimates for the District.

Table 12: Santa Rosa Population Management Unit Data

Year	Spring Population Estimate (Upper Limit)	Fall Population Estimate (Upper Limit)
2006	Not available	Not available
2005	8,199	12,581
2004	4,795	9,199
2003	4,795	No data

To measure the effects of roads and trails on sage grouse and to describe the existing condition, all routes (NFS routes and user-created) that occur within two miles of sage grouse leks were considered. Table 13 shows the miles of road or trail within sage brush habitat by alternative. These routes cause the most disruption to nesting adults and young sage grouse. Currently there are approximately 191 miles of NFS routes within critical sage grouse nesting habitat. Another 28.3 miles of user-created routes

lie in critical sage grouse habitat. Under existing conditions, NFS and user-created routes average less than one mile per section of land.

Pygmy Rabbit

The pygmy rabbit is the smallest of North American rabbits. Pygmy rabbits have either dark grizzled or slate-gray backs and buffy white or grayish chests and stomachs, with short, gray, and inconspicuous tails. They can be distinguished from other rabbits by size alone, but also by their shorter ears and tails which are not white like cottontails'. The pygmy rabbit has a discontinuous distribution occurring in Montana, Wyoming, Idaho, Utah, Nevada, California, Oregon, and Washington (USDA 2001). There is little information on the current distribution of pygmy rabbits in Nevada.

On the District, habitat for pygmy rabbits consists of broad sagebrush basins where thick and healthy Wyoming and mountain big sagebrush communities occur adjacent to riparian areas, springs, or other sources of water. Old mine sites and/or homesteads may also provide potential habitats. Formal surveys for pygmy rabbits were conducted on the District in 2006 by Forest Service personnel. Pygmy rabbits were found to occur in many areas including Granite Peak, Martin Basin, Bradshaw, Buttermilk, West Side Flat, and Indian Creek.

Based on Green and Flinders (1980a) and consultation with the Nevada Department of Wildlife (NDOW) biologists and Eveline Larrucea, the Forest mapped suitable burrowing habitat for pygmy rabbits across the district as areas having:

- 1) Mountain and Wyoming Big sagebrush stands that
- 2) occur at elevations of 6,000 to 8,000 ft, and
- 3) slopes less than 20 percent.

This mapping showed that there are approximately 36,750 acres of suitable habitat for pygmy rabbits on the district. Overlaying the existing routes, the Forest identified 14 NFS roads, totaling 16.1 miles, and nine user-created routes, totaling 2.3 miles, that occur in this potential habitat. Four of the user-created routes (0.7 miles) are included as part of the Proposed Action.

Mule Deer

Mule deer occur throughout the project area. Mule deer are a management indicator species (MIS) in the Forest Plan.

The District has little to no critical mule deer winter range. However, routes that lead up to the Forest and connect into NFS roads travel through lower elevation winter habitat on Bureau of Land Management (BLM) and private lands. These areas provide critical mule deer winter range.

The Forest Plan set a minimum viable population level for mule deer for the entire Humboldt National Forest at 11,247 with a maximum potential population of 88,200 deer. The current mule deer population for Management Area 5, which consists of just the District and surrounding lands (a small portion of the Humboldt National Forest), is estimated at 3,422, compared to 3,161 in 2002. The NDOW spring composition flight conducted in March 2003 counted 553 deer (NDOW 2003). This sample is consistent

with the ten-year average for Area 5. Most of these deer spend time on the district, as this area provides substantial summer range for area 5.

Roads and other human developments adversely affect mule deer by introducing disturbance during a period when physical stress is already high (Canfield et al 1999). Researchers have reported decreased use of areas within ¼ to ½ mile from a road (Thomas 1979; Wasley 2004; Canfield et al. 1999). As road densities increase, mule deer habitat values decrease (Canfield et al. 1999). Restricting motor vehicles to designated routes within winter, summer, and fawning habitat can be beneficial to mule deer by limiting overland travel and disturbance (Canfield et al. 1999).

Environmental Consequences

Forest Plan direction is to protect and improve key or important habitats for wildlife, including mule deer and sage grouse. The Plan states that the Forest should protect complexes comprised of moist habitats and adjacent security areas. Security areas are those used for hiding and nesting cover by wildlife.

Sage grouse population trends on the district and adjacent lands are not completely understood. But as the data listed above indicates, total numbers of sage grouse have increased in recent years; this is the result of the discovery of strutting grounds and associated nesting habitat, and increased surveys (Espinosa 2006). Preliminary data for 2007, however, shows that sage grouse reproduction and chick/hen ratios are down.

Mule deer rely heavily on the higher elevation riparian habitat and the adjacent uplands on the district. Lower elevation transitional and winter range are also critical as mule deer move down slope. Forest Plan requirements were considered when determining the effects of each alternative to mule deer.

Environmental impacts of an alternative would be significant if they resulted in:

- *A compromise or decrease in the habitats for sage brush dependent species.*

Effects Common to All Alternatives

As shown in Table 13 there are very few differences among alternatives' effects on sagebrush-dependent wildlife species. This is because less than 1% of the sagebrush habitat has been impacted by all roads and trails on the District. The alternatives differ by no greater than 30 acres, depending on the wildlife species being considered. Disturbances to sage grouse, pygmy rabbits, and mule deer from roads and trails are relatively low because road densities average less than 1 mile per square mile (Canfield et al. 1999).

The primary difference between the No Action Alternative and the action alternatives is the prohibition of cross-country motorized travel that would be initiated as part of the Proposed Action and Current System alternatives. To the extent the prohibition of cross-country travel is successful, the proliferation of unauthorized roads and associated sagebrush habitat fragmentation should be reduced. Sage grouse and mule deer population trends are expected to remain static or increase as a result of this action.

In addition, potential threats to sagebrush habitat, such as noxious weeds and human caused wildfires, would be reduced.

Table 13: Miles of Routes in Sagebrush-Dependent Species Habitat in the Santa Rosa Ranger District

Alternative	Sage grouse	Pygmy rabbit	Mule deer
No Action Alternative	219.6	18.4	154.3
Proposed Action	198.3	16.8	133.1
Current System Alternative	191	16.1	127
Routes added under Proposed Action	7.2	0.7	6.1
User-created routes not added	21.2	1.7	21.1
Roads removed from system	11.5	0	8.2

Overall none of the alternatives would significantly affect sage grouse. Protection of key sage grouse breeding complexes, such as strutting grounds and associated nesting areas, is considered part of each alternative.

Under all alternatives, mule deer populations are expected to continue at current levels and no measurable changes to mule deer populations would result from any of the alternatives. Mule deer populations on the district are affected most by rangeland conditions which are primarily affected by drought, wildfire and forage utilization.

Other sagebrush dependent species (pygmy rabbits) would not be significantly affected by any of the alternatives.

Cumulative Effects

Because the effects from the Proposed Action Alternative and other two alternatives are relatively small (less than 1% of suitable habitat) they would not contribute to any incremental cumulative effect to sagebrush-dependent species.

3.8. Affected Environment Northern Goshawk

The northern goshawk is found throughout most of North America, with a few isolated populations in the southeastern and central United States. In northern Nevada, goshawks occupy small stands of aspen that are surrounded by shrub-steppe occurring at elevations between 6,500 feet to 7,800 feet elevation during the warmer months, and in lower foothills and valley habitats during the winter (Herron et al. 1985). The goshawk in northern Nevada is considered a year-round resident (USFWS 1993).

The typical northern goshawk nest site in Nevada is located in aspen stringers about 600 feet long and 75 feet wide at approximately 7,400–7,800 feet in elevation, and near small perennial streams (typically within 100 yards). Ninety-eight percent of nests are located within 100 feet of water (Herron et al. 1985). Aspen is the most commonly used nesting tree with over 85 percent of the observed nests found in this vegetative community (Herron, et al. 1985).

Formal surveys for goshawks on the District were conducted in the early 1990s and the District was resurveyed in 2006. Surveys found active territories in Lye Creek, Abel Creek, Deep Creek, Andorno Creek, Alkali Creek, and Horse Canyon. There is additional habitat capable of supporting goshawk territories in Cabin, Road, and Flat Creeks although goshawks were not detected there. Approximately 5,896 acres of suitable nesting habitat occur within the project area.

Alkali and Lye Creek was resurveyed in 2007 because of a potential conflict with a route designation that could affect the goshawk nesting territory in the area. Several alternate nest sites were found in the aspen stands and the survey determined that red tailed hawks had occupied the site and no goshawks were present. In addition the location of the route was reviewed and determined to be outside the sensitive nesting area.

Environmental Consequences

Environmental impacts of an alternative would be significant if they resulted in:

- *Increased disturbance from routes in goshawk foraging or nesting habitat.*

Effects Common to All Alternatives

On the Santa Rosa Ranger District, goshawks forage primarily in sagebrush habitat. The effects to goshawk foraging habitat are the same as those analyzed for sagebrush-dependent species, in addition to the following analysis of nesting habitat.

As shown in Table 14 there is very little difference in the effects between alternatives for goshawk nesting habitat. This is because there is less than 1 acre difference between alternatives. Disturbances to goshawk from roads are relatively low because road densities average less than 1 mile per square mile (Canfield et al. 1999). One road of particular concern ends near a goshawk nesting territory. Use of this road and the cabin to which it leads could cause nesting failure by goshawks using the nest. Under each alternative, the nest and motorized vehicle traffic in the area would be monitored for the next two years. If monitoring identifies specific threats to a nesting pair of goshawks related to road use, the road would not be identified as a long term route.

The primary difference among the alternatives is the prohibition of cross-country motorized travel that would be initiated as part of the Proposed Action and Current System alternative. If the prohibition of cross-country travel is implemented then the development of unauthorized roads and disturbance and fragmentation in goshawk nesting and foraging habitat would be reduced. Goshawk population trends are expected to remain static or increase as a result of this action.

Potential threats to habitat such as noxious weeds and human caused wildfires would be reduced because of the prohibition of cross-country travel.

Table 14: Miles of road and trail in Goshawk Nesting Habitat*

Alternative	Miles in habitat
No Action Alternative	13.8
Proposed Action Alternative	13.2
Current System Alternative	12.6
*(1 Mile=1 Acre) of Existing Roads and Trails within in each Vegetation Type(Authorized & User-created).	

Cumulative Effects

Since the effects from the Proposed Action and alternatives are relatively non-existent (less than 0.1% of suitable habitat) they would not contribute to any incremental cumulative effects to goshawks.

3.9. Affect Environment: Bighorn Sheep

Within the District, there are three distinct groups of bighorn sheep. NDOW is trying to establish a fourth herd through recent translocation of bighorn. These herds are located on Santa Rosa Peak; Buckskin Mountain/Eight Mile Creek; Hinkey Summit; and recent introductions at the Martin Creek gorge. NDOW completes an annual bighorn census on the District; this information shows that the herd at Buckskin Mountain may have decreased or they have changed their movement patterns, which could be a result of human activity in the Buckskin Mountain Area.

The populations of bighorn sheep in the Santa Rosa Peak and adjacent Sawtooth Mountain showed a significant decline in 2005 (NDOW 2005). This decrease in population may have been caused by contact with unauthorized domestic sheep. These domestic sheep were removed. Nevada Department of Agriculture collected tissue samples from the bighorn sheep to try and isolate the cause of death.

Existing routes that traverse through bighorn habitat are in the Buckskin/Eight Mile area, Hinkey Summit Road 50084 and Sawtooth Mountain. Table 15 describes the user-created routes that are being considered for addition to the Forest transportation system which lie in bighorn habitat. These are (by area) Buckskin/Eight Mile, routes U50694 and S057; and Sawtooth Mountain, routes U50095C and S019.

Environmental Consequences

Environmental impacts of an alternative would be significant if they resulted in:

- *Increased disturbance from routes in bighorn habitat.*

Effects Common to All Alternatives

Currently, the Hinkey Summit Road (50084) provides the main access to view and hunt bighorn sheep. Bighorn viewing spots are identified by signs along the road. These hunting access and viewing opportunities would be maintained under all alternatives. Other access roads in the current system include the Buckskin/Eight Mile Road (50524) and Sawtooth Mountain (50678).

The No Action Alternative

This alternative would continue to provide viewing and hunting access into bighorn sheep habitat on approximately 42.17 miles of user-created roads. Motorized vehicles could also continue to drive off routes in pursuit of bighorn sheep.

The Proposed Action Alternative

Roads become an issue when they provide direct access to bighorn escape terrain causing bighorn to flee when vehicles or people using an area. The Proposed Action would reduce the current number of routes in bighorn sheep habitat from 200.68 miles to 169.3 miles. Many of the routes that would be added lie in bighorn sheep winter range where motor vehicle use is limited because of snow. Table 15 lists the user-created routes that access summer habitat and are being considered for addition to the forest transportation system. These roads include access to the Buckskin/Eight Mile area (routes U50694 and S057) and Sawtooth Mountain (routes U50095C and S019). Current use on these routes is very low because they provide access into remote, high elevation areas and use is not expected to increase. The Proposed Action would also prohibit motor vehicle use off designated routes. This prohibition would further reduce the disturbance in bighorn sheep habitat that results from motor vehicle use. The Proposed Action Alternative is not increasing disturbance because no new disturbance will occur; all routes being added already exist.

Table 15: Proposed Routes That Access Bighorn Sheep Habitat

Route #	Length (miles)	Vegetation/Habitat Type	Location
S019	0.5	Sagebrush	Sawtooth
S034	0.4	Sagebrush/Riparian	Buttermilk
S043	0.1	Riparian	Martin Basin
S057	0.4	Sagebrush	Eight Mile/National
S060	0.2	Sagebrush	Quinn River
S099	0.3	Sagebrush	Long Canyon Creek
U50095C	1.1	Sagebrush	Solid Silver
U50095D	0.3	Sagebrush/Barren	Solid Silver
U50694	2.1	Sagebrush	Eightmile
U50535A	0.4	Sagebrush/Riparian	Martin Basin
TOTAL	5.9		

The Current System Alternative

Travel would be confined to existing National Forest System roads and trails under this alternative, which includes approximately 158 miles of route in bighorn sheep habitat. Access to bighorn hunting and viewing would still be available to Forest users. Potential disturbance from user-created routes and overland travel would be reduced.

Cumulative Effects

The No Action Alternative could contribute to the incremental cumulative effects to bighorn sheep because overland travel would not be restricted and new routes could be established in bighorn sheep habitat. Neither the Proposed Action nor the Current System Alternatives would contribute to the incremental cumulative effects to bighorn sheep because they reduce the current access by at least 31.6 miles and prohibit motorized vehicle use off of designated routes in sensitive summer range.

3.10. Affected Environment: Migratory Birds

Executive Order 13186, signed January 10, 2001, lists several responsibilities of federal agencies to protect migratory birds. Among them is “support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.”

Additional direction comes from the Memorandum of Understanding (MOU) between the Forest Service, U.S. Department of Agriculture, and the U.S. Department of the Interior, Fish and Wildlife Service (USFWS), signed January 17, 2001. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and USFWS, in coordination with state, tribal, and local governments. The MOU identifies specific activities for bird conservation, pursuant to EO 13186 including: strive to protect, restore, enhance, and manage habitat of migratory birds, and prevent the further loss or degradation of remaining habitats on NFS lands.

Neotropical migratory birds use all habitats within the District during the breeding season. Priority species were identified in the Nevada Bird Conservation Plan (Nevada Partners in Flight 1999) and can be found in the project record.

In 2002, the Forest, in partnership with the Great Basin Bird Observatory, NDOW, and the BLM, began a long-term bird monitoring program to determine bird distribution, abundance, and population trends for neo-tropical migratory birds (GBBO 2002). This bird monitoring program samples each of the primary vegetation types on the District. Point counts have been completed across the District annually since 2002. Table 16 lists the primary habitat types that were surveyed and the bird species that have been detected. Priority species identified in the Nevada Bird Conservation Plan are in bold print.

Table 16: Neo-Tropical Migratory Birds and Their Habitat Types

Neo-Tropical Birds Detected in the Sagebrush Habitat Type		
Horned lark Green-tailed towhee American crow Turkey vulture American robin	American kestrel Gray flycatcher Brewer’s sparrow Vesper sparrow Lark sparrow	Sage thrasher Western meadowlark Prairie falcon
Neo-Tropical Birds Detected in the Aspen Habitat Type		
Western tanager Lazuli bunting Dark-eyed junco Hermit thrush Broad-tailed hummingbird Dusky flycatcher Green-tailed towhee Yellow-rumped warbler White-crowned sparrow	Dusky flycatcher Black-headed grosbeak Mourning dove Red-tailed hawk Hairy woodpecker Common poorwill Cordilleran flycatcher Sharp-shinned hawk Red-naped sapsucker American robin	Warbling vireo Western flycatcher Orange-crowned Warbler warbling vireo House wren Northern flicker Mountain chickadee MacGillivray’s warbler Brown-headed cowbird Swainson’s thrush
Neo-Tropical Birds Detected in the Montane Riparian/Wet Meadows Habitat Types		
Northern flicker Yellow-breasted chat Northern rough-winged swallow Green-tailed towhee Black-headed grosbeak Swainson’s thrush (?) American robin Hermit thrush Mountain chickadee Hairy woodpecker Yellow-rumped warbler Dusky flycatcher Brown-headed cowbird Golden eagle Great blue heron House wren Mourning dove	Cordilleran flycatcher Orange-crowned warbler Fox sparrow Western meadowlark Cooper’s hawk Western wood-pewee Killdeer Blue-gray gnatcatcher Bullock’s oriole Ruby-crowned kinglet Yellow warbler Spotted towhee Lazuli bunting Canyon wren White throated swift Chipping sparrow	Warbling vireo Violet green swallow Turkey vulture Lewis’s woodpecker American kestrel American crow Cassin’s finch Dusky flycatcher Red-tailed hawk Rock wren Bushtit Black-billed magpie Common raven Northern harrier MacGillivray’s warbler Song sparrow Lark sparrow

As the list shows, the District has a great diversity of migratory birds. The absence of western bluebird and willow flycatcher from this list may be an indication of poor riparian conditions. Of the birds that have been detected, most range over broad geographic areas and it is difficult, if not impossible, to determine the effects of Forest management (Dobkin and Sauder 2004). Although these birds breed and nest on the District, they migrate off District in the early fall and return in the spring. Some

species such as Brewer’s sparrow and sage sparrow remain on the District late in the fall until winter weather pushes them to lower elevations or more southern latitudes.

Environmental Consequences

The effects of roads and vehicular travel to migratory birds can occur through impacts to their habitat, additional energy demands and direct, unintentional mortality. The effects to the habitats have been addressed in the previous sections for vegetation, sagebrush dependent wildlife, and goshawk. Additional site specific impacts will be addressed by alternative. All of the alternatives are consistent with Executive Order 13186.

Environmental impacts of an alternative would be significant if they resulted in:

- *An increase in the amount of route created in riparian habitat.*

Effects Common to All Alternatives

Roads introduce disturbance and increase energy demands on wildlife (Taylor and Knight 2003). These effects increase (for birds) if disturbance from roads is introduced into the birds nesting area during the nesting season. Disturbance will put increased energy demands on the adults and disrupt feeding or foraging attempts. The amount of riparian habitat impacted (Table 17) was the measure used to determine the effects of the alternatives.

Table 17: Miles of Road and Trail in Riparian Habitat

Alternative	Miles of road and trail in riparian habitat
No Action Alternative	47.7
Proposed Action Alternative	42.1
Current System Alternative	40.9

The No Action Alternative

This alternative has the greatest impact to riparian habitats and migratory birds (47.7 miles). Because the District would remain open to overland travel by vehicles, new routes could be developed to create dispersed camping sites in riparian habitat. In addition to the actual removal of habitat that occurs when the roads are established there is also an increased disturbance to wildlife when people travel overland to camp or hunt. As a result, habitat quality would be expected to decrease along roads and dispersed camping areas as new routes and dispersed sites are created.

The Proposed Action

The prohibition of overland travel would reduce habitat fragmentation by the establishment of new user-created routes. Direct mortality of birds would also decrease as a result of this alternative because of the prohibition of cross country travel. There is also a reduction in the amount of route in riparian habitats (5.1 miles) with an associated decrease in the amount of disturbance in these habitats. With the closure of the 5.1 miles of route there is also an opportunity for disturbed habitat to recover over time.

The Current System Alternative

This is the most restrictive alternative and so is the most beneficial to migratory birds. This alternative is similar to the Proposed Action: both prohibit overland travel and both reduce the number of miles of road or trail in riparian habitat.

Cumulative Effects

The effects from the Proposed Action and alternatives are relatively low because of the low road densities (< 1 acre per sq. mile). They would not contribute incremental cumulative effects to migratory birds.

3.11. Affected Environment: Special Status Plant Species

Two Region 4 Sensitive Species have the potential to occur on the District: Osgood Mountain milkvetch (*Astragalus yoder-williamsii*) and obscure scorpion plant (*Phacelia inconspicua*). Since 2003, surveys for these two species have been conducted for the Buttermilk Prescribed Burn project, Buckskin and National Mine Sites. Neither species has been documented on the District.

Osgood Mountain milkvetch (*Astragalus yoder-williamsii*): Osgood mountain milkvetch is a Region 4 Sensitive Species and listed as a Fully Protected Species in Nevada (NRS 527.01). Potential habitat was mapped for Osgood Mountain milkvetch. Modeling parameters were based on habitat attributes described in Knight (1991, and Morefield 2001). Modeling identified 3,792 acres of potential habitat on the District. Field surveys for this species are incomplete, although in 1991 field surveys were conducted on outcrops of granodiorite in the Santa Rosa Range between 5,000-6,500 feet (Knight 1991), making up 1,881 acres of the potential plant habitat. No Osgood mountain milkvetch plants were located.

Obscure scorpion plant (*Phacelia inconspicua*): Obscure scorpion plant is a Region 4 Sensitive Species and listed as a Fully Protected Species in Nevada (NRS 527.01). It is an erect-stemmed annual that grows up to 8 inches (20 cm) tall and blooms from May to July. It is small and not easily detected in the field.

There are no known populations on the District. Potential habitat was mapped for obscure scorpion plant based on the broad habitat requirements described above. On the district, 65,509 acres of potential habitat exists.

Environmental Consequences

The Forest Service Handbook (FSH) 2609.25, USDA Directive 9500-004, and the Forest Plan direct the Forest to maintain rare plant populations and habitat to prevent them from trending toward a Threatened or Endangered listing and to comply with state laws. Nevada state law requires that project planning on federal lands consider impacts to species listed as sensitive, threatened or endangered by the state (Nevada Revised Statutes Section 527 and Nevada Administrative Code Section 527). Federal regulations state that OHV use areas/routes should be planned to protect resources and minimize conflicts with other Forest uses (36 CFR 212.55).

Effects Common to All Alternatives

Osgood Mountain milkvetch and obscure scorpion plant have not been found on the District. Impacts from motorized vehicles, route establishment or other activities have

not been documented on the District and are not expected. However, the full range for these plants is not fully understood. Potential habitat has been mapped and surveys have been completed in recent years in many areas on the District. The likelihood of these plants to occur on the District is questionable and no significant impacts to habitats or populations are expected from the implementation of any of the alternatives. Existing Forest Plan direction, Federal and state regulations provide for the protection of these species.

3.12. Affected Environment: Aquatic Species

There are approximately 335.88 miles of NFS roads and 55.67 miles of user-created routes within the boundaries of the District. Approximately 46.1 miles of these routes are within riparian habitat types, 80.3 miles are within 300 feet of perennial streams and another 42.7 miles are within 150 feet of intermittent channels. In all there are 106 perennial stream crossings and 241 intermittent stream crossings on the District. Included in the above totals, are 5.2 miles of user-created routes within the riparian habitats, 5.1 miles user-created routes within 300 feet of perennial streams, 5.4 miles of user-created routes within 150 feet of intermittent channels, and 10 perennial crossings and 34 intermittent crossings made by user-created routes (see Table 18).

Table 18: Route Information for Existing System and Undesignated Routes

Route Type	Total route miles	Miles in riparian habitat type on District	Miles within 300 feet of perennial stream	Miles within 150 feet of intermittent drainage	No. of perennial stream crossings	No. of intermittent drainage crossings
System routes	335.9	40.9	74.9	36.4	96	207
User-created routes	55.7	5.2	5.1	5.4	10	34
Total	391.6	46.1	80	42.7	106	241

Lahontan Cutthroat Trout

The project area supports the federally-listed Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), an inland subspecies of cutthroat trout endemic to the Lahontan basin of northern Nevada, eastern California, and southern Oregon. Lahontan cutthroat trout (LCT) were listed by the USFWS as endangered in 1970 (Federal Register, Vol. 35, p. 13520) and then reclassified as threatened in 1975 to facilitate management and allow angling (Federal Register, Vol. 40, p. 29864).

Principal threats to LCT include: habitat loss associated with land management practices; reduction and alteration of stream discharge; alteration of stream channels and morphology; degradation of water quality; and hybridization or competition with non-native fish species (USFWS1995).

The project area falls within the range of the LCT Northwestern Lahontan Basin Distinct Population Segment (DPS) and the Humboldt River Basin DPS as defined by the USFWS. Most perennial waters within the project area were likely historically

occupied by Lahontan cutthroat trout. Interagency teams have been developed for both DPSs to implement actions and conduct research necessary for LCT recovery. Since the release of the 1995 LCT recovery plan, emphasis has shifted from recovering LCT in small isolated streams to recovery efforts aimed at establishing interconnected stream systems or areas for metapopulations. The Northwestern DPS Team has not defined specific metapopulation areas for the purposes of LCT recovery at this time within the two DPSs on the District.

Geographically, drainages that provide the most connectivity within the project area are: the upper East Fork Quinn River and tributaries within the Northwestern Lahontan Basin DPS, and the North Fork Little Humboldt River and tributaries and Martin Creek and tributaries within the Humboldt River Basin DPS. Most are occupied by non-native or hybridized cutthroat trout. Three Mile Creek was not included in the 1995 LCT Recovery Plan. The creek is now considered occupied by a pure population of LCT.

Non-Native Salmonids

Non-native trout, introduced for recreational fishing include: rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), and brown trout (*Salmo trutta*). As a result of the introduction of rainbow trout, hybrid trout (rainbow/LCT cross) are present in areas historically occupied by LCT.

In the Martin Creek drainage, trout have been stocked since 1911 including brook trout, rainbow trout, and brown trout (NDOW 2007). Annual spring plantings are usually 1,500 rainbow trout, although up to 1,000 brown trout and 1,200 brook trout are stocked at times. For the North Fork Little Humboldt River, average annual stocking consists of rainbow trout and brown trout plants of 2,500 to 5,000 fish.

Columbia Spotted Frog

Surveys for Columbia spotted frog were completed within the project area in 2006 by the Forest. No spotted frogs were detected in areas surveyed.

Environmental Consequences

Roads have the potential to directly affect riparian resources by intercepting stream flow, channeling runoff and sediment into streams, and altering channel dynamics. Increased fine sediment composition in stream gravel has been linked to decreased fry emergence, decreased juvenile densities, loss of winter carrying capacity, and increased predation of fishes (USDA 2000; Phillips et al. 1975; Thurow and Burns 1992; Luce et al. 2001).

Environmental impacts to aquatic resources would be significant if an alternative resulted in:

- *Degradation of occupied Lahontan cutthroat trout habitat or made streams identified in the 1995 Lahontan Cutthroat Trout Recovery Plan unsuitable for recovery.*

The No Action Alternative

Under the No Action Alternative, 55.67 miles of user-created routes would remain open to motorized use. Cross-country travel would be allowed to continue. As described above, routes in riparian areas and stream corridors have the potential to

negatively affect aquatic resources. User-created routes could continue to expand, leading to greater impacts.

Lahontan cutthroat trout

The No Action Alternative would leave open three routes in occupied LCT habitat (see Table 18). Route S056 has 0.19 miles within 300 feet of the Three Mile Creek. The majority of the route mileage lies within 150 feet of intermittent portions of the Three Mile drainage. The route also has 10 crossings on intermittent stream habitat within the drainage. This route has significant potential to affect LCT habitat through sediment input and increased bank instability if use is allowed to continue. The current stream channel condition on lower Three Mile Creek is associated with past livestock use. This area is now fenced off to facilitate recovery of the stream.

Route S028 has 0.07 miles within 300 feet of the stream (see Table 18). The route also has one low-water crossing associated with it which is armored with gravel and cobbles. Although Indian Creek is considered an occupied LCT stream, NDOW 1995 and 2000 surveys did not find LCT in the stream reach crossed by S028. During the August 28-30, 2006 field trip, the crossing was dry. The route within the stream corridor and the crossing are currently not resulting in any impacts to LCT.

Route U50694 crosses intermittent draws/drainages on the hillside approximately 1,000 feet above Eight-mile Creek that are typically dry when the route is passable to motorized travel (see Table 19). There is no riparian vegetation associated with the crossings, which further demonstrate the dryness of the crossings. Given the distance from Eight-mile Creek, it is unlikely that the draws transport much sediment into occupied LCT habitat.

Twenty-five unauthorized routes will be left open to motorized use in areas associated with streams that are identified in the 1995 LCT Recovery Plan. None of these streams have yet to be identified as streams necessary for the establishment of metapopulations. Leaving these routes open would not preclude any future recovery efforts because they are currently maintaining suitable habitat for LCT. They all are currently occupied by non-native trout species. A total of 1.70 miles of proposed routes lie within perennial streams occupied by non-native trout. Dispersed camping would continue along these routes which could lead to additional riparian impacts.

Table 19: Alternative 1 (No Action) Information About Routes to Be Left Open, Associated with Lahontan Cutthroat Trout-Occupied Streams

Stream	Route	Miles within 300 feet of perennial stream	Miles within 150 feet of intermittent drainage	No. of perennial stream crossings	No. of intermittent drainage crossings
Indian Creek	s028*	0.07		1	
Eight-mile Creek	U50694*		0.67		7
Three Mile Creek	s056	0.12	2.45		10
Total		0.19	3.12	1	17

* Routes included as part of the Proposed Action

Non-Native Salmonids

The No Action Alternative would allow use on 80.3 miles of route within 300 feet of perennial streams and have 106 perennial stream crossings. Most perennial streams are occupied by non-native trout. Some bank instability would continue to occur at stream crossings and would contribute to some sediment into the stream. Roads adjacent to the streams will continue to result in less riparian vegetation and cover than if no road were present. This alternative will result in more continued disturbance than would result from the Proposed Action Alternative. The ongoing impacts are not expected to have a significant effect on non-native trout populations in the project area.

The Proposed Action

Under the Proposed Action, 17.0 miles of user-created roads would remain open to motorized use and be added to the forest transportation system. Cross-country travel would be prohibited.

Lahontan cutthroat trout

The Proposed Action would leave open two routes associated with LCT streams. Routes S028 and U50694 are described under the No Action Alternative and in Table 19. There are seven routes (0.78 miles) in areas associated with streams that are identified in the 1995 LCT Recovery Plan to be added to the system under the Proposed Action. The addition of these routes to the system would not preclude any future recovery efforts because they are currently maintaining suitable habitat for LCT. They are all currently occupied by non-native trout species.

Non-Native Salmonids

The Proposed Action Alternative would allow use on 76.7 miles of route within 300 feet of perennial streams and have 101 perennial stream crossings. Most perennial streams are occupied by non-native trout. Some bank instability would continue at stream crossings and would contribute to some sediment into the stream. Roads adjacent to the streams will continue to result in less riparian vegetation and cover than if no road were present. The ongoing impacts are not expected to have a significant effect on non-native trout populations in the project area because these populations are currently self-reproducing and maintaining healthy populations with current route use.

Current System Alternative

Under the Current System Alternative no user-created routes would remain open to motorized use. Cross-country travel would be prohibited.

Lahontan cutthroat trout

The Current System Alternative would add no routes associated with LCT occupied habitat or recovery streams to the forest transportation system.

Non-Native Salmonids

The Current System Alternative would maintain 74.9 miles of road within 300 feet of perennial streams and have 96 perennial stream crossings. Most perennial streams are occupied by non-native trout. Some bank instability would continue to occur at stream

crossings and would contribute to some sediment into the stream. Roads adjacent to the streams would continue to result in less riparian vegetation and cover than if no road were present. This alternative would result in less continued disturbance than the Proposed Action alternative. The ongoing impacts are not expected to have a significant effect on non-native trout populations in the project area because these populations are currently self-reproducing and maintaining healthy populations with current route use.

Cumulative Effects

Activities that have cumulatively affected stream habitats, fisheries, and particularly LCT within the project area and at the watershed scale outside of the project area include: long term grazing on public and private land, recreation, road construction and maintenance, recreational fishing, mining, water diversion and development, stocking of non-native fish, and the spread of noxious weeds.

Cumulatively, livestock grazing is the most widespread activity with the longest duration in the area, starting in the late 1800s. Impacts to the landscape have been extensive, and impacts to streams and riparian areas are particularly well documented. Over the last few decades, rangelands have generally been improving as described in the Martin Basin Rangeland Project FEIS (USFS 2006). The Proposed Action in the Martin Basin Rangeland Project includes management direction intended to decrease the impact of livestock grazing on riparian areas and streams.

Designation of the routes described in the Proposed Action would not result in a measurable increase in sediment to LCT streams or cumulatively result in further degradation of the habitat. Most of the routes in the Proposed Action are located over 300 feet from perennial streams. For routes that are located within 300 feet of either an LCT-occupied (S028 and U50694) or LCT recovery plan stream (seven routes totaling 0.59 miles), the potential impact is reduced by the fact that native vegetation and distance buffers the routes from the streams and in general the soils tend to be stable.

3.13. Affected Environment: Heritage Resources

Cultural resources on the District are richly varied and widely dispersed. The information for this analysis was derived from a literature review of the cultural resource files stored at the Elko, Nevada office of the Forest. The results of this search show that the analysis area includes prehistoric hunting camps, petroglyphs and pictographs, stone tool quarries, rock shelters, hunting blinds, historic military camps, historic roads and stage routes, town sites, and mining sites. No traditional American Indian cultural use properties have been documented in the analysis area.

During the summer and fall of 2006 and the spring of 2007, inventories were conducted along all of the routes described in the Proposed Action. During these inventories, 8 sites were recorded adjacent to several of the proposed routes. One prehistoric site is considered potentially eligible for inclusion on the National Register of historic places. The remaining seven sites were determined not to be eligible.

In the spring of 2007, the Forest submitted a Heritage Resource Report to the Nevada State Historic Preservation Office (NSHPO) describing the Proposed Action, inventory process, pre-field research and the sites recorded during the inventory. The report also

included the Forest's determination of no adverse effect to the potentially eligible site from the designation of the route that crosses the site. On June 29, 2007 the Forest received a letter from the NSHPO concurring with the finding of no adverse effect to one prehistoric site located along one of the proposed routes.

Environmental Consequences

Environmental impacts to heritage resources would be significant if alternatives resulted in:

- *Adverse effects to sites determined to be eligible for inclusion in the National Register of Historic Places; or*
- *Adverse effects to sites which remain unevaluated for inclusion in the National Register of Historic Places.*

The No Action Alternative

Under the No Action Alternative, motorized travel off designated routes would continue to cross historic properties, resulting in sites being damaged either through the mechanical action of vehicles or through casual collection of surface artifacts.

The Proposed Action Alternative

Of the routes identified in the Proposed Action, eight pass through eight recorded historic properties. Vegetation along the routes restricts motor vehicle impacts to the sites to the wheel tracks of the road. These impacts include compaction of site surface beneath those tracks and potential breakage of artifacts located in the tracks. Through consultation with the Nevada State Historic Preservation Office, the Forest and NSHPO determined that the effect to the eligible site was limited to the traveled way of the road, had already occurred, and the effects had stabilized. Adding the route to the Forest transportation system would not result in adverse effects to the site.

Adding the proposed routes to the forest transportation system would not result in additional adverse effects to significant historic properties or unevaluated properties located along the routes. Prohibiting motorized vehicle use off designated routes would protect sites from future disturbance resulting from off route travel and the creation of additional user-created routes.

The Current System Alternative

Under the Current System Alternative, motor vehicle use would be restricted to current NFS roads and trails. The limited impact to historic properties currently resulting from cross country travel and use of user-created routes would be reduced as enforcement of the travel management rule is implemented. Restricting motorized vehicle use to designated routes would protect sites from future disturbance resulting from off-road travel and limit the creation of additional user-created routes.

Cumulative Effects

Designation of the routes described in the Proposed Action would not result in impacts to Heritage Resources or cumulatively result in further degradation of sites located either along or off designated routes. In the absence of a prohibition on cross country

travel under the No Action alternative there may be an incremental increase in effects to potentially eligible sites if new routes are created that cross them.

3.14. Affected Environment: Native American Traditional Values

Federal legislation and Executive orders dictate that federal agencies consider the repercussions of their actions when Native American traditions and religious practices are involved. The Forest Service works with tribal governments to identify locations having traditional cultural or religious values to Native Americans and ensure that land management actions do not unduly or unnecessarily burden the pursuit of traditional religion or lifeways by inadvertently damaging important locations or hindering access to them.

On June 23, 2006, scoping documents were sent to six tribal organizations with affiliations to the project area. The District Ranger also consulted with the Tribal Chair of the Fort McDermitt Tribe and described the project and the Proposed Action at that time.

Environmental Consequences

Environmental impacts to Native American Traditional Cultural Properties would be significant if alternatives resulted in:

- *Access to Traditional Cultural Properties was altered in such a way as to prevent Native Americans from continued use of the property.*

Effects Common to All Alternatives

At this time, tribal representatives have not identified the location or existence of any traditional cultural properties related to any of the Proposed Action routes. No impacts to Native American traditional concerns are anticipated at this time. If in the future, Traditional Cultural Properties are identified the forest will work with tribal representatives to protect the sites from direct, indirect or cumulative effects.

3.15. Affected Environment: Visual Resources

The scenery includes groves and clumps of trees, mainly aspen on the mountainsides, and shrubs intermixed with natural-appearing openings, basalt bluffs, lava rock outcrops, and other unique landforms. The existing visual conditions vary from very high scenic integrity to low scenic integrity, depending on past development and current use. In foreground views, roads, trails, fences, and mining activity have the most visual impact on seen areas.

Environmental Consequences

Environmental impacts to the visual resources would be considered significant if alternatives result in:

- *Views from, or the visual setting of, inventoried roadless areas, wilderness areas, special interest areas, or other visually sensitive land uses are noticeably changed; or*
- *Views from, or the visual setting of, travel routes are noticeably changed.*

The No Action Alternative

Under the No Action Alternative, all user-created routes would remain open and cross-country travel would continue to be allowed. The No Action Alternative would allow continued development of user-created routes that could impact visual resources. Continued degradation of the visual resource would occur by creating lines across the landscape as user-created routes are created. Disturbance of the natural appearing landscape by user-created routes would continue to have an effect on visitors who find the disturbance unsightly. Depending on location and management area objectives, some additional user-created routes made by people traveling cross-country may not meet land management objectives for scenic values in the foreground (¼ to ½ mile) and middle ground (3 to 5 miles) viewing areas.

The Proposed Action

By restricting motor vehicle use to designated routes, views from designated road corridors, vista points, and end-of-road tangents would be improved as vegetation reseeds itself into the route and helps to return former travel routes to a more natural, visual condition.

Adding the proposed routes to the Forest transportation system would not change the views from or visual setting of travel routes across the District. Most of the designated travel routes in the Proposed Action Alternative are obscured from view by surrounding vegetation in the foreground and middle ground. In the far ground the visual impact is decreased by distance and overall continuity of landform and color. In any case, the routes are already there, and form part of the existing scenery.

Overall these effects of the Proposed Action would not result in significant changes to the visual settings of inventoried roadless areas, wilderness areas, special interest areas, or other visually sensitive land use locations.

The Current System Alternative

Under this alternative, no user-created routes would be added to the forest transportation system. Visual impacts would be unchanged over the short term (1–5 years). As travel management restrictions are implemented and compliance improves, user-created routes would fall out of use and slowly disappear from the views or visual settings of the NFS roads, IRAs, wildernesses, special interest areas and other visually sensitive land use locations.

Cumulative Effects

Cumulatively, the Proposed Action Alternative would result in an overall improvement of the visual setting of the Forest environment. Other activities occurring on the District are either limited in setting (mining exploration) or dispersed across the landscape (livestock grazing) and would not increase or decrease as a result of this Proposed Action or Current management Alternative. The No Action may incrementally contribute to a degradation of the visual setting.

3.16. Affected Environment: Recreation

Recreation activities on the District include pursuits such as hunting, fishing, camping, picnicking, rock hounding, gathering products such as firewood and plants, viewing scenery and wildlife, hiking, nature study, and riding ATVs, motorcycles, full-size trucks and other vehicles for pleasure. Participation in recreation activities varies by season, topography, vegetative cover, and number of people taking part. Almost all site-specific recreation attractions (for example, dispersed camping spots, fishing streams, and scenic areas) have roads or motorized trails leading to them.

In the past 10 years, the popularity of OHVs has increased. On the District most OHV use occurs on routes. Only a small percentage of the total recreation OHV use occurs cross-country. With the increase in motorized use over the past decade, the effects of motorized cross-country travel are more apparent and are causing concern expressed by many public land users.

There are approximately 335.88 miles of NFS roads and 55.67 miles of user-created routes on the District. Under the current Forest Plan, travel off these routes is currently permitted.

Environmental Consequences

Environmental impacts to recreation opportunities across the district would be significant if alternatives resulted in:

- *Elimination of areas identified as suitable for Semi-primitive Non-motorized recreation opportunities.*

The No Action Alternative

No recreation activities would be restricted, and OHV use would continue on all user-created routes and cross country. National trends indicate that motorized recreation use is increasing, and as this use increases more people may travel cross-country on the District. There is a potential for users to create additional routes as time progresses. User-created routes created in the future could enter areas on the Forest that are mapped as Semi-Primitive Non-Motorized (SPNM), which could cause recreation user conflicts.

Non-motorized recreationists would continue to have their recreation experience diminished by noise, exhaust fumes, and wheel tracks. Noise would prevent the solitude that many non-motorized recreationists are seeking, especially in primitive and semi-primitive non-motorized recreation settings.

There are approximately 20 miles of routes within the SPNM recreation setting. Approximately 13.4 miles of these routes are NFS roads, and 6.6 miles are user-created routes. All of these routes would remain open for use under this alternative. People seeking solitude or quiet recreation experiences may have difficulty finding desired experience in areas near routes in SPNM areas. Cross-country motorized recreation opportunities and the establishment of user-created routes would continue under this alternative.

People affected during hunting seasons are those hunters whose methods of accessing, scouting, stalking, and retrieving game are by foot or horse. Their hunting experience

could be reduced or diminished by other hunters using motorized vehicles to travel cross-country to scout for game, access favorite hunting areas, drive or chase game for a better shot, and retrieve game. Contributing to this is the noise created by motorized vehicles that increases stress on and displaces game animals from the immediate area. The effects are more pronounced where motorized cross-country use is more common, such as the flatter and more open country of the District in Martin Basin.

The Proposed Action Alternative

Under this alternative, three routes that occur within currently mapped ROS Settings of Semi-primitive non-motorized, totaling 0.8 miles, and three routes within the Primitive setting, totaling 3.9 miles would be added to the road system for motor vehicle use. The longest of these routes, Road U50694, is approximately 3.5 miles in length. This is a constructed road that has been inadvertently omitted from the Forest transportation system. Motor vehicle use would be prohibited on the remaining 31 user-created routes in the Semi-Primitive Non-Motorized and Primitive recreation settings, totaling 7.7 miles.

Designation of six user-created routes will require changes to the mapped Recreation Opportunity Spectrum (ROS) for the District. These changes are considered minor map adjustments to the current ROS coverage and within the normal limits of acceptable change to meet management objectives. The ROS map would also be adjusted to address the 13.4 miles of existing NFS roads that are mapped inside SPNM areas. The existence of dispersed campsites, and non-motorized trail access points along these six routes indicate that current ROS designation needs to be corrected to reflect that they are in a Semi-primitive Motorized ROS setting (rather than the Semi-primitive Non-motorized or Primitive setting indicated by current map layers).

Motor vehicle use off the designated National Forest System roads and trails would be prohibited under the Proposed Action. Prohibition of motor vehicle use along the user-created routes and removing 17 miles of currently open system roads would, in some cases, increase the size of areas with an ROS setting of Semi-primitive non-motorized, resulting in no net loss of Semi-primitive non-motorized acres across the District.

Non-motorized recreationists could use the Motor Vehicle Use Map to help determine where they could enjoy the recreation experience of their choice. The conflict of solitude and noise would be controlled and reduced by the route designation process.

This alternative would allow motor vehicle use to continue and adds several routes as motorized trails which offer a challenging off-highway experience. Motor vehicle use would be restricted to designated NFS roads and NFS trails. However, cross-country use is currently fairly limited on the District, and the number of people affected by this restriction would be limited. Areas off routes are typically steep and rocky and vegetation limits cross-country travel.

The Current System Alternative

Under this alternative, no user-created routes would be added to the forest transportation system. This alternative is the most responsive to those who would prefer motor vehicle use restricted. Motor vehicle users would be prohibited from traveling off-route to enjoy motorized activities, and would also lose many popular traditional user-created routes. Some may interpret this as a loss of personal freedom.

In many cases these routes access dispersed recreation sites that would be closed to motor vehicle use as a result of this alternative. The routes also access popular remote hunting areas and high country with spectacular views of the region.

Cumulative Effects

The effects of the Proposed Action on the recreation opportunity spectrum and recreation experience of District users is minimal in that very little change is occurring from what is already available. Many of the routes being added access dispersed campsites which have been in use for at least 20 years, and use of these sites would continue under the Proposed Action. The relatively minor impacts to areas designated as semi-primitive non-motorized would not result in a change in what is currently occurring on the ground. Very large areas of this opportunity type would continue to exist and serve as a buffer for the areas with primitive opportunities. Current ROS maps were developed based in part on past roading and the locations of activities on the District. Current and reasonably foreseeable activities such as livestock grazing (present on most of the District) and mineral exploration (on a relatively small portion of the District) are not expected to decrease the size of areas providing primitive or semi-primitive non-motorized opportunities because there are no road construction activities related to livestock grazing being proposed and the majority of the mineral activity is outside areas with Primitive and Semi-primitive non-motorized designations.

3.17. Affected Environment: Roadless

Since before 1970, the Forest Service has inventoried and studied roadless areas for their potential for wilderness designation. These inventories were updated and reevaluated during preparation of the existing land and resource management plans.

The 2001 Roadless Conservation Rule describes 12 inventoried roadless areas (IRA) on the District. These IRAs range in size from the 54,515 acre Santa Rosa IRA that surrounds the Santa Rosa Wilderness to the approximately 600 acre Forks IRA that is adjacent to a much larger area managed by the BLM on the eastern boundary of the District. Altogether, the twelve IRAs include approximately 179,630 acres.

Currently, motor vehicle use is allowed within the boundaries of inventoried roadless areas on both NFS routes and user-created routes.

In May, 2006 the Forest published An Assessment of Lands on the Humboldt-Toiyabe National Forest That Have Potential for Consideration by Congress for Wilderness Designation (USDA 2006). This document evaluated the IRAs described in the 2001 Roadless Conservation Rule across the Forest for wilderness potential based on the presence of routes and eight wilderness characteristics. For the District, the 2006 document identifies three areas with high wilderness capability; the South Fork Quinn IRA, the Santa Rosa IRA, and the Santa Rosa North IRA.

Environmental Consequences

Environmental impacts to IRAs would be significant if alternatives resulted in:

- *Significant reduction in the size or the wilderness and roadless characteristics of an IRA.*

The No Action Alternative

Motor vehicle use would continue on approximately 24.9 miles of user-created routes inside IRA boundaries, and cross-country use would continue to occur, as well. In addition to the existing routes, there would be a potential to expand those routes and create new routes in the IRAs across the District. As the network of user-created routes expands, there is a greater potential for impacts to the wilderness and roadless characteristics of the IRAs. This alternative would have the greatest potential to reduce the size of IRAs through the incremental attrition of IRA boundaries as routes and other indications of human activity are established.

The Proposed Action

Under this alternative, 17 existing user-created routes totaling approximately 5.5 miles would be added to the Forest transportation system within IRAs. Six routes (S013, S028, S036, S041, S043, and U50095C) provide access to dispersed campsites that have been in existence for at least the last 20 years. Nine routes (S018, S019, S034, S045, S059, S077, S085, S092, and U50090) provide motorized access into areas for recreation opportunities including hunting, non-motorized trailhead access, and camping. Two routes (S057 and U50694) provide access to private property.

Most of these routes enter only the edges of the IRAs, and none bisects an IRA or affects a significant portion of its acreage. All of these routes are well established and have been in place and in use well before the 2001 Roadless Area Conservation Rule. It is estimated by the District that the dispersed campsites these routes access have been in use by Forest visitors for over 20 years and possibly much longer. The IRAs were described in the May, 2006 *Assessment of Lands on the Humboldt-Toiyabe National Forest That Have Potential for Consideration by Congress for Wilderness Designation (USFS 2006)* and determined to have high wilderness and roadless characteristic with these routes taken into consideration. Adding these routes to the Forest transportation system will not change the roadless character of the IRAs, because the routes already exist and are in use. However, to avoid any impact to the long-term availability of these IRAs for wilderness consideration, all such routes will be added as trails.

The Proposed Action would also restrict motor vehicle use to NFS roads and NFS trails. The effect of this action would be to reduce the expansion of user-created routes into IRAs across the District. Areas off NFS routes, where vegetation or other physical features of the landscape have been affected by open travel, would have an opportunity to recover with time. While the travel management decision may take some time to be fully implemented, visitor education, enforcement, and distribution of the motor vehicle use map would begin immediately. As implementation proceeds, the District may sign routes or physically block routes if use continues. Physical closure of routes could require additional analysis to address any site specific impacts.

The Current System Alternative

The Current System Alternative would not add any user-created routes to the forest transportation system. It would restrict motor vehicles to NFS roads and NFS trails. The effect of this alternative would be that motor vehicles would be restricted from traveling on user-created routes within IRAs and, with time, the routes would recover from the past use.

The travel management decision may take some time to be fully implemented, but visitor education, enforcement, and distribution of the motor vehicle use map would begin immediately. As implementation proceeds, the District may sign routes or physically block routes where use is continuing. Physical closure of routes could require additional analysis to address any site specific impacts.

Cumulative Effects

Very few activities on the District have long term cumulative effects to the wilderness character or roadless character of the IRAs. The Buckskin/National Mining District is excluded from IRAs. Activity at those locations can affect the visual quality from the surrounding IRAs. Effects to the physical and natural resources surrounding the mining district may also affect the physical and natural resource down stream and within the boundaries of the IRA. These effects are rare and limited in nature.

Livestock grazing is an on going activity that has been part of the District landscape for over 100 years. Except in areas where permittees distribute supplements, the effects of livestock grazing may not be readily apparent to the casual forest visitor. The effects of livestock grazing on the District are being addressed in the Martin Basin Range EIS. Aspects of that project will address the impact of livestock on resources and provide direction to improve or lessen those effects.

Other Forest activities, whose effects to the characteristics of IRAs are of a shorter duration, include vegetation treatments like the recent Buttermilk Prescribed Fire project and the mechanical vegetation treatment in Martin Basin. These projects were conducted to improve wildlife habitat and release native vegetation in the areas. The projects were designed to mimic the mosaic created during natural disturbance events. The short term effect of these projects is expected to diminish with time as vegetation responds and burn areas recover. There are several of these treatments planned for the next few years.

3.18. Affected Environment: Socioeconomic

The project area is located in Humboldt County, population 17,129. The closest towns are McDermitt (pop. 269), Oravada, and Paradise, Nevada. Winnemucca, Nevada, also located in Humboldt County, is the nearest larger population center with a population of approximately 7,174 (U.S. Census 2000).

According to the State of Nevada Department of Employment, Training, and Rehabilitation, the 2006 labor force of Humboldt County is 8,269 and the unemployment rate was 3.8 percent. The median household income in 2004 was \$44,950 ([US Census](#) 2006). Services in the region surrounding the project area are limited to those motels, grocery stores, and gas stations located in McDermitt, Orvada, and Paradise. Additional services and lodging are available in Winnemucca, Nevada, approximately 30 miles south of the southern end of the District.

Environmental Consequences

Environmental impacts to the socioeconomic well being of Humboldt County would be significant if the alternatives resulted in:

- Substantial growth or concentration of population;

- Displacement of a large number of people;
- A substantial reduction in employment;
- A substantial reduction in wage and salary earnings;
- A substantial net increase in County expenditures; or
- A substantial demand for public services.

Effects Common to All Alternatives

The Proposed Action would have little positive or negative effect on the local economies because it would not result in increases or decreases in population or employment. Use of the road system is not anticipated to increase or decrease significantly as a result of this alternative. To the extent that they receive maintenance at all, the routes being identified for designation would be maintained by the Forest Service. As the proposed additions to the Forest transportation system already exist and are in use, the proposal would not affect the demand for public services.

3.19. Affected Environment: Environmental Justice

Executive Order 12898 requires federal agencies to consider impacts of proposed actions on minority and low-income populations.

Minority Populations

African-American and Hispanic populations represent approximately 25 percent of the total population of Humboldt County. American Indian, Asian, and Pacific Islanders comprise 0.9, 3.6, and 0.1 percent of the population, respectively (US Census 2000). For Nevada as a whole, African Americans and Hispanics represent 6.9 and 22.9 percent respectively, of the population. American Indian, Asian, and Pacific Islanders constitute 1.3, 5.7, and 0.6 percent of the population respectively (US Census 2004).

In accordance with EPA's Environmental Justice Guidelines (EPA 1998), these minority populations should be identified when either of the following exist:

- The minority population of the affected area exceeds 50 percent; or
- The minority population of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Neither population of African Americans, Hispanics, American Indians, Asian or Pacific Islanders exceeds 50 percent of the population and none of the populations percentages within Humboldt County is "meaningfully greater" than the minority population in the general population, in this case the State of Nevada. Therefore, for the purposes of screening for environmental justice concerns, the identified populations defined in EPA's guidance (EPA 1998) do not exist within the project area.

Low-Income Population

The median household income in Humboldt County of \$47,147 (US Census 2000) was higher than that for the State of Nevada (\$44,581) for the same time period. According to the 2000 census data the percentage of individuals below the poverty level in Humboldt County was 9.7 percent while the in the State of Nevada the percentage was

10.5 percent (US Census 2000). These data indicate that Humboldt County is not a low income area, as defined in the EPA's guidance (EPA 1998) for the purpose of screening for environmental justice concerns.

3.20. Affected Environment: Livestock Management

The District currently has 17 livestock grazing permits on 11 allotments. These allotments include the Quinn River, Indian, Wild Bill, North Fork, Martin Basin, Buttermilk, West-Side Flat Creek, Granite Peak, Lamance, Paradise, and Buffalo cattle and horse Allotments. The Rebel Creek and Bradshaw cattle and horse Allotments are currently vacant. The Eight Mile Allotment has been closed to grazing for over 20 years. The season of use varies on these allotments, but use generally occurs between May 20th and September 30th of each year. Grazing use on the Quinn River Allotment is authorized as early as mid April depending upon specific conditions each year. A total of 10,087 cattle and 25 horses are permitted on the District. Nearly all allotments are managed under rest rotation grazing systems. A small portion of the Buffalo Allotment is managed under a season-long grazing management system with a small number of cattle. The Martin Basin Allotment is currently managed as a modified deferred rotational system. There are no livestock allotments on the District where the grazing of domestic sheep is authorized.

Most user-created routes on the District were created by hunters and/or sportsmen or were developed over many years for the management of livestock allotments. Livestock permittees generally use user-created routes as well as NFS roads to access allotments on NFS lands. These routes are utilized to monitor livestock locations and use, to move livestock between pastures, to place salt supplements, and to maintain fences and water developments. In general, vehicle use on routes to maintain developments and to place salt supplements is limited to one trip per year for each activity and only occurs on select routes each year. Vehicle use by livestock permittees to monitor and move livestock varies widely by allotment. This use of the routes generally occurs almost exclusively between mid May and October. Both the Buffalo and Rebel Creek Allotments have very limited road access. The user-created routes that are proposed to remain open are generally used by livestock permittees to maintain allotment developments, place salt supplements, and monitor livestock locations.

Environmental Consequences

Environmental impacts to livestock management activities would be significant if alternatives resulted in:

- *A decreased ability of permittees to manage the livestock as specified in the terms and conditions of their grazing permits.*

Effects Common to All Alternatives

Under all alternatives livestock management would continue as specified in the terms and conditions of the grazing permits. The District is currently completing an environmental impact statement addressing alternative grazing strategies. The Martin Basin Rangeland Project should be completed by the summer of 2008.

Motorized travel management would not significantly impact livestock management. Livestock permittees would continue to have access into their allotments as specified in their grazing permits. Access could be permitted off road to manage livestock and repair range structures such as fences and water developments.

3.21. Affected Environment: Road Management

The District currently has 324 miles of National Forest System Road open for motor vehicle use. An additional 11.1 miles of the road system has a restriction on motor vehicle use. On an annual basis the District maintains the primary access routes to a standard that provides safe and comfortable travel in a passenger vehicle. These routes include the Hinkey Summitt Road (50084), the Quinn River Road (50083), and the North Fork of the Little Humboldt River Road (50531). All other NFS roads, approximately 250 miles are managed to provide access into the remote areas of the District. Very little was invested in the construction of these routes, and they require very little or no maintenance.

Environmental Consequences

Environmental impacts to road management would be significant if alternatives resulted in:

- *An increased need to expend limited road maintenance resources to maintain the districts transportation system.*

Effects Common to All Alternatives

The majority of the road maintenance funds received by the District are currently used to maintain the primary access routes. High-clearance four-wheel-drive roads and motorized trails receive very little maintenance and the District does not expect that to change with the selection of the any of the alternative. However, if roads and motorized trails are found to be causing adverse environmental impacts, the District will assess the needs for the roads and make a determination whether to repair or close the route.

Chapter 4. Consultation and Coordination

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes, and persons during the development of this environmental assessment:

Interdisciplinary Team

James Winfrey	Project Lead
Genny Wilson	Wildlife Biologist
Jim Harvey	Fisheries Biologist
Cheryl Johnson	GIS Analyst

Ron Hudson	Hydrologist
David Reis	Recreation Specialist
Terri Sonner	Engineering Specialist

Federal, State, Local Agencies

- U. S. Department of Interior, Fish and Wildlife Service
- Nevada State Historic Preservation Office
- Humboldt County Board of County Commissioners

Tribes

Fort McDermitt Tribe, Humboldt County

Works Cited

- Berg, N.; Roy, K.; McGurk, B. **1996**. Cumulative Watershed Effects: Applicability of Available Methodologies to the Sierra Nevada. In: Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. III, and Report 2. Davis: University of California, Centers for Water and Wildland Resources.
- Canfield, J.E.; Lyon, L.J.; Hillis, J.M., and others. **1999**. Ungulates. In Joslin, G; Youmans, H., coords. Effects of Recreation on Rocky Mountain Wildlife, A Review of Montana. Montana Chapter of the Wildlife Society. 6.1-3.25. Available at <http://www.montanatws.org/chapters/mt/pages/page4a.html> accessed 8/1/07.
- Dobkin, D.S.; Sauder, J. **2004**. Shrubsteppe Landscapes in Jeopardy. Distributions, Abundances, and the Uncertain Future of Birds and Small Mammals in the Intermountain West. Bend, OR: High Desert Ecological Research Institute.
- Duncan, C.L.; Clark, J., eds. **2005**. Invasive plants of range and wildlands and their environmental economic and societal impacts. Lawrence, KS: Weed Science Society of America. 222 p.
- Elliot, J.W. **2000**. Roads and Corridors. In: Dissmeyer, G.E., ed. **2000**. Forest and Grasslands: A Synthesis of Scientific Literature. GTR-SRS-39. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station.
- Elliot, J.W.; Hall, D.E. **1997**. Water Erosion Prediction Project (WEPP) Forest Applications. GTR-INT-365, Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.
- Espinosa, Shawn. **2006**. Nevada Department of Wildlife, Staff Biologist, Carson City, NV.
- Gelbard, Jonathan L. and Belnap, Jayne. 2003. Roads as Conduits for Exotic Plant Invasions in a Semiarid Landscape. Conservation Biology. Vol. 17, No. 2, 420-432.
- Great Basin Bird Observatory. **2002**. All Bird Monitoring Data. Available at <http://gbbo.org/>
- Green, J.S.; Flinders, J.T. **1980**. *Brachylagus idahoensis*. American Society of Mammalogy. Mammalian Species. 125:1-4.
- Herron, G.B.; Mortimore, C.A.; Rawlings, M.S. **1985**. Nevada Raptors: Their Biology and Management. Nevada Department of Wildlife, Biological Bulletin No.8. 114 p.
- Knight, T. **1991**. Status Report for *Astragalus yoder-williamsii*. Unpublished report on file at: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District. Winnemucca, Nevada.
- McGurk, B.J.; Fong, D.R. **1995**. Equivalent Roaded Area as a Measure of Cumulative Effect of Logging. Environmental Management. 19(4): 609-621.
- Menning, K.M.; Erman, D.C.; Johnson, K.N.; and others. **1996**. Modeling Aquatic Riparian Systems, Assessing Cumulative Watershed Effects, and Limiting Watershed Disturbance. In: Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. III, Report 2. Davis: University of California, Centers for Water and Wildland Resources.
- Morefield, J.D., ed. **2001**. Nevada Rare Plant Atlas. Carson City: Nevada Natural Heritage Program, compiled for the U.S. Department of Interior, Fish and Wildlife Service, Portland, Oregon and Reno, Nevada.

-
- Nevada Department of Wildlife. **2001**. Big Game Status Book. Nevada Division of Wildlife. Carson City, NV.
- Nevada Department of Wildlife. **2005**. Big Game Status Book. Nevada Division of Wildlife. Carson City, NV.
- Nevada Department of Wildlife. **2006**. Big Game Status Book. Nevada Division of Wildlife. Carson City, NV.
- Nevada Partners in Flight Bird Conservation Plan. **1999**. Larry Neel, ed. Available at: <http://www.blm.gov/wildlife/plan/pl-nv-10.pdf> accessed 8/1/07.
- Stiver, S. **2003**. Nevada Department of Wildlife, Staff Biologist
- Swift, L.W., Jr. **1984**. Soil Losses from Roadbeds and Cut and Fill Slopes in the Southern Appalachian Mountains. Southern Journal of Applied Forestry. 4: 209-215.
- Taylor, A.R.; Knight, R.L. **2003**. Wildlife Response to Recreation and Associated Visitor Perceptions. Ecological Applications. 13(4): 951-963.
- Thomas, J.W., ed. **1979**. Wildlife Habitats in Manage Forests in the Blue Mountains of Oregon and Washington. U.S. Department of Agriculture, Forest Service, Agriculture Handbook No. 553.
- U.S. Department of Agriculture, Forest Service. **1986** Humboldt-Toiyabe National Forest Land and Resource Management Plan. U.S.D.A. Forest Service, Humboldt National Forest, Elko, NV. 306 pp and 11 Appendices.
- U.S. Department of Agriculture, Forest Service. **1988** Cumulative Off-site Watershed Effects Analysis. In: Region 5 Soil and Water Conservation Handbook. FSH 2509.22. San Francisco, CO: U.S.D.A. Forest Service.
- U.S. Department of Agriculture, Forest Service. **1993**. Status Summary of Northern Goshawk. Reno Nevada Field Office. 2 p.
- U.S. Department of Agriculture, Forest Service. **2001**. Survey of Pygmy Rabbit Distribution, Numbers and Habitat Use in Lemhi and Numbers and Habitat Use in Lemhi and Custer Counties, Idaho.
- U.S. Department of Agriculture, Natural Resource Conservation Service. **2002**. Soil Survey of Humboldt County, Nevada, East Part: Parts I and II.
- Wasley, T. **2004**. Mule Deer Population Dynamics: Issues and Influences. Biological Bulletin No. 14.