Environmental Assessment
Churchill Canyon Grazing Allotment
EA-NV-030-08-24

U.S. Department of the Interior
Bureau of Land Management
Carson City Field Office
5665 Morgan Mill Road
Carson City, NV 89701

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I. INTRODUCTION/PURPOSE AND NEED

A. Introduction

The Churchill Canyon Grazing Allotment is located approximately twenty miles southeast of Carson City, Nevada and is within the Jurisdictional Boundary of the Carson City Field Office (CCFO) of the Bureau of Land Management (BLM). The grazing Allotment is located on the east side of the Pine Nut Mountains in Lyon and Douglas counties. The allotment encompasses approximately 47,826 acres (Map on Page 6) of BLM managed land. The BLM is currently considering the renewal of the term livestock grazing permit for this Allotment.

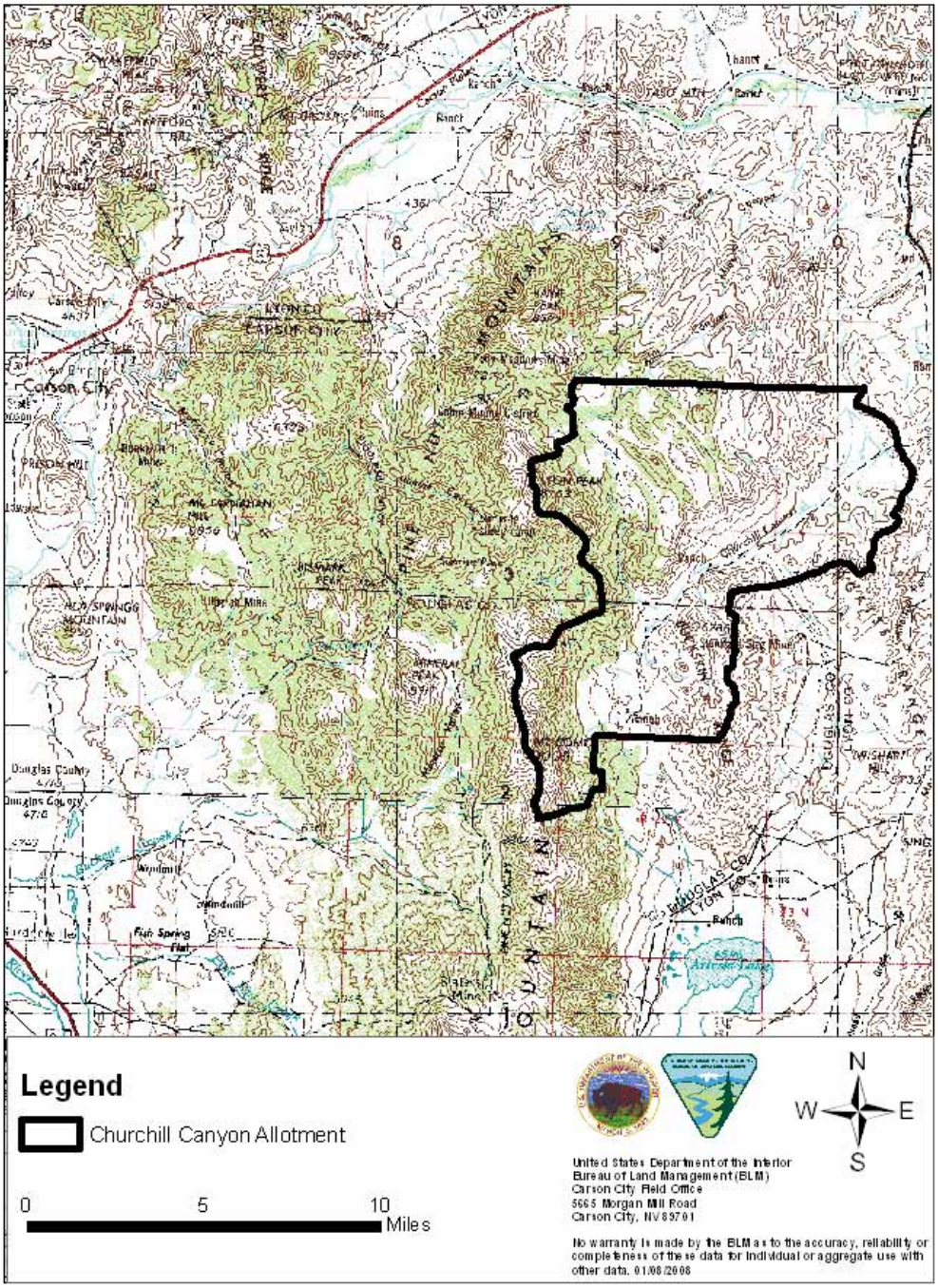
This environmental assessment (EA) analyzes the environmental impacts associated with each of the livestock management alternatives currently being considered for the Churchill Canyon Allotment. There are six management options presently under consideration. The first option is to authorize cattle grazing but reduce the number of Animal Unit Months (AUMs) and shorten the grazing season. The second option is to not authorize livestock grazing within the allotment at this time. The third option is to authorize cattle grazing and continue with current management (no action). The fourth option is to authorize cattle grazing, continue with current livestock numbers and season of use but modify the terms and conditions of the grazing permit and construct range improvements. The fifth and sixths options are to authorize cattle grazing and increase permitted livestock use and lengthen the grazing season. There is a summary table of alternatives on page 10 of this document.

B. Purpose and Need

The purpose of the proposed action is to authorize the issuance of a Term Grazing Permit for the Churchill Canyon Allotment consistent with the attainment of site specific objectives found in the Carson City Field Office (CCFO) Consolidated Resource Management Plan (CRMP), and implement livestock grazing practices that will ensure compliance with the approved Standards for Rangeland Health & Guidelines for Grazing Management (S&Gs), Sierra Front Northwestern Great Basin Area. Management of grazing will come through the issuance of a grazing permit which will provide the parameters and guidelines for management of the range resources on the Allotment. Proper management will result in improved range condition throughout the area.

These actions are needed at this time because:

1) The condition of natural resources on the Allotment was evaluated in 2007 and grazing management needs to be updated at this time through a fully processed grazing permit.
2) The BLM Managed Lands within the Allotment were identified as available for livestock grazing in the CCFO CRMP, and continued livestock grazing is consistent with the goals, objectives, standards and guidelines identified in the CRMP.
3) Where consistent with other multiple use goals and objectives, there is a congressional intent to allow grazing on BLM Managed Lands. This is evidenced by the Taylor Grazing Act of 1934 (as amended), the Federal Land Policy and Management Act of 1976, the Public Rangelands Improvement Act of 1978, and the approved Standards and Guidelines of 1997, as well as various other federal laws and regulations.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C. Land Use Plan Conformance Statement

The proposed action and four of the alternatives described in this document are in conformance with the Carson City Field Office-CRMP desired outcomes. The Increase in Livestock Use and Extend the Grazing Season of Use Alternative is not in conformance with the CRMP. The alternative was not eliminated from the document because it reflects the grazing application which was submitted in December 2007. The desired outcomes for livestock grazing are found on page LSG-1 and are as follows:

1. Maintain or improve the condition of the public rangelands to enhance productivity for all rangeland and watershed values.
2. Initially, manage livestock use at existing levels.
3. Provide adequate, high quality forage for livestock by improving rangeland condition.
4. Improve overall range administration.

The Land Use Plan identified the lands within the Churchill Canyon Allotment available for livestock grazing.

The following activity plan(s) apply to the geographic area of the proposed action and alternatives: Pine Nut Habitat Management Plan.

Additional Guidance: Standards and Guidelines (S&Gs) for Nevada's Sierra Front-Northwestern Great Basin Area (2003).

II. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action - Reduction in Livestock Use (AUMs) and Season of Use

Under this alternative, the BLM would issue a term grazing permit for 180 Cattle between 11/01-03/15 for 800 AUMs. The terms and conditions of the grazing permit would include maximum use levels on key species and maximum stocking levels by pasture. Maintain the utilization standard not to exceed 55% on key perennial plant species. This existing use standard applies to livestock and wild horses. Therefore, within the wild horse herd management area (HMA) livestock use shall not exceed 27.5% and outside of the HMA livestock use shall not exceed 55% on key perennial plant species. The maximum stocking levels by pasture would be: Sario Well (400 AUMs), Buckskins (250 AUMs), Como Burn (100 AUMs), Sunrise Burn (150 AUMs), Big Meadow (50 AUMs), and Como pasture (224 AUMs).

Fences and corrals wouldn’t be built under this alternative.

Based on the Grazing Allotment Evaluation Western Watersheds Project (WWP) requested reduced grazing alternatives be considered. The primary issue was management of habitat for sagebrush obligate species. This alternative addresses the identified issue.

B. No Livestock Grazing Alternative

Under the no grazing alternative, the BLM would not renew the term grazing permit for the Churchill Canyon Allotment. No livestock would be authorized on BLM managed lands within the Allotment at this time.

Fences and corrals wouldn't be built under this alternative.

This alternative is the baseline for environmental impacts. What would happen if livestock grazing were not permitted.

C. No Action Alternative - No Change in the Current Livestock Grazing Permit

Permitted livestock use in the Churchill Canyon Allotment would continue to be 166 cattle between 11/01-05/15 for a total of 1,074 AUMs. As part of the terms and conditions of the grazing permit utilization standards would be maintained and would be the same as those described in Alternative A.

Fences and corrals wouldn't be built under this alternative.

No action alternative. What would happen if livestock grazing occurred as permitted.

D. Modified Permit Terms and Conditions & Construction of Range Improvements

Permitted livestock use in the Churchill Canyon Allotment would continue to be 166 cattle between 11/01-05/15 for a total of 1,074 AUMs. The terms and conditions of the grazing permit would include maximum use levels on key species, maximum stocking levels by pasture and a rest rotation management system. Utilization standards would be the same as those described in Alternative A. The maximum stocking levels by pasture would be: Sario Well (350 AUMs), Buckskins (200 AUMs), Como Burn (100 AUMs), Sunrise Burn (150 AUMs), Big Meadow (50 AUMs), and Como pasture (224 AUMs).

Rest Rotation Management System:

Sario Well Pasture	11/01-03/01	Limited to Dormant Season Grazing
JW Ranch Pastures	11/01-03/01	Graze in Any JW Pasture During Plant Dormancy
Buckskin Pasture	03/01-04/01	Rotate Grazing Pattern
Sunrise Burn	03/15-05/15	Graze Odd # Years – Rest Even # Years
Como Burn	03/15-05/15	Rest Odd # Years – Graze Even # Years
Como Pasture	03/15-05/15	Rotate Grazing Pattern

Under this alternative approximately three miles of barbwire fence (maps on pages 11-12) would also be authorized. The purpose of the fencing would be to increase livestock control. The proposed fencing in the Sario Well pasture includes extending a drift fence near the allotment boundary. The proposed fencing in the JW Ranch pasture includes two small holding corrals along the northern pasture boundary, and expanding the Big Meadow riparian pasture. Fencing would consist of three strands of barbed wire and one smooth bottom wire. The fence would comply with BLM wildlife fence standards (type B antelope). The wire spacing for the wildlife standard is 16", 22", 30" and 42" and 16 1/2' spacing between T-posts. Construction would be contingent upon funding, policy, manpower, and issue mitigation.

Modified permit terms and conditions reflect BLM recommendations from the allotment evaluation along with input from the livestock operator. The fencing was requested by the livestock operator to enhance livestock control and management.

E. Historic Livestock Use (AUMs) & Modified Management

Under the historic grazing alternative, the BLM would issue a term grazing permit for 180 Cattle between 11/01-05/31 for 1,255 AUMs. The terms and conditions of the grazing permit would include maximum use levels on key species, maximum stocking levels by pasture and a rest rotation management system. Utilization standards would be the same as those described in Alternative A. The maximum stocking levels by pasture would be: Sario Well (400 AUMs), Buckskins (250 AUMs), Como Burn (150 AUMs), Sunrise Burn (200 AUMs), Big Meadow (55 AUMs), and Como pasture (200 AUMs). The Rest Rotation Management System would be the same as that described in Alternative D.

Fences and corrals wouldn't be built under this alternative.

Between 1993 and 1997 the permittee had a BLM grazing permit for 1,074 AUM's and a season of use from 11/01 till 05/15. The permittee also leased private lands within the grazing allotment. Livestock would leave BLM managed lands on 05/15 and graze on private lands until 05/31. The BLM acquired the private lands within the allotment in 1997. Livestock have been allowed to utilize the acquired lands but the BLM did not extend the season of use nor add AUMs to the grazing permit. This alternative was requested by the livestock operator in April of 2008.

F. Increase Livestock Use and Extend the Grazing Season of Use

Under this alternative, the BLM would issue a term grazing permit for 280 Cattle between 11/01-05/31 for 1,961 AUMs.

Fences and corrals wouldn't be built under this alternative.

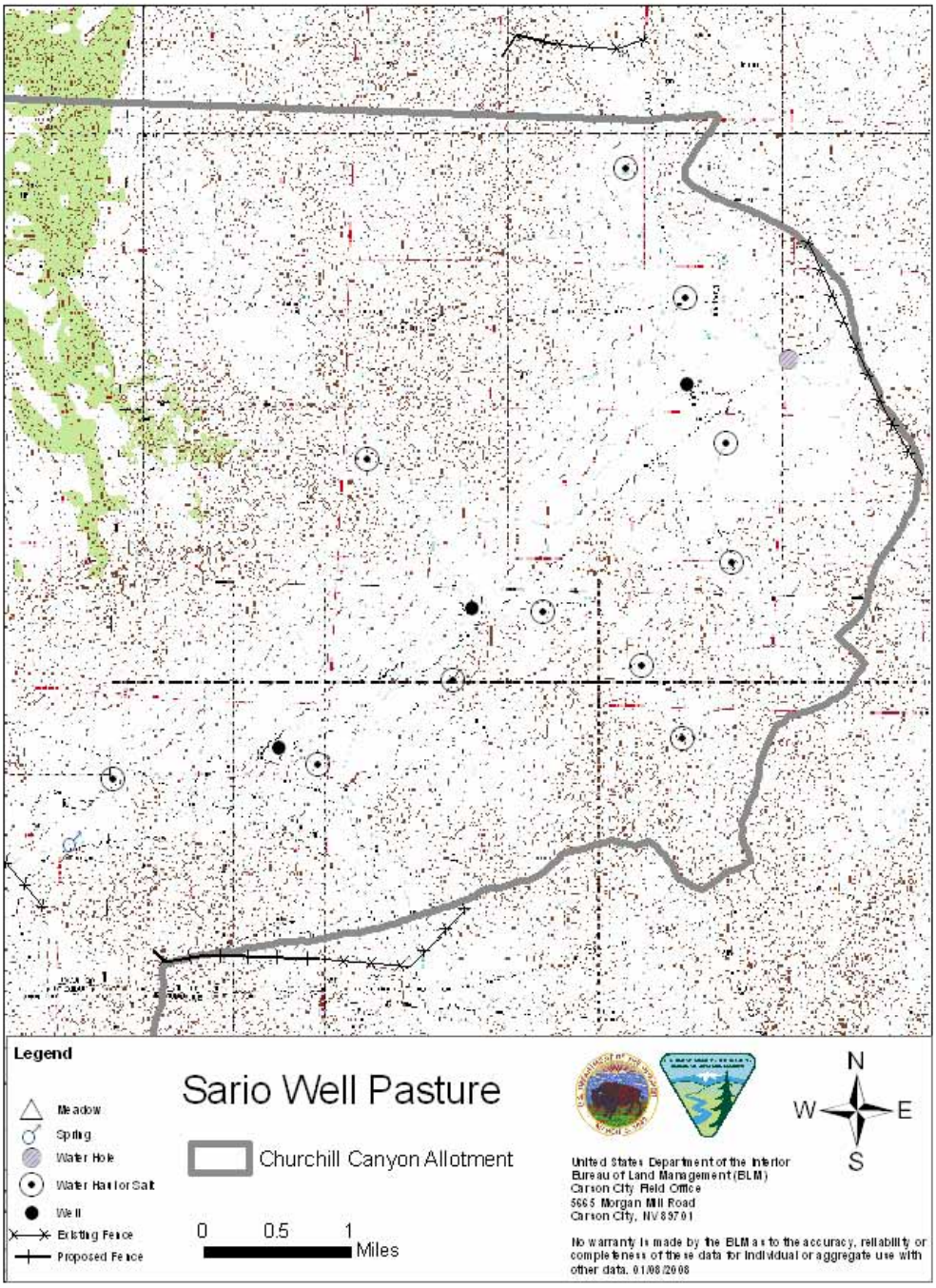
An application for grazing permit renewal was received on December 18, 2007. The application was submitted prior to the allotment evaluation being available for public review and was based on potential forage availability as listed in EA-NV-030-00-013 prepared in 2000.

Based on actual livestock use and vegetation monitoring data summarized in Appendices C & D, this alternative would not improve the condition of rangeland resources as provided for by various federal acts and in the CCFO CRMP 2001.

Summary of Alternatives	Livestock Number	Livestock Type	Season of Use	AUMs	Range Improvements	Utilization Standards	Stocking Levels by Pasture	Rest Rotation System
A. Proposed Action – Reduction in Livestock Use (AUMs) & Season of Use	180	Cattle	11/01-03/15	800	None	Yes	Yes	No
B. No Livestock Grazing	None	None	None	None	None	NA	NA	NA
C. No Action	166	Cattle	11/01-05/15	1,074	None	Yes	No	No
D. Modified Permit Terms and Conditions & Range Improvements	166	Cattle	11/01-05/15	1,074	Three miles of Fence	Yes	Yes	Yes
E. Historic Livestock Use & Modified Management	180	Cattle	11/01-05/31	1,255	None	Yes	Yes	Yes
F. Increase AUMs & Season of Use	280	Cattle	11/01-05/31	1,961	None	No	No	No

G. Alternatives Considered but Eliminated from Detailed Analysis

Three grazing alternatives were considered but eliminated from further analysis. Western Watersheds Project (WWP) requested alternatives that would analyze 50% & 75% reductions in livestock numbers. These alternatives were dismissed from further analysis because they fall within the range of analysis within the EA. The third alternative was requested by the livestock operator and consisted of 190 Cattle from 11/01 till 05/20 for 1,255 AUMs. This alternative was also dismissed from further analysis because it falls within the range analysis and is not substantially different from the historic livestock use alternative. In addition the livestock operator also requested two miles of fencing along the southern allotment boundary in the JW Ranch Pasture which was not included in the range improvement alternative. The BLM did not have the time and resources to complete the field work necessary to analyze the project in this EA. The proposed boundary fence extension is neither integral to the permit renewal process nor necessary to mitigate grazing impacts so it was dropped from the proposal.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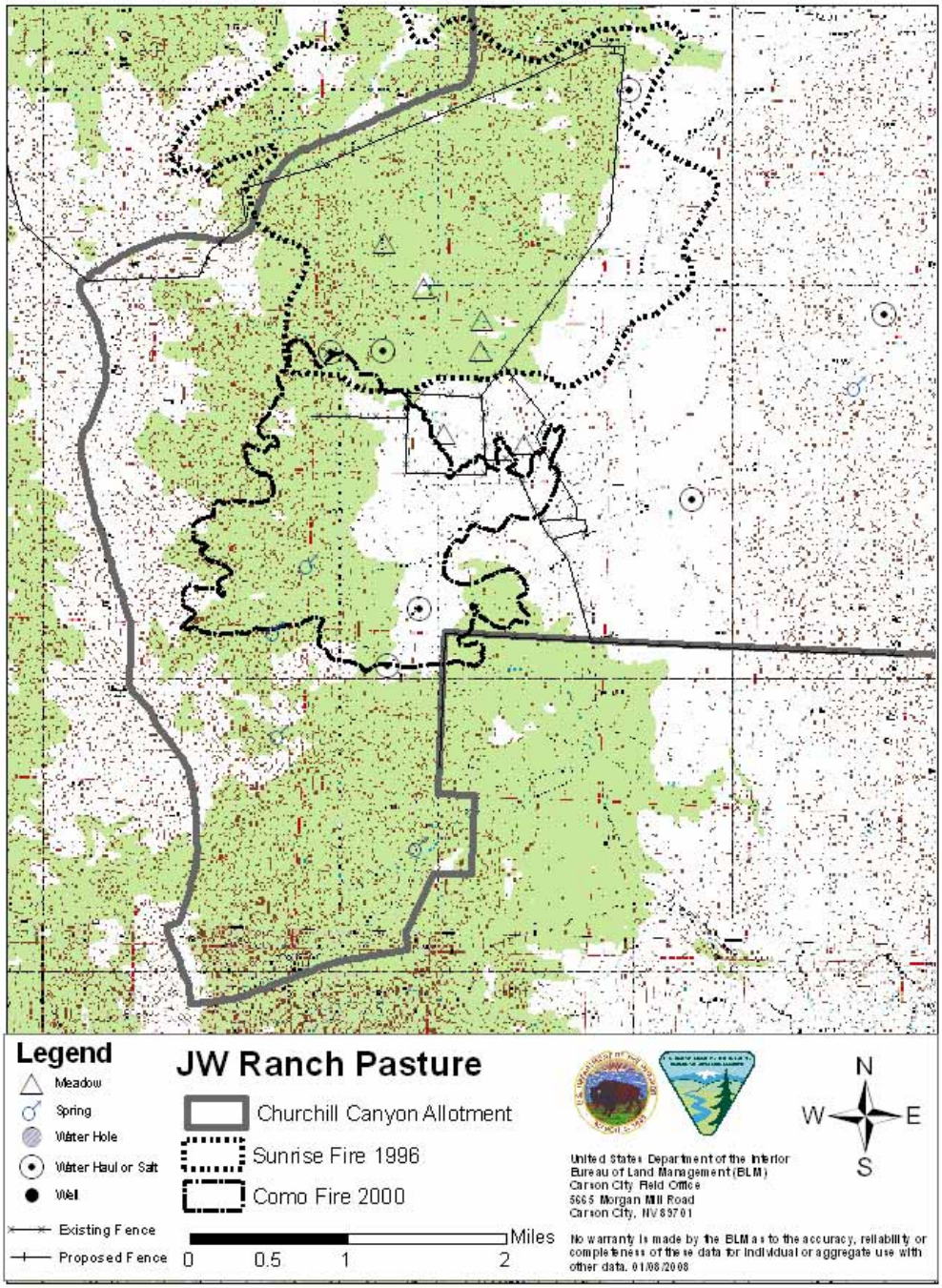
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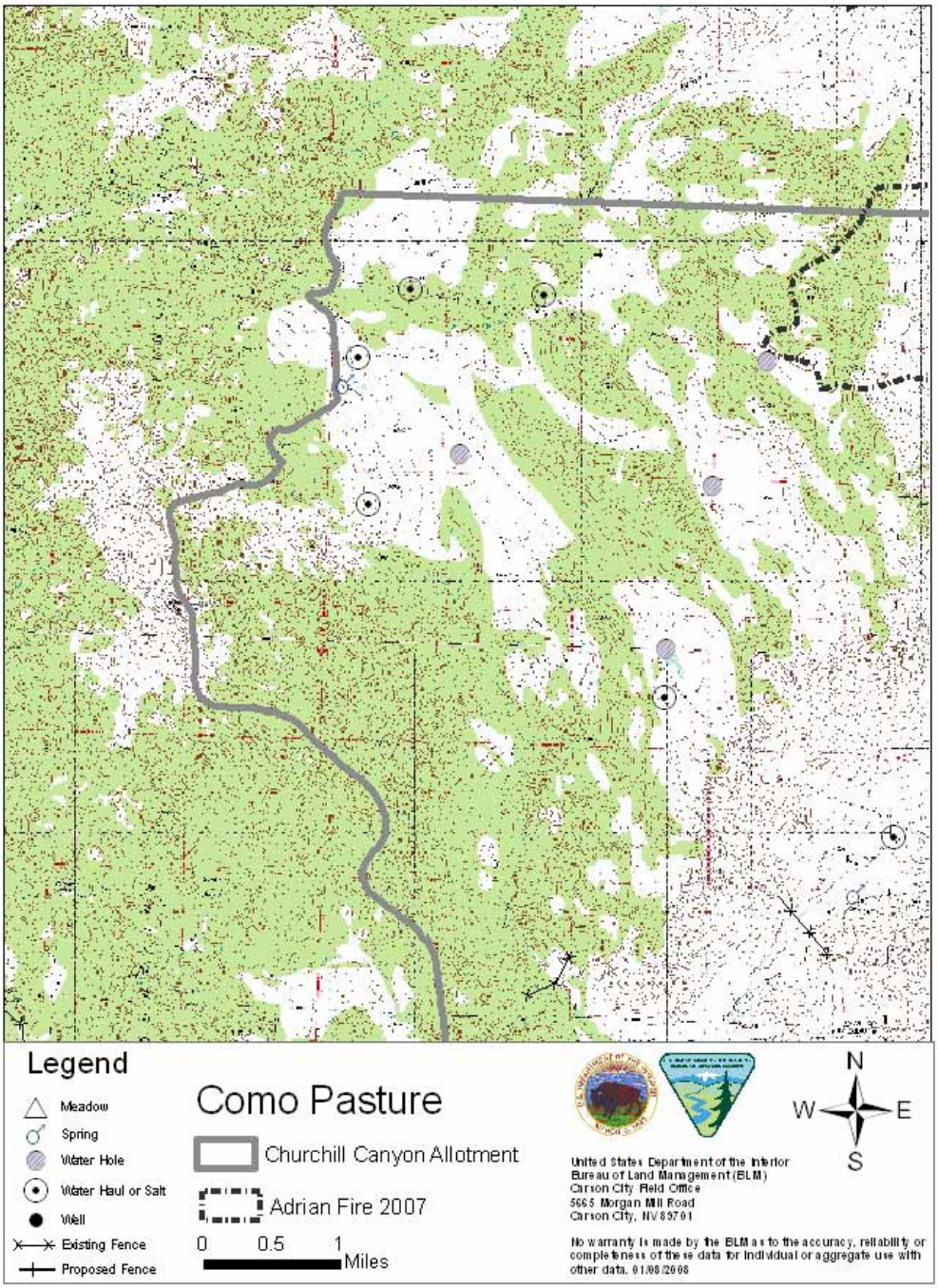
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III. AFFECTED ENVIRONMENT

A. SCOPING AND ISSUE IDENTIFICATION

On November 6, 2007, a scoping letter was sent to the interested public to identify those individuals and organizations interested in specific actions on specific Allotments under the jurisdiction of the CCFO. The purpose of this scoping letter was to gather information and determine who would be further interested in participating in actions pertinent to specific Allotments.

Standard operating procedures direct the BLM to supply the State Clearinghouse with a copy of this document for distribution amongst State Agencies. In addition, copies will be sent to the following entities: Permittee of Record Churchill Canyon Allotment; Resource Concepts, Inc.; Western Watersheds Project; Friends of Nevada Wilderness.

Internal Scoping Also Identified the Following List of Groups to be Notified:
Yerington Paiute Tribe.

B. PROPOSED ACTION

1. General Setting

The Churchill Canyon allotment is located southeast of Carson City, Nevada and encompasses approximately 47,826 acres on the east side of the Pine Nut Mountain Range. Elevations within the Churchill Canyon allotment range from approximately 4,700 feet along the Churchill Canyon drainage in the northeast to over 9,000 feet on Mt. Como in the southwest portion of the allotment.

Major plant communities are salt desert shrub, low sagebrush, Wyoming sagebrush and pinyon-juiper woodlands.

2. Critical Elements of the Human Environment

The following critical elements are not present or would not be affected by the Proposed Action, or the Alternatives: Air Quality, Areas of Critical Environmental Concern, Environmental Justice, Prime or Unique Farmlands, Floodplains, Hazardous or Solid Wastes, Native American Religious Concerns, Wild and Scenic Rivers, Wilderness.

For those critical elements that are present but were not brought forward for analysis, opting for either the proposed action or alternatives would not affect these resources. Explanations as to why are as follows.

Native American Religious Concerns
A consultation letter was sent to the Yerington Paiute Tribe on June 26, 2006, concerning the permit renewal for the Churchill Canyon Grazing Permit Renewal. During a face to

face meeting with the NAGPRA committee member on October 26, 2006, a request was made to review the location for concerns. On January 26, 2007 a second telephone call was made concerning the grazing permit renewal, no comments or concerns were stated for this renewal.

Any proposed improvements that may potentially have an effect on tribal concerns. Per 36 CFR Part 800 and 43 CFR Part 8100 (BLM), as amended, BLM would conduct Native American coordination and consultation, as necessary.

3. Resources Present but not Affected (other than critical elements)

Bureau specialists have further determined that the following resources, although present in the project area, are not affected by the proposed action, or alternatives: Recreation

Within Churchill Canyon allotment dispersed, casual recreational use occurs that generally consists of motorcycle riding, off-highway vehicle driving, rock hounding, hunting, wildlife viewing and to a lesser, degree, hiking. In terms of intensity, these activities range from limited to moderate. Use occurs year round, however; most of the dispersed use occurs in the spring and fall months.

A spring and fall Off-highway vehicle (OHV) event is typically permitted each year that utilize roads in the Singatse Range, Lincoln Flat and Churchill Canyon areas. Each event typically attracts up to 50-60 race participants.

The implementation of the proposed action or alternatives would have no potential to affect the recreation resources and uses in the project area.

4. Resources Present and Brought Forward for Analysis

Range

The permitted use within the Churchill Canyon Allotment is 166 cattle during the period 11/01-05/15 for a total of 1,074 Animal Unit Months (AUMs). The percent federal range within the allotment is 100% and 1,074 is the full active grazing preference.

However, actual livestock use has differed from permitted use. The livestock use period has typically been extended until May 31st. In an effort to evaluate a higher stocking rate, stocking has also exceeded 1,074 AUMs. These deviations from the grazing permit are documented in the actual livestock use section in Appendix C. Between 1993 and 1997 the permittee had a BLM grazing permit for 1,074 AUM’s and a season of use from 11/01 till 05/15. The permittee also leased private lands within the grazing allotment. Livestock would leave BLM managed lands on 05/15 and graze on private lands until 05/31. The BLM acquired the private lands within the allotment in 1997. Livestock have been allowed to utilize the acquired lands but the BLM did not extend the season of use nor add AUMs to the grazing permit. A final decision issued in 2003 (06-30-03), implemented the following: 1) Maintain the permitted stocking rate at 1,074 AUM's and provide for the possibility of a temporary increase in stocking rate up to a maximum of 883 additional AUM's each year, for the next five grazing seasons, based on certain requirements. These requirements are that the excess forage (over and above 1,074 AUM's)

must be verified by BLM range specialists each year that temporary non-renewable (TNR) use is applied for, and range condition on the allotment must be such that additional grazing will not cause a deterioration in such condition. The excess forage so verified must be in locations that the permittee has demonstrated are usable by his livestock under conditions existing on the allotment at that time. The construction of specific range improvements designed to increase livestock distribution were authorized along with a rotational grazing system and a fifteen day extension of the grazing season. The use of additional AUM's was authorized between 2003-2007.

The Churchill Canyon Allotment can be split into three general management areas.
The northeast portion of the allotment also known as the Sario Well Pasture is at the lowest elevation. The average elevation is around 5,000 feet. The main water sources include three wells in the bottom of the Churchill Canyon drainage. There are drift fences along the northern, eastern and southern allotment boundaries. There is also a drift fence in Churchill Canyon which separates this portion of the allotment from the southern portion of the allotment. There is a map on page 11 to accompany this description of the pasture.

The southern portion of the allotment also known as the JW Ranch pasture, contains the mid elevation pastures for the allotment. The average elevation is around 6,000 feet. Main water sources in this portion of the allotment consist of several springs and meadows. There are drift fences along the northern and southern allotment boundaries. This portion of the allotment is also cross fenced which divides the area into five separate management units, upper spring gulch, como burn, sunrise burn, big meadow and the buckskins (Map on Page 12).

The northwest portion of the allotment also known as the Como Pasture is at the highest elevation. The average elevation is around 6,500 feet. The main water sources include winter accumulation of precipitation in three dry lake plays and one dugout pond. There is also a small spring (Mud Spring). With the exception of a small drift fence on the back country byway road there in no fencing within this portion of the allotment (Map on Page 13).

Vegetation

A mosaic of plant communities are present within the Churchill Canyon allotment. Major plant communities within the Allotment include salt desert shrub, riparian, sagebrush (low, and Wyoming) and pinyon-juniper woodlands. The major perennial grass species found on the Churchill Canyon Allotment are Indian ricegrass (*Achnatherum hymenoides*), Thurber's needlegrass (*Achnatherum thurberianum*), desert needlegrass (*Achnatherum speciosum*), bottlebrush squirreltail (*Elymus elymoides*), Basin wildrye (*Leymus cinereus*), and Sandberg bluegrass (*Poa secunda*). The major shrub species found on the Allotment are big sagebrush (*Artemisia tridentata*), low sagebrush (*Artemisia arbuscula*), Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*), Bailey greasewood (*Sarcobatus vermiculatus* var. *baileyi*), fourwing saltbush (*Atriplex canescens*), shadscale (*Atriplex confertifolia*), bud sagebrush (*Artemisia spinescens*), green rabbitbrush (*Chrysothamnus viscidiflorus*), and antelope bitterbrush (*Purshia tridentata*). The major tree species found on the allotment are Utah juniper (*Juniperus osteosperma*) and singleleaf pinyon pine (*Pinus monophylla*). The invasive plant cheatgrass (*Bromus tectorum*) is common on the allotment especially in areas that burned recently.

With the exception of the burn areas in the JW Ranch pasture (Sunrise & Como), which are dominated by annual vegetation, the dominant plants within the allotment are tree and shrub species. In comparison to potential plant communities as described by the natural resource conservation service, perennial grass and forb densities are much lower than the density that would be required to meet the production levels described in the ecological site descriptions. There are also fewer key plant species than would be expected based on site potential.

Utilization refers to the proportion (usually percentage) of the current years forage production that is consumed and or trampled by grazing animals. Recommended utilization levels depend upon how fully each forage species in the plant community can be defoliated and still maintain or improve in vigor. Proper use refers to the maximum degree of use by grazing, expressed as a percent deemed to be physiologically correct from the standpoint of plant vigor, reproduction, longevity and regrowth potential. The utilization goal within the Churchill Canyon Allotment was moderate (41%-60%) or lower utilization of key plant species. Utilization for the allotment is summarized here and discussed in detail in Appendix D.

Data on livestock use of key perennial plant species in the Sario Well pasture was collected at the end of ten grazing seasons and prior to the start of one grazing season. Livestock use typically occurred within this pasture between December 1 to March 15. The majority of the livestock grazing use has occurred on the level and gently sloping terrain in the valley bottom (Churchill Canyon) within a mile of the water wells. Livestock use is much lower on the side slopes in comparison to the valley bottoms. The management goal of moderate (41%-60%), to below moderate use of key perennial plant species was met four times. Use goals were not met during the other seven grazing seasons due to heavy utilization levels in the valley bottom. During three out of the four seasons when utilization goals were met the pasture received above average precipitation levels, forage production was above average and the livestock stocking rate was increased. The remaining one season when livestock utilization levels were met the pasture received below average precipitation levels but there was an average abundance of forage; livestock stocking rates were reduced and the pasture had been rested the previous season.

During the first grazing season utilization goals were not met but this is not surprising since the cattle were new to the allotment and the area had not been grazed for several years. As livestock become familiar with new surroundings distribution usually improves and when dead biomass is removed and new shoots begin to grow forage becomes more palatable. During five of the seasons when use goals were not met there were back to back years when over utilization occurred. Little to no plant re-growth occurred after the first grazing season and over utilization occurred again the next season. Livestock stocking rates for these years for the allotment was close to permitted use. The remaining year when livestock utilization goals were not met there was an average amount of forage at the start of the grazing season but the livestock stocking rate (699 AUMs) was too high for the amount of available forage in livestock use areas.

Livestock use has typically occurred within the southern portion of the allotment (JW ranch pasture), between November 1 and May 31. Data on livestock use of key perennial plant species in the JW Ranch pasture was collected at the end of ten grazing seasons and prior to the start of one grazing season.

Seven years of use data were collected in the Buckskin Range. The management goal of moderate (41%-60%), to below moderate use of key perennial plant species was met three times. Use goals were not met during the other four grazing seasons due to heavy utilization levels in the canyon bottoms. During one of the seasons when utilization goals were met the pasture received above average precipitation levels, forage production was above average and livestock stocking rate was increased. The remaining two seasons when livestock utilization levels were met the pasture received below average precipitation levels but there was an average abundance of forage; livestock utilized between 197-240 AUMs of forage.

Utilization goals were not met in the Buckskin range during the first grazing season. During one season, use goals were not met due to little plant re-growth after the previous grazing season. The remaining two years when livestock utilization goals were not met there was an average amount of forage at the start of the grazing season but the livestock stocking rate was too high (353 AUMs) for the amount of available forage in the useable grazing areas.

Eight years of use data were collected on various portions of the eastern slope of the Pine Nut Range. In general the utilization goal of moderate (41%-60%), to below moderate use of key perennial plant species was met for the uplands during seven out of eight years. During four out of the eight years the riparian meadows were over utilized. During one year utilization goals were not met on the lower slopes of the Como burn at a stocking rate of 211 AUMS during March to May. Utilization goals were not met for meadows within the Sunrise burn at a stocking rate of 351 AUMs during November to December. However, utilization goals were met at a stocking rates 163-202 AUMs during April and May.

Livestock use has typically occurred within the northwestern portion of the allotment (Como pasture), between March 1 and May 15. The pasture was closed to cattle grazing during the 2007-2008. This pasture can only be utilized in years when sufficient winter moisture is received to fill the dry lakes and dugout tank. Utilization data was collected during five years and utilization goals were met during each year data was collected. At a stocking rate of 186 AUMs utilization goals were met.

Trend is a determination of the direction of change in the current plant community and associated soils in relation to management goals. The trend within plant communities between 1994-2000 was static to upward. The current trend (2000-2007) for plant communities within the Churchill Canyon Allotment is primarily static to downward. The photo trend plots indicate a static to downward trend due to an uneven age class distribution within the plant communities. Mature plants are dying out and there is a scarcity of young perennial replacement plants. The frequency data also indicates a downward trend. The frequency of perennial plant species significantly declined between 2000 and 2007. The exception to this decline was an increase of Bottlebrush squirreltail at Key Area #2, which is not a positive trend. Squirreltail is considered an increaser species meaning it is less palatable to cattle than the key plant species which receive higher grazing use. Higher grazing use of key species reduces the competitive abilities of the key species within the plant community in comparison to less palatable increaser species. Under these conditions the frequency of less favorable species increases while the frequency of desired key species declines. The exception to overall downward vegetative trend within the allotment is

the Como burn. Vegetative trend within the burn is slightly upward due to marginal new plant establishment following the fire; however, there is also evidence of soil erosion.

Wetlands/Riparian Zones

Eighteen separate riparian areas were assessed on the Churchill Canyon allotment between June 5 and June 21, 2007. Other riparian areas on the allotment were not assessed because of difficult access and a low likelihood of impacts. Table 1 provides some basic data for each location, and Table 2 summarizes the 2007 condition ratings for all assessed sites. Table 3 compares 2007 ratings with ratings based on assessments performed in 2000.

Tables 1 and 2 show overall ratings were generally positive. Thirty-eight percent of lentic areas were in proper functioning condition (PFC) or functional-at-risk in an upward trend (FAR-UP). Fifty-six percent were functional-at-risk in an unknown trend (FAR-?), which primarily reflects the rating of 62 acres in the Big Meadow exclosure. Big Meadow had many characteristics of a properly functioning system, but also had some severe localized hoof impacts around springs. In addition, desirable forbs were lacking while undesirable species, such as wild iris were common. Only six percent of lentic areas were in a downward trend (FAR-DN) or nonfunctional (NF).

Though a PFC rating means the riparian standard for rangeland health is being met for a particular site, this does not mean that the area is necessarily in a desired condition. Almost all the riparian areas assessed on the allotment had impacts from livestock grazing to some degree, including those rated as PFC. Because there is good spring flow at most sources, the riparian areas tend to be resilient and can recover from impacts.

Though the ratings in 2007 were generally favorable, the trends from previous years were not always positive. Table 3 shows that some areas have improved somewhat since 2000, but others have declined. Willow Spring went from PFC to FAR-DN, JW Spring went from PFC to FAR-?, and Mud Spring went from FAR-DN to NF. These areas could have been especially sensitive to heavy use because they are small. Some of the decline in conditions was also probably in response to drought conditions in 2007.

Table 1. 2007 Riparian Assessment Data for the Churchill Canyon Allotment

Name	Date Assessed	UTM Northing	UTM Easting	Rating[1]	Acres[2]	Miles	Management Recommendations
Big Meadow (inside fence)	6/5/2007	4324955	288834	FAR-?	62		Treat weeds
Big Meadow (outside fence)	6/5/2007	4324537	289764	FAR-UP	20		Treat weeds; monitor old headcuts
Sunrise Pass Rd Meadow #1	6/6/2007	4326705	288275	FAR-UP	2.4		Consider alternate drainage under road
Sunrise Pass Rd Meadow #2	6/6/2007	4326255	288757	PFC	11		Treat weeds
Sunrise Pass Rd Meadow #3	6/6/2007	4325785	289199	PFC	1		Treat weeds; monitor old headcuts
Sunrise Pass Rd Meadow #4	6/6/2007	4325556	289343	FAR-?	6		
Unnamed Seep	6/7/2007	4328320	290701	FAR-?	<0.1		
N. Presto Spring	6/7/2007	4328532	290806	FAR-?	0.1		Repair exclosure
S. Presto Spring	6/7/2007	4328049	290669	FAR-?	0.2		
Lower S. Presto	6/7/2007	4328077	290728	FAR-DN	0.1		
Presto Spring (aka Exclosure)	6/7/2007	4328374	290758	PFC	0.1		
U. Spring Gulch	6/8/2007	4320157	287991	PFC	11		
L. Spring Gulch	6/8/2007	4320502	288889	FAR-DN	7		
Willow Spring	6/20/2007	4327548	294657	FAR-DN	1		
Sario Ranch	6/20/2007	4330404	294163	FAR-?	2.6		Treat weeds
JW Spring	6/20/2007	4325155	293208	FAR-?	0.2		
Mud Spring	6/21/2007	4336506	288118	NF	0.1		Explore funding for fencing & gradient control by permittee
Upper Churchill Canyon	6/7/2007	4328996	290585	PFC	3	0.5	

Table 2. Summary of 2007 Riparian Assessments for the Churchill Canyon Allotment

Rating	Acres	Percent of Total	Miles	Percent of Total
PFC	26.1	20	0.5	100
FAR-UP	22.4	18	-	-
FAR-DN	8.1	6	-	-
FAR-?	71.1	56	-	-
NF	0.1	<0.1	-	-
Total	127.8	100	1.1	100

[1] Rating key:
PFC = Proper Functioning Condition
FAR-UP = Functional-At-Risk with an Upward Trend
FAR-DN = Functional-At-Risk with an Downward Trend
FAR-? = Functional-At-Risk with an Unknown Trend
NF = Nonfunctioning

[2] Acreages were determined by delineating riparian areas in ArcMap from 2006 digital color imagery, except for relatively small systems which were GPSed in the field. Acreage of Upper Churchill Canyon assumes an average width of 50 feet.

Table 3. Comparison of 2000 and 2007 Riparian Data for the Churchill Canyon Allotment

Name	2000 Rating	2007 Rating	Acres[3]	Miles
Big Meadow	FAR-UP	FAR-?/FAR-UP	62	
Sunrise Pass Rd Meadow #1	FAR-UP	FAR-UP	2.4	
Sunrise Pass Rd Meadow #2	FAR-UP	PFC	11	
Sunrise Pass Rd Meadow #3	FAR-UP	PFC	1	
Sunrise Pass Rd Meadow #4	FAR-UP	FAR-?	6	
Presto Spring (aka Exclosure)	PFC	PFC	0.1	
Upper Spring Gulch	PFC	PFC	11	
Willow Spring	PFC	FAR-DN	1	
JW Spring	PFC	FAR-?	0.2	
Mud Spring	FAR-DN	NF	0.1	
Upper Churchill Canyon	PFC	PFC	3	0.5

Water Quality (Ground & Surface)

No class waters or beneficial uses are designated within the Churchill Canyon allotment. Therefore, only the descriptive water quality standards pertaining to all surface waters in Nevada (NAC 445A.121) are used to determine whether water quality meets the standard for rangeland health. During the rangeland health evaluation and riparian assessments no significant impacts to water quality due to current land uses, including livestock grazing, were observed. There were no visual signs, odors, or other indications that water quality was being impaired under the current grazing system.

Table 4 summarizes measurements of the pH, temperature, conductivity, and salinity taken during riparian assessments. None of the parameters indicate unacceptable livestock impacts.

Table 4. 2007 Water Quality Data for the Churchill Canyon Allotment

Name	Date Collected	UTM Northing	UTM Easting	pH	Temp (ºC/ ºF)	Conductivity (µS)	Salinity (ppt)
Sunrise Pass Rd Meadow #1	6/6/2007	4326682	288346	7.85	13.6 / 56.5	137.5	0.1
Sunrise Pass Rd Meadow #2	6/6/2007	4326255	288757	7.03	11.4 / 52.5	421.8	0.3
Upper Spring Gulch	6/8/2007	4320180	287879	8.07	15.2 / 59.4	43.3	0
Lower Spring Gulch	6/8/2007	4320486	288768	7.46	13.1 / 55.6	155.7	0.1
U. Churchill Canyon	6/7/2007	4328980	290591	8.23	18.8 / 65.8	463	0.3

[3] Acreages shown in Table 3 were determined in 2007 with GPS or GIS. Because areas were estimated in the field during 2000 assessments they were not as precise as the 2007 acreages. Direct comparisons between the 2000 and 2007 acreages should not be made.

General Wildlife

General wildlife habitats in this allotment are diverse and some are in good condition. The major wildlife habitat types include (Wildlife Action Plan Team 2007),

Intermountain Cold Desert Scrub – Historically, this habitat would have been dominated by Indian rice grass. Spiny hopsage, shadscale and chenopods can be been found at the lower elevations of this allotment. Grasses, Ephedra sp and shadscale are also found. Some bud sagebrush can be found. Wildlife species associated with this habitat type include pale kangaroo mouse, Great Basin collared lizard and black-throated sparrow.

Sagebrush – At middle elevations, Wyoming big sagebrush dominates on this allotment. Grasses and forbs such as globemallow and lupine would be used by mule deer, pronghorn and desert bighorn. The half-shrub Eriogonum (buckwheat) can be used extensively by mule deer as fall forage. Desert peach is abundant on wildfire burned areas. Higher elevations are also dominated by Wyoming big sagebrush. Bitterbrush would not be a co-dominant with this sagebrush species. Mountain big sagebrush dominates much of the upper elevation. Low sagebrush can be found as small inclusions associated with specific soil types. Wildlife species such as Great Basin pocket mouse, sagebrush lizard and sage sparrow.

Lower Montane Woodlands - Singleleaf pinyon and Utah juniper are the dominant vegetation types in this habitat. Mountain mahogany may be present at the upper elevations of this habitat. Forbs and grasses are sparse, especially as the canopy closure increases. Cliffrose and bitterbrush are key mule deer forage species in this habitat type. Wildlife species such as short-horned lizards, gray fox and gray vireo can be found in this habitat type.

Timber / aspen - Small amounts of true timber and aspen occur at heads of canyons. These areas are inclusions within the pinyon-juniper woodland, riparian or mountain shrub habitat type. They don't support a different assemblage of wildlife species than the surrounding area.

Springs and Springbrooks - There are no rivers and the only spring brook outflows associated with springs in this allotment. Some springs have riparian vegetation mostly intact, but in other areas, mesic vegetation such as sagebrush is encroaching on the riparian vegetation. In some cases, livestock has damaged the vegetation and water source. A 1973 report identified livestock overuse of meadows (Berg 1973). Some pinyon juniper trees are encroaching on the water source and will eventually replace the riparian vegetation. Where riparian areas exist, roses, willow, rushes and sedges can be found. Almost all the riparian areas assessed on the allotment in 2007 had impacts from livestock grazing to some degree; including those rated as PFC. Thirty-eight percent of the areas sampled are in proper functioning condition (PFC) or functional-at-risk in an upward trend. Fifty-six percent are functional-at-risk in an unknown trend (BLM 2007).

In the lower meadow spring, below the Sunrise Pass road, iris is a dominant plant. There is no apparent pinyon-juniper encroachment in the riparian area. The pinyon-juniper in the meadow had burned several years ago and didn't return when the meadow re-wetted.

In the meadow in the drainage north of the low meadow, all types of use appeared light. In the upland, there was young mountain sagebrush, probably a product of the recent wildfire. Young willows are found in the drainage as well as small cottonwood and rose. These weren't hedged. The willows are reproducing. This small meadow was the best meadow / spring in the complex.

The spring on the hill that is bisected by the Sunrise Pass road has fair to good conditions for wildlife. There is willow reproduction, rose, monkey flower and columbine in the protected willow area. Water quality is better than some in the area; fairy shrimp, caddis fly cases and a stonefly were found. The last two species require at least fair water quality. The Sunrise Road is currently impacting the wet meadow by confining water to culverts and channeling it below the road. The meadow below Sunrise Road isn't nearly as large as it could be if the road were placed above the springhead or if the existing road were constructed as a French drain rather than with culverts (USFS 1996). Wildlife species associated with the spring / spring brook habitat type includes wandering garter snake, shrew sp and Cooper's hawk.

This allotment is within the BLM designated Pine Nut Habitat Management Plan area (BLM 1987).

Mule deer use this allotment. They are associated with the various elevations of woodland habitat in this allotment although a few can be found at lower elevations on the fringes of valleys. Pinyon-juniper encroachment at the mid-elevation was reported in a 1973 report (Berg 1973). This is an issue, but some of these areas have burned since 1973. Mid-elevation areas are still key travel corridor areas that connect to the Carson River. Mule deer also use the higher elevations of the allotment which are key mule deer summer ranges (NDOW 2006). Mule deer fawning would occur within this allotment. A one-mile radius around springs within mule deer range is considered key fawning habitat in spring / summer (Wickersham 1990). Some springs associated with fawning areas are impacted by roads / trails that allow vehicles and OHV use during fawning season.

The southwest portion of the allotment is key deer winter range (NDOW 2006). Deer are currently wintering along the eastern lower to mid-elevation areas of the allotment. Most of this range burned in the Como and Sunrise wildfires, and in many places only desert peach has come back instead of bitterbrush. Deer use this species in spring, but it isn't a winter forage species in the Great Basin (Longhurst 1977). The reason for this shift in shrub composition isn't known. The burns primarily have only annual weeds in the understory (BLM 2008) rather than perennial forbs and grasses. Mule deer habitat in the allotment is functional, but far from being ideal in quality or condition due to riparian condition and the lack of perennial forbs and grasses.

Historically, pronghorn were present in all valleys of Nevada (BLM 1988). Pronghorn antelope occur in the allotment, using the eastern portion of the allotment to mid-elevation; these animals use <1% of forage on western rangelands (Yoakum et al 1993). Pronghorn typically need open spaces with good forb and shrub availability – good quality mid-seral vegetation conditions (Yoakum 1993). Key areas for pronghorn have not been delineated in the allotment, but it is expected that a kidding ground could be located somewhere on the low elevation alluvial fans. General condition of the allotment for pronghorn is functional although ideal conditions don't occur because perennial forbs and grasses are absent or scarce.

The allotment is within historic bighorn range, but isn't occupied by this species. The allotment is considered potential habitat. The Churchill Canyon allotment is occupied black bear habitat (NDOW 2006).

Mountain and California quail are present in this allotment. Mountain quail benefit from riparian vegetation adjacent to shrub lands. Mourning dove can be found in the allotment. The exotic chukar partridge can be found in the allotment.

Current conditions in this allotment are functional for general wildlife species; this doesn't imply these are ideal. Thirty-eight percent of areas are in proper functioning condition (PFC) or functional-at-risk in an upward trend. Fifty-six percent are functional-at-risk in an unknown trend (BLM 2007). There is general concern for the long term health of upland native plant communities (BLM 2007a). Based on NRCS ecological site descriptions, perennial grass species should be dominant by weight but in reality shrubs and annual plants dominate the sites. There should also be a good representation of perennial forbs. Studies indicate a static to downward trend with mature plants dying out and few young plants present to replace these (BLM 2007a). For the past several years, the permittee has been allowed to run more numbers than permitted. This was based on a 2003 decision to allow temporary non-renewable (TNR) to determine if the allotment could withstand a permanent an increase in livestock numbers (BLM 2007a).

In recent years, heavy to severe over-utilization has occurred in some portions of the allotment as documented by both BLM and private range consultants (BLM 2007a; BLM 2007b; BLM 2007c). The frequency of perennial grasses and shrubs decreased between 2000 & 2007 at two key monitoring areas. File correspondence indicates that the TNR was given in part to see if the permittee could manage livestock at increased stocking without resource damage. This correspondence indicates heavy use in bottoms and low slopes with some nearing a severe level where root crowns were in danger of damage. The BLM documented a shift of livestock, at the increased numbers, from livestock-preferred forage to less preferred forage. Mechanical damage to shrubs was also noted (BLM 2007d). Both of these conditions are a result of intense livestock use.

File correspondence reveals that the permittee was asked, along with all CCFO permittees, to take voluntary non-use in the 2007 / 2008 grazing season because of severe drought conditions where plants simply didn't grow (BLM 2007 e). The correspondence described the resource damage possible during a drought (BLM 2007c). The permittee challenged needing to take non-use citing economic issues (BLM 2007f). In a final decision dated November 2007, Churchill Canyon was temporarily closed to livestock grazing due to "D-3 – extreme drought conditions". The permittee appealed this decision in a letter dated November 16, 2007 and tried to force the BLM to allow him to graze at close to fully permitted numbers under drought conditions. This was the only permittee in the CCFO area that didn't immediately plan on taking non-use or severe reductions in stocking rates in response to the request to take voluntary non-use. There is concern that resource-sustaining management under this permittee is not possible for the long-term (BLM 2007b).

Special Status Species

Federally Listed Species

There are no known federally listed endangered, threatened or proposed for listing species or habitats occurring within the Churchill Canyon Allotment (www.fws.gov/nevada/protected species/nevada_species_list.html.). There are no plant species federally listed as endangered or threatened occurring in the Churchill Canyon Allotment. There are no plant species that are proposed for federal listing in the allotment (http://www.fws.gov/nevada/protected_species/index.html). The U.S. Fish and Wildlife Service identified the possibility of the federal candidate Churchill Narrows buckwheat occurring (USFWS 2008). This species is known to occur several miles north in another allotment, but does not occur on the Churchill Canyon Allotment (Tonenna 2008). This species won't be carried further through analysis.

BLM Sensitive Species

BLM Manual 6840 defines sensitive species as "…those species not already included as BLM Special Status Species under (1) Federal listed, proposed or candidate species; or (2) State of Nevada listed species. Native species may be listed as "sensitive" if it: (1) could become endangered or extirpated from a state or significant portion of its range; (2) is under review by the FWS/NMFS; or (3) whose numbers or habitat capability are declining so rapidly that Federal listing may become necessary, or (4) has typically small and widely dispersed populations; (5) inhabits ecological refugia, specialized or unique habitats; (6) is state-listed, but is better conserved through application of the BLM sensitive species status." It is BLM policy to provide sensitive species with the same level of protection that is given federal candidate species. The major objective of this protection is to preclude the need for federal listing. BLM sensitive species associated with this allotment are shown in Appendix A (BLM 2003). There are no plant species listed as BLM sensitive that occur in the allotment.

Some BLM sensitive species use every habitat within the allotment. Some species do not occur because of a natural lack of habitat type in this specific allotment. The general condition of the grassland and shrub component of this allotment is mixed. Some is declining in condition due to drought or livestock use, some is being maintained and some is relatively untouched. Species diversity, especially of forbs and grasses is poor (BLM 2007a; BLM 2007d). The mixed condition is due, in part, to current livestock management practices. In normal precipitation years, general range conditions could support greater numbers of prey or sensitive species of wildlife that used grasses and forbs. But under the drought conditions that have occurred on the allotment in recent years coupled with overuse in some areas, range condition is not conducive for prey species or sensitive species that depended primarily on grass and forb production.

The Churchill grazing allotment lies within the Pine Nut Mountains Sage Grouse Population Management Unit (PMU). The Greater Sage-Grouse Conservation Plan for Nevada and Eastern California, June 30, 2004, Appendix L – Pine Nut Mountains PMU Plan covers this population. Sage grouse within this area are part of the Mono/Lyon population segment which has been the subject of several petitions to be listed under the Endangered Species Act, and may qualify as a Distinct Population Segment. Historically sage grouse were very abundant within and around the Pine Nut Mountains, currently only a small population exists. Encroachment of pinyon pine and to a lesser extent juniper into sagebrush habitats likely accounts for a substantial portion of the

decline. In part Appendix L includes as objectives: Remove pinyon and juniper trees and reestablish big sagebrush on sites that previously supported big sagebrush. Additionally the remaining nesting and brood rearing habitats are less than ideal (Axtell 2008).

Sage grouse (*Centrocercus urophasianus*) are a BLM sensitive species and occur in the area. BLM 6840 manual states that BLM shall ensure that actions authorized, funded, or carried out do not contribute to the need to list a species under the provision of the Endangered Species Act.

Sage grouse have experienced long-term declines throughout North America, declining by 33 percent over the past 30 to 40 years (Braun 1998). The species has become extirpated in 5 states and one Canadian province and is at risk in six other states (including Nevada) and two Canadian provinces (Connelly and Braun 1997, Crawford and Lutz 1985). The sage grouse occupying the Churchill Canyon Allotment are part of a distinct population found in Lyon and Mono counties. Based on mitochondrial DNA analysis this population of sage grouse is genetically unique (Taylor 2000, unpublished). Taylor (2000, unpublished) will continue to investigate this population to determine if it warrants sub-species status.

During the spring and summer of 2001, a BLM crew spent several months, colleting habitat information, for sage grouse in and around the Churchill Canyon Allotment. Sage grouse fecal pellets were also recorded when encountered. Most of the fecal sightings were of roost sites, and not necessarily associated with nesting sites. Sage grouse generally nest in very low densities, resulting in relatively few fecal pellets distributed over large areas greatly reducing the detection probability.

Sage grouse have specific habitat requirements for the various phases of their life cycle. The reduction of specific habitat types will result in a decrease or loss of a population. Seasonal movements and home range sizes vary between migratory and nonmigratory populations. Telemetry studies have found both a migratory and nonmigratory component within some populations. Some nonmigratory populations have a home range size of 100 km^2 (Guidelines). In migratory populations home ranges may exceed 2,700 km^2 (Hulet 1983 and Leonard et al. 2000).

Most nests are located within 6.2 km of a lek, however, some are located more than 20 km from a lek (Autenrieth 1981, Wakkinen et al. 1992, Fischer 1994). Hanf et al. (1994) found that all nests monitored were less than 12.8 km of the nearest lek and that 50 percent were within 8 km of the nearest lek and 25 percent were within 3.2 km of the nearest lek. Klott et al. (1993), reported movements up to 12.4 km from the lek of capture to the eventual nest site.

Results from 3 thesis (Heath1997, Holloran1999 and Lyon 2000) in Wyoming found that 52% of nests were 2 miles from lek of capture, 67% were 3 miles from lek of capture and 78% of nests were within 4 miles of the lek of capture.

The WAFAWA 2000 guidelines recommend managing for sage grouse nesting habitat for 5 km in non-migratory populations and 18 km for migratory populations.

Sage Grouse Breeding Habitat (March through May)

Optimum sage grouse nesting habitat generally consists of sagebrush plants 40 to 80 cm tall with a canopy cover ranging from 15 to 25 percent and an herbaceous understory of at least 10 percent forb canopy cover, and 15 percent grass canopy cover that is at least 18 cm tall (Guidelines). Ideally, these vegetative conditions should be on 80 percent of the breeding habitat.

Nests with tall (18 cm) residual grass cover were associated with greater nesting success of sage grouse (Gregg et al. 1994 and Colin 1998). Management practices need to allow for the maintenance of tall, residual grass cover, to conceal the nests from predators. Grazing by domestic livestock and feral horses have the greatest impact on residual grass cover in the Churchill Canyon Grazing Allotment.

DeLong et al. (1995), found that the fate of artificial nests were positively associated with tall grass cover and medium height shrub cover and that no other vegetation, predator, temporal or spatial variables explained any additional variation in the probability of predation. They recommended management practices that increase cover and height of native grasses in sagebrush communities with medium-height shrubs to enhance sage grouse productivity. They also recommended that where "…sage grouse nesting habitat is an objective, managers should monitor livestock distribution and depletion of grasses to remove livestock before the minimum herbaceous cover and height needed for nesting is reached. Some rangelands may need rest from grazing to increase herbaceous cover and height to desired levels."

Pre-laying hens require forbs that are high in calcium, phosphorus, and protein all of which are necessary for successful egg production. The availability of these forbs is thought to have effects on reproductive success (Barnett and Crawford, 1994).

Sage Grouse Brood Rearing Habitat (April through August)

Early Brood Rearing Habitat

Optimum brood rearing habitat consists of sagebrush stands that are 40 to 80 cm tall with a canopy cover of 10 to 25 percent and an herbaceous understory of 15 percent grasses and 10 percent forb canopy (Guidelines). Ideally this habitat will be found on at least 40 percent of the area that is considered brood rearing habitat (Guidelines).

Young sage grouse require key invertebrates for the first 2 weeks after hatching and key forbs (Crawford et al. 1992). This high protein diet is essential for the survival of young sage grouse. Taller grasses, brush and forbs provide increased escape cover for young sage grouse over grazed areas.

Late Brood Rearing Habitat

Key forbs on wet meadows become increasingly important to sage grouse chicks as the uplands dry (Savage 1969). Greer (1990) recommended that meadow grazing be delayed until mid-August to promote sage grouse chick survival and growth. Dobkin (1995) recommended that restoration should include removing livestock from wet meadows.

Sage Grouse Winter Habitat (October through March)
Winter habitats must provide adequate amounts of sagebrush because their winter diet consists almost exclusively of sagebrush. Sagebrush canopy can be highly variable. Sage grouse tend to select areas with both high canopy and taller Wyoming big sagebrush (*Artemisia tridentata wyomingensis*). It is crucial that sagebrush be exposed at least 25 to 30 cm above snow level as this provides both food and cover for winter sage grouse (Hupp and Braun 1989).

Sage Grouse Habitat Northern Pine Nut Mountains
Sage grouse are a landscape species therefore they need to be managed on a landscape/ecosystem level to insure the persistence of sage grouse populations. Managing only small units for nesting and brood rearing will not maintain sage grouse populations (Gregg, pers comm. 2001).

Based on helicopter censuses of leks the current population of sage grouse occupying the Pine Nut Range is very small, 9 males were counted in April 2001 and between 9 and 11 sage grouse were counted during 11 visits in March and April 2002. A sage grouse population of this size risks extirpation (Gregg, pers comm.). In order to increase the census number the nesting and brood rearing habitat needs to improve and expand which will not occur by only managing potential nesting habitat near leks. Potential nesting and brood rearing habitat is often substantial distances from leks and needs to be improved in order to increase the population. Merely managing for nesting and brood rearing habitat 5 or 10 kilometers from leks will not result in a population level large enough to insure persistence because a certain percent of hens nest a substantial distance from leks, sage grouse populations are generally distributed in low densities over large areas.

Livestock and feral horse grazing are the major land use practice affecting sage grouse habitat in the Pine Nut Mountains and the Churchill Grazing Allotment. In addition to affecting the height of grasses and forbs livestock grazing can change the species composition of entire plant communities. Various livestock management practices have altered sage grouse habitat over the past century, facilities such as spring developments, water pipelines, and fencing have distributed livestock use over areas that were sporadically or lightly used in the past (Guidelines). In many areas, grazing has contributed to long-term changes in plant communities and has reduced certain habitat components, such as biological crusts, which contribute to the health of sagebrush habitat (Mack and Thompson; Quigley and Arbelbide; Wisdom et al.)

Livestock grazing can markedly reduce the herbaceous understory and increase sagebrush density (Vale 1975, Tisdale and Hironaka 1981). Within the Great Basin vegetation changes from livestock grazing likely occurred because sagebrush steppe in this area did not evolve with intensive grazing by herbivores, as did the prairies of central North America (Mack and Thompson 1982). Wambolt and Payne (1986), suggest that resting Wyoming big sagebrush habitats from grazing may improve the understory production as well as decrease sagebrush cover. The Guidelines state that sagebrush canopy cover greater than 25 percent devalues sage grouse habitat. Gregg (per comm. 2001) feels that this may be true for mountain big sage, however, in *A. t. wyomingensis* Gregg feels that sage grouse habitat quality declines with canopy cover greater than 12 to 15 percent.

Drought can lead to increased competition between livestock and sage grouse for food and cover, exacerbating the adverse effects of excessive livestock grazing on vegetation and soils (Valentine).

In order for the sage grouse population inhabiting the Pine Nut Mountains to recover it is essential that all the necessary components of sage grouse habitat, of sufficient quality and quantity be available and linked together throughout the Pine Nut Mountains. For this population to persist over time there needs to be linkages to other populations, further south.

Nesting habitat and possibly brood rearing habitat is most likely limiting this population suitable winter habitat is reasonably abundant. Wild horses and livestock consume grasses needed to conceal sage grouse nests from predators. Nesting success declines when residual grass cover (drop height of previous years growth) is less than 18 cm (Gregg et al. 1994). Because sage grouse can start nesting as early as March residual grass from the previous years growth is essential.

Should their first nest fail sage grouse can re-nest through July, therefore, to optimize sage grouse production residual grass cover of 18 cm needs to be maintained from March though May, in nesting habitat. Sage grouse generally nest in big sage and low sage plant communities with a healthy forb and insect component essential for chick survival.

Due to the range sites where most of the nesting habitat is located potential grass height is marginal for nesting cover in Churchill Canyon Grazing Allotment, yet this is likely where most of the nesting occurs. Therefore, if the sage grouse population is to persist grazing needs to be managed in such a way to maintain residual grass cover into the early spring.

A small portion of the Pine Nut Wild Horse Herd Management Area (HMA) extends into the Churchill Canyon and Mill Canyon Grazing Allotments. These horses are removing a substantial amount of grass, thereby, degrading nesting habitat for sage grouse. The AML for the Churchill Canyon Allotment is 12 head (6.7% of the total AML for the Pine Nut HMA).

If residual grass cover were managed for 18 cm drop height sage grouse would be expected to have good nesting success, however to maximize nesting success residual grass height would need to be maximized.

Sage grouse require, sagebrush, habitats for all phases of their life cycle. Winter habitat includes sagebrush tall enough to be available when snow is present for food and cover. Pre-nesting habitat includes sagebrush with forbs. Nesting habitat includes areas with sagebrush and residual grass cover tall and thick enough to conceal and mitigate temperature extremes for the next. Nesting habitat has been identified by NDOW within this allotment. Studies have shown that nesting success is greatly reduced when herbaceous cover around the nest bush is less than 18 cm. In many cases the grasses have been grazed to low heights, though some that are protected from grazing can exceed 18 cm (Axtell 2008).

Leks have been identified immediately to the north of this allotment. There are likely unidentified leks within this PMU and likely within this allotment.

Big Meadow (J.W. Meadow) and other wet meadows within this allotment provide important brood rearing habitat. Grazing of the Big Meadow (J.W. meadow) has resulted in an increase of *Juncus*, wild iris, Canada thistle and other less palatable plants and a substantial reduction in forbs and grasses and insects associated with forbs and grasses both forbs and grasses and insects associated with forbs and grasses are essential to sage grouse chicks (Axtell 2008).

Almost all the riparian areas assessed on the allotment had impacts from livestock grazing to some degree; including those rated as PFC. Thirty-eight percent of riparian areas are in proper functioning condition (PFC) or functional-at-risk in an upward trend. Fifty-six percent are functional-at-risk in an unknown trend (BLM 2007). These factors coupled with some poor upland conditions leave the allotment in less than ideal condition for BLM sensitive species. Diversity and abundance are likely skewed toward those species more tolerant of early seral (Bleich 2005) and less than ideal conditions, i.e. loss of understory vegetation.

Migratory Birds

On January 11, 2001, President Clinton signed Executive Order 13186 (Land Bird Strategic Project) placing emphasis on conservation and management of migratory birds. The species are not protected under the Endangered Species Act, but most are protected under the Migratory Bird Treaty Act of 1918. Management for these species is based on Instruction Memorandum – IM 2008-050 dated December 18. 2007. The Intermountain West is the center of distribution for many western birds. Over half of the biome's Species of Continental Importance have 75% or more of their population here. Many breeding species from this biome migrate to winter in central and western Mexico or in the Southwestern biome (Beidleman 2000). The species of concern that could occur in the general project area are shown in Appendix B (BLM 2007g).

There are no Important Bird Areas (IBA) associated with the general project area. There are no identified important wintering areas within the general project area (McIvor 2005).

Some migratory bird species use every habitat within the allotment. The general condition of the grassland and shrub component of this allotment is mixed. Some is declining in condition due to drought or livestock use, some is being maintained and some is relatively untouched. Species diversity, especially of forbs and grasses is poor (BLM 2007a; BLM 2007d). The mixed condition is due, in part, to current livestock management practices. In normal precipitation years, general range conditions could support more prey species and migratory birds that used grasses and forbs. But under the drought conditions that have occurred on the allotment in recent years coupled with overuse in some areas, range condition is not conducive for prey species or migratory species that depended primarily on grass and forb production.

Riparian areas used by migratory birds are in poor to fair condition. These provide functional habitat at a low level for migratory birds. Almost all the riparian areas assessed on the allotment had impacts from livestock grazing to some degree, including those rated as having PFC. Thirty-eight percent of lentic areas are in PFC or functional-at-risk in an upward trend. Fifty-six percent are functional-at-risk in an unknown trend (BLM 2007). These factors coupled with the upland's lack of perennial forbs and grasses leave the allotment in less than ideal condition for

migratory birds. Diversity and abundance are likely skewed toward those species more tolerant of early seral (Bleich 2005) and less than ideal conditions, i.e. loss of understory vegetation.

Other Plant Species

William's combleaf (*Polyctenium williamsiae*) is an endemic perennial plant found along the margins of playa lakes in western Nevada and eastern California. The species is a BLM special status species and is listed with the State of Nevada as "critically endangered" and is fully protected by state law (NNHP, 2006).

William's combleaf has emergent leaves by March and flowers from mid May through July with most seed released by late July. There are several playa lakes within the Churchill Canyon Allotment which could serve as suitable habitat for the William's combleaf but only one of the lakes has plants. Impacts from livestock grazing include trampling by livestock when the playa lake is used as a watering site and habitat modification of the playa lakes when they were excavated in the 1980s to create a deeper pool for longer water retention for cattle and wildlife use (Holland and Morefield, 2003, Tonenna, 2007).

The possibility of backfilling the playa lakes to reestablish habitat for the William's combleaf will not be addressed in this EA. Because population management of this species involves areas outside of this grazing allotment these issues will be addressed in the Pine Nut Land Use Plan Amendment.

Soils

The soils within the Churchill Canyon grazing allotment vary considerably in physical, chemical, and biological characteristics. Parent material, surface and subsurface textures and rock fragments, elevation, aspect, and slope determine the inherent productivity. Erosion and runoff potential, while affected greatly by these factors are also dependant upon the basal and canopy cover of vegetation on site. Also, roads, livestock and horse use, mining and other overland activities, and general motorized vehicle use have impacted soils in certain areas. Generally the soils in this allotment are classified as Mollisols and Aridisols. Most of the area is within the eight to twelve inch precipitation zone. Soil reactions are neutral to slightly alkaline. The allotment is within both Lyon and Douglas Counties, and detailed descriptions of those soils can be found within those Soil Survey. Both surveys were issued in 1984 by the U.S. Dept. of Agriculture-Soil Conservation Service.

Noxious Weeds

There are a number musk and canada thistle infestations that have been located within the allotment, within riparian areas. These locations will be added to the list for spraying with herbicides in 2008.

Cultural Resources

Following BLM regulations (43 CFR Part 8100) and other federal laws including the National Historic Preservation Act (16 USC § 470f) and its implementing regulations (36 CFR Part 800), as amended, BLM reviewed the immediate region for historic properties prior to a federal undertaking (issuance of a federal permit). The potential exists for adverse impacts to cultural resources and/or historic properties due to a continuation of livestock grazing with or without

modifications to the grazing permit. By definition, an historic property is a "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" and includes "artifacts, records, and remains that are related to and located within such properties" (36 CFR 800.16(l)(1)).

Previous cultural resource inventories comprise 2,601 acres, or 5.4%, of the allotment area, and have resulted identification of 43 sites. To date, in and immediately adjacent to the BLM-managed lands of the Churchill Canyon Allotment, known cultural resources represent significant past human use of the landscape. Known site types within the allotment area include prehistoric camp sites; prehistoric limited activity/procurement sites; rock alignments and hunting blinds; historical stone structures; historical refuse scatters; mining complexes; isolated prospecting locales; ranch sites; transportation and communication sites; woodcutting locales; and charcoal production locales.

Records searches at the BLM Carson City Field Office and through the Nevada State Museum revealed that the Churchill Canyon allotment contains at least five historic properties. All five historic properties consist of areas of prehistoric material remains. Two of these historic properties have been subject to archaeological data recovery designed to resolve adverse effects from other activities. Grazing, as proposed under the Proposed Action and Alternatives, is not considered to have an impact upon these two resources. Two of the historic properties do not lie in areas of heavy or severe use. The fifth historic property lies in the vicinity of a spring. A BLM archaeologist conducted a field visit to this site, and the site has not, and based on the Preferred Action, likely will not suffered adverse effects from grazing.

BLM analyses included the potential impacts of implementing allotment improvements provided above, under the Proposed Actions and Alternatives (including Alternative D). Fieldwork at the location of each of these improvements was completed in April through June, 2008. The specific allotment improvements include two fences and two corrals. Four of the allotment improvements are not known to have significant impact to historic properties and there is no need to alter these four proposed improvements to prevent adverse effects to cultural resources (Lane 2008). However, one of the proposed fences was identified as having potential to adversely affect two potential historic properties.

All proposed project improvements have the potential to adversely affect cultural resources. Per 36 CFR 800 and 43 CFR 8100 (BLM), as amended, BLM is required to identify and evaluate cultural resource within the area of potential effect from any current or future proposal for an undertaking such as a waterline, fence, or other action that concentrates livestock.

Wild Horses

A portion, 8% of the Pine Nut Mountains Herd Management Area (HMA) lies within the Churchill Canyon Grazing Allotment. The total Animal Management Level for the entire Pine Nut Mountains HMA is a range between 119 to 179, with a range of between 9 to 13 for the Churchill Canyon Grazing Allotment portion of the HMA which comprises 18% of the grazing allotment.

C. Alternatives to the Proposed Action

The description of the affected environment for the alternatives would be the same as that for the proposed action.

IV. ENVIRONMENTAL CONSEQUENCES

A. Proposed Action - Decreased Grazing (AUMs) & Season of Use

Range

Under this alternative, the BLM would issue a term grazing permit for 180 Cattle between 11/01-03/15 for 800 AUMs. The terms and conditions of the grazing permit would include maximum use levels on key species and maximum stocking levels by pasture. Maintain the utilization standard not to exceed 55% on key perennial plant species. This existing use standard applies to livestock and wild horses. Therefore, within the wild horse herd management area (HMA) livestock use shall not exceed 27.5% and outside of the HMA livestock use shall not exceed 55% on key perennial plant species. The maximum stocking levels by pasture would be: Sario Well (400 AUMs), Buckskins (250 AUMs), Como Burn (100 AUMs), Sunrise Burn (150 AUMs), Big Meadow (50 AUMs), and Como pasture (224 AUMs).

This alternative would impact the livestock operation by shortening the grazing season by two months and reducing the permitted use by 274 AUMs. Also portions of the allotment may not be accessible to livestock during the permitted season of use due to weather and soil conditions.

Fences and corrals wouldn't be built under this alternative. Cattle would continue to drift out of the allotment into the adjacent allotments and cattle from the adjacent allotments would continue to drift into the Churchill Canyon Allotment. The corrals would not be constructed so livestock handling for the purposes of sorting and care would continue to be a time consuming and difficult process.

Vegetation

Shortening the grazing season of use would concentrate livestock use in the lower elevation portions of the allotment (Sario Well and Buckskin Pastures). During most years livestock use would not occur in the Como pasture during this season due to wet soil conditions and snow accumulation. During average to below average snow years livestock use could occur in the Sunrise and Como Burn pastures, but during heavy snow years these areas would be inaccessible to livestock. If livestock use were split between pastures as follows; Sario Well (400 AUMs), Buckskins (250 AUMs), Como Burn (50 AUMs), Sunrise Burn (50 AUMs) & Big Meadow (50 AUMs), we would expect moderate (41%-60%) use of key perennial plant species in the valley bottoms in the Sario Well and the Buckskin Pastures and slight (6%-20%) to light (21%-40%) use in the other pastures, during years of average vegetative production.

Under this alternative livestock grazing would primarily occur when perennial grass and shrub species are dormant. Leaf growth typically begins around the first of March when livestock would be being gathered for removal from the allotment. The dormant period is the least critical period for foliage removal, because plants are photosynthetically inactive. The removal of dry leaf material by livestock would not decrease vegetative food production (photosynthesis), food

storage (root reserves), nor reduce reproductive capability during this season. Although plants are more resistant to grazing when dormant it is still important to limit livestock use levels and maintain adequate leaf residue to protect grass root crowns and soil. By limiting livestock grazing to the dormant season, all available vegetative leaf area (new growth) would be utilized for food production (photosynthesis), which would maximize food storage (root reserves) and plant reproduction. In comparison with the other grazing alternatives this alternative would maximize the vigor of key plant species by shortening the grazing season of use and leaving the majority of the new leaf material. Increased plant vigor would enable key species to more effectively compete with other perennial and annual plant species. The frequency of key perennial plant species would increase and plant community trend would improve under this alternative. The positive influences of prescribed grazing on forage plants such as enhanced forage nutritive values due to increased new growth to old growth ratios, and the reduction of accumulated standing dead vegetation which sometimes slows new plant growth and soil warming would occur under this alternative.

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on vegetation. The temporary removal of six acres of vegetation in association with fence construction would not occur under this alternative.

Wetlands/Riparian Zones

Shortening the season of use so that it ends on March 15 would improve riparian conditions on the allotment. Removing livestock earlier in the season would greatly reduce impacts to riparian plants during the active spring growing season.

Water Quality (Ground & Surface)

Shortening the season of use so that it ends on March 15 would maintain or improve water quality on the allotment by reducing possible livestock grazing impacts. Wild horses would still use the area, however, and current grazing practices do not appear to be significantly affecting water quality.

General Wildlife

This alternative is the best grazing alternative for general wildlife. Although a few more cows would use the area, these animals would graze only during the winter when plants were dormant. This factor is much more critical than a small increase in the number of cattle. Most plants would begin growth after livestock had been removed; plants would be allowed to flower, seed and establish new plants as moisture and soil conditions allowed. It is expected that general wildlife populations and diversity would increase over time and would reach potential since plants, upland reproductive sites and other habitats would be minimally affected by livestock grazing.

Whether this improvement in plant community and general wildlife will occur is unknown. The management philosophy that caused the permittee to risk vegetation crown damage grazing during extended drought would be mute because livestock would be grazing during the dormant period. Long-term sustainability of wildlife habitats and key areas would have a better chance under this alternative than other grazing alternatives.

Mule deer populations may not increase significantly for the Pine Nut range because of non-grazing issues, but this allotment could be expected to at least support current mule deer numbers under this alternative. Because livestock would graze during the dormant period for plants, plant reproduction could go through its entire cycle for that year. Perennial forbs and grasses could re-establish in some areas of the allotment which would enhance the nutrition available to current mule deer use.

The wildfires that have occurred in this allotment resulting in growth of desert peach rather than bitterbrush have negated the value of a large amount of mule deer winter range. Wintering mule deer in this area must now use lesser value forage. Because livestock would graze during the winter, there is probably spatial and forage competition between the two users (Peek and Krausman 1995). If the lower elevation portions of the allotment were improved under this alternative, this competition could be minimized.

Pronghorn could see the same benefits as mule deer as would black bears. Under this alternative, the status of bighorn sheep potential habitat wouldn't change.

Riparian areas affected by allowing livestock to stay for extended periods could still remain in their present conditions since livestock patterns of use may not change since that is a function of livestock management during the permitted season. The effects would be similar to Alternative D. The wet meadow below Sunrise Road would still remain impacted from road placement and design.

Upland game birds wouldn't be affected by this alternative (Guthery 1995).

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on general wildlife.

Special Status Species

Federally Listed Species

Since federally listed animal species naturally don't occur on the allotment, there would be no impacts to these species or habitats from the proposed activity. As there are no federally listed plant species occurring on the allotment there would be no impacts to these species resulting from this alternative.

BLM Sensitive Species

This alternative is the best grazing alternative for BLM sensitive species. Most plants would begin growth after livestock had been removed; plants would be allowed to flower, seed and establish new plants as moisture and soil conditions allow. It is expected that BLM sensitive species abundance and possibly diversity would increase somewhat over time as plants and plant communities move toward potential when being minimally affected by livestock grazing.

Prey species needed by some BLM sensitive species would increase as grass and forbs increased where these could. Studies have found an inverse proportional relationship between insect production and livestock grazing (Fleischner 1994). Improved prey would allow some BLM

sensitive species to spend more time on the allotment. Bats would be especially benefitted by this effect as would raptors and owls.

In general any actions that increase sagebrush, forbs and residual grass cover for nesting between April and July will benefit sage grouse. This alternative benefits sage grouse to a greater degree than some of the other alternatives since grazing would not be permitted during the growing period for most perennial grasses. However, much of the residual herbaceous vegetation will be removed by livestock prior to nest initiation by sage grouse. Greater herbaceous cover has been shown to increase nest success for sage grouse (Axtell 2008).

Riparian areas affected by allowing livestock to stay for extended periods could still remain in their present conditions since livestock patterns of use may not change since that is a function of livestock management during the permitted season. The effects would be similar to Alternative D. The wet meadow below Sunrise Road would still remain impacted from road placement and design.

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on BLM sensitive species.

Choosing this alternative wouldn't cause any BLM sensitive species to be federally listed.

As there are no BLM sensitive plant species occurring on the allotment there would be no impacts to this species resulting from this alternative.

Migratory Birds

This alternative is the best grazing alternative for migratory bird species. No bird reproduction occurs during the winter so livestock would have no effect on reproductive sites and would have little effect on reproductive vegetation since the latter would be dormant.

Most plants would begin growth after livestock had been removed; plants would be allowed to flower, seed and establish new plants as moisture and soil conditions allowed. It is expected that migratory bird diversity and abundance might increase. The most dramatic change would be the length of time migratory birds would remain on the allotment as plants and vegetation communities improved and moved toward potential. Prey species needed by some migratory bird species would increase. Studies have found an inverse proportional relationship between insect production and livestock grazing (Fleischner 1994). Improved prey would allow some bird species to spend more time on the allotment.

In general any actions that increase sagebrush, forbs and residual grass cover for nesting between April and July will benefit sage grouse (Axtell 2008).

Riparian areas affected by allowing livestock to stay for extended periods could still remain in their present conditions since livestock patterns of use may not change since that is a function of livestock management during the permitted season. The effects would be similar to Alternative D. The wet meadow below Sunrise Road would still remain impacted from road placement and design.

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on BLM sensitive species.

Other Plant Species
Under this alternative the William's combleaf would continue to experience trampling by livestock although the impacts would be relatively less than the other alternatives, with the exception of the "no grazing alternative," as there would be fewer cattle present and the William's combleaf would be dormant for most of the grazing period with the exception of the first half of March when the species resumes active growing following dormancy.

Soils
The implementation of this alternative could have a slight beneficial effect on the soils resource. A shorter season of use would result in less impacts by livestock on perennial grasses and forbs during the growing season. Over time this could result in an increase in this type of basal (vegetative) cover which would increase infiltration of precipitation and reduce runoff.

Noxious Weeds
The implementation of this alternative would have little effect on the Canada thistle infestations since these areas will be treated as part of the Carson City District's Noxious Weed Treatment Plan.

Cultural Resources
Under the Proposed Action, there exists no need to alter the proposed term grazing allotment permit and the proposed allotment improvements in order to prevent unnecessary or undue degradation. With each future range improvement, BLM will review the area of potential affect (the area where concentrated livestock use could affect the values that make a historic property important) prior to implementation, and if adverse effect cannot be avoided, either cancel the proposed project, relocate it away from any historic property, or modify allotment use.

Wild Horses
This alternative would benefit wild horses by increasing the amount of available forage. Currently there appears to be adequate forage for wild horses, however, continued over use of the native grass plants could result in fewer plants in the long term thereby potentially adversely affecting the wild horses.

B. No Livestock Grazing Alternative

Range
Under the no grazing alternative no livestock would be authorized in the Churchill Canyon Allotment at this time.

Changes to the public land grazing permit would impact the livestock operator. Few grazing permits are available on public lands and if the Churchill Canyon permit were lost, it is unlikely that the operator could locate another permit in the local area. The fees for private land grazing

are higher than fees for public land grazing which would increase the cost of running the livestock operation.

Fences and corrals wouldn't be built under this alternative. Livestock grazing would not be permitted under this alternative therefore, not constructing the fences would not impact the livestock operation.

Vegetation

Under the no grazing alternative, vegetation would not be impacted by livestock. No livestock would trample or eat vegetation within the allotment. Plants obtain food for their maintenance and growth from the photosynthetic process that occurs in plant leaves. By not authorizing livestock grazing the available vegetative leaf area would be maximized. All available vegetative leaf area would be utilized for food production (photosynthesis), which would maximize food storage (root reserves) and plant reproduction. The frequency of key perennial plant species would increase and plant community trend would improve under this alternative.

The positive influences of prescribed grazing on forage plants such as stimulated plant growth and re-growth due to pruning, enhanced forage nutritive values due to increased new growth to old growth ratios, and the reduction of accumulated standing dead vegetation which sometimes slows new plant growth and soil warming would not occur under this alternative.

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on vegetation. The temporary removal of six acres of vegetation in association with fence construction would not occur under this alternative.

Wetlands/Riparian Zones

Canceling the grazing permit would improve riparian conditions on the allotment to some degree by eliminating livestock grazing impacts. Impacts from wild horses would continue, however, since they would still use the area.

Water Quality (Ground & Surface)

Canceling the grazing permit would maintain or improve water quality on the allotment by eliminating possible livestock grazing impacts. Wild horses would still use the area, however, and current grazing practices do not appear to be significantly affecting water quality.

General Wildlife

This alternative would be most ideal for general wildlife, game, BLM sensitive species and migratory birds. Since federally listed animal species naturally don't occur on the allotment, there would be no impacts or benefits derived from this alternative for this group. As there are no federally listed or BLM Sensitive plant species occurring on the allotment there would be no impacts or benefits to these species resulting from this alternative. There would be no opportunity for impacts from livestock grazing. With total rest, it would be possible for perennial forbs and grasses to re-establish to a certain extent. In general any actions that increase sagebrush, forbs and residual grass cover for nesting between April and July will benefit sage grouse (Axtell 2008). This alternative would offer the greatest benefits to sage grouse since residual herbaceous cover would be maximized. Residual herbaceous cover has been shown to

be important to sage grouse nest success. Some of this allotment is in a static state – removing livestock won't change it that much. However, with no grazing, every plant resource available will be left for wildlife. All wildlife habitats would *move* toward more ideal conditions under this alternative even if some never reached potential. Water penetration should increase which will in turn improve plant growth and productivity. Infiltration of water can be as much as 2.5 times higher on lightly (or not) grazed rangelands than on heavily grazed rangeland (Yasuda 1993; Murray ND). There would be no livestock management issues under this alternative.

Density and diversity of general wildlife, BLM sensitive species and migratory birds that use the area should increase. In Nevada, density of wildlife individuals was one-third lower on grazed sites with species diversity nearly one-half lower on grazed sites (Fleischner 1994).

Under this alternative, most riparian areas would move toward proper functioning condition, although some OHV damage and effects to some wildlife would still remain. The wet meadow below Sunrise Road would still remain impacted from road placement and design.

Fences and corrals wouldn't be built under this alternative, but there wouldn't be an important positive or negative effect from this.

Other Plant Species
The William's combleaf would not be impacted under this alternative as there would be no grazing permitted and therefore trampling by cattle would not occur.

Soils
The implementation of this alternative could have a slight positive impact on the soil resource within the allotments, but since the soils/watersheds within the allotment are meeting the soil standards, the magnitude of the impact would probably be un-measurable.

Noxious Weeds
The implementation of this alternative would have little effect on the Canada thistle infestations since these areas will be treated as part of the Carson City District's Noxious Weed Treatment Plan.

Cultural Resources
The implementation of the No Grazing alternative could have a slight positive impact on unknown cultural resources within the allotments, but since the proposed action is analyzed to meet standards of no adverse effect, the magnitude of the impact improvement likely would not be measurable.

Wild Horses
This alternative would positively benefit wild horses by maximizing the quantity and quality of forage grasses. If all livestock were removed from the allotment conceivably the AML could be increased for the 18% of the allotment that is within the Pine Nut Mountains HMA, however, this would only result in a very modest increase in AML because horses utilize the grass plants year round which is detrimental to grass plants to any potential would be very modest. Currently the BLM is overwhelmed with excess wild horses, so increasing the AML would only exacerbate the current situation by increasing the number of horses producing foals.

C. No Action Alternative

Range

Permitted livestock use in the Churchill Canyon Allotment would continue to be 166 cattle between 11/01-05/15 for a total of 1,074 AUMs. As part of the terms and conditions of the grazing permit utilization standards would be maintained and would be the same as those described in Alternative A. Maintaining the existing permitted season of use would allow livestock to utilize all of the pastures within the allotment during most years.

Under this alternative there would be no changes in permitted livestock use. In relation to permitted use there would be no impacts to the livestock operation. However, in the past the livestock permittee was given a great deal of latitude in regard to livestock management in an effort to evaluate stocking rates. Actual livestock use varied from the grazing permit, in the form of increased stocking rates and longer seasons of use. These variances were authorized by the BLM on a temporary basis for evaluation purposes.

Fences and corrals wouldn't be built under this alternative. Cattle would continue to drift out of the allotment into the adjacent allotments and cattle from the adjacent allotments would continue to drift into the Churchill Canyon Allotment. The corrals would not be constructed so livestock handling for the purposes of sorting and care would continue to be a time consuming and difficult process.

Vegetation

In comparison to alternatives A & B this alternative would have more impacts on vegetation due to the removal of leaf area during the spring growing season. In comparison to alternative D, the impacts to vegetation from livestock grazing may be slightly higher under this alternative, because there are no stocking rates by pasture to help distribute livestock use throughout the allotment nor a rest rotation management system to provide plants spring rest from grazing. The impacts to vegetation under this alternative are less than those from alternatives E & F.

Key forage species in grazed areas would be utilized by livestock during the winter and spring. Between March and May livestock would remove a portion of the new leaf growth which is needed to complete photosynthesis to recharge root reserves. During years of average and above average production, and moderate or less livestock use, forage plants would have sufficient leaf area for food production (photosynthesis), to store sufficient food (root reserves) to complete plant reproduction. The key grasses are cool-season species, therefore, plant growth is concentrated in a limited growing season in the spring. During drought years, overutilization of key species in valley bottoms would occur due to decreased vegetative production levels unless stocking rates are reduced. Overutilization of key species can damage root crowns, add additional stress to drought stressed plants and remove new plant growth that is needed to complete photosynthesis and recharge root reserves. During drought years, new plant growth typically occurs early in the growing season, and there has often not been enough moisture for plant re-growth after livestock are removed. Removal of most of the new leaf area drastically reduces vegetative food production (photosynthesis), food storage (root reserves), and

reproductive capability of key forage species. Overutilization also reduces the ability of key forage species to compete with other species in the plant community.

Because the stocking rate for the allotment was being evaluated actual livestock stocking rates have exceeded permitted use. Livestock were permitted to remain on the allotment until May 31st, historically (private property) and during the evaluation period. Because actual use was different from permitted use vegetative trend is expected to improve under this alternative. The grazing season of use would be two weeks shorter than what has occurred in the past. In comparison to actual use, key forage species would have two additional weeks of leaf growth to utilize for food production (photosynthesis), food storage (root reserves), which would contribute to reproductive capability. TNR livestock use would no longer be authorized during above average production years, therefore plants would be able to utilize the extra resources available during good years to increase overall plant vigor.

If livestock are managed to ensure utilization standards are met and livestock grazing is adjusted during drought years the frequency of key perennial plant species would increase and plant community trend would improve. In comparison with the other grazing alternatives this alternative would moderately improve the vigor of key plant species by ending the grazing season on May 15 (actual livestock use – cattle have been on the allotment two weeks longer). Increased plant vigor would enable key species to more effectively compete with other perennial and annual plant species. The positive influences of prescribed grazing on forage plants such as stimulated plant growth and re-growth due to pruning, enhanced forage nutritive values due to increased new growth to old growth ratios, and the reduction of accumulated standing dead vegetation which sometimes slows new plant growth and soil warming would occur under this alternative.

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on vegetation. The temporary removal of six acres of vegetation in association with fence construction would not occur under this alternative.

Wetlands/Riparian Zones

Based on assessment data from 2000 and 2007, riparian conditions would be maintained under current management practices. Some localized, temporary impacts from grazing would continue to occur, but overall riparian areas would be maintained with the current level of use.

Water Quality (Ground & Surface)

Continuing current management would maintain water quality on the allotment. Current grazing practices do not appear to be significantly affecting water quality.

General Wildlife

The effects to general wildlife and game species would be essentially the same as for Alternative D – current numbers of cattle and season. This alternative is not as beneficial to general wildlife. The stocking rates for livestock by pasture and the rest rotation management system to ensure spring rest from livestock grazing is not included as part of this alternative. Therefore impacts to vegetation would impact wildlife habitat.

Special Status Species

Federally Listed Species
Since federally listed animal species naturally don't occur on the allotment, there would be no impacts to these species or habitats from this alternative. As there are no federally listed plant species occurring on the allotment there would be no impacts to these species resulting from this alternative.

BLM Sensitive Species
The effects to BLM sensitive animal species would be essentially the same as for Alternative D – current numbers of cattle and season. This alternative is not as beneficial to BLM sensitive species. Choosing this alternative would not cause any BLM sensitive species to be federally listed. As there are no BLM sensitive plant species occurring on the allotment there would be no impacts to this species resulting from this alternative.

In general any actions that increase sagebrush, forbs and residual grass cover for nesting between April and July will benefit sage grouse. This alternative benefits sage grouse to a lesser degree than some of the other alternatives since grazing is permitted until 15 May, which as stated previously adversely impacts perennial grasses to a much greater degree than grazing during the dormant periods. Much of the residual herbaceous vegetation will be removed by livestock prior to nest initiation by sage grouse. Greater herbaceous cover has been shown to increase nest success for sage grouse (Axtell 2008).

Migratory Birds
The effects to migratory bird species would be essentially the same as for Alternative D – current numbers of cattle and season. This alternative is not as beneficial to general wildlife.

Other Plant Species
Under this alternative, the William's combleaf would continue to experience trampling by livestock. The impacts due to trampling would be more than would occur under alternatives A & B, as a greater amount of AUMs would be permitted under this alternative and the cattle could potentially remain longer on the allotment during the first half of May when the plant is in flower. This alternative is similar to Alternative D, as the permitted AUMs and season of use are the same and therefore the impacts to the plant would be similar. The impacts due to trampling, under this alternative, would be relatively less than the impacts from Alternatives E & F, because these alternatives specify increased AUMs and would allow cattle to remain on the allotment until the end of May when the plant is in flower.

Soils
The implementation of this alternative would have no effect on the soils resource since the soils standard is already being met.

Noxious Weeds
The implementation of this alternative would have little effect on the Canada thistle infestations since these areas will be treated as part of the Carson City District's Noxious Weed Treatment Plan.

Cultural Resources
Adoption of this alternative would result in an increased time period of impacts to unknown and sensitive cultural resources. Relative to adverse effects to historic properties, the magnitude of the increased impact likely would not be measurable. Therefore, relative to cultural resources there would not be an appreciable difference between Alternative 2 and the Proposed Action.

Wild Horses
In the short term the wild horse AML would be unchanged with this alternative. However, over the long term if heavy use is occurring the quantity and quality of perennial grasses could diminish which could lead to a reduction in the AML.

D. Construction of Range Improvements & Modified Management

Range
Permitted livestock use in the Churchill Canyon Allotment would continue to be 166 cattle between 11/01-05/15 for a total of 1,074 AUMs. As part of the terms and conditions of the grazing permit utilization standards would be maintained and would be the same as those described in Alternative A. The permit would also include stocking rates by pasture and a rest rotation management system. Stocking rates by pasture would be: Sario Well (350 AUMs), Buckskins (200 AUMs), Como Burn (100 AUMs), Sunrise Burn (150 AUMs), Big Meadow (50 AUMs), and Como pasture (224 AUMs). Rest Rotation Management System:

Sario Well Pasture	11/01-03/01	Limited to Dormant Season Grazing
JW Ranch Pastures	11/01-03/01	Graze in Any JW Pasture During Plant Dormancy
Buckskin Pasture	03/01-04/01	Rotate Grazing Pattern
Sunrise Burn	03/15-05/15	Graze Odd Numbered Years – Rest Even Numbered Years
Como Burn	03/15-05/15	Rest Odd Numbered Years – Graze Even Numbered Years
Como Pasture	03/15-05/15	Rotate Grazing Pattern

Under this alternative approximately three miles of barbwire fence (maps on pages 11-12) would also be authorized. The purpose of the fencing would be to increase livestock control. The proposed fencing in the Sario Well pasture includes extending a drift fence near the allotment boundary. The proposed fencing in the JW Ranch pasture includes two small holding corrals along the northern pasture boundary, and expanding the Big Meadow riparian pasture. Fencing would consist of three strands of barbed wire and one smooth bottom wire. The fence would comply with BLM wildlife fence standards (type B antelope). The wire spacing for the wildlife standard is 16", 22", 30" and 42" and 16 1/2' spacing between T-posts. Construction would be contingent upon funding, policy, manpower, and issue mitigation.

There would be very few impacts to the livestock operation from the proposed management changes. Livestock would need to be moved between pastures to ensure stocking rates are not exceeded and the rest rotation management system is similar to the system that has been utilized since 2003. The construction of the proposed fences would benefit the livestock operation by decreasing cattle drift in and out of the allotment. The construction of the proposed corrals would facilitate livestock handling for the purposes of sorting and care. This would make these tasks a little easier by providing corrals to work in.

Vegetation

In comparison to alternatives A & B this alternative would have more impacts on vegetation due to the removal of leaf area during the spring growing season. In comparison to alternative C, the impacts to vegetation from livestock grazing may be slightly less under this alternative, because stocking rates by pasture are proposed to help distribute livestock use throughout the allotment and a rest rotation management system is proposed to provide plants spring rest from grazing. The impacts to vegetation under this alternative from livestock grazing are less than those from alternatives C, E & F.

Key forage species in grazed areas would be utilized by livestock during the winter and spring. Between March and May livestock would remove a portion of the new leaf growth which is needed to complete photosynthesis to recharge root reserves. During years of average and above average production, and moderate or less livestock use, forage plants would have sufficient leaf area for food production (photosynthesis), to store sufficient food (root reserves) to complete plant reproduction. The key grasses are cool-season species, therefore, plant growth is concentrated in a limited growing season in the spring. During drought years, overutilization of key species in valley bottoms would occur due to decreased vegetative production levels unless stocking rates are reduced. Overutilization of key species can damage root crowns, add additional stress to drought stressed plants and remove new plant growth that is needed to complete photosynthesis and recharge root reserves. During drought years, new plant growth typically occurs early in the growing season, and there has often not been enough moisture for plant re-growth after livestock are removed. Removal of most of the new leaf area drastically reduces vegetative food production (photosynthesis), food storage (root reserves), and reproductive capability of key forage species. Overutilization also reduces the ability of key forage species to compete with other species in the plant community.

Because the stocking rate for the allotment was being evaluated actual livestock stocking rates have exceeded permitted use. Livestock were permitted to remain on the allotment until May 31st, historically (private property) and during the evaluation period. Because actual use was different from permitted use vegetative trend is expected to improve under this alternative. The grazing season of use would be two weeks shorter than what has occurred in the past. In comparison to actual use, key forage species would have an additional two weeks of leaf growth to utilize for food production (photosynthesis), food storage (root reserves), which would contribute to reproductive capability. TNR livestock use would no longer be authorized during above average vegetative production years therefore plants would be able to utilize the extra resources during good years to increase overall plant vigor. The proposed stocking rates for livestock by pasture should reduce some of the overutilization by distributing livestock use throughout the pastures in the allotment. The proposed rest rotation system provides for some rest of key forage species from livestock grazing during the spring. The rest rotation system has been used since 2003 but combined with a shortened season of use, fewer livestock AUMs and reduced livestock use of key species is expected to contribute to improved vegetative conditions.

If livestock are managed to ensure utilization standards are met and livestock grazing is adjusted during drought years the frequency of key perennial plant species would increase and plant community trend would improve. In comparison with the other grazing alternatives this

alternative would moderately improve the vigor of key plant species by ending the grazing season on May 15 (actual livestock use – cattle have been on the allotment two weeks longer). Increased plant vigor would enable key species to more effectively compete with other perennial and annual plant species. The positive influences of prescribed grazing on forage plants such as stimulated plant growth and re-growth due to pruning, enhanced forage nutritive values due to increased new growth to old growth ratios, and the reduction of accumulated standing dead vegetation which sometimes slows new plant growth and soil warming would occur under this alternative.

The construction of three miles of fence would require the temporary removal of six acres of vegetation. Vegetation would be removed along the fence line during construction and the fence would likely be driven along during maintenance which would crush vegetation.

Wetlands/Riparian Zones

Implementing this Alternative would improve or maintain riparian conditions on the allotment. Areas such as Willow Spring and Lower Spring Gulch that were rated in a downward trend during the 2007 assessments should improve because the downward trend appeared to be drought related. Other riparian areas on the allotment should at least be maintained at current conditions, which were generally favorable.

Water Quality (Ground & Surface)

Implementing the proposed action would maintain or slightly improve water quality on the allotment. Current grazing practices, however, do not appear to be significantly affecting water quality.

General Wildlife

Although fewer cows would use the area, these animals would graze into the spring. This factor is much more critical than the number of cattle. Most plants will be actively growing and some will be reproducing during this time. Some plants will begin reproduction after livestock have been removed; plants would be allowed to flower, seed and establish new plants as moisture and soil conditions allowed. It is expected that general wildlife populations and diversity could increase somewhat over time.

However, whether this improvement in plant community and general wildlife will occur is unknown. The management philosophy that caused the permittee to risk vegetation crown damage grazing during extended drought would still remain. Long-term sustainability of wildlife habitats and key areas may not occur or could be in question.

This allotment might be expected to support current mule deer numbers under this alternative. Because fewer livestock numbers would graze primarily before plant reproduction was fully active, many species could reproduce and go through its entire cycle for that year. Perennial forbs and grasses could re-establish in some areas of the allotment which would enhance the nutrition available to current mule deer use.

The wildfires that have occurred in this allotment resulting in growth of desert peach rather than bitterbrush have negated the value of a large amount of mule deer winter range. Wintering mule

deer in this area must now use lesser value forage. Because livestock graze during the winter, there is probably spatial and forage competition between the two users (Peek and Krausman 1995). If the lower elevation portion of the allotment were improved somewhat under this alternative, this competition could be minimized.

Riparian areas affected by allowing livestock to stay for extended periods could still remain in their present conditions since livestock patterns of use may not change since that is a function of livestock management during the permitted season. If livestock were allowed to remain on riparian areas during much of the spring, livestock would remove some of the protective vegetation from the meadow soils. The soft, mucky soils in these meadows offer little resistance to livestock hooves when wet, especially in spring when soils are saturated. The result is a stippling of the meadow with hoof depressions and hillocks. The muck erodes rapidly and the depressions cause the water table to lower and drain the meadow. As water drains out of the soil, the air quickly oxidizes and destroys the finely organic soils (Murray ND). The wet meadow below Sunrise Road would still remain impacted from road placement and design.

Pronghorn and black bears could see the same benefits and impacts as mule deer. Under this alternative, the status of bighorn sheep potential habitat wouldn't change.

Upland game birds wouldn't be affected by this alternative (Guthery 1995).

The proposed fences and corrals won't affect general wildlife or game species. The fences are built to wildlife specification that allows easier passage by mule deer and pronghorn.

Special Status Species

Federally Listed Species
Since federally listed animal species naturally don't occur on the allotment, there would be no impacts to these species or habitats from the proposed activity. As there are no federally listed plant species occurring on the allotment there would be no impacts to these species resulting from this alternative.

BLM Sensitive Species
Effects to BLM sensitive animal species would be similar to general wildlife. As there are no BLM sensitive plant species occurring on the allotment there would be no impacts to this species resulting from this alternative.

In general any actions that increase sagebrush, forbs and residual grass cover for nesting between April and July will benefit sage grouse. This alternative benefits sage grouse to a lesser degree than some of the other alternatives since grazing is permitted until 15 May, which as stated previously adversely impacts perennial grasses to a much greater degree than grazing during the dormant periods. Much of the residual herbaceous vegetation will be removed by livestock prior to nest initiation by sage grouse. Greater herbaceous cover has been shown to increase nest success for sage grouse (Axtell 2008).

The proposed fences and corrals won't affect BLM sensitive species. Fences aren't an identified issue for bats. Owls and hawks in open country can usually avoid these. Loggerhead shrike will actually benefit from the new fences since this will create new territorial singing posts and food storage/territory marking areas along the fence (National Research Council 2007).

Migratory Birds
Effects to migratory bird species would be similar to general wildlife.

The proposed fences and corrals won't affect migratory birds. Owls and hawks in open country can usually avoid these. Loggerhead shrike will actually benefit from the new fences since this will create new territorial singing posts and food storage/territory marking areas along the fence. Fences are a minimal threat to passerine species (National Research Council 2007).

Other Plant Species
Under this alternative the William's combleaf would continue to experience negative impacts due to trampling by livestock, primarily through 2 ½ months of the growing season, March-May 15th. This alternative would allow greater negative impacts to the plant than alternatives A & B, as this alternative would permit greater AUMs and allow cattle to remain on the allotment for a longer period of time. This alternative is similar to Alternative C, as the AUM's and season of use are identical and therefore the negative impacts from trampling would be similar. The negative impacts resulting from livestock trampling in this alternative would be less than the impacts anticipated from Alternatives E & F because the amount of AUMs permitted and the length of the grazing season, under these alternatives, are greater than that proposed under this alternative. The proposed range improvements in this alternative would not occur in the vicinity of the playa lakes and therefore there would be no impacts to the plant.

Soils
The implementation of this alternative could have a slight positive effect on the soils resource within the allotment. The soils standard is currently being met.

Noxious Weeds
The implementation of this alternative would have little effect on the Canada thistle infestations since these areas will be treated as part of the Carson City District's Noxious Weed Treatment Plan.

Cultural Resources
It is important that there is no net loss of scientific information regarding cultural resources, and that NRHP eligible sites (historic properties) are managed so as to prevent or minimize adverse impacts. Cultural resource concerns regarding livestock grazing and related effects focus on NRHP eligibility of historic properties, site type, and the potential impacts from livestock-related activities.

Relative to NRHP eligibility, as discussed above in affected environment, livestock use around one proposed improvement within the allotment has potential to affect historic properties through current or future livestock activities. Specific location of these resources is detailed in a technical

report prepared for the project (Lane 2008). Impacts will be viewed relative to the elements making these properties eligible for inclusion on the NRHP prior to a final decision being issued.

The BLM recognizes the potential for grazing to impact historic properties can occur through three scenarios:

(1) Potential grazing impacts from dispersed livestock distribution on historic properties not associated with existing range improvements, or natural conditions of shade, shelter, or water that may attract and concentrate the animals.

> Based on previous work by BLM throughout the Intermountain West and Southwestern U.S., BLM considers continued dispersed livestock grazing in this EA to have no effect on prehistoric sites that are historic properties on the open landscape.

(2) Potential grazing impacts from concentrated livestock distribution on historic properties located near or within range improvements (corrals, water troughs, tanks, loading chutes, stock ponds, etc.) that attract the animals.

> Potential historic properties were identified in the vicinity of one of the proposed allotment improvement fences. The significance of these two sites is related to their ability to provide information related to the local prehistory. Adverse effects to these sites from concentrated use by livestock along the fence line are possible. No additional areas of potential conflict between concentrated livestock use and historic properties are anticipated within the Churchill Canyon allotment.

(3) Potential grazing impacts from concentrated livestock distribution on historic properties located where the natural conditions of shade, shelter, or water (alcoves, drainages, cliff walls, etc.) attract the animals, or potential grazing impacts from other grazing-related operations such as improvements (i.e. access roads) on historic properties.

> These types of locations that concentrate livestock are not known to be present in the Churchill Canyon allotment.

Based on analysis of sensitive cultural resources relative to this Alternative, there exist a potential that construction of a portion of the proposed fencing and a resulting concentrated grazing pattern would conflict with the values present at two historic properties, and this would likely result in adverse effects to cultural resources.

For the undertaking of the issuance of term grazing permit renewals, the BLM must insure that every historic property will have any potential adverse effects resolved, ideally through avoidance. Resolution of adverse effects can be completed in other means—such as through data recovery of the values present at the property—but, pursuant to 36 CFR 800, this must be completed prior to initiating the undertaking of issuance of a term grazing permit renewal and in consultation with the Yerington Paiute Tribe and the Nevada State Historic Preservation Office. If these cannot be accomplished, specific project undertakings will be cancelled, or the allotment use will be modified to otherwise result in no adverse effect to a historic property.

Wild Horses
In the short term the wild horse AML would be unchanged with this alternative. However, over the long term if heavy use is occurring the quantity and quality of perennial grasses could diminish which could lead to a reduction in the AML. Grazing until May 15, has more deleterious effects on perennial grasses than grazing during the winter dormant period.

E. Historic Livestock Grazing & Modified Management

Range
Under the historic grazing alternative, the BLM would issue a term grazing permit for 180 Cattle between 11/01-05/31 for 1,255 AUMs. The following maximum stocking levels by pasture along with the rest rotation management system would be included as part of the terms and conditions in the grazing permit. Sario Well (400 AUMs), Buckskins (250 AUMs), Como Burn (150 AUMs), Sunrise Burn (200 AUMs), Big Meadow (55 AUMs), and Como pasture (200 AUMs). Rest Rotation Management System:

Sario Well Pasture	11/01-03/01	Limited to Dormant Season Grazing
JW Ranch Pastures	11/01-03/01	Graze in Any JW Pasture During Plant Dormancy
Buckskin Pasture	03/01-04/01	Rotate Grazing Pattern
Sunrise Burn	03/15-05/31	Graze Odd Numbered Years – Rest Even Numbered Years
Como Burn	03/15-05/31	Rest Odd Numbered Years – Graze Even Numbered Years
Como Pasture	03/15-05/15	Rotate Grazing Pattern

This alternative would benefit the livestock operation by modifying the BLM grazing permit to reflect livestock use that occurred within the allotment when there were both leased private and BLM managed lands within the allotment. The BLM acquired the leased private lands within the allotment but did not modify the BLM grazing permit. However, the temporary continuation of this grazing system was authorized during the evaluation period. This alternative would modify the BLM grazing permit by extending the grazing season approximately two weeks and increasing permitted use by 181 AUMs.

Fences and corrals wouldn't be built under this alternative. Cattle would continue to drift out of the allotment into the adjacent allotments and cattle from the adjacent allotments would continue to drift into the Churchill Canyon Allotment. The corrals would not be constructed so livestock handling for the purposes of sorting and care would continue to be a time consuming and difficult process.

Vegetation
In comparison to alternatives A, B, C & D this alternative would have more impacts on vegetation due to the removal of more leaf area, during a longer period in the spring growing season. Permitted use would be increased by 181 AUMs and the permitted season of use would be extended 17 days. There would be less new leaf material available for food production (photosynthesis), which would reduce the production of food (root reserves) and plant reproduction. The effects of livestock grazing on vegetation would be similar to what has occurred in the past under the authorization of TNR use. Although there have been above average vegetative production years when the authorization of additional AUMs did not result in

overuse of key forage species the additional forage has not been consistently available. In the past livestock numbers were reduced during below average production years and increased during above average production years and livestock remained on the allotment until the end of May. Between 1992-2000 the overall vegetative trend was upward in the allotment, there was a wetter precipitation cycle, there were fewer livestock on the allotment and livestock left the upland portions of the allotment sooner. Between 2000-2007 the overall vegetative trend was was downward, there was a dryer precipitation cycle, more livestock were on the allotment and livestock stayed on the allotment longer. Although range improvements were authorized in 2003 to help distribute livestock and a rest rotation system was started to provide spring rest, portions of the allotment have consistently been over-utilized by livestock. The proposed rest rotation system and stocking rates by pasture proposed under this alternative would also help distribute livestock within the allotment. However, due to observations of past vegetative responses to livestock management the downward trend within the allotment would be expected to continue under this alternative.

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on vegetation. The temporary removal of six acres of vegetation in association with fence construction would not occur under this alternative.

Wetlands/Riparian Zones

Increasing the permitted use by 14 cattle and extending the season of use through the end of May might cause some decline in riparian conditions. Riparian areas usually receive a disproportionate amount of grazing pressure because of the water, shade, and palatable forage. Though some localized impacts were observed, current allotment grazing levels appear sustainable based on 2000 and 2007 assessment data. Implementing the increase in AUMs proposed in this Alternative, however, could cause more extensive and longer term impacts that would cause an overall decline in riparian conditions.

Water Quality (Ground & Surface)

Increasing the permitted use by 14 cattle and extending the season of use through the end of May might cause some decline in water quality. A disproportionate amount of grazing pressure in riparian areas could lead to impacts that begin to impair water quality due to sedimentation, animal wastes, and heating from a reduction in shade.

General Wildlife

The current heavy use in bottoms and lower side slopes that is related to higher TNR numbers as proposed by this alternative is not conducive to supporting robust populations of general wildlife in these areas. The number of riparian areas either non-functional or at risk impacts the abundance and diversity of species using this resource. Because the current trend has been found to be downward, increasing permitted numbers would continue this trend and general wildlife habitat would decline in condition too. Additionally, livestock would remain on the allotment until late spring when most plants were fully growing and many were reproducing.

The wildfires that have occurred in this allotment and resulting growth of desert peach rather than bitterbrush have negated the value of a large amount of mule deer winter range. Wintering mule deer in this area must now use lesser value forage. Because livestock graze during the

winter, there is probably spatial and forage competition between the two users (Peek and Krausman 1995). If the lower elevation allotment were in good condition, this competition would be minimal. However, the lower elevations were found to be in a downward trend and were experiencing heavy use under increased TNR numbers. Drought is magnifying the effects. The documented shift in forage use by the livestock and mechanical shrub damage would continue, which would impact deer forage. Under this alternative remaining mule deer winter range would be expected to decline in condition.

The number of riparian areas in less than fully functional condition under TNR numbers would remain under increased permitted numbers. Additionally, livestock would remain on the allotment through late spring. Use at this level was found to be heavy or severe so riparian areas would be expected to remain or go into a downward trend. Many of these riparian areas are also being impacted by OHV use. Because these areas are key fawning areas, recruitment into the Pine Nut deer population could be lessened by the continuing downward trend of the habitat.

Although pronghorn populations in the general area are doing well, further decline in habitat condition could affect local occurrence. Black bear habitat would continue in a downward trend under this alternative. Poor back country habitat condition is one reason why black bears have become an urban problem in recent years. However, choosing this alternative wouldn't affect overall State populations of pronghorn or black bears. This alternative wouldn't change the re-introduction status of bighorn sheep.

Moderate grazing levels don't affect other upland game bird species (Guthery 1995). However, lower elevations of this allotment were found to be heavily utilized. Riparian areas were non-functional or at risk. This condition would cause upland game bird species to use the allotment less for life cycle completion. Increased numbers of livestock would continue the recorded downward trend. Although local occurrence of upland game birds might be affected, this wouldn't have an effect on overall State game bird populations.

Under this alternative some areas would probably still be used heavily or severely. The management philosophy that caused the permittee to risk vegetation damage by grazing during extended drought would still remain. In a letter dated May 31, 2007, BLM stated that a permanent increase in livestock numbers on Churchill allotment would be based on two factors: 1) adequate forage, and 2) "a demonstrated ability to manage the extra livestock in such a manner so as to properly utilize the extra forage and prevent over use of sensitive areas such as meadows and riparian zones". As stated, the permittee has been running more numbers than permitted on a TNR basis as a test. According to the letter, the permittee never actually ran full TNR numbers but still had heavy to severe use in bottoms and lower side slopes. The second factor needed to permit increased livestock numbers was failed. Long-term sustainability of wildlife habitats and key areas probably would not occur under this alternative.

Special Status Species

Federally Listed Species

Since federally listed animal species naturally don't occur on the allotment, there would be no impacts to these species or habitats from the proposed activity. As there are no federally listed

plant species occurring on the allotment there would be no impacts to these species resulting from this alternative.

BLM Sensitive Species

Livestock grazing can reduce wildlife species abundance by one-third and diversity by nearly one-half (Fleischner 1994). Livestock grazing allows some species to respond positively, some to respond negatively and some to have a mixed response (Finch et al 1993). This means that some species may use a grazed area more, some may use it less. It doesn't necessarily preclude the presence of a species (Fagerstone and Ramey 1995). Livestock grazing in this allotment is impacting some BLM sensitive species because the bottoms and slide slopes of this allotment have experienced heavy to near severe use. BLM sensitive species needing food sources such as seeds and forbs would be less abundant due to the lack of these on the allotment. BLM sensitive species needing prey that eat seeds or forbs would also be less abundant. BLM sensitive species that needed good quality riparian areas could be less abundant because of the large number of riparian areas that were either not functional or were functional at risk. These areas would not be expected to improve under this alternative. The lengthy grazing season extending into late spring would compound the impacts by amplifying livestock distribution problems or overutilization.

Insect and rodent prey species abundance is reduced significantly under heavy livestock grazing (Fleischner 1994) such as is currently being done. The bat species are probably less abundant due to the less than ideal riparian areas that would produce less insect prey. Bats would also be affected by the lack of nectar producing forbs. Some of the hawks could use the area less due to the lack of seeds that would support an abundant rodent base.

With the heavy to severe utilization that has occurred in some areas of the allotment coupled with increased numbers under TNR, and the permittee's demands to graze close to full permitted numbers under drought conditions, there hasn't been a demonstration of managing for the increased livestock numbers. The downward trend recorded under TNR would likely continue if the increase were permitted. Drought conditions that allowed less production of grasses and forbs would amplify the above effects. However, none of the BLM sensitive species would be pushed toward further listing as a result of implementing this alternative.

In general any actions that increase sagebrush, forbs and residual grass cover for nesting between April and July will benefit sage grouse. This alternative is second only to alternative F increase grazing and season in deleteriousness to sage grouse, as it increases the number of cows consuming vegetation and permits grazing through much of the growing season which as stated previously adversely affects perennial grasses. It also would remove much of the herbaceous vegetation necessary for successful nest concealment from predators (Axtell 2008).

Fences and corrals wouldn't be built under this alternative, but there wouldn't be an important positive or negative effect from this.

As there are no BLM sensitive plant species occurring on the allotment there would be no impacts to these species resulting from this alternative.

Migratory Birds

Livestock grazing allows some species to respond positively, some to respond negatively and some to have a mixed response (Finch et al 1993). This means only that some species may use a grazed area more, some may use it less. It doesn't necessarily preclude the presence of a species. Livestock grazing was not listed as a threat to mourning dove and loggerhead shrike (www.natureserve.com). *Heavy* livestock grazing can be an impact on Brewer's sparrow, gray vireo and sage thrasher (www.natureserve.com; Finch et al 1993) as well as Sage Sparrow, Ferruginous Hawk, Burrowing Owl and Prairie Falcon (Neel 1999; Beidleman 2000, Nevada Wildlife Action Plan 2006). Because bottoms and lower side slopes were found to have heavy utilization, this alternative would impact migratory birds associated with this allotment since the bird species listed are associated with the heavy use areas. Migratory bird species needing food sources such as seeds and forbs would be less abundant due to the lack of these on the allotment. Migratory bird species needing prey that ate seeds or forbs would also be less abundant. Migratory bird species that needed good quality riparian areas could be less abundant because of the large number of riparian areas that were either not functional or were functional at risk. The lengthy grazing season extending into late spring would compound the impacts by amplifying livestock distribution problems or overutilization.

Pinyon jay can be benefited by grazing but is more likely to be unaffected (BISON ND). Sources don't indicate that the remainder of the migratory bird species listed in Appendix B is affected by livestock grazing (www.nature.serve.com; Neel 1999; Beidleman 2000, Nevada Wildlife Action Plan 2006, Floyd 2007).

Again, with the heavy and severe utilization that has occurred with increased numbers under TNR and the permittee's demands to graze close to full permitted numbers under drought conditions, there hasn't been a demonstration managing increased livestock numbers. The downward trend recorded under TNR would likely continue under permitted increased numbers. Drought conditions that allowed less production of grasses and forbs would amplify the above effects. Although this alternative could affect migratory bird occurrence in the general allotment area causing these to be less than if habitat conditions were better, it wouldn't affect state or regional populations.

Fences and corrals wouldn't be built under this alternative, but there wouldn't be an important positive or negative effect from this.

Other Plant Species

Under this alternative the William's combleaf would continue to experience negative impacts due to trampling by livestock primarily during 3 months of the growing season from March to May. The impacts due to livestock trampling, in this alternative, would be greater than the impacts from alternatives A through D, because the AUMs permitted and the season of use is greater. The negative impacts associated with livestock trampling, in this alternative, are less than those from Alternative E, due to the increase number of cattle that would be authorized.

Soils

The implementation of this alternative could have a slight negative effect on the soils resource due to the longer season of use. Over time a longer season of use could reduce basal vegetative

ground cover, which would result in decreased infiltration and an increase in annual grasses and runoff.

Noxious Weeds
The implementation of this alternative would have little effect on the Canada thistle infestations since these areas will be treated as part of the Carson City District's Noxious Weed Treatment Plan.

Cultural Resources
Adoption of this alternative would result in an increased numbers of livestock and could potentially increase impacts to unknown, sensitive cultural resources. Relative to adverse effects to historic properties, the magnitude of the increased impact likely would not be measurable. Therefore, relative to cultural resources there would not be an appreciable difference between this Alternative and the Proposed Action.

Wild Horses
In the short term the wild AML would be unchanged with this alternative. However, over the long term if heavy use is occurring the quantity and quality of perennial grasses could diminish which could lead to a reduction in the AML. Increasing livestock AUMs would exacerbate any use problems.

F. Increase Permitted Livestock Use & Extend the Grazing Season

Range
Under this alternative, the BLM would issue a term grazing permit for 280 Cattle between 11/1-5/31 for 1,961 AUMs.

In the short term this alternative would benefit the livestock operation by increasing livestock numbers. However, in the long term natural resource conditions would decline which would negatively impact the livestock operation. There would be less forage available and livestock condition would decline.

Fences and corrals wouldn't be built under this alternative. Cattle would continue to drift out of the allotment into the adjacent allotments and cattle from the adjacent allotments would continue to drift into the Churchill Canyon Allotment. The corrals would not be constructed so livestock handling for the purposes of sorting and care would continue to be a time consuming and difficult process.

Vegetation
Under the increased grazing alternative, up to 1,961 AUMs of forage would be utilized by cattle between 11/01-05/31. Livestock use would occur while vegetation is dormant and during spring re-growth. Based on observations of actual use between 1,537 to 1,750 AUMs within the allotment we would expect heavy (61%-80%) to severe (81%-100%) use of key perennial plant species in the valley bottoms during years of average vegetative production. Root crown damage and increased soil erosion would likely occur due to excessive defoliation of key perennial plant species.

This livestock grazing alternative would minimize the available vegetative leaf area of forage species. Most of the available vegetative leaf area would be removed by livestock grazing during the winter and spring. Between March and May livestock would remove new plant leaf growth which is needed to complete photosynthesis to recharge root reserves. During most years forage plants would likely not have sufficient leaf area for food production (photosynthesis), to store food (root reserves) and complete plant reproduction. Plant growth is concentrated in a limited growing season. The key grasses are cool-season species, therefore, the effects of overutilization would be less in above average moisture years and more severe during drought years. The vigor and frequency of key perennial plant species would decrease and plant community trend would decline under this alternative.

Fences and corrals wouldn't be built under this alternative; this shouldn't have much effect on vegetation. The temporary removal of six acres of vegetation in association with fence construction would not occur under this alternative.

Based on actual livestock use and vegetation monitoring data summarized in Appendices C & D, this alternative would not improve the condition of rangeland resources as provided for by various federal acts and in the CCFO CRMP 2001.

Wetlands/Riparian Zones

Increasing the permitted use by 114 cattle and extending the season of use through the end of May would likely cause a decline in riparian conditions. Riparian areas usually receive a disproportionate amount of grazing pressure because of the water, shade, and palatable forage. Though some localized impacts were observed, current allotment grazing levels appear sustainable based on 2000 and 2007 assessment data. Implementing the substantial increase in AUMs proposed in this Alternative, however, would likely cause more extensive and longer term impacts that would cause an overall decline in riparian conditions.

Water Quality (Ground & Surface)

Increasing the permitted use by 114 cattle and extending the season of use through the end of May could cause a decline in water quality. A disproportionate amount of grazing pressure in riparian areas could lead to impacts that begin to impair water quality due to sedimentation, animal wastes, and heating from a reduction in shade.

General Wildlife

This alternative would be the least ideal grazing alternative for general wildlife. The effects for general wildlife would be similar to those for alternative E except that nearly 1/3 more cattle would be on the range. Impacts would be expected to increase proportionately.

Special Status Species

Federally Listed Species

Since federally listed species naturally don't occur on the allotment, there would be no impacts to these species or habitats from the proposed activity.

As there are no federally listed plant species occurring on the allotment there would be no impacts to these species resulting from this alternative.

BLM Sensitive Species
This alternative would be the least ideal grazing alternative for BLM sensitive species. The effects on BLM sensitive species would be similar to those for alternative E except that nearly 1/3 more cattle would be on the range. Impacts would be expected to increase proportionately.

In general any actions that increase sagebrush, forbs and residual grass cover for nesting between April and July will benefit sage grouse. This alternative is the most deleterious to sage grouse as it increase the number of cows and permits grazing through most of the growing period for perennial grasses. As stated previously grazing of growing perennial grasses is more deleterious than grazing during the dormant period, in addition additional livestock will remove even more herbaceous cover necessary for sage grouse nest concealment from predators and further stress the growing perennial grasses by increasing the impacts on them (Axtell 2008).

As there are no BLM sensitive plant species occurring on the allotment there would be no impacts to this species resulting from this alternative.

Migratory Birds
This alternative would be the least ideal grazing alternative for migratory birds. The effects on migratory birds would be similar to those for alternative E except that nearly 1/3 more cattle would be on the range. Impacts would be expected to increase proportionately.

Other Plant Species
Under this alternative the William's combleaf would continue to experience negative impacts due to trampling by livestock primarily during 3 months of the growing season from March to May. The impacts due to livestock trampling, in this alternative, would be greater than the No Grazing, Reduction in Livestock Use and Season of Use, No Change in the Current Grazing Permit, No Change to Grazing Permit & Construction of Range Improvements and Historic Livestock Use and Extend the Season of Use alternatives because the AUMs permitted and the season of use is greater or the amount of cattle permitted and season of use is greater.

Soils
The implementation of this alternative could have a slight negative effect on the soils resource. Although the allotment as a whole is meeting soil standards there is less vegetative ground cover than optimal in some areas. An increase in livestock numbers could result in further depletion of perennial grasses and forbs.

Noxious Weeds
The implementation of this alternative would have little effect on the Canada thistle infestations since these areas will be treated as part of the Carson City District's Noxious Weed Treatment Plan.

Cultural Resources
Adoption of this alternative would result in an increased numbers of livestock and the period of time those animals were concentrated on the landscape. This possibly could increase impacts to unknown and sensitive cultural resources. Relative to adverse effects to historic properties, the magnitude of the increased impact potentially may be measurable. Therefore, relative to cultural resources there would potentially be an appreciable difference between this Alternative and the Proposed Action, however, it is unlikely that the level of impact will not rise to adversely affect the significant values of historic properties.

Wild Horses
In the short term the wild AML would be unchanged with this alternative. However, over the long term if heavy use is occurring the quantity and quality of perennial grasses could diminish which could lead to a reduction in the AML. Increasing livestock AUMs would exacerbate any use problems.

G. Mitigation Measures

Additional mitigation includes establishing a critical avoidance period for William's combleaf from May to July where cattle are kept out of the playa lakes area would allow the plant time to recover from trampling and allow the plant to flower and bear seed without impacts during this crucial stage of reproduction.

There are no additional mitigating measures beyond what is listed above for Williams combleaf and under the terms and conditions of the expiring term grazing permit and management included as parts of the proposed action and alternatives. If the no grazing alternative were selected, there would be no need for any mitigating measures. No maintenance of any range improvement would occur. The potential for unauthorized grazing occurring from adjacent Allotments could become a problem.

H. Cumulative Impacts

All resource values have been evaluated for cumulative impacts for past, present, or reasonably foreseeable future actions. It has been determined that cumulative impacts would be negligible as a result of the proposed action.

The issuance of the term grazing permit for the Churchill Canyon Allotment is a specific action, and would cause no known cumulative impact to the environment when considered in combination with any known or anticipated actions on these or adjacent lands in the past, present or reasonably foreseeable future. Any effects of the grazing levels proposed would be limited to the project areas. Grazing at or below moderate utilization levels has not been shown to be injurious to plant or animal species in the area. The effects of grazing, along with associated activities in the management of this Allotment such as the maintenance or use of range improvements, would be limited to the immediate area of the allotment. They would not combine with any known or reasonably foreseeable activities on these or adjacent lands to produce any detrimental cumulative impacts in the area.

I. Monitoring

Monitoring would continue as it has before for the Allotment. This includes the reading frequency studies, performing use pattern mapping, gathering utilization data at key areas, monitoring cultural resources, etc., where applicable and as resources allow.

V. CONSULTATION AND COORDINATION

A. List of Preparers

John Axtell	Wild Horse and Burro Specialist/Sage Grouse
James Carter	Lead Archaeologist
James deLaureal	Soil Scientist/Noxious Weeds
Arthur Callan	Recreation Specialist
Terri Knutson	Environmental Coordinator
Katrina Leavitt	Rangeland Ecologist
Robert Mead	Lead Rangeland Management Specialist
Jim Schroeder	Lead Hydrologist
Rita Suminski	Supervisory Wildlife Biologist
Dean Tonenna	Plant Ecologist

B. Persons, Groups and/or Agencies Consulted

Permittee of Record Churchill Canyon Allotment
Yerington Paiute Tribe
Western Watersheds Project
Nevada Natural Heritage Program

VI. APPENDICES

Appendix A – BLM Sensitive Species
Appendix B – Neo-tropical Migratory Birds, Species of Concern
Appendix C – Actual Livestock Use
Appendix D – Livestock Utilization
References

APPENDIX A

BLM Sensitive Species associated with Churchill Canyon Allotment

Animal

Golden Eagle – *Aquila chrysaetos*
Ferruginous Hawk - *Buteo regalis*
Northern Goshawk - *Accipiter gentilis*
Burrowing owl - *Athene cunicularia*
Long-billed Curlew – *Numenius americanus*
Juniper Titmouse - *Baeolophus griseus*
Pinyon Jay - *Gymnorhinus cyanocephalus*
Greater sage-grouse- *Centrocercus urophasianus*
Mountain quail - *Oreortyx pictus*
Cooper's Hawk – *Accipiter cooperii*
Sharp-shinned Hawk- *Accipiter striatus*
Prairie Falcon – *Falco mexicanus*
Peregrine Falcon- *Falco peregrinus*
Swainson's Hawk- *Buteo swainsoni*
Western Snowy Plover- *Charadrius alexandrinus*
Loggerhead shrike- *Lanius ludovicianus*
Gray vireo- *Vireo vicinior*
Pallid bat – *Antrozous pallidus*
Spotted bat – *Euderma maculatum*
Long-eared myotis – *Myotis evotis*
Fringed myotis – *Myotis thysanodes*
Yuma myotis – *Myotis yumanensis*
Silver-haired bat - *Lasionycteris noctivagans*
California myotis - *Myotis californicus*
Small-footed myotis -*Myotis ciliolabrum*
Long-eared myotis -*Myotis evotis*
Little brown myotis - *Myotis lucifugus*
Long-legged myotis - *Myotis volans*
Townsend's big-eared bat - *Corynorhinus townsendii*
Hoary bat - *Lasiurus cinereus*
Western pipistrelle bat - *Pipistrellus hesperus*
Brazilian free-tailed bat - *Tadarida braziliensis*

APPENDIX B (Page 1 of 2)

Neo-tropical Migratory Birds, Species of Concern on Churchill Canyon Allotment

Salt Desert (Neel 1999) -

Burrowing Owl	*Athene cunicularia*
Loggerhead Shrike	*Lanius ludovicianus*

Issues: Loss of understory due to excessive livestock grazing, invasion of exotic annuals (Neel 1999). Conversion of habitat for human use (Floyd et al 2007), OHV collision for burrowing owls (NDOW 2008),
Livestock grazing not an issue for loggerhead shrike (www.natureserve.com)

Western Shrublands (Beidleman 2000)

Shrubsteppe (Beidleman 2000), **Sagebrush** (Neel 1999)

Sage Sparrow	*Amphispiza belli*	
Sage grouse	*Centrocercus urophasianus*	
Brewer's sparrow	*Spizella breweri*	
Ferruginous Hawk -	*Buteo regalis*	

This bird uses flat topped juniper strings in sagebrush for nesting. East & SE slopes especially used if strings present.

Prairie Falcon	*Falco mexicanus*	(cliffs critical for nesting)

This falcon needs cliffs for nesting

Mourning Dove	*Zenaida macroura*

Mountain Shrub (Neel 1999; Beidleman 2000)

Virginia's Warbler	*Vermivora virginiae*

Issues: fragmentation from man-caused activities. Overgrazing of grasses and forbs that alter community structure, invasion of non-native grasses and fire suppression / crown-killing wildfire (Beidleman 2000). Loss of shrub understory, increasing human infrastructure which fragments and degrades habitat, and increases soil erosion was also identified (Neel; Nevada Wildlife Action Plan 2006). Loss of habitat due to heavy grazing, altered fire regimes, spread of introduced plants (Neel 1999; Floyd et al 2007). Loss of loggerhead shrike due to rangeland pesticide a concern. Human disturbance for loggerhead not an issue. Sage Sparrow sensitive to habitat fragmentation. Land management effect on Virginia's warbler unknown. Brewer's sparrow issues related to ag and urban development, livestock grazing, cheatgrass invasion, herbicides, altered fire regimes (Floyd et al 2007)

Note: Shrubsteppe was identified as the highest priority habitat for conservation for breeding birds (Saab and Rich 1997; Paige and Ritter 1999). 10% of the world's population of ferruginous hawks breed in Nevada (Floyd et al 2007)

APPENDIX B (Page 2 of 2)

Neo-tropical Migratory Birds, Species of Concern on Churchill Canyon Allotment

Woodland – (Beidleman 2000

Gray Vireo	*Vireo vicinior*
Pinyon Jay	*Gymnorhinus cyanocephalus*
Swainson's Hawk	*Buteo swainsoni*

Issues: fragmentation from man-caused activities and conversion to grasslands (Beidleman 2000), heavy livestock grazing and cowbird parasitism are threats to gray vireo. Cutting mature pinyon, changes in fire regimes a threat to pinyon jay. Nevada has high regional responsibility for protecting pinyon jay (Floyd et al 2007). Pinyon jay responds negatively to picnicking and hiking (BISON ND) Loss of winter habitat and pesticide poisoning in South American winter range is largest contributor to decline of Swainson's hawk (Floyd et al 2007)

Note: This habitat type supports the largest nesting-bird species list of any upland vegetation type in the West (Beidleman 2000). Nevada supports a sizable proportion of the breeding population of black-throated gray warblers (Floyd et al 2007).

Cliffs and Talus (Neel 1999)

Golden Eagle	*Aquila chrysaetos*

Issues: mining activity, rock climbing (Neel 1999) Golden eagles relatively intolerant of human activity (Floyd et al 2007)

APPENDIX C
Actual Livestock Use

Grazing Year	Type of Livestock	Winter Season	Winter Use (AUMs)	Spring/ Summer Season	Spring/ Summer Use (AUMs)	TOTAL ACTUAL USE (AUMs)
1992-1993	Cattle	No Use	-	No Use	-	-
1993-1994	Cattle	11/20-02/28	996	03/01-03/10	41	1,037
1994-1995	Cattle	11/19-02/28	456	03/03-05/15	293	749
1995-1996	Cattle	11/24-02/28	730	03/01-04/30	459	1,189
1996-1997	Cattle	11/16-02/28	729	03/01-04/19	347	1,076
1997-1998	Cattle	11/22-02/28	649	03/01-06/02	613	1,262
1998-1999	Cattle	11/22-02/28	814	03/01-06/02	723	1,537
1999-2000	Cattle	12/15–02/28	500	03/01-05/25	565	1,065
2000-2001	Cattle	12/26-02/28	461	03/01-05/22	630	1,091
2001-2002	Cattle	11/13-02/28	547	03/01-05/21	497	1,044
2002-2003	Cattle	01/05-02/28	326	03/01-05/19	372	698
2003-2004	Cattle	11/22-02/28	728	03/01-05/25	526	1,254
2004-2005	Cattle	11/14-02/28	787	03/01-06/01	474	1,261
2005-2006	Cattle	11/13-02/28	870	03/01-06/01	793	1,663
2006-2007	Cattle	11/12-02/28	1,074	03/01-05/30	674	1,750
2007-2008	Cattle	No Use	-	No Use	-	0

Appendix D. Livestock utilization within the Churchill Canyon Allotment Page 1 of 7

Grazing Year Allotment Actual Use Precipitation	Description of Grazing Use and Forage Conditions	Utilization Levels
1993-1994 1,037 AUMs Precipitation +	Precipitation data from weather stations surrounding the allotment indicate average to above average amounts of precipitation were received during the 1993 growing season. This data is consistent with observations of vegetation within the allotment. At the start of the 1993 grazing season there was an average abundance of forage available. In the Sario Well pasture ricegrass plants had produced seed and were average to above average in size. Livestock use was heavy in the valley bottom and slight to light on the side hills at the end of the grazing season in the spring of 1994. Actual use in the pasture was 650 AUMs. In the JW Ranch pasture needlegrass plants were below average to average in size and produced few seed heads. Use in the eastern portion of the Buckskins south of Willow Spring was heavy. Use on other slopes within the Buckskins was slight. In the canyon bottoms in the Buckskins and along the main Churchill Canyon road use was light to moderate. Around the Big Meadow and JW Ranch use was heavy. On the eastern slope of the Pine Nut range use was slight to light. Actual use in the pasture was 650 AUMs.	Sario Well -/+ JW Ranch -/+
1994-1995 749 AUMs Precipitation -	Total precipitation was below average in 1994 and observations of vegetation within the allotment indicate grass plants grew a few inches following grazing but did not produce seed.	No Data
1995-1996 1,189 AUMs Precipitation +	Both total and growing season precipitation levels were above average in 1995. In the Sario Well pasture livestock use was light to moderate in the valley bottom and none to slight on the side hills at the end of the grazing season in the spring of 1996. Actual use in the pasture was 751 AUMs. In the JW Ranch pasture use was moderate in the canyon bottoms in the Buckskins and along the main Churchill Canyon road. Use on the side hills in the Buckskins and on the eastern slopes of the Pine Nut Range was slight to light. Use in the big meadow, around Presto Spring and JW Ranch was Heavy. The Sunrise Fire occurred in July of 1996. Actual use in the pasture was 437 AUMs.	Sario Well + JW Ranch -/+

Appendix D. Livestock utilization within the Churchill Canyon Allotment

Grazing Year Allotment Actual Use Precipitation	Description of Grazing Use and Forage Conditions	Utilization Levels
1996-1997 1,076 AUMs Precipitation +	Precipitation data indicated above average precipitation levels for 1996 but little to no re-growth occurred on grass plants following the 1995-1996 grazing season. At the start of the 1996-1997 grazing season in the Sario Well pasture use levels were still at light to moderate levels in the valley bottom. At the end of the grazing season utilization was heavy in Churchill Canyon, moderate in the salt desert shrub and low sage communities next to the canyon and slight to light on the side hills. Actual use in the pasture was 616 AUMs.	Sario Well -
	In the JW Ranch pasture grass plants were below average to average in size at the start of the growing season, and very few seed stalks were visible. Use in the valley bottoms was moderate to heavy. Use on the sidehills was slight to light. Actual use in the pasture was 375 AUMs. Use was moderate to severe in Upper Spring Gulch, actual use was 31 AUMs.	JW Ranch -
	In the Como Pasture use was moderate along the main roads (back county byway and jeep trial to the use cage) and slight along the northern allotment boundary. Actual use in the pasture was 265 AUMs.	Como +
1997-1998 1,262 AUMs Precipitation -	The precipitation data for the 1997 growing season indicates average and below average precipitation levels at the weather stations. At the end of the 1997-1998 grazing season use in the Sario Well pasture was heavy in lower Churchill Canyon, moderate in the salt desert shrub communities, and light to slight in the low sage side hills. Actual use in the pasture was 452 AUMs.	Sario Well -
	In the JW Ranch Pasture use was light to moderate in the valley bottoms, slight on the side hills and heavy around Presto Spring and in the Big Meadow. Actual use in the pasture was 416 AUMs on the uplands and 101 AUMs from the Big Meadow.	JW Ranch +
	Use in the Como pasture was light along the main roads. Actual use in the pasture was 288 AUMs.	Como +

Appendix D. Livestock utilization within the Churchill Canyon Allotment Page 3 of 7

Grazing Year Allotment Actual Use Precipitation	Description of Grazing Use and Forage Conditions	Utilization Levels
1998-1999 1,537 AUMs Precipitation ++	Precipitation data for the 1998 growing season was above average. This data is consistent with observations of vegetation within the allotment. At the start of the 1998 grazing season there was an above average abundance of forage available. Grass plants were larger than average in size and had produced seed. At the end of the grazing season use within the Sario Well pasture was light to moderate in the valley bottoms and light to slight on the side hills. Actual use in the pasture was 612 AUMs.	Sario Well +
	Use in the JW Pasture was light in the valley bottoms and slight on the eastern slope of the Pine Nut range. Actual use in the pasture was 371 AUMs in the uplands and 105 AUMs from the Big Meadow.	JW Ranch +
	Use in the Como pasture was slight along the main raods. Actual use in the pasture was 328 AUMs.	Como +
1999-2000 1,065 AUMs Precipitation -	Precipitation data for the 1999 growing season was below average. Note use data was collected in September 2000 after plant re-growth to assess available forage for the next grazing season (2000-2001). In the Sario Well pasture use within the valley bottom was primarily moderate. Use on the side slopes was slight to light.	Sario Well -
	In the JW ranch pasture two areas within the Buckskins received heavy use. The meadows along the Sunrise Pass Road received moderate use. Use on the eastern slope of the Pine Nuts was light. The Como fire occurred in October of 2000.	JW Ranch -
	Use in the Como pasture was heavy along the main roads.	Como -

Appendix D. Livestock utilization within the Churchill Canyon Allotment Page 4 of 7

Grazing Year Allotment Actual Use Precipitation	Description of Grazing Use and Forage Conditions	Utilization Levels
2000-2001 1,091 AUMs Excluding the Como Burn Precipitation -	Precipitation data for the 2000 growing season was below average. At the start of the 2000-2001 grazing season there was very little re-growth of forage plants from the previous grazing season in the Sario Well Pasture. A drought letter was sent instructing the permittee to only trail livestock in and out of the moderately used Churchill Canyon valley bottom and to encourage livestock use in the side canyons and hills. At the end of the grazing season use within the valley bottom was heavy. Actual use in the pasture was 392 AUMs. In the JW Ranch pasture use was light in the main valley along the main Churchill Canyon road and slight to light in the Sunrise burn. The Como burn was rested from grazing. Actual use in was 489 AUMs in the uplands, 103 AUMs from Big Meadow and 47 AUMs from Upper Spring Gulch.	Sario Well - JW Ranch +
2001-2002 1,044 AUMs Excluding the Como Burn Precipitation -	Precipitation data for the 2001 growing season was below average. Observations of vegetation within the allotment, at the start of the 2001-2002 grazing season indicted there was an average abundance of forage available. Grass plants were below average to average in size and had produced seed. At the end of the grazing season in the Sario Well pasture use was heavy in the valley bottom. Actual use in the pasture was 596 AUMs. In the JW Ranch pasture, the Como burn was rested from grazing. Actual use was 141 AUMs in the uplands and 89 AUMs from Big Meadow. Actual use in the Como pasture was 214 AUMs.	Sario Well -

Appendix D. Livestock utilization within the Churchill Canyon Allotment

Grazing Year Allotment Actual Use Precipitation	Description of Grazing Use and Forage Conditions	Utilization Levels
2002-2003 698 AUMs Excluding the Sario Well Pasture and Como Burn Precipitation -	Data for the 2002 growing season indicated below average precipitation. Observations of forage within the Sario Well pasture indicated very little re-growth had occurred since the previous grazing season. The Sario Well pasture was rested from livestock grazing during the 2002-2003 grazing season. In the JW Ranch and Como pastures there was a below average to average abundance of forage available at the beginning of the grazing season. Grass plants re-grew following the 2001-2002 grazing season but did not produce seed heads. Water was hauled to five locations in the Buckskins to redistribute livestock use. The Como burn was rested from grazing due to the small size of establishing plants. The fence dividing the JW Ranch Pasture was constructed in 2003. Actual use in the uplands was 529 AUMs, in big meadow 60 AUMs and in Upper Spring Gulch 36 AUMs. Actual use in the Como pasture was 77 AUMs.	Sario Well No Use JW Ranch No Data
2003-2004 1,254 AUMs Precipitation -	Precipitation data for the 2003 growing season was below average. Observations of vegetation within the allotment at the start of the 2003-2004 grazing season indicated there was an average abundance of forage available. In the Sario Well pasture livestock use was light to moderate in the valley bottom and slight on the side hills at the end of the grazing season. Actual livestock use within the Sario Well pasture was 401 AUMs. In the JW Ranch pasture use was light in the main valley bottom near the key area. Moderate to heavy use at Presto Spring and Big Meadow. Water was hauled to five locations in the Buckskins to redistribute livestock use and use was slight in the canyons. Use within the Sunrise burn varied from slight to moderate. The sunrise meadows were lightly used. Actual livestock use within the JW ranch pasture was: 1) 240 AUMs Buckskins; 2) 163 AUMs Sunrise Burn; 3) 182 AUMs Como Burn; 4) 77 AUMs Big Meadow; and 5) 40 AUMs Upper Spring Gulch. The rest rotation management system began for the pasture. Water was hauled to one location in the Como Canyon to redistribute livestock use. Actual livestock use within the Como pasture was 146 AUMs.	Sario Well + JW Ranch -/+ Como No Data

Appendix D. Livestock utilization within the Churchill Canyon Allotment

Grazing Year Allotment Actual Use Precipitation	Description of Grazing Use and Forage Conditions	Utilization Levels
2004-2005 1,261 AUMs Precipitation -	Data for the 2004 growing season indicated below average precipitation. During the grazing season water was hauled up two side canyons in the Sario Well Pasture to distribute livestock use. Actual livestock use within the pasture was 617 AUMs for the 2004-2005 grazing season.	Sario Well No Data
	In the JW Ranch pasture use was slight to light in the main canyon along the Churchill Canyon road and in the side canyons in the Buckskin range. There was no use on the side hills. Actual livestock use within the JW ranch pasture was: 1) 197 AUMs Buckskins; 2) 183 AUMs Sunrise Burn; 3) 54 AUMs Como Burn; and 4) 80 AUMs Big Meadow.	JW Ranch +
	Water was hauled to one location in the Como Canyon to redistribute livestock use. Actual livestock use within the Como pasture was 136 AUMs.	Como No Data
2005-2006 1,663 AUMs Precipitation +	Data for the 2005 growing season indicate above average precipitation during the growing season at three weather stations and below average moisture at two stations. Above average amounts of snow were received in the allotment during January of 2005. In the Sario Well pasture livestock use was light to moderate in the valley bottom and slight on the side hills at the end of the grazing season. Actual livestock use at the end of the grazing season was 637 AUMs.	Sario Well +
	In the JW ranch pasture use was moderate to severe on the north end of the Buckskin range and slight to light on the south end of the range. Water was hauled to five locations in the Buckskins to redistribute livestock use. Use was light in the Big Meadow and the Sunrise meadows. Use was slight to light within the Sunrise Burn. Actual livestock use within the JW ranch pasture was: 1) 353 AUMs Buckskins; 2) 202 AUMs Sunrise Burn; 3) 274 AUMs Como Burn; 4) 78 AUMs Big Meadow; and 5) 5 AUMs Upper Spring Gulch.	JW Ranch -
	Use was slight to light along the main road. Water was hauled to one location in the Como Canyon to redistribute livestock use. Actual livestock use within the Como pasture was 156 AUMs.	Como +

Appendix D. Livestock utilization within the Churchill Canyon Allotment Page 7 of 7

Grazing Year Allotment Actual Use Precipitation	Description of Grazing Use and Forage Conditions	Utilization Levels
2006-2007 1,750 AUMs Precipitation -	Data for the 2006 growing season indicate above average precipitation during the growing season at three weather stations and below average moisture at two stations. Observations of vegetation within the allotment before the start of the 2006-2007 grazing season indicated there was an average abundance of perennial forage available and an abundance of dry cheatgrass. During the grazing season water was hauled up two side canyons in the Sario Well pasture to distribute livestock use. Livestock use in the Sario Well pasture was heavy in the valley bottom and slight to no use on the side hills at the end of the grazing season. Actual livestock use within the pasture was 699 AUMs. In the JW ranch pasture use was moderate along the valley bottom along the main Churchill Canyon road. Use was heavy in the side canyons slight on the side slopes in the Buckskin range. Water was hauled to five locations in the Buckskins to redistribute livestock use. In the Sunrise burn use was heavy on the Sunrise meadows and light on the uplands. In the Como burn use was heavy on the lower slopes and light on the upper slopes. Actual livestock use within the JW ranch pasture was: 1) 352 AUMs Buckskins; 2) 351 AUMs Sunrise Burn; 3) 211 AUMs Como Burn; 4) 29 AUMs Big Meadow; and 5) 20 AUMs Upper Spring Gulch. Use was slight along the main road. Actual livestock use within the Como pasture was 186 AUMs.	Sario Well - JW Ranch - Como +
2007-2008 0 AUMs Precipitation -	Perennial plants did not re-grow following the 2006-2007 grazing season. The allotment was rested from livestock use during the 2007-2008 grazing season.	No Use

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