**Table 11-T: General Aquatic Wildlife Survey (GAWS)**

| STREAM[1] | Width/Depth Ratio[2] | Canopy Density[3] | Bank Vegetation Stability[4] | Bank Soil Stability[5] | Ungulate Damage Rating[6] |
|---|---|---|---|---|---|
| **Martin Creek 2001 (1993 survey)** | 27.4 | 53.4 (44.7) | 79.7 (63.7) | 77.9 (65.4) | 24.3 (18.0) |
| **North Fork Little Humboldt River 1998 (1993 survey)** | No Data | 42.6 (25.8) | 68.3 (62.3) | 72.5 (64.8) | 7.8 (25.3) |
| **Long Canyon 1998 (1993 survey)** | No Data | 58.0 (37.0) | 73.2 (63.2) | 65.4 (63.6) | 0 (26.2) |
| **Dutch John 2000 (1995 survey)** | 25.6 Mainstem<br>42.9 Mid Fork<br>43.0 N. Fork | 81.5 | 88.9 (57.8) | 83.1 (56.5) | 12.8 |
| **Cabin Creek 1998 (1993 survey[8])** | 18.1 | 62.2 (59.0) | 81.0 (73.4) | 70.6 (63.2) | 17.3 (2.5) |
| **North Fork Cabin 1997 (1993 survey)** | 22.1 | 58.0 (62.2) | 55.7 (79.6) | 49.8 (75.3) | 53.1 (3.4) |
| **Deep Creek 2000 (1995 survey)** | 36.0 | 83.3 | 86.1 (76.2) | 85.4 (76.6) | 37.0 (21.9) |
| **Lye Creek 2000 (1994 survey)** | 34.1 | 75.9 (59.0) | 93.2 (95.4) | 87.1 (95.4) | 3.2 (3.9) |
| **Round Corral 2000 (1995 survey)** | 27.7 | 81.2 | 78.0 (87.3) | 76.5 (87.0) | 50.8 (24.2) |
| **Siard Creek 2001 (1993 survey)** | 22.1 | 80.6 (51.4) | 67.9 (70.7) | 53.9 (70.3) | 10.7 |
| **Road Creek 2000(1994 survey)** | 31.9 | 85.7 | 86.8 (80.0) | 80.3 (70.3) | 20.2 (17.8) |

*Notes: North Fork Cabin 1993 survey was conducted in June 1993. It is likely that some habitat parameters measure were improved due to the time of year. For example, ungulate damage is expected to be 'light' early in the season when livestock have only been in the area for a brief time.*

*The following footnotes apply to Tables 11-T, 13-T, 15-T, 17-T, and 19-T.*

1 *Data presented for each stream is from latest GAWS survey; past years' comparison data is in parenthesis.*

2 *Low flow-wetted width/depth ratio*

3 *Optimum is considered to be excellent canopy coverage (100%).*

4 *Optimum is >80% of streambanks covered by vegetation in vigorous condition or by boulders and rubble.*

5 *Optimum considered to be excellent with >80% plant density; 65% of upper bank material large is angular boulders, <25% of bank under stress or eroding.*

6 Optimum is considered 0%-20% bank damage from ungulate use. Little or no bank erosion or sloughing.

The following notes and abbreviations apply to Tables 12-T, 14-T, 16-T, 18-T, and 20-T:

*RBT = Rainbow Trout*
*BRN = Brown Trout*
*Hyb = Hybrid (LCT x RBT)*
*SF = South Fork of*
*Trib = tributary*
*LCT = Lahontan Cutthroat Trout*
*BRK = Brook Trout*
*NF = North Fork of*
*Crk = Creek*

**Table 12-T. Current Fish Populations-Salmonids in the Martin Basin Area**

| STREAM | Fish Species | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RBT | | *LCT* | | BRN | | Other | |
| | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population |
| **Martin Crk** | 64 | 809 | 0 | 0 | 8 | 331 | 0 | 0 |
| **NF Little Humboldt River 1998** | 3 | 24 | N/A | 2 found @ Long Canyon confluence | 72 | 457 | 16 (BRK) | 84 (BRK) |
| **Long Canyon Crk 1998** | 0 | 0 | 272 | 1,234 | 0 | 0 | 0 | 0 |
| **Dutch John 2000 – Main Stem** | 188 | 655 | 0 | 0 | 45 | 157 | 60 (BRK) | 210 (BRK) |
| **Dutch John 2000 - N. Fork** | 887 | 1,687 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dutch John 2000 – Mid-Fork** | 62 | 138 | 0 | 0 | 0 | 0 | 62 (BRK) | 138 (BRK) |
| **Cabin Crk 1998** | 269 | 1,449 | 0 | 0 | 10 | 39 | 29 (BRK) | 129 (BRK) |
| **N. Fork Cabin Crk 1997** | 509 | 1,116 | 0 | 0 | 0 | 0 | 66 (Hyb) | 230 (Hyb) |
| **Deep Crk 2000** | 693 | 3,465 | 0 | 0 | 45 | 231 | 433 (Hyb) | 2,145 |
| **Lye Crk 2000** | 693 | N/A | 0 | 0 | 0 | 0 | 0 | 0 |
| **Round Corral 2000** | 277 | 1,375 | 0 | 0 | 47 | 236 | 137 (Hyb) 5 (BRK) | 653 (Hyb) 22 (BRK) |
| **Siard Crk 2001** | 68 | 108 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Road Crk 2000** | 221 | 769 | 0 | 0 | 0 | 0 | 152 (Hyb) 102 (BRK) | 633 (Hyb) 280 (BRK) |

## Granite Peak Allotment

With the exception of Willow Creek, streams within the Granite Peak Allotment are part of the Humboldt River Basin DPS for LCT, and flow off the east side of the Santa Rosa Range. Willow Creek and Gabica Fork of Willow Creek have their inception at an elevation of about 2,500 meters (8,200 feet) and flow in a westerly course toward the Quinn River. Major streams in the Granite Peak Allotment include: Mullinix, Indian, South Fork Indian, and Willow Creek.

In 2001, the Willow Creek Fire impacted many of the streams on the west side of the Santa Rosa Range and headwater portions of some streams on the east side. Within the Forest, there were several streams within the fire area that had historical LCT populations and are considered potential recovery areas: Gabica Fork of Willow Creek, North Fork Cabin, Flat Creek, South Fork Flat Creek, Dutch John (upper forks) and Lye Creek. Three-Mile Creek was also within the fire area, and LCT are still present.

Observations on South Fork Indian Creek in 2002 found the stream to be stabilized mainly by cobble substrate; however, sediment levels and embeddedness were high. Ungulate damage from the 2000 survey was rated at 33.4%. The only salmonid species found in the South Fork Indian Creek during the 2000 survey

were LCT; however, hybrids (cutthroat x rainbow) are present in the main stem of Indian Creek. Sediment levels on Mullinix Creek were high at 54.11% on the lower end of the stream. Unstable banks were seen, and the stream had incised sometime in the past, likely during the 1984 flooding.

**Photograph 5-P:**

Mullinix Creek. June 5, 2002.

**Table 13-T: Stream Survey Habitat Parameters for Granite Peak Allotment.**

| STREAM[1] | Width: Depth Ratio[2] | Canopy Density[3] | Bank Vegetation Stability[4] | Bank Soil Stability[5] | Ungulate Damage Rating[6] |
|---|---|---|---|---|---|
| **Mullinix Creek 2000 (1995 Survey)** | 21.97 | 56.3 | 77.3 (72.7) | 77.5 (71.2) | 23.9 (20.0) |
| **Indian Creek 2000 (1995 Survey)** | 34.63 | 62.1 | 74.3 (89.8) | 72.9 (89.1) | 33.4 (4.4) |
| **South Fork Indian Creek 2000 (1995 Survey)** | 21.84 | 73.9 | 91.3 (91.0) | 72.9 (90.0) | 33.4 (2.9) |
| **Willow Creek 1986** | No data | 32.0 | 58.9 | 51.1 | 32.2 |

**Table 14-T: Current Fish Populations-Salmonids for Granite Peak**

| STREAM | FISH SPECIES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RBT | | LCT | | BRN | | Other | |
| | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population |
| **Mullinix Crk 2000** | 92 | 466 | 0 | 0 | 0 | 0 | 57 (Hyb) | 299 (Hyb) |
| **Indian Crk 2000** | 0 | 0 | 117 | 853 | 0 | 0 | 132 (Hyb) | 758 (Hyb) |
| **SF Indian Crk 2000** | 0 | 0 | 224 (344 in trib) | 1,171 (448 in trib) | 0 | 0 | 0 | 0 |
| **Willow Crk 1986** | 970 | 11,625 | 02 | 02 | 0 | 0 | 809 (BRK) 158 (Hyb) | 10,435 (BRK) 1,741 (Hyb) |

## NORTHWESTERN LAHONTAN BASIN DPS

### Rebel Creek and Buffalo Allotments

Streams in the Rebel Creek and Buffalo Allotments originate on west slope of the Santa Rosa Range and flow off the Forest onto the alkali flats towards the Quinn River system. Flows from these streams generally do not actually reach the Quinn River, disappearing in the flats beforehand. While on the Forest, the dominant gradient of these streams is in excess of 7%. Much of the headwater portion of these streams is located within the Santa Rosa Paradise Peak Wilderness Area. Major streams in these allotments include: Andorno Creek, Buffalo Canyon, Falls Canyon, and Horse Canyon. These streams are within the Northwestern Lahontan Basin DPS for LCT.

Habitat conditions on Andorno Creek have improved from past surveys (Table 15-T). The 2001 survey, which was conducted in August, found no signs of ungulate damage. Ungulate damage was rated at 30.5% in the 1986 survey, and has been light to nonexistent ever since. A barrier exists at station 630, and all fish are found below that point. A concrete diversion at mouth of the canyon diverts water, amount unknown, into a pipeline and to Andorno Creek Ranch. The LCT found in Andorno Creek were transplanted from Washburn Creek in the Montana Mountains.

A Proper Functioning Condition assessment was conducted on Falls Canyon in 2002; the stream was rated as “proper functioning condition.” However, fine sediment levels and embeddedness were high at 50.63% and 35.5% respectively. A total of six (6) individual LCT were transplanted into Falls Canyon from Eight Mile Creek in 2001. Below the Forest boundary, a channel has been constructed to divert water from Falls Canyon Creek to Horse Canyon Creek. Falls Canyon Creek is generally dry downstream of that diversion except in high water (NDOW 1998).

The most recent GAWS survey for Buffalo Canyon is 1986. Conditions at that time were considered below desired conditions (Table 15-T). 2002 observations noted that Buffalo Canyon was a stable stream with a cottonwood gallery. With a steep gradient of 9.8%, this stream derives much of its stability from substrate and existing healthy riparian vegetation.

**Photograph 6-P:**

Good riparian and habitat conditions. Falls Canyon Creek. August 26, 2002.

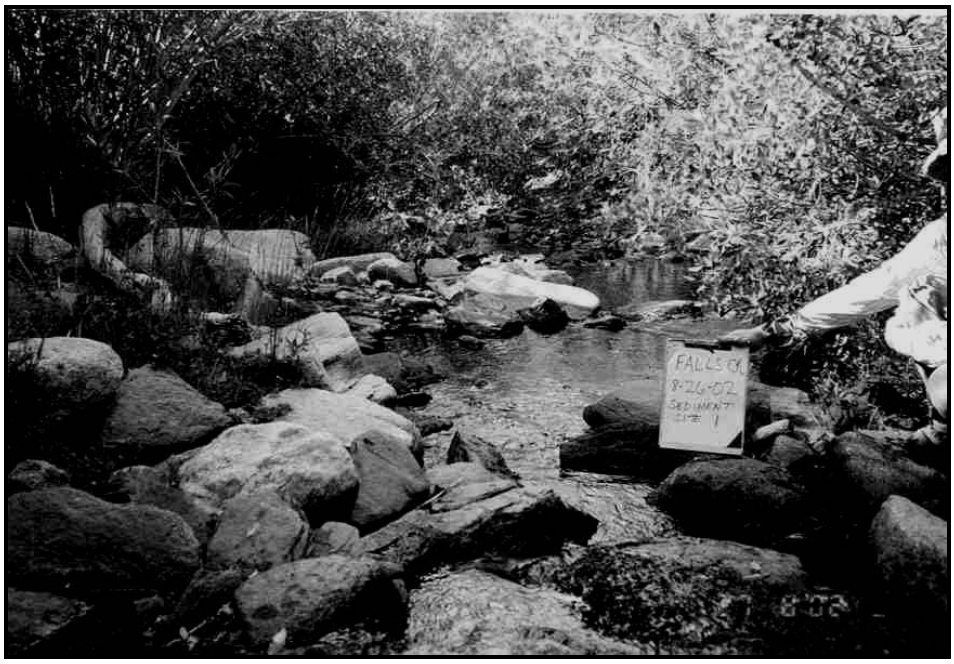


**Table 15-T. Stream Survey Habitat Parameters for Rebel Creek & Buffalo Allotments.**

| STREAM[1] | Width: Depth Ratio[2] | Canopy Density[3] | Bank Vegetation Stability[4] | Bank Soil Stability[5] | Ungulate Damage Rating[6] |
|---|---|---|---|---|---|
| **Andorno Creek 2001 (1996 survey)** | 16.00 | 77.0 (64.0) | 91.0 (79.5) | 86.5 (65.5) | None (0.4) |
| **Buffalo Canyon 1986** | 28.8 | No data | 43.6 | 43.6 | 25.0 |
| **Falls Canyon 1998 (1986 survey)** | 14.47 | 51.8 | 80.2 (54.0) | 81.6 (49.2) | 16.1 (35.2) |
| **Horse Canyon 1986** | No data | No data | 43.4 | 40.6 | 31.6 |

**Table 16-T. Current Fish Populations-Salmonids for Rebel Creek & Buffalo Allotments**

| STREAM | FISH SPECIES[1] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RBT | | LCT | | BRN | | Other | |
| | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population |
| **Andorno Crk 2001** | None | None | 42 | 118 | None | None | None | None |
| **Falls Canyon 1998** | 33 | 192 | N/A[1] | N/A[1] | None | None | 5 BRK | 28 BRK |
| **Buffalo Canyon 1986** | None | None | None | None | None | None | 517.42 | 2,070[2] |
| **Horse Canyon 1986** | None | None | None | None | None | None | 179 BRK | 538 BRK |

*Notes:*
*[1]A total of 6 individual LCT were moved into Falls Canyon in 2001.*
*[2]1986 survey stated only "cutthroat" trout were found.*

## West Side Flat Creek Allotment

Streams in the Westside Flat Creek Allotment are within the Northwestern DPS of LCT. The Willow Creek Fire did burn through much of this area in 2001. Major streams in the Westside Flat Creek Allotment include: Flat Creek, South Fork Flat Creek, and Three-Mile Creek.

Three-Mile Creek is of special interest in this allotment. Three-Mile Creek contains a pure population of LCT, and has only one known stocking of non-native rainbow trout in 1951, which did not persist. Conditions on Three-Mile Creek are not at desired levels according to surveys in 1997 and 2002 (Table 17-T.). Bank soil stability and vegetation stability ratings were 61.3% and 63.2%. Fine sediment levels and embeddedness levels are considered high at 35.1% and 40.2% respectively.

**Photograph 7-P:**

Downcutting and raw banks on Three-Mile Creek. August 27, 2002.

**Photograph 8-P:**

Downcutting and raw banks on Three-Mile Creek. August 27, 2002.

**Table 17-T. Stream Survey Habitat Parameters for West Side Flat Creek Allotment.**

| STREAM[1] | Width/Depth Ratio[2] | Canopy Density[3] | Bank Vegetation Stability[4] | Bank Soil Stability[5] | Ungulate Damage Rating[6] |
|---|---|---|---|---|---|
| **South Fork Flat Creek 1997** | No data | 45.2 | 63.2 | 61.3 | 35.6 |
| **Three Mile Creek 1997** | No data | 53.1 | 56.4 | 55.7 | 46.9 |

**Table 18-T: Current Fish Populations-Salmonids – West Side Flat Creek**

| | FISH SPECIES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| STREAM | RBT | | LCT | | BRN | | Other | |
| | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population |
| **South Fork Flat Creek 1997** | None | None | None | None | None | None | 212 (BRK) | 546 (BRK) |
| **Three Mile Creek 1997** | None | None | 693 | 3,203 | None | None | None | None |

## Indian Allotment

The Indian Allotment is located on the northwestern tip of the Santa Rosa Range, and drainages within the allotment include South Fork (SF) Quinn River, Jakes Creek, and a portion of East Fork (EF) Quinn River. The South Fork Quinn originates at an elevation of 2,164 meters (7,100 feet). Like most of the project area, the water source for the system is springs and snowmelt. Some portions of the South Fork Quinn flow subsurface, particularly at higher elevations. Jakes Creek enters the South Fork Quinn at an elevation of 1,487 meters (4,880 feet). A small section of the East Fork Quinn River flows through the allotment.

The East Fork Quinn River was impacted by a fire in 1996, and surveyors in 1997 noted that many parameters were in a downward trend since the fire. The high level of embeddedness found in the system during the 1997 survey was likely caused, in part, by the 1996 fire. The river was historically populated by LCT (one cutthroat fingerling was found during the 1987 survey), but no LCT were found during the 1979 survey. East Fork Quinn has been stocked by non-native fish since 1896, and is still periodically stocked with brown trout and rainbow trout. The area is a popular fishery within this project area and is well-used by anglers.

**Table 19-T. Stream Survey Habitat Parameters for Indian Allotment.**

| STREAM[1] | Width/Depth Ratio[2] | Canopy Density[3] | Bank Vegetation Stability[4] | Bank Soil Stability[5] | Ungulate Damage Rating[6] |
|---|---|---|---|---|---|
| **South Fork Quinn River 1987** | No data | 24.4 | 59.0 | No data | 23.4 |
| **East Fork Quinn River 1997(1992)** | No data | 25.6 | 65.6 (73.1) | 59.3 (70.2) | 27.2 (21.0) |
| **Jakes Creek 1987** | No data | No data | 63.8 | 60.8 | 24.5 |

South Fork Quinn River was historically occupied by LCT, but currently none are found in the river (Table 20-T). The 1996 fire burned through this area as well. The most recent survey on South Fork Quinn was in 1987. At that time, hybrid trout (cutthroat x rainbow) and brown trout were found to be the dominant fish species occupying the river. Brook trout and rainbow trout were also present. Substrate embeddedness was considered moderate at 30%, and ungulate damage was rated as light.

**Table 20-T. Current Fish Populations-Salmonids – Indian Allotment**

| STREAM | FISH SPECIES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RBT | | LCT | | BRN | | Other | |
| | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population | Fish per Mile | Population |
| **South Fork Quinn River** | 200 | 1,003 | 0 | 0 | 468 | 4,681 | 539 Hyb 411 BRK | 6,738 Hyb 2,058 BRK |
| **East Fork Quinn River 1997** | N/A | 1 | 0 | 0 | 211 | 4,572 | 77 (BRK) | 2,317 (BRK) |
| **Jakes Creek 1987** | 132 | N/A | 0 | 0 | 0 | 0 | 528 Hyb | N/a |
| | | | | | | | | |

# WILDLIFE

## MANAGEMENT INDICATOR SPECIES (MIS)

MIS identified in the *Forest Plan* include sage grouse, mule deer, Lahontan and Bonneville cutthroat trout and other trout species, and northern goshawk. MIS are intended to represent certain habitat characteristics and are used to monitor wildlife habitat condition. All of the MIS occur within the project area except Bonneville Cutthroat Trout, which only occur on the Ely Ranger District in the eastern portion of the Forest.

### Sage Grouse

Over the past two (2) years, seven (7) petitions have been filed with the USFWS to list the sage grouse as a federally-listed species under the Endangered Species Act. (Kritz, USFWS, pers. comm., 2003). Correspondingly, concerns have also been raised by both the public and land managers.

The *Forest Plan* identifies the sage grouse as an indicator of the condition and trend of the sagebrush/grassland and riparian community types. The *Forest Plan* sets population goals for sage grouse at a minimum population of 3,900 and a maximum of 40,000. Standards and guidelines in the *Forest Plan* require that key sage grouse habitat and its various components are identified as part of the analysis of all proposed projects, with the potential to adversely affect habitat capability. The *Forest Plan* also requires project impacts to sage grouse and sagebrush habitats to be evaluated in partnership with NDOW (Amendment #2, Jeffress and Pardee, personal communication, 2003).

Sage grouse rely heavily on sagebrush communities to meet life requirements, depending upon sagebrush year ‘round for cover. Throughout its range, sage grouse generally select low rolling hills and adjacent valleys especially where patches of big sagebrush are intermixed with areas of low sagebrush (Autenrieth 1981). Preferred areas are generally where slopes are less than 30 percent, although they are also found on steeper slopes. Standing water is an essential component of sage grouse habitat. The need for water depends on the availability of preferred, succulent vegetation and when the preferred forbs dry out (Autenrieth 1981, Klebenow 1985).

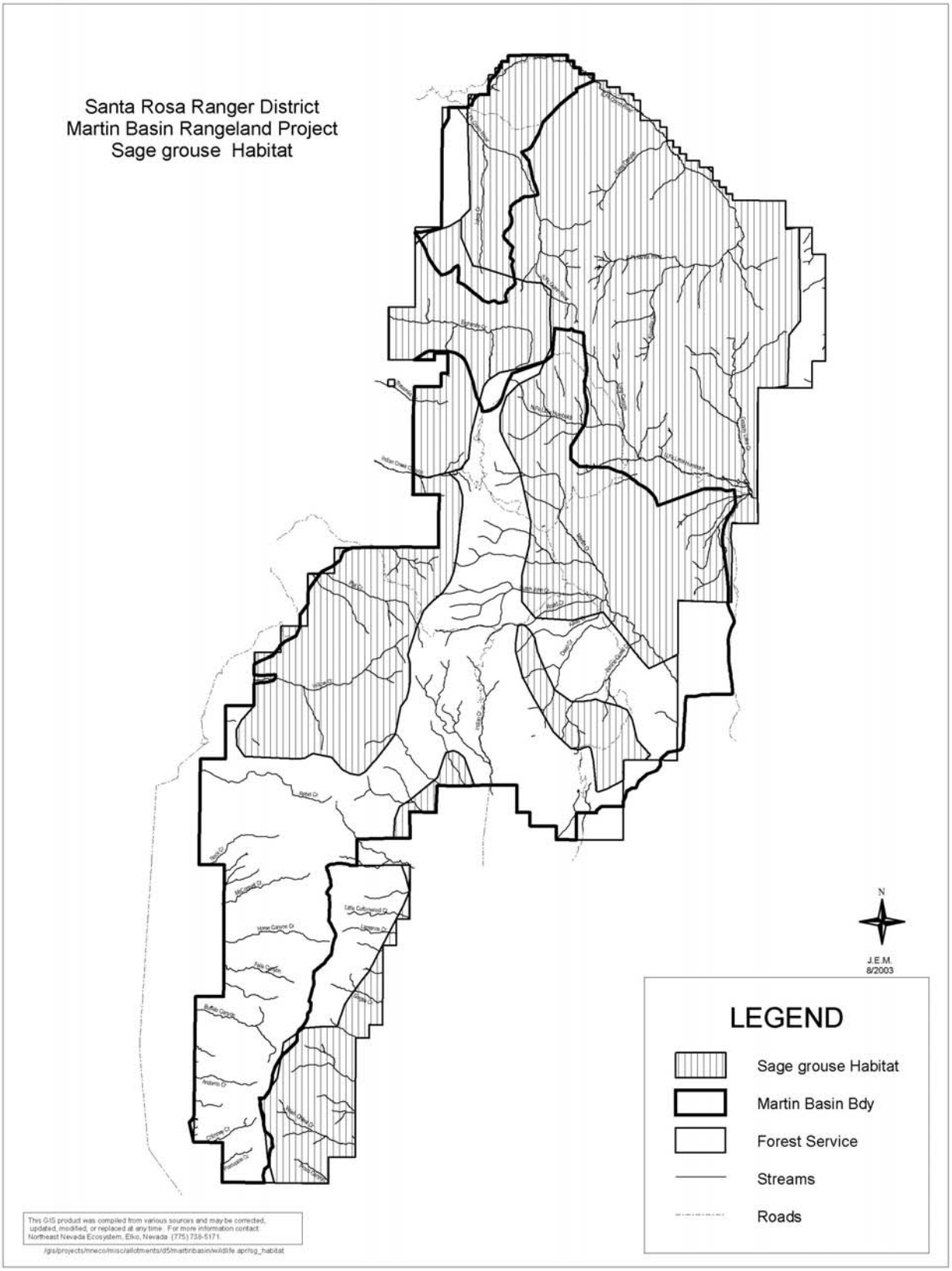
Sage grouse are considered a landscape species, requiring several square miles of sagebrush and other habitat types such as meadows, riparian and water. By managing for sage grouse and the diversity of habitat requirements across the landscape, it is assumed that the habitat requirements for other sage dependent species such as sage thrasher, Brewer’s sparrow, pygmy rabbit, and mule deer would also be met.

Sage grouse is the primary species of upland game bird present in the project area. They occur primarily in the sagebrush and adjoining vegetative community encompassing the analysis area. There are approximately 91,337 acres of potential sage grouse habitat within the project area. (Jeffress, pers. comm., 2003). Map 8-M shows the dominant sage grouse habitats; however, small areas of potential habitats may occur outside of those identified on the map.

Sage grouse populations within the state of Nevada are currently estimated at approximately 65,000 adult birds (Governor’s Strategy, 2001). Sage grouse populations in the state peaked during the late 1970’s;

however, they have been on a steady decline since and are currently down an estimated 49%-60% from their peak (Governor's Strategy, 2001). These declines may have resulted from multiple factors that included the hard winters and heavy snow years during the early to mid 1980's which were followed by multiple drought periods during the 1980's, 1990's and the past few years.

**Map 8-M: Sage Grouse Habitat**

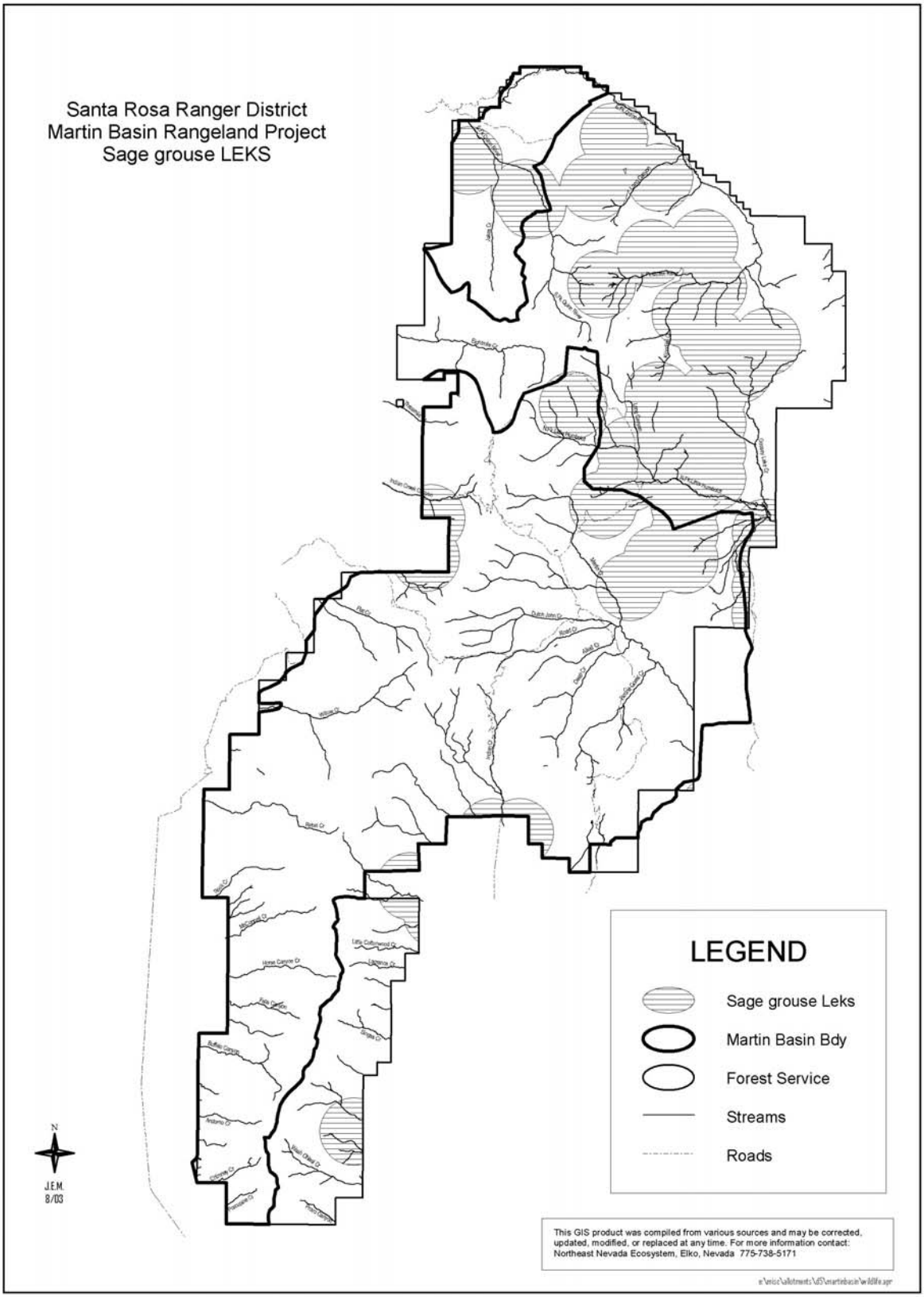


### *Breeding and Nesting*

The breeding areas, or leks, of sage grouse tend to be located at a point intermediate between the winter and summer range (Map 9-M). Males perform a strutting display (Schroeder, et. al. 1999) on established open areas usually 0.2 to 12 acres in size, but they may be as large as 100 acres or more (Autenrieth 1981, Governor's strategy 2001). Sage grouse prefer leks adjacent to dense brushy cover, which is important during strutting when the birds are exposed to predators. Most nests are within 4 miles of a lek, (Connelly et. al. 1991, Connelly et. al. 2000) but some females may nest more than 12 miles away (Autenrieth 1981). Leks occur throughout much of the Santa Rosa Ranger 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). These counts have been completed by NDOW. Counts are not completed at each lek. A small percentage of leks are surveyed each year to determine sage grouse trends in Nevada. Recent data in Humboldt County shows an upward trend for sage grouse populations in the Montana Mountain Range, which just east of the project area. Lek counts there show an average of 12 males per lek, which is an increase of approximately 10% (ibid). Data for the Santa Rosa Mountains are still being tabulated by NDOW and would be included as part of the project record.

Sage grouse build nests in the vicinity of a lek within 7-10 days after breeding. Most sage grouse nests occur under sagebrush. Mean height of the sagebrush used is commonly 29-80 cm and nests tend to be under the tallest sagebrush within a stand (Connelly et. al. 2000). Grass height and cover also are important components of sage grouse nest sites. Herbaceous cover associated with nest sites, provides scent, visual and physical barriers to potential predators (DeLong et. al. 1995). The nests consist of a shallow depression on the ground underneath large sagebrush and are sparsely lined with only grass, sagebrush leaves and a few feathers. Clutch size of sage grouse normally ranges from seven to ten eggs and incubation takes 25-28 days. Leks and nesting areas within the project area are most common on the Martin Basin, Buttermilk, Indian and Bradshaw Allotments. Leks and nesting habitats also occur on or near the Granite Peak and West Side Flat Creek Allotments. There are no known leks and only limited potential nesting habitats on the Buffalo and Rebel Creek Allotments.

**Map 9-M: Sage Grouse Leks**



### *Brood-Rearing*

Early brood-rearing areas occur in upland sagebrush habitats close to nest sites. These may be relatively open stands of sagebrush with greater than 15% canopy cover of grasses and forbs (Connelly et. al. 2000). Plant species richness with abundant forbs and insects characterize brood areas. Grouse usually move to more mesic (wetter) sites during June and July (Autenrieth 1981, Klebenow 1985). Broods occupy a variety of habitats during summer, including sagebrush, wet meadows, farmland and other irrigated areas adjacent to sagebrush habitats (Connelly et. al. 2000).

Sage grouse also rely upon sagebrush for food, but the degree of this dependence varies seasonally. During early brood-rearing the chicks' diet consists of succulent forbs, grasses, and insects, while the adults still rely on some sagebrush at this time. Insects, especially ants and beetles are an important component. Forbs increase in the diet after the first week and remain the major food item for juveniles throughout the summer, with the adult grouse relying slightly more upon the sagebrush in their diet. Common forbs found in the diet of juvenile sage grouse are: common dandelion (*Taraxacum officianale)*, yellow salsify (*Tragopogon dubius)*, prickly lettuce (*Lactuca serriola*), pepperweed (*Lepidium densilflorum*), Harkness flaxflower (*Linanthus harknessii*), tapertip hawksbeard (*Crepis acuminata*), lesser rushy milkvetch (*Astragalus convallarius*), longleaf phlox (*Phlox longifolia*) and common yarrow (*Achillea millifolum*) (Dunn et. al. 1986). As meadows dry and frost leads to the drying and killing of forbs, grouse shift their primary diet to sagebrush leaves (Connelly and Markham 1983).

Within the project area, springs, seeps, meadows, riparian areas and high elevation sagebrush basins provide important brood rearing habitats. These areas provide water, succulent forbs and insects, which are important to young sage grouse. Important brood rearing habitats within the project area are found within the Martin Basin, Buttermilk, Indian and Bradshaw Allotments. These habitats also occur within the Granite Peak and West Side Flat Creek Allotments. Potential nesting habitats are limited within the Buffalo and Rebel Creek Allotments.

### *Fall and Winter Habitats*

Sage grouse form flocks as brood groups break up in early fall. Fall movements to winter range occur from late August to December, depending on snowfall. From late summer to the following spring, sagebrush continues to be the main diet of sage grouse. Several species of sagebrush are used, including Wyoming big sagebrush, mountain big sagebrush, low sagebrush, black sagebrush, fringed sagebrush and silver sagebrush (Governor's Strategy, 2001). Overall, the sage grouse's need for sagebrush influences the species occurrence in the use of the project area. Potential wintering habitats occur on the Martin Basin, Buttermilk, Indian, Granite Peak and West Side Flat Creek Allotments.

### *Nevada Sage Grouse Conservation Strategy*

Currently several efforts have been initiated to provide conservation plans for the management of sage grouse. The Governor of the State of Nevada, Kenny Quinn, implemented a statewide Conservation Strategy on sage grouse in 2001. This strategy outlines the goals and objectives for a statewide conservation plan to be written by local planning groups. These local groups comprise of federal and state agencies, tribal governments, private landowners and other interested parties. These groups are known as Population Management Units (PMUs) and have discussed management practices and recommendations for the conservation of sage grouse in their areas. The North Central planning groups is comprised of three counties: Humboldt, Pershing and Churchill, which are managing nineteen distinct PMUs. The focus of these PMU groups is to assess the sagebrush habitat in the PMU boundary and note the population risks. The next step for these groups is to address recommendations for their areas. This Conservation Plan would provide new guidelines for the management of sagebrush habitat. The PMU that would be addressed in this analysis is the Santa Rosa PMU, which includes all of the Santa Rosa Ranger District and parts of the surrounding BLM, private, and Native American Reservation land.

**Table 21-T: Land Ownership in the Santa Rosa PMU (938,696 acres)[a]**

| Ownership | Acres | Percent (%) |
|---|---|---|
| **Public – BLM** | 570,910 | 61 |
| **Public – USFS** | 275,268 | 29 |
| **Native American Reservation** | 2,433 | <1 |
| **Private** | 87,900 | 9 |
| **Surface Water** | 2,185 | <1 |

[a]*PMU Description information gathered from the BLM and the Forest Service.*

## Mule Deer

Mule deer occur throughout the project area. Under the criteria for MIS and Amendment #2, if the habitat requirements for mule deer are met then habitat diversity would be provided for many other species, which are similar to sage grouse since they use similar habitats.

Potential mule deer range is characterized by aspen, sagebrush, mountain brush, and all types of vegetative community types in association with herbaceous meadow and riparian community types along stream courses (Taylor 1991). Based on these characterizations, all of the Santa Rosa Ranger District is considered summer and fall range. Within the analysis area, the vegetative community present provides good distribution and diversity of vegetation for mule deer use from spring through fall. Browse plants were used in greatest variety in summer and fall when the plants are presumably in leaf (ibid). Among the most commonly reported browse plants used by mule deer throughout the area were big sagebrush, antelope bitterbrush, snowberry, willow, and rubber rabbitbrush (ibid). Diets of the deer herd include three major forage classes: 1) browse or shrubs, including both shrub (sagebrush and antelope bitterbrush) and tree material (willow, aspen, and cottonwood); 2) graminoids, which include sedges and rushes and grass-like species; and 3) forbs, which include lower plant forms such as mosses and lichens (ibid). Food habits of deer appear to be influenced by phenological changes in forage as well as the abundance of different species.

The project area is within Nevada Department of Wildlife's (NDOW) Management Area 5. This management area is over a million acres in size. The Santa Rosa Ranger District falls entirely within Management Area 5. Recently, range wildfires have burned large tracts of deer winter, summer, and transitional ranges in Management Area 5. The Santa Rosa Ranger District has little to no critical mule deer winter range (Jeffress, per. Comm., 2003), however, surrounding BLM and private lands are very important and provide critical mule deer winter range. Within NDOW's Management Area 5, over 350,000 acres or approximately 550 square miles of seasonal mule deer range has been impacted by wildfires over the past two decades. In 2001, the Upper Willow fire on the west side of the Santa Rosa range consumed over 41,000 acres of Forest, BLM and private land. Sagebrush habitat types, particularly on BLM winter ranges, have been converted to annual exotics as a result of the wildfires.

The *Forest Plan* set a minimum viable population level for mule deer at 11, 247 with a maximum potential population of 88,200 deer. The current mule deer population, for Management Area 5, is estimated at 3,422, compared to 3,161 in 2002. NDOW spring composition flight conducted in March 2003, resulted in classification of 553 deer (NDOW 2003). This sample is consistent with the ten-year average for Area 5 and 30% higher than last years' sample (NDOW 2003). Most of these deer spend time on the Santa Rosa Ranger District, as this area provides substantial summer range for area 5. Deer were not heavily concentrated on traditional spring sites because of the lack of significant snowpack and were using various elevational ranges (NDOW 2003).

Sampling for 2003 yielded 42 fawns: 100 adults ratio versus 2002 sample of 30 fawns: 100 adults (NDOW 2003). This slight population increase is mainly attributable to the mild winter conditions of 2002. In some portions of Area 5, deer did not have to move far to find open forage, thus decreasing fawn loss rates. During mild winters deer populations would increase. However, poor winter range would dictate long-term population levels.

Seasonal deer range lost to wildfires over the past two decades has been high (NDOW 2002). These fires have resulted in vegetation conversions that have seriously reduced the capability of these sites to support adequate forage and cover to support deer through an annual cycle. It is estimated that less than 30-40% of the deer winter ranges remain intact (NDOW 2003). Deer populations may increase or decrease from year to year, but the overall trend is expected to decrease due to the loss of habitat to wildfire. This is especially true

on the lower elevation winter range that continues to be converted to cheat grass following wildfire. Areas that convert to cheat grass provide very little nutritional value to deer. Most often sagebrush, which mule deer depend upon heavily for winter forage, is completely lost and cannot recover due to the increased fire interval. Long term drought and erratic weather patterns have also impacted the long term health of mule deer populations and habitats.

### Fisheries (Including Lahontan Cutthroat Trout)

The affected environment and potential environmental effects of the alternatives on fish as an MIS, as well as the effects on LCT are discussed within the preceding Fisheries Section.

### Northern Goshawk

The affected environment and potential environmental effects of the alternatives on northern goshawk as an MIS would be disclosed under Forest Service Sensitive Species and within the Biological Evaluation.

## THREATENED AND ENDANGERED SPECIES

### Bald Eagle

The Santa Rosa Ranger District does not provide suitable nesting habitats for bald eagle because they require large trees in association with lakes, reservoirs, rivers or large streams (Lehman 1979). Bald eagles do not use the area during the summer season and are not present when livestock are on the District. Bald eagles may pass through the project area during the late Fall or Winter. During this time bald eagles are typically found near waterways or in locations where carrion may be found such as along highways or on winter ranges. The Santa Rosa Ranger District does not have any major waterways, no highways, and only limited winter ranges that would provide suitable foraging areas for bald eagles. Potential roosting trees on the District are extremely limited and would be restricted to a few large cottonwoods at lower elevations. Bald eagle use on the Santa Rosa Ranger District would be limited to birds passing through the district on their way to important wintering and foraging areas. Because this species is only an occasional migrant passing over the Santa Rosa Ranger District, this species would not be affected by grazing management and therefore will not be carried through the analysis.

## FOREST SERVICE SENSITIVE SPECIES

Forest Service sensitive species for which suitable habitat may exist within the analysis area include: spotted bat, Townsend's big-eared bat, peregrine falcon, flammulated owl, great gray owl, Columbia spotted frog, three-toed woodpecker and northern goshawk.

### Northern Goshawk

In addition to being a R4 Sensitive Species, the Northern goshawk is also considered a management indicator species in the *Forest Plan*. The distribution of the Northern goshawk is throughout most of North America, with a few isolated populations in the southeastern and central United States. In northern Nevada, the goshawk breeds in somewhat atypical habitat as compared to the rest of North America. Goshawks occupy small stands of aspen that are surrounded by shrub-steppe habitats occurring at elevations between 6,500 feet to 7,800 feet elevation during the warmer months, and in lower foothills during the winter (Herron et. al. 1985). The goshawk in northern Nevada is considered a year-round resident (USFWS 1993).

Goshawks prey on a variety of species, particularly small mammals and birds in timber areas. Foraging has been documented to occur in heavy canopied forests with open understories. Goshawks have been observed foraging within aspen stands, in small sagebrush inclusion in aspen stands, along aspen stand ecotones, and in open sagebrush conditions (Younk and Bechard 1994). Goshawks generally use perches to identify prey while hunting, so they probably do not forage in expansive treeless areas.

The Forest Plan identifies goshawks as a management indicator species for old growth cottonwood, aspen, and fir stands associated with riparian areas. A typical nest site in Nevada is located in an aspen stringer about 600 feet long and 75 feet wide and is located near a small perennial steam. Ninety-eight percent have been located within 100 feet of water (Herron et. al. 1985). Most nests are located in aspen stands in swales, where the deeper soils produce larger trees (Herron et. al. 1985).

There have been several reported sightings of goshawks on the Santa Rosa Ranger District. A critical element for goshawks on the Santa Rosa's is the presence of aspen stands or stringers of aspen that follow the drainages. Mature aspen stands would be considered potential nesting habitat for goshawk throughout the analysis area. Map 10-M in Appendix D aspen vegetation that could provide potential habitat for the northern goshawk. There are approximately 20,929 acres of potential habitat on the district.

In July 1990, the *Forest Plan* was amended. Although MIS were discussed in that plan amendment, there was no new information in 1990 to change population goals for MIS. The *Forest Plan* has identified a population level of 500 pairs to be maintained through the life of the plan with a maximum potential population Forest-wide of 1,000 pairs. These numbers were established through consultation with NDOW. The numbers were based primarily on known nest sites and an estimate of habitat. No goshawk nests were known of on the Santa Rosas Ranger District when the forest population was established. However, the plan estimated that the Santa Rosa Ranger District could support three to four pairs of nesting goshawks.

## Spotted Bat

The spotted bat occurs in a wide range of habitats in the western regions of the continent, most often in rough, rocky, semi-arid, and arid terrain, varying from ponderosa pine forest to scrub country and open desert. The distribution ranges from south central British Columbia to southern Mexico. Current Nevada records indicate this species is distributed between 1,770-7,000 feet (Nevada Bat Conservation Plan 2002). Often this bat is associated with the sagebrush and the shrub-steppe ecosystem at low elevations. It is extremely rare wherever it occurs and is considered one of the rarest bats in North America. Due to its rarity, habitat relationships are poorly defined. In most cases they seem to prefer crevices in rocks and cliffs for roosting and maternity, while riparian zones are preferred for foraging (Wai-pong and Fenton, 1989). Spotted bats are usually solitary and roost alone in steep cliffs or rock faces. Spotted bats hibernate during the winter and emerge in spring, generally March or April depending upon daytime temperatures during those months (Watkins 1977).

The spotted bat would eat a variety of insects, but its diet consists predominantly of moths. In desert settings, foraging occurs in canyons, in the open, or over riparian vegetation. Animals generally forage alone, apparently maintaining foraging territories. (Nevada Bat Conservation Plan, 2002).

Spotted bats have not been documented in the Martin Basin analysis area. Potentially suitable roosting and maternity habitat is present within rocky cliffs in the analysis area. Potentially suitable foraging habitats would likely include springs, seeps, and riparian areas.

## Townsend's Big-Eared Bat

The distribution of Townsend's big-eared bats ranges from western Canada, the western United States to southern Mexico, and a few isolated populations in the eastern United States. They are considered locally common in the western United States. Current Nevada records indicate this species is distributed between 688- 11,500 feet primarily in pinyon, juniper, mahogany, white fir, blackbrush, sagebrush, salt desert scrub, agricultural and urban habitats (Nevada Bat Conservation Plan 2002). The Townsend's big-eared bat is known to roost in crevices of rocky outcrops, caves, abandoned mines, and abandoned buildings. Maternity and hibernation habitats are similar to roosting sites. These bats do not migrate long distances and have demonstrated strong site fidelity (Kunz and Martin, 1982). Hibernation sites in caves often are near entrances in well-ventilated areas. They hibernate in clusters of a few to more than 100 individuals. Townsend's big-eared bats forage in woodlands and forest edges, feeding primarily on moths.

Food items are primarily small moths. Foraging occurs near vegetation and other surfaces and prey is probably gleaned from these surfaces. Telemetry studies in Nevada have revealed over 95% of foraging activity to be concentrated in open forest habitats of pinyon, juniper, mahogany, white fir, aspen and cottonwood (Bradley 2000).

Townsend's big-eared bats have not been documented in the Martin Basin project area (Bradley, pers comm., 2003). Potentially suitable roosting and maternity habitat may be present in caves, rock crevices, old buildings and abandoned mines. Potentially suitable foraging habitats would likely include springs, seeps, and riparian areas.

## Flammulated Owl

The flammulated owl (*Otus flammeolus*) is a tiny owl that feeds on invertebrates and nests in cavities in western forests (McCallum 1994). This species was originally thought to be rare and always associated with coniferous forests; however, it is now believed to be more common, yet secretive, and would also utilize aspen forests. This species is considered a neotropical migratory bird.

On the Santa Rosa Ranger District potentially suitable habitat is limited to larger, mature aspen stands. There is one historical record of a flammulated owl vocalization on the District near the Lye Creek Campground (District File). No other sightings have been reported and it is unknown if the one sighting was of a resident bird or one migrating north to population strongholds in Oregon and western Idaho. Potentially suitable habitats are considered very limited on the Santa Rosa Ranger District due to a lack of forested habitats, in particular the absence of coniferous forests.

## Great Gray Owl

Great gray owls are listed as a sensitive species for the HTNF. A review of historical records shows the only suspected sightings of the species in Nevada have occurred on or near the Carson Ranger District near Reno and Lake Tahoe. No great gray owls have ever been reported on the Santa Rosa Ranger District.

Great gray owls are typically associated with mature coniferous forests. The Santa Rosa Ranger District has only minimal coniferous forests that are limited to patches of limber pine at high elevations and a few patches of Douglass-Fir less than 5 acres in size that were planted. Given these circumstances and the lack of sightings throughout most of Nevada, it has been determined that the project area does not provide potential habitat for the great gray owl. This species will not be tracked through this analysis.

## Peregrine Falcon

Until recently, peregrine falcons were listed as an endangered species under the Endangered Species Act. Since their de-listing they have been addressed as a sensitive species during environmental analysis. There are no known peregrine falcon eyries on the Santa Rosa Ranger District. There have also been no confirmed sightings of peregrine falcons on the District. Potential nesting and foraging habitats do exist within the project area. Potential nesting habitats are located high on cliff faces and along steep walled stream canyons. Foraging habitats would typically include riparian habitats, cliffs and agricultural areas and river valleys adjacent to the project area.

## Three-Toed Woodpecker

The three-toed woodpecker is a sensitive species, which may have potentially suitable habitat on the Santa Rosa Ranger District. Mature aspen stands could provide potential nesting and foraging habitats for this species. No formal surveys have been conducted on the district for this species and there have been no reported sightings. Although the project area provides potential habitat, that habitat is considered marginal. This species relies heavily on coniferous forest habitat types, which are very limited on the District. Three-toed woodpeckers feed heavily upon insects that live under the bark of tree species such as lodge pole pine and other conifers. Foraging habitat is limited within the project area.

## Columbia Spotted Frog

There are no known populations of Columbia spotted frogs on the Santa Rosa Ranger District. Research of historical observations and records has produced no presence of spotted frog ever occurring on the Santa Rosa Ranger District (Morefield, pers. comm. and Scheuering, pers. comm.). Inventories for spotted frogs were conducted in 1994 on the Santa Rosa Ranger District and there were no confirmed sightings. The geographically closest known historic record is on the 45 Ranch in the 1930s on the South Fork of the Owyhee River in Southern Idaho, which is over 65 miles to the northwest of the District (Tait, pers. comm.) Potential habitat may exist within the analysis area in springs, ponds and riparian areas that retain water throughout the entire year.

## OTHER WILDLIFE SPECIES

### Small Mammals

Small mammals that would likely be present on the district include: western jumping mouse (*Zapus princeps*), mountain vole (*Microtus montanus*), deer mice (*Peromyscus maniculatus*) long-tailed weasel (*Mustela frenata*), badger (*Taxidea taxus*) and numerous species of bats.

Most species of bats forage for insects in riparian areas and wetlands. Bats, among other mammals, require stream riparian systems for roosting, drinking and foraging (*Nevada Bat Conservation Plan*, 2002). Regardless of water accessibility, most riparian habitat rated in good to excellent condition sustains riparian vegetation resulting in a richer insect fauna than surrounding upland areas. Bats congregate around these riparian areas due, in part, to the rich forage base. Those riparian habitats rated in poor to fair condition sustain an insect forage base more reminiscent of surrounding upland habitats. Although data is inadequate to fully understand the dynamics and importance of riparian system for bats and other small mammals, preliminary information indicates a richer, more diverse fauna is more important than previously known (Williams 2001).

### Reptiles

Some reptiles that would be present on the district include: Long-nosed leopard lizard (*Gambelia wislizenii*), Sagebrush lizard (*Sceloporus graciosus*), Western whiptail (*Cnemidophorus tigrus*), Rubber boa (*Charina bottae*), and Long-nosed snake (*Rhinocheilus lecontei*). Many species of reptiles can be sensitive to structural changes in vegetation. As structural diversity is decreased, reptile abundance and species diversity is also decreased (Jones 1981). Habitat components such as small size class of trees and shrubs and surface litter are important for maintaining abundance and diversity of reptiles and amphibians (Jones 1988). Species, such as the western skink, require cover of perennial grasses to maintain micro-environmental conditions at the surface in order to maintain a favorable body temperature while foraging. An abundance of residual vegetation, which forms piles of organic debris, provides both escape and thermal cover for snakes (Szaro et. al. 1985).

### Amphibians

Amphibian presence/absence surveys were conducted on the Santa Rosa's during the summer of 1994. Some amphibians that would be present on the district include: Pacific chorus frog (*Pseudacris regilla*), Northern leopard frog (*Rana pipiens*), Great Basin spadefoot (*Spea intermontana*) and Western toad (*Bufo boreas*) (Cook pers. comm.). Amphibians depend on water sources and riparian areas for all or part of their life cycle, and are sensitive to alterations in this habitat. Surface litter or residual vegetation is an important habitat component for many species (Jones 1988). Healthy riparian areas provide desirable habitat for beavers. Beaver ponds and slow moving streams provide habitat for amphibians.

### Neotropical Migratory Birds

Executive Order (EO) 13186, signed January 10, 2001, lists several responsibilities of federal agencies to protect migratory birds, among them: (1) 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 USDA Forest Service and USDI Fish and Wildlife Service, signed January 17, 2001. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and Fish and Wildlife Service, in coordination with state, tribal and local governments. The MOU identifies specific activities for bird conservation, pursuant to EO 13186 including: 2) Strive to protect, restore, enhance, and manage habitat of migratory birds, and prevent the further loss or degradation of remaining habitats on National Forest System lands. This includes: a) Identifying management practices that impact populations of high priority migratory bird species, including nesting, migration, or over-wintering habitats, on National Forest System lands, and developing would help inform future specific protocols called for in an MOU implementing the Executive Order.