Photograph 17-P:

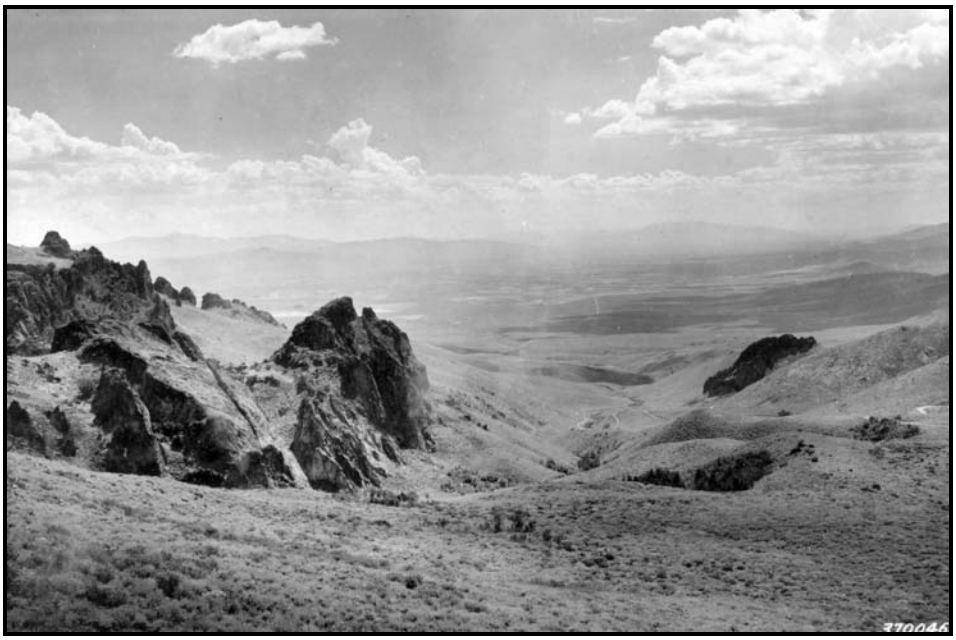
Aspen stand in Buttermilk Allotment The understory species of grasses, forbs and shrubs are absent. Note the easy access into the stand. July 2003.

Photograph 17-P shows an aspen stand in Buttermilk Allotment. This aspen stand is typical of many smaller stands within the project area. Easier accessibility for cattle and wildlife results in the loss of the vegetative understory component and heavier grazing impacts. Larger stands in the area are less impacted from grazing because cattle and wildlife are only able to access the periphery of the stand, rather than moving through the entire stand.

Photographs 18-P, 19-P, and 20-P show the south facing view from Hinkey Summit, with Paradise Valley is in the distance. Vegetative cover includes mountain brush, sagebrush, native grass, and patches of aspen. The increases in aspen stands shown in the photographs indicated that aspen stands are recovering over time due to changes in livestock management since the 1930s.

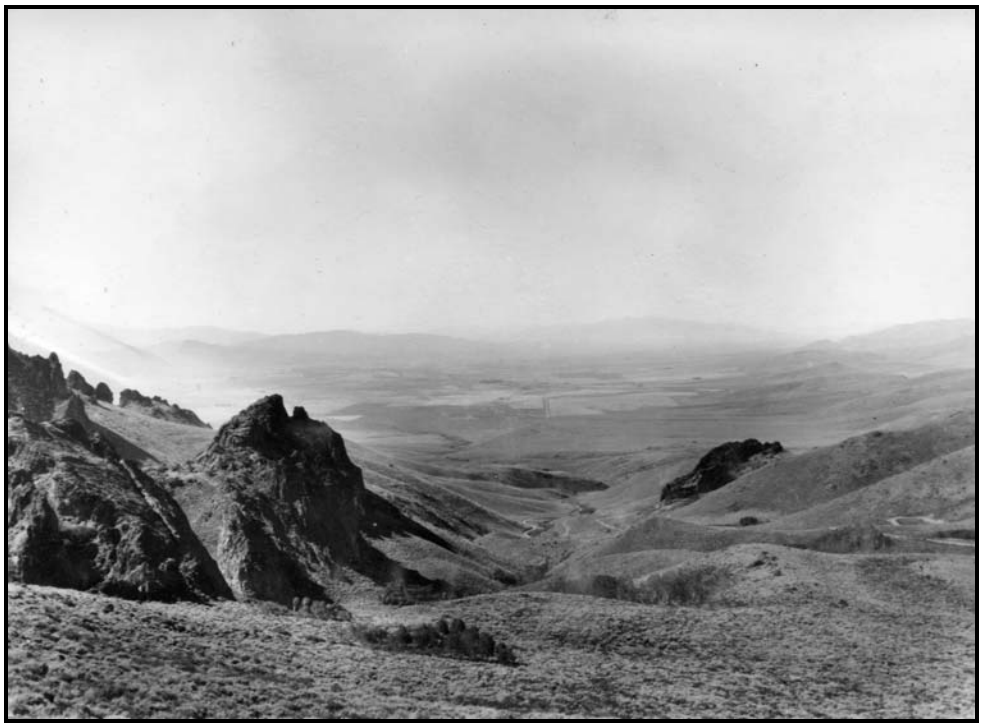
Photograph 18-P:

Hinkey Summit-Indian Creek (1938)



Photograph 19-P:

Hinkey Summit – Indian Creek (1966)



Photograph 20-P:

Hinkey Summit-Indian Creek (2003)

Currently the majority of the aspen stands are managed similar to the adjacent uplands. Allowable utilization is 65% of the herbaceous vegetation and there are no browsing limits except on the upland brush species. That limit is 35% - 50% of current year's growth. Aspen located along streams have an allowable use limit of 35% of current year's growth.

Allowing 65% utilization on the understory vegetation may result in browsing on saplings and seedlings. Because of this, the periphery of the larger aspen stands can have a reduced age class representation. Many of the smaller stands are showing no regeneration. This is evident from recent photographs.

Major Aspen Community Types

Aspen / mountain snowberry (*Populus tremuloides/Symphoricarpos oreophilus*) community is typical of an intermediate elevation type, occurring on a wide range of soils, resulting in a greater diversity of vegetation. Other diverse plant components include tall forbs, low forbs, graminoids, shrubs, and annuals. Heavy grazing can affect the understory species and perpetuate the occurrence of less desirable or less palatable perennials and annuals. (Mueggler,1988).

A second major aspen community is aspen / snowberry / meadow rue (*Populus tremuloides* / *Symphoricarpos oreophilus* / *Thalictrum fendleri)*. This aspen community typically occurs on low to moderate elevations and on igneous and sedimentary soil materials. This community type is similar to aspen / mountain snowberry type, except that it lacks the graminoid feature, has reduced silver lupine (*Lupinus argenteus),* and generally has a greater occurrence of annuals (Mueggler, 1988).

The third major aspen community type is aspen / mountain brome understory (*Populus tremuloides / Bromus carinatus).* This community occurs in high elevations above 8,000 feet and often on steep slopes of different degrees of soil materials. This community type is characterized by a dominant tall grass component, including blue wildrye (*Elymus glaucus),* mountain brome (*Bromus carinatus)* and slender wheatgrass *(Elymus trachycaulum)* (Mueggler, 1988). Although a distinct shrub layer does not exist in this aspen community, wild rose and mountain snowberry occur in small quantities. Livestock congregate on these sites due to the open undergrowth and overstory shade. Mueggler (1988) noted that past heavy sheep use likely reduced mountain snowberry and shifted undergrowth composition from forb to dry graminoid dominance. Lack of a dense shrub layer reduces structural diversity relative to other aspen community types. Soil compaction may occur if these sites are grazed heavily in the spring when soils are wet.

Incidental Aspen Community Type

Incidental aspen / false hellebore (*Populus tremuloides / Veratrum californicum*) stands occur in elevation ranges between 7,000-8,000 feet. Moist sites associated with poor draining, heavy soils are characteristic of these incidental aspen communities. False hellebore dominates these sites; however, shrub species such as wild rose, and mountain snowberry may occur. Some stands have dense wild rose cover, which indicates past livestock grazing and current grazing was noted except where a dense shrub layer limited livestock access. Dense shrub cover may also inhibit ungulate access (Manning and Padgett, 1995).

Aspen regeneration is not favorable on these sites due to the site being wet for an extended period of time from snow melt (Mueggler, 1988). Another incidental aspen community type is snow bank aspen, also known as dwarf aspen, which occurs on snow banks, high wind prone areas, and northerly aspects. The growth form is not perpendicular to the ground; instead, these aspen tend to grow horizontal to the ground surface at 6,500-9,000 feet in elevation (USDA-NRCS, 1996).

Photograph 21-P:

False Hellebore (*Veratrum californicum*) is increasing in this meadow. Hinkey Summit, Buttermilk Allotment. 2003

UPLAND VEGETATION

The major upland vegetation types within the project area are composed of sagebrush and mountain brush communities. In the areas where wildfires have occurred recently, these communities are composed primarily of grass and forb species; Table 22-T lists these areas as montane grasslands. The majority of montane grasslands would transition back to their pre-fire vegetative community type, such as sagebrush or mountain brush.

Drought

Drought has affected the upland plant communities. Heavy grazing, along with fire and severe drought, have caused the increase in sagebrush density (Vallentine, 1989). The area has had below average precipitation 13 years out of the last 22 years. Below average precipitation has also been recorded since 1999.

There are three (3) major sagebrush community types and one (1) mountain brush community type located within the project area. These upland vegetation community types are described below.

Fire

Generally removing livestock grazing would tend to result in an increase in grass species but not in all situations. As grass, considered a fine fuel, increases the potential for wildland fires may increase. The potential for these fires to become relatively large would also increase. In the higher elevations the effects would be short term and the native plant communities should recover. The lower elevation plant communities may take longer to recover, however, with no livestock grazing the native vegetation may increase over time and provide competition to slow or reduce cheatgrass invasion.

Impacts from fire may have the most added impacts. Fire may affect large acreages as in the Upper Willow Fire, 2001 that burned 42,000 acres, and the Quinn/Odell fire that burned 50,000 acres. Sagebrush cover is reduced in higher elevation fires, however brush typically responds in 2-5 years. Mountain mahogany can be adversely impacted from fire and does not re-sprout after fire.

The effects from fires occurring at low elevations are the most detrimental to these vegetative communities. Fires within the Wyoming sagebrush communities can result in a conversion to cheatgrass and little or no recovery of sagebrush. This has occurred on the west side of the project area and on surrounding lands on the BLM. Because of the cheatgrass conversion the fire re-occurrence cycle is approximately fire years (John Ruhs, BLM Fire Management Officer, Personal Communication, 2003). Seeding and post fire rehabilitation has been somewhat successful and may lengthen the fire re-occurrence cycle and temper long term effects.

Wyoming Big Sagebrush

The project area contains approximately 2,040 acres of Wyoming big sagebrush and is generally located on the periphery of the project area between 4,500-6,800 feet in elevation. Wyoming big sagebrush is the most drought tolerant species of sagebrush, receiving 6-13 inches of precipitation annually. The soils are generally shallow and may be associated with a hardpan layer.

Wyoming big sage occurs at lower elevations in the project area, the understory species consist of perennial grasses and forbs to annuals, primarily cheatgrass. When fires occur in Wyoming big sagebrush sites with understories primarily consisting of annuals, these sites tend to convert to annual weedy habitats lacking a sagebrush overstory. These sites are then more susceptible to frequent fire intervals and are very difficult to restore to their prior productivity and condition.

Adjacent lower elevation lands are currently experiencing the conversion to cheatgrass at a pace much faster than National Forest System Lands. However, the cheatgrass conversion cycle is slowly moving up in elevation and eventually may be more prominent within the project area.

Graminoids that may occur include Great Basin wildrye, Indian ricegrass (*Achnatherum hymenoides*), Thurber's needlegrass (*Achnatherum thurberianum*), needle and thread (*Hesperostipa comata*), squirreltail (*Elymus elymoides*), blue bunch wheatgrass (*Psuedoroegneria spicata*), cheatgrass, red brome (*Bromus rubens*), and crested wheatgrass (*Agropyron cristatum*). Forbs, which may be present include scarlet globemallow (*Sphaeralcea coccinea*), Hood's phlox (*Phlox hoodii*), longleaf phlox (*Phlox longifolia*), lupine (*Lupinus spp.*), biscuitroot (*Lomatium spp.*), Indian paintbrush (*Castilleja spp.*) and other associated forbs.

Associated shrub species may include green rabbitbrush (*Chrysothamnus viscidiflorus*) and rubber rabbitbrush (*Ericameria nauseosa*).

Mountain Big Sagebrush

Mountain big sagebrush encompasses approximately 72,600 acres within the project area. Mountain big sagebrush occurs between 6,000 and 9,700 feet in elevation, occupying the upper sagebrush precipitation zone of 10 to 25 inches annually. Soils are moderately deep, well drained and include a high rock or gravel component.

Mountain big sagebrush stands generally produce forage for livestock and wildlife. Cheatgrass may increase over time, although not to the extent as in drier sagebrush stands. Mountain big sagebrush is easily impacted by fire; however, re-establishment is quick due to the abundance of available seed. Other shrubs such as green rabbitbrush and gray horsebrush are quick to sprout after fire and increase with reoccurring fire events, forming dense stands. Other shrubs occurring more commonly on moister sites include mountain snowberry.

The graminoid understory is generally composed of Great Basin wildrye, Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass, Thurber's needle grass, Sandberg bluegrass, mountain brome and other associated species.

Low Sagebrush

Low sagebrush occurs in the project area at moderate to high elevations 5,000 to 9,000 feet and contains approximately 6,900 acres. This community is characterized by a shrub layer of low sagebrush and a herbaceous layer of perennial bunchgrasses and forbs. Low sagebrush is the most abundant shrub and green rabbitbrush occurs frequently but in much smaller amount (*Rangeland Cover Types of the United States*, Society for Range Management, 1994). The graminoid layer includes bluebunch wheatgrass, squirreltail, and Sandberg bluegrass. Cheatgrass is common but usually not as abundant as in the Wyoming big sagebrush community. Forb species include wild onion, phlox, vetch (*Astragalas* spp.) and pussytoes (*Antenneria* spp.)

This community generally occurs in a mosaic with one of the big sagebrush types. It usually occurs on shallow soils of 12-20 inches with an impermeable clay "B" horizon or bedrock.

Mountain Brush Community

Several, shrub dominated types have been grouped under mountain brush. Species include antelope bitterbrush (*Purshia tridentata*), serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos spp.*), wax currant (*Ribes cereum*), gooseberry currant (*Ribes montigenum*), snowbrush, chokecherry, wild rose, and low sagebrush as the dominant shrub components. The mountain brush group occurs between 6,000-9,700 feet in elevation and receives 12-22 inches of precipitation annually, mostly in the form of snow. The approximate acreage of mountain brush species in the project area is 48,900.

Large stands occur within the Martin Basin, Buttermilk, Indian and Granite Peak Allotments on moister sites than sagebrush and near or within large aspen stands. The mountain brush community supports a diverse group of plant species, provides important watershed values, very good forage for livestock and wildlife, cover and protection for wildlife species.

The graminoid understory is generally composed of Great Basin wildrye, Idaho fescue, bluebunch wheatgrass, slender wheatgrass, western needlegrass, Letterman's needlegrass (*Achnatherum lettermanii*), Columbia needlegrass (*Achnatherum occidentale*), squirreltail, needle-and-thread (*Hesperostipa comata*), and mountain brome.

NOXIOUS WEEDS

Noxious weeds are highly invasive plants that generally possess poisonous, toxic, parasitic, invasive, and/or aggressive characteristics. The presence of noxious weeds signifies an area that is at risk from a health and sustainability viewpoint whether or not the landscape is disturbed or pristine (USDA, 2003).

The competitive nature of both noxious and invasive species allows them to invade and dominate native ecosystems. Noxious and invasive species are advantageous and have the potential to rapidly invade sites that have had a major disturbance. These species typically dominate areas after major disturbances such as fire and over grazing. Noxious weeds are capable of producing highly viable seeds, which can persist in the

soil for several decades and germinate easily in a variety of conditions. Noxious weed seed can be dispersed by livestock, wildlife, recreation and motor vehicles. Several species of noxious weeds can also reproduce vegetatively.

Currently the project area contains seven (7) different weed species that are on the Nevada Department of Agriculture (NDA) noxious weed list. These species include Scotch thistle (*Onopordum acanthium*), Canada thistle (*Cirsium arvense*), hoary cress (*Cardaria draba*), leafy spurge (*Euphorbia esula*), medusahead (*Taeniatherum caput-medusae*), musk thistle (*Carduus nutans*) and Russian knapweed (*Acroptilon repens*). The HTNF utilizes an integrated pest management program that includes mapping, early detection, mechanical, biological, and herbicide treatment. The majority of weeds in the project area have been treated with herbicides. In addition, Scotch thistle along Flat Creek was grazed by goats in 2003 in order to determine if this experimental, non-herbicidal method was effective in thistle control.

Photograph 22-P

Experimental goat grazing plots, Scotch thistle leaves were stripped and removed. Flat Creek. May 2003.

Photograph 23-P

Experimental goat grazing plots, Scotch thistle leaves were stripped and removed. Flat Creek. May 2003.

Photograph 24-P

Experimental goat grazing plots, Scotch thistle leaves were stripped and removed. Flat Creek. May 2003.

Fire

Invasive weeds often become established following disturbances, including mechanical disruption or fire. Although many weeds are capable of invading well-managed undisturbed areas, disturbance allows rapid establishment and spread of many noxious range species (DiTomaso, 2000). The greater the disturbance, the more likely that an invasive weed will occupy all available niches and form a monotypic stand (Sheley et al. 1998).

Noxious weed infestations vary within the project area; however Scotch Thistle highly infests the burn area of the Upper Willow Fire of 2001. Other fires have occurred within the project area; Quinn Odell 1996 favored the spread of Canada thistle, which now occupies the entire length of the Quinn River.

The Quinn/Odell fire that occurred in 1996 favored the spread of Canada thistle. Prior to this fire Canada thistle had been found on the middle portion of the East Fork Quinn River within the Quinn River Allotment. Following the fire Canada thistle has spread throughout almost the entire length of this river.

Scotch Thistle

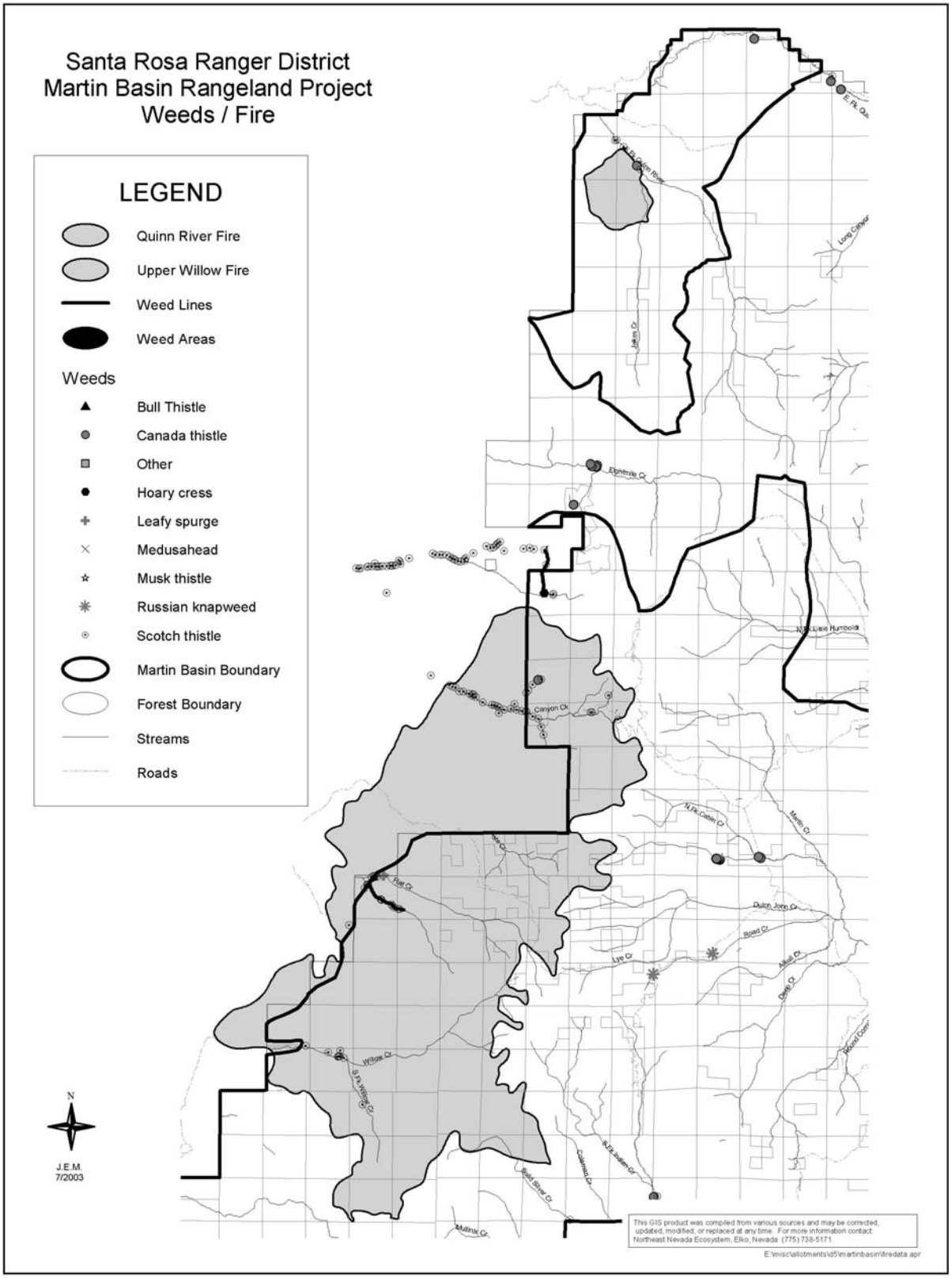
Scotch thistle is an invasive species that spreads primarily by seed and forms dense stands impermeable to livestock, wildlife and recreationists. Each plant can produce thousands of seeds that can remain in the soil for several decades. Populations have been monitored and treated with intense herbicide applications.

In August 2001, the Upper Willow Fire burned approximately 41,800 acres, with approximately 25,270 acres on National Forest System lands. Major drainages burned included Willow Creek, South Fork Willow Creek, Canyon Creek, South Fork Canyon Creek, Flat Creek, South Fork Flat Creek, and Skull Creek. Scotch thistle has increased substantially in the drainages that burned. Scotch thistle also occurs on the South Fork and East Fork of the Quinn River in Indian Allotment. Map 13-M shows locations of noxious weeks within recently burned areas.

Photograph 25-P:

Scotch thistle encroaching in the riparian corridor. South Fork Flat Creek. June, 2003.

Map 13-M: Noxious Weed Locations within Recently Burned Areas



Canada Thistle

Canada thistle occurs on the East Fork and South Fork of the Quinn River within the riparian community. The infestation spans the entire length of the river. Canada thistle spreads by both seed and creeping rootstocks.

Hoary Cress

Hoary cress occurs along the main route through the forest, along Forest Roads 792 and 084. This plant is generally found along roadsides; however, some large patches occur within the project area and on several allotments.

Photograph 26-P:

Hoary Cress. Willow Creek.
May 2003

Leafy Spurge

Leafy spurge may occur within the project area. Several drainages outside of the project area, which border Granite Peak Allotment, have known infestations. The estimated acreage is 30 acres. Leafy spurge is a perennial noxious weed, capable of spreading by seed or creeping roots and is known to inhabit nearly all soil types. The seed components are able to spread from an explosion in the seed capsule and may reach up to 20 feet in distance.

Medusahead

Medusahead may occur within the project area. A small patch occurs near the boundary of Granite Peak, outside the project area. Medusahead is a winter annual grass, exhibiting long, awned-spiked, inflorescences. This species flowers in May and June and is highly unpalatable to livestock and wildlife.

Musk Thistle

Musk thistle has not been identified in the project area, however this species does occur adjacent to the project area in a very small patch.

Russian Knapweed

Russian knapweed has been identified in several locations in the Buttermilk and Granite Peak Allotments. A small patch was found on Hinkey Summit, and these plants were removed. New infestations were identified during the summer of 2003 in Buttermilk Allotment. Knapweed occurs at lower elevations on private lands adjacent to the project area. These infestations are contributing to the new populations occurring in the project area.

Potential Invasive Species Near the Project Area

The following species are not known to occur within the project area, but border the area and have the potential to become established. Spotted knapweed (*Centaurea maculosa*), yellow star thistle (*Centaurea solstitialis*), musk thistle (*Carduus nutans*), rush skeleton weed (*Chondrilla juncea*), Dalmatian toadflax (*Linaria genistifolia ssp. dalmatica*) and tall whitetop (*Lepidium latifolium*).

SENSITIVE AND RARE PLANTS

Sensitive species require special management efforts and conservation need under Forest Service Handbook guidelines (FSH 2609.25, 1988) and Forest Service Manual directives (FSM 2670). The National Forest Management Act and the Forest Service policy require that National Forest System land be managed to maintain populations of all existing native animal and plant species at or above minimum viable population levels. A viable population is the maintenance of enough individuals throughout their range to perpetuate the existence of the species in natural, self-sustaining populations.

Table 23-T: Sensitive or Rare Plant Species that Could Occur within the Project Area.

Name	R4 Status	State Status	Habitat Description
Cusick Hyssop (Agastache cusickii)	None	None	Dry, open limestone talus slopes, sagebrush or mountain mahogany at 6,900 to 9,600 feet.
Lonesome milkvetch (*Astragalus solitarius)*	None	None	Washes and banks of shallow soils on volcanic flat-rock from 3,115 to 5,200 feet.
Osgood Mountain milkvetch (Astragalus yoder-williamsii)	Sensitive	Fully Protected	Decomposed granite gravel flats in sagebrush communities at 5,170 to 7,300 feet.
Obscured scorpion plant (Phacelia inconspicua)	Sensitive	Fully Protected	Steep north or northeast facing slopes on loose soil rich in organic matter at 5,000 to 8,630 feet.

Large fires have occurred in the past seven (7) years and are expected in the future. With the introduction of cheatgrass, fires are occurring more often and can result in fragmentation of the habitat and the loss of sagebrush habitat. This dynamic would impact habitat for Osgood Mountain milkvetch, obscured scorpion plant, and solitary milkvetch. Obscured scorpion plant may be an early successional species following fire. However, with the invasion of cheatgrass and other species, competition may limit this species after the large fires. Cusick's hyssop occurs of talus slopes that typically would not be impacted by fire.

Sensitive Plant Species:

Osgood Mountain Milkvetch

Osgood mountain milkvetch is a Region 4 Sensitive Species and is listed as a Fully Protected Species in Nevada (NRS 527.01). It is a dwarf perennial herb that forms dense clumps up to 3 inches (7 cm) tall blooming from late May to mid-July. It is found on the crest of the northern end of the Osgood Mountains, Humboldt County, Nevada; the upper forks of the Owyhee River in Owyhee County, Idaho; and from Oregon (NatureServe, 2003). The reported elevation range is between 5,170-7,300 feet.

The habitat that the plant is associated with is dry, open, coarse decomposed granite soils among boulders on flats and gentle slopes in healthy sagebrush steppe vegetations. The species is also found on loose silty soils on moderate south slopes. There are two known sites in NV with an estimated 22 acres of occupied habitat on the lands managed by the Bureau of Land Management (Special Status Species). Surveys have been performed in the Santa Rosa Ranger District on the outcrops of granodiorite in the Santa Rosa Range (Knight 1991). Habitat was searched between 5,000-6,500 ft. GIS modeling was used to predict Osgood Mountain milkvetch potential habitat on the Santa Rosa Ranger District using parameters of elevation, slope, and geology to predict suitable habitat with the analysis area. There are approximately 4,468 acres of potential habitat in the project area and 6,725 acres on the District.

Threats include mining, road maintenance and off-road vehicle use, trampling by livestock and feral animals, and competition from invasive weeds (Barneby 1989, Morefield 2001).

Obscured scorpion plant

Inconspicuous phacelia is a Region 4 Sensitive Species and is listed as a Fully Protected Species in Nevada (NRS 527.01). It is an erect stemmed annual up to 8 inches (8 - 20 cm) tall blooming May to July. It is found in the Humboldt Mountains, Pershing County, Nevada and the Snake River Plains of Blaine and Butte Counties, Idaho. The fact that there is considerable distance between the two known locations of Obscured scorpion plant suggests that this taxon may be more widely distributed (Holland 1996, Mozingo and Williams 1980). It is small and not easily detected in the field. The elevation range is between 5,000 – 8,360 feet.

In Nevada, obscured scorpion plant is restricted to sandy, small, nearly unvegetated terraces of mountain big sage *(Artemisia. tridentata* ssp. *vasyana)* sagebrush in association with ocean spray (*Holodiscus microphyllus*), roundleaf snowberry (*Symphoricarpos rotundifolius*), and basin wildrye (*Leymus cinereus*) usually surrounded by low sagebrush *(Artemisia arbuscula)*. The species is found in deep organic-rich soils on steep to very steep, north or northeast facing concave slopes which receive enhanced ground water, surface runoff and slope wash from persistent snow drifts upslope which provide seasonal soil saturation and somewhat enhance the soil moisture throughout the year (Holland, 1996). The obscured scorpion plant is found in microsites that lack soil cover in small clearings among the shrubs and beneath shrubs where it can locally dominate the herbaceous understory. In Idaho, the habitat is also described as toe-slopes immediately above ephemerally moist drainages and within chokecherry (*Prunus virginiana)* dominated communities, mountain big sagebrush/bluebunch wheatgrass (*Artemisia tridentata* ssp. *vaseyana*/P*seudoroegneria spicata*), and the edges of aspen/mountain snowberry (*Populus tremuloides/Symphoricarpos oreophilus)* communities (IFG, 2003). The soil type ranges from early Mesozoic limestone to quaternary and late tertiary rhyolite or basalt in Nevada (Holland, 1996) and volcanic substrates in Idaho (IFG, 2003).

Formal surveys have not been conducted in the Santa Rosa Ranger District although potential habitat may exist. Holland (1996) states the suitable stands of mountain big sagebrush exists in most of the higher ranges of central and northern Nevada. GIS modeling was used to predict obscure scorpion plant's potential habitat on the Santa Rosa Ranger District using parameters of elevation, slope, aspect, and dominant vegetation. There are approximately 47,250 acres of potential habitat in the project area with approximately 76,700 in the District although there are currently no known locations in the analysis area.

Observations suggest that obscure scorpion plant is an early- to mid-seral species that is fire adapted (Holland, 1996). Although obscure scorpion plant appears to require periodic disturbance by fire to regenerate its populations, the species does not appear capable of colonizing disturbed soil such as tailing piles and road cuts in its habitat. The plant is also not capable of colonizing undisturbed soil in other habitat types. Holland (1996) suggests obscure scorpion plant may not tolerate much soil disturbance, but Moseley (1989) reports that the microsites are unstable due to the steep slopes with volcanic substrates. In Idaho, the species is reported associated with game trails, old cattle trails, and gopher diggings (IFG, 2003). The habitat of one Idaho population is reported to occur near livestock watering and two other sites may have been heavily grazed in the past as indicated by low cover of the native bunch grasses (Moseley, 1989).

Rare Plant Species:

Cusick's giant hyssop

Cusick's giant hyssop is a rare species found in the project area (R1 Forest Service Sensitive Species) found in Nevada (S2- imperiled), Montana (S1-critically imperiled), Oregon (S2-imperiled), and ID (reported) (NatureServe, 2003). It is a herbaceous, long-lived perennial arising from a branched root crown with stems often prostrate beneath the surface spreading from the root crown. It flowers in late June – early July. In Nevada, the species range occurs in the Humboldt and Lander Counties in the Santa Rosa and Austin Ranger Districts. The habitat is dry, open, limestone talus slopes, often with sagebrush, western juniper, aspen, or mountain mahogany in the montane zone from 5,000-11,020 feet (Cronquist, 1984 MTNHP, 2003). There is one known population in the analysis area on dry, rocky slopes.

Lonesome milkvetch

Lonesome milkvetch is considered to be a USFWS "Species of Concern" for Oregon and Nevada. Lonesome milkvetch is a perennial herb that grows from a buried root crown and flowers from May to early June. It is found in bluffs, washes, and rolling plants and banks of shallow soils on gray volcanic tuff or diatomaceous clay soils with little sagebrush (*Artemisia arbuscula),* big sagebrush *(A. tridentata),* littleleaf horsebrush *(Tetradymia glabrata),* Sandberg bluegrass *(Poa secunda),* shadscale saltbush *(Atriplex confertifolia),* and

rubber rabbitbrush *(Ericameria nauseous)* from 3,115-5,200 feet (Cronquist 1984, Morefield 2001). The individual plants are nearly always under and "entangled in sagebrush (Mozingo and Williams 1980). No known locations are found in the project area or on the Santa Rosa Ranger District. Potential habitat would be limited on the Santa Rosa Ranger District.

SOCIO-ECONOMIC FACTORS

Livestock grazing is recognized as an important multiple use on the Santa Rosa Ranger District. Historically, livestock grazing permits were issued after the establishment of the NFS, but not before thousands of sheep, cattle and horses grazed the range to very poor condition. Sheep bands entered the area from California in the late 1880s, looking for productive range. However, with great concern by the local ranchers, in the spring of 1912, livestock grazing permits were issued and the permit system was in effect (Wilcox, 1967).

Prior to the establishment of the Santa Rosa National Forest in 1911, the Humboldt County Assessor's Office records indicated there were 16,000 cattle, 1,500 horses, and 150,000 sheep grazing the Santa Rosas. The grazing permits issued in 1912 included sixty-two permittees holding either a term or temporary permits for 13,585 cattle, 67,050 sheep and 1,051 horses. In addition, private land permits for 1,009 cattle, and 4,541 sheep were issued to twelve individuals. By 1920, grazing allotments were established and stocking rates were reconsidered due to the poor condition of the range. Great quantities of top soil were lost from trampling and wind erosion and many dominant plant species disappeared from the range. Through voluntary and forced reductions, permitted numbers were reduced to 12,000 cattle and 30 horses. The last sheep permit was exchanged in 1960 for a cattle permit (Wilcox, 1967).

Intensive management was initiated on the Santa Rosa Ranger District with "rest rotation" and deferred rotation grazing systems implemented in the late 1960's and early 1970's.

The project area contains eight (8) allotments of which two are currently vacant. There are 12 permitees with permits to graze 5,305 head of cattle and 25 horses. There are no sheep permits. The grazing season is generally from May 31 through September 30. Current livestock management is summarized in the following table and discussed in more detail by allotment.

Table 24-T: Current Livestock Management

Allotments	Acres	Grazing System	Season of Use	Permitted Numbers	Head Months
Martin Basin	33,677	DR	6/06-9/27	1,935 C/C + 25 H	7,353 (95 H)
Indian	18,111	RR	6/16-9/30	301 C/C	1,074
West Side Flat Creek	20,112	RR	6/01-8/25	461 C/C	1,322
Buffalo	21,021	RR/SL	6/16-8/31	255 C/C	631
Bradshaw	3,471	Vacant	Vacant	Vacant	Vacant
Buttermilk	36,811	RR	5/22-9/30	1,303 C/C	5,655
Granite Peak	37,357	RR	5/21-9/30	1,050 C/C	4,655
Rebel Creek	20,349	Vacant	Vacant	Vacant	Vacant
Total	190,909	N/A	N/A	5,305 C/C + 25 H	20,639 C/C (95 H)

Notes DR = Deferred Rotation SL = Season Long RR = Rest Rotation
C/C = Cow/Calf H – Horse(s) Crk = Creek

The entire project area lies within Humboldt County which has an estimated population of 16,159 (National Association of Counties, 2004). The largest part of Humboldt County's economy comes from mining, with agriculture, services, government and tourism also playing large roles. In 1999, 24.6% of the population listed agriculture, forestry fishing, hunting, and mining as the industry of their employment (U.S. Census Bureau, Census 2000)