# United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Winnemucca Field Office
5100 East Winnemucca Boulevard
Winnemucca, Nevada 89445
(775) 623-1500
http://www.nv.blm.gov/winnemucca

In Reply Refer To:
4120
(NV-022.18)

March 10, 2003

Dear Interested Public:

On March 3, 2003, I issued the Final Allotment Re-Evaluation for the Soldier/Paiute Meadows Allotments along with a Determination/Management Action Selection Report. At that time, I stated that the Environmental Assessment for these two allotment would be forth coming.

Please find the Environmental Assessment for the Soldier Meadows Allotment. Please review and provide comments back to me at the above address by March 28, 2003.

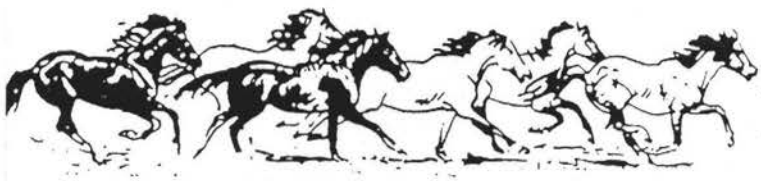
If you have any questions, please contact Matt Varner at (775) 623-1500.

Sincerely,

Les W. Boni
Assistant Field Manager
Renewable Resources

Enclosure – Environmental Assessment Soldier Meadows Allotment

Sent fax 3/27



In Memoriam
LOUISE C. HARRISON
VELMA B. JOHNSTON, "Wild Horse Annie"
GERTRUDE BRONN

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S valuation Summary

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th worn to protect and manage; but I have not.
T ou put on the legally stipulated agreements.
B uctant in the future to agree to settlements
a tion will be spent on your every word.

It blics thorough review is denied. NEPA
re t for a two week turn around does not comply
with regulations.

WHOA participated throughout the MFP process so there is no misunderstanding on either side. The BLM has long known of our disapproval of inappropriate use of weight averaging. It is also against NSO policies. The inappropriate use averages slight, moderate, heavy, and severe; painting an unrealistic picture of the resources. As it is applied by the BLM, it also softens use by livestock and hardens data use for wild horses. So if you have a important and strategic wetland that is important to all survival, the lessening of the real impacts is inexcusable.

Monitoring before livestock turnout or removal of horses was to focus on the offending class of animal, thereby removing much of the adversarial number game. I strongly disagree with your argument that since AML was not achieved, it removed your responsibilities on monitoring.
I could just as easily argue what if monitoring had shown 20% or less use by wild horses; what if a bad winter killed hundreds of horses and their use was less than 20% before AML was

**WHOA**
WILD HORSE ORGANIZED ASSISTANCE
P.O. BOX 555
RENO, NEVADA 89504
(775) 851-4817

In Memoriam
LOUISE C. HARRISON
VELMA B. JOHNSTON, "Wild Horse Annie"
GERTRUDE BRONN

March 27, 2003

TO: Mr. Les Boni
FROM: Dawn Y. Lappin (WHOA)
SUBJECT: Soldier and Paiute Meadows Final Re-evaluation Summary

Mr. Boni:

As a representative of WHOA I find it exceedingly hard to comment in a very civilized manner regarding these allotment reevaluations. You may have forgotten the very poor condition of the horses on the Paiute Meadows, horses your sworn to protect and manage; but I have not. This reevaluation bespeaks of how little mettle you put on the legally stipulated agreements. Be advised that this organization will be more reluctant in the future to agree to settlements and of course, it goes without saying, that attention will be spent on your every word.

It appears that due to your own priorities, the publics thorough review is denied. NEPA requires 30 days (business) and your requirement for a two week turn around does not comply with regulations.

WHOA participated throughout the MFP process so there is no misunderstanding on either side. The BLM has long known of our disapproval of inappropriate use of weight averaging. It is also against NSO policies. The inappropriate use averages slight, moderate, heavy, and severe; painting an unrealistic picture of the resources. As it is applied by the BLM, it also softens use by livestock and hardens data use for wild horses. So if you have a important and strategic wetland that is important to all survival, the lessening of the real impacts is inexcusable.

Monitoring before livestock turnout or removal of horses was to focus on the offending class of animal, thereby removing much of the adversarial number game. I strongly disagree with your argument that since AML was not achieved, it removed your responsibilities on monitoring.
I could just as easily argue what if monitoring had shown 20% or less use by wild horses; what if a bad winter killed hundreds of horses and their use was less than 20% before AML was

achieved?
Your failure to monitor different class of animals, when appropriate, just continues the political management rather than resource based decisions.

In summary, we steadfastly deny that you can abstain from your responsibilities and argue that
you must determine horses deemed to be overgrazing before their removal. Since you have seen fit not to monitor their use of the vegetation then you can hardly argue for their removal. What did you base the next grazing season use on, if not monitoring? I no longer suspect that BLM does not want to know the truth, the wiggling out of the Stipulated Agreement proved it.
I believe my files paint a very bleek picture of the management of the wild horses on this allotment and as an activist, reborn, its my job now to paint that picture for the public.

Sincerely,

Dawn Y. Lappin
Director

3-1003

# SOLDIER MEADOWS
# MULTIPLE USE MANAGEMENT
# ENVIRONMENTAL ASSESSMENT

## *E.A. NO. NV-020-03-09*


**MARCH 10, 2003**

# 1 BACKGROUND

## 1.1 Introduction

The Draft Soldier/Paiute Meadows Allotments Re-evaluation (AE) was mailed to the interested publics and permittees on December 7, 2001. The final AE was sent to the interested publics and permittees on March 3, 2003 along with BLMs "Determination/Management Action Selection Report" (MASR), which was also signed on March 3, 2003. The purpose of the Draft AE was to obtain data to evaluate if present livestock and wild horse and burro management was meeting allotment specific objectives and the Standards for Rangeland Health. The Draft AE also provided technical recommendations for management of livestock, wild horse and burros, and wildlife that would result in achievement and/or maintaining objectives and standards.

The Draft AE identified six livestock management technical recommendations for the SMA. However, it did not recommend any change in management of wild horses and burros or for wildlife.

The Soldier Meadows Allotment (SMA) MASR concluded that some of the Allotment Objectives and the Standards for Rangeland Health were not being met or achieved, and existing livestock and wild horse and burro management were contributing to the non-attainment. The areas not meeting objectives and/or standards include: exceeding upland and riparian herbaceous vegetative utilization levels, exceeding stubble height criteria and not improving the riparian condition.

The Final AE and MASR identified one livestock management action from the six technical recommendations identified in the Draft AE. Neither of these documents recommended changes in the management of wild horses and burros or for wildlife.

Based on the technical recommendations, livestock management alternatives were developed and analyzed in this Environmental Assessment (EA). Other than the Alternative 2 (No Action), the alternatives would achieve allotment specific Objectives, Terms/Conditions and the Standards for Rangeland Health. This EA evaluates impacts on the natural, cultural and human environment resulting from livestock grazing management throughout the SMA. A separate EA will be prepared for the Paiute Meadows Allotment.

## 1.2 Purpose/Need:

The purpose for this EA is to develop and analyze grazing management alternatives including the proposed action that would result in achieving site specific Allotment Objectives and the Standards for Rangeland health. On March 3, 2003 a MASR was issued by BLM, which established the need for change in livestock management for the SMA.

## 1.3 Decisions To Be Made:

This EA would be utilized by the Authorized Officer to determine livestock management for the allotment and would be used to identify and develop stipulations and mitigation measures. In addition, the EA would be used to determine if there are significant impacts generated from the

proposed action or alternatives. Upon completion of this EA, the Authorized Officer will issue a Finding Of No Significant Impact (FONSI) or will determine that an environmental impact statement (EIS) should be prepared pursuant to Section 102(2) (C) of the National Environmental Policy Act (NEPA). Upon completion of the NEPA process, the Authorized Officer intends to issue a Multiple Use Decision (MUD) for the SMA identifying livestock management practices and reaffirm appropriate management levels (AML) for wild horses and burros. Unless the No Livestock Grazing Alternative is selected, the livestock management determined in the MUD would be implemented through a term grazing permit.

## 1.4 Issues:

As concluded in the MASR, livestock grazing practices and wild horse and burro populations were contributing factors to the non-attainment of Allotment Objectives and the Standards for Rangeland Health within the SMA. The following are the areas of non-attainment:

- Upland and riparian vegetative utilization objectives have not been achieved in some areas of the allotment.
- Water quality criteria was not achieved in 2002 on Colman Creek.
- Riparian/Wetland Systems in Proper Functioning Condition (PFC) was not achieved on portions of Cherry, Colman, Donnelly, Slumgullion, Snow and Soldiers Creeks.

Several streams within the SMA support existing populations of the federally listed threatened Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*). The allotment also provides critical habitat for the federally listed threatened desert dace (*Eremichthys acros*), a small thermal endemic species of fish. The allotment contains one of only two known populations of Soldier Meadows cinquefoil *(Potentilla basaltica*) a federal Candidate species. Several species of Hydrobiidae snails, including the Elongate Mud Meadows springsnail (*Prygulopsis notidicola*) a federal Candidate species, have also been identified in the spring complexes within SMA.

Since the SMA evaluation and Multiple Use Decision (MUD) was issued in January of 1994 there have been some significant changes in public land designations.

The Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area Act of 2000 (Public Law 106-554), passed by the 106th Congress, designated approximately 795,200 acres of public land managed by the Bureau of Land Management (BLM) as the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area (NCA). This legislation also designated about 752,000 acres of public land managed by BLM as Wilderness in 10 Wilderness areas. Approximately 378,600 acres of the designated Wilderness are within the NCA. The SMA contains portions of five Wilderness Areas and a portion of the NCA.

Comments received during the Evaluation Process from Native Americans (see Chapter 3.9 American Native Values Section) identified water quality, wild horse and livestock grazing issues related to the Summit Lake Watershed.

## 1.5 Land Use Plan:

The proposed action and alternatives are in conformance with the Sonoma-Gerlach Management Framework Plan (7/82) and with other federal, state, and local laws, regulations, and plans to the maximum extent possible.

## 1.6 Location:

The SMA is located in the northwest portion of Humboldt County. The Allotment is approximately forty miles northeast of Gerlach, Nevada and ranges from the valley floor of the west arm of the Black Rock Desert to the higher terrain of the Calico and Black Rock Mountain Ranges.

Vegetative types in the allotment range from greasewood and saltgrass sites on the flats at elevations of 4,000' to sagebrush, bitterbrush, mountainmahogany and aspen sites in the higher elevations at 8,600'.

Refer to the SMA location map in Appendix 12.

# 2 PROPOSED ACTION AND ALTERNATIVES

The proposed action for wild horses/burros is to manage at the appropriate management level identified in the 1994 SMA Multiple Use Decision.

In accordance with 43 CFR Subpart 4700, it has been determined through the evaluation of monitoring data that a thriving natural ecological balance will be maintained by managing and providing forage (AUMs) for the following numbers of wild horses and burros within the Herd Management Areas (HMAs):

| HERD MANAGEMENT AREA | HORSES @AML | AUMs @AML | BURROS@AML | AUMs@ AML |
|---|---|---|---|---|
| Black Rock Range West | 93 | 1116 | 0 | 0 |
| Warm Springs | 175 | 2100 | 24 | 288 |
| Calico* Mountain | 65 | 780 | 0 | 0 |
| Subtotals | 333 | 3996 | 24 | 288 |

*Approximately twenty-nine percent (29%) of the horse numbers listed for the Calico HMA are within the SMA.

Excess wild horses and burros within the SMA would be gathered periodically to maintain the population within a forty percent (40%) below AML to AML range.

The proposed action for reasonable numbers of wildlife would remain at the level identified in the Land Use Plan, which are:

| SOLDIER MEADOWS ALLOTMENT | |
|---|---|
| **Species** | **AUMs** |
| **Mule Deer** | **786** |
| **Pronghorn Antelope** | **429** |
| **Bighorn Sheep** | **264** |

## 2.1 ACTIONS APPLICABLE TO ALTERNATIVES 1, 3 & 5

**TERMS AND CONDITIONS** - SEE APPENDIX 3

**Fencing Projects** – SEE APPENDIX 14 FOR LOCATION MAPS

**Stanley Camp Riparian Pasture Fences**

Two separate locations between the Idaho Canyon Use Area and the Stanley Camp Riparian Pasture have been identified where adequate fencing is required in order to control livestock drift. Refer to Appendix 6 map for more details.

The first area extends from the northwest portion of the existing Mahogany Creek exclosure fence in a northwesterly direction and connects to the northeastern boundary of the existing Summit Lake Reservation boundary fence. There is approximately 1.5 miles of existing fence that has fallen into disrepair and would require reconstruction. The fence is located within T.42N., R.26E., Secs. 22 & 23. A second fence would extend from the northeastern portion of the existing Mahogany Creek exclosure fence in a northeasterly direction and connect to the existing Pine Forest allotment fence. This project would require approximately 0.5 mile of new fence that would connect the Mahogany Creek exclosure fence to the Reservation boundary fence. The proposed fence is located within T.42N., R.27E., Secs. 30 & 31.

**Hot Springs Use Area Desert Dace Fences**

This project would require construction of approximately 10 miles of fence to protect Desert Dace critical habitat. This project is identified as a Term and Condition in the Biological Opinion from the USFWS dated June 28,2002.

This project would utilize some of the existing fences as well as the construction of approximately 10 miles of new fence. Some of the existing fencing may require reconstruction in order to control livestock drift. The proposed fence is located within portions of the following area; T.40N., R.25E., Secs. 29 & 31 and T.40N., R.24E., Secs. 14, 22, 23, 24, 25, 26, & 27.

**Cultural**

A cultural resource inventory and compliance with Section 106 of the National Historic Preservation Act and the Nevada State Protocol will be required prior to construction of all fences. A site-specific project planning process would be conducted prior to construction.

## 2.2 Alternative 1 (Proposed Action)

Under the proposed action for livestock, the SMA would be separated into nine use areas or pastures. Only eight of these use areas or pastures would be grazed in the two year cycle. These use areas or pastures would be unfenced or partially fenced requiring herding to insure livestock are maintained within the proper use areas or pastures within the allotment. Implementation of this alternative would require reconstruction of approximately 1.5 miles of existing fence and construction of approximately 0.5 miles of proposed fence in the northeastern portion of the Stanley Camp Riparian Pasture to protect LCT and their habitat. Also under this alternative approximately 10 miles of fence would be constructed to protect Special Status species and their habitats within the Hot Springs use area.

This grazing alternative would implement an annually deferred rotational grazing system that utilizes the entire allotment, with the exception of the Stanley Camp Riparian Pasture and exclosures. Livestock would be required to trail around the Stanley Camp Riparian Pasture when moving between the Idaho Canyon and Colman/Slumgullion use areas. The livestock would graze specific use areas or pastures within the allotment in a clockwise (Idaho Canyon to Colman/Slumgullion) rotation the first year followed by counterclockwise (Colman/Slumgullion to Idaho Canyon) rotation the next year, requiring two years to complete a cycle.

This alternative would activate a portion of the Non Scheduled AUMs, if all of the allotment Objectives, Terms/Conditions and Rangeland Health Standards are achieved. These are active AUMs identified as Non Scheduled in the 1994 Multiple Use Decision.

This alternative would also impose a reduction of livestock numbers, season of use or Active AUMs if the allotment Objectives, Terms/Conditions, and Rangeland Health Standards are not achieved and maintained.

Pasture locations by livestock grazing alternative are located in Appendix 13.

**YEAR 1 - CLOCKWISE ROTATION (Idaho Canyon to Colman Creek)**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock South | 700 | Cows | 01/01 to 03/31 | 100 | 2071 |
| Black Rock North | | | Rest | | |
| Calico South | 700 | Cows | 04/01 to 05/31 | 100 | 1404 |
| Calico North | | | Rest | | |
| Warm Springs | 700 | Cows | 06/01 to 07/31 | 100 | 1404 |
| Idaho Canyon | 700 | Cows | 08/01 to 08/31 | 100 | 713 |
| Stanley Camp | | | Nonuse | | |
| Colman/Slumgullion | 700 | Cows | 09/01 to 09/30 | 100 | 690 |
| Hot Springs | 700 | Cows | 10/01 to 11/30 | 100 | 1404 |
| | | | | | Total 7686 |

**YEAR 2 - COUNTERCLOCKWISE ROTATION (Colman Ck. to Idaho Canyon)**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock North | 700 | Cows | 01/01 to 03/31 | 100 | 2071 |
| Black Rock South | | | Rest | | |
| Calico North | 700 | Cows | 04/01 to 05/31 | 100 | 1404 |
| Calico South | | | Rest | | |
| Colman/Slumgullion | 700 | Cows | 06/01 to 06/30 | 100 | 690 |
| Idaho Canyon | 700 | Cows | 07/01 to 07/31 | 100 | 713 |
| Stanley Camp | | | Nonuse | | |
| Warm Springs | 700 | Cows | 08/01 to 09/30 | 100 | 1404 |
| Hot Springs | 700 | Cows | 10/01 to 11/30 | 100 | 1404 |
| | | | | | Total 7686 |

**INTERIM GRAZING SYSTEM**

Until fencing is completed between the Idaho Canyon use area and the Stanley Camp Riparian Pasture herding would be required to prevent livestock from impacting LCT habitat or the areas burned in the wildland fire of 2000.

## 2.3 Alternative 2 - No Action - Existing System

This alternative uses six use areas or pastures in a four-year rest rotation grazing system. The fall and winter use areas or pastures remain the same throughout the rotation. The spring and summer use areas or pastures are used for two years followed by two years of rest. Two years are required to complete a grazing cycle.

The livestock graze public lands within the winter and spring use areas or pastures from 01/01 to 04/30 then are removed from public lands in the SMA. The livestock return to graze on public lands in the summer and fall use areas from 07/15 to 10/14 and then would be removed from public lands within the allotment from 10/15 to 11/15.

The 1994 Final Multiple Use Decision (FMUD) authorized this system and subsequent livestock grazing term permit. Livestock grazing within the Summit Lake summer pasture was conditional based upon construction of fencing to maintain cattle within their respective seasonal use areas or pastures. The Summit Lake summer pasture includes the Idaho Canyon, Mahogany, Summer Camp, Snow, and Colman creeks. The fences were never constructed; therefore livestock grazing was not authorized. There have been no livestock authorized to graze the Summit Lake summer pasture since 1990.

Pasture locations by livestock grazing alternative are located in Appendix 13.

**YEARS 1 & 2**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock | 500 | Cows | 01/01 to 03/31 | 100 | 1496 |
| Soldier Meadow | | | Rest | | |
| Summit Lake | | | Rest | | |
| Calico | 1117 | Cows | 04/01 to 04/30 | 100 | 1120 |
| Warm Springs | 1117 | Cows | 07/15 to 10/14 | 100 | 3379 |
| Hot Springs | 1117 | Cows | 11/16 to 12/31 | 100 | 1689 |
| | | | | | Total 7649 |

**YEARS 3 & 4**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock | 500 | Cows | 01/01 to 03/31 | 100 | 1496 |
| Soldier Meadow | 1117 | Cows | 04/01 to 04/30 | 100 | 1120 |
| Summit Lake | 1117 | Cows | 07/15 to 10/14 | 100 | 3379 |
| Hot Springs | 1117 | Cows | 11/16 to 12/31 | 100 | 1689 |
| Calico | | | Rest | | |
| Warm Springs | | | Rest | | |
| | | | | | Total 7649 |

## 2.4 Alternative 3 - Stanley Camp Riparian Pasture Use

This Alternative is the same as Alternative 1, with the addition of two weeks of livestock grazing annually in the Stanley Camp Riparian Pasture.

Pasture locations by livestock grazing alternative are located in Appendix 13.

**YEAR 1 - CLOCKWISE ROTATION (Idaho Canyon to Colman Creek)**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock South | 700 | Cows | 01/01 to 03/31 | 100 | 2071 |
| Black Rock North | | | Rest | | |
| Calico South | 700 | Cows | 04/01 to 05/31 | 100 | 1404 |
| Calico North | | | Rest | | |
| Warm Springs | 700 | Cows | 06/01 to 07/31 | 100 | 1404 |
| Idaho Canyon | 700 | Cows | 08/01 to 08/31 | 100 | 529 |
| Stanley Camp | 700 | Cows | 08/24 to 09/07 | 100 | 345 |
| Colman/Slumgullion | 700 | Cows | 09/01 to 09/30 | 100 | 529 |
| Hot Springs | 700 | Cows | 10/01 to 11/30 | 100 | 1404 |
| | | | | | Total 7686 |

**YEAR 2 - COUNTERCLOCKWISE ROTATION (Colman Creek to Idaho Canyon)**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock North | 700 | Cows | 01/01 to 03/31 | 100 | 2071 |
| Black Rock South | | | Rest | | |
| Calico North | 700 | Cows | 04/01 to 05/31 | 100 | 1404 |
| Calico South | | | Rest | | |
| Colman/Slumgullion | 700 | Cows | 06/01 to 06/30 | 100 | 529 |
| Stanley Camp | 700 | Cows | 06/24 to 07/07 | 100 | 322 |
| Idaho Canyon | 700 | Cows | 07/01 to 07/31 | 100 | 552 |
| Warm Springs | 700 | Cows | 08/01 to 09/30 | 100 | 1404 |
| Hot Springs | 700 | Cows | 10/01 to 11/30 | 100 | 1404 |
| | | | | | Total 7686 |

## 2.5 Alternative 4 - No Livestock Grazing

Under this alternative, no livestock grazing would be authorized on public lands within the SMA. No fences would be constructed or reconstructed.

Pasture locations by livestock grazing alternative are located in Appendix 13.

## 2.6 Alternative 5 - Multiple Spring Use Areas or Pastures

Under the proposed action for livestock, the SMA would be separated into eight use areas or pastures. These use areas or pastures would be unfenced, or partially fenced, requiring herding to insure livestock are maintained within the proper use area or pastures within the allotment. Implementation of this alternative would require reconstruction of approximately 1.5 miles of existing fence and construction of approximately 0.5 miles of proposed fence in the northeastern portion of the Stanley Camp Riparian Pasture to protect LCT and their habitat. Also under this alternative approximately 10 miles of fence would be constructed to protect Special Status species and their habitats within the Hot Springs use area.

This grazing alternative would implement a rest rotational grazing system that utilizes most of the allotment on an annual basis, with the exception of the Stanley Camp Riparian Pasture. Livestock would be required to trail around the Stanley Camp Riparian Pasture when moving between the Idaho Canyon and Colman/Slumgullion use areas. This alternative would use three spring (4/1–5/1) use areas or pastures in a three-year cycle. The cattle would graze the Calico South use area the first year followed by Calico North Use Area the second year and Colman/Slumgullion Use Area the third year thereby completing the three-year cycle.

The livestock would be removed from public lands within the allotment from 5/2 to 7/13.

This alternative would activate a portion of the Non Scheduled AUMs, if all of the allotment Objectives, Terms/Conditions and Rangeland Health Standards are achieved. These are active AUMs identified as Non Scheduled in the 1994 Multiple Use Decision.

This alternative would also impose a reduction of livestock numbers, season of use or Active AUMs if the allotment Objectives, Terms/Conditions and Rangeland Health Standards are not achieved and maintained.

Pasture locations by livestock grazing alternative are located in Appendix 13.

**YEAR 1 – Calico - South**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock South | 896 | Cows | 01/01 to 03/31 | 100 | 2651 |
| Black Rock North | | | Rest | | |
| Calico North | | | Rest | | |
| Calico South | 896 | Cows | 04/01 to 05/01 | 100 | 913 |
| Warm Springs - East | | | Rest | | |
| Warm Springs - West | 896 | Cows | 07/14 to 09/30 | 100 | 2327 |
| Hot Springs | 896 | Cows | 10/01 to 11/30 | 100 | 1797 |
| Colman/Slumgullion | | | Rest | | |
| Stanley Camp | | | Nonuse | | |
| | | | | | Total 7688 |

**YEAR 2 – Calico - North**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock North | 896 | Cows | 01/01 to 03/31 | 100 | 2651 |
| Black Rock South | | | Rest | | |
| Calico North | 896 | Cows | 04/01 to 05/01 | 100 | 913 |
| Calico South | | | Rest | | |
| Warm Springs - East | 896 | Cows | 07/14 to 09/30 | 100 | 2327 |
| Warm Springs - West | | | Rest | | |
| Hot Springs | 896 | Cows | 10/01 to 11/30 | 100 | 1797 |
| Colman/Slumgullion | | | Rest | | |
| Stanley Camp | | | Nonuse | | |
| | | | | | Total 7688 |

**YEAR 3 – Colman/Slumgullion**

| Use Area | No. | Kind | Period of Use | %PL | AUMs |
|---|---|---|---|---|---|
| Black Rock South | 896 | Cows | 01/01 to 03/31 | 100 | 2651 |
| Black Rock North | | | Rest | | |
| Colman/Slumgullion | 896 | Cows | 04/01 to 05/01 | 100 | 913 |
| Warm Springs - West | 896 | Cows | 07/14 to 09/30 | 100 | 2327 |
| Warm Springs - East | | | Rest | | |
| Hot Springs | 896 | Cows | 10/01 to 11/30 | 100 | 1797 |
| Calico North | | | Rest | | |
| Calico South | | | Rest | | |
| Stanley Camp | | | Nonuse | | |
| | | | | | Total 7688 |

**INTERIM GRAZING SYSTEM**

Until fencing is completed between the Idaho Canyon use area and the Stanley Camp Riparian Pasture, herding would be required to prevent livestock from impacting the LCT habitat or the areas burned in the wildland fire of 2000.

## 2.7 Alternative Comparison Summary

| SOLDIER MEADOWS ALLOTMENT | Alt 1 | Alt 2 | Alt 3 | Alt 4 | Alt 5 |
|---|---|---|---|---|---|
| AUMs of Active Use | 7686 | 7649 | 7686 | 0 | 7688 |
| Opportunity to activate Non Scheduled AUMs | Yes | No | Yes | No | Yes |
| Period of time cattle are on BLM lands (mos.) | 11 | 8.5 | 11 | 0 | 8.5 |
| Grazing in Mahogany Creek Exclosure | No | No | No | No | No |
| Stanley Camp Riparian Pasture Livestock Use | No | Yes | Yes | No | No |
| Number of Grazed Use Areas | 8 | 6 | 9 | 0 | 8 |
| Years to complete a grazing cycle | 2 | 4 | 2 | 0 | 3 |
| Proposed reasonable numbers of wildlife would remain at the following levels established in the Land Use Plan:<br>➢ Antelope – 429 AUMs<br>➢ Bighorn Sheep – 264 AUMs<br>➢ Mule Deer – 786 AUMs | Yes | Yes | Yes | Yes | Yes |
| Retain existing established Appropriate Management Levels for wild horses (and burros) as follows:<br>➢ Black Rock/West - 93<br>➢ Warm Springs - 175/(24)<br>➢ Calico Mountain - 65 | Yes | Yes | Yes | Yes | Yes |
| Includes Terms and Conditions, Allotment Objectives, & Rangeland Health Standards. | Yes | Yes | Yes | No | Yes |

## 2.8 Alternatives Considered BUT Eliminated from Detailed Analysis

### *2.8.1.1 Domestic Sheep Grazing Within The Black Rock Range*

This grazing system contains most of the same elements as the other analyzed alternatives such as season of use, use areas or pastures, and initial amount of Active AUMs. This is however the only alternative that specified grazing domestic sheep in combination with cattle.

This alternative was eliminated from detailed analysis since it could not be implemented without violating BLM policy and jeopardizing existing populations of California bighorn sheep in the Black Rock and Calico Range. BLM's guidance and the Sierra Front Northwestern Great Basin Area Guidelines For Grazing Management (BLM/NV/PT-97/013+4000) require that precautionary measures be taken to prevent transmission of disease between domestic and bighorn sheep.

Bureau guidance found in the Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska (BLM IM No. 92-264) requires up to a nine-mile buffer between domestic and bighorn sheep. Since there are currently thriving populations of bighorn sheep in the same areas or pastures that were proposed for domestic sheep grazing this alternative will not be included in the alternative analysis section of this Environmental Assessment.

### *2.8.1.2 Stanley Camp Riparian Pasture Use + Add All Non Scheduled AUMs In Year One*

This alternative is the same as Alternative 3, except for the addition of the non scheduled AUMs in year one.

This alternative was eliminated from detailed analysis due to:

- Data in Draft Allotment Re-evaluation indicate some of the allotment specific objectives were not being achieved at current levels of authorized livestock use.
- The MASR concluded that Standards for Rangeland Health were not being achieved at current levels of authorized livestock use.
- The allotment is recovering after the removal of approximately 1,100 wild horses in the winter of 2000/2001.

### *2.8.1.3 No Stanley Camp Riparian Pasture Use + Add All Non-Scheduled AUMs In Year One*

This alternative is the same as Alternative 1, except for the addition of the non-scheduled AUMs in year one.

This alternative was eliminated from detailed analysis due to:

- Data in Draft Allotment Re-evaluation indicate some of the allotment specific objectives were not being achieved at current levels of authorized livestock use.
- The MASR concluded that Standards for Rangeland Health were not being achieved at current levels of authorized livestock use.
- The allotment is recovering after the removal of approximately 1,100 wild horses in the winter of 2000/2001.

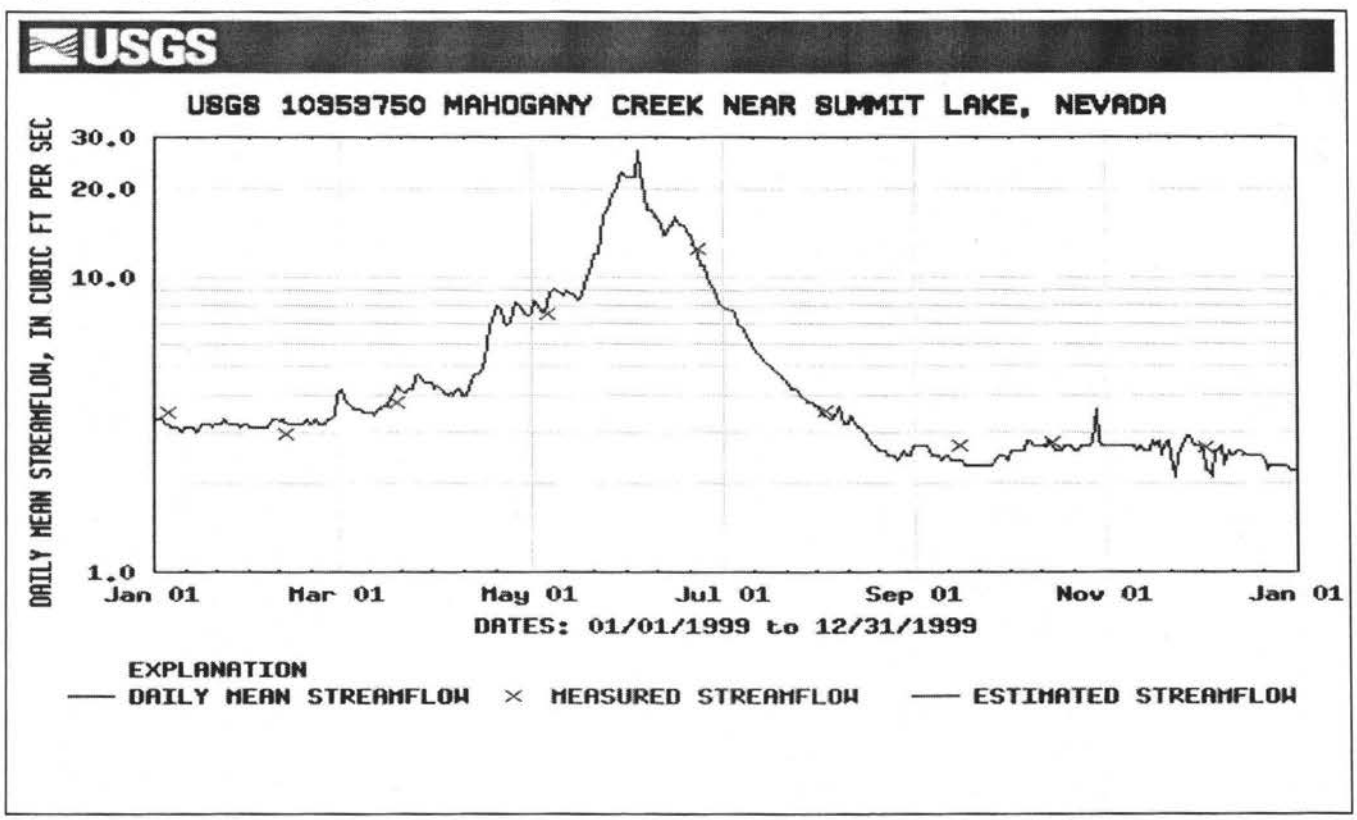
# 3 AFFECTED ENVIRONMENT

## 3.1 Water Resources

The SMA contains numerous surface water resources, including: perennial, intermittent and ephemeral streams, cold springs, wet meadows, thermal springs and a reservoir. The area is unique because it generates a high level of public and regulatory interest due to the cultural, recreational and biological diversity. This diversity is intrinsically linked to the water resources of the allotment.

Precipitation within the allotment is spatially variable and orographically influenced with annual estimates ranging from 5 inches on the valley bottoms to 20-24 inches at the upper elevations. Climate patterns are typical of the Great Basin physiographic province with hot, dry summers and cold, moist winters. The hydrography of the area follows this same pattern with north/south trending mountain ranges with primary drainage perpendicular to the ranges, running towards the axis of the valleys.

**Figure 1. Hydrograph of Mahogany Creek (1999)**




The perennial stream reaches are located in the primary drainage features. The majority of the perennial stream reaches are found within the Colman Creek, Donnelly Creek, Slumgullion Creek, Snow Creek, Mahogany Creek, and Summer Camp Creek (a tributary of Mahogany) watersheds. They tend to have a runoff flow event in the months of March through May or June at which time they quickly retreat to a baseflow condition extending from July through

September or October, and then they tend to rebound slightly as transpiration in the riparian zone slows and evaporation is at a minimum. The magnitude and duration of flow events differ for all of the above listed streams, yet the annual flow behavior of each is similar. This behavior is typical of streams within this region and is graphically illustrated above in the 1999 hydrograph for Mahogany Creek (Figure 1).

The quality of Soldier Meadows' water resources has been measured since 1995. The analysis has included continuous temperature monitoring, chemical constituent sampling, and physical habitat assessment. The temperature monitoring and physical habitat condition assessment are addressed in the Fisheries/Aquatic Resources section. The following sections describe the chemical water quality for those constituents that were analyzed.

### 3.1.1 Water Quality of the Desert Dace Habitat Area

In 1999, the Winnemucca Field Office commissioned the University of Nevada-Reno to conduct a water quality investigation of the Soldier Meadows hot springs complex. More specifically, the analysis was conducted to determine what level of impact was occurring to the Desert Dace habitat as a result of grazing and recreation. The shaded values represent measurements that exceed either the standard or the EPA recommendations.

**Table 1. Desert dace water quality data**

| | TDS (ppm) | Turbidity (NTU) | Ammonia as N (ppm) | Phosphate (ppm) | BOD | Temperature °C | Conductivity µS | pH (SU) | Dissolved Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|---|
| **Benchmarks** | 500[1] | 4.3[2] | .228[3] | .30[1] | | | | 6.5-8.5[1] | 5.0[1] |
| Site 1 | 222-246 | 0.4-1 | <.1-<.1 | .03-.04 | .2-<2 | 34.9-39.0 | 293-350 | 8.27-9.03 | 5.16-6.44 |
| Site 2 | 235-255 | .8-2.3 | <.1-<.1 | .03-.05 | .3-<2 | 18-29.8 | 298-347 | 7.39-8.67 | 6.03-7.66 |
| Site 3 | 232-249 | .7-2.5 | <.1-<.1 | .03-.05 | .2-<2 | 21.3-29.0 | 296-348 | 7.7-8.8 | 5.88-7.15 |
| Site 4 | 202-214 | .4-5.2 | <.1-<.1 | .03-.07 | .5-<2 | 24.1-27.5 | 176-276 | 7.1-7.9 | 3.89-5.82 |
| Site 5 | 201-212 | .2-.5 | <.1-<.1 | .04-.04 | .2-<2 | 26.0-27.0 | 235-287 | 6.9-7.6 | 4.29-4.68 |
| Site 6 | 189-206 | .3-1.6 | <.1-<.1 | .04-.05 | .1-<2 | 24.6-27.5 | 241-286 | 6.0-7.9 | 4.4-6.4 |
| Site 7 | 198-220 | 1-25.8 | <.1-<.1 | .03-.13 | .6-<2 | 22.1-29.2 | 215-283 | 7.2-8.5 | 5.77-9.78 |

[1] Adopted from NAC 445A.124-Commonly referred to as Nevada's Class A standards

[2] EPA 2000

[3] This benchmark, as taken from the Environmental Protection Agency's document EPA 822-B-00-016, is for Total Kjeldahl Nitrogen (TKN). TKN is a measure of both organic nitrogen and Ammonia. Therefore, if the ammonia results are exceeding the recommendation for TKN, there is a high likelihood that livestock or human activities are unduly influencing the water source.

The study included seven sample points within the desert dace habitat area (see Appendix 19). Of the seven sites four were sampled six times and three were sampled five times. Table 1 depicts the range of results across all sampling events. As stated in the report, and can be seen in the table, the resulting water quality was good to excellent. The report did note that there were slight increases in total dissolved solids and conductivity following Memorial and Labor Day weekends which was most likely associated with recreational bathing in the spring pools. The report further noted that sites four and seven showed increases in turbidity and site seven also demonstrated one elevated result for phosphorous which the authors attributed to livestock grazing (Peacock et al. 2001).

It is also important to note, when evaluating water quality, that the quality of a specific water resource must take into consideration the quality that the source is ***capable*** of producing. There are many instances where, due to natural degradation, a water source may not be capable of meeting standards or resource objectives where standards are not established.

### 3.1.2 Water Quality of the Perennial Stream Reaches

The water quality of the perennial stream reaches was sampled during 2001 and 2002. The sampling was conducted to obtain data to determine whether or not the Standards for Rangeland Health, specific to water quality, were being achieved. As such, the analysis was limited to those constituents that are most readily influenced by livestock grazing. The monitoring events included three discreet samples to correspond with the three flow periods described previously.

The benchmarks (located in Tables 1 and 2) are for reference purposes only. They have been derived from the Environmental Protection Agency's document EPA 822-B-00-016 *Ambient Water Quality Criteria Recommendations,* and the State of Nevada's Class A standards (NAC 445A.124 Appendix 12). The EPA recommendations have only been incorporated where Nevada's Class A standards are silent. The majority of water sources within the SMA have not been evaluated by the Nevada Division of Environmental Protection (NDEP), Bureau of Water Quality Planning (BWQP) and consequently, have no specific water quality standards. This holds true for all sources except for the tributaries of Summit Lake.

Mahogany Creek and, by virtue of the tributary rule, Summer Camp Creek have been designated as Class A waters by BWQP. The designation extends from the headwaters to Summit Lake. Summit Lake is designated as a Class B water. Snow Creek, which has not been specifically designated, is considered to be a Class B water since it is directly tributary to Summit Lake.

The shaded values represent measurements that exceed either the standard or the EPA recommendations.

**Table 2. Perennial Stream Water Quality**

| | | TKN | $NO_3$ | TP | TDS | Sc | PH | | Flow | Temperature | | Coliform | | Turbidity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Benchmarks | 228[1] | .038[1] | .30[2] | 500[2] | Micro-mhos | 6.5-8.5[2] | | | | | 200/400[2] | | 4.3[1] |
| | Units | mg/L | mg/L | mg/L | mg/L | | Field | Lab | CFS[3] | Air °F | Water °F | Fecal | E. coli | NTU |
| Lower Summer Camp Creek | 5/8/01 | .19 | <.1 | <.2 | 79 | 71 | 7.7 | 7.55 | 2.19 | 65 | 41 | <10 | <10 | 4.9 |
| | 8/8/01 | .19 | <.1 | <.2 | 71 | 66 | 8.1 | 7.0 | NA | NA | 55 | 10 | 31 | 1.7 |
| | 10/10/01 | .086 | <.1 | <.2 | 72 | 71 | 7.5 | 7.19 | NA | NA | 34 | <10 | <10 | .6 |
| Middle Mahogany Creek | 5/8/01 | .35 | <.1 | <.2 | 77 | 92 | 8.1 | 7.7 | 2.51 | NA | 46 | <10 | <10 | 3.6 |
| | 8/8/01 | .18 | <.1 | <.2 | 324[4] | 94 | 8.0 | 6.97 | NA | NA | 56 | 120 | 42 | 1.31 |
| | 10/10/01 | .098 | <1 | <.2 | 86 | 93 | 8.0 | 7.44 | NA | NA | 35 | <10 | <10 | .98 |
| Lower Mahogany Creek | 5/8/01 | .27 | .1 | <.20 | 82 | 94 | 7.8 | 7.73 | NA | 72 | 44 | 10 | <10 | 7.4 |
| | 8/8/01 | .31 | <.1 | .22 | 94 | 101 | 8.1 | 6.96 | NA | NA | 57 | 30 | 20 | .84 |
| | 10/10/01 | .12 | <1 | <.2 | 92 | 104 | 8.1 | 7.58 | NA | NA | 41 | 20 | 10 | .51 |
| Lower Snow Creek | 5/21/02 | .22 | <.1 | <.20 | 48 | 78 | 8.1 | 7.06 | 1.5 | 37 | 39 | <10 | <10 | 0.0 |
| | 8/20/02 | .12 | <.1 | <.20 | 44 | 87 | 8.1 | 7.28 | .8-1.1 | 62 | 49 | 130 | 99 | 0.0 |
| | 10/15/02 | .17 | <1.0 | <.20 | 74 | 86 | 7.8 | 7.20 | .75-1.0 | 55 | 39 | 10 | <10 | 0.0 |
| Colman Creek | 5/14/02 | .23 | <.1 | <.20 | 110 | 121 | 8.1 | 7.82 | 3 | 63 | 47 | <10 | <10 | 13.8 |
| | 8/12/02 | .19 | <.1 | <.20 | 106 | 123 | 8.3 | 7.76 | 1.0-1.5 | 80 | 57 | 80 | 53 | .85 |
| | 10/15/02 | .18 | <1.0 | <.20 | 93 | 122 | 8.5 | 7.2 | 1.0-1.25 | 60 | 42 | 10 | 20 | 0.0 |
| Donnelly Creek | 5/14/02 | .30 | <.1 | .26 | 180 | 234 | 8.3 | 8.0 | 2.7-3.2 | NA | 57 | <10 | <10 | 6.6 |
| | 8/12/02 | .16 | <.1 | <.20 | 190 | 258 | 8.4 | 7.92 | .25-.50 | 92 | 71 | 270 | 222 | 5.9 |
| | 10/28/02 | <.5 | <.10 | <.20 | 180 | 305 | 8.3 | 7.75 | .6-.8 | 58 | 46 | 20 | 42 | 1.4 |
| Lower Slumgullion Creek | 5/21/02 | .27 | <.1 | <.20 | 73 | 177 | 8.1 | 7.09 | .4-.6 | 50 | 49 | <10 | <10 | 45 |
| | 8/20/02 | .3 | <.1 | .22 | 199 | 288 | 8.1 | 7.55 | .15-.25 | 70 | 57 | 60 | 42 | 7.7 |
| | 10/28/02 | <.50 | <10.0 | .25 | 170 | 239 | 8.1 | 7.68 | .1-.2 | 51 | 40 | 40 | 75 | 11 |

## 3.1.3 Water Quality of the Southern Hot Springs

The water quality of Black Rock Hot Spring and Double Hot Spring was sampled during 2002. This sampling was conducted to determine the level of impacts from grazing and recreational use. The timing of the sampling was altered slightly from that of the previously discussed streams for two reasons: 1) The springs do not exhibit a strong, seasonal flow pattern, and 2) to detect specific impacts from recreational use, the second sample was collected immediately following the Labor Day weekend.

[1] EPA 2000
[2] NAC 445A.124 Nevada Class A standards-These are included in Appendix 12
[3] all flows are visual estimates
[4] Sample failed the QC parameters and is not accurate as verified by the Sc readings

**Table 3. Hot Spring Water Quality**

| Parameters | UNITS | Black Rock Hot Spring | | | Double Hot Spring | | |
|---|---|---|---|---|---|---|---|
| | | 5/20/02 | 9/03/02 | 10/29/02 | 5/20/02 | 9/03/02 | 10/29/02 |
| ALKALINITY, TOTAL | mg/L | 757 | 100 | 715 | 216 | 214 | 210 |
| BICARBONATE | mg/L | <1 | 100 | 715 | 210 | 214 | 193 |
| CARBONATE | mg/L | <1 | <1 | <1 | 6 | <1 | 17 |
| HYDROXIDE | mg/L | <1 | <1 | <1 | <1 | <1 | <1 |
| ALUMINUM | mg/L | 0. 248 | 0.153 | 0.036 | 0.115 | 0.113 | 0.060 |
| ANTIMONY | mg/L | 0.018 | 0.016 | 0.012 | 0.008 | 0.007 | 0.005 |
| ARSENIC | mg/L | 0.130 | 0.129 | 0.124 | 0.088 | 0.089 | 0.085 |
| BARIUM | mg/L | 0.139 | 0.147 | 0.130 | <0.020 | <0.020 | <0.020 |
| BERYLLIUM | mg/L | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| BORON | mg/L | 2.87 | 3.70 | 3 | 1.97 | 1.92 | 2 |
| CADMIUM | mg/L | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| CALCIUM | mg/L | 16 | 16 | 20 | 5.3 | 5.5 | 5 |
| CHLORIDE* | mg/L | 180 | 180 | 150 | 65 | 66 | 60 |
| CHROMIUM | mg/L | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| COPPER | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| FLUORIDE* | mg/L | 9.9 | 9.2 | 12 | 12 | 11 | 10 |
| IRON | mg/L | 0.080 | 0.124 | 0.091 | <0.020 | 0.058 | <0.020 |
| LEAD | mg/L | <0.007 | <0.007 | <0.007 | <0.007 | <0.007 | <0.007 |
| MAGNESIUM | mg/L | 2.9 | 3.1 | 2.9 | 0.14 | 0.18 | 0.13 |
| MANGANESE | mg/L | 0.015 | 0.016 | 0.013 | 0.006 | 0.010 | <0.005 |
| MERCURY | mg/L | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| NICKEL | mg/L | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| NITRATE-N* | mg/L | <0.5 | <0.2 | <1.0 | <0.1 | <0.1 | <1.0 |
| NITRITE-N* | mg/L | <0.25 | <0.1 | <0.010 | <0.05 | <0.05 | 0.120 |
| NITRATE + NITRITE -N* | mg/L | <0.5 | <0.2 | <1.0 | <0.1 | <0.1 | <1.0 |
| pH | s.u. | 7.96 | 8.26 | 7.82 | 8.42 | 8.20 | 8.62 |
| POTASSIUM | mg/L | 19.2 | 22.4 | 20 | 5.2 | 7.4 | 5 |
| SELENIUM | mg/L | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| SILVER | mg/L | 0.031 | <0.010 | <0.010 | 0.037 | 0.090 | <0.010 |
| SODIUM | mg/L | 515 | 467 | 470 | 201 | 185 | 190 |
| SULFATE* | mg/L | 140 | 130 | 100 | 130 | 130 | 110 |
| THALLIUM | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| TDS | mg/L | 1300 | 1280 | 1200 | 650 | 637 | 600 |
| ZINC | mg/L | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Fecal Coli | Colonies /100 mls | <10 | >10 | <10 | <10 | >600 | <10 |
| E. Coli | Colonies /100 mls | <10 | 10 | <10 | <10 | 1445 | <10 |
| Turbidity | NTU | 0.0 | 3.5 | 0.0 | 0.0 | .3 | 0.0 |

## 3.2 Fisheries/Aquatic Resources

Fisheries and Aquatic Resources on the Soldier Meadows Allotment (SMA) are comprised of both lotic (streams) and lentic (meadows/seeps) environments, which support a diverse array of habitats for both plant and wildlife communities. SMA supports several sensitive species, including one federally listed Candidate species of springsnail and two federally listed Threatened species of fish. The affected environment section for Fisheries/Aquatic Resources is broken into several sections.

1. **Sensitive Aquatic Species (Federally listed Threatened, Endangered, or Candidate species, including BLM Sensitive Species and USFWS Species of Concern)**
   This section identifies the aquatic federally listed Threatened or Candidate species, a description of the areas inhabited by these species, their current status (if known), and the status of the species' respective habitats (if known). This subsection also discusses the aquatic species that are listed as BLM Sensitive and USFWS Species of Concern, including a description of the areas inhabited by these species, their current status (if known), and the status of the species' respective habitats (if known)

2. **Temperature Data**
   This section depicts the temperature regime of selected LCT streams and the effects of temperature on LCT and other cold-water aquatic species

3. **Stream Survey Data**
   This section identifies the streams that were surveyed during the evaluation period and a brief description of the protocol used. The stream survey data are discussed in the context of riparian functionality class and channel type characteristics (Rosgen 1996).

4. **General Fisheries/Aquatic Resources**
   This section briefly discusses the conditions of the aquatic and fisheries resources, which were not discussed in the previous sections

5. **Riparian Functionality Assessments**
   This section represents the riparian functionality assessment data that have been collected on the SMA. The section graphically displays the lotic and lentic functionality and also the riparian functionality classes by stream system. This section also includes a summary of the 1999 report submitted by Whitehorse Associates of Logan, Utah, which rated the stream and riparian conditions of target watersheds.

### 3.2.1 Sensitive Aquatic Species (Federally listed Threatened, Endangered, or Candidate species, including BLM Sensitive and USFWS Species of Concern)

See Appendix 7 for the USFWS Species List for the SMA.

**Springsnails (Hydrobiidae)**
Numerous spring systems exist within the SMA area, which range from cold (near or below mean air temperature), thermal (5-10° C above mean air temperature), or hot (more than 10° C above mean air temperature) (see Sada et al. 2001). Within the SMA several springsnails, which are small (1-8mm high) mollusks that require high quality water (Sada et al. 2001), have been identified as being unique to the area. The majority of these species are members of the genera *Prygulopsis*, with one species belonging to the *Fluminicola* genus. These genera prefer cool, flowing water and gravel substrate (Sada et al. 2001).

The "Recovery Plan for the Rare Species of Soldier Meadows" identified several spring systems, which were known to be occupied by springsnails (USFWS 1997). Additional information has increased the known number of springsnail species to nine and also the number of springs that are inhabited by springsnails within the SMA. Six of the nine unique species found within the SMA have been identified to genus/species (Table 4). Primary threats to springsnails, according to Sada et al. (2001), are habitat alteration via water diversions, excessive livestock grazing, nonnative macroinvertebrate establishment, and water depletion.

The riparian areas associated with the spring systems found on the SMA are generally dominated by herbaceous species, including sedges (*Carex* spp.) and rushes (*Juncus* spp.). Willow (*Salix* spp.) is also a common riparian species found on a few spring systems. The outflow streams of the cold, thermal, and the lower downstream reaches of the hot springs are dominated by watercress (*Rorippa nasturtium-aquaticum*) with the sporadic occurrence of duckweed (*Spirodela* spp.), aquatic butter-cup (*Ranunculus* spp.), and cattail (*Typha* spp.). These outflow reaches also host a variety of macroinvertebrates, including ephemeropterans (mayflies), plecopterans (stoneflies), and trichopterans (caddisflies). The upper reaches of the hot springs are dominated by blue green algae (Cyanobacteria) and bacteria, along with the aquatic mites (*Partnuniella thermalis*) and other thermophilic species.

**Table 4. Hydrobiidae snails**

| Common Name | Scientific Name | Status |
|---|---|---|
| Northern Soldier Meadows pryg | *Prygulopsis militaris* | Proposed BLM Sensitive, USFWS Species of Concern |
| Southern Soldier Meadows pryg | *Prygulopsis umbilicata* | Proposed BLM Sensitive, USFWS Species of Concern |
| Elongate Mud Meadows pryg | *Prygulopsis notidicola* | Federal Candidate Species |
| Squat Mud Meadows pryg | *Prygulopsis limaria* | Proposed BLM Sensitive, USFWS Species of Concern |
| Surprise Valley pryg | *Prygulopsis gibba* | USFWS Species of Concern |
| Western Lahontan pyrg | *Prygulopsis longiglans* | No Status |
| 2 species found unique[2] | *Prygulopsis* spp. | No Status |
| 1 species found unique[2] | *Fluminicola* spp. | No Status |

Although some springs within the SMA have been inventoried to determine the presence of Hydrobiidae snails, none have been inventoried to determine if unique endemic macroinvertebrates are present. Furthermore, none of the springs within the SMA have had their riparian condition evaluated using techniques outlined in Technical Reference 1737-17, "A Guide to Managing, Restoring, and Conserving Springs in the Western United States"(Sada et al. 2001).

**Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*, LCT)**

Four streams and a portion of one other exist within the SMA that are considered occupied or potential habitat for LCT, a federally listed Threatened species since 1975 (Federal Register Vol. 40, p. 29864). Mahogany, Summer Camp, Snow, and Colman Creeks exist entirely within the SMA and currently are occupied by LCT. The majority of Donnelly Creek exists within the SMA, although it does not contain a population of LCT. The current stream survey data, temperature, and riparian functionality conditions are shown within this section.

The SMA contains the only lacustrine population of LCT within the Northwestern Lahontan Distinct Population Segment[3] (NWLDPS). This population exists within the Summit Lake basin and is the largest and most stable population of LCT within the NWLDPS (USFWS 1995). Management within this basin since the mid-1970s has attempted to restore riparian and aquatic habitats, which had been severely degraded by improper livestock grazing during the previous decades (Platts 1990). The exclusion of livestock from the majority of the watershed has resulted in a 400% increase in summer streamflow and a 50% increase in water depth, which has led to a significant increase in LCT (Platts 1990). Mahogany and Summer Camp Creeks serve as the sole spawning tributaries for this terminal lake population. Furthermore, Mahogany and Summer Camp also support a fluvial population of LCT. The majority of these lotic habitats exist on public land with the lower portions of Snow and Mahogany Creek flowing through the Summit Lake Paiute Tribe (SLPT) reservation before entering Summit Lake. Colman Creek

[2] *pers. comm.* Dr. Robert Hershler, Smithsonian Institute

[3] The Endangered Species Act of 1973, as amended, included within its definition of a protectable species any subspecies of fish, wildlife, or plant, and any **distinct population segment** of any species of vertebrate fish or wildlife which interbreeds when mature. Thus, three DPS units of LCT were identified when the species was listed as federally listed Endangered in 1970 and maintained when the species was reclassified in 1975, as federally listed Threatened.

contains an increasing population of transplanted LCT, which were moved from Washburn Creek in 1999 and then further supplemented in 2000. Donnelly Creek is listed in the 1995 LCT Recovery Plan as a stream with the potential for LCT reintroduction (USFWS 1995).

**Desert Dace (*Eremichthys acros*)**
The hot springs and their outflows to the south and west of the Soldier Meadows Ranch are the only known habitats for the desert dace. The desert dace has been federally listed as Threatened since 1985 (Federal Register Volume 50, p. 50304,) and is the only member of the genus, *Eremichthys*. At the time of listing, critical habitat was also listed, that encompasses 50 feet on each side of designated thermal springs and their outflow streams (USFWS 1997). At least ten thermal outlets and the associated downstream channels support this unique, spring dwelling species.

To date, there is little information regarding the species or its habitat requirements. The basic habitat requirements for the desert dace were identified in the "Recovery Plan for the Rare Species of Soldier Meadows" (USFWS 1997). These data were derived from the characteristics of spring systems that were occupied by desert dace, although these data may not represent optimal conditions for the species. Research is currently being conducted by the United States Geological Survey (USGS) to determine the seasonal distribution and population levels of desert dace within each spring system. The research project is also determining the presence and distribution of non-native fish species within the spring complexes of the SMA, which were identified as a threat to the long term viability of the desert dace (USFWS 1997).

## 3.2.2 Temperature Data

Temperature plays an important role in the quality of aquatic habitats. Temperature is affected by ground water, surface exposure to solar radiation, and the volume of water being heated (Schlosser 1990). Temperature can also be influenced by stream channel shape and orientation, air temperature, and local/regional climatic conditions. Brown and Krygier (1970) determined that canopy cover is the principle factor in elevated stream temperatures. Platts and Nelson (1989a) indicated that thermal inputs and salmonid biomass are directly correlated. Therefore, streams that are shielded from increased solar inputs often have increased trout biomass, especially in high desert streams (Tait et al. 1994). Further, the removal of riparian vegetation not only allows large fluxes in seasonal stream temperature, but also may allow for increased stream evaporation rates. Temperature can be a major determinant in how a water source is used by humans, aquatic species, and terrestrial wildlife (Brown and Krygier 1970). In the Lahontan Basin region, summer stream temperatures have possibly increased over the past 150-200 years, due to anthropogenic impacts on aquatic systems (Minshall et al. 1989).

Trout growth is maximized at various temperatures depending upon individual species (Moyle and Cech 2000). The temperature preference for brook trout (*Salvelinus fontinalis),* brown trout (*Salmo trutta)*, rainbow trout (*Oncorhynchus mykiss*) is 41-66.2° F, 53.6-68° F, and 53.6-66.2° F, respectively (Jenkins and Berkhead 1993). LCT have been shown to decrease growth rates at 75.2° F and have complete mortality when temperatures exceed 82.4° F (Dickerson and Vinyard 1999). These data represent the effects of temperature on LCT in optimum conditions, e.g. high food availability, no competition, low ammonia, high dissolved oxygen, and no other water quality problems. Optimum fluvial cutthroat trout habitat has been further characterized by

temperatures that do not exceed an average maximum of 71.6° F and a stable summer regime of 55.4° F (48.2-62.6° F) (USFWS 1995). More recent research by Dunham et al. (1999), which was based on actual fish distribution data, indicate that LCT downstream distribution more closely parallels the 64.4 ° F isocline. This downstream distribution limit was pushed further upstream based on the occurrence of non-native salmonids. Dunham (1999) conservatively recommends that "[t]o minimize risk of mortality and sublethal stress for LCT, water temperatures should not exceed a *daily* maximum of 71.6° F." The author also recommends that "[t]o minimize risk of exposure to excessive daily maximum temperatures and cumulative weekly exposure to high and fluctuating temperatures an interim Maximum Weekly Maximum Temperature [MWMT] of 68° F...for LCT."

The table below depicts the temperature regimes of selected LCT streams and also the date of collection within the SMA (Table 5). These data were collected during spring through late fall during the evaluation period using in-situ HOBO© Temperature Loggers or thermographs. According to the thermograph information, all the LCT streams within the SMA, except Colman Creek, met the temperature recommendations outlined by the USFWS (USFWS 1995). Colman Creek currently has a population of LCT within its headwater reaches while Donnelly Creek is considered as potential LCT habitat. Both streams were determined as potential for LCT habitat in the "1995 LCT Recovery Plan" (USFWS 1995). This determination was ostensibly based on the perceived ability of these waters to support a viable population of LCT. The potential of these streams to support LCT, at least at the selected thermograph locations, will be examined further using research conducted by Jason Dunham and others.

Dunham et al. (1999) examined the local and geographic distribution of LCT within the eastern Lahontan Basin, which includes the Quinn and Humboldt River basins and also the Coyote Lake Basin found in Oregon. They noted a correlation between latitude/ longitude and LCT distributions within the study area. Using their findings, if LCT were present at the thermograph sites on Donnelly and Colman Creeks, they would exist as outliers of the data set, due to each site's elevation and latitudinal location. A more definitive method of determining if LCT could actually exist at the Donnelly and Colman Creek's thermograph locations is mean July air temperatures according to Dunham et al. (1999). The authors found that the stream distribution of LCT corresponded to the stream areas that exhibited a mean July air temperature of $\leq$64.4° F.

As shown in the table below, Lower Mahogany Creek exhibited a mean July air temperature of 67.1° F in 2002. This may be related to the recovering riparian zone, which was burned in a wildland fire in 2000, and also the record highs observed in the region in July 2002. In 1999, Colman and Donnelly Creeks exhibited a mean July air temperature of 68.2° F and 74°F, respectively. These data for Colman Creek may indicate that the thermograph location exists relatively close to the potential downstream distribution limit for LCT. This theory is reinforced by the mean daily maximum water temperature that was observed on Colman Creek during the same year, which was less than two tenths of a degree above the mean thermal maxima recommended by the USFWS of 71.6° F for LCT. Donnelly Creek, on the other hand, exhibited a mean July air temperature in 1999 of 74°F. These data may indicate that if LCT existed in Donnelly Creek their downstream distribution limit would be much further up in the watershed. Yet, these data are complicated by the mean daily maximum water temperature of 70.11°F that was observed on Donnelly during the same year. This temperature is nearly one and a half

degrees below the mean thermal maxima recommended by the USFWS of 71.6° F for LCT. These data indicate that LCT could exist at the thermograph location based on mean daily maximum water temperature criteria, whereas they could not using the mean July air temperature theory proposed by Dunham et al. (1999). Additional thermograph sites will be included in the future to gain a more complete picture of the temperature regime of these systems and the projected downstream distribution of LCT.

**Table 5. LCT Stream Temperatures (Shading indicates recommendation exceedance)**

| Site Name | Year | Mean July Air Temperature ° F | Approximate Site Elevation (Feet) | Approximate Watershed Area Above the Site (Acres) | Water Temperature ° F (7/1-9/1) | |
|---|---|---|---|---|---|---|
| | | | | | Mean Daily Maximum | Mean Daily Diurnal |
| Lower Mahogany | 1995 | - | 6140 | 8448.6[4] | 55.79 | 9.30 |
| Lower Mahogany | 1999 | 61.5 | | | 55.89 | 8.31 |
| Lower Mahogany | 2001 | 64.4 | | | 60.66 | 9.96 |
| Lower Mahogany | 2002 | 67.1 | | | 60.36 | 10.90 |
| Upper Mahogany | 1995 | - | 6410 | 4028.3 | 56.34 | 11.40 |
| Upper Mahogany | 2001 | - | | | 68.22 | 20.87 |
| Upper Mahogany | 2002 | - | | | 64.95 | 17.75 |
| Lower Summer Camp | 1995 | - | 6410 | 2900.8 | 56.62 | 12.22 |
| Lower Summer Camp | 2001 | - | | | 58.76 | 8.59 |
| Lower Summer Camp | 2002 | - | | | 58.86 | 10.91 |
| Colman Creek | 1996 | - | 5050 | 6590.6 | 75.14 | 22 |
| Colman Creek | 1999 | 68.19 | | | 71.77 | 20.96 |
| Donnelly Creek | 1999 | 74.0 | 4680 | 6368.6 | 70.11 | 15.43 |

[4] Includes the Summer Camp watershed acreage

### 3.2.3 Stream Survey Data

The Sonoma-Gerlach Grazing EIS (1981) indicated that approximately 97 miles of perennial streams[5] exist on the SMA. Less than half of these streams support salmonids, with a portion of the remaining streams supporting various warm water species, such as cyprinids and centrarchids. The streams, which are habitat or potential habitat for salmonids, are surveyed using a reach-based stream survey. These surveys are conducted by the BLM and/or the Nevada Division of Wildlife (NDOW), based on a 4-5 year rotation cycle. The NDOW uses the General Aquatic Wildlife Survey (GAWS) and the BLM uses the protocol listed in the BLM 6671 Manual. Both survey techniques are very similar, yet slight differences exist between habitat classification and computation of the indices[6].

During the evaluation period, stream surveys were conducted by the NDOW. Stream survey station locations are located in Appendix 22. The GAWS and the BLM 6671 stream survey methodologies are designed to quantify and qualify the condition of various habitat components, which are important to salmonids and other cold water aquatics. The collected parameters of the surveys are used to derive several indices of aquatic habitat condition. These indices, which include pool measure (PM), pool structure (PS), stream bottom (SB), bank cover (BC), bank soil stability (BSS) and bank vegetative stability (BVS), are used to derive a cumulative index called the Habitat Condition Index (HCI). These indices and their relevance to cold-water aquatic habitat condition are summarized in Appendix 8. The Riparian Functionality Assessment classes are also described in Appendix 8.

The section below contains stream survey data tables collected during the evaluation period[7] for Mahogany Creek, Summer Camp Creek, Snow Creek, Colman Creek, Donnelly Creek and Slumgullion Creek in the Soldier Meadow Allotment. Below each table is a brief explanation of the channel characteristics and riparian condition, which may provide insight into the stream survey results.

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[5] perennial streams in the SMA commonly contain intermittent reaches, which is not reflected in the mileage estimates. Colman Creek (7.8 miles in length) was not identified in the S-G Grazing EIS (1981), but was included in this mileage approximation.

[6] The GAWS and BLM Stream Survey indices are designed to indicate the quality of habitats for salmonids and cold-water aquatics. The methodologies are similar to the Representative Reach Extrapolation technique, in which randomly selected reaches are assumed to be "representative" of a larger area. The survey involves intensive transect-based sampling of microhabitats within each reach. The results of this survey are then extrapolated to the entire drainage. As a result, this survey has a high degree of extrapolation error, which is largely reduced via increased sample size. Benefits of GAWS include reduced measurement error and detailed information on microhabitat within each study reach. Streams exhibit a high degree of spatial and temporal heterogeneity; therefore instream habitat assessments are conducted during the summer season when flows are lowest to reduce year to year survey error. By conducting surveys using a high number of stations and resurveying those same stations over time, trends in aquatic habitat, riparian condition, and morphological condition of the stream channel can be derived.

[7] Slumgullion, Donnelly, and Colman Creeks were surveyed only once during the evaluation period, therefore the previous survey data was shown for comparison.

***Mahogany Creek***

| Year | Agency | %PM | %PS | %SB | %BC | %BSS | %BVS | %HCI | %UD |
|---|---|---|---|---|---|---|---|---|---|
| 1992 | NDOW | 19.6 | 2.0 | 42.0 | 63.9 | 85.0 | 91.7 | 49.4 | 1.4 |
| 1997 | NDOW | 68.6 | 48.8 | 77.8 | 56.9 | 76.4 | 92.1 | 70.5 | 0 |

The public portion of Mahogany Creek has been excluded from livestock grazing since 1990. Rosgen channel types (see Rosgen 1996) on Mahogany Creek range from C6 to A2. Five survey reaches are composed of B4 channel types, with only a portion of 2 reaches being A2 or B3. The remaining 2 reaches being C3 and C3/C6 channel types (NDOW 1992). Newman (2001) studied the relationships between stream habitat and riparian measurements and found that certain Rosgen channel types are commonly associated with changes in specific habitat parameters. Newman noted that B channel types generally show improvement in the riparian functionality assessment rating and Bank Cover (BC). Newman also found that C channel types show improvement in riparian functionality, Habitat Condition Index (HCI), Bank Cover (BC), and Bank Soil Stability (BSS). The author noted that A channel type habitat conditions are best reflected in the riparian functionality assessment ratings. Mahogany Creek was assessed in 1993 and 1998 for riparian functionality and was rated as in Proper Functioning Condition (PFC).

Habitat conditions on Mahogany Creek are in excellent condition for cold-water aquatics. Although, the BC and BSS decreased, it is important to note that HCI dramatically improved and that riparian habitats are rated as PFC. The channel types located in the headwater reaches of Mahogany Creek are characterized by a low sensitivity to disturbance and excellent recovery potential. Yet, the mid to lower reaches of the watershed exhibit moderate to high sensitivities to disturbance with a good to excellent recovery potential. Therefore, grazing may have a dramatic effect on stream channel types found within the mid to lower reaches of Mahogany Creek, while a negligible effect on the headwater reaches. This is based solely on the Rosgen channel type characteristics of the system and does not take into account the detrimental effects that grazing could have on LCT or other cold-water aquatics. These effects are evaluated in Chapter 4.3 of the Fisheries/Aquatic Resources Section for Alternative 3.

In 2000, over 12,000 acres was burned in a wildland fire, which included a portion of the Mahogany Creek watershed. The recovery of the vegetative resources within the Mahogany Creek watershed has dramatically improved since 2000, with abundant recruitment of aspen and vegetative cover.

***Summer Camp Creek***

| Year | Agency | %PM | %PS | %SB | %BC | %BSS | %BVS | %HCI | %UD |
|---|---|---|---|---|---|---|---|---|---|
| 1992 | NDOW | 77.8 | 33.6 | 68.8 | 50.0 | 75.0 | 80.0 | 64.3 | 8.3 |
| 1997 | NDOW | 76.2 | 60.6 | 84.1 | 51.5 | 77.5 | 92.0 | 74.5 | 0 |

Both surveyed reaches on Summer Camp Creek were composed of A3 Rosgen channel types, with the first reach being partially composed of a B4 Rosgen channel type. Although the stream survey data indicate improvement over the last decade, Newman (2001) found that riparian functionality is the only statistically significant method of determining temporal improvement in habitat condition on A channel types. The riparian functionality and the stream survey data indicate that habitat conditions are very good to excellent. The riparian conditions were assessed in 1993 and found to be at PFC.

The Rosgen channel types found on Summer Camp Creek are characterized by a moderate to very high sensitivity to disturbance with an excellent to a very poor recovery potential as progression is made from the confluence with Mahogany Creek to its headwater reaches. The excellent habitat conditions found on Summer Camp Creek could likely be attributed to the lack of livestock grazing coupled with the lack of concentrated activity of wild horses within the watershed. Based on Rosgen channel type, livestock grazing within this watershed could have dramatic effects on the channel morphology and also the aquatic habitats associated with this watershed and the areas downstream. These effects are evaluated in Chapter 4.3 of the Fisheries/Aquatic Resources Section for Alternative 3.

***Snow Creek***

| Year | Agency | %PM | %PS | %SB | %BC | %BSS | %BVS | %HCI | %UD |
|---|---|---|---|---|---|---|---|---|---|
| 1992 | NDOW | 59.2 | 2.0 | 49.6 | 59.2 | 77.8 | 80.3 | 55.0 | 28.2 |
| 1997 | NDOW | 78.6 | 50.0 | 72.9 | 58.1 | 85.0 | 90.0 | 72.4 | 12.1 |

Snow Creek's surveyed Rosgen channel types ranged from C at the mouth to A at the headwaters, which is a typical stream channel profile. Only the headwater reach lies on public land and it's classified as an A4 Rosgen channel type, although the stream index averages are shown for both private and public lands. Riparian functionality for the public land reach upstream of the Summit Lake Reservation was conducted in 1993 and found to be Functional At-Risk (FAR) with a static trend. This rating was based on the wild horse impacts to the riparian area, which were preventing improvement of the riparian area, and also the stream channel morphology.

Channel types, such as A4, exhibit an extreme sensitivity to disturbance and a very poor recovery potential. Therefore, based on Rosgen channel type, livestock grazing within this watershed could have dramatic effects on the channel morphology and also the aquatic habitats associated with this watershed and the areas downstream. These effects will be evaluated in Chapter 4.3 of the Fisheries/Aquatic Resources Section for Alternative 3.

***Slumgullion Creek***

| Year | Agency | %PM | %PS | %SB | %BC | %BSS | %BVS | %HCI | %UD |
|---|---|---|---|---|---|---|---|---|---|
| 1990 | NDOW | 65.3 | 0.0 | 64.5 | 77.1 | 67.5 | 67.5 | 53.3 | 25.6 |
| 1999 | NDOW | 47.5 | 14.6 | 40.2 | 70.6 | 52.1 | 57.4 | 47.1 | 28.8 |

Slumgullion Creek's surveyed Rosgen channel types were nearly all comprised of G4c/G5c with only one reach being classified as a B channel type. G4 and G5 channels exhibit a very high sensitivity to disturbance, poor recovery potential, and a high sediment load (Rosgen 1996). The stream survey data indicate relatively fair conditions, which correlates with the poor habitat characteristics of the G4/G5 channel types for salmonids. The fluxuation of habitat conditions over time, which are reflected in the riparian functionality and stream survey data, may operate independently of land use. Riparian functionality (1998) indicates that the headwater area is FAR with a downward trend, due to wild horse impacts to the channel and riparian vegetation.

Current conditions on Slumgullion Creek can be summarized as poor for cold-water aquatic species, such as salmonids. These conditions should improve as riparian functionality improves and the channel evolves into a State F (Jensen 1992), which has a widened riparian-wetland area and stabilized banks. It is important to note that channel types, such as G4c/G5c, are characterized by a very high to extreme sensitivity to disturbance and a poor to very poor recovery potential. Therefore, based on Rosgen channel type, livestock grazing could have dramatic effects on the channel morphology and also the associated aquatic habitats. Season of use, intensity, and duration of grazing will play an important role in the various alternatives effect on these habitats.

***Colman Creek***

| Year | Agency | %PM | %PS | %SB | %BC | %BSS | %BVS | %HCI | %UD |
|---|---|---|---|---|---|---|---|---|---|
| 1992 | NDOW | 50.0 | 28.7 | 38.1 | 54.5 | 61.5 | 61.0 | 49.8 | 48.1 |
| 1997 | NDOW | 66.3 | 47.9 | 68.2 | 63.1 | 70.2 | 75.9 | 65.9 | 12.3 |

Colman Creek is dominated by A3 and B3 Rosgen channel types. The reaches classified as A Rosgen channel types occur in the headwater area of the watershed. This area was rated as Nonfunctional (NF), due to the presence of headcuts and unvegetated banks during the 1998 riparian functionality survey. These headcuts have progressed upstream from below the confluence with Soldier Creek, leaving a deeply incised channel in the downstream reaches. The reach identified as a B3 Rosgen channel type by NDOW during their stream surveys was found by the BLM to be FAR with no apparent trend. This was due to the incised channel, which was in the early stages of floodplain development and progression toward a State F (see Jensen 1992). The lowest reach surveyed for riparian functionality was not surveyed by NDOW during the GAWS. This reach was found to be at PFC, due to the development of a wide floodplain and establishment of a diverse community of riparian vegetation, including species of deep rooted

vegetation. This reach will be surveyed in the future by NDOW to determine habitat quality and fish population status.

Channel types, such as A3 and B3, exhibit a very high and very low sensitivity to disturbance, respectively. Furthermore, Rosgen A3 channel types exhibit a very poor recovery potential, while B3 channel types have an excellent recovery potential. Based on these Rosgen channel types' characteristics, the stream is showing improvements in aquatic habitat. Although, the limiting factor may be the poor conditions of the headwater reaches, which could limit the rate of improvement in the lower watershed. Therefore, improvements within this system will be determined by the level of ungulate use in the upper watershed. Primary consideration should be to improve the riparian functionality of this area. The season of use, intensity, and duration of livestock grazing combined with wild horse numbers will play an important role in the recovery of these habitats.

***Donnelly Creek***

| Year | Agency | %PM | %PS | %SB | %BC | %BSS | %BVS | %HCI | %UD |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | NDOW | 73.7 | 54.3 | 56.0 | 70.6 | 72.1 | 73.0 | 66.6 | 1.7 |
| 2000 | NDOW | 72.4 | 90.0 | 66.1 | 90.2 | 79.1 | 77.3 | 75.6 | 7.0 |

***North Fork Donnelly Creek***

| Year | Agency | %PM | %PS | %SB | %BC | %BSS | %BVS | %HCI | %UD |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | NDOW | 79.9 | 29.2 | 37.2 | 68.3 | 70.0 | 71.7 | 59.4 | 24.5 |
| 2000 | NDOW | 49.0 | 61.9 | 64.5 | 65.8 | 57.5 | 56.7 | 59.2 | 35.0 |

Both the North Fork of Donnelly and the mainstem Donnelly Creek were surveyed in 1995 and 2000 by NDOW to determine aquatic habitat conditions. These reaches are characterized by B3, B4, or A3 channels (NDOW 2000). Rosgen (1996) states that B3 and B4 channel types have excellent recovery potential with a very low to moderate sensitivity to disturbance. In 1998, Donnelly was assessed for riparian functionality and found to be FAR in the lower and uppermost reaches. The middle reach was found to be at PFC. The headwater reach was found to be FAR with a static trend, due to lack of riparian cover and the braided channel. This reach was classified as an A3 channel type, which generally has a very poor recovery potential and is very sensitive to disturbance (Rosgen 1996). The lowest portions of the watershed were found to be FAR with a static trend, due to the deeply incised channel and erosive banks. The 1998 assessment did not identify any active headcuts, yet recent monitoring has revealed several headcuts that are progressing up the North Fork. These headcuts are threatening the riparian and stream habitat values within the upper watershed, and are currently being monitored to determine the rate of progression. A riparian functionality reassessment will likely result in this reach being reclassified in the future as FAR with a downward trend, due to the vertical instability of the channel.

Based on these Rosgen channel types' characteristics and the riparian assessment ratings the limiting factors appear top be in the headwater reaches. Primary consideration should be to

improve the riparian functionality of this area. Although, the season of use, intensity, and duration of ungulate grazing will play an important role in the condition of these habitats in the future, no management will be able to halt the progression of the existing headcuts found in the lower watershed. Therefore, management of this watershed should focus on improving the woody species dominated riparian area and minimizing impacts to the already unstable stream channel.

### 3.2.4 General Fisheries/Aquatic Resources

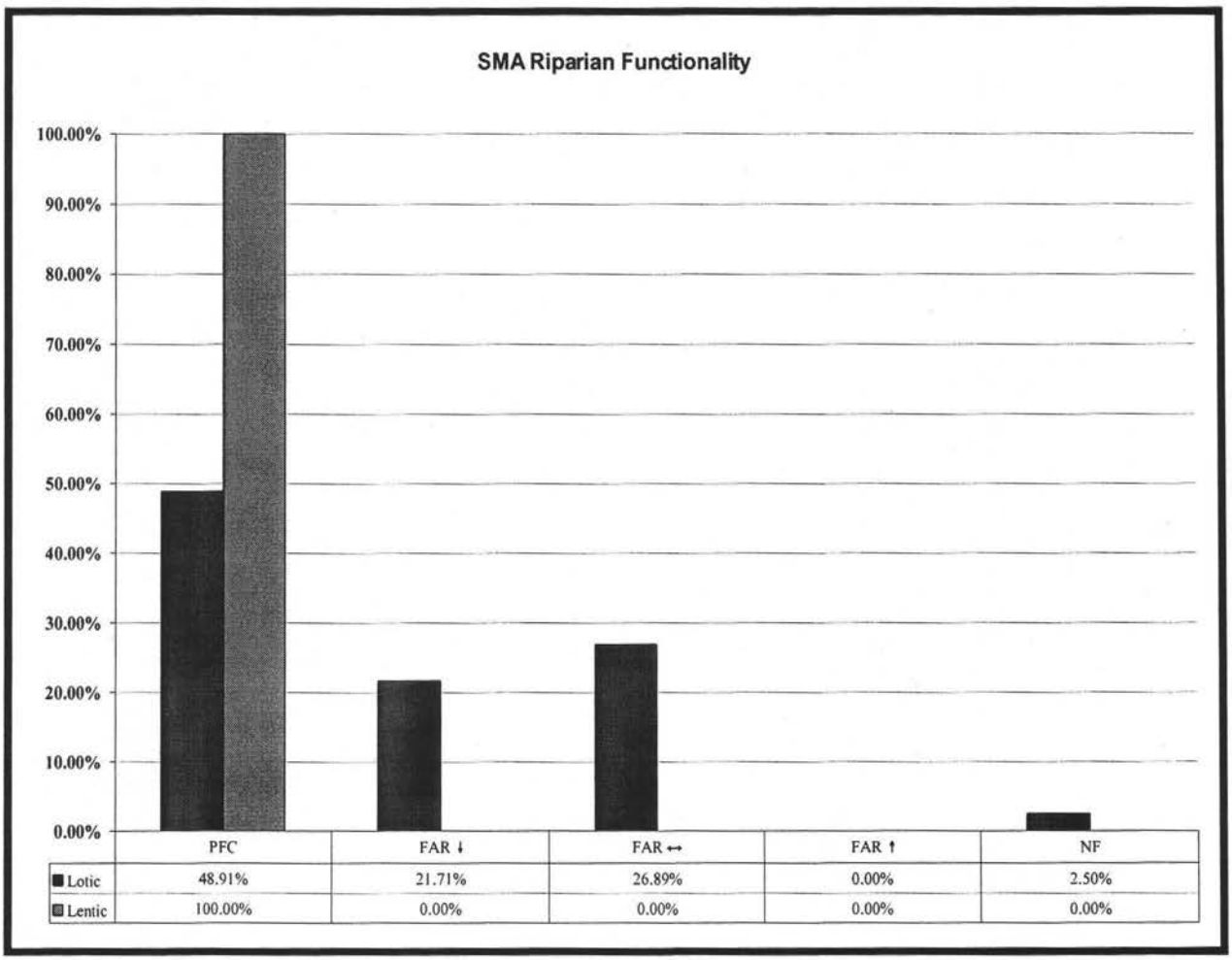
Mud Meadow Creek is the only other stream in the allotment that has the potential to support a fish population. This stream drains north to south and is impounded as a reservoir on private lands south of the Soldier Meadows Ranch. Mud Meadow Creek and its reservoir provide limited habitat for largemouth bass (*Micropterus salmoides*), goldfish (*Carassius auratus*), and green sunfish (*Lepomis cyanellus*).

### 3.2.5 Riparian Functionality

Riparian habitats directly influence the adjacent aquatic ecosystems by providing shade, organic matter, cover, bank stability, and sediment filtration. Riparian vegetation and trout habitat quality and survival are strongly correlated in a stream system. Nearly all impacts to aquatic resources from livestock are a result of riparian and/or stream channel degradation. Vegetation allows runoff to slow and absorb into the soil and also acts to capture sediment, thus lessening the potential for sediment to enter the stream (Waters 1995). Riparian vegetation also contributes to the amount of large woody debris (LWD) and organic material that are input into aquatic systems. LWD creates increased total cover, pool volume, mean depth, and percentage of fine substrate (Gowan and Fausch 1996). Further, Merritt and Cummings (1996) distinguished that woody debris "provides a significant portion of stable habitat for insects". Macroinvertebrates are the major energy source for salmonids and other aquatic predators (Waters 1995). Another stream input from woody species is coarse particulate organic material (CPOM), which becomes sources of habitat and nutrients for the aquatic ecosystem at the point of entry and downstream as it is broken down into fine particulate organic material (FPOM) (Platts and Raleigh 1984, Benke et al. 1985, Vannote et al. 1990, Gregory et al. 1991, Powell et al. 1991). Riparian vegetation stabilizes the stream channel, buffering it from extreme flow events and temperature fluctuations. It also buffers the aquatic system from nutrification, which can cause increased primary productivity in aquatic plants. This increase in primary productivity and the subsequent increase in aquatic plant mass can cause anoxic conditions via plant respiration and organic breakdown, which can lead to fish kills. Excessive algae blooms can also lead to decreased stream visibility, thereby inhibiting the ability of fish to capture prey. The maintenance and improvement of riparian vegetation structure and diversity is critical to aquatic ecosystem health and sustainability.

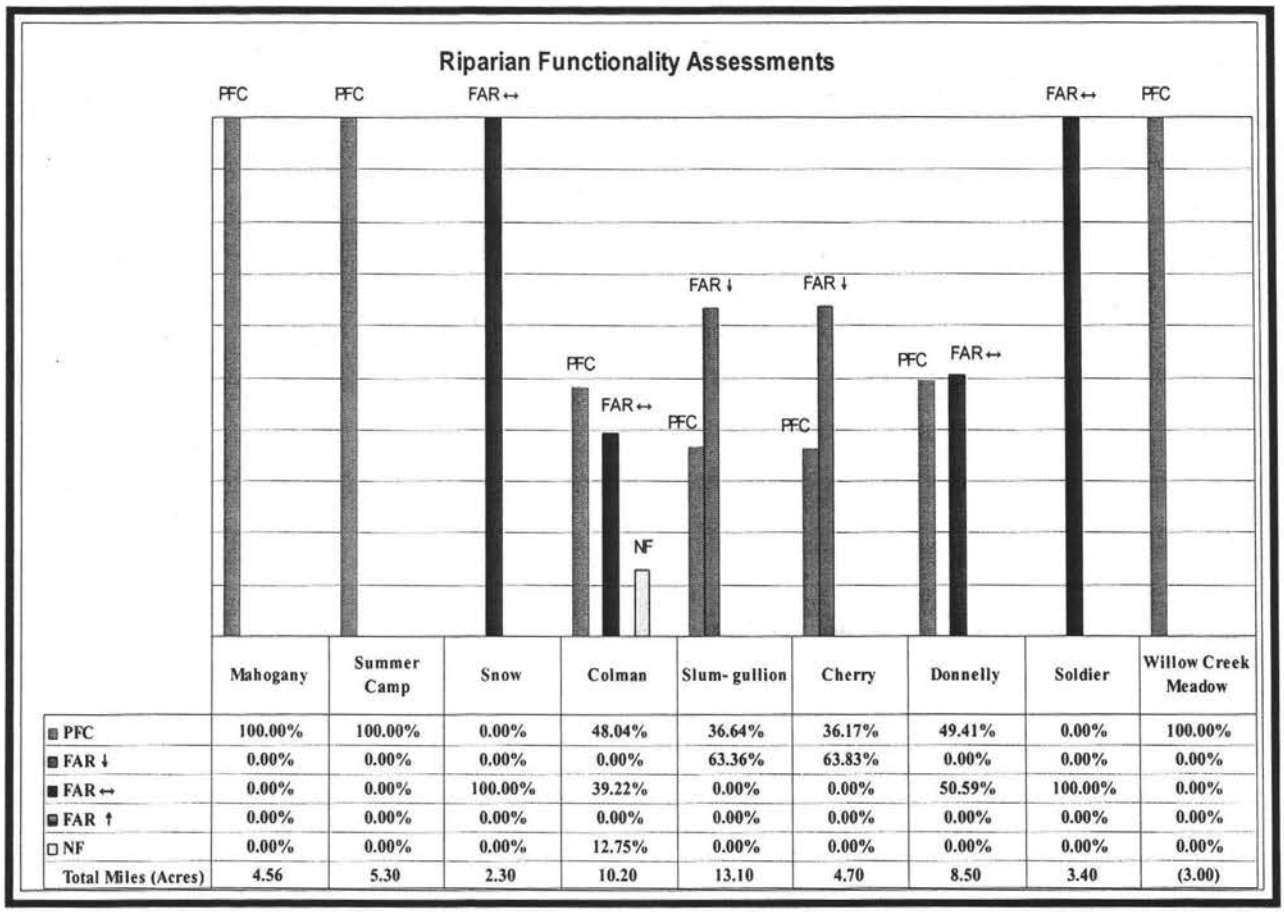
Riparian assessments are conducted to assess the riparian zones ability to dissipate stream energy, thus protecting stream banks and minimizing erosion. These assessments classify riparian zones into three categories: PFC, FAR, and NF. Trends can also be established for the riparian zone reach being surveyed. Currently, riparian data within the SMA indicate that approximately 51% of the reaches are FAR or NF, while approximately 49% are at PFC (Graph 1).

**Graph 1. SMA Riparian Functionality**




| | PFC | FAR ↓ | FAR ↔ | FAR ↑ | NF |
|---|---|---|---|---|---|
| Lotic | 48.91% | 21.71% | 26.89% | 0.00% | 2.50% |
| Lentic | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% |

**Graph 2. Individual Riparian Functionality Assessment Data**




| | Mahogany | Summer Camp | Snow | Colman | Slum-gullion | Cherry | Donnelly | Soldier | Willow Creek Meadow |
|---|---|---|---|---|---|---|---|---|---|
| PFC | 100.00% | 100.00% | 0.00% | 48.04% | 36.64% | 36.17% | 49.41% | 0.00% | 100.00% |
| FAR ↓ | 0.00% | 0.00% | 0.00% | 0.00% | 63.36% | 63.83% | 0.00% | 0.00% | 0.00% |
| FAR ↔ | 0.00% | 0.00% | 100.00% | 39.22% | 0.00% | 0.00% | 50.59% | 100.00% | 0.00% |
| FAR ↑ | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| NF | 0.00% | 0.00% | 0.00% | 12.75% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Total Miles (Acres) | 4.56 | 5.30 | 2.30 | 10.20 | 13.10 | 4.70 | 8.50 | 3.40 | (3.00) |

Below is a general description of the riparian functionality assessment conducted on the riparian areas, which were not discussed within the Stream Survey Data section. The riparian functionality class of these systems and the ones described in the Stream Survey Data Section are illustrated in Appendix 21.

*Cherry Creek*

Cherry Creek was assessed in 1998. It is an intermittent stream that occurs north of Donnelly Creek in the Calico Mountain Range. For the purpose of riparian functionality assessment, Cherry Creek was divided into two reaches. The upper reach was located in the headwater portion of the watershed and was rated as FAR with a downward trend, due to its deeply incised channel and lack of riparian vegetation. The lower reach ended at a meadow-like area near the canyon mouth and was rated at PFC.

No Rosgen channel type information is available for this system, although it may exhibit channel types similar to those found on Donnelly Creek. Therefore, the Chapter 4.3 analysis within the Fisheries/Aquatics Section will consider Cherry and Donnelly Creeks as exhibiting similar channel sensitivities and recovery potentials.

*Soldiers Creek*

Soldiers Creek was assessed in June of 1998. It lies north of and parallels the Colman Creek drainage. The stream was assessed as one reach from the headwaters to just above the confluence with Colman Creek. This reach was rated as FAR with a static trend, due to the lack of stable banks and riparian vegetation.

No Rosgen channel type information is available for this system, although it may exhibit channel types similar to those found in the headwater reaches of Colman Creek. This theory is reinforced by the similarities of basin area, gradient, and linear nature of both watersheds. Therefore, the Chapter 4.3 analysis within the Fisheries/Aquatics Section will consider Soldier Creek and the headwater reach characteristics of Colman Creek as exhibiting similar channel sensitivities and recovery potentials for the purpose of analysis.

*Willow Creek Meadow and Outlet*

The Willow Creek Meadow and outlet was inventoried in June of 1998. The meadow is approximately 3 acres in size and was rated at PFC.

## Riparian and Stream Ratings

In 1999, the Winnemucca BLM Field Office contracted Whitehorse Associates of Logan, Utah to develop an ecological classification of the LCT watersheds that exist on the district. Whitehorse Associates used a hierarchical classification based on seven levels. These levels included: Ecoregion, Geologic District, Subsection, Valley-bottom Type, State, Valley-bottom Landform, and Riparian Vegetation Type. The classification was designed to rate the stream and riparian attributes of a watershed from one of seven states. Each state had a numerical score attached to it from 0 (worst) to 100 (best). A class was then developed for each stream based on the number of valley bottom acres in each riparian state or the number of channel miles in each stream state. The results are shown in Table 6 below.

**Table 6. Riparian and Stream Ratings**

| *Watershed* | *Riparian Rating* | *Class* | *Stream Rating* | *Class* |
|---|---|---|---|---|
| Mahogany Cr. | 100 | Good | 100 | Good |
| Summer Camp Cr. | 78 | Good | 79 | Good |
| Snow Cr. | 82 | Good | 83 | Good |
| Colman Cr. | 57 | Fair | 60 | Fair |
| Donnelly Cr. | 57 | Fair | 71 | Fair |

These data reinforce the individual stream discussion shown above in Chapter 3.2.3 and 3.2.5. Mahogany Creek exhibited the best score possible based on its valley bottom type, landform, and riparian vegetion type. Summer Camp and Snow Creeks exhibited lower scores, which may be due to the poor recovery potential of certain channel types found within those systems. In these systems, the impacts associated with the historical grazing practices are still evident to some

degree. Although Colman and Donnelly Creeks are improving in overall aquatic habitat condition, the incised nature and riparian functionality ratings are strong factors in their riparian and stream rating classes.

## 3.3 Terrestrial Wildlife

Terrestrial wildlife resources on the SMA are typical of much of the Northern Great Basin. This section will be divided into two sections covering priority species and special status species. Where riparian areas are referenced, they include meadows, streambank, and spring vegetative communities.

The range of specific wildlife species within the SMA is illustrated in Appendices 24 and 23.

### 3.3.1 Priority Species

Priority species for the allotment include mule deer, pronghorn antelope and Neo-tropical migrant bird species associated primarily with riparian areas. California bighorn sheep and Greater sage-grouse are considered in the Special Status Species section below. There are many other wildlife species that occupy habitats within the allotment including raptors, predators, small mammals, reptiles, amphibians, and small game species. However, the above species were chosen because of past consideration in BLM's planning process, knowledge about habitat needs and conditions, and known potential impacts from livestock grazing.

**Mule deer (*Odocoileus heminonus*)**

Mule deer are widespread, typically associated with complex middle to upper elevation landforms that support a wide variety of sagebrush, mountain shrubs, quaking aspen and herbaceous vegetation. Mule deer also use lower elevations during years when heavy snowfall depth forces them to move. Mule deer habitat in the SMA is comprised of about 90,000 acres winter habitat, 8,000 acres for summer habitat, and 25,000 acres for yearlong habitat.

Mule deer are frequently associated with meadow and riparian habitat contiguous with large expanses of brush. The presence of green vegetation in riparian areas and palatable shrubs with high protein levels in the fall is essential for healthy fall breeding. It prepares mule deer for winter. If these habitats have heavy grazing utilization, then these areas decrease in value for mule deer.

Mule deer habitats within the SMA occupy about 35 percent of the allotment (121,000 acres). Most of the mule deer habitat is winter range (87,750 acres) with yearlong range occupying 25,150 acres and summer range occupying 8,100 acres.

Deer migrating from higher elevations to lower elevations increase populations of some local herds in winter. Based on NDOW survey data, mule deer numbers are currently low, relative to historic numbers and State management objectives. Drought and other biological factors have contributed to these low numbers.

Deer are generally classified as browsers, and shrubs and forbs make up the bulk of their annual diet. The diet of mule deer is quite varied, however, and the importance of various classes of

forage plants varies by season. In winter, especially when grasses and forbs are covered with snow, the entire diet may consist of shrubby species. Tall shrubs and trees are very important for food and cover.

Rangeland management actions have the potential to influence mule deer cover and forage. Healthy quaking aspen, juniper, mountain shrub, and sagebrush communities provide important tall cover habitats for mule deer.

NDOW surveys indicate stable to increasing populations. All of the spring fawn data indicate an overall healthy and viable mule deer population for the SMA.

**Pronghorn Antelope (*Antilocapra americana*)**
Pronghorn antelope are distributed throughout much of SMA. There are about 100,000 acres of summer habitat, where pronghorn antelope are widely distributed throughout valleys and mountain foothill habitats. Yearlong habitat comprises about 35,000 acres. Pronghorn are sagebrush obligates, but are known to use salt desert scrub communities during the late winter and spring.

Rangelands with a mixture of grasses, forbs, and shrubs provide the best habitat (Yoakum 1972). The sagebrush community is used for both cover and forage. Competition for forage with cattle and wild horses is considered low due to differences in dietary preference. Lack of water at natural or developed sites can be a serious problem during periods of drought. NDOW data for 1992 to 2002 indicate that pronghorn populations within the SMA are stable.

**Neo-tropical Migrant Birds (see Appendix 10 for Species List)**
Executive Order #13186 (01/11/01) requires that migratory bird species considerations be included in federal actions. A complete Migratory Bird inventory has not been completed for this allotment. Preliminary surveys have been collected at several locations within the allotment. The data is insufficient to identify trends. Neo-tropic migrants species needs are generally met when a diversity of habitat structure, including structural diversity associated with multi-aged and multi-height woody vegetation, is contained across the landscape.

Neo-tropical migrant birds are bird species that migrate from the temperate portions of the continent to winter in the tropics of North and South America. Neo-tropical migrants are most commonly associated with habitats with a strong vertical component of woody shrubs and trees. In the SMA the most important habitats are associated with woody riparian communities. The primary locations of these communities include the riparian communities associated with Mahogany, Summer Camp and Snow Creek systems. Secondary woody riparian communities include upper Colman Creek and Donnelly Creek. Upland woody communities important to Neo-tropical migrants include the mountainmahogany communities in the Warm Springs pasture.

Riparian habitats comprise less than one percent of the SMA, but the value of these habitats far exceed their limited geographic extent. It is estimated that over half of the bird species considered potential breeders in the allotment are dependent upon riparian communities.

Additionally migrants that pass through the allotment in the fall and spring make disproportional use of riparian habitats.

Riparian habitats vary in size and quality for Neo-tropical migrants. Meadow habitats dominated by grasses and grass-like species without brush or tree cover have less bird species diversity than those with multi-layered canopies.

### 3.3.2 Sensitive Terrestrial Species (Federally listed Threatened, Endangered, or Candidate species, including BLM Sensitive and USFWS Species of Concern)

Special status species for the allotment include those terrestrial species listed or proposed for listing under the Endangered Species, species designated by the USFWS and candidates for listing and species contained in the BLM's Nevada Species of Concern list. The USFWS Species List for the SMA is included in Appendix 7 .

#### Species Existing or Likely To Occur Within the SMA

**Pygmy rabbit (*Brachylagus idahoensis*)**
This species is the smallest North American rabbit and a sagebrush obligate. The rabbit uses tall, dense stands of big sagebrush, primarily basin big sagebrush, with deep, friable soils typically loamy in texture. The Pygmy rabbit mates in early spring and summer. Its primary food is sagebrush, which makes up to 98% of its winter diet. Grasses are important during the summer, comprising as much as 30-40% of its diet. No inventories for pygmy rabbits have been completed within the allotment, and potential high quality habitat sites are considered rare. Potential sites include the edges of floodplains in the upper portions of watersheds and degraded floodplains at lower elevation where channel down-cutting has allowed for the invasion of basin big sagebrush into sites that were formerly occupied by wet and semi-wet meadows.

**Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)**
**Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)**
**Spotted bat (*Euderma maculatum*)**
**Small-footed myotis (*Myotis ciliolabrum*)**
**Long-eared myotis (*Myotis evotis*)**
**Fringed myotis (*Myotis thysanodes*)**
**Long-legged myotis (*Myotis volans*)**
**Yuma myotis (*Myotis yumanesis*)**

All of these species uses natural caves and cracks in rock outcrops or man-made cavities for breeding, rearing, and/or hibernating habitat. There is no specific information related to breeding colonies of any of these species within the allotment. Potential breeding and hibernating habitat is considered common in the mountainous and rocky areas. Bats depend upon insect prey and the best potential for insect prey within the allotment occurs near wet meadows and marshlands. That would restrict potential high quality foraging areas to less than one percent of the allotment.

**California bighorn sheep (*Ovis canadensis californiana*)**
Populations of this species occur on the Black Rock Range and the Calico Range. Due to a number of factors, bighorn sheep were eliminated from northern Nevada early in the 20th century. Existing populations are the result of numerous NDOW-initiated reintroductions and supplemental releases that began as early as 1963 and most recently in January 2003. The total population in both ranges is estimated by NDOW to be about 170 animals and they currently occupy about 7,000 acres of about 100,000 acres of potential habitat. Populations increase slowly as sheep expand into vacant habitat. The NDOW data for both populations shows excellent fall recruitment of lambs, which is indicative of bighorn sheep populations that are healthy and viable.

Bighorn occupy mountainous areas with extensive areas dominated by large rock outcrops that serve as escape cover. Their diet is primarily grasses supplemented by forbs and limited browse.

Spatial separation in habitat preferences among wild horses, cattle and bighorn sheep results in forage competition in the region being generally low (Ganskopp 1983). Domestic sheep grazing/trailing permits do not occur within currently occupied bighorn sheep range, so the risk of disease transmission between domestic sheep and bighorn sheep is limited. Disease transmission between bighorn sheep and domestic sheep can result in massive bighorn sheep losses and the potential for public controversy.

**Preble's shrew (*Sorex preblei*)**
This species is a small burrowing mammal associated with meadows and riparian areas in the upper portions of the sagebrush zone. There are no records of shrews within the allotment but potential habitat exists associated with riparian areas and meadows in the northern portion of the Black Rock Range. Shrews feed primarily on insects and other soil invertebrates. Quality habitat includes plant communities dominated by dense herbaceous vegetation that support high levels of prey and soils high in organic matter.

**Northern goshawk (*Accipter gentiles*)**
This species is a known breeder in the Mahogany Creek watershed aspen stands. Found in a variety of dense, mature or old growth aspen habitat, goshawks require large, healthy multi-story stands for nesting and foraging. They forage for prey in and near woodland communities.

**Western burrowing owls (*Athene cunicularia hypugea*)**
No known colonies of this species have been observed in the allotment, however Western burrowing owls are known from the Black Rock desert area. Owls occupy open terrain with low vegetation, burrows created by mammals, and an adequate prey base.

**Greater sage-grouse (*Centrocercus urophasianus*)**
This species is a common large bird of the sagebrush zone. The allotment contains about 200,000 acres of sage-grouse habitat, as well as 6 known leks (communal breeding sites). Recent BLM habitat classifications have been completed as part of the Nevada sage-grouse conservation planning effort. The classifications indicate that about 39 percent of the habitat within the SMA contain all the required habitat components, 67 percent have adequate sagebrush cover but are lacking in appropriate amounts of herbaceous cover and 4 percent are lacking in adequate

sagebrush cover. Upon completion of this planning effort, the developed guidelines would be adopted as objectives, where possible.

Sage-grouse are sagebrush obligates and require large areas of contiguous sagebrush communities. Sagebrush is the primary nesting cover and for much of the year sagebrush leaves form the major component of their diet. Sage-grouse are found throughout the West and have been declining for many years. Historic records, which are mostly anecdotal, indicate that sage grouse populations have fluctuated widely in Nevada. NDOW has indicated it considers sage-grouse populations to be declining (Willis et al. 1993). Much of the regional decline is thought to be related to predation in areas of low quality nesting habitat and loss of sagebrush due to wildfire and cheatgrass invasion. A basic requirement of nesting cover is concealment of the sage-grouse hen and her nest. Quality nest sites offer shelter from above by branches, good growth of understory grasses, and sagebrush within 70 centimeters (cm) of the nest. (Wakkinen 1990, Fischer 1994, Sveum et al. 1998, Holloran 1999).

This species is highly dependent upon the presence of several species and subspecies of shrubs, notably Wyoming, mountain, and basin big sagebrush. Other species such as low and Lahontan sagebrush are also important. Nesting tends to occur at mid-elevation habitats that support adequate shrubby and herbaceous plant cover (Connelly et al. 2000). Spring, summer, and fall ranges with a good compliment of native grasses and forbs are associated with productive sage grouse habitat. During the winter, sage grouse forage almost exclusively on either big sagebrush or low sagebrush depending upon severity of snowfall and migratory habits of populations.

Hens with broods require well-sheltered areas that provide protection from predators and the weather (Wakkinen 1990, Gregg 1991, Sveum et al. 1998). Proximity to preferred forbs and insects is important for hen and chick nutrition. (Patterson, 1952, Trueblood 1954, Klebenow and Gray 1968, Savage 1968, Peterson 1970, Johnson and Boyce 1990, Drut et al. 1994, Pyle and Crawford 1996). Chicks have limited mobility, so suitable food such as forbs and insects must be readily available. As plants mature and dry, broods move to areas still supporting succulent vegetation, especially native meadows and high elevation drainages. These areas are important as a source of forbs, insects, and free water (Girard 1937, Griner 1939, Patterson 1952, Trueblood 1954). Adult and juvenile birds congregate in these wetter areas during late summer and early fall (Peterson 1970, Wallestad 1975).

As these areas dry, sage grouse consumption of sagebrush increases and the grouse move to areas with sagebrush that is taller than the snow for the winter season. During the winter, sage-grouse feed almost entirely on sagebrush leaves (Wallestad et al. 1975, Remington and Braun 1985, Welch et al. 1988, 1991). Typical winter ranges are large expanses of dense sagebrush (>10% canopy cover) with an average height of 25 cm. This association with dense sagebrush stands typically begins in September and continues through the breeding season.

**Least bittern (*Ixobrychus exilis hesperis*)**
Habitat for this species is limited to fresh water marshes and reedy ponds. The only habitat of this type within the allotment is on acquired lands near Soldier Meadows that are not part of any pasture and not included in the grazing schedules of any alternative.

**White-faced ibis (*Plegadis chihi*)**
Ibis are seen occasionally as migrants in the fall. They nest in marshes (mainly hardstem bulrush) and feed in marshes and meadows. There is no known breeding habitat within the allotment.

**Nevada viceroy (*Limenithus archippus lahontani*)**
The species is a butterfly whose preferred host plants are willows and aspen. Habitat includes riparian areas, meadows, and aspen wood edges.

## Species Not Known to Occur within the SMA

The following species were also included in a Species List provided by the FWS as species of concern that may occur within the allotment (see Appendix 7). Each of these species is not known to occur within the SMA nor is suitable habitat on public land known. Therefore they will not be considered further.

**Western yellow-billed cuckoo (*Coccyzus americanus*)**
This species requires multistory cottonwood flood plain. The closest population is located along the Carson River to the south.

**Black tern (*Childonias niger*)**
This species is associated with open water wetlands. There are no habitats of this type within the allotment.

## 3.4 Vegetation

The SMA supports vegetation typical of the Great Basin. The extremes of climate, elevation, exposure, and soil types combine to produce a diverse variety of plant communities (Table 7). The Potential Vegetation Map (Appendix 16) including locations and acreages, is derived from the Natural Resource Conservation Service SSURGO database.

**Table 7. Major Plant Species within the SMA**

| Common Name | Scientific Name |
|---|---|
| Low gray sagebrush | *Artemsisia arbuscula ssp. arbuscula* |
| Lahontan sagebrush | *Artemsisia arbuscula ssp. longicaulis* |
| Basin big sagebrush | *Artemsisia tridentata* |
| Mountain big sagebrush | *Artemsisia tridentate ssp. vaseyana* |
| Wyoming big sagberush | *Artemsisia tridentate var. wyomingensis* |
| Fourwing saltbush | *Atriplex canescens var. canescens* |
| Shadscale | *Atriplex confertifolia* |
| Bud sagebrush | *Artemsisia spinescens* |
| Black greasewood | *Sacrcobus vermiculatus* |
| Bailey greasewood | *Sacrcobus vermiculatus var.baileyi* |
| Bluegrass | *Poa spp.* |
| Willow | *Salix spp.* |
| Aspen | *Populus spp.* |
| Antelope Bitterbrush | *Purshia tridentata* |
| Mountainmahogany | *Cercocarpus spp.* |
| Sedges | *Carex spp.* |
| Rushes | *Juncus spp.* |

### 3.4.1 Ecological Status Inventory

Ecological status site data for SMA was collected in 1991. Ecological site inventory is designed to serve as a base inventory of present vegetation compared to potential. Four classes are used to express the degree to which production or composition of the present plant community reflects that of the potential natural community.

**Table 8. Ecological Seral Status**

| Seral Stage | Percent of Present Plant Community to Potential | Acres by Seral Stage |
|---|---|---|
| Potential Natural Community (PNC) | 76-100 | 47,146 |
| Late | 51-75 | 152,862 |
| Mid | 26-50 | 36,634 |
| Early | 0-25 | 912 |

The General Ecological Status Map (Appendix 16) represents seral stages for the allotment. This map consists of single seral stage units. The map shows dominant seral stages and the estimated acres for each stage.

## 3.4.2 Sensitive Plant Species (Federally listed Threatened, Endangered, or Candidate species, including BLM Sensitive and USFWS Species of Concern)

The Soldier Meadows Allotment contains a number of rare species, with two taxa identified as special status species.

**Soldier Meadow cinquefoil *(Potentilla basaltica)***
This species occurs in moist salt-crusted clay in alkaline meadows and cooled outflow stream margins below thermal springs, generally on slight southeast slopes. The recorded elevations are 4,380 to 4,580 feet. It occurs in the moist meadow environment of the Hot Springs use area. Soldier Meadow cinquefoil appears to invade disturbed sites but does not appear to be a disturbance dependent species. They appear to be confined to a narrow range of micro-sites associated with moist but not saturated alkaline silty soils associated with micro terrain features near thermal springs.

Cinquefoil is a low growing, perennial herb with prostate stems. Flowering begins in May and continues through the summer. Flowers are bright yellow and occur in loose clusters. A total population is estimated at 85,000 individuals in eleven subpopulations adjacent to hot springs in the Soldier Meadows area. A number of threats to the species have occurred in the vicinity of populations including:

- modification of spring outflow for recreational bathing in thermal waters
- burning of meadows to change vegetation composition
- direct disturbance and soil compaction from vehicles, livestock and wild horse use
- loss of habitat due to localized erosion of meadow systems
- development of hot springs and camping areas
- introduction of exotic plant species.

As a result of these potential threats, Soldier Meadows cinquefoil was listed a Candidate Species for listing under the Endangered Species Act by the U.S. Fish and Wildlife Service in 2002.

**Smooth stickleaf (*Mentzelia mollis*)**
An erect annual herb that blooms in May and June and known from two sites within the Black Rock use area. Habitat is associated with nearly barren eroding shoulder and side slopes of shrink-swell clay soils formed by hydrothermal alteration and weathering of air-fall volcanic ash deposits.

**The following species were also included in a Species List provided by the FWS as species of concern that may occur within the allotment. Each of these species is not known to occur within the SMA.**

**Tiehm milkvetch (*Astragalus tiehmii*)**
**Schoolcraft catseye (*Cryptantha schoolcraftii*)**
**Crosby buckwheat (*Eriogonum crosbaye*)**

These three species commonly occur together on whitish lake deposited volcanic ash deposits that weather to deep clay soils. They generally occur on gentle slopes north and west of the allotment in the sagebrush steppe zone.

**Windloving buckwheat (*Eriogonum anemophilum*)**
This is a low perennial herb with leafless flower stalks rising above clumps of white leaves, which are associated with barren, rocky sites of volcanic or other origin. It blooms in late June and July. The nearest population is in Jackson Mountains east of the allotment. Other populations are located south and east of the allotment.

**Grimy ivesia (*Ivesia rhypara var. rhypara*)**
This is a low, spreading perennial cushion plant. Its habitat is dry, relatively barren, light-colored outcrops of welded tuffs on east, south, and west aspects. The nearest population is in Yellow Rock Canyon west of the allotment.

**Cordelia beardtongue (*Penstemon floribundus*)**
This is a perennial herb with tubular blue-violet flowers blooming on the top half of the stems. Its habitat is dry, open, mostly dark-colored volcanic talus, very rocky slopes, or alluvium. The nearest population is in Jackson Mountains east of the allotment.

## 3.5 Noxious Weeds

Noxious weeds are defined by the State of Nevada and are typically non-native invasive plants. They are fast spreading and often expensive or difficult to control. When introduced to an area, they can quickly dominate the landscape if management action is not initiated to control the infestations expansion. Noxious weeds may proliferate, forming monocultures, which can crowd out other plants that provide biodiversity and benefit wildlife and domestic animals. Noxious weeds are spread from infested areas by people, equipment, livestock/wildlife, and by the wind.

The potential for additional weed infestations grows along with increased weed populations as a result of man's activities. Grazing intensity and related vegetative condition and trend can effect where, when and the magnitude of noxious weed invasions. If vegetative condition and trend decrease from an area's potential vegetation as a direct result of over grazing, less desirable plant species, such as the non-native noxious weed species listed above, can become established, expand and result in valueless monocultures.

The Winnemucca Field Office (WFO) conducts annual inventories of noxious weeds through contract and with office personnel. Although a complete inventory of the SMA has not been completed, inventory efforts completed to date, have identified numerous noxious weeds within the planning area, e.g., perennial pepperweed [or tall whitetop] (*Lepidium latifolium*), Russian knapweed (*Acroptilon repens*), spotted knapweed (*Centaurea maculosa*), scotch thistle (*Onopodum acanthium*), musk thistle (*Carduus nutans*), Canada thistle (*Cirsium arvense*), salt cedar (*Tamarix ramosissima*), whitetop or hoary cress (*Cardaria draba*), and Scotch thistle (*Onopordum acanthium*). A noxious weed inventory is scheduled for the 2003 field season.

Treatment for priority noxious weed species is occurring yearly. Most areas occupied by noxious weeds are relatively small in size and generally associated with riparian areas, disturbed areas or road systems. The WFO is currently participating in developing Cooperative Weed Management Areas (CWMAs) that will include the SMA and result in coordinated weed management control efforts between state, federal, tribal, county agencies as well as private landowners.

## 3.6 Soils

Soils for the SMA are diverse, ranging from lake deposits in the Black Rock Desert to residual soils at the higher elevations of the Black Rock Range. SMA contains 66 soil map units and 13 general map units in the draft Soil Survey of Humboldt County Nevada, West Part and are shown in Appendix 18. These 13 general units were grouped into five categories, based on major landforms and are briefly described below:

**PLAYAS**

Playas are nearly level dry lakes that occupy the lowest depressions on the basin floor. Temporary flooding occurs primarily in response to precipitation-runoff events. Playa deposits are fine textured and are strongly saline and alkaline. Playas are barren of vegetation.

## LAKE PLAIN TERRACES

The Sondoa-Wendane-Isolde, Wendane-Humboldt, Boton-Mazuma, and Toulon-Bluewing soil units are on lake plain terraces that are nearly level, very deep, and well drained. These soils occur along the margins of the Black Rock Desert Lake plain terrace. Textures are coarse through moderately fine with strongly saline and alkaline subsoils. Vegetation is mainly black greasewood and shadscale.

## FAN PIEDMONTS

The McConnel-DunGlen-Pumper, Shawave-Deadyon, Aboten-Tumtum-Oxcorel, and Simon-Fulstone-Welch soils units are on fan piedmonts. These soil units are nearly level through strongly sloping, shallow through very deep, and well drained. These soils have medium textured surface layers and moderately fine and fine textured subsoils with strongly cemented layers. Vegetation is mainly shadscale/bud sagebrush at lower elevation, Wyoming big sagebrush at mid-elevation, and basin big sagebrush at higher elevations.

## FOOTHILLS

The Singatse-Grumblem and Soughe-Hoot soils units are on the footslopes of mountains that are moderately steep and steep, shallow, and well drained. These soils have very cobbly, medium textured surfaces and very gravelly fine textured subsoils. Vegetation is mainly Wyoming big sagebrush and shadscale.

## PLATEAUS

The Wylo-Bucklake-Pickup, Devada-Tuffo, and Badger Camp-Bear Butte soil units are on plateaus that are moderately sloping through very steep, shallow or moderately deep, and well drained. They have very stony medium textured surface layers and fine textured subsoils. Vegetation is mainly bluebunch wheatgrass, Lahontan sagebrush and big sagebrush.

## SOIL EROSION HAZARD POTENTIAL

Soil erosion hazard potential varies with parent material, elevation, slope, aspect, and vegetation cover. Erosion hazard is the probability that erosion damage may occur as a result of site preparation, fires, and overgrazing (Soil Survey Manual 1993). Because of the number of soil units, it is only possible to make general assessment of erosion potential. Soil parameters are extracted from the Natural Resource Conservation Service Soil Survey Geographic (SSURGO) database and used to determine erosion hazard potential. Parameters are soil erodibility (K factor), slope percent (S factor) wind erodibility index (I factor), and climate (C factor). This information allows development of a general guide for estimating erosion hazards.

Water and wind erosion hazards are divided into three classes: slight, moderate, and high (National Soil Handbook 430-VI Supplement – NV-2). Erosion hazards are estimated by using the formulas:
Water Erosion Hazard = K x S
Wind Erosion Hazard = I x C

Refer to the erosion hazard maps in Appendix 17 for locations and acreages.

**Table 9. Erosion Hazard Values (Water)**

| Erosion Hazard | Value |
|---|---|

| | |
|---|---|
| Slight | <4 |
| Moderate | 4-8 |
| High | >8 |

**Table 10. Erosion Hazard Values (Wind)**

| Erosion Hazard | Value |
|---|---|
| Slight | <40 |
| Moderate | 40-80 |
| High | >80 |

## 3.7 Wild Horses/Burros

The Black Rock Range West, Calico Mountains, and Warm Springs Canyon HMAs are wholly or partially in the Soldier Meadows Allotment (see Appendix 15 for Map). The Black Rock-West HMA consists of 93,199 acres and is entirely in the Soldier Meadows Allotment. Approximately 29% (46,439 acres) of the Calico Mountains HMA is included in the Soldier Meadows Allotment. Warm Spring Canyon HMA consists of 91,708 acres and is completely within the Soldier Meadows Allotment. Horses (and burros in the Warm Springs Canyon HMA) have been present in these three HMAs since before the Wild Free-Roaming Horse and Burro Act was passed in December of 1971. Established Appropriate Management Levels (AML) for the HMAs are listed below:

**Table 11. AML Levels**

| Black Rock-West | SMA Portion Calico Mountain | Warm Springs Canyon |
|---|---|---|
| **93 Horses** | **65 Horses** | **175 Horses/24 Burros** |

## SEASONAL WILD HORSE AND BURRO DISTRIBUTION

### BLACK ROCK RANGE WEST HMA

During the winter wild horses are found at all elevations except the highest peaks and ridge tops. The majority of horses are located at mid slope. By late spring the majority of horses move to higher elevations. North Slumgullion horses are concentrated in the vicinity of Colman Creek and Slumgullion Creek. There is no particular concentration south of Slumgullion Creek.

The distribution of horses in the summer is similar to late spring. North of Slumgullion, horses are concentrated from Colman Creek north to Summit Lake Mountain. It appears that many of the horses found in the vicinity of Burnt Spring and the South Fork of Battle Creek in the Black Rock Range East HMA, move to the Colman Creek area during spring. South of Slumgullion there is not particular concentration. The distribution of horses in the fall is nearly the same as spring and summer except that horses are found at all elevations.

**CALICO MOUNTAINS HMA**

Wild horses within the Soldier Meadows Allotment portion of the HMA are widely distributed throughout the year. During the winter, horses are primarily found along the toe slopes and lower elevations. By late spring horses move to higher elevations and are concentrated between Donnelly Creek and Cherry Creek. Since the December 2000 wild horse removal, concentrations are small. The distribution of horses in the summer is nearly the same as late spring. There may be some movement to the Buffalo Hills Allotment portion of the HMA at this time, with the horses moving back during the fall. During fall the majority of horses are on mid and upper elevation areas between Donnelly Creek and Willow Canyon.

**WARM SPRINGS CANYON HMA**

During the winter horses are found primarily in the south and southeast area of the HMA along the toe slopes and lower elevations. By late spring the majority move to higher elevations. At this time horses are found in large groups between Buck Spring and Black Buttes, and northwest of Bear Buttes. There are large areas of the HMA where horses are not found. The distribution of horses in the summer is similar to late spring. Horses are concentrated from Buck Spring to Black Buttes, and from Trough Mountain north to the Sheldon National Wildlife Refuge. During fall the horses scatter throughout the HMA and begin moving south.

During the 1994 and 1996 removals all horses that were released back into the HMA were freeze branded on the left hip. After the removals, freeze branded horses were observed in the adjacent High Rock and Wall Canyon HMAs. These horses apparently are moving through holes in the C-2-N fence to the High Rock HMA at Mustang Spring and south of Buck Spring. Horses are moving to the Wall Canyon HMA through a hole in the C-2-N fence north of Black Buttes and west of Bear Buttes.

Burros are found primarily along the toe slopes from Chukar Gulch south-southwest to Fly Canyon. However, a few burros have been observed in the vicinity of Buck Spring during the spring and summer, and the mouth of Warm Spring Canyon in the fall. There were a few burros found in the adjacent Calico Mountains HMA just south of Fly Canyon from 1993 through 1996. There have not been any burros found in the Calico Mountains HMA since the Warm Springs population was reduced to the appropriate management level.

## 3.7.1 Wild Horse Census Data

A wild horse census is usually conducted every 3 years. Censuses were conducted in July 1994, July 1997, and July 2000 with another one conducted in August 2001 following the December 2000 removal. The following represents the animals observed in the three HMAs in the Soldier Meadows Allotment. No burros were observed on the Warm Springs Canyon HMA during the 2001 census. The lack of animals counted could be due to the burro's ability to blend into the topography and their tendency to not flee from the noise of the helicopter.

Table 12. Wild Horse and Burro Census Data and AUM Comparison

| Date | Black Rock-West | Calico Mountains | Warm Spring Canyon | Estimated Annual WH & B AUMs | Annual Livestock AUMs | AUM Ratio of WH & B to Livestock |
|---|---|---|---|---|---|---|
| July, 1994 | 343H | 167H & 3B | 476H & 10B | 11,988 | 6,108 | 1.96: 1 |
| July/Aug. 1997 | 316H | 207H | 453H & 24B | 12,000 | 4,948 | 2.43: 1 |
| July 2000 | 494H | 320H | 749H & 22B | 19,020 | 7,650 | 2.48: 1 |
| July/Aug. 2001 | 108H | 77H | 255H | 5,280 | 7,650 | 0.69: 1 |
| | | | **TOTAL** | 48,288 | 26,356 | |

## 3.7.2 Wild Horse and Burro Removal Data

Wild horse removals were conducted in February of 1994, November and December of 1996, and November, December, and January 2000/2001. Removal criteria required that only wild horses 5 years old and younger could be removed during the 1994 gather. In 1996, removal criteria allowed the removal of wild horses 9 years old and younger. Removal criteria were not implemented or require for the 2000/2001 removal.

Black Rock West, Calico Mountains, and Warm Springs Canyon HMAs are shown below. The number of wild horses shown for the Calico Mountains is for the entire HMA, which includes part of the Buffalo Hills, and Leadville Allotments except for the December 2000 removal, which includes only those horses removed from the Soldier Meadows Allotment portion of the HMA.

**Table 13. Wild Horse (and Burro) Removal Data**

| Date | Black Rock West | Calico Mountains | Warm Spring Canyon |
|---|---|---|---|
| Feb. 1994 | 231 H | 313 H | 175 H |
| Nov/Dec 1996 | 236 H | 430H | 243 H (22 B) |
| Dec. 2000 | 490 H | 262 H | 389 H (31 B) |

## 3.8 Cultural Resources

The SMA includes a rich array of prehistoric and historic sites. Prehistoric sites range from as early as 12,000 years ago to as late as the mid-1800's when Euroamericans entered the area. Prehistoric sites include rock shelters, occupation sites (with probable buried deposits), temporary camps, petroglyphs and pictographs, hunting blinds, quarry sites, and lithic scatters. The highest concentration of prehistoric sites is in association with permanent and intermittent water sources.

Historic routes, which pass through the SMA, include the 1843-44 John C. Fremont Exploration Route, the 1846 Applegate Trail, the 1848 Applegate-Lassen Trail, and the Idaho Stage Route. There are also a number of historic campsites and features associated with these routes in the SMA. A one-mile corridor along the Applegate-Lassen Trail is listed on the National Register of Historic Places. The portion of the Applegate-Lassen Trail, which passes through the Black Rock Desert and High Rock Canyon, is the longest existing segment of emigrant trail, which the public can travel, surrounded by virtually the same vistas witnessed by the emigrants. In order to protect this trail segment and the surrounding setting, Congress established the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area in 2000. The Applegate-Lassen Trail is also part of the California Trail, which Congress designated as a National Historic Trail in 1992.

Other historic sites include an outpost of Camp McGarry (private) at present day Soldier Meadows Ranch, sites associated with homesteading, farming and ranching, Basque aspen carvings and other sites associated with sheep herding, and historic mining sites. During World War II through the 1950s, the Black Rock Desert served as a gunnery range for the military. Remnants of this activity can still be found in the form of bullets, shell casings and targets.

Monitoring in the SMA indicates utilization levels were exceeded in the vicinity of the Desert Dace hot springs north of Mud Meadows as well as in Rock Springs and Clear Springs in the Warm Springs Pasture. Although impacts to these resources by livestock grazing have not been documented within the SMA, negative impacts by trampling and the effects of accelerated erosion may be present.

## 3.9 Native American Values

The SMA is within the traditional homeland of the Northern Paiute. The northern portion of the allotment falls within the area used by the Agaipanadokado (fish lake eaters) and/or Moadokado (wild onion eaters) of Summit Lake. The southern portion lies within the area traditionally used by the Kamodokado (jack rabbit eaters) of Gerlach, Nevada. Paiutes from other areas probably also used and passed through the SMA. The Summit Lake Paiute Reservation is adjacent to the SMA to the North

Ethnographic information and past consultation with Native American Tribes indicate they consider all water sacred. Hot springs are considered particularly valuable because of their role in healing, as places of prayer, and their association with water babies. Many of the plants in the SMA were used for medicinal purposes as well as for food, shelter, baskets, tools, and clothing.

Riparian zones are particularly rich sources of such plants. Some Native Americans continue to gather medicinal and other plants.

The AE for the Soldier Meadows and Paiute Meadows Allotments was sent out to the Summit Lake Paiute Tribe. The Tribe commented on the AE; some of these comments relevant to this EA are listed below:

1. A 6" stubble height should be required for Colman and Donnelly in order to improve and protect LCT habitat in these streams.
2. Protect water that flows onto the reservation including Mahogany Creek, Summer Camp Creek, and Snow Creeks.
3. "Portions of the allotments which are east of the Summit Lake Reservation and within the Summit Lake basin [Stanley Camp Riparian Pasture] should be excluded from all grazing and trailing of cattle, while being managed to prevent excessive wild horse damage."
4. "Lower amounts of grazing may be a primary cause of increased biodiversity in the Mahogany Creek basin. Protection of the Mahogany Creek basin and slight improvement on Colman Creek could lead to this becoming one of the last, best natural areas of northwest Nevada and the Great Basin."
5. The Mahogany Fire of 2000 has jeopardized future reproduction and recruitment processes for LCT in the Mahogany Creek Basin (Mahogany, Summer Camp, Pole, Stanley Camp and Snow Creeks)
6. Riparian utilization and stubble height objectives are not being met for Snow and Colman Creeks.
7. Trespass cows use the Mahogany Creek basin, and in particular Summer Camp Creek, frequently throughout a growing season
8. Better protection should be afforded the Summer Camp Creek Basin.

The Summit Lake Paiute Tribe has expressed interest in the Mahogany Creek watershed as a drinking water source and as subsistence hunting and fishing grounds.

The Summit Lake Paiute Tribe relies on the quality and condition of the tributaries that drain into Summit Lake for the maintenance and future sustainability of their subsistence fishery and tribal heritage. The condition of these tributaries and the potential impacts by alternatives are described in Chapter 3.2 Fisheries/Aquatic Resources Affected Environment and Chapter 4.3 Fisheries/Aquatic Resources Environmental Consequences Sections. The Summit Lake Paiute Tribe also maintains a spring fed LCT hatchery on the Reservation.

## 3.10 Recreation

A large majority of the SMA lies within the boundaries of the Black Rock Desert – High Rock Canyon Emigrant Trails National Conservation Area (NCA). The NCA was established to protect the nationally significant cultural, geological, ecological and recreation resources of the area, and is a favorite recreation place for local communities, other areas in Nevada, and neighboring states. Visitors from other parts of the States and the world also frequent the area. The legislation creating the act was largely intended to preserve the terrain, scenic vistas and primitive conditions of the Black Rock Desert and High Rock Canyon areas as they were during the emigrant passage.

A wide diversity of recreation occurs in the SMA and NCA. Some people visit the area simply to enjoy its solitude and naturalness, while others go there to tour historic trails, ride off highway vehicles, rockhound, or view wildlife and wild horses. Recreation opportunities in the SMA predominately include camping use, hunting, hot springs bathing, and wilderness trekking. A large section of the Applegate-Lassen Emigrant Trail is located within the SMA. The viewshed from the emigrant trails has been of primary importance from the inception of the NCA in 2000. The relative absence of development in these areas provides for unique opportunities to experience an un-manipulated landscape, which has become increasingly rare in modern times. Protection of the recreational experience associated with the primitive and undisturbed landscape is a high priority for several of the high-use areas found within the SMA, and continues to be an important management objective for the area as a whole.

Several popular recreation destinations occur within the SMA. These include: Soldier Meadows Hot Spring Complex, Double Hot Springs, Black Rock Hot Springs, Portions of the Applegate-Lassen Emigrant Trail and the Lahontan Cutthroat Trout Wilderness Study Area. These sites are among the highest in visitation numbers. A portion of the Black Rock Desert Playa, which is the focal point for visitation in the NCA, is also contained within the SMA. The table below indicates yearly visitation for the recreation sites identified.

**Table 14. Visitor Days for specified recreation sites**

| Recreation Site | Visitor Days (2002) 12-hour stays[8] |
|---|---|
| Soldier Meadows Hot Springs and Cabin | 6,134 |
| Double Hot Springs | 1,964 |
| Black Rock Hot Springs | 1,371 |
| Lahontan Cutthroat Trout WSA | 774 |
| California National Historic Trail | 3,714 |

The highest use sites in the SMA are associated with the Applegate-Lassen Emigrant Trail (a portion of the California National Historic Trail), hot springs, and other water resources. The segments of the Applegate-Lassen Emigrant Trail found in the NCA are some of the most intact sections of trail in the nation. Big game and upland bird hunting opportunities in areas within the SMA also concentrates use to these areas. The LCT WSA contains the largest stands of aspen,

[8] *Visitation Numbers were derived from records found in the Recreation Management Information System. A small percentage of the visitor days shown for the various hot springs may be duplicated within the California National Historic Trail total.*

as well as one of the largest perennial streams in the region, which provides excellent camping and hunting opportunities.

### 3.10.1 The Applegate-Lassen Emigrant Trail

The driving force of the NCA designation was the protection of the Applegate-Lassen Emigrant Trail and its viewshed. History enthusiasts from across the nation visit this area to experience the primitive conditions similar to those found during the emigrant passage. A large percentage of use at the hot springs can be attributed to people exploring the trail.

### 3.10.2 Soldier Meadow Hot Springs

Soldier Meadows hot springs and cabin are among the highest use areas in the NCA. The springs are a desirable camping location, and their proximity to the Applegate-Lassen Trail make them a well know attraction area. An abandoned line-shack near the hot springs, which is free for public use, also attracts users to the area. The highest use times are in the fall during the hunting season, at which time large groups of campers have been observed. These areas are important recreation resources that receive increased visitation yearly.

### 3.10.3 Double Hot Springs

Double hot springs is also a favorite destination for area users. The cultural history, natural hot springs, as well as the proximity to Applegate-Lassen Emigrant Trail and Black Rock Desert Playa provides excellent opportunities for both overnight and day-use recreation. The natural pools reach temperatures near 200° F, and are not safe for bathing. However, a stock tank filled with diverted water from the springs is a popular attraction for soaking. The majority of use at this area, which includes camping and hot spring bathing, is located on private land that lies immediately adjacent to the natural pools.

### 3.10.4 Black Rock Hot Springs

The Black Rock Hot Spring is a favorite destination for many of the same reasons as Double Hot Springs. The cultural history, natural hot springs, as well as the proximity to the Applegate-Lassen Emigrant Trail and Black Rock Desert Playa provides excellent opportunities for both overnight and day-use recreation. The "Black Rock" was a prominent landmark along the Applegate-Lassen Emigrant Trail and continues to be today. The proximity of Black Rock Springs to this famous landmark is likely to account for much of the visitation. Additionally, bathing in the outer pond downstream of the spring is a major use of the area.

### 3.10.5 Lahontan Cutthroat Trout Wilderness Study Area (LCT WSA)

The LCT WSA is a popular location for different reasons. The extensive aspen groves, perennial streams and abundant wildlife provide excellent recreation opportunities. Most of the use is thought to occur during the hunting season, but the shade and water found in the area make it desirable throughout the year. Two private in-holdings are also located in the area, accounting for some of the use. The LCT WSA is managed for wilderness values, and is an important resource for primitive recreation.

## 3.11 Wilderness Areas /Wilderness Study Area

Refer to Appendix 25 for the Map of Special Designations

### 3.11.1 Wilderness Areas

The SMA contains portions of the North Black Rock Range, East Fork High Rock Canyon, High Rock Lake, Calico Mountains and the Pahute Peak Wilderness Areas. The total acreage of each Wilderness Area within the allotment is shown below.

**Table 15. Wilderness acreages within the SMA**

| Wilderness Area | Wilderness Acres in the SMA | Total acres in Wilderness | Percentage of the area in the SMA |
|---|---|---|---|
| North Black Rock Range WA | 26,824 | 30,646 | 87% |
| East Fork High Rock Canyon WA | 6,611 | 52,616 | 12% |
| Pahute Peak WA | 25,633 | 56,890 | 45% |
| High Rock Lake WA | 47,963 | 59,093 | 81% |
| Calico Mountains WA | 6,437 | 64,983 | 10% |

These Wilderness Areas were designated on December 31, 2000 by the Black Rock Desert High Rock Canyon Emigrant Trails National Conservation Area Act of 2000, and must be managed in accordance with the Wilderness Act of 1964. Detailed descriptions of the areas can be found in the Nevada Statewide Wilderness Report, October 1991.

Wilderness Areas are to be managed to preserve and protect their wilderness character, provide for their use and enjoyment, by the American people, in such a manner that will leave them unimpaired for future use and enjoyment as wilderness, and allow for recreational, scenic, scientific, educational, conservation, and historical use (43 CFR 6300). Actions proposed within wilderness are evaluated on the basis of their possible direct and indirect impacts on wilderness values of naturalness, solitude and primitive or unconfined recreation, and special features. Several special features were specifically mentioned for the Wilderness Areas in the NCA Act of 2000 they are: prehistoric and historic Native American sites, untouched segments of the historic California Emigrant Trails, wagon ruts, historic inscriptions, a largely untouched emigrant trail viewshed, threatened fish and sensitive plants, and some of the largest natural potholes in North America.

The Wilderness Act of 1964 and the NCA Act allowed grazing to continue in wilderness areas where it was established prior to designation, subject to reasonable regulations that are deemed necessary by the Secretary of the Interior. This EA is being prepared to analyze the impacts associated with the grazing of the allotment.

### 3.11.2 Wilderness Study Area

The proposed action would also affect portions of the Lahontan Cutthroat Trout Wilderness Study Area (WSA). Detailed descriptions of this area can also be found in the Nevada Statewide Wilderness Report, October 1991. Approximately 86% of the 12,378 acres of the WSA are

located within the SMA. This area is managed under the BLM's Interim Management Plan for Lands under Wilderness Review (IMP). The area is to be managed in a way that will not impair its wilderness qualities until Congress decides to designate the area as wilderness or release it for other purposes.

The WSA straddles the north end of the Black Rock Range. It is an outstandingly beautiful area with its running water, large stands of quaking aspen, willow and mahogany trees, lush meadows, colorful rock formations and good populations of wildlife. The area was originally designated as a Natural Area to ensure the preservation of the Lahontan cutthroat trout, a threatened species of fish, in its natural habitat and to maximize available spawning areas.

There are good opportunities for primitive and unconfined recreation. Activities such as backpacking, hunting, nature study, horseback riding, photography, cross country skiing, and winter camping are all feasible. The presence of cool flowing water appeals to a number of people who desire a change from the lower hot, arid desert.

The 1991 Nevada Statewide Wilderness Report recommended that the area not be designated as wilderness, because of the small size of the study units, excessive intrusions and private property and extensive route system. Since 1991 most of the private property has come into federal ownership and now only two 40-acre parcels exist within the WSA.

## 3.12 Special Designations

### 3.12.1 ACEC

In 1982 an Area of Critical Environmental Concern (ACEC) was created through designation within the SMA. The area was 307 acres in size and is located northeast of Mud Meadow Reservoir. The ACEC designation serves as a reminder of the special values or resources that are present and to ensure that these values area accommodated when considering future management actions.

The special values associated with the Soldier Meadows ACEC are the habitats of the Desert Dace and the Soldier Meadows Cinquefoil. These species are discussed further in Chapter 3.2 Fisheries/Aquatic Resources Section and the Chapter 3.4 Vegetation Section.

**Research Natural Area**

In 1984 the area described above was further designated as a Research Natural Area (RNA). This designation is created for areas, which contain natural resource values of scientific interest and are managed primarily for research and educational purposes.

**Lahontan Cutthroat Natural Area**

The area encompassing the Mahogany Creek watershed was designated as the Lahontan Cutthroat Natural Area in 1974. This designation was created to protect the genetically pure strain of LCT that was present. With the passage of the Federal Land Policy and Management Act in 1976 this designation was converted into a wilderness study area, which is further discussed in the Chapter 3.11 Wilderness Section.

## 3.13 Visual Resource Management

BLM uses visual resource management (VRM) in the planning area to manage the quality of the landscape by minimizing potential impacts to visual resources resulting from human activities or developments. The objectives of these classes vary from very little change in the landscape, (e.g. Class 1) to activity that allows major landscape modifications (e.g., Class IV). VRM classes within the SMA vary from Class I to Class IV (see Appendix 26 for VRM Map and Class descriptions).

All wilderness areas and the Lahontan Cutthroat Trout WSA are currently managed as Class I. The Black Rock Desert playa, an area around High Rock Lake, and a corridor along the western edge of the Black Rock Range are managed as Class II. The remaining areas of the SMA are managed as Class IV. Current planning efforts are redefining the VRM classes in several areas, and it is likely that visual requirements will be intensified as an end result.

A portion of the SMA lies within the boundaries of the Black Rock Desert – High Rock Canyon Emigrant Trail National Conservation Area (NCA). The NCA was established to protect the nationally significant cultural, geological, ecological and recreational resources of the area. The legislation creating the act was largely intended to preserve the terrain, scenic vistas and primitive conditions of the Black Rock Desert and High Rock Canyon areas as they were during the emigrant passage. It is the pristine vastness of the area that appeals to many recreation users.

The view shed from the Applegate-Lassen Emigrant Trail is of great importance for many area users. Visitors traveling along segments of the trail, especially as part of an emigration reenactment, are able to relate to the emigrant experience, largely as a result of the relatively untouched scenic vistas. Protecting this viewshed and the associated experiences are high among management objectives for the NCA.

The most visible man-made features in the SMA include historic sites such as the Applegate-Lassen Emigrant Trail and Soldier Meadows Ranch (Fort McGarry outpost). More recent developments include the major access roads, secondary routes and ways, Mud Meadows Reservoir, gravel pits, Wheeler ranch and reservoir, the opal and Fluorite mines, a few private residences, and fences. The ranch landscapes typically include small dwellings, outbuildings, barns, fences, trees, corrals, and fields. They are all situated on private lands, and only the larger features (such as trees) are visible from a distance.

## 3.14 Socio-Economic

The SMA is located within Humboldt County, Nevada. Humboldt County is the fourth largest of 17 counties within the State. The County encompasses a total area of approximately 9,700 square miles and is sparsely populated. The City of Winnemucca is the only incorporated City within the County.

### 3.14.1 Local Economy & Business Climate

Approximately $323.6 million of work place earnings were generated within Humboldt County for 2002[9]. The Agriculture and Agricultural Services sector generated approximately $57.0 million of revenues[10]. Total employment for Humboldt County is approximately 9,836 jobs. Service industries are the largest employers followed by retail trade and mining. The Agriculture sector provides approximately 840 jobs.

The SMA is utilized by one grazing permittee, Estill Ranches LLC. The existing grazing permit includes 7649 AUMs of Active Use. Grazing permits are not property, but rather provide revocable privileges to harvest forage from public lands. At the same time, grazing preference does increase the market value of the base property to which it is attached. Estill Ranches LLC current ranching operation is dependent upon public land grazing. The Estill Ranches LLC economic base includes farming, operating a bed and breakfast as well as ranching. The ranch currently employs fewer than 10 permanent and/or part-time employees.

[9] Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, May 2002.

[10] Source: 1997 Census of Agricultural County Data, USDA National Agricultural Statistics Service

# 4 ENVIRONMENTAL CONSEQUENCES

## 4.1 Critical Elements

The following critical elements of the human environment are subject to requirements specified in statute, regulations, or executive order. Those elements present within the SMA have been analyzed in this EA; all others have not been further evaluated.

| Critical Elements | Chapters | Present | Affected | | Critical Elements | Chapters | Present | Affected | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | | | | Yes | No |
| Air Quality | | X | | X | Nat. Amer. Rel. Concerns | 3.9/4.10 | X | X | |
| ACEC's | 3.12/4.13 | X | X | | T & E Species | 3.2/4.3<br>3.3/4.4<br>3.4/4.5 | X | X | |
| Cultural Resources | 3.8/4.9 | X | X | | Wastes, Hazardous/Solid | | | | X |
| Environmental Justice | | | | X | Water Quality | 3.1/4.2 | X | X | |
| Farmlands, Prime/Unique | | | | X | Wetlands/Riparian Zones | 3.2/4.3 | X | X | |
| Floodplains | | | | X | Wild & Scenic Rivers | | | | X |
| Invasive, Nonnative Species | 3.5/4.6 | X | X | | Wilderness | 3.11/4.12 | X | X | |
| Migratory Birds | 3.3/4.4 | X | X | | | | | | |

## 4.2 Water Resources

In general, livestock and wild horse grazing can impact water resources in many ways. They have the ability to alter the chemical, physical and biologic integrity of water. They also have the ability to modify the hydrologic response of watersheds by reducing infiltration and surface roughness and increasing compaction. All of these impacts are known to occur, but these impacts cannot be quantified in a predictive manner. There are too many independent variables that influence the degree of impact. Although impacts cannot be quantified, causal relationships have been identified that impact water resources and water quality. Through the development of mitigation measures implemented through Terms and Conditions (see Appendix 3 & 4), these impacts can be minimized and grazing can co-exist with other multiple uses of the public lands.

Grazing under these Terms and Conditions (Appendix 3) will achieve the short-term objectives in Alternatives 1, 3, & 5. What are left to be analyzed is which of these grazing alternatives will allow for the quickest attainment of those objectives, and what the final stocking rate will be after being either reduced due to non-attainment of objectives or increased through the issuance of the non-scheduled AUMs.

### 4.2.1 Alternative 1 (Proposed Action)

The impacts of the clockwise/counter-clockwise rotation with new use areas are difficult to predict. Confidence intervals cannot be applied, with any degree of certainty, due to the dependence of the systems on herding rather than physical barriers and that past levels of wild horse use have been greatly reduced.

The rest periods that are built into the Calico and Black Rock Use Areas should promote overall plant health and vigor. Yet, this proposal would also result in more intensive grazing (i.e. increased livestock numbers) within a smaller area for a longer period of time (as compared to the existing system). This can be accomplished if herding efforts are diligent. If herding is not successful, it is likely that impacts to Donnelly, Cherry, and Willow Creeks will occur in the form of erosion, and mechanical damage to the stream channel. Water quality impacts would primarily be increased turbidity and sedimentation, while temperature would not be an issue at this time of year.

The Warm Springs and Idaho Canyon Use Areas would not receive rest but they would be grazed at slightly different times of the year. Water resources are limited in these two pastures, but there would likely be impacts similar to those discussed in the Introduction to this chapter to several isolated springs within both areas due to the consistent hot season grazing. These impacts may be mitigated through cattle exclusion, provided that water is available outside of the exclusion area.

The Colman/Slumgullion Use Areas is problematic. For each year of the rotation this area is grazed during the warm part of the year. This, coupled with the topography of the area, would tend to congregate livestock along Colman, Slumgullion, and Soldiers Creeks. If herding is unable to rectify this situation, adverse impacts to water resources would occur. These impacts would be most evident in the physical properties of water quality, with increases in temperature, sediment and turbidity. These factors typically increase as physical habitat deteriorates. The

floodplain topography of lower Colman and Soldiers Creeks also would present a problem for livestock management. This area is deeply incised into the historic floodplain and causing cattle to become "trapped" within the area, which focuses their use directly on the developing floodplain. Herding is potentially the only solution to this problem, during this season of use.

The proposed grazing for the Hot Springs Use Areas should not result in substantial impacts to water resources. The proposal for late fall/early winter grazing would reduce livestock dependence on the water resources and aid in distribution. The proposed exclosure project would also reduce livestock impacts to the hot springs and the desert dace habitat.

Over the long term, the proposed fencing project would alter the hydrology and geomorphology of the site. Many of these spring sources have been historically altered to facilitate their use for irrigation. In the absence of disturbance it is likely that these irrigation channels would fill in with vegetation and trap sediment and organic material, up to the point where the site evolves in to a wet meadow. Eventually, the amount of habitat available for desert dace would be reduced.

### 4.2.2 Alternative 2 - No Action - Existing System

The "no action" alternative, which would retain the existing grazing system, would be expected to result in conditions similar to those described in the Affected Environment section. Data indicate that the Standards for Rangeland Health related to water quality have been achieved. However, when compared to the EPA Nutrient Recommendations, data indicate that TKN and turbidity may be elevated compared to the 25$^{th}$ percentile for the Ecoregion. Further analysis must be conducted to define baseline conditions for those systems. For the most part impacts to the water resources have been to the physical properties of water quality i.e. temperature. Please refer to the Aquatic/Fisheries Resources section.

### 4.2.3 Alternative 3 - Stanley Camp Riparian Pasture Use

The grazing system proposed under this alternative is similar to that proposed under Alternative 1 with the exception of continual hot season grazing in the Stanley Camp Riparian Pasture. The impacts would be the same for both alternatives with the addition of impacts to the Mahogany Creek watershed. These impacts would be much the same as previously described but they would be magnified due to the sensitivity of the Stanley Camp Riparian Pasture. Summit Lake, which is downstream and terminal, would be impacted from any increase in sediment and turbidity. Since the lake is terminal any sediment it receives is sequestered there, and over geologic time, the lake will evolve into a marsh. These effects have already been seen in the lake through the formation of a delta. These are natural processes, yet they are expedited when upstream land management practices increase sediment yield beyond that of background levels.

### 4.2.4 Alternative 4 - No Livestock Grazing

The removal of all livestock under this proposal would reduce the threat of potential impacts to water resources. The potential would not be eliminated since the area would continue to be inhabited with wild horses. If wild horse populations are allowed to exceed AML, the degree of impact to water resources and to the range in general would be more severe since wild horses maintain a year round presence.

### 4.2.5 Alternative 5 - Multiple Spring Use Areas or Pastures

Under this alternative many of the impacts would be the same as previously described in Alternative 1, with the exception of introducing two years of rest into the spring use areas and the removal of most hot and warm season use in riparian areas. This alternative would offer the quickest opportunity to meet the short term riparian and water quality objectives. As proposed, this alternative would result in an increase in grazing intensity, with a corresponding increased reliance on herding. Failure to perform adequate herding could result in two consecutive years of grazing on riparian areas within the Calico Use Area. The effects of this grazing cannot be predetermined due to: shortened grazing period, early spring use, decreased horse population, and increased livestock intensity. Implementation of this alternative would place an increased importance on monitoring.

## 4.3 Fisheries/Aquatic Resources

Fisheries and Aquatic Resources for the most part are negatively affected by livestock grazing. Livestock impacts to these resources include increased sedimentation, degradation of the stream channel, increased turbidity, increased nutrient inputs, increased soil compaction, loss of flora diversity, reduced sediment capture ability, and the removal of riparian vegetation and overstory. These impacts will become more considerable as the intensity (i.e. numbers) of livestock and duration of grazing increases, especially during the summer months. Topographical complexity of an area can also contribute to increased impacts to these resources. Off-site water developments and herding are essential to minimizing negative impacts to riparian and aquatic environments. Impacts to aquatic and riparian resources by alternative will be described below based on the season of use, slope or topography of an area, intensity of grazing, amount of upland water developments, sensitivity of the channel, channel recovery potential, duration of use, and the known tendencies of livestock, specifically cow/calf pairs within each Use Area. Following the discussion of impacts for each alternative is a brief summary. The summary is designed to capture the ability of the specified alternative to achieve the Terms and Conditions, short-term objectives, and the Standards for Rangeland Health in the shortest period of time. Special emphasis is placed on the proposed changes for the Use Areas containing TES population and/or habitats and also riparian values, the Bureau is required to maintain, restore, or enhance habitats to assist in the recovery of Federal threatened or endangered species (43 CFR 4180.2).

All of the grazing alternatives, except Alternative 2, would result in the eventual achievement of the Standards for Rangeland Health and the short-term objectives, which includes factors that affect the maintenance or improvement of aquatic habitat conditions. The adjustments would be based on the achievement or non-achievement of the short-term objectives, Terms and Conditions, and/or the Standards for Rangeland Health. The adjustments would include changes in the intensity (number of cows) and/or duration (length of time) in a Use Area.

One factor that common to all the alternatives is that the SMA permittee owns and operates a bed & breakfast and "dude ranch". The "dude ranch" operation supplements the normal ranch staff and their abilities to move livestock to other Use Areas. Visitation peaks during late spring through the summer months, thereby providing additional people when more intense herding is required to prevent livestock concentration in sensitive areas.

### 4.3.1 Alternative 1 (Proposed Action)

Under this alternative, it is possible for the phased activation of 4,481 AUMs over time. The implementation of these additional AUMs will be contingent upon meeting **all** the short-term allotment specific objectives and the Standards for Rangeland Health. These objectives and Standards are designed to minimize impacts and improve riparian and aquatic habitats, especially those designated as critical or occupied by Threatened species. Therefore if additional AUMs are implemented based on the achievement of these objectives and Standards minimal impacts to these resources are anticipated.

Under the proposed system, livestock would use the Black Rock South Use Area (BRSUA) and Black Rock North Use Area (BRNUA) from January 1st to March 31st on an annual rest rotation system. This proposal will increase the intensity of livestock within a smaller area compared to the existing system, which could potentially impact the aquatic and riparian resources within these Use Areas. One important factor is that these areas contain a very small amount of perennial aquatic environments, most of which occurs on private land.
These resources would receive minimal impacts from livestock, due to several factors:

- Winter and early spring seasons of use are typically the most compatible with conserving riparian values. Generally, during this season of use, livestock are widely distributed with proportionate forage utilization throughout an area and do not congregate near riparian areas, like that observed during hotter seasons of use.
- Numerous ephemeral waters exist throughout these Use Areas that will be beneficial for livestock dispersion over the range, minimizing areas of concentrated activity.
- The slope of these Use Areas is low compared to the rest of the allotment, which will further contribute to a broad distribution of livestock within the BRSUA and the BRNUA.
- The rest-rotation system will allow for vegetative recovery and increased plant vigor of grazed riparian areas.

The Calico North (CNUA) and Calico South (CSUA) Use Areas will be utilized from April 1st to May 31st on an annual rest rotation system. The CNUA and CSUA are divided by Cherry Creek. The CSUA contains Donnelly Creek, which is listed in the 1995 LCT Recovery Plan as a potential LCT recovery stream. These Use Areas occur on the northern end of the Calico Mountains, which exhibit elevations of approximately 4000 feet to over 6000 feet. Cherry and Donnelly Creeks exist within this Use Area and, as determined by the MASR, are currently not meeting the Standards for Rangeland Health. This alternative proposes increased intensity and duration of use within these Use Areas compared to the existing system. These factors may impact the already unstable reaches of these systems and increase the progression of headcuts located on Donnelly Creek. Higher levels of utilization on the riparian areas may further contribute to the degradation of these unstable systems. Therefore, these resources will likely continue to be negatively impacted. Several factors may aid in the recovery of these degraded resources and other aquatic resources within these Use Areas and allow for the achievement of the Standards for Rangeland Health:

- The proposed season of use would limit livestock to mostly the lower elevation areas until late April because of the residual snow pack from the winter season. The lower elevation areas have limited perennial aquatic resources and generally are considered ephemeral drainages once they reach the valley bottom floor.
- The receding winter snow pack will gradually facilitate livestock movement upslope to the mid - high elevation areas, minimizing areas of concentrated activity and allowing for good distribution of livestock across the Use Area.
- The increased soil moisture level will stimulate vegetative green-up, thus attracting livestock away from the sensitive riparian areas and streambank habitats.
- The rest-rotation will allow for the riparian areas which are FAR to be rested every other year, which will allow for improvement towards PFC
- Early spring grazing has been found to be compatible, in some instances, with willow and streambank herbaceous dominated riparian systems. This compatibility is due to the broad abundance of forage across the range, cool temperatures, and the abundance of water in intermittent and ephemeral drainages due to snowmelt runoff.

The Colman/Slumgullion Use Area (CUA) will annually rotate use between June 1st – 30th and September 1st - 30th. The CUA contains 3 perennial streams: Colman Creek, Soldier, and Slumgullion Creek. Colman Creek, Soldier, and Slumgullion Creek, as determined by the MASR, are not meeting the Standards for Rangeland Health. Colman Creek is the only stream that is inhabited by LCT on the SMA, which is authorized to have livestock grazing under this alternative. The CUA also contains Soldier Creek, which is an intermittent drainage with a perennial portion existing below its confluence with Colman Creek. The lower portions of Colman, Slumgullion, and Soldier Creeks are deeply incised which could potentially allow for livestock to remain unnoticed or "trapped" when the herd is moved to the next scheduled Use Area. This may be compounded by the livestock's concentrated use of the riparian areas during the summer season and the high palatability of willow (*Salix*) during the fall, due to the high sugar concentration in the shoots. The topography of the Use Area could also focus livestock use within these sensitive areas. These systems are especially sensitive due to their channel types and overall riparian condition. Therefore it is likely given the previously discussed tendencies of livestock, especially during these seasons of use and the high potential for livestock to be inadvertently left in the Use Area that these resources would be negatively impacted in this Use Area.

Herding would be essential to minimize the potential impacts that would occur in the sensitive riparian and aquatic habitats associated with the Colman, Soldier, and Slumgullion Creek watersheds.

The Idaho Canyon Use Area (ICUA) will be utilized on an annual rest-rotation either from August 1st – 31st or July 1st - 31st. This Use Area is north of the Stanley Camp Riparian Pasture (SCRP) and northeast of the Summit Lake Indian Reservation. Idaho Canyon is the major drainage feature within this Use Area and is ephemeral in nature. Several springs and water developments exist within this Use Area, which has not had authorized grazing since 1990. Springs are the only aquatic habitat found within this Use Area, although access to Mahogany Creek could occur prior to fence reconstruction and construction on the southern border of the ICUA. Current access is limited to one unfenced area which totals less than one mile, and also

areas of downed or damaged fence along the existing fence of the SCRP.
Potential impacts to the aquatic habitats within the ICUA and the areas adjacent to the SCRP and Mahogany Creek basin would be minimal, due to two factors:

- The ICUA has been ungrazed for over a decade, therefore a broad abundance of forage exists. The abundant forage coupled with the wide-ranging distribution of livestock water developments, would minimize the potential for livestock drift out of the ICUA into the SCRP and also reduce concentrated livestock activity around springs and seeps within the ICUA.
- Herding would focus use out of the springs and seeps and would also effectively eliminate drift into the SCRP, prior to fence construction.

The Warm Springs Use Area (WSUA) would be used on an annual rest rotation from either June 1st to July 31st or August 1st to September 30th. The WSUA is located in the northwestern corner of the SMA and contains numerous livestock water developments. Numerous springs and intermittent drainages also occur within this Use Area, which may be directly impacted by livestock during this season of use. Typically hot season use results in the concentrated use of riparian areas, which impacts the associated aquatic resources. Fall livestock grazing often increases the potential for heavy willow (*Salix*) utilization levels, which is primarily due to the plants high palatability from its higher sugar concentration in the shoots during this time period. Two factors would contribute to alleviate the potential impacts that could occur in the sensitive riparian and aquatic habitats associated springs and intermittent drainages within the WSUA and allow for the attainment of the Standards for Rangeland Health:

- The abundance of livestock water developments away from riparian and aquatic habitats would reduce areas of concentrated use within these sensitive habitats.
- Herding would be necessary to maintain a widely distributed herd throughout the WSUA

The Hot Springs Use Area (HSUA) will be utilized from October 1st to November 30th and includes the habitat, including designated critical habitat, for the federally listed threatened Desert Dace (*Eremichthys acros*) and also the majority of the habitats associated with the several unique species of Hydrobiidae springsnails that are known to exist within the SMA. The proposed alternative includes the fencing of approximately 3000 acres of the HSUA, which is designed to include the entire federally designated critical habitat for the desert dace that occurs on public land. This additional fence is required as part of the Terms and Conditions of the Biological Opinion (USFWS 2002). It will eliminate the potential livestock impacts to the encompassed spring systems, which will potentially benefit desert dace and also the springsnails (Hydrobiidae) inhabiting those systems.

Current information is unclear as to the optimum habitat conditions required by desert dace or the species of Hydrobiidae snails found in the area. From a historical perspective, one can rationalize that desert dace and the spring biota in the SMA would achieve a natural balance in the absence of ungulate grazing. This theory is based on the absence of wild ungulates in the ecosystem, in which desert dace and the springsnails evolved. Yet, the outflow channels occupied by desert dace have been modified to facilitate livestock watering and irrigation. These

unnatural conditions coupled with the proposed exclusion of livestock and wild ungulates may result in reduced habitat availability for the desert dace and springsnails, due primarily to the expanse of vegetation into the channel. This vegetation would capture sediment and organic debris resulting in the evolution of the springs to a marsh-like state with effectively no flowing water. This evolution would eliminate or reduce the available habitat for the desert dace and spring system invertebrate community.

Due to the numerous unknown factors related to the desert dace and its habitat requirements and also the minimal information related to various species of Hydrobiidae snail niches, it is difficult to determine what the implications of the fence proposal would be. Outside of these concerns, the following factors could allow for the achievement of the Standards for Rangeland Health:

- The spring systems outside of the area proposed for fencing would receive minimal impacts, since the cooler season of use would promote a widely distributed livestock herd.
- The slope of the Use Area is relatively low compared to other portions of the allotment, which would further contribute to a broad distribution of livestock within the HSUA.

### 4.3.2 Summary

This alternative proposes to increase the intensity and duration of use within certain areas, which currently are not meeting the Standards for Rangeland Health as determined by the MASR. This alternative also proposes to change the season of use in the Use Area encompassing Colman Creek from spring to early summer. This season of use often results in major impacts to aquatic and riparian resources, which may be compounded by the concentrating effect of the incised channel on Colman, Soldier, and Slumgullion Creeks. It is reasonable to assume that adverse impacts would occur on Colman, Soldier, and Slumgullion Creeks during this season of use if herding is not effective.

It is reasonable to assume that this alternative would allow for the achievement of the Standards for Rangeland Health and the short-term objectives if herding is adequate. Yet, it is also reasonable to assume that herding would not occur at the intensity level required. Therefore, it would be necessary to adjust the intensity and/or the duration of grazing within certain Use Areas. The process of adjustments would eventually lead to the achievement of the Standards for Rangeland Health and short-term objectives, but the degree of non-achievement in the interim may result in adverse impacts to LCT, their habitats, and the associated aquatic/riparian resources within the SMA.

### 4.3.3 Alternative 2 - No Action - Existing System

Under the No Action Alternative, livestock would use the Black Rock Use Area (BRUA) (BRNUA & BRSUA in the proposed alternative) from January 1st to March 31st. This alternative would graze 500 cows (200 less than the proposed action alternative) over a much larger area. The following would minimize the potential impacts to the aquatic habitats within the BRUA allow for the achievement of the Standards for Rangeland Health:

:

- Winter and early spring seasons of use are typically the most compatible with conserving riparian values compared to other seasons of use. Generally, during winter and spring, livestock are widely distributed with proportionate forage utilization throughout an area.
- Numerous ephemeral waters exist throughout this Use Area that would be beneficial for livestock dispersion over the range, minimizing areas of concentrated activity.
- The slope of this Use Area is very low compared to the rest of the allotment, which would further contribute to a broad distribution of livestock within the BRUA.
- This alternative would have a much lesser intensity of grazing, due to the reduced livestock numbers and the increased size of the Use Area when compared to the proposed alternative.

The Calico Use Area (CUA) (CNUA & CSUA in the proposed action alternative) would be used under this alternative from April 1st-30th on an annual rest rotation system with the Soldier Meadow Use Area (SMUA). The CUA would be grazed by 1117 cows for a much shorter duration and over a much larger area than that of the proposed alternative. The Soldier Meadow Use Area is the southern portion of the Colman/Slumgullion Use Area and the Warm Springs Use Area that was identified and described in the proposed alternative. The use within the SMUA would involve a two-herd system, which could be problematic. The relatively small size and herding demands of the SMUA might result in increased livestock drift into the sensitive areas associated with the Hot Springs Use Area and also the Colman Creek drainage. The current system has resulted in the non-achievement, yet it is difficult to determine the causal factor since wild horse numbers have been reduced. Achievement of the Standards for Rangeland Health would be aided by the following:

- The proposed season of use within the CUA would limit livestock to mostly the lower elevation areas because of the residual snow pack from the winter season, which will allow for increased livestock control within the areas that are accessible.
- The receding winter snow pack within the CUA will gradually facilitate livestock movement upslope to the mid - high elevation areas, minimizing areas of concentrated activity.
- The increased soil moisture level will also stimulate vegetative green-up, thus attracting livestock away from the sensitive riparian areas and streambank habitats in both the CUA and SMUAs.
- Early spring grazing has been found to be compatible, in some instances, with willow and streambank herbaceous dominated riparian systems. This compatibility is due to the broad abundance of forage across the range, cool temperatures, and the abundance of water in intermittent, ephemeral, and perennial drainages due to snowmelt runoff. This factor may aid the permittee in minimizing drift into the Colman Creek watershed from the SMUA.

From May 1st to July 14th, livestock are grazed on privately owned lands.

The Warm Springs Use Area (WSUA) would annually alternate use with the Summit Lake Use Area (SLUA) under the No Action Alternative from July 15th to October 14th.
The WSUA is located in the northwestern corner of the SMA and contains numerous livestock water developments. Numerous springs and intermittent drainages occur within this Use Area,

which may be impacted by livestock during this season of use. The SLUA occurs in the northeastern portion of the SMA, which includes the Idaho Canyon Area, Stanley Camp Riparian Pasture, and the Colman Creek basin. One important factor is that livestock grazing within the SLUA was contingent upon the construction of fencing to maintain livestock within the authorized Use Areas. These fences were never constructed; therefore livestock have not been authorized to graze within the SLUA since 1990. Typically hot season grazing results in concentrated livestock use within riparian areas, thereby negatively impacting the associated aquatic habitats. Fall grazing often increases the potential for heavy willow (*Salix*) utilization levels, which is primarily due to the plants high palatability that stems from the higher sugar concentration in the shoots during this time period. From an aquatic resource standpoint, the benefits from the large size of the WSUA and the ability to achieve a broad distribution of livestock will be potentially negated due to the larger numbers of livestock, hot season use, and the longer duration of use compared to the proposed action alternative. As the livestock disperse into the WSUA, the ability to control livestock and keep them from concentrating in riparian and aquatic resource areas will become difficult, even with the additional help from the "dude ranch" operation.

If fences were constructed in the SLUA, the season of use, topography of the area, limited upland water developments for livestock, intensity, and duration of grazing could create major impacts to the aquatic resources within this Use Area. The SLUA contains a variety of springs, seeps, streams, and associated riparian areas. A large proportion of these resources are linked to the conditions of LCT habitat within the Summit Lake Basin and the Colman Creek drainage (see Chapter 3.2 Fisheries/Aquatic Resources Affected Environment Section). The potential impacts to riparian and aquatic resources discussed in the previous paragraph will be difficult to minimize. Achievement of the Standards for Rangeland Health would be aided by the following within the WSUA. Unless specified, the factors listed below do not apply to the SLUA:

- The abundance of livestock water developments away from riparian and aquatic habitats within the WSUA would reduce areas of concentrated use within these sensitive habitats. Conversely, the lack of these developments in the Summit Lake Basin and Colman Creek drainage could cause increased impacts in sensitive aquatic/ riparian habitats in the SLUA, which could be to the detriment of LCT.
- The rest-rotation between both Use Areas will allow for riparian areas to be rested every other year, which has been found to be compatible, in some instances, with riparian rehabilitation.

Livestock will be moved onto fenced private lands from October 15th to November 15th.

The Hot Springs Use Area (HSUA) would be used from November 16th to December 31st under the No Action Alternative. This area includes the entire designated critical habitat and all other occupied spring systems for the federally listed threatened desert dace (*Eremichthys acros*). It also encompasses the majority of the habitats associated with the several unique species of Hydrobiidae springsnails that are known to exist within the SMA. The following factors could allow for the achievement of the Standards for Rangeland Health:

- The slope of the Use Areas is relatively low compared to other portions of the allotment, which will further contribute to a broad distribution of livestock HSUA.
- The spring systems that exist within the HSUA will receive minimal impacts due to the cooler temperatures, frozen streambanks, and widely distributed livestock during the proposed season of use.

### 4.3.4 Summary

This alternative proposes to continue the existing system, which BLM determined in the MASR contributed to the non-attainment of short-term objectives and the Standards for Rangeland Health. Therefore impacts to these resources would be expected.

### 4.3.5 Alternative 3 - Stanley Camp Use

Under this alternative, it is possible for the activation of 4,481 AUMs phased in over time. The implementation of these additional AUMs will be contingent upon meeting **all** the short-term allotment specific objectives and the Standards for Rangeland Health. These objectives and Standards are designed to minimize impacts and improve riparian and aquatic habitats, especially those designated as critical or occupied by Threatened species. Therefore if additional AUMs are phased in based on the achievement of the objectives and Standards, then minimal impacts to these resources are anticipated.

This alternative has the same seasons of use, duration, and intensity of livestock grazing that was specified in the proposed action alternative. Therefore, the impacts analyzed for the proposed action alternative are applicable for Alternative 3, as well. Further analysis is necessary for Alternative 3, due to the two major differences that exist between it and the proposed action alternative. The first difference is that instead of the annual rotation of Use Areas being clockwise followed by counterclockwise; it will be a biannual system. This system will utilize a clockwise rotation for 2 years followed by 2 years of counterclockwise use. The second difference is that a period of grazing through the Stanley Camp Riparian Pasture (SCRP), which has not been authorized for grazing since 1990, will be authorized during either August 24$^{th}$ to September 7$^{th}$ or June 24$^{th}$ to July 7th.

The SCRP encompasses the vast majority of the Mahogany, Summer Camp, and Snow Creek watersheds that occur on public land. These basins and their importance to the long-term viability of the lacustrine Summit Lake and the existing fluvial LCT populations that exist there are explained in the Fisheries/Aquatic Resources Section of the Affected Environment in Chapter 3.2.

Several potential impacts to the aquatic/riparian resources could occur from grazing livestock through the SCRP. Due to the steep slopes within the SCRP, livestock will prefer movement along the streamside areas. The large number of livestock being moved, either in small groups or all at one time, could impact large areas of streamside vegetation by trampling and streambank alteration. Livestock fording the creeks could trample young-of-the-year or juvenile LCT. These impacts vary depending on which of the two anticipated trailing methods that could be employed by the permittee.

One method to graze through the watershed could be to move the entire herd (700 cows) all at once. This system could be compared to a short duration-high intensity livestock grazing system, which is described by Platts (1991) as one of the most poorly compatible with fishery needs out of 17 grazing strategies. This method is further flawed by the difficult terrain of the area, lack of off-site water, and the hot season, which would increase the task of keeping cows out of the riparian/aquatic habitats.

The second method could be to graze through the SCRP using smaller groups (i.e. approximately 50 cows). Employing this technique would still make it difficult to minimize adverse impacts to the aquatic/riparian habitats. These difficulties are the same as those expressed in the latter method of grazing through the SCRP (e.g. the steep terrain, the lack of off-site waters, and hot season use).

Attempts to graze through this area have resulted in riparian and aquatic impacts in the past. To adequately graze through this area while maintaining the quality of riparian and aquatic habitats, the permittee would have to employ an intense herding effort.

### 4.3.6 Summary

The grazing through the SCRP would impact the excellent riparian and aquatic habitats found there. The channel types found in this area are sensitive to disturbance and have poor recovery potentials; therefore livestock impacts to these areas could take decades to repair and would have long lasting effects on LCT within the system. The proposed increases in AUMs would be extremely difficult to implement based on the anticipated non-achievement of the short-term objectives and/or the Standards for Rangeland Health using 700 cows. This grazing system is evaluated further in the Environmental Consequences Summary for the proposed action alternative.

### 4.3.7 Alternative 4 - No Livestock Grazing

Under this alternative, no livestock grazing would be authorized within Soldier Meadows Allotment. The removal of all livestock under this proposal would reduce the threat of potential impacts to fisheries and aquatic resources. The potential would not be eliminated since the area would continue to be inhabited with wild horses and burros. If wild horse and burro populations are allowed to exceed AML, the degree of impact to fisheries and aquatic resources and the range in general would be more severe since wild horses maintain a year round presence.

Please refer to the Sonoma-Gerlach Grazing EIS (1981) for the additional impacts to aquatic/riparian resources from the No Livestock Grazing Alternative.

### 4.3.8 Alternative 5 - Multiple Spring Use Areas or Pastures

Under this alternative, it is possible for the activation of 4,481 AUMs phased in over time. The implementation of these additional AUMs will be contingent upon meeting **all** the short-term allotment specific objectives and the Standards for Rangeland Health. These objectives and Standards are designed to minimize impacts and improve riparian and aquatic habitats, especially those designated as critical or occupied by Threatened species. Therefore if additional AUMs are phased in based on the achievement of these objectives and Standards, then minimal impacts to these resources are anticipated.

Under this alternative the Black Rock South (BRSUA) and Black Rock North (BRNUA) would be used during the same time period (January 1st-March 31st) that was analyzed in the proposed action alternative. The only difference is that the intensity or number of livestock grazed would be increased. Therefore, the impacts and factors that would minimize those impacts would be similar to those described in Alternative 1 for the BRSUA and BRNUA.

The Calico South Use Area (CSUA), Calico North Use Area (CNUA), and Colman/Slumgullion Use Area (CUA) would be used under this alternative from April 1st -31st on a 3-year rest-rotation cycle. The Use Areas would be grazed by 896 cows for a much shorter duration yet with a higher intensity than that of the proposed alternative.

As stated in the analysis of the proposed action alternative, the CNUA and the CSUA are divided by Cherry Creek. The CSUA contains Donnelly Creek, which is listed in the 1995 LCT Recovery Plan as a potential LCT recovery stream. These Use Areas occur on the northern end of the Calico Mountains, which exhibit elevations of approximately 4000 feet to elevations over 6000 feet. As indicated in the MASR, Cherry and Donnelly Creeks within this Use Area are currently not meeting the Standards for Rangeland Health. This alternative will increase the intensity within these Use Areas by 196 cows compared to the proposed action alternative, yet will allow for 2 years of consecutive rest to occur. Platts (1991) described this grazing system as better than a standard rest rotation for fisheries resources, although the high intensity of grazing may result in resource impacts prior to implementing annual adjustments similar to those found with a short duration-high intensity grazing system.

As stated in the analysis of proposed action alternative, the CUA contains 2 perennial streams, Colman Creek and Slumgullion Creek. A stable population of the LCT currently inhabits Colman Creek. Colman Creek is the only stream that is inhabited by LCT on the SMA, which is authorized to have livestock grazing under this alternative. The CUA also contains Soldier Creek, which is an intermittent drainage with a perennial portion existing below its confluence with Colman Creek. The lower portions of Colman, Slumgullion, and Soldier Creeks are deeply incised which could potentially allow for livestock to remain unnoticed or "trapped" when the CUA has been gathered and the herd moved to the next scheduled Use Area. With this alternative, several factors may aid in the recovery of the degraded resources and also the conservation of the sensitive resources within the CSUA, CNUA, and CUA:

- The proposed season of use would limit livestock to mostly the lower elevation areas because of the residual snow pack from the winter season. The lower elevation areas have limited perennial aquatic resources and generally are considered ephemeral

drainages once they reach the valley bottom floor.

- The increased soil moisture level would also stimulate vegetative green-up, thus attracting livestock away from the sensitive riparian areas and streambank habitats. Furthermore, this broad distribution of livestock away from sensitive habitats would minimize the occurrence of livestock becoming "trapped" within the channel of Colman Creek.
- The double rest-rotation would allow for riparian areas which are FAR to be rested for 2 consecutive years, which would allow for improvement towards PFC, via increased plant vigor and recruitment success.
- Early spring grazing has been found to be highly compatible with willow and streambank herbaceous dominated riparian systems. This compatibility is due to the broad abundance of forage across the range, cool temperatures, and the abundance of water in intermittent and ephemeral drainages due to snowmelt runoff.

The Warm Springs Use Area (WSUA) described in proposed action alternative would be combined with the Idaho Canyon Use Area (ICUA) and split into 2 separate Use Areas: Warm Springs West (WSWUA) and Warm Springs East (WSEUA). Grazing within these Use Areas would annually alternate and be used from July 15th to September 30th.

Both the WSWUA and the WSEUA contain numerous livestock water developments. Numerous springs and intermittent drainages also occur within these Use Areas, which may be impacted by livestock during this season of use. The WSEUA occurs in the northeastern portion of the SMA, which includes the Idaho Canyon Use Area. As noted earlier there have been no livestock authorized to use ICUA since 1990. The WSWUA lies in the northwestern portion of the SMA. The larger numbers of livestock, hot season use, and the longer duration of use compared to the proposed action alternative within the smaller Use Areas may become problematic from an aquatic/riparian resource standpoint. Although, the smaller size of the Use Areas may allow for increased control of livestock and enhance the ability to keep them from concentrating in riparian and aquatic resource areas. This could also aid in the prevention of incidental drift in the adjacent Use Areas. Factors that could help alleviate pressure on the limited aquatic and riparian habitats within the WSEUA and WSWUA are shown below:

- The abundance of livestock water developments away from riparian and aquatic habitats within the WSEUA and WSWUA would reduce areas of concentrated use within these sensitive habitats.
- The rest-rotation would allow for riparian areas to be rested every other year, which has been found to be moderately compatible with riparian rehabilitation.

The Hot Springs Use Area (HSUA) would be utilized from October 1st to November 30th, which is the same as proposed action alternative. The only difference is that under this alternative cow numbers would be increased by 196. This would minimally affect the aquatic resources of the HSUA, due to the exclusion of livestock from approximately 3000 acres of nearly all of the aquatic resources found within this Use Area and also the ability to obtain a wide distribution of livestock during this season of use. Therefore, please refer to the proposed action alternative for the effects of this Season of Use on Aquatic Resources within the HSUA.

### 4.3.9 Summary

This alternative proposes to increase the intensity of use within certain areas, which the MASR determined are currently not meeting the short-term objectives and/ or the Standards for Rangeland Health. Conversely, this alternative proposes a double rest rotation and early season of use within those Use Areas containing potential or occupied habitat for LCT, major riparian resource values, and areas that are not meeting the Standards for Rangeland Health due to riparian condition and/or water quality. The two years of consecutive rest coupled with the cool season of use should result in significant progress towards the achievement of the Standards for Rangeland Health and the short-term objectives. If adjustments are required then the changes should allow for the attainment of the Standards for Rangeland Health and short term objectives in the quickest time period, without the likelihood of adversely impacting LCT habitats in the process.

## 4.4 Terrestrial Wildlife

This section is subdivided into priority species and special status species.

### 4.4.1 Priority Species

Priority species for the SMA include mule deer, pronghorn antelope and neo-tropical migrant bird species associated primarily with riparian areas. California bighorn sheep and greater sage-grouse are considered in the Special Status Species section below. Impacts associated with each alternative will be considered for the priority species. Analyzing impacts on these species will provide a reasonable assessment of important wildlife habitat communities. The selected priority species are associated with sagebrush steppe and mid-elevation riparian systems. The Terms and Conditions included in Appendix 11 are assumed to be adequate to achieve the Rangeland Health Standards that support healthy wildlife populations and other wildlife related objectives.

### 4.4.2 Alternative 1 (Proposed Action)

**Mule deer (*Odocoileus heminonus*)**

Mule deer are primarily affected by livestock grazing during the hot and dormant seasons from mid June through March. Hot season grazing tends to be concentrated in riparian areas where green forage remains when upland grasses cure and dry, decreasing forage quality and palatability to livestock. Riparian grazing removes both herbaceous and woody vegetation that provides cover and forage for mule deer year round. Dormant season grazing by cattle often includes a substantial amount of browse, particularly antelope bitterbrush, mountainmahogany and other palatable shrubs of the rose family. Mule deer depend on these shrubs as a source of protein and escape and thermal cover for the summer, fall and winter months.

Mule deer seasonal habitats within the SMA are not evenly distributed across the allotment. Mule deer winter habitat is widely distributed across the allotment, with substantial areas in every Use Area except Hot Springs. Mule deer summer habitat is associated with higher elevation areas in the Black Rock, Calico, Colman-Slumgullion, and Stanley Camp Use Areas.

In this alternative, hot season grazing occurs in the Warm Springs, Idaho Canyon and Colman-Slumgullion Use Areas. These areas include about 63 percent of the mule deer habitat in the

SMA. Hot season grazing would be expected to remove upland browse vegetation, including bitterbrush and mountainmahogany, from mule deer use, slowing the improvement of mule deer habitats and populations. Water is limited in the three Use Areas and grazers do not travel far from water during the hot season. Shrub use by livestock would be concentrated in easily accessible areas. Riparian vegetation communities of high value to mule deer are more common in the Colman-Slumgullion Use Area than in the other two Use Areas. Hot season grazing in this pasture would be likely to slow the improvement of woody riparian communities that are important for mule deer use year-long.

Alternative 1 includes dormant season grazing in the Black Rock and Hot Springs Use Areas. There is little mule deer habitat in either of these Use Areas; therefore, minimal impacts to mule deer are anticipated from dormant season grazing.

**Pronghorn Antelope (*Antilocapra americana*)**
Pronghorn antelope habitat often overlaps with areas preferred by livestock during much of the year. Pronghorn prefer open terrain of moderate slopes with access to water. Although pronghorn consume little grass and livestock diets are primarily grass, both species utilize forbs in the spring and browse shrubs in the dormant season. However, dietary overlap studies show that pronghorn and cattle rarely compete for forage. One place where cattle grazing would be likely to affect pronghorn is the grazing of upland meadows. Meadows provide green, succulent forage during the hot season for livestock and antelope. Meadows grazed to light to moderate levels have increased forb composition desired by antelope. Heavily grazed meadows have decreased productivity of grasses and forbs that reduce the quality of pronghorn forage within these areas.

Hot season grazing would occur in the Warm Springs, Idaho Canyon and Colman-Slumgullion Use Areas in Alternative 1. These pastures include about 70 percent of the pronghorn habitat in the SMA. Hot season livestock use in these three areas is limited to the vicinity of water sources, many of which are small spring meadows. Because almost all the upland forbs are desiccated during the hot season there would be no cattle use of upland forbs and this important class of spring pronghorn forage would be allowed full growth and reproduction.

It is likely that yearlong horse use combined with hot season livestock use would continue to result in overutilization of the few meadows in these three areas. Continued use at this level within these areas would result in decreased production and availability of summer forbs for antelope.

If fence design specifications for areas occupied by antelope (BLM Handbook H1641) are used to construct about 12 miles of fence to exclude Desert Dace habitats and LCT habitats from livestock and wild horse use, there would be no impact on pronghorn antelope. This fence design would allow antelope to move through fences while providing effective livestock and wild horse control.

**Neo-tropical Migrant Birds (see Appendix 3 for Species List)**
Neo-tropical Migrant bird species are those species that breed in the temperate portions of North America and winter in the tropics in either North or South America. They are protected by

international treaty and additional emphasis on maintaining or improving their habitats is provided by Executive Order #13186. Within the Great Basin and the SMA quality riparian habitats are required for healthy Neo-tropical Migrants populations.

Grazing can impact the quantity and quality of riparian habitats that support Neo-tropical Migrants. Grazing animals can remove herbaceous or woody vegetation that support nests and provide seeds, buds and leaves to birds. Decreased vegetation due to grazing also decreases insect production, which decreases food availability of insectivores. Grazing can lead to nest disturbance and trampling. Abusive grazing practices can lead to loss of plant species and structural classes due to direct grazing or browsing or indirectly through changes to the hydrology of riparian areas. These changes would lead to habitat loss or changes that reduce the number of bird species supported within each riparian area.

Hot season livestock grazing would be more likely to directly or indirectly affect Neo-tropical Migrants when compared to dormant season or spring grazing. During this period, livestock tend to concentrate in riparian areas because of the limited availability of water and green forage in the uplands. Forage quality of grasses on the uplands decreases as grasses cure and dry. Livestock make less use of riparian areas during the dormant and spring seasons. During these two seasons, temperatures are cooler, with riparian areas in canyons being too cold for livestock to use for bedding sites. Cooler temperatures allow cattle to forage up to several miles from water sources. Green forage is readily available on the uplands during the spring season and usually fall rains allow for green-up of upland grasses during the dormant season. This upland forage is often of higher quality to livestock than riparian vegetation during these periods.

In this alternative, hot season grazing occurs in the Warm Springs, Idaho Canyon and Colman-Slumgullion Use Areas. Riparian vegetation communities of high value to Neo-tropical Migrants are more common in the Colman-Slumgullion Use Area than in the other two use areas but not widespread. Hot season grazing in this pasture would be likely to slow the improvement of a small portion of the woody riparian communities in the SMA that are important for Neo-tropical Migrants.

Willow communities dominate portions of Donnelly Creek. These areas would be grazed every other year during the spring. Spring livestock grazing within this area has the potential to disturb or displace nesting birds. It is expected that the riparian communities used by Neo-tropical Migrants would show improvement under this grazing strategy.

The most important riparian areas in the SMA, within the Stanley Camp Pasture and the Mahogany Exclosure, would not be grazed under this alternative. Therefore there would be no impact to Neo-tropical Migrants that prefer climax riparian communities, yet species that prefer early to mid successional riparian communities may be impacted.

### 4.4.3 Alternative 2 - No Action - Existing System

Under this alternative livestock would graze two years followed by two years rest during the majority of the hot season and a portion of the early dormant season use alternating between the Warm Springs and Summit Lake Use Areas.

**Mule deer (*Odocoileus heminonus*)**
During the first portion of the hot season livestock would not graze in the SMA. The hot and dormant season livestock grazing would occur on about 39 percent of the mule deer habitat in the allotment. Livestock grazing would remove shrubs otherwise available for mule deer use on portions of the two Use Areas. Hot season livestock grazing commonly results in moderate to high levels of livestock utilization on these shrubs needed for healthy deer conditions during the fall season. The 50 percent utilization limit would assure that browse is available for mule deer use; although this utilization objective has been exceeded in the Warm Springs use area. Dormant season use would also occur in the Black Rock use area, which has minimum mule deer habitat.

**Pronghorn Antelope (*Antilocapra americana*)**
These Use Areas encompass roughly the same area as discussed in Alternative 1. Hot season livestock use and yearlong horse use would continue to impact the few, small meadows. Meadow forbs desired by antelope during the hot season would be less available than optimum for antelope forage quality needs. This would decrease antelope habitat quality in these areas. Upland forbs would be expected to slowly improve in vigor and availability due to periods of rest from livestock grazing.

The construction of about two miles of fencing to completely separate the Stanley Camp Pasture from Idaho Canyon would have impacts as described in Alternative 1 for antelope.

**Neo-tropical Migrant Birds (see Appendix 3 for Species List)**
During the early portion of the hot season livestock would not graze in the SMA. Therefore there would be no impact to Neo-tropical Migrants that prefer climax riparian communities, yet species that prefer early to mid successional riparian communities may be impacted within the Warm Springs and Summit Lake Use Areas.

Willow communities dominate portions of Donnelly Creek. These areas would be grazed every other year during the spring season. It is expected that the riparian communities used by Neo-tropical Migrants would show improvement under this grazing strategy.

The most important areas for Neo-tropical Migrants in the SMA, the riparian corridors within the Mahogany Exclosure would not be grazed under this alternative. Therefore there would be no impact to Neo-tropical Migrants that prefer climax riparian communities, yet species that prefer early to mid successional riparian communities may be impacted from the elimination of livestock grazing in this exclosure.

## 4.4.4 Alternative 3 - Stanley Camp Riparian Pasture Use

**Mule deer (*Odocoileus heminonus*)**
Impacts to mule deer would be very similar to Alternative 1. The only difference would be associated with two weeks of hot season grazing in the Stanley Camp Riparian Pasture. A substantial portion of the livestock use would be expected to occur in riparian communities including aspen stands, which are important to mule deer for thermal and fawning cover as well

as forage. This use would be expected to slightly decrease cover and forage values to summer deer populations.

**Pronghorn Antelope (*Antilocapra americana*)**
Impacts to pronghorn antelope would be similar to Alternative 1. The two weeks of hot season grazing in the Stanley Camp Pasture would result in short-term grazing on about 8 percent of the antelope habitat in the SMA. The short-term grazing period would be likely to decrease grass composition of the meadow areas while increasing forb production desired by antelope.

Impacts to pronghorn from fence construction would be the same as described in Alternative 1.

**Neo-tropical Migrant Birds (see Appendix 3 for Species List)**
Impacts to mule deer would be similar to Alternative 1. The only difference would be associated with two weeks of hot season grazing use in the Stanley Camp Pasture. A substantial portion of the use would be expected to occur in riparian communities including aspen stands, which are important to Neo-tropical Migrants nesting and foraging habitat. This grazing would be expected to decrease cover and forage values to Neo-tropical Migrants.

### 4.4.5 Alternative 4 - No Livestock Grazing

**Mule deer (*Odocoileus heminonus*)**
All the palatable shrub production in mule deer habitats would be available for wildlife use including mule deer. Riparian communities, especially those dominated or potentially dominated by woody vegetation would be expected to maintain or improve herbaceous and woody vegetation cover consistent with mule deer cover and forage needs. Where mule deer habitats are less than optimal as a result of past livestock grazing of forage, improvements in forage quantity and quality and improvements to vegetation structure would be expected to occur more rapidly than in other alternatives. However, this will only occur if wild horse and burro populations are kept at or below AML.

**Pronghorn Antelope (*Antilocapra americana*)**
Any potential competition between antelope and livestock would be eliminated. In the Warm Springs, Idaho Canyon and Colman-Slumgullion areas spring meadows would be expected to improve in composition and production. Continued year long grazing by wild horses would be expected to maintain meadows favored by horses in less than optimal condition for summer forb availability by pronghorn.

**Neo-tropical Migrant Birds (see Appendix 3 for Species List)**
Riparian communities, especially those dominated, or potentially dominated, by woody vegetation would be expected to maintain or improve herbaceous and woody vegetation cover consistent with Neo-tropical Migrant habitat structure and forage needs. Where Neo-tropical Migrant habitats are less than optimal as a result of past livestock grazing of forage, improvements in forage quantity and quality and improvements to vegetation structure would be expected to increase in alternatives where no hot season grazing occurs. This alternative, however, would result in a decrease in habitat for those species that prefer early to mid successional riparian communities. However, this will only occur if wild horse and burro populations are kept at or below AML.

## 4.4.6 Alternative 5 - Multiple Spring Use Areas or Pastures

**Mule deer (*Odocoileus heminonus*)**

In this alternative, hot season grazing would occur every other year in the Warm Springs East and Warm Springs West Use Areas. These areas include about 38 percent of the mule deer habitat in the SMA. During the early portion of the hot season, livestock would not be authorized to graze within the SMA. Hot season grazing would be expected to remove relatively low quantities of upland shrub vegetation from the mule deer population. This would slow the improvement of mule deer habitats and populations. Except in areas near water, grazing these two Use Areas every other year would allow vigor and seed production in upland shrubs supporting the long-term maintenance of these communities. Livestock water is limited in the two Use Areas and cattle do not travel far from water during the hot season, shrub use by livestock would be concentrated in easily accessible areas. Riparian vegetation communities of high value to mule deer are rare in the two Use Areas. Hot season grazing would have some impact on woody riparian communities that are important for mule deer use yearlong.

Alternative 5 includes dormant season grazing in the two Black Rock and the Hot Springs Use Areas. Little mule deer habitat is in the Black Rock or Hot Springs Use Areas. Minimal impacts to mule deer are anticipated from dormant season grazing.

**Pronghorn Antelope (*Antilocapra americana*)**

Hot season use by livestock would occur every year during the latter part of the hot season. The hot season use would occur alternately in the Warm Springs East and West Use Areas. These two areas would include about 52 percent of the antelope habitat in the SMA. Impacts to pronghorn antelope would be similar to those discussed in Alternative 1. The hot season use area would involve about one third less antelope habitat, but the grazing use period and the every other year use scheme would be the same as Alternative 2.

**Neo-tropical Migrant Birds (see Appendix 3 for Species List)**

In this alternative, hot season grazing would occur every other year in the Warm Springs East and Warm Springs West Use Areas. During the first portion of the hot season, livestock would not be grazed within the SMA. Riparian vegetation communities of high value to Neo-tropical Migrants are rare in the two Use Areas. Hot season grazing would have some impact on woody riparian communities that are of primary importance for Neo-tropical Migrants.

Willow communities dominate portions of Donnelly Creek. These areas would be grazed every third year during the growing season. It is expected that the riparian communities used by Neo-tropical Migrants would show improvement under this grazing strategy.

The most important riparian areas in the SMA, within the Stanley Camp Pasture and the Mahogany Exclosure, would not be grazed under this alternative. Therefore there would be no impact to Neo-tropical Migrants.

## 4.4.7 Sensitive Terrestrial Species (Federally listed Threatened, Endangered, or Candidate species, including BLM Sensitive and USFWS Species of Concern)

Special status species for the allotment include those terrestrial species listed or proposed for listing under the Endangered Species, species designated by the FWS and candidates for listing and species contained in the BLM's Nevada Species of Concern list.

Little specific information is known about the current status or habitat conditions within the SMA for a number of species. Potential impacts for these species can only be discussed in general terms related to their potential habitats.

**Pygmy rabbit (*Brachylagus idahoensis*)**
Pygmy rabbits occupy tall, dense stands of big sagebrush growing on deep, well drained, loamy soils containing a good understory of native grasses. Within the SMA, such sites would likely occur in small patches on the edge of upper elevation intact floodplains or on old floodplains that have been invaded by sagebrush following stream downcutting. Livestock or wild horse grazing could affect these sites during the hot season, when grazing is concentrated near water sources in or near the floodplain or during the spring when the forage provided by these sites is of high quality for livestock use.

In the alternatives with livestock (1, 2, 3 and 5), hot season grazing use occurs during most or a portion of the hot season in the northern portions of the allotment, which include the sagebrush plant communities. Livestock or wild horse grazing has the potential to decrease the native grass cover of these sites through direct harvest of grass and physical damage to sagebrush when livestock use these sites for grazing and shade. This could affect pygmy rabbits by decreasing forage availability and altering the sagebrush and herbaceous cover.

Spring livestock would occur on the southern pastures, which are dominated by salt desert scrub communities. There is almost no potential pygmy rabbit habitat within these pastures. Therefore there would be no impacts from livestock or wild horse grazing to pygmy rabbit habitats.

Livestock would not affect pygmy rabbit habitats if the No Grazing alternative were implemented. However, potential pygmy rabbit habitats in the northern portion of the allotment would be subject to impacts similar to those discussed above due to continued wild horse grazing.

**Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)**
**Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)**
**Spotted bat (*Euderma maculatum*)**
**Small footed-myotis (*Myotis ciliolabrum*)**
**Long-eared myotis (*Myotis evotis*)**
**Fringed myotis (*Myotis thysanodes*)**
**Long-legged myotis (*Myotis volans*)**
**Yuma myotis (*Myotis yumanesis*)**

Potential impacts on bats of implementing any of the alternatives that include livestock grazing on bats are largely unknown. Grazing would have no impact on breeding or hibernation sites. Hot season grazing could result in changes to riparian systems that are thought to provide a disproportionate share of the flying insects that bats depend upon as prey. Hot season grazing that results in declines in insect production from riparian and meadow systems would be the primary mechanism that livestock grazing could affect bats.

Hot season grazing occurs in each alternative that allows grazing on the SMA. However in each of these alternatives hot season grazing occurs primarily in pastures with few riparian and meadow areas (the Warm Springs and Idaho Canyon Use Areas) or is limited to a portion of the hot season (Alternatives 2 and 5). The largest riparian and meadow areas are fenced and either ungrazed (Alternatives 1, 2, 4 and 5) or grazed for a limited time (Alternative 3). Therefore it is anticipated that livestock grazing would have minimal impact on these bat species.

**Preble's shrew (*Sorex preblei*)**
**Northern goshawk (*Accipter gentiles*)**
**Nevada viceroy (*Limenithus archippus lahontani*)**
These three species are riparian obligates associated with woody sites or large semi-wet meadows in the case of the shrew. Potential impacts on bats of implementing any of the alternatives that include livestock grazing are related to the presence of woody riparian communities or large, healthy meadow systems. Hot season grazing could result in the direct reduction of vegetation, compaction of meadow soils, and changes in vegetation structure within riparian systems that decrease the habitat quality of these species.

Hot season grazing occurs in each alternative that allows grazing on the SMA. However in each of these alternatives hot season grazing occurs primarily in pastures with few riparian and meadow areas (the Warm Springs and Idaho Canyon Use Areas) or is limited to a portion of the hot season (Alternatives 2 and 5). The largest riparian and meadow areas, and therefore the best habitat for these species, are fenced and either ungrazed (Alternatives 1, 2, 4 and 5) or grazed for a limited time (Alternative 3). Riparian areas at lower elevations, including willow habitats in Donnelly Creek may provide suitable habitat for the Nevada viceroy and would be expected to improve under all alternatives because the season of use for livestock would not result in livestock concentration in the willow stands. Therefore it is anticipated that livestock grazing would have minimal impact on these species.

**Western burrowing owl (*Athene cunicularia hypugea*)**
Western burrowing owl habitat and colonies may occur in the southern portions of the SMA in the spring and summer. Under all the alternatives that include livestock grazing this area would be grazed during the dormant season. Livestock use would overlap little with the burrowing owl presence. Dormant season grazing would result in livestock harvesting vegetation produced during the previous growing season. Grazing during this season has been shown to maintain the vigor and production of both and grasses and shrubs on these arid sites. It is likely that light levels of dormant season grazing would have measurable impact on burrowing owls if they occur within the allotment.

**Least bittern (*Ixobrychus exilis hesperis*)**
The only potential habitat on public land within the SMA is the fenced wetlands below the Soldier Meadows hot springs. These wetlands are not included into the grazing schedules being considered in the alternatives. Therefore there would be no impact of any of the alternatives on the Least bittern.

**White-faced ibis (*Plegadis chihi*)**
White-faced ibises are colonial nesters, associated with tule marshes in the Great Basin, and no suitable habitat exists within the SMA. Ibises do use other wetlands during migration and may make use of the fenced wetlands below the Soldier Meadows hot springs. These wetlands are not included into the grazing schedules being considered in the alternatives. Therefore there would be no impact of any of the alternatives on the white-faced ibis.

The following two species occupy known areas within the SMA and substantial information is available about their habitat needs and the potential impacts from livestock grazing.

## 4.4.8 Alternative 1 (Proposed Action)

**California bighorn sheep (*Ovis canadensis californiana*)**
Bighorn occupy a small portion (currently less than 10,000 acres) of the mountainous areas within the SMA. The potential, but currently unoccupied habitat, covers about 25 percent of the allotment. Although bighorn, cattle and wild horses are primarily grazers, bighorn habitat preference overlaps with cattle and wild horse preferred grazing areas only slightly, except on mountain meadow habitats. Bighorn prefer rugged, rock terrain and usually are found with a quarter mile of steep, rocky escape cover. Cattle and wild horses are usually found on more gentle terrain and avoid rocky areas if possible. Interaction is most likely at water sources during the all seasons in or near steep rocky country. Cattle, wild horses and bighorn sheep are not closely related, so the potential for disease transmission between these animals is considered low.

In this alternative, hot season grazing would occur in the Warm Springs, Idaho Canyon and Colman-Slumgullion Use Areas. Little potential bighorn habitat exists in the Warm Springs and Idaho Canyon Use Areas. Bighorn were reintroduced into the Colman-Slumgullion use area in 2003, where about 60 percent of the use area is potential bighorn habitat. Livestock would be expected to use the lower portions of the use area, while bighorn would be expected to summer at the upper elevations of the use area and the Stanley Camp Pasture. There maybe some impacts from livestock on bighorn. Spring grazing would occur in the Calico use area and dormant season grazing would occur in the Black Rock and Hot Springs Use Areas. Each of these Use Areas have little potential or occupied bighorn habitat (See Appendix 24). Overlap between bighorn and livestock would be minimal, therefore few impacts to bighorn would be anticipated.
However, wild horse and burros occur yearlong in the bighorn sheep occupied and potential habitats. As long as wild horse and burros populations are kept at or below AML minimal impacts are anticipated.

**Greater sage-grouse (*Centrocercus urophasianus*)**
Sage-grouse are year around occupants of the sagebrush communities within the SMA. Livestock and year long wild horse and burro grazing indirectly affects sage-grouse through alterations of habitat components important to sage-grouse during the nesting and brood rearing periods (March through September). This period corresponds to the spring and hot grazing seasons.

Grazing of grasses and forbs in nesting habitat decreases the herbaceous cover that provides visual screening of sage-grouse nests occur under sagebrush plants. Data collected on the Sheldon National Wildlife Refuge just north of the SMA indicates that nests without herbaceous vegetation greater than about seven inches are more subject to predation than nests with taller herbaceous cover. Sage-grouse hens require forbs in their diets prior to egg laying to be successful in raising chicks. Heavy grazing during the hot season on meadows and high elevation sites decrease the production of insects and forbs required by the rapidly growing sage-grouse chicks. Grazing is a cause of decreased herbaceous vegetation, including forbs, in nesting and brood rearing habitats. Some grazing has been shown to be effective in restoring forb production on meadows that have not been grazed for a number years.

Hot season grazing could also affect nesting sage-grouse within these Use Areas. Much of the sage-grouse incubation period occurs prior to the rapid growth period of bunch grasses and tall forbs that provide nest screening. Standing, residual vegetation from the previous growing season provides screening during much of the nesting period. Removal of grasses in the previous season by grazers may indirectly increase sage-grouse nest predation.

Spring grazing would occur in the Calico Use Area, where about 60 percent of the Use Area is potential nesting habitat. The sage-grouse nesting habitats are associated with the sagebrush zones at the top of the Calico Range while much of the livestock grazing occurs on the lower slopes of the range in the salt desert scrub zone where temperatures are warmer and slopes are gentler. Therefore there would be little impacts to nesting sage grouse by livestock in spring Use Areas. However, wild horse and burros populations graze the Calico Use Area year long and may impact sage-grouse nesting and brooding habitats.

Hot season use would be made in the Warm Springs, Idaho Canyon and Colman-Slumgullion Use Areas, which include over 70 percent of the nesting and brood rearing habitats in the SMA. There are few meadows of the type preferred by brooding sage-grouse within these Use Areas, primarily in the Warm Springs Use Area, therefore these limited habitats are crucial for sage-grouse in the area. Data in the AE indicated that several of these meadows were not meeting the Standards for Rangeland Health. Livestock grazing would be limited to 50 percent utilization on the meadows and uplands and six inches of remaining stubble would be required at the end of the livestock grazing period. The combination of livestock grazing during the hot season and yearlong wild horse use would likely result in the meadows not producing the quantity or quality of forbs or insects required by sage-grouse broods.

Hot season livestock use within the Warm Springs, Idaho Canyon and Colman-Slumgullion Use Areas would be likely to maintain sub-optimal sage-grouse nest screening on portions of the Use Areas. The portions affected would be associated with water sources used by livestock during

the summer months. The magnitude of the impact is unknown due a lack of information on livestock use patterns and stubble heights. The lack of water sources in the Use Areas suggests that large areas in these Use Areas exist with little or no livestock use where grazing would have minimal impacts on sage-grouse nest screening. However, the available meadows are important for sage-grouse and likely to be impacted by livestock and/or wild horse and burros.

### 4.4.9 Alternative 2 - No Action - Existing System

**California bighorn sheep (*Ovis canadensis californiana*)**

In this alternative, livestock grazing seasons and Use Areas would generally correspond to those described in Alternative 1. Therefore the impacts to bighorn sheep would be the same as described for Alternative 1.

**Greater sage-grouse (*Centrocercus urophasianus*)**

In this alternative, livestock grazing seasons and Use Areas would generally correspond to those described in Alternative 1. Livestock would be removed from the SMA during the end of the nesting season and the first portion of the brood rearing season, but livestock use would occur in large areas of sage-grouse brood rearing habitats in the Warm Springs, Summit Lake and Soldier Meadows Use Areas during the latter portions of the hot season. Therefore the impacts to sage-grouse would be the same as described for Alternative 1.

### 4.4.10 Alternative 3 - Stanley Camp Riparian Pasture Use

**California bighorn sheep (*Ovis canadensis californiana*)**

Impacts would be the same as those described in Alternative 1. Although this alternative includes two weeks of cattle use in the Stanley Camp Pasture, no additional impacts to bighorn sheep would be anticipated.

**Greater sage-grouse (*Centrocercus urophasianus*)**

Impacts would be similar to those described in Alternative 1. This alternative includes two weeks of cattle use in the Stanley Camp Pasture, which is entirely within the identified sage-grouse nesting and brood rearing habitats. The two weeks of livestock use during the hot season would be likely to slightly increase forb production within the pasture through the selective removal of grasses that compete with forbs. The grazing use period is short and would not be expected to decrease herbaceous cover enough to adversely affecting nesting cover. Therefore grazing within the Stanley Camp Pasture would be likely to slightly improve the condition of about several thousand acres of sage-grouse brood rearing habitat.

### 4.4.11 Alternative 4 - No Livestock Grazing

**California bighorn sheep (*Ovis canadensis californiana*)**

There would be no impact on bighorn sheep from grazing under this alternative. However, wild horse and burro populations will limit optimal bighorn habitat if they exceed AML.

**Greater sage-grouse (*Centrocercus urophasianus*)**

The removal of livestock grazing from the SMA would result in potential changes to sage-grouse nesting and brood rearing habitats. Elimination of grazing from sagebrush dominated areas used as nesting habitats would increase herbaceous vegetation desirable for nest screening. The area of nesting habitat where herbaceous vegetation screening would increase above the seven-inch

threshold is unknown but may only involve a small portion of these habitats. Continuous yearlong wild horse grazing would maintain some areas with less than the optimum nest screening cover.

Brood rearing habitats would not be expected to experience substantial changes from present conditions. The continued heavy use by wild horses of these small meadow systems, primarily in the northern portion of the SMA, would not allow major changes in meadow conditions that would lead to improvement in forb or insect availability for sage-grouse broods.

### 4.4.12 Alternative 5 - Multiple Spring Use Areas or Pastures

**California bighorn sheep (*Ovis canadensis californiana*)**

In this alternative, hot season grazing would occur in alternating grazing seasons in the Warm Springs West and Warm Springs East Use Areas. Little potential bighorn habitat exists in the two Warm Springs Use Areas. Spring grazing would occur one year in three in each of the Calico North, Calico South and Colman-Slumgullion Use Areas and dormant season grazing would occur in alternating years in the Black Rock South and Black Rock North Use Areas. The Black Rock South Use Area has little potential or occupied bighorn habitat. The other Use Areas have little potential for overlap between bighorn and cattle due to differences in habitat preferences. Therefore there would be few potential impacts from livestock on bighorn. However, yearlong wild horse and burros grazing would impact bighorn sheep habitat.

**Greater sage-grouse (*Centrocercus urophasianus*)**

Spring grazing would occur in the once every three years in Calico North, Calico South and Colman-Slumgullion Use Areas, which include about 35 percent of the potential sage-grouse nesting habitat in the SMA. The sage-grouse nesting habitats are associated with the sagebrush zones at the top of the Calico Range while much of the livestock grazing occurs on the lower slopes of the range in the salt desert scrub zone where temperatures are warmer and slopes are gentler. Spring grazing in the Colman-Slumgullion Use Area would be expected to overlap much of the sage-grouse nesting habitats. Allowing two years of rest following each year of grazing would allow for improvements of vigor of forbs and native bunch grasses which would lead to improvements in nest screening and forb availability. Therefore there would be long-term improvements expected to sage-grouse nesting habitats associated with spring livestock grazing.

Yearlong wild horse and burros grazing would impact sage-grouse habitats minimally as long as wild horse and burro populations are kept at or below AML.

Hot season grazing use would be made in alternating years in the Warm Springs East and Warm Springs West Use Areas, which include over 70 percent of the nesting and brood rearing habitats in the SMA. There are few meadows of the type preferred by brooding sage-grouse within these Use Areas, primarily in the Warm Springs West Use Area. Data in the AE indicated that several of these meadows were not meeting the Standards for Rangeland Health. Every other year livestock grazing would be limited to 50 percent utilization on the meadows and uplands and six inches of remaining stubble would be required at the end of the livestock grazing period. Alternate year rest from cattle grazing would not be expected to allow long-term recovery of the meadow sites. The combination of livestock grazing during the hot season and yearlong wild

horse use would likely result in the meadows not producing the quantity or quality of forbs or insects required by sage-grouse broods.

Hot season livestock use within the Warm Springs East and Warm Springs West Use Areas would be likely to maintain sub-optimal sage-grouse nest screening on portions of the Use Areas. The portions affected would be associated with water sources used by livestock during the summer months. The magnitude of the impact is unknown due a lack of information on livestock use patterns and stubble heights. Resting each Use Area every other year from livestock grazing would result in some long-term increases in vigor of forbs and native bunch grasses on portions of the Use Areas. These improvements would slightly increase the areas where sage-grouse nest screening and forb availability meet the needs of the birds. The lack of water sources in the Use Areas suggests that large areas in these Use Areas exist with little or no livestock use where grazing would have minimal impacts on sage-grouse nest screening.

## 4.4.13 Summary

### Common to All Alternatives

There would be few impacts from any of the alternatives on:

**Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)**
**Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)**
**Spotted bat (*Euderma maculatum*)**
**Small footed-myotis (*Myotis ciliolabrum*)**
**Long-eared myotis (*Myotis evotis*)**
**Fringed myotis (*Myotis thysanodes*)**
**Long-legged myotis (*Myotis volans*)**
**Yuma myotis (*Myotis yumanesis*)**
**Preble's shrew (*Sorex preblei*)**
**Northern goshawk (*Accipter gentiles*)**
**Nevada viceroy (*Limenithus archippus lahontani*)**
**Western burrowing owl (*Athene cunicularia hypugea*)**
**Least bittern (*Ixobrychus exilis hesperis*)**
**White-faced ibis (*Plegadis chihi*)**

These species either have low interaction with livestock grazing; use habitats that are not included in the grazing schedules or occur in habitats that would receive no grazing or minimal grazing. However, when these species are present, yearlong wild horse and burros grazing could impact these species.

#### 4.4.13.1 Alternative 1 (Proposed Action)

Mule deer habitats in hot season grazing areas would slowly improve due to livestock grazing utilization limits on herbaceous and woody vegetation. Pronghorn antelope habitat conditions would be unlikely to substantially change, but would generally support the species needs because lack of dietary overlap with grazing animals and lack of improvement to small meadows in the Warm Springs Use Area(s). Neo-tropical Migrant Birds riparian habitat would slightly improve in areas with dormant or spring grazing and remain in current conditions on Use Areas not

grazed. California bighorn sheep habitat conditions would be unlikely to change from current conditions, due to lack of common Use Areas with livestock. Greater sage-grouse habitat would be maintained in satisfactory condition over much of the allotment due to large areas without livestock grazing due to a lack of water. Small meadows in the Warm Springs area would continue to remain in unsatisfactory condition for summer use by pronghorn and sage-grouse due to continued wild horse use.

#### 4.4.13.2 Alternative 2 - No Action - Existing System

Impacts would be similar to Alternative 1. The Use Areas and seasons of use are much the same as in Alternative 1. The removal of livestock from the SMA for the first portion of the hot season would result in less livestock of upland browse, which would slightly benefit mule deer.

#### 4.4.13.3 Alternative 3 - Stanley Camp Riparian Pasture Use

Impacts would the same as Alternative 1. The two weeks of cattle use in the Stanley Camp Pasture would slightly decrease Neo-tropical Migrant habitat and slightly improve forb availability for pronghorn.

#### 4.4.13.4 Alternative 4 - No Livestock Grazing

Mule deer would benefit from decreased browse use by livestock in the northern portions of the allotment. Antelope would benefit from decreased forb use by livestock on portions of pronghorn habitat. Bighorn sheep and Neo-tropical Migrant habitat would not be expected to significantly change. Small meadows in the Warm Springs area would continue to remain in unsatisfactory condition for summer use by pronghorn and sage-grouse due to continued yearlong wild horse use.

#### 4.4.13.5 Alternative 5 - Multiple Spring Use Areas or Pastures

Mule deer habitats in hot season grazing areas would slowly improve due to livestock grazing utilization limits on herbaceous and woody vegetation and period rest periods during all seasons. Pronghorn antelope habitat conditions would slightly improve on portions of spring and hot season Use Areas due to increased forb productions. Neo-tropical Migrant Birds riparian habitat would slightly improve in areas with dormant or spring grazing and remain in current conditions on Use Areas not grazed. However, yearlong wild horse and burros grazing may impact all species habitats, if populations exceed AML. California bighorn sheep habitat conditions would be unlikely to change from current conditions due to lack of common Use Areas with livestock. Greater sage-grouse habitat would be maintained in satisfactory condition over much of the allotment due to large areas without livestock grazing due to a lack of water. Small meadows in the Warm Springs area would continue to remain in unsatisfactory condition for summer use by pronghorn and sage-grouse due to continued wild horse use.

#### 4.4.13.6 Proposed Mitigation

Fence small spring meadows in the Warm Springs Use Area to allow recovery meadow health and productivity due to combined livestock and wild horse use during much of the year. Make the fenced areas large enough to minimize potential sage-grouse predators from using fence posts as viewing sites. Provide for occasional grazing to maintain forb populations and health.

## 4.5 Vegetation

Proper vegetative management maintains or improves the plant community for protection of soil and water resources. Sufficient seedling and young plant recruitment is needed to maintain or increase status of species in the community. Generally, two growing seasons of rest allows sufficient time for germination of seed and seedling establishment. Development of adequate seedling root growth is necessary (to prevent uprooting by grazing animals) for seedlings to develop good vigor and produce viable seed. Ecological status inventory identifies that 20 percent of the SMA to be at potential natural community, 64 percent at late status, 15 percent at mid, and less than, one percent at early.
For the analysis the following terms are defined below:

- **Boot Stage-** when first reproductive culm is in the sheath; that point where the discernible floral parts within the sheath and up to emergence of floral parts
- **Dough Seed-** seed with milky juice
- **Early Critical Growth Period-** boot to soft dough
- **Late Critical Growth Period**-soft dough to mature seed

Fence reconstruction/construction proposed in alternatives 1, 3, & 5 would remove and crush vegetation. Impacts associated with construction of these projects would be short term

### 4.5.1 Alternative 1 (Proposed Action)

Black Rock South and North Use Areas are grazed by livestock prior to the critical growth period for upland plants. Portions of the Black Rock South Use Area are in early status. These early status sites are on the Saline Bottom ecological site. This proposal would allow existing upland plants to increase vigor, productivity, cover, and seedling establishment. Seedlings would establish after early spring grazing. This would provide two growing seasons of rest for establishment of new seedlings. Early and mid status vegetative communities would improve over the long term.

Calico South and North Use Areas are grazed by livestock during the early critical growth period for upland plant species, followed by one year of rest. This alternating system would allow for increased vigor, productivity, seedling establishment, and cover of upland plants. Mid status vegetative communities would improve over the long term.

The Warm Spring Use Area is grazed by livestock during the late critical growth period during year one. Warm Spring Use Area is grazed after the critical growth period during year two. This alternating system would allow existing grasses and forbs to increase vigor, productivity, cover, and to establish new seedlings. As grasses and forbs dry protein content decreases, therefore livestock grazing shifts to palatable shrubs, such as mountainmahogany and bitterbrush, in late summer and fall. This shift in grazing often results in over utilization and subsequent adverse impacts to those species. Overall, the grass and forb communities would improve over the long term within this Use Area, yet the palatable shrubs would decrease.

The Idaho Canyon Use Area is grazed by livestock after the critical growth period for upland plants during year one. Thirty days of hot season use may have adverse impacts to riparian

vegetation. Idaho Canyon Use Area is grazed by livestock during the late critical growth period during year two. This area is in late ecological status; this system would maintain that condition.

The Colman/Slumgullion Use Area is grazed by livestock after the critical growth period during year one. Colman/Slumgullion Use Area is grazed during the late critical growth period during year two. This alternating system would allow for increased vigor, productivity, cover, and establishment of upland plant seedlings. As grasses and forbs dry protein content decreases, therefore livestock grazing shifts to palatable shrubs, such as mountainmahogany and bitterbrush, in late summer and fall. This shift in grazing often results in over utilization and subsequent adverse impacts to those species. Overall, the grass and forb communities would improve over the long term within this Use Area, yet the palatable shrubs would decrease.

Hot Springs Use Area would be consistently used after the critical growth in the fall. Grazing during the dormant season would maintain or improve the plant communities.

### 4.5.2 Alternative 2 - No Action - Existing System

The Black Rock Use Area is grazed by livestock each year from January 1 to March 31. This is prior to the critical growth period. Portions of the Black Rock Use Area are in early seral status. These early seral status sites are on the Saline Bottom ecological site. This proposal would allow existing upland plants to increase vigor, productivity, and cover. Grazing during the early growing season may allow for seedling establishment but would not allow adequate seedling root growth necessary (to prevent uprooting by grazing animals) to develop good vigor and produce viable seed. Early and mid status vegetative communities would improve over the long term.

The Calico Use Area is grazed by livestock during the early critical growth period allowing for recovery of grazed upland plants, followed by one year of rest. This system would allow existing upland plants to increase vigor, productivity, cover, and seedling establishment. Mid seral status vegetative communities would improve over the long term.

The Warm Springs and Summit Lake Use Areas are grazed by livestock after the critical growth period during years one and two; years three and four are rested. This system would allow existing upland plants to increase vigor, productivity, cover, and seedling establishment. As grasses and forbs dry protein content decreases, therefore livestock grazing shifts to palatable shrubs, such as mountainmahogany and bitterbrush, in late summer and fall. This shift in grazing often results in over utilization and subsequent adverse impacts to those species. Utilization has been exceeded. This may be due to a combination of both livestock and previously excessive wild horse numbers. Mid seral status vegetative communities would not improve over the long term and late seral status vegetative communities could decline unless utilization objectives are met.

The Hot Springs Use Area would be grazed by livestock after the critical growth in the fall. Grazing during the dormant season would maintain or improve the plant communities.

### 4.5.3 Alternative 3 - Stanley Camp Riparian Pasture Use

The Black Rock South and North Use Areas are grazed by livestock prior to critical growth for upland plants. Portions of the Black Rock South Use Area are in early seral vegetative status.

This proposal would allow existing upland plants to increase vigor, productivity, cover, and seedling establishment. Seedlings would establish after early spring livestock grazing and the following year rest would occur. This would provide two growing seasons of rest for establishment of new seedlings. Early and mid status vegetative communities would improve over the long term.

The Calico South and North Use Areas are grazed by livestock during the early critical growth period, followed by two years of rest. This system would allow existing upland plants to increase vigor, productivity, cover, and seedling establishment. Mid seral status vegetative communities would improve over the long term.

The Warm Springs Use Area is grazed by livestock in the late critical growth period, during years one and two; years three and four are rested. This alternating system would allow existing plants to increase vigor, productivity, cover, and seedling establishment. Mid seral status vegetative communities would improve over the long term.

The Idaho Canyon Use Area is grazed by livestock after the critical growth period for upland plants during years one and two. Thirty days of hot season use during August would have adverse impacts to riparian vegetation. Idaho canyon Use Area is used during the late critical growth period during years three and four. Upland vegetation in August is dry and less palatable than riparian vegetation. This alternating system would allow upland plants to increase vigor, productivity, cover, and seedling establishment, but would adversely impact riparian vegetation. This area is in late ecological status; this system would maintain that condition.

The Stanley Camp Riparian Pasture is grazed by livestock after critical growth period for upland plants. Livestock graze the area for two weeks in late August and one week in September and would adversely impact riparian vegetation during years one and two. Upland vegetation is dry and less palatable than riparian vegetation. Stanley Camp Riparian Pasture is grazed by livestock for two weeks during the late critical growth period for upland plants during years three and four. This alternating system would allow upland plants to increase vigor, productivity, cover, and seedling establishment, but would adversely impact riparian vegetation. This area was at its potential natural community prior to a 2000 fire. This area would recover to late status or potential natural community for upland plants.

The Colman/Slumgullion Use Area is grazed by livestock after the critical growth period for upland plants in September during years one and two; years three and four are used during the late critical growth period in June. This system would allow upland plants to increase vigor, productivity, cover, and seedling establishment, but would adversely impact riparian vegetation. Mid seral status vegetative communities would improve over the long term.

The Hot Springs Use Area would be grazed by livestock after the critical growth period in the fall. Grazing during the dormant season would maintain or improve the plant communities.

### 4.5.4 Alternative 4 - No Livestock Grazing

Reduced utilization of the vegetative resources would be achieved resulting in improved ecological condition. This improvement would increase vigor, production, cover, and composition of desirable species.

### 4.5.5 Alternative 5 - Multiple Spring Use Areas or Pastures

The Black Rock South and North Use Areas are grazed by livestock prior to critical growth for upland plants. Portions of the Black Rock South Use Area are in early status. These early status sites are on the Saline Bottom ecological site. This alternative would allow existing upland plants to increase vigor, productivity, cover, and seedling establishment. Seedlings would establish after early spring grazing. This would provide two growing seasons of rest for establishment of new seedlings. Early and mid status sites would improve over the long term.

The Calico South and North Use Areas are grazed by livestock prior to the critical growth period for upland plants, followed by one year of rest. This alternating system would allow for increased vigor, productivity, seedling establishment, and cover of upland plants. Mid status sites would improve over the long term.

The Warm Springs West and East Use Areas are grazed by livestock after the critical growth period for one year, followed by one year of rest. Idaho Canyon Use Area would be combined into the Warm Spring East Use Area. This alternating system would allow existing grasses and forbs to increase vigor, productivity, cover, and establish new seedlings. As grasses and forbs dry protein content decreases, therefore livestock grazing shifts to palatable shrubs, such as mountainmahogany and bitterbrush, in late summer and fall. This shift in grazing often results in over utilization and subsequent adverse impacts to those species. Overall, the grass and forb communities would improve over the long term within this Use Area, yet the palatable shrubs would decrease.

The Colman/Slumgullion Use Area is grazed by livestock prior to the critical growth period during year one. Colman/Slumgullion is rested for two years following one year of grazing. This alternating system would allow for increased vigor, productivity, cover, and establishment of seedlings. Mid seral status vegetative communities would improve over the long term.

The Hot Springs Use Area would be grazed by livestock after the critical growth in the fall. Grazing during the dormant season would maintain or improve the plant communities.

### 4.5.6 Sensitive Plant Species (Federally listed Threatened, Endangered, or Candidate species, including BLM Sensitive and USFWS Species of Concern)

Two special status plant species are known to occur within the Soldier Meadows Allotment.

**Soldier Meadow cinquefoil *(Potentilla basaltica)***
**Alternatives 1, 3, 4 and 5**
In each of these alternatives, livestock would not graze any of the known habitats of Soldier Meadows cinquefoil on public land within the SMA. In Alternatives 1, 3 and 5 the habitat would

be fenced as part the exclosure that would be constructed to protect the critical habitat of the Desert Dace. The exclosure is not scheduled for livestock use and would also keep horses from using the Soldier Meadows cinquefoil habitats. In Alternative 4 no fencing would be constructed, but the entire allotment would be closed to livestock grazing. Therefore any potential impacts to Soldier Meadows cinquefoil from livestock use; including direct livestock grazing, trampling or compaction would be eliminated. Potential impacts from livestock grazing would be eliminated and factors other than livestock grazing, both human and natural, would regulate the condition of the populations of Soldier Meadows cinquefoil and the area occupied.

**Alternative 2**

Under this alternative, livestock use would occur within the Hot Springs Use Area during the dormant season. Potential impacts to Soldier Meadows cinquefoil from livestock grazing include the pocking of wet soils, compaction of silty sites and alteration of surface runoff patterns than would alter the micro-terrain features used by the species to allow rooting in soils that are not fully saturated. Under similar grazing conditions over the past ten years, Soldier Meadows cinquefoil populations appeared to have been stable and several suitable micro-sites were colonized by the species. Therefore it would be anticipated that Soldier Meadows cinquefoil populations would be unchanged in size and vigor.

**Smooth stickleaf (*Mentzelia mollis*)**

Smooth stickleaf is a small annual plant that occurs on almost barren, clay hillsides in the North Black Rock Use Area. Under all alternatives where grazing is permitted within the SMA this portion of the allotment would be grazed during the dormant season. These sites are not known livestock forage sites, as they contain virtually no palatable livestock forage. Smooth stickleaf would be germinating and initiating growth during this period and it is unlikely that cattle would be able to obtain forage value from the plant even if they did use hillsides where the species grows. This impact to the plant would be the same as not having livestock grazing in the area. Therefore none of the alternatives would be likely to impact smooth stickleaf.

**The following species were also included in a Species List provided by the FWS as species of concern that may occur within the allotment. Currently there are no records that these species occur within the SMA. However there may be suitable habitat within the allotment and future inventories may determine that one or more species are present.**

**Tiehm milkvetch (*Astragalus tiehmii*)**
**Schoolcraft catseye (*Cryptantha schoolcraftii*)**
**Crosby buckwheat (*Eriogonum crosbaye*)**
**Windloving buckwheat (*Eriogonum anemophilum*)**
**Grimy ivesia (*Ivesia rhypara var. rhypara*)**
**Cordelia beardtongue (*Penstemon floribundus*)**

If these species do not occur within the allotment there would be no impacts from livestock grazing within the SMA on the species. However, if one or more of the listed plants does occur within the allotment little interaction between any of the plant species and livestock grazing would be expected. All are rare because of limited habitats and these habitats have low value for livestock. In other areas where livestock grazing occurs and the plant species is present,

livestock grazing has not been identified as an important risk factor for any of the species. Therefore it is unlikely that livestock grazing within the SMA would affect the species.

## 4.6 Noxious Weeds

Noxious weeds are very aggressive introduced plants that readily occupy disturbed sites. They are highly competitive and can effectively compete with and replace native perennial plant species. Once established, monocultures of weeds can develop and are accompanied by declining resource values, such as lack of plant biodiversity, wildlife habitat and livestock forage. Noxious weed infestations can also impact aesthetic values and reduce recreation and Wilderness experiences. Noxious weed infestations are frequently found in disturbed areas along roads and burned areas.

### 4.6.1 Alternatives 1, 3, & 5

Subject to achievement of allotment specific objectives and Standards for Rangeland Health the risk of increasing noxious weeds or establishing new populations is low for livestock grazing alternatives 1, 3, & 5. The spread of noxious weeds would be hampered, as vegetation and watersheds would gradually improve, ultimately deterring the establishment of noxious weeds.

Concentrated livestock grazing and wild horse and burro use could create disturbed sites that would be subject to noxious weed establishment, if the objectives, Terms and Conditions, and Standards for Rangeland Health are not met. Fence construction activities would remove or crush existing vegetation leaving disturb areas prone to the establishment of noxious weeds. The degree of establishment would be dependent on any available noxious weed seed source, such as vehicles used to build the fence. Based on the limited amount of disturbance and the ability for existing vegetation to heal, fence building would pose a low risk for spreading noxious weeds.

### 4.6.2 Alternative 2

Under this alternative, there is a higher risk of noxious weed populations increasing, as grazing management within the allotment is not achieving objectives or Standards for Rangeland Health. More areas within the allotment would be subject to concentrated livestock grazing and continued wild horse and burro use would create disturbed areas from grazing and trampling of vegetation. These disturbed areas would be more susceptible to the establishment of noxious weed populations.

### 4.6.3 Alternative 4

Under this alternative there would be no livestock grazing authorized and no fence building. The potential for weed infestations would be reduced compared to the other alternatives. There would be fewer disturbed areas associated from livestock grazing activities.

## 4.7 Soils

Soils would be managed to maintain the natural habitat of the area and to minimize the potential for accelerated (man caused) wind and water erosion. To maintain soil processes a healthy, productive and diverse plant community is necessary. Improved ecological condition would increase productivity, litter, soil fertility, infiltration and nutrient cycling. Healthy plant communities must be able to complete their life cycle by preventing damage during the critical growth period. Critical growth period in a plant growth cycle is when food reserves are the lowest and grazing is the most harmful. This period begins with the boot stage and closes with complete mature seed. Periodic rest during the critical growth period allows for plants to increase vigor, maintain and increase root reserves, increase density and produce seed.

For the analysis the following terms are defined below:

- **Boot Stage-** when first reproductive culm is in the sheath; that point where the discernible floral parts within the sheath and up to emergence of floral parts
- **Dough Seed-** seed with milky juice
- **Early Critical Growth Period-** boot to soft dough
- **Late Critical Growth Period**-soft dough to mature seed

Adverse impacts from wild horses and burros would continue under all alternatives, since wild horses and burros are present year-round on the SMA.

Fence reconstruction/construction proposed in Alternatives 1, 3, & 5 would remove and crush vegetation, resulting in compaction and increased water and wind erosion of soils.

### 4.7.1 Alternative 1 (Proposed Action)

Livestock would graze prior to critical growth for upland plants in the Black Rock South and North Use Areas. Portions of Black Rock South and Black Rock North Use Areas are susceptible to high wind erosion. This proposal would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from wind erosion.

Livestock would graze during the early critical growth period for upland plants, followed by one year of rest in the Calico South and North Use Areas. This system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion.

Livestock would graze during the late critical growth period during year one in the Warm Springs Use Area. Livestock graze after the critical growth period during year two in the Warm Springs Use Area. Portions of the Warm Springs Use Area contain soils that are susceptible to high wind erosion. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion.

Livestock would graze after the critical growth period for upland plants during year one in the Idaho Canyon Use Area. Livestock graze during the late critical growth period during year two in the Idaho Canyon Use Area. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion. Hot season use would impact riparian vegetation increasing water erosion.

Livestock would graze after the critical growth period for upland plants during year one in the Colman/Slumgullion Use Area. Livestock graze during the late critical growth period during year two. Portions of the Coleman/Slumgullion Use Area contain soils that are susceptible to high water erosion. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion.

Livestock would graze after the critical growth in the Hot Springs Use Area. Grazing during the dormant season would maintain or improve the plant communities, resulting in the protection of the soil resources from erosion.

The largest concentration of biological soil crusts occurs on the lake plain terrace and fan piedmont. Soil units are: Sondoa-Wendane-Isolde; Wendane-Humboldt; Boton-Mazuma, Toulon-Bluewing; McConnel-DunGlen-Pumper; Shawave-Deadyon; Aboten-Tumtum-Oxcorel; and Simon-Fulstone-Welch. Managing for healthy biological soil crusts requires that grazing occur when crusts are less vulnerable to shear and compressional forces. It is important to remove livestock before wet season's end to allow regrowth of biological crusts. This system does allow periods of rest by livestock reducing impacts to biological crusts. Wild horses may impact biological crusts during dry periods.

### 4.7.2 Alternative 2 - No Action - Existing System

Livestock would graze each year from January 1 to March 31 prior to critical growth for upland plants in the Black Rock Use Area. Portions of the Black Rock Use Area contain soils that are susceptible to high wind erosion. This system would allow existing upland plants to increase cover and reducing bare soil, thus lessening the impacts from wind erosion. Although, the existing system does not allow sufficient rest for the establishment of new seedlings.

Livestock would graze during the early critical growth period would allow for the recovery of the grazed upland plants in the Calico Use Area, which is followed by two years of rest. This system would allow existing upland plants to increase cover and increase establishment of seedlings, thereby reducing bare soil and lessening the impacts from erosion.

The no action alternative would fail to meet the Standards for Rangeland Health. Utilization would be exceeded in the Warm Springs Use Area. Portions of the Warm Springs Use Area contain soils that are susceptible to high wind erosion. Livestock graze after the critical growth period in Warm Springs Use Area during years one and two; while in years three and four this Use Area would be rested. This system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion. This system would lessen the potential for wind erosion, yet over utilization is

preventing this from happening. Wild horse numbers have been reduced to approximately AML, although it is unknown if use levels are being met.

Livestock would graze in the Summit Lake Use Area after the critical growth for upland plants. This Use Area is then rested from livestock grazing for two years. Portions of the Colman/Slumgullion Use Area contain soils that are susceptible to high water erosion. This system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion.

Livestock would graze after the critical growth in the Hot Springs Use Area. Grazing during the dormant season would maintain or improve the plant communities, resulting in the protection of the soil resources from erosion.

The largest concentration of biological soil crusts occurs on the lake plain terrace and fan piedmont. Soil units are: Sondoa-Wendane-Isolde; Wendane-Humboldt; Boton-Mazuma, Toulon-Bluewing; McConnel-DunGlen-Pumper; Shawave-Deadyon; Aboten-Tumtum-Oxcorel; and Simon-Fulstone-Welch. Managing for healthy biological soil crusts requires that grazing occur when crusts are less vulnerable to shear and compressional forces. It is important to remove livestock before wet season's end to allow regrowth of biological crusts. This system does allow periods of rest by livestock reducing impacts to biological crusts. Wild horses may impact biological crusts during dry periods.

### 4.7.3 Alternative 3 - Stanley Camp Riparian Pasture Use

Livestock would graze prior to critical growth for upland plants in the Black Rock South and North Use Areas. Portions of Black Rock South and Black Rock North Use Areas contain soils that are susceptible to high wind erosion. This proposal would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from wind erosion.

Livestock would graze during the early critical growth period for upland plants, which is followed by two years of rest in the Calico South and North Use Areas. The rest period would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion.

Livestock would graze during the late critical growth period during years one and two in the Warm Springs Use Area. In years three and four this Use Area is grazed after the critical growth period. Portions of the Warm Springs Use Area contain soils that are susceptible to high wind erosion. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion.

Livestock would graze after the critical growth period for upland plants during years one and two in the Idaho Canyon Use Area. Thirty days of hot season use during August would have adverse impacts to riparian vegetation. Livestock graze during the late critical growth period during years three and four in the Idaho Canyon Use Area. Thirty days of use during July would allow for attainment of riparian objectives. This alternating system would allow existing upland plants to

increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion. Hot season use would adversely impact riparian vegetation, resulting in increased water erosion.

Livestock would graze after the critical growth period for upland plants for one week in late August and one week in early September during years one and two in the Stanley Camp Riparian Pasture. Livestock grazing would adversely impact riparian vegetation, resulting in increased water erosion. Upland vegetation is dry and less palatable than riparian vegetation. Years three and four are grazed by livestock for two weeks during the late critical growth period for upland plants. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion. Hot season use would adversely impact riparian vegetation, resulting in increased water erosion.

Livestock would graze after the critical growth period for upland plants during years one and two for thirty days in September in the Colman/Slumgullion Use Area. Livestock graze during the late critical growth for thirty days in June during years three and four. Portions of the Colman/Slumgullion Use Area contain soils that are susceptible to high water erosion. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion.

Livestock would graze after the critical growth in the Hot Springs Use Area. Grazing during the dormant season would maintain or improve the plant communities, resulting in the protection of the soil resources from erosion.

The largest concentration of biological soil crusts occurs on the lake plain terrace and fan piedmont. Soil units are: Sondoa-Wendane-Isolde; Wendane-Humboldt; Boton-Mazuma, Toulon-Bluewing; McConnel-DunGlen-Pumper; Shawave-Deadyon; Aboten-Tumtum-Oxcorel; and Simon-Fulstone-Welch. Managing for healthy biological soil crusts requires that grazing occur when crusts are less vulnerable to shear and compressional forces. It is important to remove livestock before wet season's end to allow regrowth of biological crusts. This system does allow periods of rest by livestock reducing impacts to biological crusts. Wild horses may impact biological crusts during dry periods.

### 4.7.4 Alternative 4 - No Livestock Grazing

Reduced utilization of the vegetation resources would be achieved lessening soil and water erosion. Improved ecological condition would increase productivity, litter, soil fertility, infiltration and nutrient cycling.

### 4.7.5 Alternative 5 - Multiple Spring Use Areas or Pastures

Livestock would graze prior to critical growth for upland plants in the Black Rock South and North Use Areas. Portions of Black Rock South and Black Rock North Use Areas contain soils that are susceptible to high wind erosion. This proposal would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from wind erosion.

Livestock would graze during the early critical growth period for upland plants, followed by one year of rest in the Calico South and North Use Areas. This system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion

Livestock would graze after the critical growth period during year one in the Warm Springs West and East Use Area, which is followed by rest in year two. Portions of the Warm Springs Use Area contain soils that are susceptible to high wind erosion. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion

Livestock would graze prior to the critical growth period for upland species during year one in the Colman/Slumgullion Use Area, which is followed by rest in year two. This alternating system would allow existing upland plants to increase cover and increase establishment of seedlings, thus reducing bare soil and lessening the impacts from erosion. Portions of Colman/ Slumgullion Use Area contain soils that are susceptible to high water erosion. This systematic rest would allow for increase cover and increase establishment of seedlings, thereby reducing bare soil and lessening the impacts from erosion.

Livestock would graze after the critical growth in the Hot Springs Use Area. Grazing during the dormant season would maintain or improve the plant communities, resulting in the protection of the soil resources from erosion.

The largest concentration of biological soil crusts occurs on the lake plain terrace and fan piedmont. Soil units are: Sondoa-Wendane-Isolde; Wendane-Humboldt; Boton-Mazuma, Toulon-Bluewing; McConnel-DunGlen-Pumper; Shawave-Deadyon; Aboten-Tumtum-Oxcorel; and Simon-Fulstone-Welch. Managing for healthy biological soil crusts requires that grazing occur when crusts are less vulnerable to shear and compressional forces. It is important to remove livestock before wet season's end to allow regrowth of biological crusts. This system does allow periods of rest by livestock reducing impacts to biological crusts. Wild horses may impact biological crusts during dry periods.
This alternative would result in the achievement of the short term objectives, due to rest during the critical growth period in all Use Areas, allowing sufficient rest for seedling establishment in the shortest timeframe compared to the other alternatives.

## 4.8 Wild Horses/Burros

Wild horses (and burros in the Warm Springs Canyon HMA) have been present in the three HMAs that are included in the Soldier Meadows Allotment since before the Wild Free-Roaming Horse and Burro Act was passed in December of 1971. Four censuses have been conducted since the 1994 allotment evaluation along with three wild horse and burro removals (see Affected Environment). For all five of the alternatives horse management will remain the same as identified in the 1994 SMA FMUD.

### 4.8.1 Alternative 1 (Proposed Action)

Under this alternative wild horse and burro management would abide by the terms and conditions of the Biological Opinion (USFWS 2002), which include gathering when population levels reach AML, minimizing impacts to LCT and desert dace habitats.

The proposed action would divide both the Calico Pasture and the Black Rock Pasture into north and south Use Areas with an alternating year rest-rotation grazing system. A total of 700 cows would graze the north pastures, and then the south pastures on alternating years during the same grazing period. The Calico pastures would have use extended one month compared to the existing system. That would essentially increase the number of AUMs consumed in each Use Area resulting in more intensive grazing within a smaller area. Although this proposal would build rest into the system, it would also greatly increase the competition for forage for wild horses and burros. They would most likely move out of the Use Area being grazed, into the rested area of the pasture, doubling the horse numbers on the rested area, and limiting the benefits of the proposed grazing system. It is also possible the horses would move into the Hot Springs Pasture, entirely outside of any HMA, and cause spring season impacts on that winter pasture. Should the AUMs be adjusted up in subsequent years, the competition, and resultant movement, would increase as well.

All the other Use Areas would experience a decrease in cow numbers from what they currently carry. Initially, that would be a decrease of 417 animals. However, they all, except for the Hot Springs Use Area, currently receive two years rest and with the proposed alternative they would receive none. This alternative would reduce competition with wild horses and burros until (and if) adjustments were made to increase the number of cattle grazing to near current numbers, based on monitoring. However, reduced livestock numbers based on the non-achievement of objectives would reduce competition between livestock and wild horses and burros.

The proposed reconstruction of the 1.5 miles of fence between the Idaho Canyon Use Area and the Stanley Camp Riparian Pasture, and the construction of 0.5 miles of fence along the wilderness cherrystemmed road from the Mahogany Creek exclosure fence to the Soldier/Paiute Meadows allotment boundary fence would impact the horses in the Black Rock Range West HMA that currently use the area north of the proposed fence. The proposed fences would restrict the free-roaming nature of the wild horses (see Section 4700.0-6(c) of the 43 CFR Ch. II). Both areas serve as corridors between the area north of the Mahogany Creek Exclosure and the area south. If these fences were reconstructed/constructed the horses would effectively be limited to a small area north of the fences and to a northeasterly access into Warm Springs Canyon HMA. The elevation in the Idaho Canyon Use Area is such, that in the event of normal to above normal

snowfall, horse movement from summer pasture to winter pasture might be restricted. They could conceivably become trapped and starve to death. Additionally, wild horses tend to injury themselves on newly constructed fences. These impacts could be minimized through the implementation of mitigation measures.

The proposed Desert Dace fence would be adjacent to, but entirely outside of the Warm Springs Canyon HMA. Although the horses presently make use of the springs that would be within the exclosure, there are numerous other spring sources from which they could water.

### 4.8.2 Alternative 2 - No Action - Existing System

The "no action" alternative would retain the existing grazing system. Environmental impacts would increase annually and allotment objectives would not be met, due to impacts from both livestock and wild horses and burros. Competition between wild horses and burros, livestock, and wildlife would increase as equine numbers increase, and would decrease after wild horse and burro removals. However, having livestock entirely off the allotment from May 1st until July 14th and also from October 15th until November 15th would decrease impacts to uplands and riparian areas, except from horses.

### 4.8.3 Alternative 3 - Stanley Camp Riparian Pasture Use

This alternative is the same as the proposed action with the addition of hot season grazing of the Stanley Camp Riparian Pasture. Environmental impacts will mirror those of the proposed action except for the additional impacts that will be experienced in the Stanley Camp Riparian Pasture, especially to the riparian areas. A small population of horses would continue to graze the Stanley Camp Riparian Pasture seasonally. Livestock grazing would exacerbate any impacts made by horses.

### 4.8.4 Alternative 4 - No Livestock Grazing

Under this alternative all livestock would be removed and no grazing, other than that done by wild horses and burros would occur. This would allow horses to widely disperse and minimize the potential for negative impacts to the resources based on the maintenance of AML. These reduced impacts would allow riparian areas to improve. Although burro numbers are few, they are known to spend more time in riparian areas than do horses, so impacts would be greater where they reside than in horse areas. No fences would be reconstructed/constructed; therefore horses would have free access to the south at all times of the year.

### 4.8.5 Alternative 5 - Multiple Spring Use Areas or Pastures

The impacts with this alternative would be similar to those of Alternative 1. In this alternative the pastures would be more uniform in size, which should create similar use in all pastures grazed annually. Although livestock grazing would be more intense with an additional 196 head of livestock, three of the pastures would receive two years of rest and four of them would receive one year of rest. Hot Springs Pasture would be grazed every year, but that grazing would be during the dormant period with minimum negative impacts. Having livestock entirely off the allotment from May 1st until July 14th would decrease impacts to uplands, meadows, and riparian areas, except from horses. The more intense grazing would cause more competition for the horses (and burros) in the particular Use Areas being grazed. They most likely would move

out of those Use Areas into a rested area. This would lessen the benefits from the rest rotation system. There is a concentration of horses in the Colman/Slumgullion Pasture, most of which might move into the ungrazed Stanley Camp Riparian Pasture, and some of which might move out of the HMA into the Hot Springs Pasture during the spring season, causing negative impacts to vegetative and aquatic resources in both areas.

**Mitigation Measures**

- Install drop down fences in the Idaho Canyon Use Area in order to minimize impacts to the free roaming behavior of wild horses
- To prevent injury to the horses and repeated maintenance to the fence, a minimum of two strips of reflective flagging should be placed in each 16-foot section of fence.

## 4.9 Cultural Resources

Because most of the cultural resource sites in the SMA are situated on or just below the ground surface, they are susceptible to disturbance or destruction by erosional and weathering processes. While these processes occur naturally, the reduction in vegetative cover and soil disturbance resulting from ungulate grazing accelerates these processes, resulting in deterioration of cultural resource sites. In areas where there are concentrations of livestock and wild horses and burros, cultural resource sites can also be damaged by trampling. In areas of concentration by livestock and wild horse and burros, the potential for increased artifact visibility can occur, which can lead to increased rates of illegal collection. Adverse impacts to cultural resource sites from overgrazing and trampling include modification and displacement of artifacts and features as well as erosion of organic middens containing valuable information. Organic middens, as well as soil strata, can provide information regarding dates of use, plants and animals utilized and past environments.

Areas in the vicinity of permanent and intermittent water sources (i.e. riparian areas) have the highest potential for cultural resource sites.

Impacts to cultural resource sites due to wild horses and burros would continue to occur under all alternatives.

### 4.9.1 Alternative 1 (Proposed Action)

No adverse impacts to cultural resources from construction of 0.5 miles of new fence in the Idaho Canyon Use Area or the approximately 10 miles of new fence in the Hot Springs Use Area (HSUA) are anticipated since completion of a cultural resource inventory and compliance with Section 106 of the National Historic Preservation Act and the Nevada State Protocol would be required prior to construction. Fencing the springs in the HSUA would benefit cultural resources by eliminating adverse impacts to cultural resources from trampling and overgrazing related erosion.

The proposed grazing system is anticipated to minimize impacts to cultural resources. Changes in season of use, duration of use, rotation, and rest rotation systems as well as the availability of abundant dispersed water sources are anticipated to disperse livestock use and regenerate riparian zones. This in turn should reduce impacts to cultural resources resulting from trampling and

overgrazing related erosion. Interim herding until fence construction/reconstruction is completed should also help to alleviate impacts.

### 4.9.2 Alternative 2 - No Action - Existing System

Adverse impacts to cultural resource sites in the vicinity of the desert dace hot spring complex north of Mud Meadows in the HSUA, as well as in Rock Springs and Clear Springs in the Warm Springs Pasture would continue.

### 4.9.3 Alternative 3 - Stanley Camp Riparian Pasture Use

Adverse impacts to cultural resources in the Stanley Camp Riparian Pasture would result from livestock grazing in this area. Adverse impacts from trampling and erosion would occur from the short duration, high intensity grazing system. The Stanley Camp Riparian Pasture is a very culturally sensitive area and the steep terrain, season of use, and lack of off-site waters would make it difficult to keep livestock out of the riparian areas.

Other impacts from this alternative would be the same as Alternative 1.

### 4.9.4 Alternative 4 - No Livestock Grazing

Elimination of grazing would be beneficial to cultural resources. Vegetation cover would improve; thereby eliminating adverse impacts from livestock grazing related erosion. Impacts from livestock trampling would also be eliminated.

### 4.9.5 Alternative 5 - Multiple Spring Use Areas or Pastures

Impacts under this alternative would be the same as Alternative 1 except that the rest allowed during the critical growth period in all Use Areas would allow for increased seedling establishment, although the intensity of use would increase. This alternative would result in reduced impacts to cultural resource sites, particularly in culturally sensitive riparian zones if annual adjustments in AUMs are made as necessary to meet short term objectives and/or the Standards for Rangeland Health.

## 4.10 Native American Values

Impacts to Native American values from wild horses would continue under all alternatives.

### 4.10.1 Alternative 1 (Proposed Action)

Fencing of the springs in the HSUA would help protect the hot springs, which are valued by Native Americans. Impacts to aquatic, riparian, and water quality values in Mahogany Creek Basin would be minimized by this alternative. Because of the economic and cultural importance of the LCT, value placed on subsistence hunting and fishing, and the potential of Mahogany Creek watershed as a water source for the Summit Lake Paiute Tribe this alternative would be beneficial.

The majority of the Summit Lake Paiute Tribe's concerns would be addressed under this Alternative (see concerns list in Chapter 3.9 Native American Values)

### 4.10.2 Alternative 2 - No Action - Existing System

The majority of the Summit Lake Paiute Tribe's concerns would not be addressed under this Alternative (see concerns list in Chapter 3.9 Native American Values)

### 4.10.3 Alternative 3 - Stanley Camp Riparian Pasture Use

Riparian and aquatic habitats in the Stanley Camp Riparian Pasture would be adversely impacted by intense use in this area. This would include adverse impacts to LCT habitat. Since the Summit Lake Tribe considers these LCT to have high cultural and economic value, this would represent an adverse impact to the Tribe. Since they also practice subsistence hunting and fishing in the Summit Lake watershed, these opportunities could also be adversely impacted. The Summit Lake Tribe would like the Mahogany Creek watershed to be the water source for the Reservation. While there would be impacts to the water quality, required water purification would mitigate these impacts.

The majority of the Summit Lake Paiute Tribe's concerns would not be addressed under this Alternative (see concerns list in Chapter 3.9 Native American Values)

### 4.10.4 Alternative 4 - No Livestock Grazing

Under this alternative, there would be no adverse impacts from livestock grazing to water quality, riparian or aquatic habitats.
The majority of the Summit Lake Paiute Tribe's concerns would be addressed under this Alternative (see concerns list in Chapter 3.9 Native American Values)

### 4.10.5 Alternative 5 - Multiple Spring Use Areas or Pastures

Impacts under this alternative would be the same as Alternative 1 except that the rest allowed during the critical growth period in all Use Areas would allow for increased seedling establishment, although the intensity of use would increase. This alternative would result in reduced impacts to areas of Native American concern if adjustments in AUMs are made as necessary to meet short term objectives and/or the Standards for Rangeland Health.

The majority of the Summit Lake Paiute Tribe's concerns would be addressed under this Alternative (see concerns list in Chapter 3.9 Native American Values)

## 4.11 Recreation

Proposed actions contained in this EA for the SMA could impact the environmental setting, which is necessary to provide the desired range of recreation opportunities. Given the priority of the NCA to protect the scenic landscapes, wilderness values and largely undeveloped nature of the area, constructing new fences, reconstructing fences, increasing AUMs and the increased animal management activities have the potential for both long and short term impacts to the recreating public.

### 4.11.1 Alternative 1 (Proposed Action)

Active grazing operations, including herding, trailing, fence construction and the repair of water structures and range improvements could have some short and long-term impacts to the primitive

recreation experience (see wilderness impacts section for further discussion). Although a large percentage of the SMA has been subject to domestic livestock grazing in the past, increasing AUMs could adversely impact the recreation experience. Most adverse impacts would be short-term in duration and dependant on the location and perception of individual visitors. However, if the Standards for Rangeland Health are achieved, as proposed, there would be a long-term improvement to naturalness and the visual appearance of the landscape, which would benefit the primitive recreation experience. Interactions between recreation users, livestock grazing, and wild horses and burros would be eliminated around Soldier Meadows hot springs as a result of the proposed fencing.

**Access**

Vehicular access throughout the SMA would be largely unaffected by the proposed action. All existing roads that intersect fence lines would have gates and/or cattle guards, and would remain open for public use. A few visitors, who enjoy cross-country travel, may be inconvenienced by the fencing. Recreational impacts to spring areas would be expected to continue.

### 4.11.2 Alternative 2 - No Action - Existing System

Since the SMA hot springs would not be fenced, the potential for interactions between recreation users and livestock grazing would be greater under this alternative. Under the existing livestock management system the Standards for Rangeland Health are not being met, yet it would be expected that resource conditions would improve based on the removal of approximately 1,100 wild horses and burros.

### 4.11.3 Alternative 3 - Stanley Camp Riparian Pasture Use

Although, a large percentage of the SMA has been subject to domestic livestock grazing in the past, increasing AUMs could result in increased conflict between recreation users and livestock. The Stanley Camp Riparian Pasture has not had authorized livestock grazing since 1990. Visitors to these areas would be most sensitive to authorized grazing within the Stanley Camp Riparian Pasture and also increased AUMs on the SMA. Under this alternative, impacts to visitors in the WSA and North Black Rock Range Wilderness would be likely, since livestock grazing within these areas would be authorized. Interactions between recreation users and livestock grazing would be eliminated around the SMA hot springs as a result of the proposed fencing.

Impacts to access would be the same as under alternative 1.

### 4.11.4 Alternative 4 - No Livestock Grazing

Impacts related to domestic livestock grazing would not occur under this alternative.

### 4.11.5 Alternative 5 - Multiple Spring Use Areas or Pastures

Same impacts as those listed under Alternative 1.

## 4.12 Wilderness/Wilderness Study area

### 4.12.1 Wilderness Areas

There are no developments proposed inside the Wilderness Areas. All potential impacts to the Wilderness Areas would be associated with changes in grazing practices (i.e. number of cattle, time of use). For purposes of analysis it is assumed that the sights and sounds associated with the grazing operation has an impact on the opportunities for solitude and primitive recreation in the Wilderness Areas.

The Congressional Grazing Guidelines for Wilderness state, "It is anticipated that the numbers of livestock permitted to graze in wilderness would remain at the approximate levels existing at the time an area enters the wilderness system. If land management plans reveal conclusively that increased livestock numbers or AUMs could be made available with no adverse impact on wilderness values such as plant communities, primitive recreation, and wildlife populations or habitat, some increases in AUMs may be permissible".

The activation of the Non Scheduled AUMs would be consistent with the Grazing Guidelines because the AUMs were established and considered part of the active preference at the time of designation, but were not scheduled. The Non Scheduled AUMs would only be activated upon meeting all the short term allotment specific objectives and the Standards for Rangeland Health. These objectives and Standards are designed to minimize impacts and improve riparian and aquatic habitats, which would maintain or enhance the naturalness of the Wilderness Areas. Therefore if the Non Scheduled AUMs are phased in over time, than minimal impacts to naturalness are anticipated.

### 4.12.2 Alternative 1 (Proposed Action)

**Naturalness**

Under this alternative the naturalness of 2,237 acres or 8% of the North Black Rock Range Wilderness Area would be maintained or enhanced by permanently removing the Stanley Camp Riparian Pasture from livestock grazing.

**Opportunities for solitude/primitive or unconfined recreation**

This grazing alternative would implement a deferred rotational grazing system that utilizes the entire allotment on an annual basis. For purposes of comparison with the No Action alternative the table below shows the duration of grazing in each of the Wilderness Areas during a 4 year cycle.

**Table 16. Duration of grazing within Wilderness Areas**

| Wilderness Area | No. of months grazing occurs in portion of area during 4 year cycle |
|---|---|
| North Black Rock Range | 6 |
| Pahute Peak | 12 |
| East Fork High Rock Canyon | 8 |
| High Rock Lake | 16 |
| Calico Mountains | 4 |

During the time that portions of the Wilderness Areas are grazed by livestock the opportunities for primitive recreation and solitude are decreased by the sights and sounds associated with the livestock and the grazing operations needed to manage the livestock (i.e. herding, range developments, fences). Under this alternative there are approximately 46 months during the four year cycle when portions of the affected Wilderness Areas are being grazed. Although the overall number of months that portions of the Wilderness Areas are being grazed is the same under this alternative as the No Action, the timing and location of that grazing does differ.

If the activation of Non Scheduled AUMs occurred, there would be a decrease in the opportunities for solitude and primitive recreation in the Wilderness Areas. This decrease would occur because the probability of encountering livestock or human activity, such as herding, to manage the livestock would increase as more livestock were allowed to graze on the allotment.

**Special Features**

The probability of historic or prehistoric sites being impacted by trampling or erosion may increase if the Non Scheduled AUMs were activated. Conversely, these impacts would be reduced if AUMs were reduced, due to the non-attainment of the Standards for Rangeland Health or short term objectives.

## 4.12.3 Alternative 2 - No Action - Existing System

**Naturalness**

As BLM indicated in the MASR, the existing grazing system contributed to the non-attainment of the Standards for Rangeland Health and the allotment specific objectives on areas of the allotment inside of the Wilderness Areas. The naturalness of the Wilderness Areas has been decreased by not attaining the Standards and other allotment objectives. These impacts have occurred primarily in the riparian areas of Colman, Slumgullion and Soldier Creeks in the North Black Rock Range Wilderness and Cherry and Donnelly Creeks in the Calico Mountains Wilderness Area. If the current grazing system were to remain in place and continued to not meet the Standards and objectives, naturalness of the Wilderness Areas would continue to decrease in portions of the Wilderness Areas.

**Opportunities for solitude/primitive or unconfined recreation**

The current grazing system in the SMA occurs on 4 year rest/rotation grazing system. The table below shows the duration of grazing in each of the Wilderness Areas during the 4 year cycle.

**Table 17. Duration of grazing within Wilderness Areas**

| Wilderness Area | No. of months grazing occurs in portion of area during 4 year cycle |
|---|---|
| North Black Rock Range | 14 |
| Pahute Peak | 12 |
| East Fork High Rock Canyon | 8 |
| High Rock Lake | 10 |
| Calico Mountains | 2 |

During the time that the Wilderness Areas are grazed by livestock the opportunities for primitive recreation and solitude are decreased by the sights and sounds associated with the livestock and the grazing operations needed to manage the livestock (i.e. herding, range developments, fences).

Under this alternative there are approximately 46 months during the four year cycle when portions of the affected Wilderness Areas are being grazed.

**Special Features**
Potential impacts to the prehistoric and historic resources from trampling and erosion would continue, for a detailed description of these impacts see Chapter 4.9 Cultural Resources section. Impacts to the LCT associated with non-attainment of riparian objectives in Colman Creek could continue, for a detailed description of these impacts see Chapter 4.3 Aquatic/Fisheries section. These impacts would be reduced if AUMs were reduced, due to the non-attainment of the Standards for Rangeland Health or short term objectives.

### 4.12.4 Alternative 3 - Stanley Camp Riparian Pasture Use

**Naturalness**
Impacts to naturalness would be the same as the Proposed Action except, that it may be impacted in the 2,237 acres of the North Black Rock Range Wilderness Area located within the Stanley Camp Pasture where light grazing/trailing could occur under this alternative, during part of the year.

**Solitude/Primitive or unconfined recreation**
Impacts to solitude/primitive recreation would be the same as the Proposed Action except, that it may be impacted in the 2,237 acres of the North Black Rock Range Wilderness Area located within the Stanley Camp Pasture where light grazing/trailing could occur under this alternative during part of the year.

**Special Features**
Same as the Proposed Action

### 4.12.5 Alternative 4 - No Livestock Grazing

**Naturalness**
Naturalness of the Wilderness Areas would be enhanced by not authorizing any livestock grazing in the area. Plant communities would not be subject to grazing pressure from large domestic ungulates. Natural processes would determine the composition of the plant communities in wilderness.

**Opportunities for solitude/primitive or unconfined recreation**
Solitude and primitive recreation would be enhanced by not authorizing livestock grazing in the area. Impacts associated with the sights and sounds of the grazing operations would not occur.

**Special Features**
There may be a benefit to the special features of prehistoric and historic sites, because the potential trampling and erosion associated with livestock grazing would not occur, see Chapter 4.9 Cultural Resources section for details. Impacts to LCT associated with livestock grazing would not occur under this alternative, see Chapter 4.3 Aquatic/Fisheries section for details.

## 4.12.6 Alternative 5 - Multiple Spring Use Areas or Pastures

**Naturalness**

Impacts would be similar to Alternative 1, but there would be less impact to naturalness under this alternative due to the fact that most of the grazing in the Wilderness Areas would occur during the spring, which would tend to better distribute the impacts from livestock grazing, and not concentrate them in the sensitive riparian areas.

**Opportunities for solitude/primitive or unconfined recreation**

This grazing alternative would implement a rest rotational grazing system that utilizes most of the allotment on an annual basis. For purposes of comparison with the No Action alternative the table below shows the duration of grazing in each of the Wilderness Areas during a 4 year cycle.

**Table 18. Duration of grazing within Wilderness Areas**

| Wilderness Area | No. of months grazing occurs in portion of area during 4 year cycle |
|---|---|
| North Black Rock Range | 1.3 |
| Pahute Peak | 12 |
| East Fork High Rock Canyon | 13 |
| High Rock Lake | 10.6 |
| Calico Mountains | 1.3 |

During the time that portions of the Wilderness Areas are grazed by livestock the opportunities for primitive recreation and solitude are decreased by the sights and sounds associated with the livestock and the grazing operations needed to manage the livestock (i.e. herding, range developments). Under this alternative there are approximately 38.2 months during the four year cycle when portions of the affected Wilderness Areas are being grazed. Because livestock grazing would occur for a smaller amount of time in the wilderness areas, there would be less of an impact to solitude/primitive recreation under this alternative than under the Alternatives 1, 2 and 3.

If the Non Scheduled AUMs were activated there would be a decrease in the opportunities for solitude and primitive recreation in the Wilderness Areas. This decrease would occur because the probability of encountering livestock or human activity , such as herding, to manage the livestock would increase as more livestock were allowed to graze on the allotment.

**Special Features**

Similar to Alternative 1, but impacts to LCT habitat would be decreased, see Chapter 4.3 Aquatic/Fisheries section for details

## 4.12.7 Wilderness Study Area

For purposes of analysis it is assumed that the sights and sounds associated with the grazing operation has an impact on the opportunities for solitude and primitive recreation in the Wilderness Study Area.

## 4.12.8 Alternative 1 (Proposed Action)

**Naturalness**

Grazing the Idaho Canyon Use Area will impact the naturalness of the 3000 acres or 28% of the WSA. Under this alternative approximately 1.5 miles of existing fence would be reconstructed and approximately 0.5 miles of new fences would be constructed inside the northern portion of the WSA (See Appendix 10 for Fencing Location Map). The fencing is being proposed to allow the Idaho Canyon Use Area to be grazed by domestic livestock, while stopping livestock drift into the Stanley Camp Riparian Pasture. The fences would have an impact on the appearance of naturalness in the immediate vicinity, but this would be mitigated by constructing the fences along existing "cherrystemmed" routes inside the WSA. There is not a buffer along the "cherrystemmed" routes and the WSA boundary is based on the edge of the road disturbance, which would put the location of the fences several feet inside the WSA. The IMP does allow for the construction of new fences when the fence would clearly enhance or protect the areas wilderness values. The proposed fences would protect the Mahogany and Summer Camp Creek watersheds within the WSA from potential impacts from stray livestock and wild horse and burros.

**Opportunities for solitude/primitive or unconfined recreation**

The sights and sounds associated with grazing the Idaho Canyon Riparian Pasture will impact the opportunities for solitude and primitive recreation on 3000 acres or 28% of the WSA. This impact would only occur for one month of the year (4 months during a 48 month cycle).

If the Non Scheduled AUMs were activated there would also be a decrease in the opportunities for solitude and primitive recreation in the Idaho Canyon Pasture portion of the WSA. This decrease would occur because the probability of encountering livestock or human activity, such as herding, to manage the livestock would increase as more livestock were allowed to graze on the allotment.

**Special Features**

No impact would occur to special features

## 4.12.9 Alternative 2 - No Action - Existing System

**Naturalness**

Continuing to not graze the WSA would maintain the naturalness of the area. Plant communities would not be subjected to grazing pressure from large domestic ungulates. Natural processes would determine the composition of the plant communities in the WSA. Impacts associated with the sights and sounds of the grazing operations would not occur.

**Opportunities for solitude/primitive or unconfined recreation**

Continuing to not graze the WSA would maintain the opportunities for solitude and primitive recreation in the area.

**Special Features**

Continuing to not graze the WSA would maintain the special features associated with the area.

## 4.12.10 Alternative 3 - Stanley Camp Riparian Pasture Use

**Naturalness**

Same as Alternative 1, but allowing livestock grazing within the Stanley Camp Riparian Pasture would impact the naturalness of that portion of the WSA.

**Opportunities for solitude/primitive or unconfined recreation**

Same as the Proposed Action, but allowing livestock grazing within the Stanley Camp Riparian Pasture would further impact the opportunities for solitude and primitive recreation in that portion of the WSA. This impact would occur because the probability of encountering livestock or human activity associated with managing livestock would increase if livestock were grazed within the Stanley Camp Riparian Pasture.

**Special Features**

The LCT and riparian habitats could be impacted by allowing livestock grazing within the Stanley Camp Riparian Pasture, see Chapter 4.3 Aquatic/Fisheries section for details.

## 4.12.11 Alternative 4 - No Livestock Grazing

**Naturalness**

Continuing to not graze the WSA would maintain the naturalness of the area. Plant communities would not be subjected to grazing pressure from large domestic ungulates. Natural processes would determine the composition of the plant communities in the WSA

**Opportunities for solitude/primitive or unconfined recreation**

Not authorizing grazing in the WSA would maintain the opportunities for solitude and primitive recreation in the area. Impacts associated with the sights and sounds of the grazing operations would not occur.

**Special Features**

Not authorizing grazing in the WSA would maintain the special features associated with the area.

## 4.12.12 Alternative 5 - Multiple Spring Use Areas or Pastures

**Naturalness**

Same as Alternative 1

**Opportunities for solitude/primitive or unconfined recreation**

Same as Same as Alternative 1, but the Idaho Canyon Use Area portion of the WSA would be grazed for 5 months during a 4 year cycle. Because the amount of time grazing would occur in the WSA is increased under this alternative by one month there would be a corresponding decrease in solitude and primitive recreation, during that month.

**Special Features**

Same as Alternative 1.

## 4.13 Special Designations

The special designations described in the affected environment were all created to identify areas that contain values and resources, which warrant special attention when considering management actions.

The Lahontan Cutthroat Natural Area is discussed under the Wilderness Chapter for all impacts.

### 4.13.1 Alternative 1 (Proposed Action)

The Soldier Meadows ACEC and RNA would be completely fenced under this alternative. Short term impacts associated with fencing would result from construction activities including: crushing or temporary removal of vegetation. Impacts from livestock grazing would be limited to incidental use resulting from livestock breaking through the fence, due to the proximity to the Soldier Meadows Ranch it is anticipated that the unauthorized use would be of short duration.

### 4.13.2 Alternative 2 - No Action - Existing System

Impacts to the ACEC and RNA would be much the same as those described for the Desert Dace Habitat under the Aquatic Resources Chapter.

### 4.13.3 Alternative 3 - Stanley Camp Riparian Pasture Use

For the ACEC and RNA the impacts would be similar to those described under Alternative 1.

### 4.13.4 Alternative 4 - No Livestock Grazing

Under this alternative the fencing would not be constructed and there would be no impacts from livestock. Although it is outside of the HMA, the area would continue to receive some impacts from wild horses.

### 4.13.5 Alternative 5 - Multiple Spring Use Areas or Pastures

For the ACEC and RNA the impacts would be similar to those described under Alternative 1.

## 4.14 Visual Resource Management

Alternatives 1, 2, 3, & 5 could impact important visual resources necessary to provide the desired range of recreation opportunities. Given the priority of the NCA to protect the scenic landscapes, wilderness values and largely undeveloped nature of the area, constructing new fences, reconstructing fences, increasing AUMs and the increased animal management activities have the potential for both long and short term impacts to the visual resources.

### 4.14.1 Alternative 1 (Proposed Action)

Constructing new fences to protect sensitive habitat in the SMA, if unmitigated, would likely impact the visual resources of the area. Fence lines, cattle guards, gates and other human improvements would detract from the primitive environment that was intended for protection by the establishment of the NCA and designation of the WSA. Although new fences would detract from the primitive landscape, if the Standards for Rangeland Health are achieved, there would be

the potential for improved resource conditions at springs and riparian areas, including popular recreation sites, and possibly at the landscape level.

**Mitigation**

The visual impact of fencing could be offset by the following:

- Strategic placement of fences to minimize visual intrusions
- Using temporary fences (i.e. drop-down fences)
- Selecting fencing materials that blend with the natural setting

### 4.14.2 Alternative 2 - No Action - Existing System

The visual resource impacts anticipated by this alternative would not occur since no new fences would be built. However, under the existing livestock grazing the Standards for Rangeland Health are not being met, yet it would be expected that resource conditions would improve based on the removal of approximately 1,100 wild horses and burros.

### 4.14.3 Alternative 3 - Stanley Camp Riparian Pasture Use

Visual impacts related to fence construction would be similar to those under alternative 1.

### 4.14.4 Alternative 4 - No Livestock Grazing

Impacts related to domestic livestock grazing operations would not occur under this alternative.

### 4.14.5 Alternative 5 - No Multiple Spring Use Areas or Pastures

Visual impacts related to fence construction would be similar to those listed under alternatives 1 and 3.

## 4.15 Socio-Economic

### 4.15.1 Alternative 1 (Proposed Action)

Environmental effects from alternative #1 would in general improve the economics of the ranch by allowing for the opportunity to implement suspended AUMs, thereby increasing livestock populations and associated increase of income. There would be some adverse impacts to ranch operations from costs associated with constructing/reconstructing fences. This alternative includes herding livestock, which would continue and not adversely impact the economics of the bed & breakfast and dude ranch operations conducted at the ranch. Overall, adverse socio-economic impacts would me minimal from implementation of this alternative and the potential for economic growth would increase.

### 4.15.2 Alternative 2 - No Action - Existing System

Environmental effects of the No Action would be similar to Alternative #1, the Proposed Action. The costs associated from construction and maintenance of fencing, described in Alternative #1 would not be incurred.

### 4.15.3 Alternative 3 - Stanley Camp Riparian Pasture Use

This alternative would have similar environmental effects to socio-economic resources as described in alternative #1.

### 4.15.4 Alternative 4 - No Livestock Grazing

Under the No Grazing Alternative, ranch operations would be limited to private lands with no public land grazing. This alternative would reduce the number of livestock that the ranch could support and consequently reduce income. The loss of income to the ranch would most likely cause reduction of employment and cutbacks in purchasing agricultural related services and equipment. Although, grazing privileges on public lands is not a property right, loss of such privileges would reduce the market value of the Soldier Meadows Ranch. Implementation of the No-Grazing Alternative would most likely cause socio-economic impacts to the ranch.

### 4.15.5 Alternative 5 - Multiple Spring Use Areas or Pastures

This alternative would have similar environmental effects to socio-economic resources as those described in Alternative 1.

## 4.16 Cumulative Impacts

The Council of Environmental Equality (CEQ) regulations implementing NEPA defines cumulative impacts as: "...[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, ore reasonably foreseeable future actions regardless of what agency (Federal or Non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The cumulative impact analysis area for this EA is the public lands administered by BLM in the SMA and portions of the Black Rock Region Hydrographic Basin and the Northwest Region Hydrographic Basin shown in the map located in Appendix 27. The area includes 6 other grazing allotments: Paiute Meadows, Knott Creek, Pine Forest, Leadville, Wall Canyon East, and Buffalo Hills.

### 4.16.1 Past, Present, and Reasonably Foreseeable Future Actions.

#### 4.16.1.1 Past Actions

The major past uses within the cumulative impact assessment area are ranching, recreation, mineral exploration, livestock, wild horse and burro management, and wildlife management. Grazing is the dominant land use that has occurred within the assessment area. The NCA Act was designated by the Congress in 2000.

##### *4.16.1.1.1 Grazing*

Over the past 15 years, livestock grazing evaluations have been conducted or are currently being conducted on the allotments listed above. On March 3, 2003, BLM issued a MASR & Determination document and Final Allotment Evaluation for the SMA and Paiute Meadows Allotment. The last evaluation had been completed on the SMA in 1994 and on Paiute Meadows Allotment in 1995. Past decisions have resulted in adjustments of livestock and wild horse and burros for the SMA and other allotments. While these adjustments were not associated with the Standards for Rangeland Health,

they were done to improve rangeland conditions, improve habitat for sensitive or threatened species, and to balance livestock and wild horse and burro use.

The Bureau of Land Management and the Nature Conservancy in the early 1990s worked cooperatively to secure a conservation easement and to purchase private lands within the SMA. This effort helped facilitate the increased protection of several sensitive species, two federally listed Threatened species of fish, and their habitats. These purchased lands included the federally designated critical habitat for the desert dace and several in-holdings within the Mahogany Creek watershed.

#### *4.16.1.1.2 Wildlife Management*

Bighorn sheep and LCT were reintroduced within the analysis area over the last two decades.

#### *4.16.1.1.3 Recreation*

Past dispersed recreation uses include camping, hunting, hiking, rockhounding, off highway vehicle (OHV) use, and commercial activities such as motorcycle and OHV racing events. Past BLM management actions for commercial events were addressed through issuance of special recreation permits (SRPs).

#### *4.16.1.1.4 Mineral Activity*

Past activity includes exploration and small developments of mineral resources. After 1981, these activities were managed under the Surface Management Regulations, 43 CFR 3809 & 3802.

### 4.16.1.2 Present Actions

The major present uses within the cumulative impact assessment area are ranching, recreation, mineral exploration, livestock, wild horse and burro management, and wildlife management. Grazing is the dominant land use that occurs within the assessment area.

#### *4.16.1.2.1 Grazing*

There are currently two grazing allotment evaluations in progress within the assessment area. These evaluations include the Knott Creek and Pine Forest Allotments. The evaluations will assess if these allotments are meeting specific allotment objectives and Standards for Rangeland Health. A MASR was issued for the SMA and Paiute Meadows Allotment on March 3, 2003. The MASR concluded that some of the Allotment objectives and Standards for Rangeland Health were not being met or achieved under existing livestock and wild horse and burro management.

#### *4.16.1.2.2 Wildlife Management*

Bighorn sheep and LCT populations have been augmented within the analysis area in 2003 and 2001, respectively.

#### *4.16.1.2.3 Recreation*

Dispersed recreation uses include camping, hunting, hiking, rockhounding, off highway vehicle (OHV) use, and commercial activities such as motorcycle and OHV racing events continue within the analysis area.

#### *4.16.1.2.4 Mineral Activity*

Mineral activity includes hard rock mining and exploration, geothermal exploration and development, and mineral materials (gravel). Mineral activities are limited to the portion of the analysis area outside of the NCA boundary, with the exception of valid existing rights. For those operations, whose rights are determined to be valid, activity will continue.

### 4.16.1.3 Reasonable Foreseeable Future Actions (RFFAs)

The RFFAs applicable to the assessment area are:

1. Issuance of multiple use decisions and grazing permits for ranching operations through the allotment evaluation process and the reassessment of the allotments within the NCA boundary.
2. Construction of rangeland improvement projects.
3. Wild horse and burro gathers.
4. Changes in livestock grazing management.
5. Development of Sage Grouse Management Plans
6. Development and issuance of a Resource Management Plan for the NCA.
7. Augmentations of LCT and bighorn sheep
8. Land tenure adjustments
9. Recreational facility development
10. Continued mineral activity

#### *4.16.1.3.1 Summary*

Issuance of grazing permits would be expected for all grazing allotments within the assessment area, subject to the allotment evaluation process and meeting Standards for Rangeland Health. A MASR was issued on the SMA and Paiute Meadows allotment on March 3, 2003. It is anticipated that grazing management within these allotments would change. No MASR has been issued for the Pine Forest and Knott Creek Allotments. There are a number of range improvement projects, such as fencing that are pending on allotments within the assessment area. Wild horse and burro gathers would continue to ensure Appropriate Management Levels (AMLs) are met and the Allotment Objectives and Standards for Rangeland Health are attained. In October 2001, Nevada Governor, Kenny Guinn, introduce the Nevada Sage Grouse Conservation Strategy. This strategy includes development of a task force charged with the task of developing a plan that would conserve and protect Nevada's sage grouse and their habitat. Augmentations of the existing bighorn and LCT will likely continue in the future as populations require. Land tenure adjustments will be considered as opportunities become available.

With the passage of the NCA Act in 2000, the development of a Resource Management Plan (RMP) was required. The RMP would include management actions to address

recreation and other resource uses within the NCA. The RMP would also include a management plan for the Wilderness areas included as part of the NCA Act.

### 4.16.1.4 Impact Analysis

Unless otherwise specified the following cumulative impact analysis addresses Alternatives 1, 3, and 5.

#### *4.16.1.4.1 Water Resources & Fisheries/Aquatic Resources/Special Status Species*

**Past Actions**

Livestock grazing led to the gradual deterioration of watershed health until the passage of the Taylor Grazing Act in 1934. Until the passage of the Endangered Species Act of 1973 (ESA), few livestock management actions addressed aquatic resources or aquatic special status species, which subsequently led to the imperilment of numerous aquatic species.

**Present**

Although conditions have improved since the 1930s, portions of the analysis area continue to have adverse cumulative impacts to water resources and watersheds. These impacts are due primarily to concentrated livestock use in riparian areas, which reduces habitat diversity needed to sustain aquatic organisms by altering channel morphology, increasing sediment loads, and altering the natural water quality characteristics within areas. Other impacts are associated with recreational bathing, which have impacted the aquatic biota of hot springs within the analysis area.

**RFFAs**

Implementing grazing management and the NCA RMP within the analysis area will ensure the attainment of the Standards for Rangeland Health, thereby allowing for the gradual improvement of overall watershed conditions. Although continued livestock grazing will lead to minor negative impacts to fisheries and aquatic resources within small-localized areas. Elimination of livestock within sensitive areas, containing special status species, will lead to improvements to fisheries and aquatic habitats. The SMA has the majority of the water resources compared to the balance of the assessment area. Meeting Standards for Rangeland Health would result in an incremental improvement or stabilization of resources within the SMA. Other changes in livestock management as a result of allotment evaluations and meeting Standards for Rangeland Health would also improve watersheds outside of the SMA. Implementation of the NCA RMP would include management actions to protect sensitive species and aquatic habitats.

**Summary**

The incremental impacts from past, present and RFFA would result in an overall improvement of watershed condition based on the attainment of allotment specific objectives and Standard for Rangeland Health. Although fisheries and aquatic habitats would maintain or improve in overall condition over time, areas of small-localized impacts would be likely to continue.

Alternative 2
The non-attainment of the Standards for Rangeland Health would result in incremental degradation of the water resources and fisheries/aquatic resources within the analysis area.

Alternative 4
The elimination of livestock grazing would lead to improvement of the water resources and fisheries/aquatic resources within the analysis area.

#### *4.16.1.5 Terrestrial Wildlife/Special Status Terrestrial Wildlife Species*

**Past Actions**

Overgrazing by livestock and wild horses and burros coupled with introduction of invasive or exotic species has adversely impacted habitat for cover and forage availability for wildlife prior to the passage of the Taylor Grazing Act of 1934.

**Present Actions**

Current conditions within the analysis area include areas where concentrated livestock and wild horses and burros and also wildfires have caused degradation of wildlife habitat. This impact has led wildlife to seek other suitable habitat within the assessment areas. This displacement creates more competition between species occupying similar habitat niches.

**RFFAs**

Implementation of grazing management actions that ensure attainment of allotment specific objectives and Standards for Rangeland Health should maintain or improve wildlife habitats within the SMA and adjoining allotments. Nevada Sage Grouse Conservation Strategy guidelines would be adopted where possible.

**Summary**

Impacts from past, present and RFFAs have varied from moderate to low for wildlife resources within the analysis area depending on the Alternative. Adverse impacts from large wildfires would be dependant on the ability of the range to recover, especially if management actions to restore burned areas are not implemented. The attainment of allotment specific objectives and Standard for Rangeland Health would maintain or improve overall habitat conditions for wildlife species, including special status species.

Alternative 2
The non-attainment of the Standards for Rangeland Health would result in incremental degradation of the wildlife habitat within the analysis area.

Alternative 4
The elimination of livestock grazing would lead to improvement of the wildlife habitat, for those species which prefer climax vegetative communities, within the analysis area. Conversely, for those species, which prefer early to mid succession stages, habitats would be degraded.

### *4.16.1.6 Vegetation/Special Status Species*

**Past Actions**

Historic impacts to sagebrush steppe habitats occurred from overgrazing livestock at the turn of the century. These impacts combined with the introduction of invasive species, such as cheatgrass led to a reduction in understory grasses and forbs. It also led to moderate to low ecological condition in the remaining sagbrush habitats.

**Present Actions**

Impacts continue as in the past with the exception that wildland fires have increased in size and frequency, combined with the yearlong grazing by wild horse and burros. The non-attainment of allotment objectives and the Standards for Rangeland Health within portions of the analysis area continues to affect upland/riparian habitat by reducing native species diversity and vigor.

**RFFAs**

Implementation of grazing management actions that ensure attainment of the allotment specific objectives and Standards for Rangeland Health should improve vegetation communities throughout the analysis area by increasing cover and diversity of vegetation. Fencing habitats occupied by sensitive species of plants would protect those species from the impacts associated with trampling.

**Summary**

Impacts from past, present and RFFAs to vegetation has varied from moderate to low. Present impacts remain low to sensitive species without implementation of management actions. Implementation of management actions that ensure the attainment of Standards for Rangeland Health would allow for overall improvement of upland vegetation condition. Maintaining wild horse and burro populations at or below Appropriate Management Level (AML) will allow for the maintenance or improvement of vegetative resources.

Alternative 2

The non-attainment of the Standards for Rangeland Health would result in incremental degradation of the vegetative resources within the analysis area.

Alternative 4

The elimination of livestock grazing would lead to improvement of the vegetative resources within the analysis area towards a climax community state dependent on fire frequency and wild horse and burro population levels.

### *4.16.1.7 Noxious Weeds*

**Past Actions**

Noxious weeds were of little consideration in the past and no comprehensive weed management programs were developed. Historic overgrazing, road maintenance, and wildland fires created disturbed areas that allowed for the introduction and spread of noxious weeds.

**Present Actions**

There are no complete inventories within the analysis area, although the presence of noxious weeds are known to occur. Large range fires would continue in intensity, thereby creating larger disturbed areas where invasive weeds could become established. Grazing allows increased areas of disturbance subject to noxious weed invasion, creating the future potential for monocultures of weed communities to develop.

**RFFAs**

Increases in noxious weed populations within the analysis area could occur if allotment objectives and Standards for Rangeland Health are not achieved. Noxious weeds could also continue to spread dependent on rates of increased areas of disturbance. Declines in native plant vigor from other causal elements, such as recreation and road maintenance, could also lead to noxious weed infestation.

**Summary**

Impacts from Past, Present, and RFFAs would incrementally increase the spread of noxious weeds over time consistent with levels of surface disturbance. These impacts would be minimized subject to the implementation of livestock management actions that would ensure Standards for Rangeland Health are achieved, the maintenance of wild horse and burros at AML, management of recreation per the NCA RMP, and implementation of cooperative efforts between BLM, State and Counties to control weeds.

Alternative 2

The non-attainment of the Standards for Rangeland Health would result in increased areas of surface disturbance, which would lead to increases in noxious weed infestations within the analysis area.

Alternative 4

The elimination of livestock grazing would lead to decrease in noxious weeds within the analysis area.

### *4.16.1.8 Soils*

**Past Actions**

Past areas where overgrazing from livestock and wild horses and burros combined with the introduction of invasive or exotic species has adversely impacted soils leaving them susceptible to erosion.

**Present Actions**

Current areas within allotments where concentrated livestock grazing, wild horses and burros use has occurred has resulted in removal of vegetation making soils vulnerable to erosion. These conditions are compounded by wildfires and recreation.

**RFFAs**

Implementation of grazing management actions that ensures allotment specific objectives and Standards for Rangeland Management are achieved should limit soil erosion throughout the assessment area by increasing cover and diversity of vegetation. Increased recreation could lead to increased areas of vegetation removal and soil compaction from OHV use and concentrated recreational uses.

**Summary**

Incremental impacts from past, present and RFFA to soils has varied over time from low to moderate depending on the degree of grazing intensity, size of wildfires, and recreation use. Present impacts remain moderate to soils without the implementation of management actions. Attainment of allotment objectives and the Standards for Rangeland Health would allow for overall improvement of vegetation condition, thereby reducing the potential for soil erosion. Implementation of fire rehabilitation efforts and the NCA RMP would further reduce soil erosion.

Alternative 2

The non-attainment of the Standards for Rangeland Health would result in incremental degradation of the soil resources within the analysis area. This is due to increased compaction and reduced vegetative cover, which could increase levels of erosion.

Alternative 4

The elimination of livestock grazing would lead to improvement of the soil resources within the analysis area, if wild horse and burro population levels are maintained at or below AML.

### *4.16.1.9 Wild Horses and Burros*

**Past Actions**

Prior to the Wild Horse and Burro Act of 1971, wild horse and burros were unprotected and populations were limited mainly by natural processes.

**Present Actions**

Current management of wild horses and burros by BLM has included a number of gathers (see Chapter 4.8). Wild horse and burro populations and subsequent grazing impacts are dependent on adoptions and funding. There continues to be impacts to herd demographics and herd health in wild horse and burro populations from artificial management related to gathers. The occurrence of wildfire has displaced wild horse and burro populations, which has increased competition within other areas. Increased recreation could displace wild horse and burro populations from human interaction, especially during the foaling season.

**RFFAs**

Implementation of grazing management actions that ensure allotment specific objectives and Standards for Rangeland Health attainment should improve forage availability. Managing at or below AML would result in the stabilization of populations by reducing grazing intensity and improving habitat.

**Summary**

Incremental impacts from past, present and RFFAs to wild horses and burros has varied over time depending on the degree of grazing intensity, gather frequency, and the size of wildfires. Present impacts to range resources remain moderate without continued implementation of management actions to maintain the wild horses and burros at AML. The attainment of allotment objectives and the Standards for Rangeland Health would improve forage quality allowing for viable healthy herds in the long term within the analysis area.

Alternative 2

Continuing the No Action Alternative would result in reduced forage availability for wild horse and burros, due the non-attainment of the Standards for Rangeland Health.

Alternative 4

The elimination of livestock grazing would lead to increased forage availability for wild horse and burro within the analysis area.

### *4.16.1.10 Cultural Resources/ Native American Values*

**Past Actions**

Prior to the establishment of the National Historic Preservation Act of 1966 there was little management to protect cultural resources. This led to increased adverse impacts to these resources.

**Present Actions**

Current conditions within the analysis area include areas where concentrated livestock, wild horses and burros, recreation, and wildfire have removed vegetation exposing cultural artifacts. These activities also remove Native American medicinal plants, thus limiting their availability. The increased potential for illegal collection and physical damage from trampling resulted from these activities.

Impacts to Native Americans values are expressed in Chapter 3.9 and are tied to the condition of and the impacts to the rangeland resources by land use activities.

**RFFAs**

Implementation of grazing management actions that ensures the attainment of allotment specific objectives and the Standards for Rangeland Health should improve vegetation cover and dispersion of ungulates, which would reduce impacts to cultural resources and address Native American concerns within the analysis area. The implementation of the NCA RMP will address recreation management, taking into consideration Native American concerns.

**Summary**

Incremental impacts from past, present and RFFAs to cultural resources has varied over time from moderate in the past to low at present. Present impacts remain low to moderate to cultural resources as concentrated activities continue in portions of the analysis area. The attainment of allotment objectives and the Standards for Rangeland Health and Alternative 4 would allow for overall improvement of vegetation cover and the broad distribution of ungulates, reducing adverse impacts to cultural resources in the long term and improve conditions in areas that are important or sacred to Native Americans. Implementation of the NCA RMP would help mitigate impacts to cultural resources from recreational activities. Overall, cumulative adverse impacts to cultural resources and Native American resources would be minimal.

Alternative 2

The non-attainment of the Standards for Rangeland Health would result in incremental degradation of the cultural resources within the analysis area. This is due to increased trampling and reduced vegetative cover, which could increase levels of exposure.

Alternative 4

The elimination of livestock grazing would lead to increased protection of the cultural resources, if wild horse and burro populations remain at AML.

#### *4.16.1.11 Recreation*

**Past Actions**

Dispersed recreation use within the analysis area was unconstrained prior to the 1970s and included hunting, fishing, rockhounding, hiking, and other outdoor activities. Restrictions on these activities occurred in the 1970s, due to the LCT listing under ESA, wilderness study area and other designations, and bighorn lambing periods.

**Present Actions**

With the passage of the NCA Act, the BLM is in the process of developing a NCA RMP. A number of these lands are located within the analysis area. Current recreation growth, including OHV use, has steadily increased along with changing the diversity of recreation use. The NCA RMP, will manage recreation uses to conserve resources and enhance specific recreational opportunities.

**RFFAs**

It is anticipated that recreation growth would expand within the area. Commensurate with this growth will likely be increased limitations on recreational activities in accordance with multiple use management and the NCA RMP. Attainment of allotment objectives and the Standards for Rangeland Health will increase opportunities for wildlife related recreation. Impacts to recreation from the NCA RMP will remain unknown until a final alternative is selected.

**Summary**

Incremental impacts from past, present, and RFFAs to recreation use have varied over time from low to moderate depending on the level of management present. The NCA RMP will address future recreation growth while establishing management actions to protect resources.

Alternative 2

Same as described above.

Alternative 4

The elimination of livestock grazing would lead to decreased interactions between livestock and recreationalists.

#### *4.16.1.12 Wilderness Areas/Wilderness Study Areas (WSAs)*

**Past Actions**

In the 1980s Wilderness Study Areas were designated within the analysis area. These areas have been managed as wilderness under the Interim Management Policy to protect their wilderness values until Congress decides to designate them as wilderness or release them for other purposes. Impacts to these areas have been primarily limited to unauthorized motorized traffic. The NCA Act of 2000 designated a portion of the WSAs within the analysis area as Wilderness Areas.

**Present Actions**

With the enactment of the NCA Act, management of the Wilderness Areas and WSAs has improved, resulting in increased boundary identification, route rehabilitation, and compliance checks. These management actions would improve wilderness values for those seeking naturalness and solitude.

**RFFAs**

The NCA RMP proposes a management plan for wilderness, which should improve wilderness values.

**Summary**

Incremental impacts from past, present, and the RFFAs on wilderness/WSAs have remained consistent since the mid 1980s as special designations continued to exist. Present impacts remain minimal to wilderness values. Implementation of the NCA RMP would address future recreation growth while establishing management actions to protect wilderness resources

Alternative 2

Same as described above.

Alternative 4

The elimination of livestock grazing would improve wilderness values and opportunities for naturalness and solitude.

### *4.16.1.13 Visual Resource Management (VRM)*

**Past Actions**

Visual resources were not considered when making land use decisions until the late 1970s. Impacts, such as range improvement projects and powerlines, caused adverse impacts to the viewsheds within the analysis area. Private lands purchased within the SMA in the 1990s limited the construction of facilities or activities that would impact the historical characteristic of the ranch, which includes visual resource values.

**Present Actions**

VRM is considered for all federal actions within the analysis area. Impacts, which include range improvement projects, powerline construction, and agricultural development, create features that may intrude on viewsheds. However, the implementation of VRM techniques and mitigation measures would minimize these impacts within the analysis area.

**RFFAs**

With the passage of the NCA Act, visual resource management with respect to the Applegate-Lassen Emigrant Trail may change within the assessment area. These changes may limit the extent or degree of development and visual intrusion of the viewshed. Range improvement construction related to grazing within the analysis area would negatively impact VRM to some degree, due to the addition of man-made features on the landscape.

**Summary**

Incremental impacts from past, present and RFFAs on visual resources have been minimal. Present and RFFAs impacts would be mitigated by implementation new VRM classifications and the impacts would remain low, outside of the Applegate-Lassen Emigrant Trail viewshed.

Alternative 2

Same as described above, except fencing mileage would be lessened under this alternative. Therefore visual resource impacts would be decreased under this alternative.

Alternative 4

The elimination of livestock grazing would lead to improvements to visual resources, due to the lack of need for fences.

### *4.16.1.14 Social & Economic*

**Past Actions**

Historically, agriculture has steadily contributed to the economic base of Humboldt County. In the early 1980s, mining became a major contributor to the economy. There is little mining within the analysis area and impacts to social and economic resources have remained static.

**Present Actions**

Attainment of allotment objectives and the Standards for Rangeland Health may result in an increase or decrease in AUMs to livestock operations within the analysis area. Decreases in AUMs would result in the ranch purchasing fewer agriculture related goods and services due to reduced ranch income. Conversely, increases in AUMs would result in local economic growth for the opposite of the above described factors.

**RFFA**

With the implementation of the NCA Act, it is anticipated that recreation use would increase. Human interaction with livestock may increase livestock stress from displacement into other areas. There may be economic gain to the area from increased recreation use as local economies may react by providing goods and services to recreation users.

**Summary**

Overall, past, present, and RFFAs impacts to socio and economic resources would be considered minor compared to the Humboldt County earnings base (See Socio-Economic Section Chapter 3.14).

Alternative 2

Same as described above

Alternative 4

The elimination of livestock grazing would result in greater impacts to the ranch, due to private operations requiring a smaller herd size commensurate with private land size. The ranch may also have to purchase feed to sustain livestock, further reducing profits and increasing expenses. Although grazing privileges are not property rights, loss of said privileges would reduce the value market values of ranches within the area.

# 5 Coordination and Consultation

## 5.1 List of Preparers

| | |
|---|---|
| Mike Zielinski | Soils |
| Matthew Varner | Fisheries/Riparian/T&E |
| Clarence Covert | Wildlife |
| Craig Drake | Water Resources |
| Nadine Paine | Wild Horses & Burros |
| Peggy McGuckian | Cultural & Native American |
| Brian Murdock | Wilderness |
| Ron Pearson | Range |
| Dave LeFevre | Recreation & VRM |
| Jeff Johnson | Environmental Coordinator |
| Roger Farschon | Ecologist |
| Lynnda Jackson | GIS Support |

## 5.2 Agency/Group/Individuals Contacted

1. Estill Ranches LLC
2. Irv and Sandy Brown
3. Donna Potter
4. U.S. Fish and Wildlife Service – Reno Office
5. U.S. Geological Services – BRD
6. NDOW – Winnemucca
7. NDOW – Fallon
8. Western Watershed Project
9. Committee for High Desert
10. USDA – Carson City
11. Humboldt County Commissioners
12. Natural Resources Defense Council (NRDC)
13. Dawn Lappin, Wild Horse Organized Assistance (WHOA)
14. Kathy Barcomb, Nevada Commission for the Preservation of Wild Horses (NCPWH)
15. International Society for the Protection of Mustangs and Burros (ISPMB)
16. Sierra Club
17. USDA – NRCS – Reno Office
18. Cedarville Field Office – BLM
19. Summit Lake Paiute Tribe
20. Intermountain Range Consultants
21. Shaaron Netherton, Friends of Nevada Wilderness
22. Nevada Outdoor Recreation Association, C/O Charles Watson
23. The Sierra Club, Toiyabe Chapter, C/O Marjorie Sill
24. The Wilderness Society, C/O Jay Watson
25. The Sierra Club, Toiyabe Chapter, C/O Glen Miller
26. The Wilderness Society
27. Sierra Club, Debbie Sease
28. John Davis
29. Roger Scholl
30. Phil Briggs
31. Rose Strickland, Sierra Club
32. Paul Clifford
33. James Morefield, Nevada Heritage Program
34. Nevada United 4-Wheel Association
35. Joanna Wald, Natural Resources Defense Council
36. Leah Brashear
37. Tom Myers
38. Susan Lynn, Public Resource Associates
39. Nobby Reidy, Executive Director, Wild Spaces
40. Bob Ellis
41. Steve Tabor, Desert Survivors
42. Wilderness Watch
43. Northern Nevada Native Plant Society
44. Northwest Great Basin Association

45. Mr. Whitney, Washoe County Dept. of Comprehen.
46. Denise Pollard, Ft. Bidwell Tribal Council
47. Gale Dupree, NV Wildlife Federation
48. Jim Eaton, CA Wilderness Coalition
49. John Walker, Division of Administration
50. Karen Boeger, Friends of NV Wilderness
51. Marisha Fragua, Cedarville Rancheria
52. Senator Harry Reid's Office
53. Mary Conelly
54. Pyramid Lake Tribe
55. Norman Harry
56. Rich Heap, NDOW
57. Robert P. Davison, Wildlife Mgt. Institute
58. Stephen Smith, BLM State Office
59. Terry Williams, Modoc County
60. Vicky Hoover, Sierra Club
61. Willie Molini, The Wildlife Society
62. Dave Pulliam, NDOW
63. Great Old Broads for Wilderness
64. Oregon Natural Desert Association
65. Resource Concepts
66. Nevada Cattleman's Association
67. Nevada Woolgrowers Association
68. William Cowen
69. Friends of Nevada Wilderness
70. Donna Potter, Orient Farms
71. Schroeder & Lezamiz

# APPENDIX 1 – STANDARDS FOR RANGELAND HEALTH

**Sierra Front Northwestern Great Basin Area Guidelines For Grazing Management**
**(BLM/NV/PT-97/013+4000)**

1. Soil processes will be appropriate to soil types, climate and land form.

2. Riparian/wetland systems are in proper functioning condition.

3. Water quality criteria in Nevada or California State Law shall be achieved or maintained.

4. Populations and communities of native plant species and habitats for native animal species are healthy, productive and diverse.

5. Habitat conditions meet the life cycle requirements of special status species.

# APPENDIX 2 - ALLOTMENT SPECIFIC OBJECTIVES FOR ALTERNATIVES 1, 3, & 5

A. Short Term:

1. The standards below apply to all streams that are habitat or potential habitat for the federally listed threatened Lahontan cutthroat trout (LCT):

a. Riparian herbaceous vegetation will not exceed six inches (6") in streambank communities.

b. Utilization of woody riparian vegetation is thirty percent (30%) : Aspen (*Populus* spp.) and Willows (*Salix* spp.).

c. Mechanical streambank alteration will not exceed ten percent (10%) along streams that are habitat or potential habitat for the federally listed threatened Lahontan cutthroat trout.

2. A minimum stubble height of six inches (6") shall be maintained on the grass and grass-like plants, herbaceous vegetation, and emergent aquatic vegetation (consisting primarily of sedges and rushes, with stubble height measured above the water surface) within wetland and riparian communities associated with desert dace populations or within designated critical habitat. If stubble heights fall below the minimum height criteria prior to the end of the designated grazing season, the livestock permittee will be given a seven (7) day notice in which to remove livestock from the use area/pasture and/or allotment.

3. Mechanical streambank damage from livestock hoof action resulting in bank punching or shearing shall not exceed 10 percent on spring systems associated with desert dace populations or within designated critical habitat.

4. The objective for utilization of key plant species in wetland riparian habitats is fifty percent (50%) for sedges (Carex spp.), rushes (Juncus spp.) and bluegrass (Poa).

5. The objective for utilization of key plant species in upland habitats is fifty percent (50%) on the following: bluebunch wheatgrass (*Agropyron spicatum*), serviceberry (*Amelanchier*), curlleaf mountainmahogany (*Cercocarpus ledifolius*), basin wildrye (*Elymus cinereus*), ephedra (*Ephedra*), winterfat (*Eurotia lanata*), Idaho fescue (*Festuca idahoensis*), meadow barley (*Hordeum brachyantherum*), Baltic rush (*Juncus balticus*), lupine (*Lupinus caudatus*), Indian ricegrass (*Oryzopsis hymenoides*), bluegrass (*Poa*), Nevada bluegrass (*Poa nevadensis*), Sandberg bluegrass (*Poa secunda*), antelope bitterbrush (*Purshia tridentata*), bottlebrush squirreltail (*Sitanion hystrix*), needleandthread (*Stipa comata*), Thurber needlegrass (*Stipa thurberana*),and snowberry (*Symphoricarpos*).

B. Long Term:

1. Manage, maintain, or improve rangeland conditions to provide forage on a sustained yield basis for big game, with an initial forage demand of 786 AUMs for mule deer, 429 AUMs for pronghorn, and 264 AUMs for bighorn sheep.

a. Improve to or maintain good to excellent mule deer habitat conditions within the ecological site potential of the range.

b. Improve to or maintain fair to good pronghorn habitat conditions within the ecological site potential of the range.

c. Improve to or maintain good to excellent bighorn sheep habitat conditions within the ecological site potential of the range.

2. Improve or maintain suitable sage grouse strutting, nesting, brood rearing, and/or wintering habitat in good condition within the site potential of the rangeland habitat.

The following parameters have been found to constitute optimum (good) conditions for sage grouse use:

Strutting Habitat

Low sagebrush or brush free areas for strutting and nearby areas of sagebrush having 20-50% canopy cover for loafing.

Nesting Habitat

1. Sagebrush between seven 7 and 31 inches in height (optimum= 16 inches).
2. Sagebrush canopy cover of 15-30% (optimum = 27%).
3. 25-35% basal ground cover.
4. Average understory height of 6-7 inches (grasses).

Brood Rearing Habitat

Early Season

1. Sagebrush canopy cover 10-21% (optimum = 14%).

Late Season

1. Meadow areas that are in functioning condition.
2. Residual meadow vegetation of no less than 3-6 inches in height.

Winter Habitat

1. Greater than 20% sagebrush canopy cover.

3. Improve public rangeland conditions to provide forage on a sustained yield basis for livestock, with a stocking level of 7,687 AUMs.

4. Maintain and improve the free-roaming behavior of wild horses and burros by protecting and enhancing their home ranges.

a. Manage, maintain, or improve public rangeland conditions to provide 4,284 AUMs of forage on a sustained yield basis for wild horses.
b. Maintain and improve wild horse habitat by assuring free access to water.

5. Improve to and/or maintain ceanothus (*Ceanothus*), mountainmahogany (*Cercocarpus*), aspen (*Populus tremuloides*) habitats by allowing for successful reproduction and recruitment based on site potential.

6. Improve to and/or maintain riparian and meadow habitat types to ensure species diversity and quality and to maximize reproduction and recruitment.

7. Improve to and/or maintain serviceberry (*Amelanchier*), bitterbrush (*Purshia tridentata*), ephedra (*Ephedra*) and winterfat (*Eurotia lanata*) habitat by allowing for successful reproduction and recruitment based on site potential.

8. Improve to and/or maintain fisheries habitat in good to excellent condition based on the stream's potential.

9. Improve to and/or maintain lentic and lotic riparian habitats to Properly Functioning Condition (PFC).

WATER QUALITY OBJECTIVES

13. Maintain Mahogany Creek and Summer Camp Creek to the State of Nevada designated Class A water standards.

14. Prevent Bureau authorized activities from degrading the natural quality of water. The Bureau will use the State's water quality criteria, found at NAC 445A.119, as benchmarks to determine whether or not the objective is being met.

A. The criteria for watering of livestock, coldwater aquatic life propagation, water contact recreation and wildlife propagation shall be applied to the following sources:

Snow Creek
Donnelly Creek
Colman Creek.

B. The criteria for watering of livestock, water contact recreation and wildlife propagation shall be applied to the following sources:

Slumgullion Creek
Soldier Creek

# APPENDIX 3 – TERMS AND CONDITIONS FOR ALTERNATIVES 1, 3, & 5

The terms and conditions must be in conformance with the Standards and Guidelines for the Sierra Front - Northwestern Great Basin Resource Advisory Council, approved by the Secretary of the Interior on February 12, 1997.

1. Since the majority of the use areas are unfenced it is the responsibility of the permittee to incorporate riding and herding to insure livestock grazing occurs within the appropriate pasture in accordance with the permit schedules.

2. Livestock will be allowed up to five (5) days to trail between allotment use areas or onto private lands within the allotment.

3. There will be no livestock grazing authorized within the exclosures.

4. The standards below apply to all streams that are habitat or potential habitat for the federally listed threatened Lahontan cutthroat trout (LCT):

    a. Riparian herbaceous vegetation will not exceed six inches (6") in streambank communities.

    b. Utilization of woody riparian vegetation is thirty percent (30%) : Aspen (*Populus* spp.) and Willows (*Salix* spp.).

    c. Mechanical streambank alteration will not exceed ten percent (10%) along streams that are habitat or potential habitat for the federally listed threatened Lahontan cutthroat trout.

5. A minimum stubble height of six inches (6") shall be maintained on the grass and grass-like plants, herbaceous vegetation, and emergent aquatic vegetation (consisting primarily of sedges and rushes, with stubble height measured above the water surface) within wetland and riparian communities associated with desert dace populations or within designated critical habitat. If stubble heights fall below the minimum height criteria prior to the end of the designated grazing season, the livestock permittee will be given a seven (7) day notice in which to remove livestock from the use area/pasture and/or allotment.

6. Mechanical streambank damage from livestock hoof action resulting in bank punching or shearing shall not exceed 10 percent on spring systems associated with desert dace populations or within designated critical habitat.

7. "Pursuant to 43 CFR 10.4(g) the holder of this authorization must notify the authorized officer, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined at 43 CFR 10.4(c) and (d), you must stop activities in the immediate vicinity of the discovery and protect it from your activities for 30 days or until notified to proceed by the authorized officer."

8. Salt and/or mineral blocks shall not be placed within one quarter (1/4) mile of springs, streams, riparian habitats or aspen stands. Additionally, salting locations will be changed twice per month throughout the authorized use period within the allotment.

9. The permittees are required to perform maintenance on range improvements as per their signed cooperative agreements and section 4 permits prior to livestock turnout.

10. The permittees certified actual use report, by pasture, is due 15 days after the end of the authorized grazing period.

11. The grazing authorization with the schedules of use outlined in this evaluation will be the only approved use and all other schedules, flexibilities and terms and conditions addressed in the 1994 Soldier Meadows Allotment Multiple Use Decisions are suspended, unless revised.

12. The authorized officer reserves the right to modify annual grazing authorizations as long as the modification is consistent with management objectives, standards for rangeland health and remains in the designated season of use.

13. If monitoring at the end of the grazing season indicates that the short term allotment specific objectives and standards for rangeland health were not met[11] on wetland riparian, streambank riparian or upland habitats, appropriate corrective actions will be taken the following year. The BLM, in conjunction with the permittee and interested publics, will determine what appropriate management action will be implemented to meet these objectives and standards. If a consensus is not reached, the annual authorization will be reduced by fifteen (15) days and/or a reduction in authorized use that is commensurate with the level of the objectives' non-attainment[12], within the use area or pasture that the objective was not met.

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[11] When current livestock grazing practices or levels of use are the significant factor for non-achievement of objectives or the standards for rangeland health

[12] For example, if utilization objectives are exceeded by 10% then a 10% reduction in authorized use would occur the following grazing season. If the six (6) inch stubble height objective is exceeded on the riparian/aquatic habitats listed in the biological opinion by three (3) inches then a 30% reduction in AUMs (with a maximum of 60%) would occur the following grazing season.

# APPENDIX 4 - ALLOTMENT SPECIFIC OBJECTIVES FOR ALTERNATIVE 2

Riparian/Wet Meadows:

1. Do not exceed 30% utilization of current years growth on the key riparian trees and shrubs, which includes: Aspen (*Populus tremuloides*) and Willows (*Salix* spp.). For Mahogany, Summer Camp, Snow Creeks, and the hot springs associated with the Desert Dace grasses and grass-like plants will have a minimum stubble height of 6 inches. A 4 inch stubble height will apply for Colman, Slumgullion, and Donnelly Creeks when the cows leave the pasture for the following: Nevada Bluegrass (*Poa nevadensis*), sedges (*Carex* spp.), rushes (*Juncus* spp.), Intermediate Wheatgrass (*Agropyron intermedium*), and Tufted Hairgrass (*Deschampsia cespitosa*).

2. The utilization levels for the wet meadows (not identified above), grass and grass-like species is 50%. If the utilization level is exceeding the 50% level by February 28 the carrying capacity will be evaluated to determine if a downward adjustment is required. The evaluation will include livestock and wild horse actual use, along with wildlife and climatic factors.

Upland Grass/Dry Meadows:

1. Livestock and wild horse vegetative utilization levels are not to exceed 50% at the end of the livestock use period (except for the Black Rock Pasture).

2. The Black Rock Pasture combined vegetative utilization shall not exceed 60% by February 28 or the start of the new growing season.

3. By February 28, or the start of the new grazing season, vegetative utilization shall not exceed 60% (utilization on these species from 50 to 60% will occur during the dormant season and should not have a detrimental impact to plant health and vigor).

4. The vegetative utilization level by wild horses, once the AML is reached, shall not exceed 20% by July 15 (seed dissemination) in livestock rested pastures.

5. For the Black Rock Pasture, once AML is reached, vegetative utilization level by wild horses shall not exceed 30% by December 31.

Upland Browse:

1. Livestock vegetative utilization levels shall not exceed 50% by the end of the livestock grazing use period.

WATER QUALITY OBJECTIVES

1. Improve or maintain Mahogany Creek to Class A water quality standards.

2. Improve or maintain the water quality of the following streams to the State criteria set for livestock drinking water, cold water aquatic life, water contact recreation (wading), and wildlife propagation: Snow Creek to Class B water quality standards.

Summer Camp Creek
Snow Creek
Donnelly Creek
Slumgullion Creek
Soldiers Creek

3. Maintain water quality standards for Desert Dace habitat in the springs where they occur to the following:

| | |
|---|---|
| temperature | 32-38"C/90-100"F |
| nitrates | 90 mg/L |
| turbidity | 50 NTU |
| pH | 6.5-9.0 |
| D.O. | 5.0 mg/L |

VEGETATION OBJECTIVES

A. Riparian Objectives:

1. Improve the riparian condition class on six (6) miles of Mahogany Creek to 70% (from 1992 baseline data of 68%) within the short term (2001) and maintain excellent riparian stream condition (70% of optimum or better) to the year 2017.

2. Improve the riparian condition class on 2 miles of Summer Camp Creek to 70% (from 1990 baseline data of 60%) within the short term (by 2001) and maintain excellent riparian stream condition (70% of optimum or better) to the year 2017.

3. Improve the riparian condition class on 3 miles of Snow Creek to 70% (from 1990 baseline data of 60%) within the short term (by 2001) and maintain excellent riparian stream condition (70% of optimum or better) to the year 2017.

4 Improve the riparian condition class on 8 miles of Donnelly Creek to 62% (from baseline 1989 data of 52%) within the short term (by 2001) and achieve excellent riparian stream condition (70% of optimum or better) to the year 2017.

5. Improve the riparian condition class on 8 miles of Colman Creek to 66% (from baseline 1991 data of 44%) within the short term (by 2001) and achieve excellent riparian stream habitat condition (70% of optimum or better) to the year 2017.

6. Improve the riparian condition class on 8 miles of Slumgullion Creek to 63% (from baseline 1990 data of 48%) within the short term (by 2001) and achieve excellent riparian stream habitat condition (70% of optimum or better) to the year 2017.

B. Sage Grouse:

Protect known sage grouse strutting and nesting habitat and improve brooding habitat by: (WL-1.Il)

1. Following Nevada Division Of Wildlife (NDOW) guidelines for Vegetal Control Programs in Sage Grouse Habitat in Nevada.

2. Maintain sagebrush canopy at 30% in sage grouse nesting areas where sagebrush does not exceed three (3) feet in height.

C. Desired Plant Community Objectives for Uplands and Meadows:

Rationale: The limiting factor for wildlife is forage vigor, quality, and cover, therefore, the objectives need to be vegetative ones. Livestock and wild horse objectives are for a sustainable yield of forage, which desired plant communities would account for.

Objectives for this allotment were based on ecological status inventory data. The seral stage of each vegetative community and it's potential was considered in conjunction with the wildlife, wild horse, and livestock use to develop desired plant community objectives, Short term objectives will be used to determine the progress each community is making toward it's desired stage. Key areas for all pastures will be established by an interdisciplinary team in key Ecological Sites.

## Summit Lake Pasture

### Resource Objectives

Key areas will be established by an interdisciplinary team in key Ecological Sites based on the desired plant community objective.

**Objective 1** **Short Term**

Increase the composition by weight the overall percentage of the following perennial grasses: AGSP, FEID, STTH2, ELCI2, POA++, STCO4, and SIHY from 28% to 35% on Ecological Site 023XY007 (Loamy 14-16") in Site Write-up Area (SWA) U044 by the year 2001. The aggregate of ELCI2, POA++, SIHY, and STCO4 can only make up 10% of the total composition.

**Long Term**

Within Ecological Site 023XY007 (Loamy 14-16") manage for the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 28% | 45% | 60% |
| FORBS | 7% | 10% | 10% |
| SHRUBS | 65% | 45% | 30% |

This objective should be achieved by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer habitat as described in BLM's 6630 Manual.

**Objective 2** **Short Term**

Maintain or increase perennial grasses at 45% composition by weight on Ecological Site 023XY017 (Claypan 14-16") in SWA U044 by the year 2001. These perennial grasses are FEID, AGSP, STTH2, POA++, SIHY, and ELCI2 with the aggregate of the latter three making up no more than 10% of the total composition.

**Long Term**

Within Ecological Site 023XY017 (Claypan 14-16") manage for a desired plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 45% | 55% | 65% |
| FORBS | 11% | 10% | 10% |
| SHRUBS | 44% | 35% | 25% |

This objective should be accomplished by the year 2017.

**Objective 3** **Short Term**

Increase FEID and AGSP each from 2% to 6% composition by weight on Ecological Site 023XY026 (Mahogany Savanna) in SWA U044 by the year 2010. Maintain PUTR2 above 10% and CELE3 at 22% composition by weight.

**Long Term**

Within Ecological Site 023XY026 (Mahogany Savanna) manage for a desired plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 23% | 30% | 40% |
| FORBS | Trace | 8% | 10% |
| SHRUBS | 77% | 62%* | 50 |

At least 25% must be CELE3 and 10% PUTR2.

This objective should be accomplished by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer habitat as described in BLM's 6630 Manual.

**Objective 4** **Short Term**

Maintain the existing plant community with 61% perennial grasses, 22% forbs, and 17% shrubs in Ecological Site 023XY013 (dry meadows) in SWA U044 by the year 2001.

**Long Term**

Within Ecological Site 023XY013 (dry meadows) in SWA U044 manage for the desired plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 61% | 65% | 80% |
| FORBS | 22% | 22% | 20% |
| SHRUBS | 17% | 13% | 0% |

Decrease the percent composition by weight of JUBA by increasing the percent composition by weight of PONE3 and HOBR. This objective should be achieved by 2017.

**Objective 5** **Short Term**

Maintain the existing plant community with 89% perennial grasses, 11% forbs, and 0% shrubs in Ecological Site 023XY025 (wet meadows) in SWA U202 by the year 2010.

**Long Term**

Within Ecological Site 023X025 (wet meadows) in SWA U202 manage for the desired plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 89% | 85% | 80% |
| FORBS | 11% | 15% | 20% |
| SHRUBS | 0% | 0% | 0% |

Decrease the percent composition by weight of Carex by increasing the percent composition by weight of DECE.

This objective should be achieved by 2017.

**Rationale**: The Summit Lake Pasture has been identified as yearlong bighorn sheep range ( BRBY-2, BRBY-4), mule deer summer range (BRDS-8), as well as a sage grouse strutting ground and brood use area. It is also used yearlong by wild horses and by cattle for 3 months. By achieving these objectives the vegetative communities would be meeting the needs of the mentioned wildlife, wild horses, and livestock.

**Warm Springs Pasture**

**Resource Objectives:**

Key areas will be established by an interdisciplinary team in key Ecological Sites based on the desired plant community objective.

**Objective 1** **Short Term**

Increase perennial grasses from 34% to 41% composition by weight on Ecological Site 023XY017 (Claypan 14-16") in SWA U125 by the year 2010. These perennial grasses are: AGSP, STTH2, POA++, SIHY, and FEID.

**Long Term**

Increase FEID from a trace to 7% composition by weight while managing for a desired plant community with the following percent composition by weight.

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 34% | 50% | 65% |
| FORBS | 8% | 10% | 10% |
| SHRUBS | 56% | 40% | 25% |

This objective should be completed by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer habitat as described in BLM's 6630 Manual.

**Objective 2** **Short Term**

Maintain the following perennial grasses: STTH2, SIHY, and POA++ at 46% composition by weight through the year 2001 on Ecological Site 023XY031 (Claypan 10-14") in SWA U174. Also try to get AGSP established on the site.

**Long Term**

Increase AGSP to 5% composition by weight, as it's potential on the site is 20 to 50% composition by weight. Establish a desired plant community consisting of the following vegetation:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 46% | 55% | 65% |
| FORBS | 12% | 12% | 10% |
| SHRUBS | 42% | 33% | 25% |

This objective should be achieved by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer habitat as described in BLM's 6630 Manual.

**Objective 3** **Short Term**

Increase AGSP from 9% to 13% and STTH2 from 8% to 12% composition by weight on Ecological Site 023XY039 (Loamy Slope 10-14") in SWA U125 by the year 2010.

**Long Term**

Manage for a desired plant community consisting of the following percent composition by weight within Ecological Site 023XY039 (Loamy Slope 10-14"):

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 35% | 50% | 65% |
| FORBS | 6% | 10% | 10% |
| SHRUBS | 52% | 40% | 25% |

This objective should be reached by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer habitat as described in BLM's 6630 Manual.

**Objective 4** **Short Term**

Increase AGSP, FEID, and STTH2 collectively, from 27% to 36% composition by weight on Ecological Site 023XY066 (Ashy Loam 12-14") in SWA U162 by the year 2010 while maintaining PUTR2 above 20% composition by weight.

**Long Term**

Within Ecological Site 023XY066 (Ashy Loam 12-14") manage for the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 33% | 43%* | 60% |
| FORBS | 2% | 8% | 10% |
| SHRUBS | 65% | 49%** | 30% |

*Must be at least 20 % FEID.
** Must be at least 20% PUTR2.

This objective should be achieved by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer habitat as described in BLM's 6630 Manual.

**Objective 5** **Short Term**

Maintain or increase FEID at 12% and increase AGSP from 2% to 5% composition by weight. Maintain PUTR2 at 9% composition; increase CELE3 from 3% to 6% composition by weight on Ecological Site 023XY026 (Mahogany Savanna) in SWA U161 by the year 2010.

**Long Term**

Manage for the following percent composition by weight on Ecological Site 023XY026 (Mahogany Savanna):

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 35% | 40%* | 40% |
| FORBS | 3% | 10% | 10% |
| SHRUBS | 54% | 50%** | 50% |

* Must be at least 15% FEID, 10% AGSP.
** Must be at least 9% CELE3, and 9% PUTR2.

This objective should be achieved by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer habitat as described in BLM's 6630 Manual.

**Objective 6 Short Term**

Maintain PONE3 at 12% and increase composition by weight for forbs from 8% to 11% with LUPIN making up no more than 5% composition by weight of the forbs in SWA U199 on Ecological Site 023XY013 (dry meadows) by the year 2010.

**Long Term**

Within Ecological Site 023xy013 (dry meadows) in SWA U199 manage for the desired plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 92% | 85% | 80% |
| FORBS | 8% | 15% | 20% |
| SHRUBS | 0% | 0% | 0% |

Increase composition by weight PONE3 from 12% to 15% in SWA U199 on Ecological Site 023XY013 (dry meadows) by the year 2017.

**Rationale**: This Warm Springs Pasture has been identified as pronghorn yearlong (BRPY-7) and summer range (BRPS-1, BRPS-8); mule deer yearlong (BRDY-3) and winter range (BRDW-4); and as a sage grouse brood use area. It is also used yearlong by wild horses/burros and by cows for three months a year.

**Calico Pasture**

**Resource Objectives:**

Key areas will be established by an interdisciplinary team in key Ecological Sites based on the desired plant community objective.

**Objective 1 Short Term**

Increase STTH2 from 9% to 12% composition by weight on Ecological Site 027XY079 (Gravelly Claypan 8-10") in SWA U063 by the year 2010.

**Long Term**

Within Ecological Site 027XY079 (Gravelly Claypan 8-10") manage for the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 25% | 32% | 45% |
| FORBS | 8% | 8% | 5% |
| SHRUBS | 67% | 60% | 50% |

This objective should be achieved by the year 2017. The shrub component still maximizes the potential of the site to provide quality antelope habitat as described in BLM's 6630 Manual.

**Objective 2** **Short Term**

Increase AGSP from 2% to 5% composition by weight on Ecological Site 023XY037 (Clay Slope 8-12") in SWA U109 by the year 2010.

**Long Term**

Manage for a desired plant community with the following percent composition by weight on Ecological Site 023XY037 (Clay Slope 8-12"):

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 26% | 36% | 70% |
| FORBS | 25% | 22% | 10% |
| SHRUBS | 41% | 42% | 20% |

Perennial grasses may include: AGSP- must be at least 8%, STTH2, POA++, SIHY, FEID. This objective should be achieved by the year 2017. The shrub component still maximizes the potential of the site to provide quality antelope habitat as described in BLM's 6630 Manual.

**Objective 3** **Short Term**

Increase FEID from 2% to 6% composition by weight while trying to establish AGSP on Ecological Site 023XY017 (Claypan 14-16") in SWA U042 by the year 2010.

**Long Term**

Manage for a desired plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 34% | 46% | 65% |
| FORBS | 28% | 20% | 10% |
| SHRUBS | 38% | 34% | 25% |

Perennial grasses include FEID, AGSP, POA++, STTH2, SIHY and other perennial grasses. This objective should be accomplished by 2017. The shrub component still maximizes the potential of the site to provide quality antelope habitat as described in BLM's 6630 Manual.

**Rationale**: The Calico Pasture has been identified as pronghorn antelope winter range (BRPW-1). Wild horses use this pasture yearlong and cows use it for one month (April 1 - April 30) for two years and then rest it for two years.

**Soldier Meadows Pasture**

**Resource Objectives:**

Key areas will be established by an interdisciplinary team in key Ecological Sites based on the desired plant community objective.

**Objective 1** **Short Term**

Increase composition by weight of AGSP from 31% to 36% on Ecological Site 023XY039 (loamy slope 10-14") in SWA U159 by the year 2010.

**Long Term**

Within Ecological Site 023XY039 (loamy slope 10-14") manage for the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 35% | 44% | 65% |
| FORBS | 7% | 10% | 10% |
| SHRUBS | 58% | 46% | 25% |

This objective should be achieved by the year 2017. The shrub component still maximizes the potential of the site to provide quality mule deer and antelope habitat as described in BLM's 6630 Manual.

**Objective 2** **Short Term**

Increase FEID and STTH2 collectively from 12% to 18% composition by weight on Ecological Site 023XY017 (claypan 14-16") in SWA U229 by the year 2010.

**Long Term**

Within Ecological Site 023XY017 (claypan 14-16") in SWA U229 manage for the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 23% | 35% | 65% |
| FORBS | 8% | 10% | 10% |
| SHRUBS | 69% | 55% | 25% |

This objective should be achieved by the year 2017.

**Objective 3** **Short Term**

Increase the composition by weight STTH2 from 1% to 6% on Ecological Site 024XY005 (loamy 8-10") in SWA U181 by the year 2010.

**Long Term**

Within Ecological Site 024XY005 (loamy 8-10") in SWA 181 manage for the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING %* | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 7% | 17% | 55% |
| FORBS | 3% | 5% | 5% |
| SHRUBS | 87% | 78% | 40% |

* The remaining 3% is comprised of BRTE.

This objective should be achieved by 2017.

**Objective 4** **Short Term**

Maintain or increase by weight the perennial grasses at 40% or higher on Ecological Site 023XY039 (loamy slope 10-14") in SWA U117 by 2010. The perennial grasses include AGSP and SIHY.

**Long Term**

Within Ecological Site 023XY039 (loamy slope 10-14") in SWA U117 manage for the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING %* | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 40% | 45% | 65% |
| FORBS | 7% | 10% | 10% |
| SHRUBS | 48% | 45% | 25% |

* The remaining 5% is comprised of BRTE.

This objective should be achieved by 2017.

**Objective 5** **Short Term**

Increase by weight the following perennial grasses: SIHY, STTH2, and POA++ collectively from 12% to 18% on Ecological Site 023XY037 (clay slope 8-12") in SWA U187 by 2010. Also try to establish AGSP on the site from the adjacent range sites.

**Long Term**

Within Ecological Site 023XY037 (clay slope 8-12") manage for the following Desired Plant Community while trying to establish AGSP on the site:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 12% | 25% | 70% |
| FORBS | 2% | 7% | 10% |
| SHRUBS | 86% | 68% | 20% |

This objective should be achieved by 2017.

**Objective 6 Short Term**

Increase by weight the perennial grasses from 5% to 8% and increase ARSPS5 from 4% to 10% on Ecological Site 024XY025 (loamy slope 5-8") in SWA U114 manage for the following Desired Plant Community:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 5% | 10% | 20% |
| FORBS | Trace | 5% | 5% |
| SHRUBS | 92% | 85% | 75% |

* The remaining 3% is comprised of BRTE.

This objective should be achieved by 2017.

**Objective 7 Short Term**

Maintain the existing plant community with 61% perennial grasses, 22% forbs, and 17% shrubs in Ecological Site 023XY013 (dry meadows) in SWA U201 by the year 2010.

**Long Term**

Within Ecological Site 023XY013 (dry meadows) in SWA U201 manage for the desired plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 61% | 65% | 80% |
| FORBS | 22% | 22% | 20% |
| SHRUBS | 17% | 13% | 0% |

Increase the percent by weight of the perennial grasses by 4%, while maintaining or decreasing the percent JUBA at 24%.

**Rationale:** The Soldier Meadows Pasture has been identified as pronghorn yearlong (BRPY-5) and winter (BRPW-6, BRPW-7); mule deer summer (BRDS-7, BRDS-5) and winter (BRDW-4); and bighorn sheep yearlong (BRBY-1, BRBY-2). It is also used yearlong by
wild horses and burros and cows for one month a year (April 1- April 30).

**Black Rock Pasture**

**Resource Objectives:**

Key areas will be established by an interdisciplinary team in key Ecological Sites based on the desired plant community objective.

**Objective 1 Short Term**

Increase ORHY, SIHY, and STSP3 from a trace to 3% composition by weight on Ecological Site 027XY018 (Gravelly Loam 4-8") in SWA U005 by the year 2010.

**Long Term**

Manage for a desired plant community with the following percent composition by weight on Ecological Site 027XY018 (Gravelly Loam 4-8").

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | Trace | 9% | 25% |
| FORBS | Trace | 3% | 5% |
| SHRUBS | 100% | 88% | 70% |

The perennial grasses may include ORHY, POSE, SIHY, and STSP3. This objective should be achieved by 2017.

**Objective 2** **Short Term**

Increase ORHY from 6% to 9% composition by weight on Ecological Site 027XY016 (Sodic Dunes) in SWA U004.

**Long Term**

Within Ecological Site 023XY016 (Sodic Dunes) manage for a plant community with the following percent composition by weight:

PERCENT COMPOSITION BY WEIGHT

| | EXISTING % | DESIRED % | POTENTIAL % |
|---|---|---|---|
| GRASSES | 16% | 20% | 35% |
| FORBS | Trace | 3% | 5% |
| SHRUBS | 84% | 77% | 65% |

Perennial grasses may include : ORHY- must be at least 12% composition, DISP3, ELCI2, and SIHY. This objective should be accomplished by the year 2017.

**Rationale**: The Black Rock Pasture has been identified as yearlong pronghorn antelope range (BRPY-5). It is used as a winter pasture by cattle (Jan. 1 - March 30) and it has wild horse use.

**Hot Springs Pasture**

**Resource Objectives**

Resource objectives, including livestock, wild horse and wildlife use will be addressed in the Soldier Meadows Activity Plan (SMAP).

# APPENDIX 5- USFWS 1993 BIOLOGICAL OPINION TERMS AND CONDITIONS FOR ALTERNATIVE 2

**Reasonable and Prudent Measures**

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize take:

1) Measures shall be taken to minimize mortality and injury of LCT and desert dace due to livestock and wild horse and burro grazing.

2) Measures shall be taken to minimize utilization levels of riparian vegetation along Mahogany, Summer Camp, and Snow Creeks and around desert dace springs.

3) Measures shall be taken to minimize destruction of LCT and desert dace habitat during wild horse and burro gathers.

**Terms and Conditions**

The service hereby incorporates the following measures, proposed by the Bureau, as terms and conditions, which implement the reasonable and prudent measures described above. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the anticipated incidental take that may result from the proposed action. In order to be exempt from the prohibitions of section 9 of the Act, the Bureau must comply with these terms and conditions.

1) To implement Reasonable and Prudent Measure number 1, the following terms and conditions shall be implemented:

   a. Pastures with LCT spawning habitat shall not be grazed during the spawning season.

   b. Grazing of the Hot Springs pasture shall occur only during the late fall/early winter when streambanks are more likely to freeze, thus minimizing mechanical damage from livestock hooves.

   c. When the LCT Recovery Plan is approved, the Bureau shall adopt the recovery plan objectives for riparian vegetation and streambank conditions.

2) To implement Reasonable and Prudent Measure number 2, the following terms and conditions shall be implemented:

   a. No grazing shall occur in any portion of the Summit Lake Pasture until all range improvements (drift fences, exclosure fences, water developments, etc.) are completed.

b. No grazing shall occur in the Stanley Camp sub pasture of the Summit Lake pasture unless riparian condition class in Summer Camp, Snow, and Mahogany Creeks (outside exclosure) is at excellent condition (70 percent of optimum or above).

c. There shall be no authorized grazing within the Mahogany Creek exclosure.

d. Herding shall be required for all pastures, and the Bureau shall provide a resource specialist for the Summit Lake Pasture to monitor utilization and ensure intensive herding occurs at all times livestock graze the Stanley Camp sub pasture. If a rider is not present or a Bureau resource specialist is not available for the Summit Lake pasture, livestock shall not be turned out or shall be removed immediately. (For pastures with riparian habitat, other than the Summit Lake pasture, a range rider should be present at least 80 percent of the time a pasture is grazed, as required on the adjacent Sheldon Wildlife Refuge).

e. Mahogany, Summer Camp, and Snow Creeks' grasses and grass-like plants shall have a minimum stubble height of 6 inches when cows leave the pasture, and aspen and willow utilization shall not exceed 30 percent. A 4-inch stubble height for grass and grass-like plants shall apply for Colman, Slumgullion, and Donnelly Creeks when cows leave the pasture.

f. Livestock shall only be allowed to trail across pastures not scheduled for use for a maximum of 3 days and trailing routes shall avoid riparian areas.

g. For adjacent pastures where utilization levels or residual vegetation heights have not been exceeded, gates may be opened a week before the scheduled move date to facilitate livestock drift into the new pasture. Within 1 week after the move date, all remaining cows shall be moved and the gate shut. If livestock have to be moved due to other criteria, all shall be removed within 1 week and excluded from that area for the remainder of the grazing period.

h. Salt and/or mineral blocks shall not be placed within 1-quarter mile of springs, streams, meadows, riparian areas, or aspen stands; nor within 1-half mile of springs containing desert dace.

i. If livestock cannot be kept out of desert dace habitat through riding, then a pasture fence or appropriate alternative technique shall be evaluated and implemented.

j. A wild horse and burro gather shall occur during the winter of 1993-1994 and wild horse and burro AMLs shall be achieved over 6 years using two gather cycles.

3) To implement Reasonable and Prudent Measure number 3, the following term and condition shall be implemented.

Wild horse and burro gathers shall avoid desert dace and LCT habitat and shall take place when the ground is frozen to minimize effects of trampling, machinery and ground crews.

# APPENDIX 6 – STATE OF NEVADA'S CLASS A STANDARDS (NAC 445A.124)

***Description; beneficial uses; quality standards.***

*1. Class A waters include waters or portions of waters located in areas of little human habitation, no industrial development or intensive agriculture and where the watershed is relatively undisturbed by man's activity.*

*2. The beneficial uses of class A waters are municipal or domestic supply, or both, with treatment by disinfection only, aquatic life, propagation of wildlife, irrigation, watering of livestock, recreation including contact with the water and recreation not involving contact with the water.*

*3. The quality standards for class A waters are:*

| | ***Specifications*** |
|---|---|
| *(a) Floating solids, sludge deposits, tastes or odor-producing substances.* | *None attributable to man's activities.* |
| *(b) Sewage, industrial wastes or other wastes.* | *None.* |
| *(c) Toxic materials, oils, deleterious substances, colored or other wastes.* | *None.* |
| *(d) Settleable solids.* | *Only amounts attributable to man's activity which will not make the waters unsafe or unsuitable as a drinking water source or which will not be detrimental to aquatic life or for any other beneficial use established for this class.* |
| *(e) pH.* | *Range between 6.5 to 8.5.* |
| *(f) Dissolved oxygen.* | *Must not be less than 6.0 milligrams/liter.* |
| *(g) Temperature.* | *Must not exceed 20°C. Allowable temperature increase above natural receiving water temperature: None.* |

| | |
|---|---|
| *(h) Fecal coliform.* | *The fecal coliform concentration, based on a minimum of 5 samples during any 30 day period, must not exceed a geo-metric mean of 200 per 100 milliliters nor may more than 10 percent of total samples during any 30 day period exceed 400 per 100 milliliters.* |
| *(i) Total phosphate.* | *Must not exceed 0.15 mg/l in any stream at the point where it enters any reservoir or lake, nor 0.075 mg/l in any reservoir or lake, nor 0.30 mg/l in streams and other flowing waters.* |
| *(j) Total dissolved solids.* | *Must not exceed 500 mg/l or one-third above that characteristic of natural conditions (whichever is less).* |

# APPENDIX 7 – USFWS SPECIES LIST FOR THE SMA

**File No. 1-5-03-SP-098**

**Threatened Species**

| | |
|---|---|
| **Fish** | |
| Desert Dace | *Eremichthys acros* |
| Lahontan cutthroat trout | *Oncorhynchus clarki henshawi* |

**Candidate Species**

| | |
|---|---|
| **Bird** | |
| Western yellow-billed cuckoo | *Coccyzus americanus* |
| **Invertebrate** | |
| Elongate Mud Meadows springsnail | *Pyrgulopsis notidicola* |
| **Plant** | |
| Soldier Meadow cinquefoil | *Potentilla basaltica* |

**Species of Concern**

| | |
|---|---|
| **Mammals** | |
| Pygmy rabbit | *Brachylagus idahoensis* |
| Pale Townsend's big-eared bat | *Corynorhinus townsendii pallescens* |
| Pacific Townsend's big-eared bat | *Corynorhinus townsendii townsendii* |
| Spotted bat | *Euderma maculatum* |
| Small-footed myotis | *Myotis ciliolabrum* |
| Long-eared myotis | *Myotis evotis* |
| Fringed myotis | *Myotis thysanodes* |
| Long-legged myotis | *Myotis volans* |
| Yuma myotis | *Myotis yumanensis* |
| California bighorn sheep | *Ovis canadensis californiana* |
| Preble's shrew | *Sorex preblei* |
| **Birds** | |
| Northern goshawk | *Accipiter gentiles* |
| Western burrowing owl | *Athene cunicularia hypugea* |
| Sage grouse | *Centrocercus urophasianus* |
| Black tern | *Childonias niger* |
| Least bittern | *Ixobrychus exilis hesperis* |
| White-faced ibis | *Plegadis chihi* |

**Invertebrate**

| | |
|---|---|
| Unnamed springsnail | *Pyrgulopsis gibba* |
| Northern Soldier Meadow pyrg | *Pyrgulopsis militaris* |
| Southern Soldier Meadow pyrg | *Pyrgulopsis umbilicata* |
| Squat Mud Meadow pyrg | *Pyrgulopsis limaria* |

**Plants**

| | |
|---|---|
| Tiehm milkvetch | *Astragalus tiehmii* |
| Schoolcraft cryptantha | *Cryptantha schoolcraftii* |
| Windloving buckwheat | *Eriogonum anemophilum* |
| Crosby buckwheat | *Eriogonum crosbyae* |
| Grimy ivesia | Ivesia rhypara var. rhypara |
| Smooth stickleaf | Mentzelia mollis |

# APPENDIX 8 – STREAM SURVEY PARAMETERS & DISCUSSION (INCLUDING FUNCTIONALITY DESCRIPTIONS)

**Pool measure (PM)** is a rating derived from the pool to riffle ratio of a given reach. Studies indicate that the optimum pool to riffle ratio for salmonid production and over-winter survival is approximately 1:1 (Nickelson et al. 1992). This ratio allows for optimal resting habitat while in close proximity to feeding habitats. PM is rated 100% if the pool to riffle ratio is 1:1 using the GAWS protocols.

**Pool Structure (PS)** is a rating based on the quality of a given pool. The quality rating is derived from a pool's size, depth, and availability of cover. These factors are important in determining whether a pool is optimal, marginal, or poor habitat for salmonids, due to its ability to provide forms of refugia. Refugia can be described as anything that provides security to a species, such as turbulent flows, undercut banks, deep water, dense overhanging vegetation, or a variety of in-stream materials. As salmonids grow larger they require various forms of cover (Balz et al. 1991), which represents one of the most important aspects of a salmonid's life. Cover yields security and visual isolation, which is important to the survival of young salmonids. Studies have shown that salmonids spent over 90% of their time utilizing cover (Hunter 1991, Young 1995, Kershner et al. 1997). Cover is a necessary habitat component for trout to mature and survive in the aquatic biota. Both pool volume and overhead cover have been found to be important for salmonid survival during winter within all age classes (Chapman and Knudson 1980). Furthermore, cover is an important component of reproductive habitat quality and reproductive success (Bjornn and Reiser 1991).

**Streambottom (SB)** is derived from the composition of the reaches' substrate, which is composed of those materials found to be beneficial to cold-water aquatics. Optimum substrate composition can be characterized as being relatively silt-free with a complexity of substrate sizes, which includes rubble and gravel. Shifts to a sand/silt substrate can occur as a result of anthropogenic influences or catastrophic event within a watershed. Elevated turbidities and benthic sedimentation can have detrimental effects on an aquatic community. Sedimentation and increased turbidity levels have been shown to cause decreased reproduction and reduced foraging efficiency in salmonids (Marschall and Crowder 1996, Davies and Nelson 1993, Waters 1995, Sweka and Hartman 2001), reduced macroinvertebrate abundance and diversity (Waters 1995, Hartman et al. 1996), and to alter stream geomorphology (Alexander and Hansen 1986). Embryo survival in salmonids has been shown to be reduced to less than 25% when spawning redds are infiltrated by 30% of fine sediment (<6.35mm)(see Bjornn and Reiser 1991). In addition, successful emergence of fry after hatching has been shown to be less than 15% when redds are infiltrated with fines ranging from 2-6.4mm in diameter (see Bjornn and Reiser 1991). By reducing reproductive rates, fish populations are more susceptible to population declines by a catastrophic event, such as a drought, fire, or flood. Macroinvertebrate declines caused by the filling of interstitial spaces can further impact the aquatic system, since their condition affects the entire food web from the bottom up.

**Bank Cover (BC)** is derived using the riparian vegetative community composition and density within a reach, based on a numerical rating scale. Bank cover (i.e. riparian vegetation) affects the aquatic community in a number of ways. Reduced canopy cover has been shown to cause increased thermal variability and to reduce thermal refugia for aquatic species (Platts and Nelson 1989a, Brown and Krygier 1970), which can be detrimental to the aquatic community. This insulating effect protects the aquatic system from extreme temperatures in both summer and winter. It is also critical to protecting streambanks from freeze-thaw fractures (Bohn 1989) and subsequent mass erosion events during spring runoff periods. The insulating effect of riparian vegetation is necessary for the maintenance of the aquatic ecosystem at the watershed scale, since the effects of extreme temperatures on in-stream habitats can fragment reaches and increase seasonal mortality of aquatic species.

**Bank Soil Stability (BSS)** and **Bank Vegetation Stability (BVS)** are derived using a rating system, which is based on the percentage of the streambank within a reach that are stable and the amount of vegetative soil cover and type of bank material present, respectively. As stated in the SB section, erosion and the subsequent effects of sedimentation and turbidity levels can be detrimental to aquatic communities.

The **Habitat Condition Index (HCI)** value attempts to qualify the overall condition of a given stream habitat based on the extrapolation of reach based information to the watershed. The conditions of the above described parameters cumulatively affect aquatic habitat conditions within a watershed. Since stream habitat quality for cold-water aquatic species is based on the conditions of a variety of habitats and the connectivity of these habitats, it is important to determine the level of cumulative impacts occurring within a system. Cumulative impacts on fish and other aquatic species, such as sedimentation, loss of undercut banks, loss of canopy cover, degradation of the stream channel, increased turbidity, increased nutrients, soil compaction, loss of flora diversity, and reduced sediment capture ability often result from livestock use within the streamside riparian zone (Meehan et al. 1977, Stuber 1985, Bjornn and Reiser 1991, Clary and Webster 1989, 1990a, 1990b, Murphy and Meehan 1991, Armour et al. 1994, Waters 1995). The maintenance of good to excellent aquatic habitat at the watershed scale is important since fish require different physical habitats, spatial heterogeneity and the connectivity of habitat patches for the completion of their life cycles (Bisson et al. 1982). Furthermore, the maintenance of watershed connectivity has become a major issue in the recovery of Lahontan cutthroat trout, other salmonid species, and aquatic biodiversity; since fragmentation eliminates the ecological, genetic, and demographic dispersion of a population (see Zwick 1992, Vinyard and Dunham 1994).
Therefore by maintaining optimal aquatic habitats throughout a watershed the potential for a population or for an important habitat component to become isolated is significantly reduced.

**Ungulate Damage (UD)** is determined by assessing the percent of a reach that exhibits ungulate induced streambank damage. This factor is very important since livestock impacts on channel morphology and stream margins can dramatically affect the quality of aquatic habitat for cold-water aquatics. The removal of riparian vegetation reduces bank stability causing increased hoof shear and bank slough (Clary and Webster 1989), which increases bank angle and water width while reducing water depth (Platts 1990). Hoof shearing and mechanical damage on the streambanks increases erosion and stream sedimentation (see Powell et al. 2000, Pfankuch 1978, Hayslip 1993, Platts et al. 1987, Montana Working Group 1998, Thompson et al. 1998, Bengeyfield and Svoboda 1998, Hockett and Roscoe 1994). According to the authors, the amount of unaltered streambank necessary for channel maintenance ranged from 70-100 percent stable banks. Thus a 30 percent altered streambank (natural and unnatural) appears to be the maximum allowable amount for streambank maintenance. Improper or unmanaged grazing within the riparian-stream ecosystem can lead to an imbalance between the aquatic ecosystem, riparian zone, and watershed (Debano and Schmidt 1989), therefore it is important to monitor the direct impacts livestock have on stream systems.

Evaluations of streambank condition and stability are conducted during the stream survey protocol and also using a stand alone streambank alteration protocol. These data are used to evaluate impacts from livestock and wild ungulates on stream morphology. The degree of morphological impacts can also be determined using a reach's sensitivity to disturbance and recovery potential using its Rosgen channel type (Rosgen 1996). Riparian structure and function can be evaluated using several techniques, one of which is the Bureau's Riparian Functionality Assessment.

## Riparian Functionality Assessment

**Properly Functioning Condition (PFC)** - a riparian wetland area is considered to be in properly functioning condition when adequate vegetation, landform, or large woody debris is present to :

- Dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality
- Filter sediment, capture bedload, and aid floodplain development
- Improve flood-water retention and ground-water recharge
- Develop root masses that stabilize streambanks against cutting action
- Develop diverse ponding and channel characterstics to provide the habitat and water depth, duration, and temperature necessary, for fish production, waterfowl breeding, and other uses
- Support greater biodiversity

**Functional-At Risk (FAR)** - Riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

**Nonfunctional (NF)** - Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality, etc.

# APPENDIX 9 - ACRONYM LIST

| | |
|---|---|
| AE | Allotment Evaluation |
| AML | Appropriate Management Level |
| AUM | Animal Unit Month |
| BA | Biological Assessment |
| BLM | Bureau of Land Management |
| BO | Biological Opinion |
| BRHRNCA | Black Rock High Rock National Conservation Area |
| CFR | Code of Federal Regulations |
| CFS | Cubic feet per second |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EPA | Environmental Protection Act |
| ESA | Endangered Species Act |
| ESI | Ecological Site Inventory |
| FAR | Functional – At Risk |
| FONSI | Finding on No Significant Impacts |
| GAWS | General Aquatic Wildlife Survey |
| GIS | Geographic Information System |
| HMA | Herd Management Area |
| ISA | Instant Study Area |
| LCT | Lahontan cutthroat trout |
| LLC | Limited Liability Corporation |
| MASR | Management Action Selection Report |
| MUD | Multiple Use Decision |
| NAC | Nevada Administrative Code |
| NCA | National Conservation Area |
| NDEP | Nevada Department of Environmental Protection |
| NDOW | Nevada Division of Wildlife |
| NEPA | National Environmental Policy Act |
| NF | Not Functional |
| NHPA | National Historic Preservation Act |
| NRS | Nevada Revised Statutes |
| PFC | Properly Functioning Condition |
| RA | Resource Area |
| RFFA | Reasonable Foreseeable Future Action |
| SHPO | State Historic Preservation Office |
| SMA | Soldier Meadows Allotment |

| | |
|---|---|
| T&C | Terms and Conditions |
| T&E | Threatened & Endangered |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| WSA | Wilderness Study Area |

# APPENDIX 10- NEO-TROPICAL BIRD SPECIES (43 CFR 10.13)

**Neotropical Birds**

The following bird list contains 245 species of neotropical birds, which may be seen in the planning area. Not all birds listed are common in the planning area, some only occur on rare occasions.

| Common Names | Scientific Name |
|---|---|
| **Loons** | |
| Common Loon | *Gavia immer* |
| **Grebes** | |
| Eared Grebe | *Podiceps nigricollis* |
| Western Grebe | *Aechmophorus occidentalis* |
| Pied-billed Grebe | *Podilymbus podiceps* |
| Horned Grebe | *Podiceps auritus* |
| **Pelicans and Cormorants** | |
| White Pelican | *Pelecanus erythrorhynchos* |
| Double-crested Cormorant | *Phalacrocorax auritus* |
| **Herons, Bitterns, Ibises, Egrets** | |
| Great Blue Heron | *Ardea herodias* |
| Black-crowned Night Heron | *Nycticorax nycticorax* |
| Green-backed Heron | *Butorides striatus* |
| White-faced Ibis | *Plegadis chihi* |
| Great Egret | *Casmerodius albus* |
| Snowy Egret | *Egretta thula* |
| American Bittern | *Botaurus lentiginosus* |
| Least Bittern | *Ixobrychus exilis* |
| **Waterfowl** | |
| Whistling Swan | *Cygnus columbianus* |
| Canada Goose | *Branta canadensis* |
| White-fronted Goose | *Anser albifrons* |
| Snow Goose | *Chen caerulescens* |
| Ross' Goose | *Chen rossii* |
| Black Brant | *Branta nigricans* |
| Mallard Duck | *Anas platyrhynchos* |
| Gadwall Duck | *Anas strepera* |
| Pintail Duck | *Anas acuta* |
| Green-winged Teal | *Anas crecca* |
| Blue-winged Teal | *Anas discors* |
| Cinnamon Teal | *Anas cyanoptera* |
| Shoveler | *Anas clypeata* |

| | |
|---|---|
| Wood Duck | *Aix sponsa* |
| Fluvous Duck | *Dendrocygna bicolor* |
| Redhead | *Aythya americana* |
| Canvasback Duck | *Aythya valisineria* |
| Greater Scaup | *Aythya marila* |
| Lesser Scaup | *Aythya affinis* |
| Common Goldeneye | *Bucephala clangula* |
| Barrow's Goldeneye | *Bucephala islandica* |
| Bufflehead | *Bucephala albeola* |
| Ruddy Duck | *Oxyura jamaicensis* |
| Common Merganser | *Mergus merganser* |
| Red-breasted Merganser | *Mergus serrator* |
| Hooded Merganser | *Lophodytes cucullatus* |
| American Widgeon | *Anas americana* |
| Eurasian Widgeon | *Anas penelope* |
| Ring-necked Duck | *Aythya collaris* |
| Oldsquaw | *Clangula hyemalis* |
| White-winged Scoter | *Melanitta fusca* |
| Surf Scoter | *Melanitta perspicillata* |

**Vultures, Hawks, and Falcons**

| | |
|---|---|
| Turkey Vulture | *Cathartes aura* |
| Sharp-shinned Hawk | *Accipiter striatus* |
| Cooper's Hawk | *Accipiter cooperii* |
| Red-tailed Hawk | *Buteo jamaicensis* |
| Swainson's Hawk | *Buteo swainsoni* |
| Rough-legged Hawk | *Buteo lagopus* |
| Ferruginous Hawk | *Buteo regalis* |
| Marsh Hawk | *Circus cyaneus* |
| Pigeon Hawk | *Falco columbarius* |
| Sparrow Hawk | *Falco sparverius* |
| Prairie Falcon | *Falco mexicanus* |
| Peregrine Falcon | *Falco peregrinus* |
| Golden Eagle | *Aquila chrysaetos* |
| Bald Eagle | *Haliaeetus leucocephalus* |
| Goshawk | *Accipiter gentilis* |
| Osprey | *Pandion haliaetus* |

**Cranes, Rails, and Gallinules**

| | |
|---|---|
| Greater Sandhill Crane | *Grus canadensis* |
| Virginia Rail | *Rallus limicola* |
| Sora Rail | *Porzana carolina* |
| American Coot | *Fulica americana* |
| Common Gallinule | *Gallinula chloropus* |

**Shorebirds**

| | |
|---|---|
| Mountain Plover | *Charadrius montanus* |
| Semipalmated Plover | *Charadrius semipalmatus* |
| Snowy Plover | *Charadrius alexandrinus* |
| Black-bellied Plover | *Pluvialis squatarola* |
| Ruddy Turnstone | *Arenaria interpres* |
| Kildeer | *Charadrius vociferus* |
| Common Snipe | *Gallinago gallinago* |
| Long-billed Curlew | *Numenius americanus* |
| Spotted Sandpiper | *Actitis macularia* |
| Solitary Sandpiper | *Tringa solitaria* |
| Baird Sandpiper | *Calidris bairdii* |
| Least Sandpiper | *Calidris minutilla* |
| Western Sandpiper | *Calidris mauri* |
| Stilt Sandpiper | *Calidris himantopus* |
| Willet | *Catoptrophorus semipalmatus* |
| Red Knot | *Calidris canutus* |
| Greater Yellowlegs | *Tringa melanoleuca* |
| Lesser Yellowlegs | *Tringa flavipes* |
| Dunlin | *Calidris alpina* |
| Long-billed Dowitcher | *Limnodromus scolopaceus* |
| Short-billed Dowitcher | *Limnodromus griseus* |
| Marbled Godwit | *Limosa fedoa* |
| Sanderling | *Calidris alba* |
| American Avocet | *Recurvirostra americana* |
| Black-necked Stilt | *Himantopus mexicanus* |
| Wison's Phalarope | *Phalaropus tricolor* |
| Red-necked Phalarope | *Phalaropus lobatus* |

**Gulls, Tern, and Murrelets**

| | |
|---|---|
| Herring Gull | *Larus argentatus* |
| California Gull | *Larus californicus* |
| Ring-billed Gull | *Larus delawarensis* |
| Bonapart's Gull | *Larus philadelphia* |
| Heermann's Gull | *Larus heermanni* |
| Forester's Tern | *Sterna forsteri* |
| Caspian Tern | Sterna caspia |
| Black Tern | *Chlidonias niger* |
| Ancient Murrelet | *Synthliboramphus antiquus* |

**Dove**

| | |
|---|---|
| Mourning Dove | *Zenaida macroura* |

**Owls**

| | |
|---|---|
| Barn Owl | *Tyto alba* |
| Great Horned Owl | *Bubo virginianus* |
| Screech Owl | *Otus kennicottii* |
| Burrowing Owl | *Athene cunicularia* |
| Long-eared Owl | *Asio otus* |
| Short-eared Owl | *Asio flammeus* |
| Pigmy Owl | *Glaucidium gnoma* |
| Saw-whet Owl | *Aegolius acadicus* |
| Flammulated Owl | *Otus flammeolus* |

**Goatsuckers**

| | |
|---|---|
| Poor-will | *Phalaenoptilus nuttallii* |
| Common Nighthawk | *Chordeiles minor* |

**Swifts**

| | |
|---|---|
| Black Swift | *Cyseloides niger* |
| White-throated Swift | *Aeronautes saxatalis* |
| Vaux's Swift | *Chaetura vauxi* |

**Hummingbirds**

| | |
|---|---|
| Broad-tailed Hummingbird | *Selasphorus platycercus* |
| Rufous Hummingbird | *Selasphorus rufus* |
| Calliope Hummingbird | *Stellula calliope* |
| Black-chinned Hummingbird | *Archilochus alexandri* |

**Kingfisher**

| | |
|---|---|
| Belted Kingfisher | *Ceryle alcyon* |

**Woodpeckers**

| | |
|---|---|
| Red-shafted Flicker | *Colaptes cafer* |
| Yellow-shafted Flicker (Northern) | *Colaptus auratus* |
| Lewis' Woodpecker | *Melanerpes lewis* |
| Hairy Woodpecker | *Picoides villosus* |
| Downy Woodpecker | *Picoides pubescens* |
| William's Sapsucker | *Sphyrapicus thyroideus* |
| Yellow-bellied Sapsucker | *Sphyrapicus varius* |

**Flycatchers**

| | |
|---|---|
| Cassin's Kingbird | *Tyrannus voriferans* |
| Western Kingbird | *Tyrannus verticalis* |
| Eastern Kingbird | *Tyrannus tyrannus* |
| Black Phoebe | *Sayornis nigricans* |
| Say's Phoebe | *Sayornis saya* |
| Ash-throated Flycatcher | *Myiarchus cinerascens* |
| Gray Flycatcher | *Empidonax wrightii* |

| | |
|---|---|
| Trail's Flycatcher(Willow) | *Empidonax trailii* |
| Western Flycatcher | *Empidonax difficilis* |
| Hammond Flycatcher | *Empidonax hammondii* |
| Dusky Flycatcher | *Empidonax oberholseri* |
| Olive-sided Flycatcher | *Contopus borealis* |
| Western Wood Pewee | *Contopus sordidulus* |

**Larks and Swallows**

| | |
|---|---|
| Horned Lark | *Eremophila alpestris* |
| Violet-green Swallow | *Tachycineta thalassina* |
| Tree Swallow | *Tachycineta bicolor* |
| Bank Swallow | *Riparia riparia* |
| Rough-winged Swallow | *Stelgidopteryx serripennis* |
| Cliff Swallow | *Hirundo pyrrhonota* |
| Barn Swallow | *Hirundo rustica* |

**Jays, Magpies, and Crows**

| | |
|---|---|
| Scrub Jay | *Aphelocoma coerulescens* |
| Pinyon Jay | *Gymnorhinus cyanocephalus* |
| Steller's Jay | *Cyanocitta stelleri* |
| Black-billed Magpie | *Pica pica* |
| Common Raven | *Corvus corax* |
| Common Crow | *Corvus brachyrhynchos* |
| Clark's Nutcracker | *Nucifraga columbiana* |

**Chickadees and Bushtits**

| | |
|---|---|
| Mountain Chickadee | *Parus gambeli* |
| Black-capped Chickadee | *Parus atricapillus* |
| Common Bushtit | *Psaltriparus minimus* |
| Plain Titmouse | *Parus inornatus* |

**Nuthatches**

| | |
|---|---|
| Red-breasted Nuthatch | *Sitta canadensis* |
| White-breasted Nuthatch | *Sitta carolinensis* |

**Dippers and Wrens**

| | |
|---|---|
| Dipper | *Cinclus mexicanus* |
| House Wren | *Troglodytes aedon* |
| Bewick's Wren | *Thryomanes bewickii* |
| Long-billed Marsh Wren | *Cistothorus palustris* |
| Rock Wren | *Salpinctes obsoletus* |
| Winter Wren | *Toglodytes troglodytes* |
| Canyon Wren | *Catherpes mexicanus* |

**Thrashers**

| | |
|---|---|
| Sage Thrasher | *Oreoscoptes montanus* |
| Mockingbird | *Mimus polyglottos* |

**Thrushes**

| | |
|---|---|
| Robin | *Turdus migratorius* |
| Varied Thrush | *Ixoreus naevius* |
| Hermit Thrush | *Catharus guttatus* |
| Swainson's Thrush | *Catharus ustulatus* |
| Western Bluebird | *Sialis mecicana* |
| Mountain Bluebird | *Sialis currucoides* |
| Townsend's Solitaire | *Myadestes townsendi* |

**Kinglets, Gnatcatchers, and Pipets**

| | |
|---|---|
| Ruby-crowned Kinglet | *Regulus calendula* |
| Golden-crowned Kinglet | *Regulus satrapa* |
| Blue-gray Gnatcatcher | *Polioptila caerulea* |
| Witer Pipet | *Anthus spinoletta* |

**Waxwings**

| | |
|---|---|
| Cedar Waxwing | *Bombycilla cedrorum* |
| Bohemian Waxwing | *Bombycilla garrulus* |

**Shrikes**

| | |
|---|---|
| Northern Shrike | *Lanius excubitor* |
| Loggerhead Shrike | *Lanius ludovicianus* |

**Vireos**

| | |
|---|---|
| Warbling Vireo | *Vireo gilvus* |
| Solitary Vireo | *Vireo solitarius* |

**Warblers**

| | |
|---|---|
| Orange-crowned Warbler | *Vermivora celata* |
| Yellow Warbler | *Dendroica petechia* |
| Black-throated Blue Warbler | *Dendroica caerulescens* |
| Black-throated Gray Warbler | *Dendroica nigrescens* |
| Myrtle Warbler (Yellow-rumped) | *Dendroica coronata* |
| MacGilliivray's Warbler | *Oporonis tolmiei* |
| Wislon's Warbler | *Wilsonia pusilla* |
| Nashville Warbler | *Vermivora ruficapilla* |
| Virginia Warbler | *Vermivora virginiae* |
| Townsend's Warbler | *Dendroica townsendi* |
| Hermit Warbler | *Dendroica occidentalis* |
| Yellow-throated Warbler | *Dendroica dominica* |
| Yellow-breasted Chat | *Icteria virens* |

**Blackbirds and Orioles**

| | |
|---|---|
| Western Meadowlark | *Sturnella neglecta* |
| Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| Red-winged Blackbird | *Agelaius phoeniceus* |
| Tricolored Blackbird | *Agelaius tricolor* |
| Brewer's Blackbird | *Euphagus cyanocephalus* |
| Brown-headed Cowbird | *Molothrus ater* |
| Common Grackle | *Quiscalus quiscula* |
| Northern Oriole | *Icterus galbula* |

**Tanager**

| | |
|---|---|
| Western Tanager | *Piranga ludoviciana* |

**Grosbeak, Finches, Sparrows, Buntings**

| | |
|---|---|
| Black-headed Grosbeak | *Pheucticus melanocephalus* |
| Blue Grosbeak | *Guiraca caerulea* |
| Evening Grosbeak | *Coccothraustes vespertinus* |
| Pine Grosbeak | *Pinicola enucleator* |
| Cassin's Finch | *Carpodacus cassinii* |
| House Finch | *Carpodacus mexicanus* |
| Black Rosy Finch | *Leucosticte atrata* |
| American Goldfinch | *Carduelis tristis* |
| Lesser Goldfinch | *Carduelis psaltria* |
| Pine Siskin | *Carduelis pinus* |
| Red Crossbill | *Loxia curvirostra* |
| Green-tailed Towhee | *Pipilo chlorurus* |
| Rufous-sided Towhee | *Pipilo erythrophthalmus* |
| Savannah Sparrow | *Passerculus sandwichensis* |
| Vesper Sparrow | *Pooecetes gramineus* |
| Lark Sparrow | *Chondestes grammacus* |
| Black-throated Sparrow | *Amphispiza bilineata* |
| Sage Sparrow | *Amphispiza belli* |
| Chipping Sparrow | *Spizella passerina* |
| Brewer's Sparrow | *Spizella breweri* |
| White-crowned Sparrow | *Zonotrichia leucophrys* |
| Fox Sparrow | *Passerella iliaca* |
| Grasshopper Sparrow | *Ammodramus savannarum* |
| Harris' Sparrow | *Onotrichia querula* |
| Lincoln's Sparrow | *Melospiza lincolnii* |
| Tree Sparrow | *Spizella arborea* |
| Song Sparrow | *Melosipza melodia* |
| Dark-eyed Junco | *Junco hyemalis* |
| Lark Bunting | *Calamospiza melanocorys* |
| Lazuli Bunting | *Passerina amoena* |
| Common Redpoll | *Carduelis flammea* |

# APPENDIX 11 – LITERATURE CITED


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# GLOSSARY

ACEC – Area of Critical Environmental Concern; type of special land use designation specified within the Federal Land Policy and Management Act (FLPMA).

AUM – Animal Unit Month; the amount of forage required to sustain one cow and calf for one month.

BLM - Bureau of Land Management; government agency with the mandate to manage Federal lands under its jurisdiction for multiple uses.

Candidate Species – Any species included in the Federal Register Notice of Review that are being considered for listing as threatened or endangered by the U. S. Fish and Wildlife Service.

CFR – Code of Federal Regulations; government publication listing all Federal regulation in existence.

Cherrystemmed-A term used by BLM to decribe narrow linear areas, usually roads or routes, which intrude into an area surrounded by a wilderness or wilderness study area but which are not part of the wilderness or wilderness study area.

Cumulative Impacts – The impact that results from identified actions when they are added to other past, present, present and reasonably foreseeable future actions, regardless of who undertakes these actions. Such impacts can result from individually minor, but collectively significant actions occurring over a period of time.

Endangered Species – Any species defined under the endangered Species Act as being in danger of extinction throughout all or a significant portion of its range. Listing are published in the Federal Register.

EA – Environmental Assessment; one type of document prepared by Federal agencies in compliance with the National Environmental Policy Act (NEPA) which portrays the environmental consequences of proposed Federal actions which are not expected to have significant impacts on the human environment.

Fluvial- Flowing as in streams, or of streams

HMA – (Wild Horse/Burro) Herd Management Area; public land under the jurisdiction of the Bureau of Land Management that has been designated for special management emphasizing the maintenance of an established wild horse herd.

Lacustrine- Refers to lakes and aspects of lakes

Lacustrine Habitat – Riparian areas that are permanently flooded lakes and reservoirs, and both seasonally and intermittently flooded lakes; typically extensive areas of deep water with extensive wave action.

Lentic Habitat – Riparian areas with low flows or standing water habitats such as lakes, ponds, seeps, bogs and meadows.

Lotic Habitat – running water habitat such as rivers, streams and springs.

Midden – A organic archeological deposit marking a former habitation site it might contain such artifacts as bone, food products, charcoal, ash, etc.

Monitoring and Evaluation – The collection and analysis of data used to evaluate the progress and effectiveness of on-the-ground actions in meeting resource management goals and objectives.

NEPA – National Environmental Policy Act of 1969; law requiring all Federal agencies to evaluate the impacts of proposed major Federal actions with respect to their significance on the human environment.

Noxious Weed – a plant specified by law as being especially undesirable, troublesome and difficult to control.

Seral Stage – the rated departure of a plant community from a described potential natural community (PNC) for a specific ecological site. Low-seral stage is an existing plant community which is defined as 0-25% comparability to the defined PNC; Mid-seral stage is an existing plant community which has 26-50% comparability to the defined PNC; Late seral stage is 51-75% comparability to the defined PNC; PNC is an existing plant community with 76-100% comparability to the defined PNC.

Special Status Species – Plant or animal species falling into any one of the following categories: Federally listed threatened or endangered species, species proposed for Federal listing as threatened or endangered, candidate species for Federal listing, State listed species, Bureau assessment species (see separate definition for each).

Species Diversity – The number, different kinds of, and relative abundances of species present in a given area.

Threatened Species – Any plant or animal species defined under the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Listing are published in the Federal Register.

USFWS – U.S. Fish and Wildlife Service; a government agency responsible for managing fish and wildlife and their habitats.

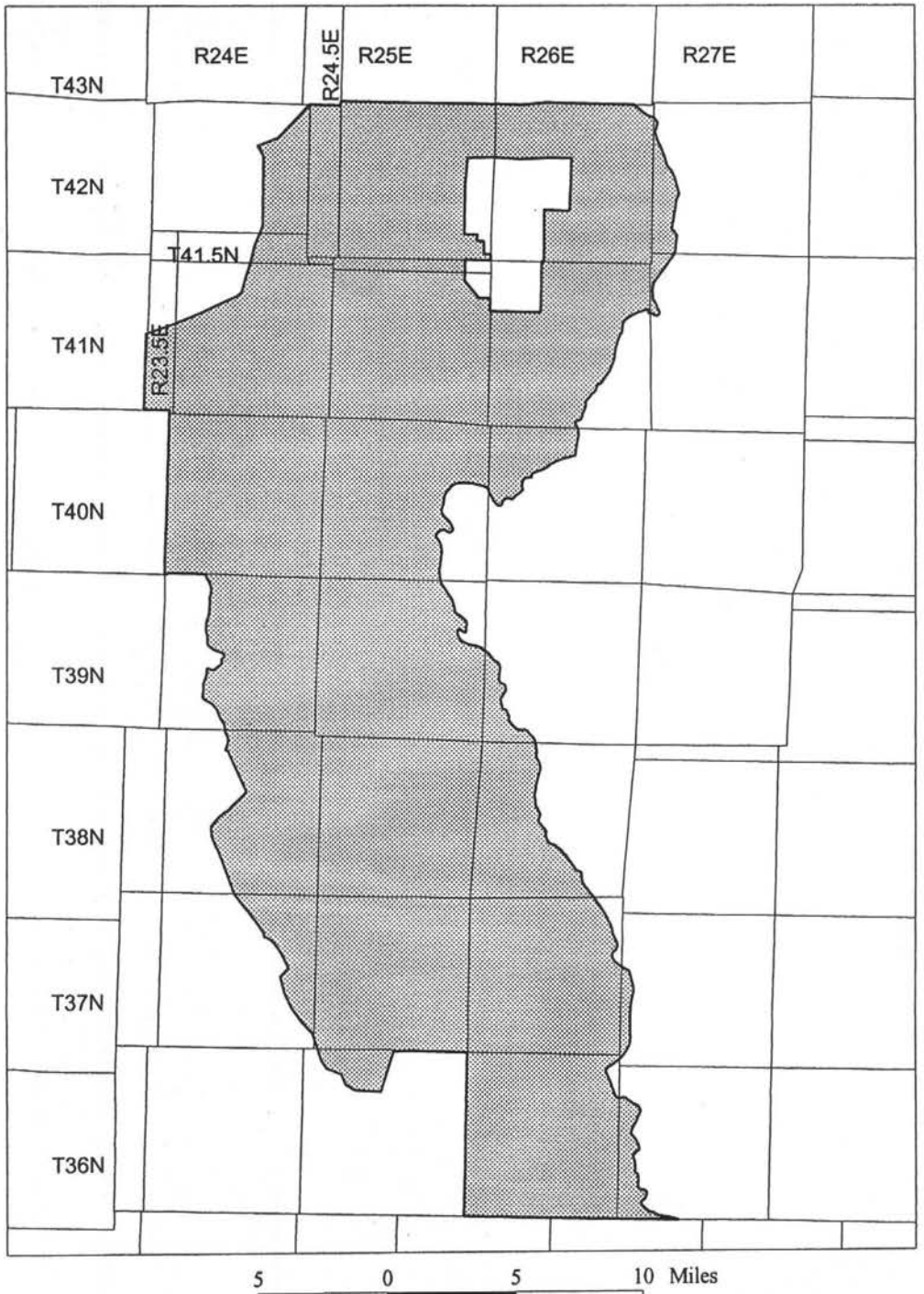
Visual Resource – The visible physical features of a landscape.

Management classes are determined on the basis of overall scenic quality, distance from travel routes, and sensitivity to change.

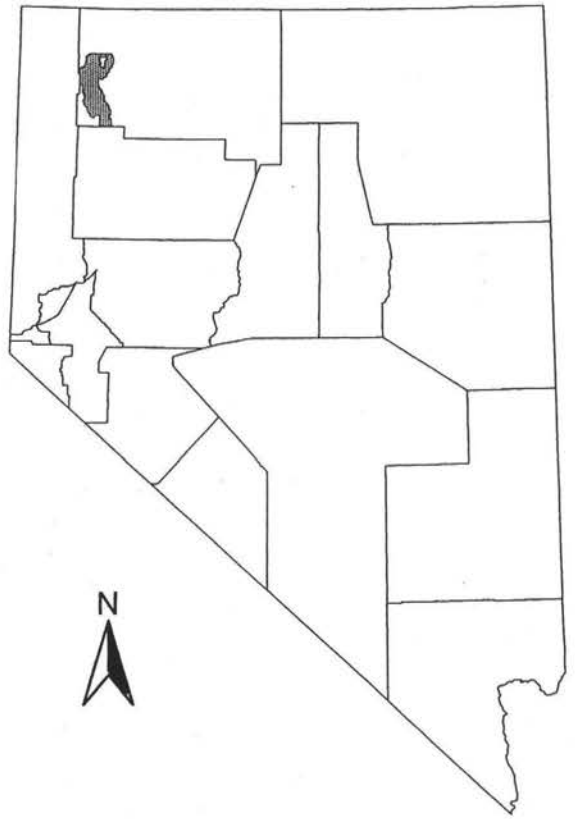
> **Class I**: Provides primarily for natural ecological changes only. It is applied to wilderness areas, some natural areas, and similar situations where management activities are to be restricted.
>
> **Class II**: Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
>
> **Class III**: Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
>
> **Class IV**: Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape.

WSA – Wilderness Study Area; public land under the jurisdiction of the Bureau of Land Management which has been studied for wilderness character and is currently in an interim management status awaiting official wilderness designation or release from WSA status by Congress.

# APPENDIX 12 - ALLOTMENT LOCATION MAP

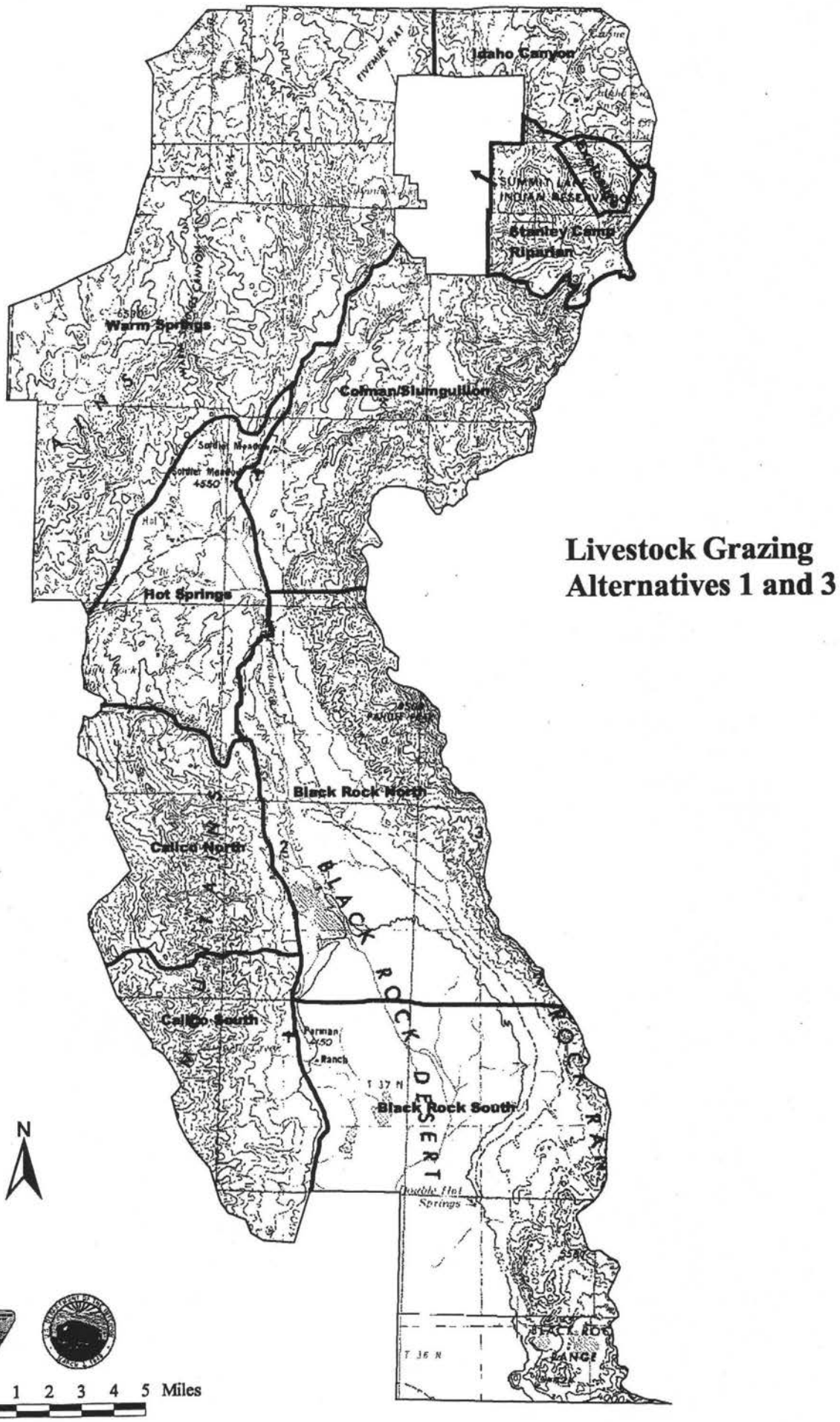



# Location of Soldier Meadows Allotment



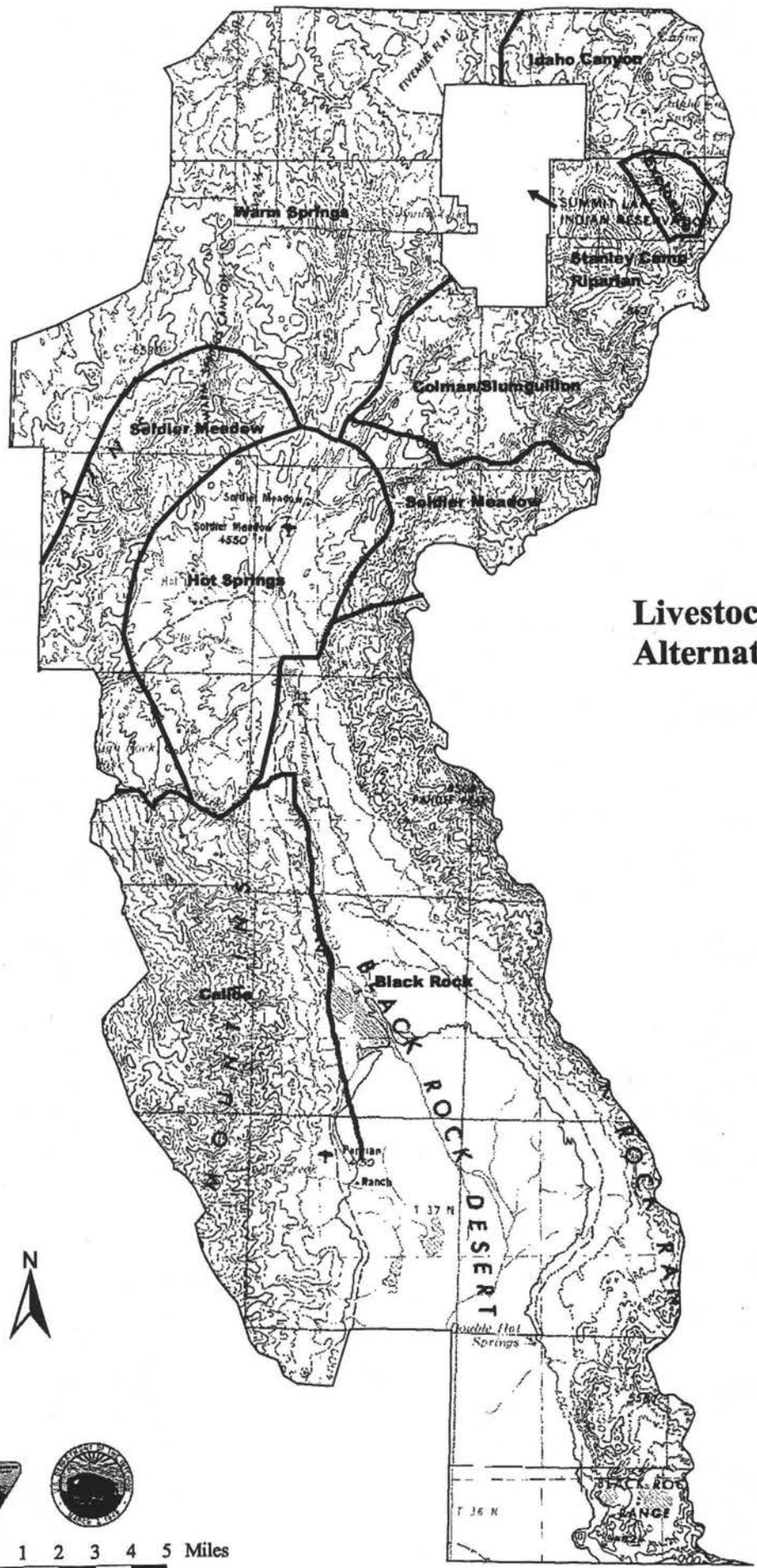

*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 13 - LIVESTOCK GRAZING BY ALTERNATIVE MAPS

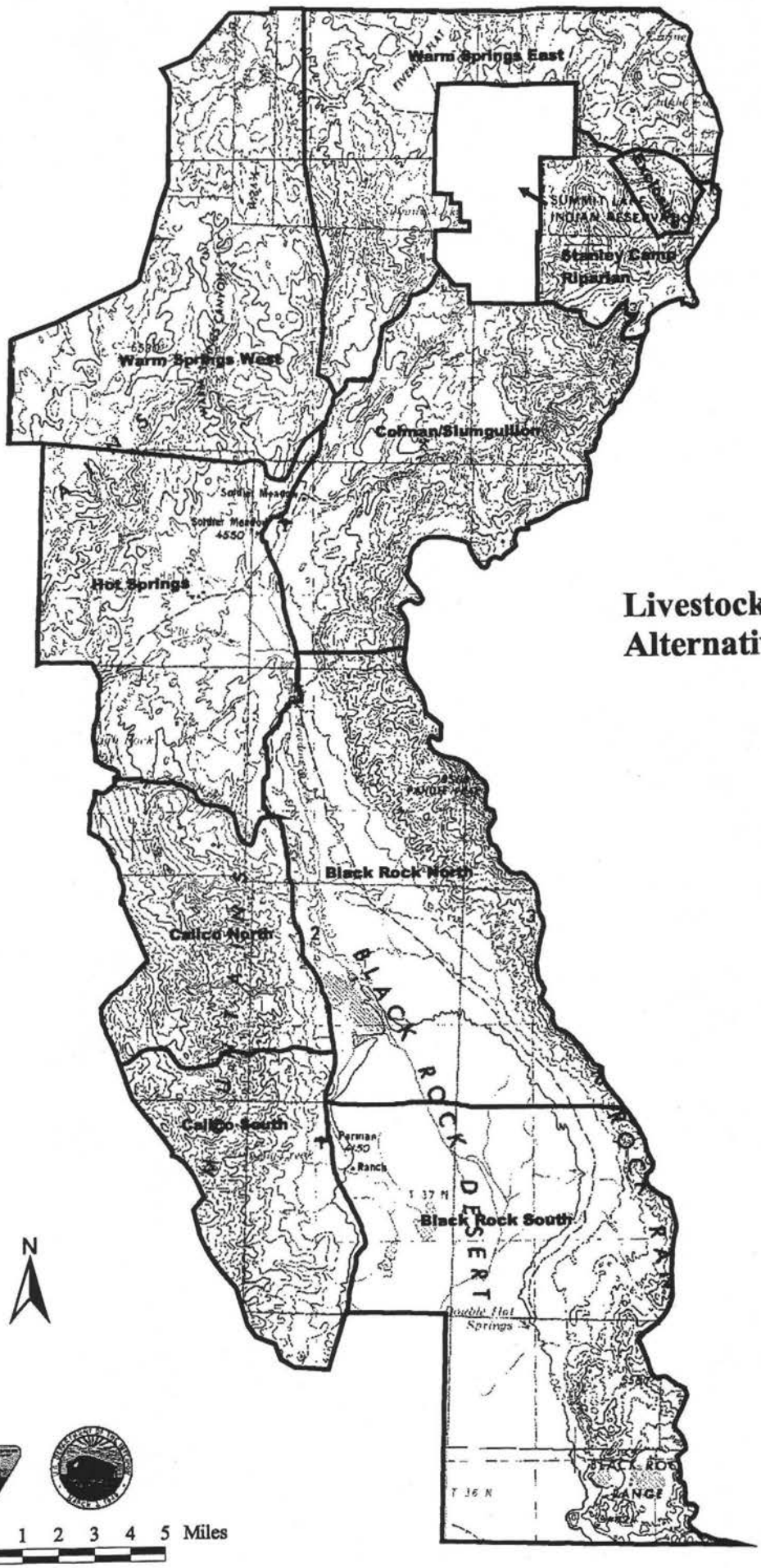



# Livestock Grazing Alternatives 1 and 3

*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*



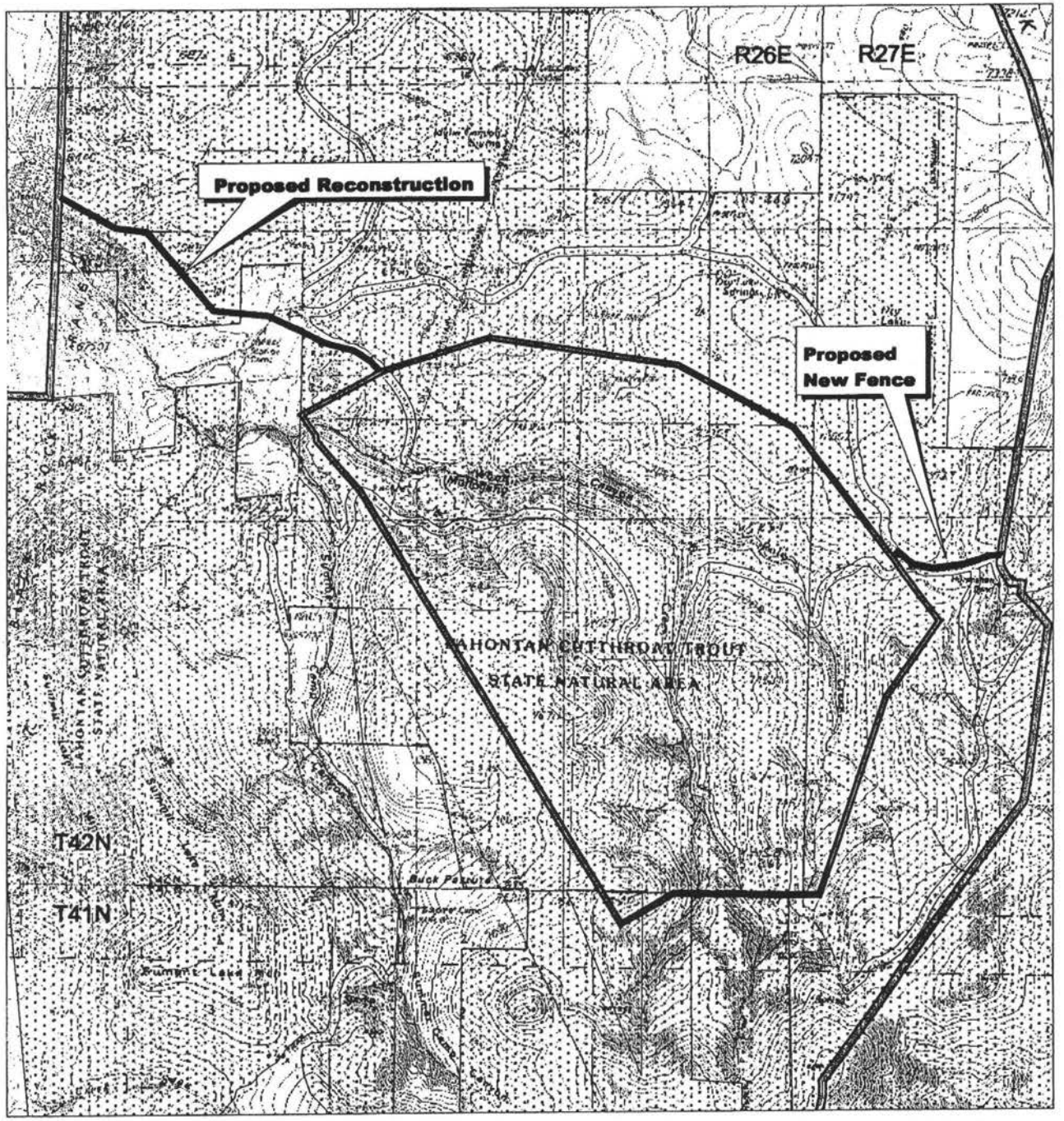

# Livestock Grazing Alternative 2




# Livestock Grazing Alternative 5

*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 14 - PROPOSED FENCING MAPS




# Stanley Camp Proposed Fencing

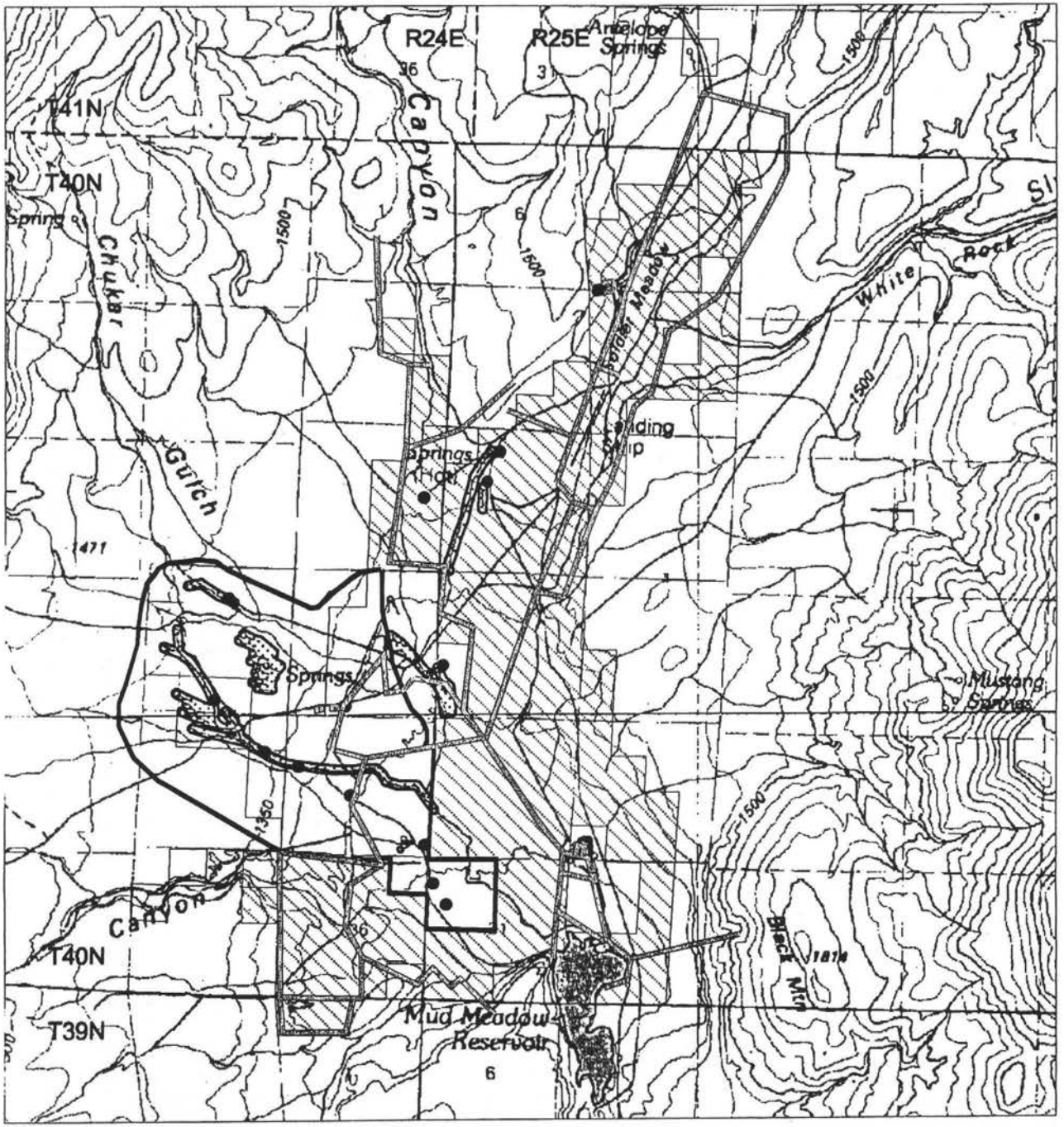
Fences
- Existing
- Proposed

Lahontan Cutthroat Trout Instant Study Area

N

1 0 1 Miles

*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*




# Desert Dace Proposed Fencing

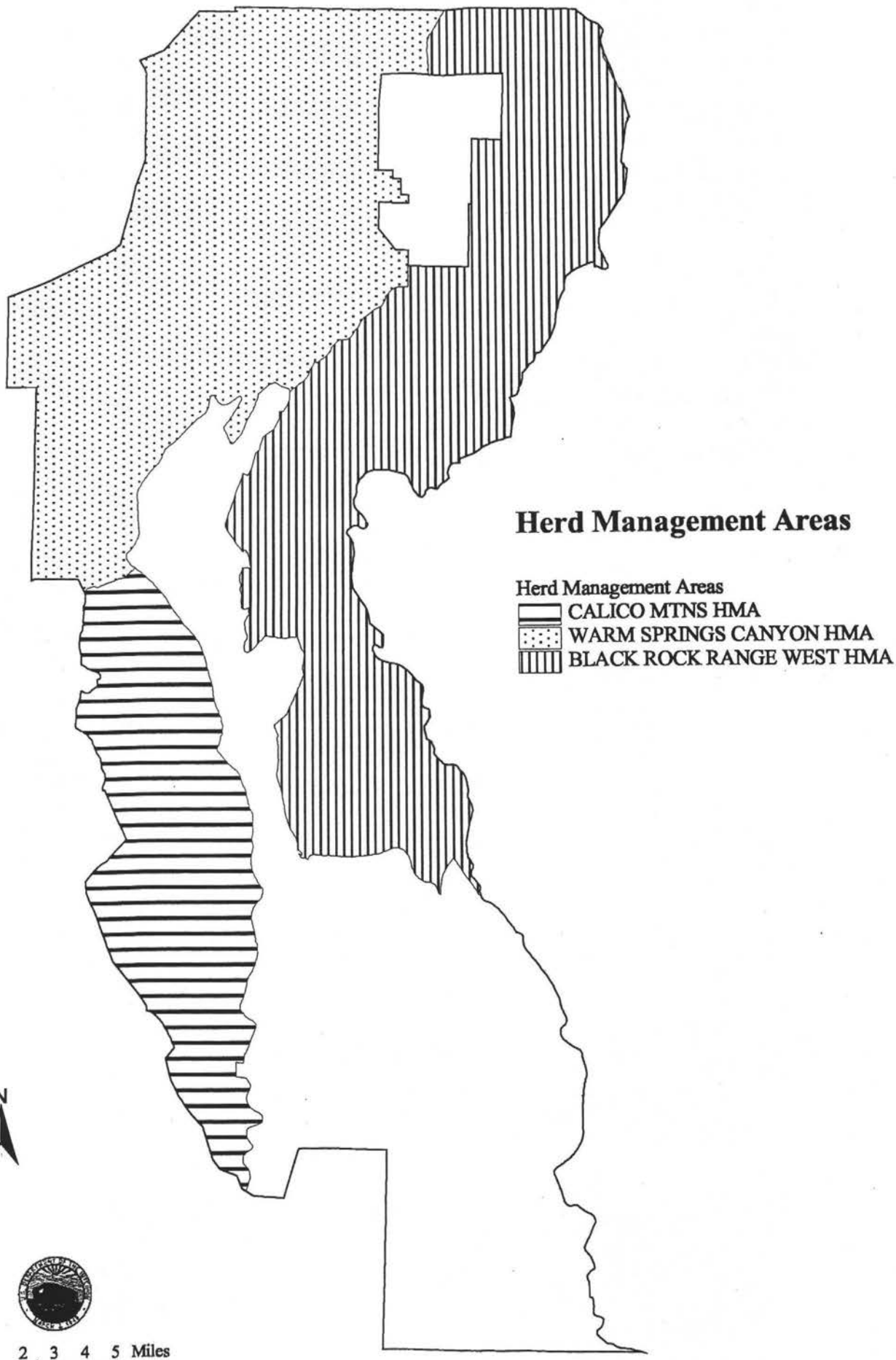
Existing Fence
Proposed Desert Dace Critical Habitat Protection Fence
Desert Dace Distribution (1997)
Desert Dace Critical Habitat
Namcode
BLM
PRIVATE

N

1 0 1 2 Miles

*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

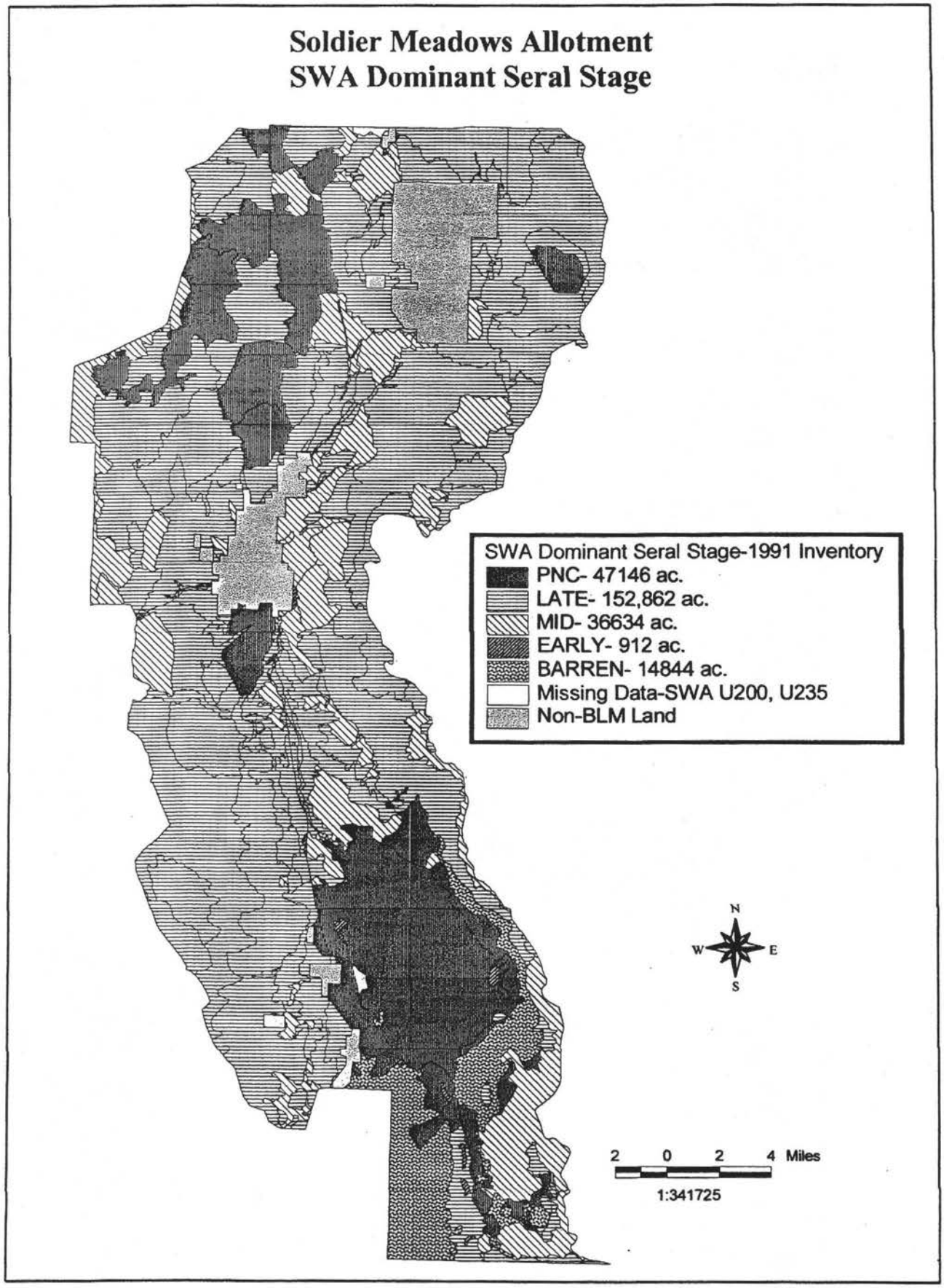
# APPENDIX 15 – HERD MANAGEMENT AREA MAP




*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

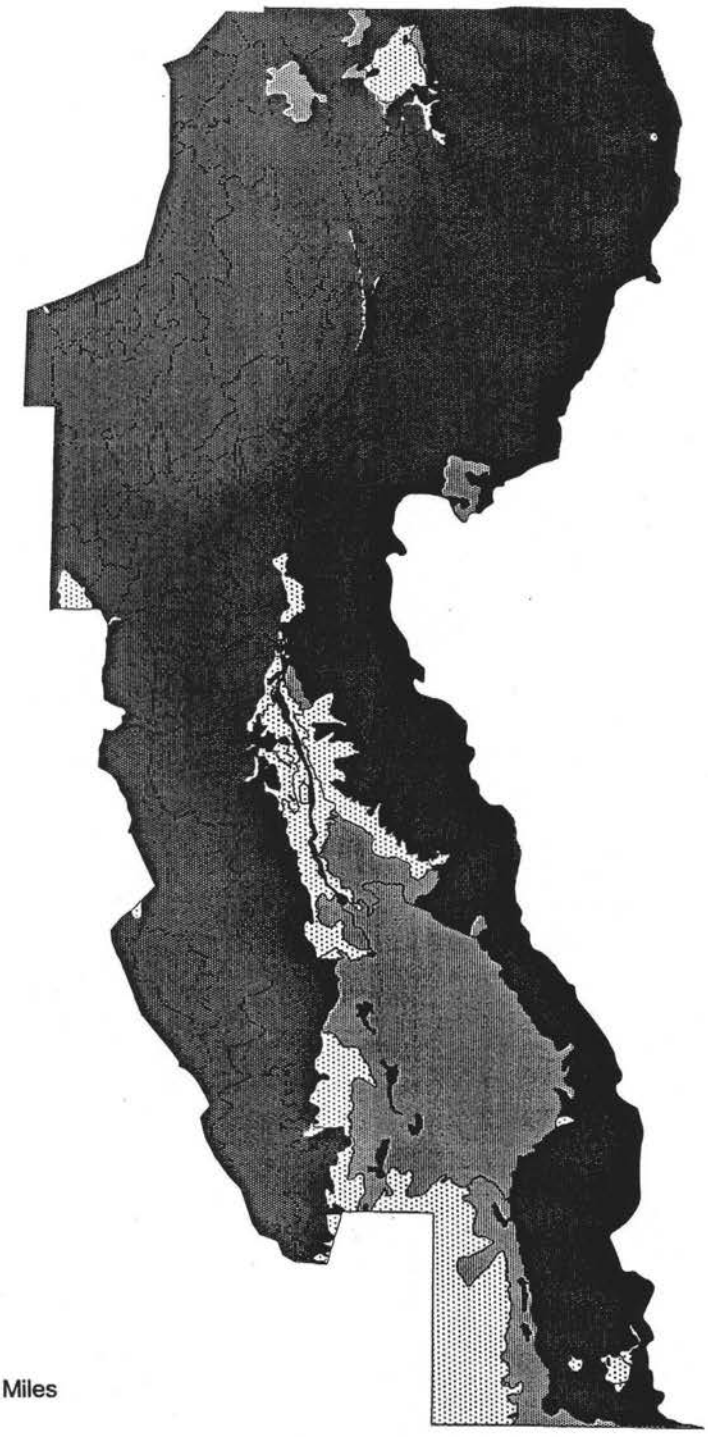
# APPENDIX 16 - ALLOTMENT ECOLOGICAL STATUS INVENTORY (ESI) MAP

# Soldier Meadows Allotment
# SWA Dominant Seral Stage



# APPENDIX 17- SOIL EROSION HAZARDS MAPS

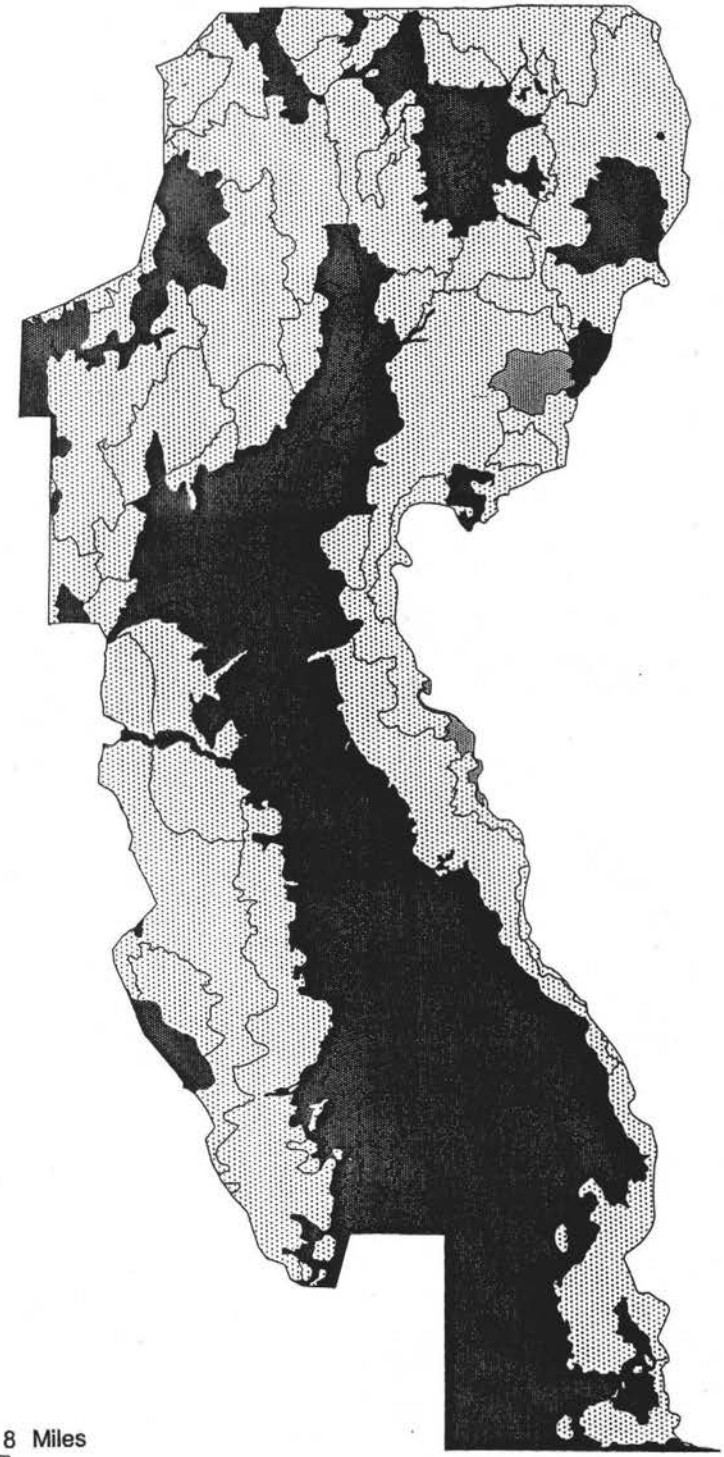
# Soldier Meadows Allotment
# Wind Erosion Hazard



Wind Erosion Hazard
- High- 42,496 ac.
- Moderate- 26670 ac.
- Slight- 285262 ac.

4 0 4 8 Miles

# Soldier Meadows Allotment
# Water Erosion Hazard

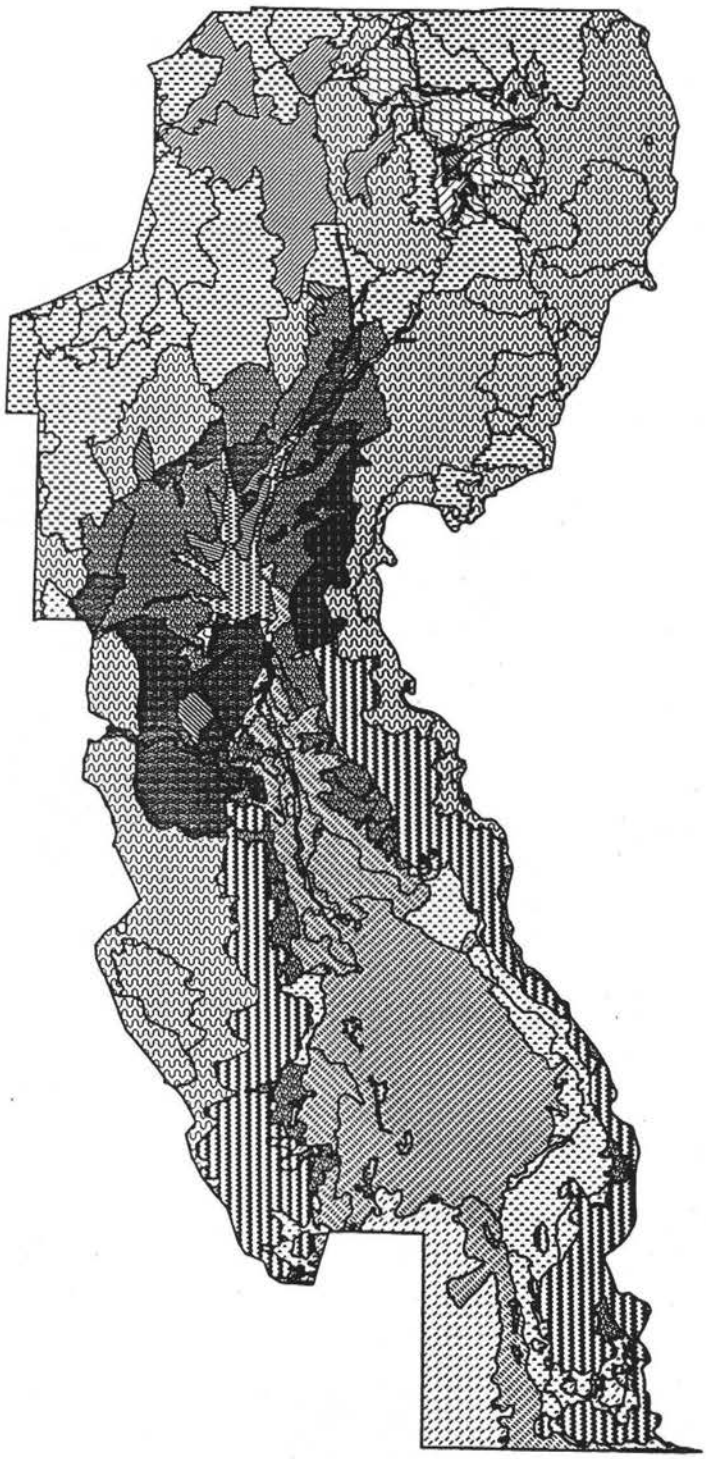


Water Erosion Hazard
High- 2884 ac.
Moderate- 189,292 ac.
Slight - 162,252

4 0 4 8 Miles

# APPENDIX 18- SOIL SURVEY MAP OF THE SMA

# Soldier Meadow Allotment
# Soils

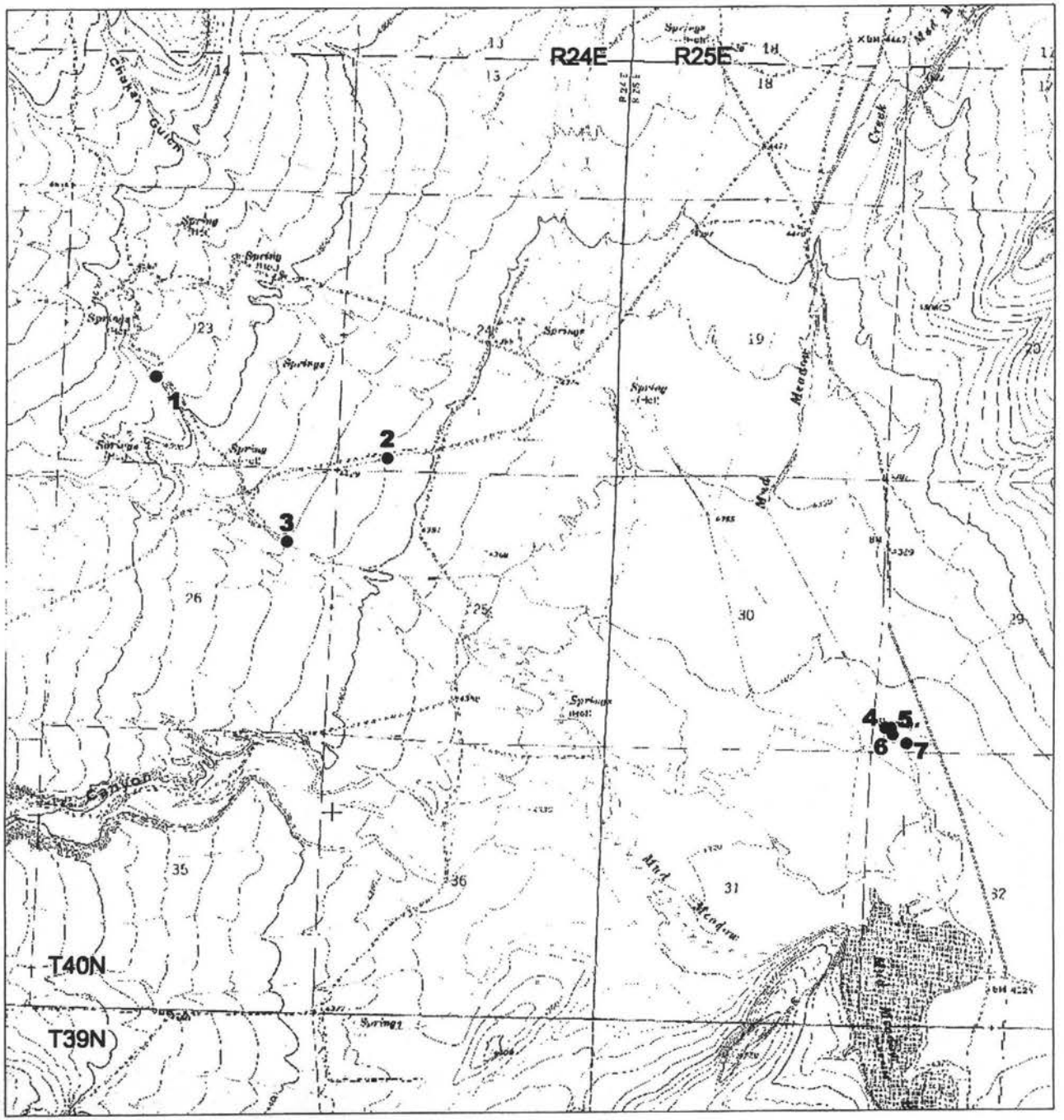


**Soils**

- Water- 1115 ac.
- Playas- 10,570 ac.
- Sondoa- Wendane- Isolde- 35,236 ac.
- Wendane- Humboldt- 5811 ac.
- Boton- Mazuma- 17,507 ac.
- Toulon- Bluewing- 18,028 ac.
- McConnel- Dun Glen- Pumper- 1819 ac.
- Shawave- Deadyon- 7325 ac.
- Aboten- Tumtum- Oxcorel- 30,944 ac.
- Simon- Fulstone- Welch- 2133 ac.
- Singatse- Grumblem- Sojur 39,411 ac.
- Sough- Hoot- 22,808 ac.
- Wylo- Bucklake- Pickup- 92,277 ac.
- Devada- Tuffo- 55,169 ac.
- Badger Camp- Bear Butte- 14,275 ac.

4 0 4 8 Miles

# APPENDIX 19- DESERT DACE WATER QUALITY STUDY SITES MAP

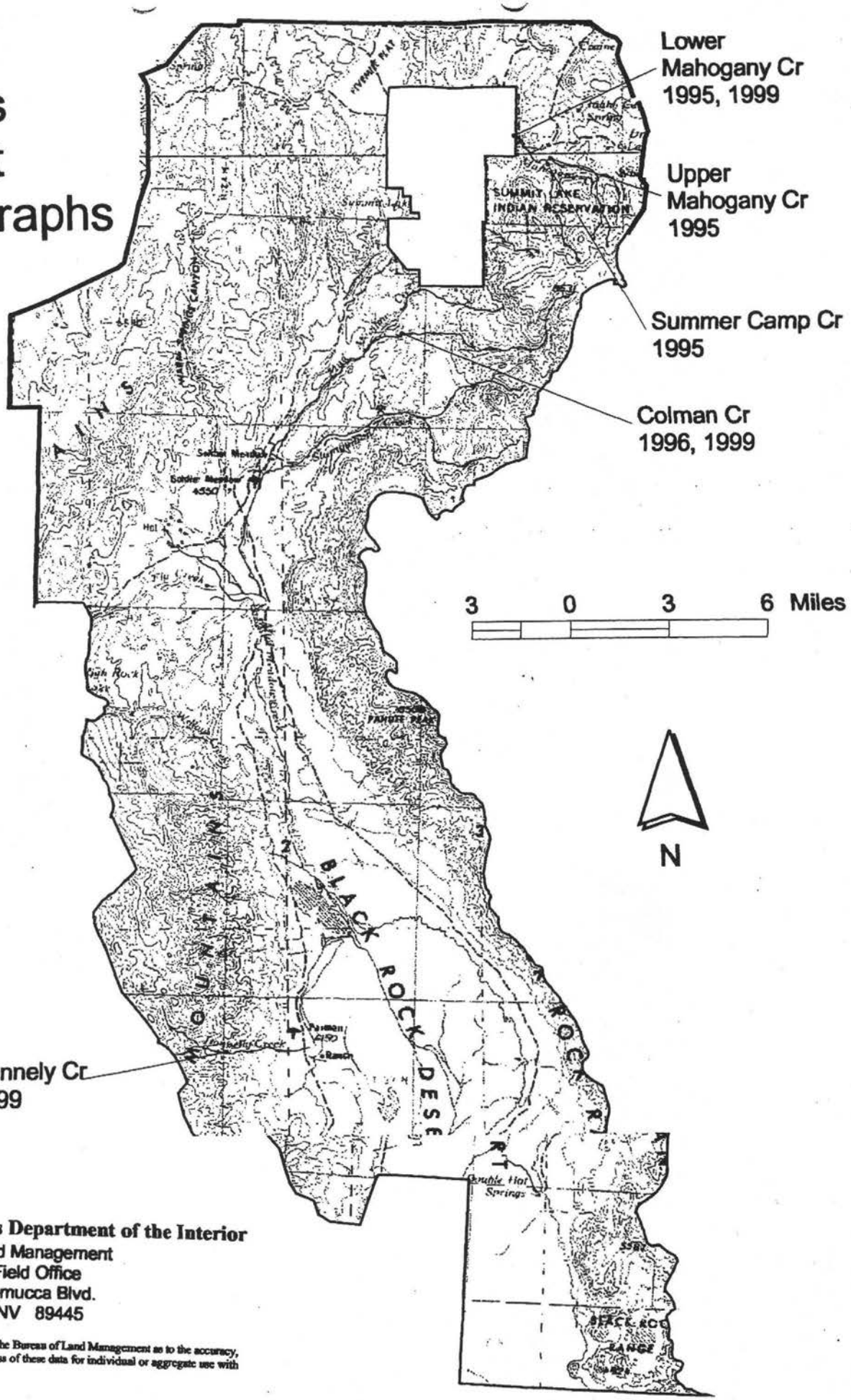



# Desert Dace
# Water Quality Sites

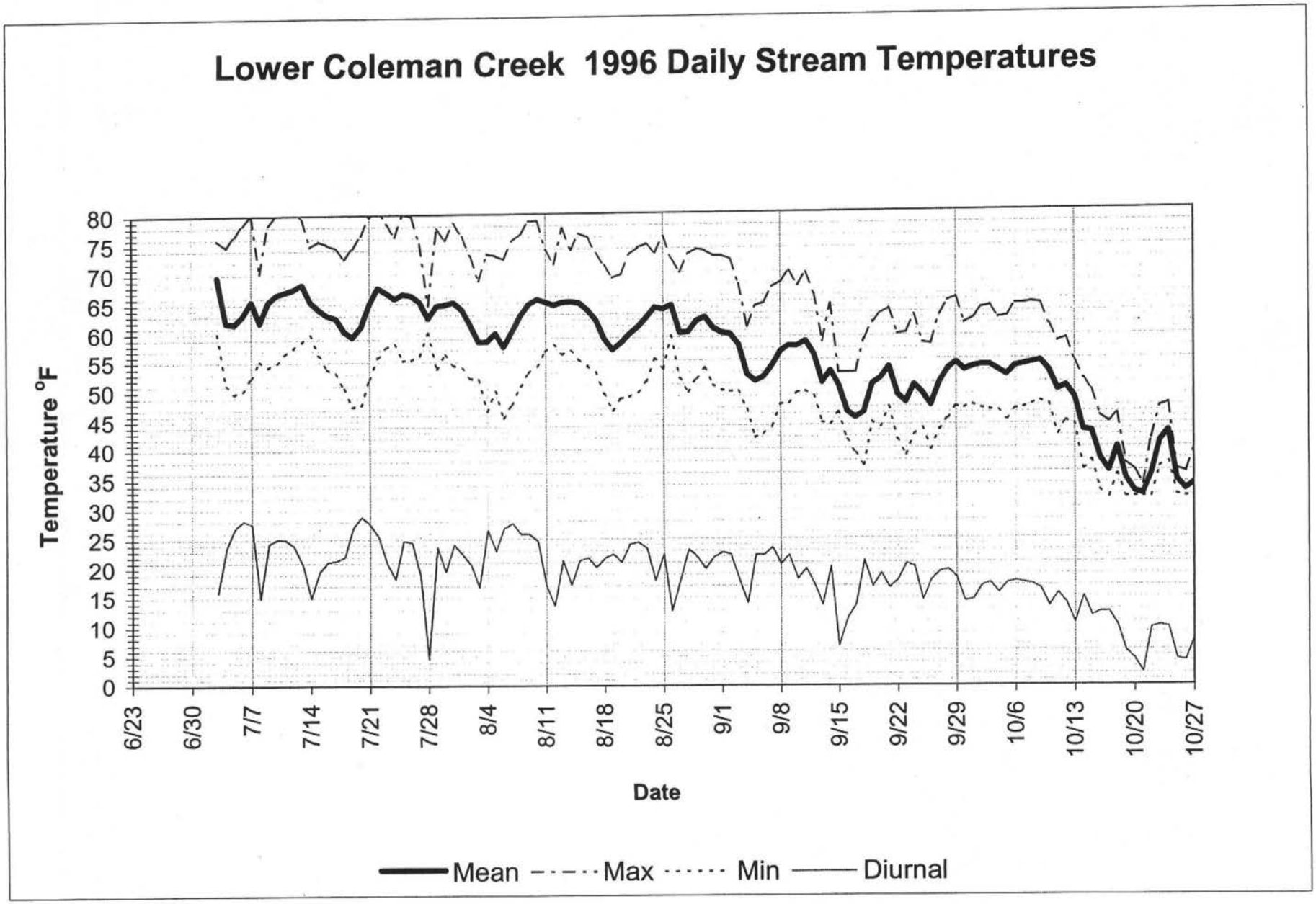
*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

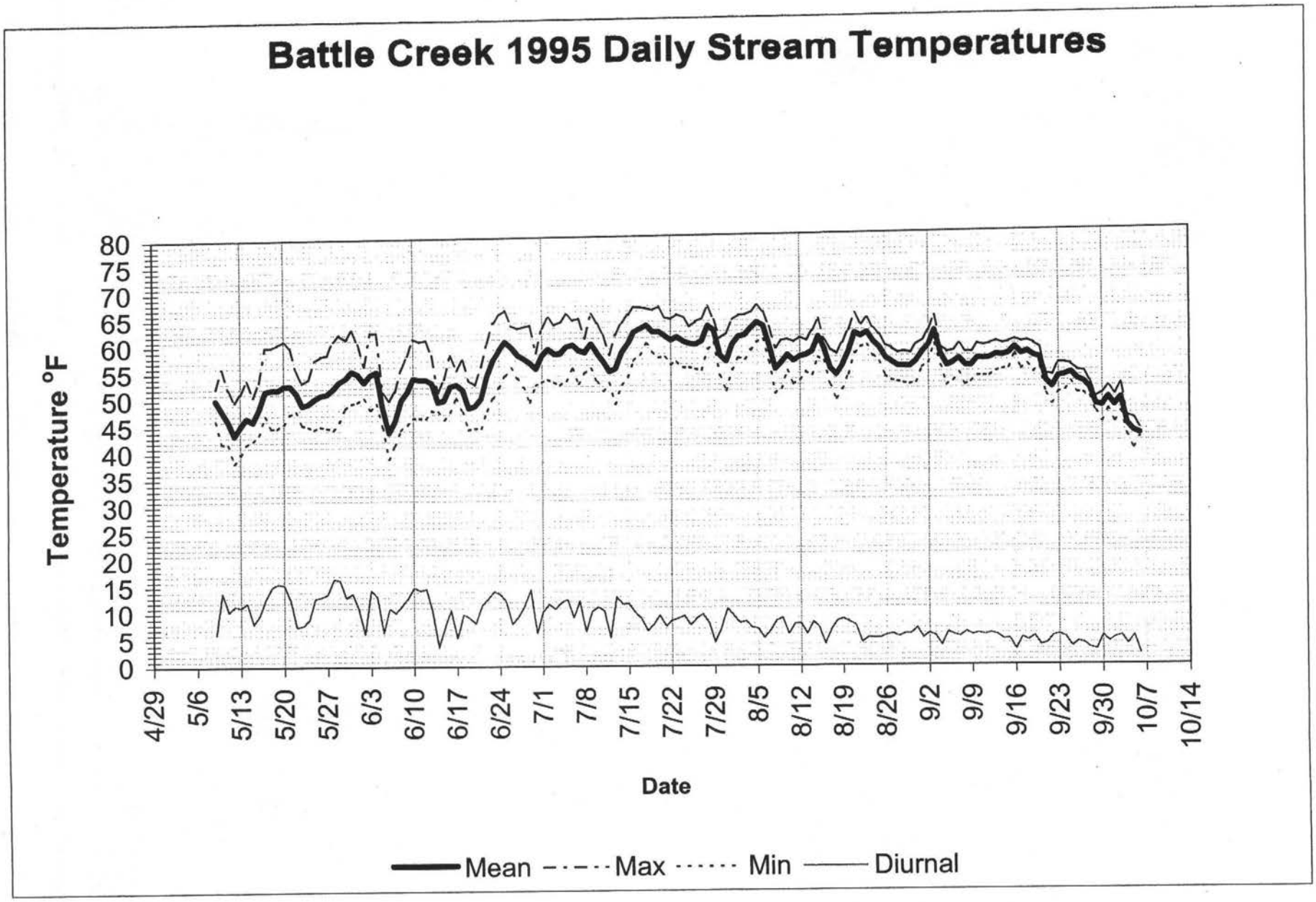
# APPENDIX 20 - WATER QUALITY SITES & THERMOGRAPH DATA

# Soldier Meadows Allotment Thermographs

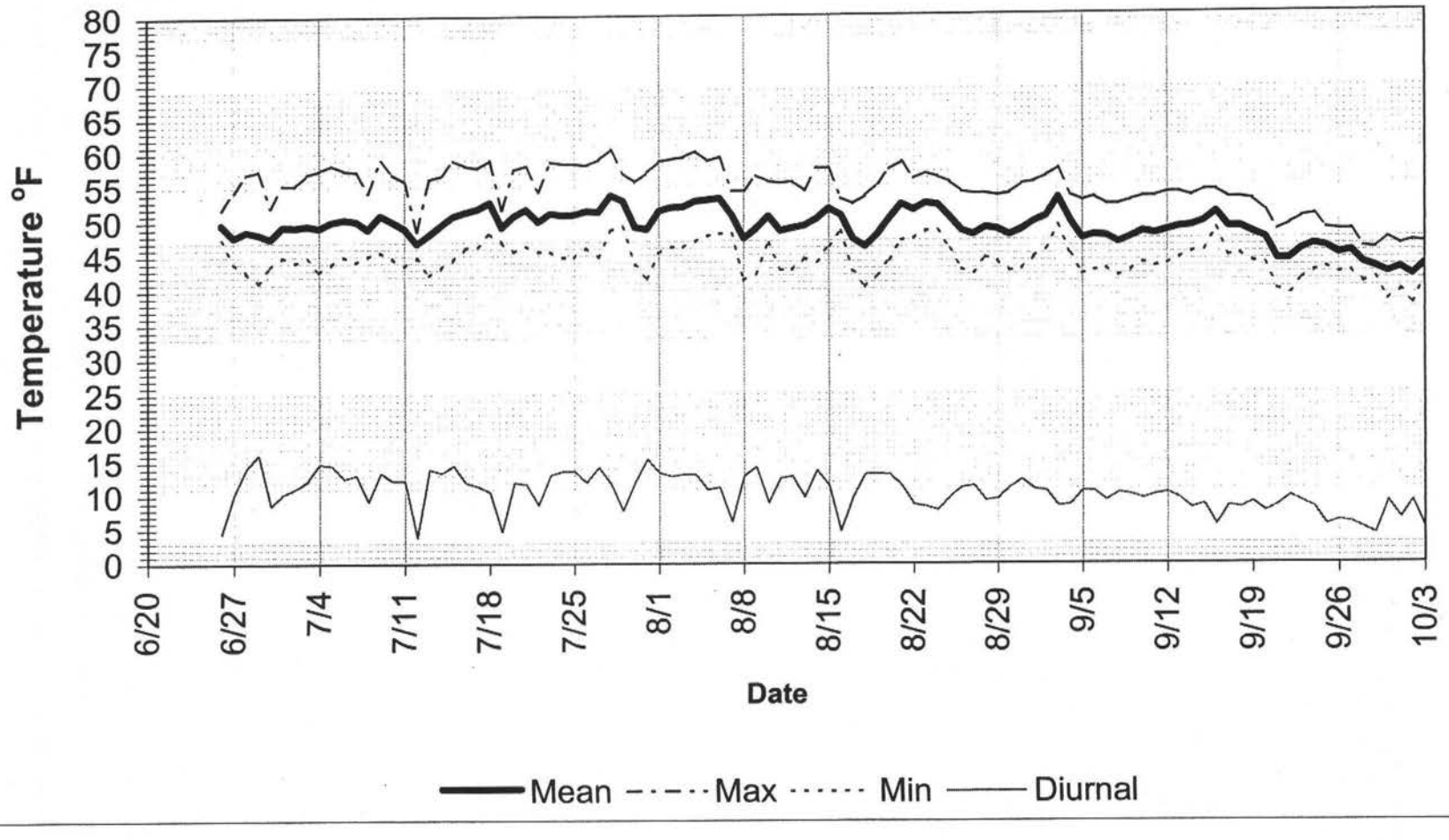



**United States Department of the Interior**
Bureau of Land Management
Winnemucca Field Office
5100 E. Winnemucca Blvd.
Winnemucca, NV 89445

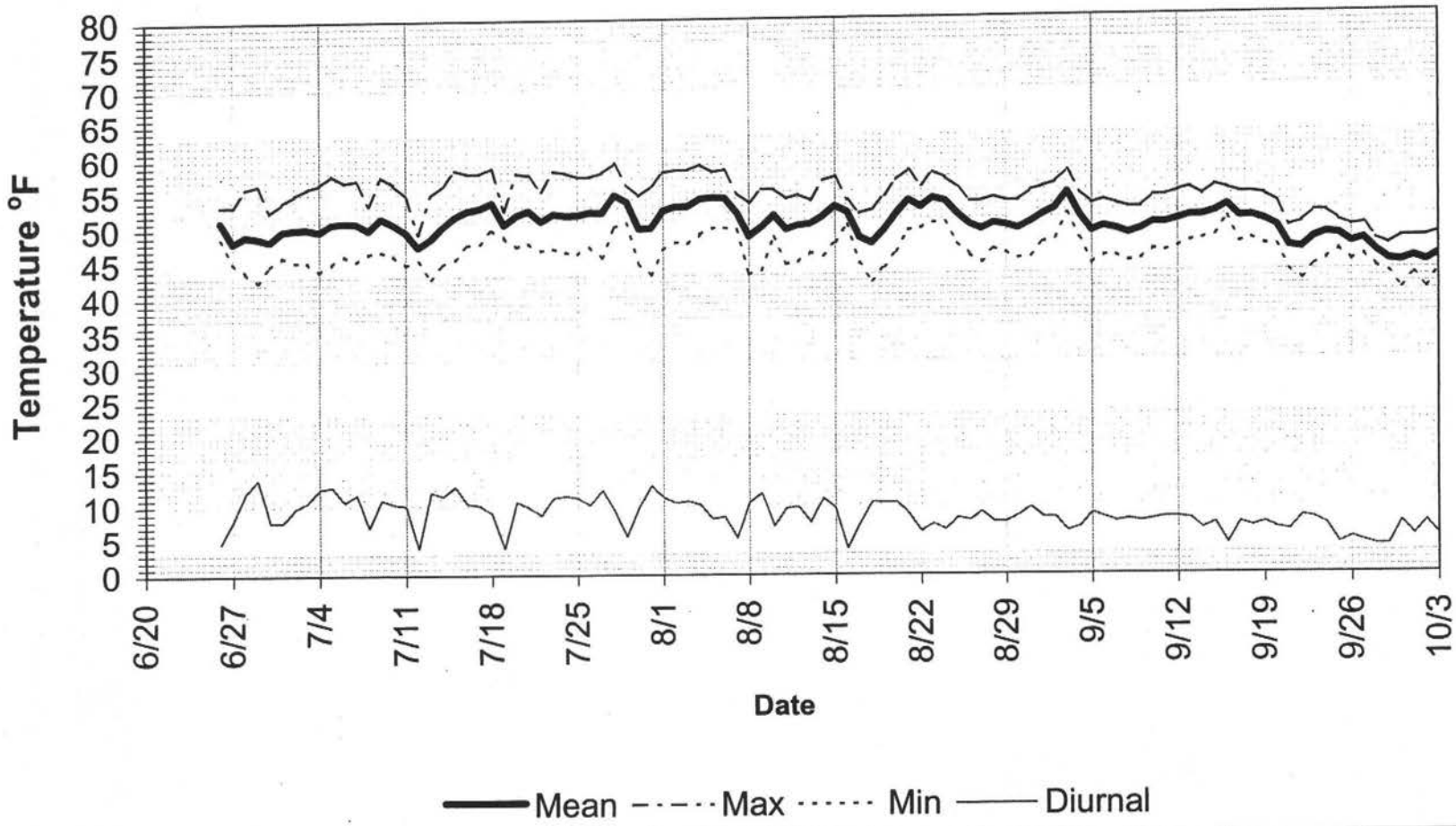

Lower Coleman Creek 1996 Daily Stream Temperatures
Temperature °F
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
6/23
6/30
7/7
7/14
7/21
7/28
8/4
8/11
8/18
8/25
9/1
9/8
9/15
9/22
9/29
10/6
10/13
10/20
10/27
Date
Mean
Max
Min
Diurnal


Battle Creek 1995 Daily Stream Temperatures
Temperature °F
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
4/29
5/6
5/13
5/20
5/27
6/3
6/10
6/17
6/24
7/1
7/8
7/15
7/22
7/29
8/5
8/12
8/19
8/26
9/2
9/9
9/16
9/23
9/30
10/7
10/14
Date
Mean
Max
Min
Diurnal

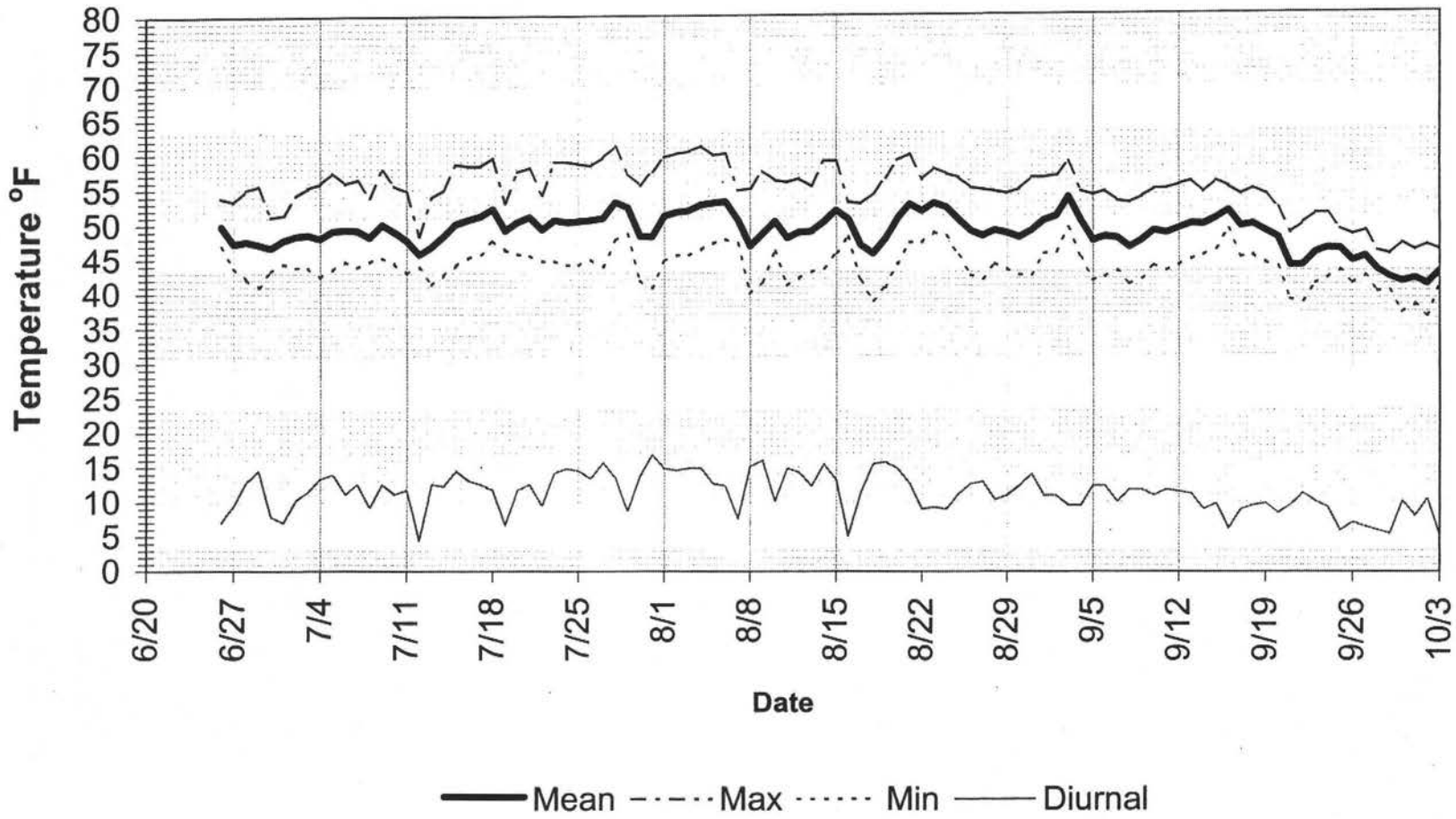
# Upper Mahogany Creek 1995 Daily Stream Temperatures

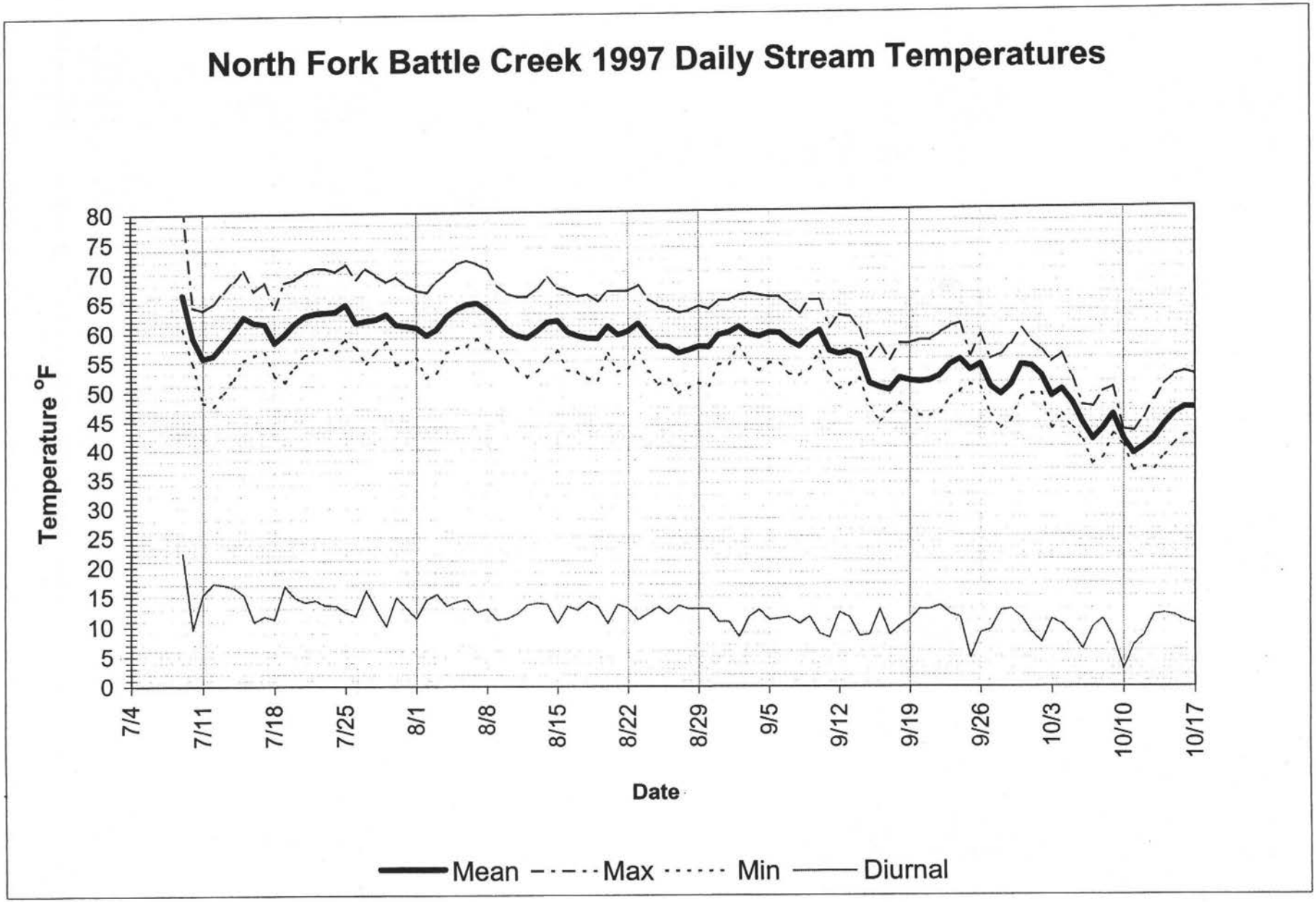


# Lower Mahogany Creek 1995 Daily Stream Temperatures

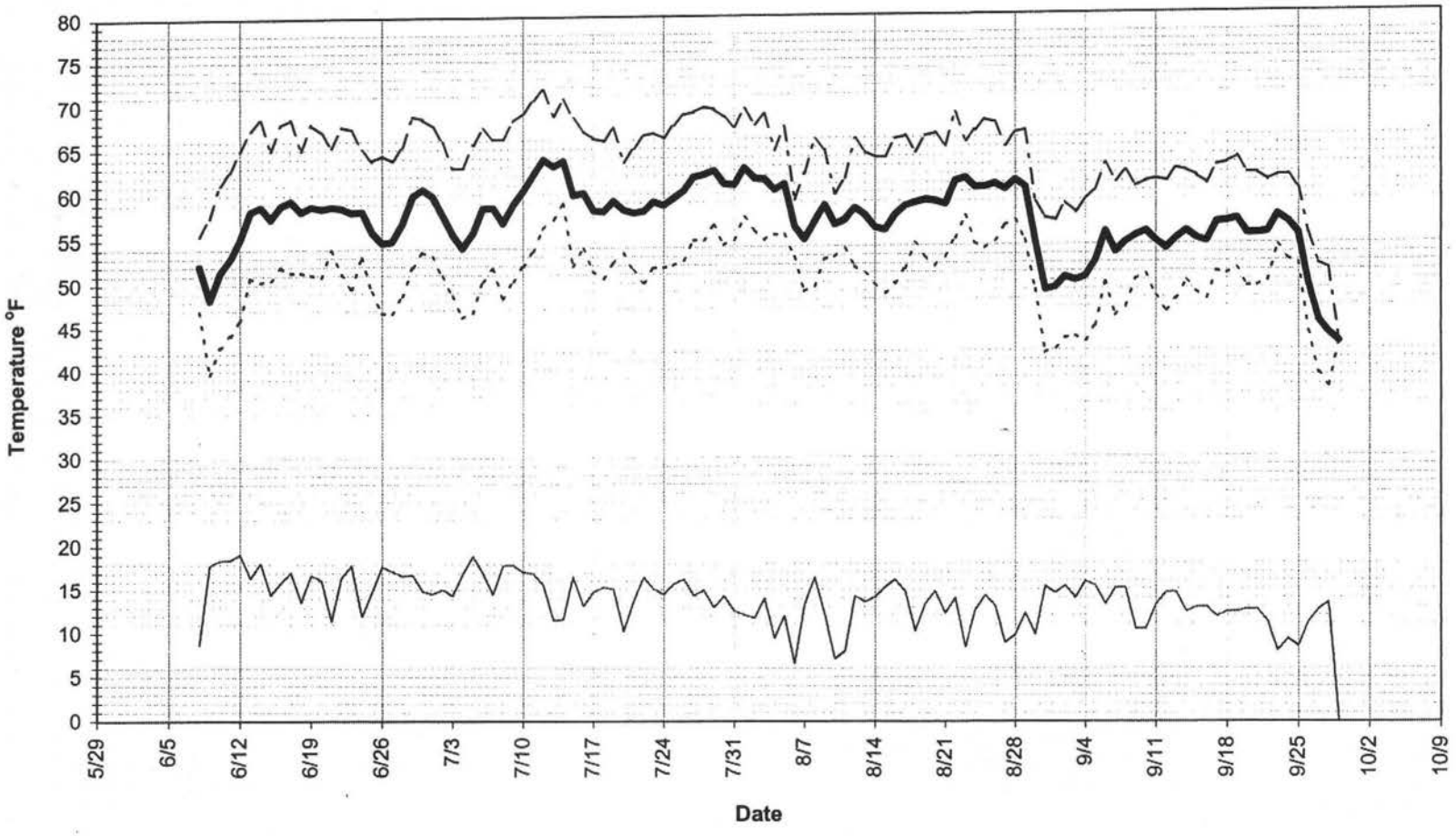


# Lower Summer Camp Creek 1995 Daily Stream Temperatures

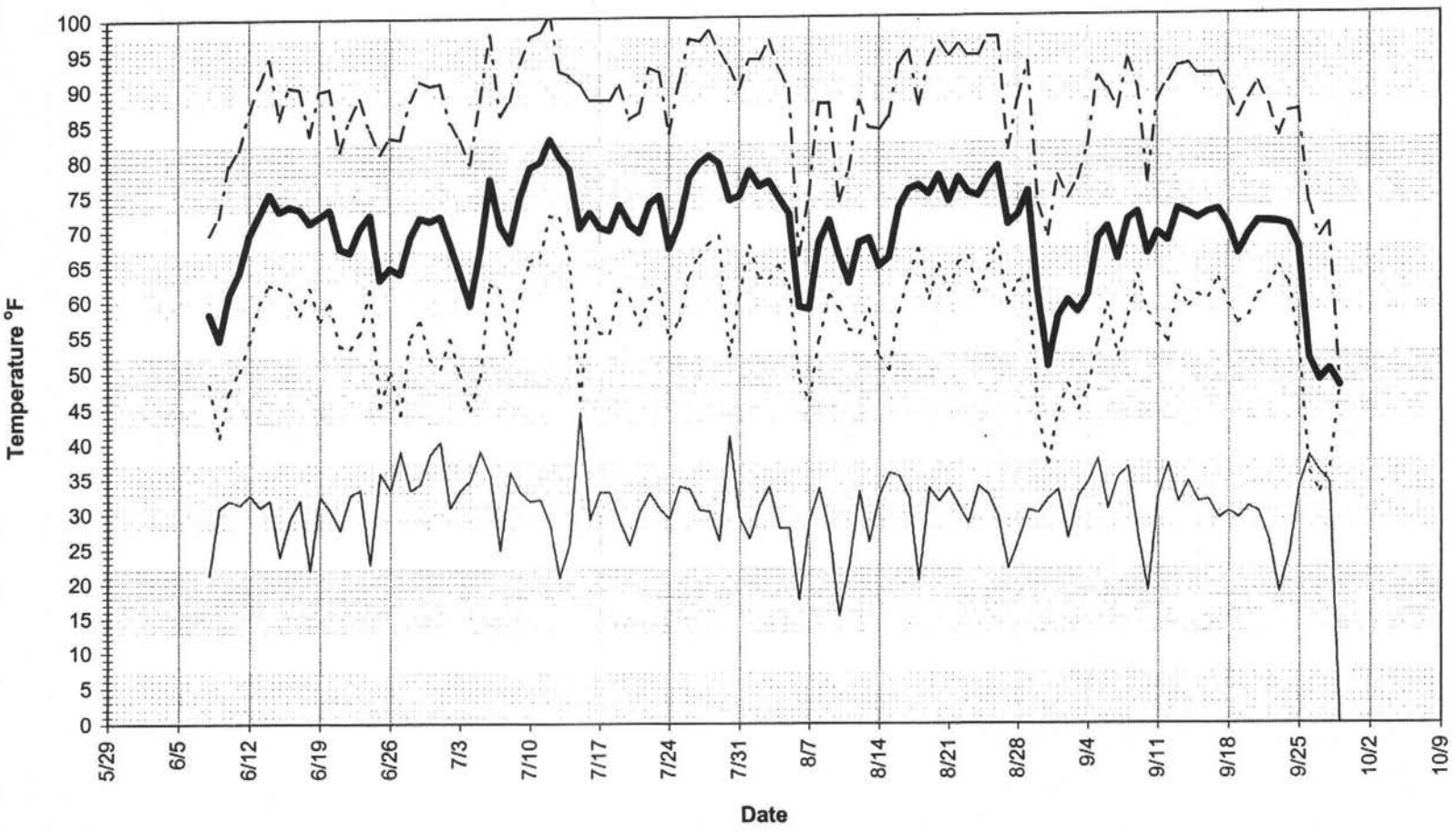


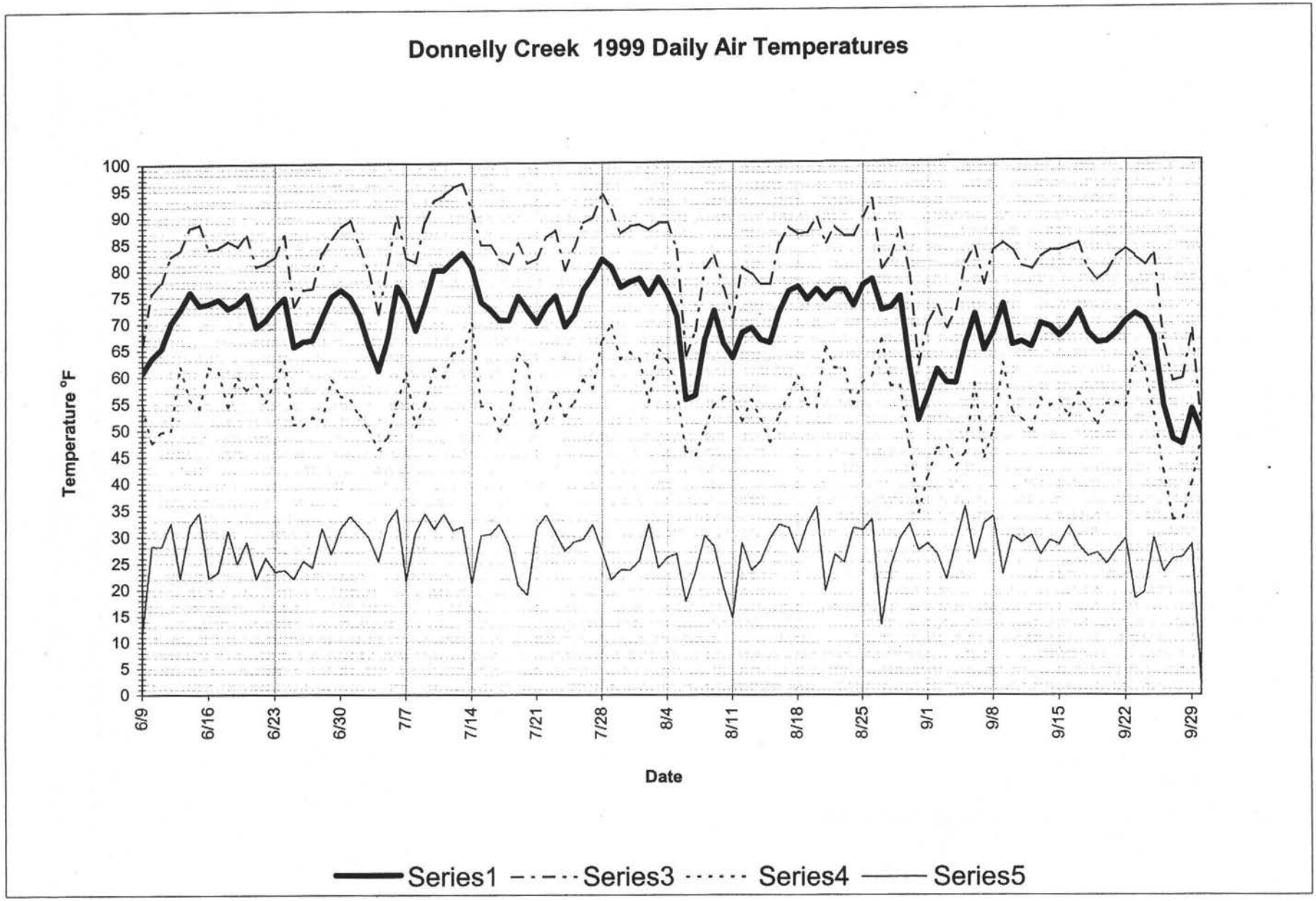

North Fork Battle Creek 1997 Daily Stream Temperatures
Temperature °F
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
7/4
7/11
7/18
7/25
8/1
8/8
8/15
8/22
8/29
9/5
9/12
9/19
9/26
10/3
10/10
10/17
Date
Mean
Max
Min
Diurnal

## NF Battle Creek 1999 Daily Stream Temperatures

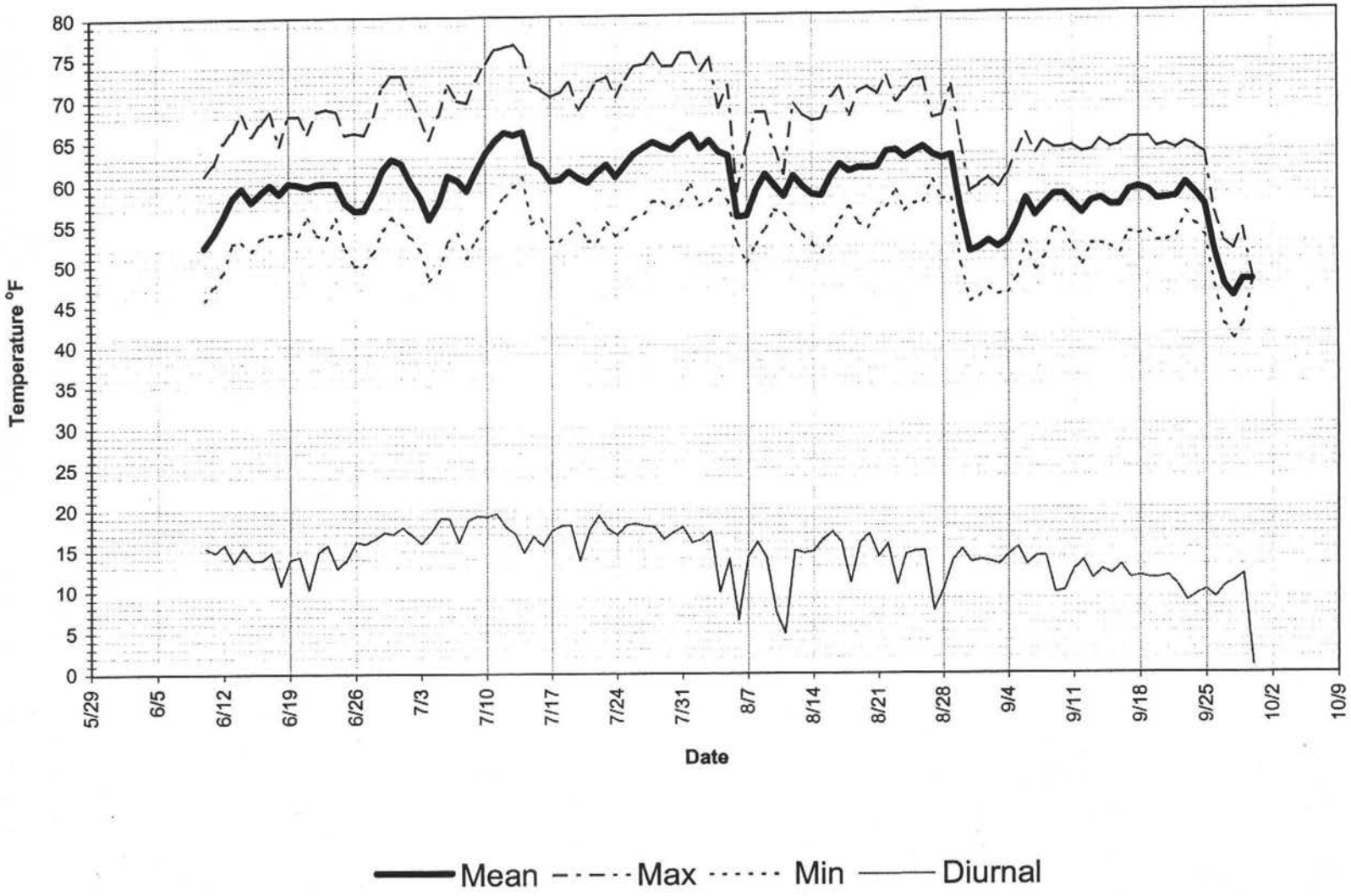


## NF Battle Creek 1999 Daily Air Temperatures

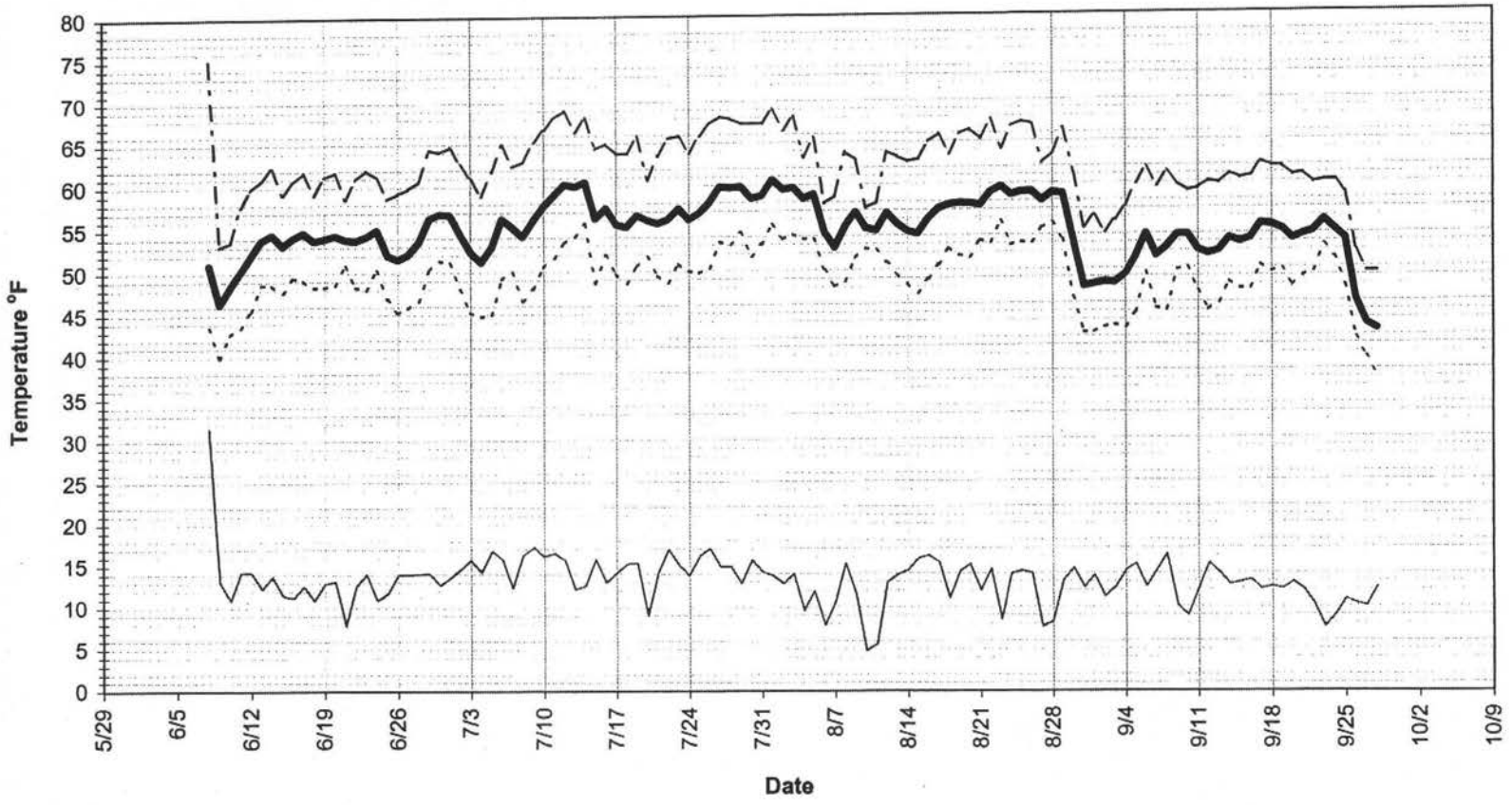



Donnelly Creek 1999 Daily Air Temperatures
Temperature °F
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
6/9
6/16
6/23
6/30
7/7
7/14
7/21
7/28
8/4
8/11
8/18
8/25
9/1
9/8
9/15
9/22
9/29
Date
Series1
Series3
Series4
Series5

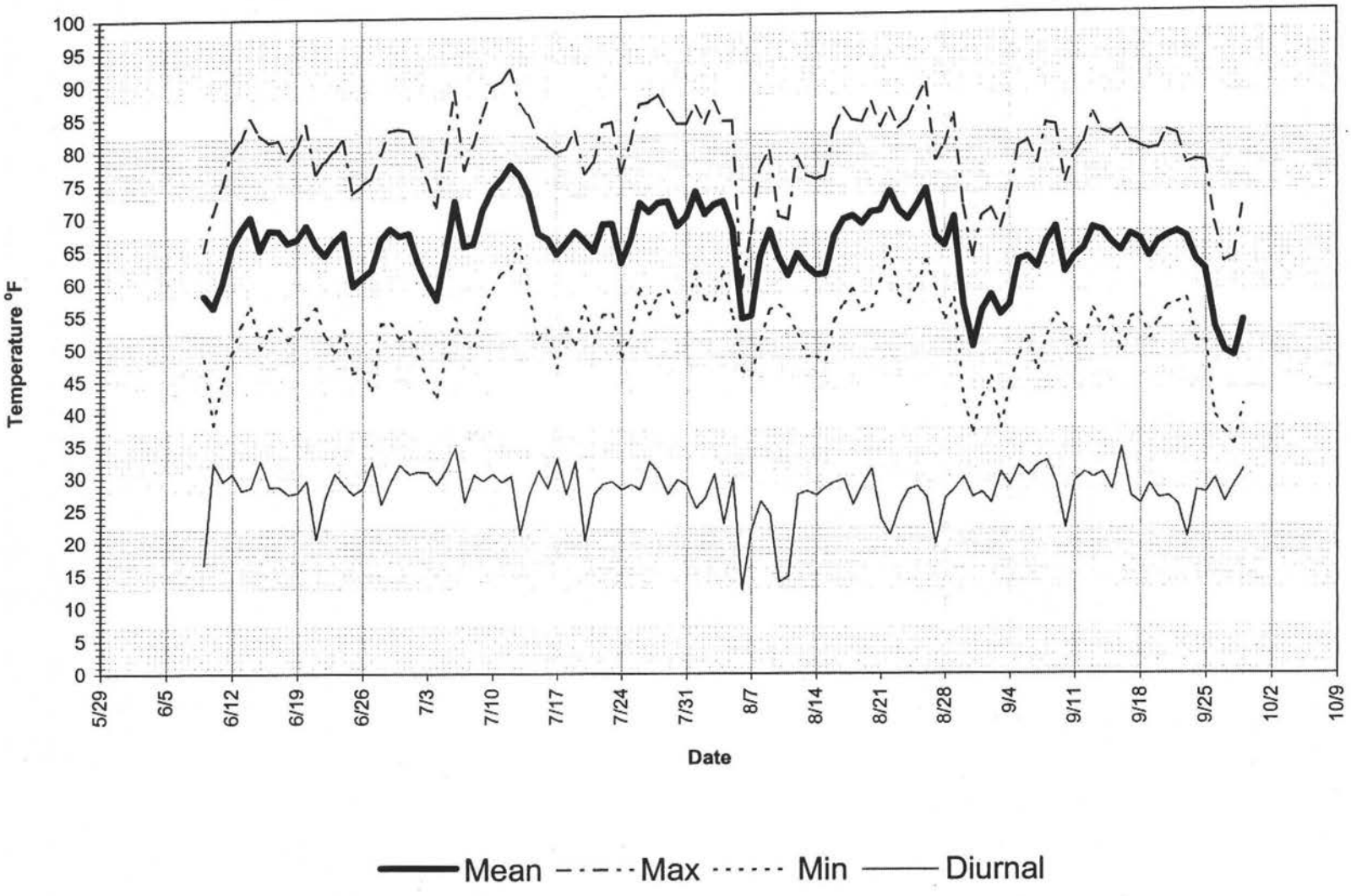
## Donnelly Creek 1999 Daily Stream Temperatures



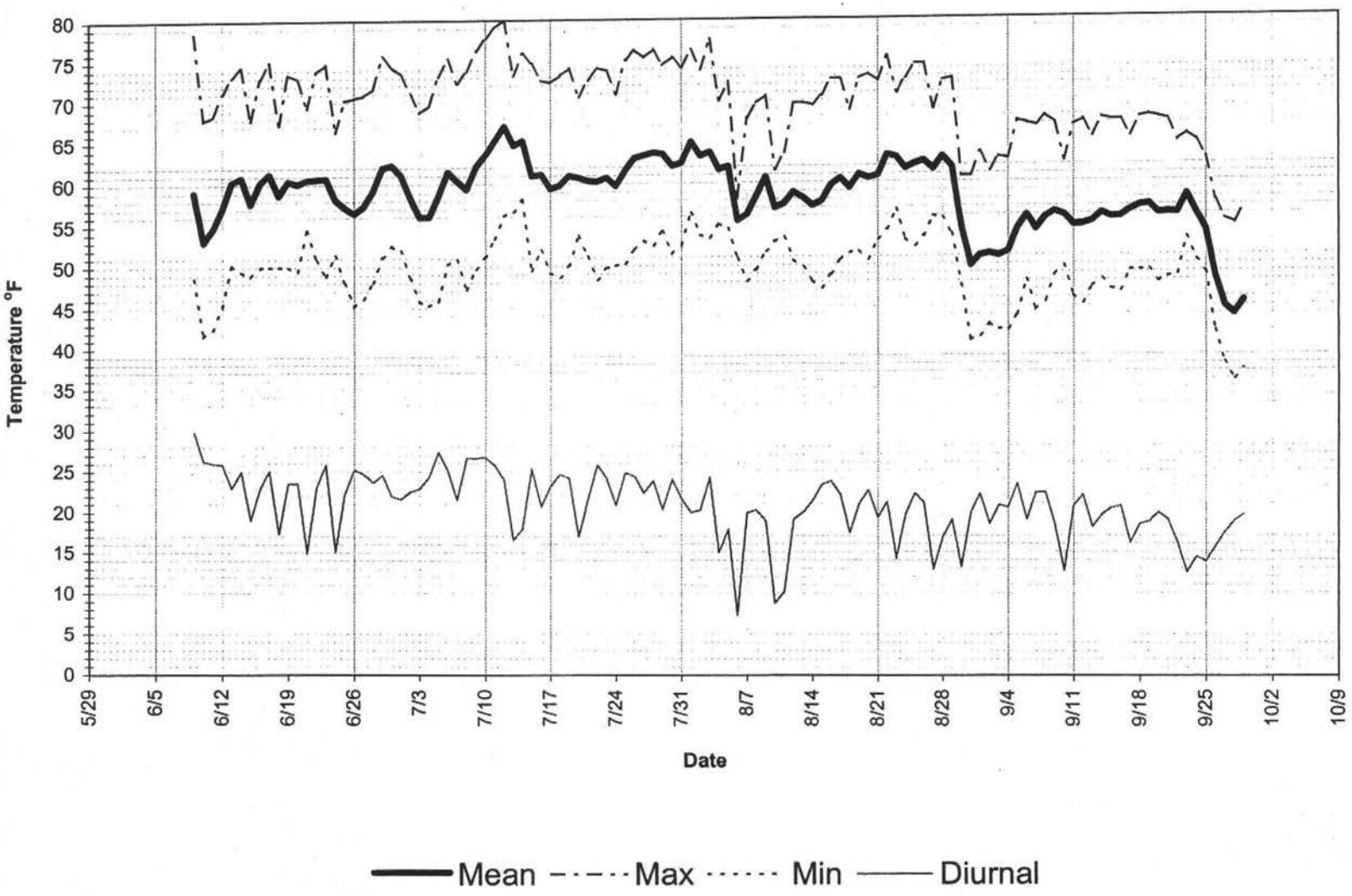
## U Bartlett Creek 1999 Daily Stream Temperatures



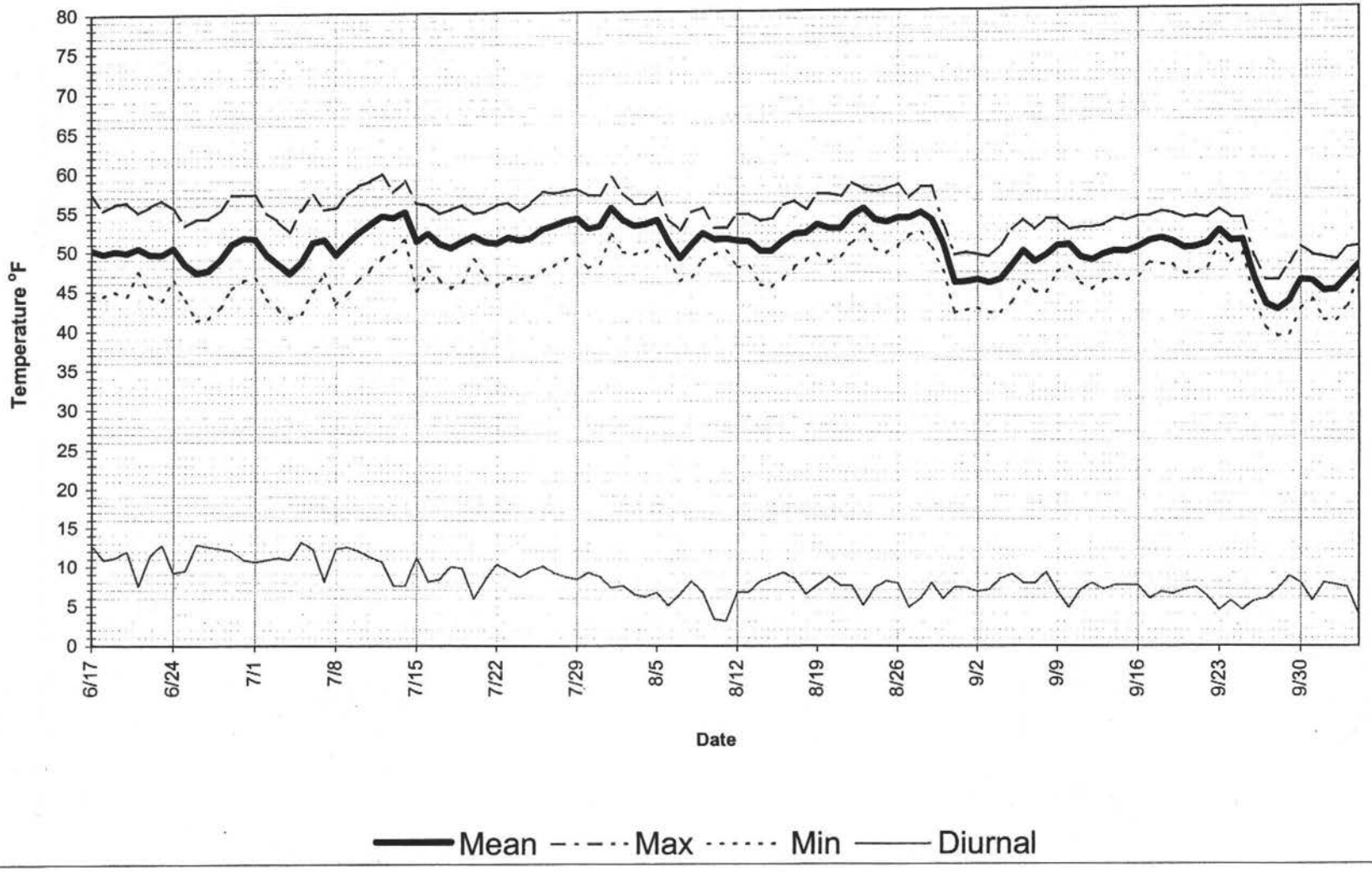
## Coleman Creek 1999 Daily Air Temperatures



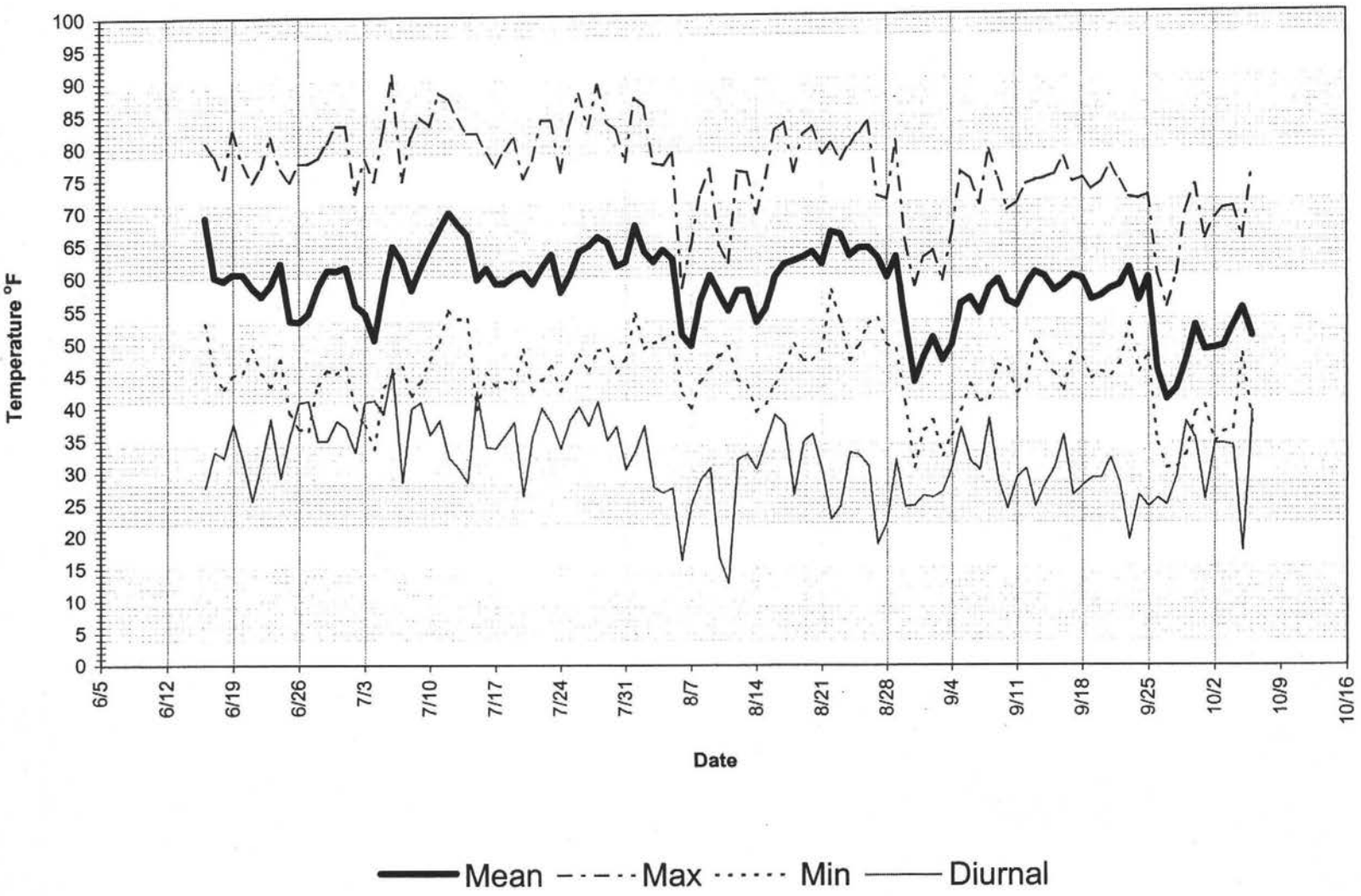
## Coleman Creek 1999 Daily Stream Temperatures



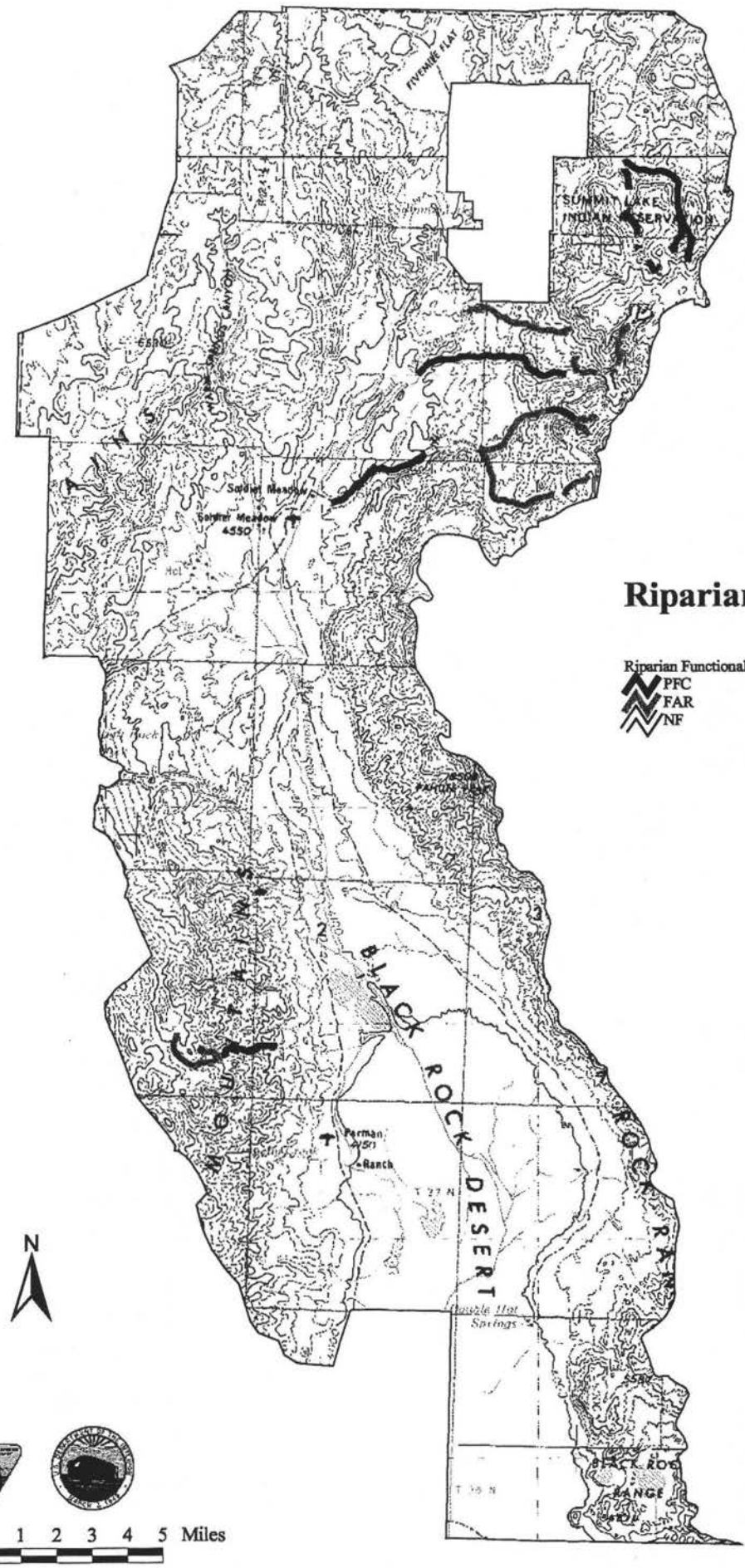
## Lower Mahogany 1999 Daily Stream Temperatures



## Lower Mahogany Creek 1999 Daily Air Temperatures



# APPENDIX 21 - RIPARIAN FUNCTIONALITY MAP

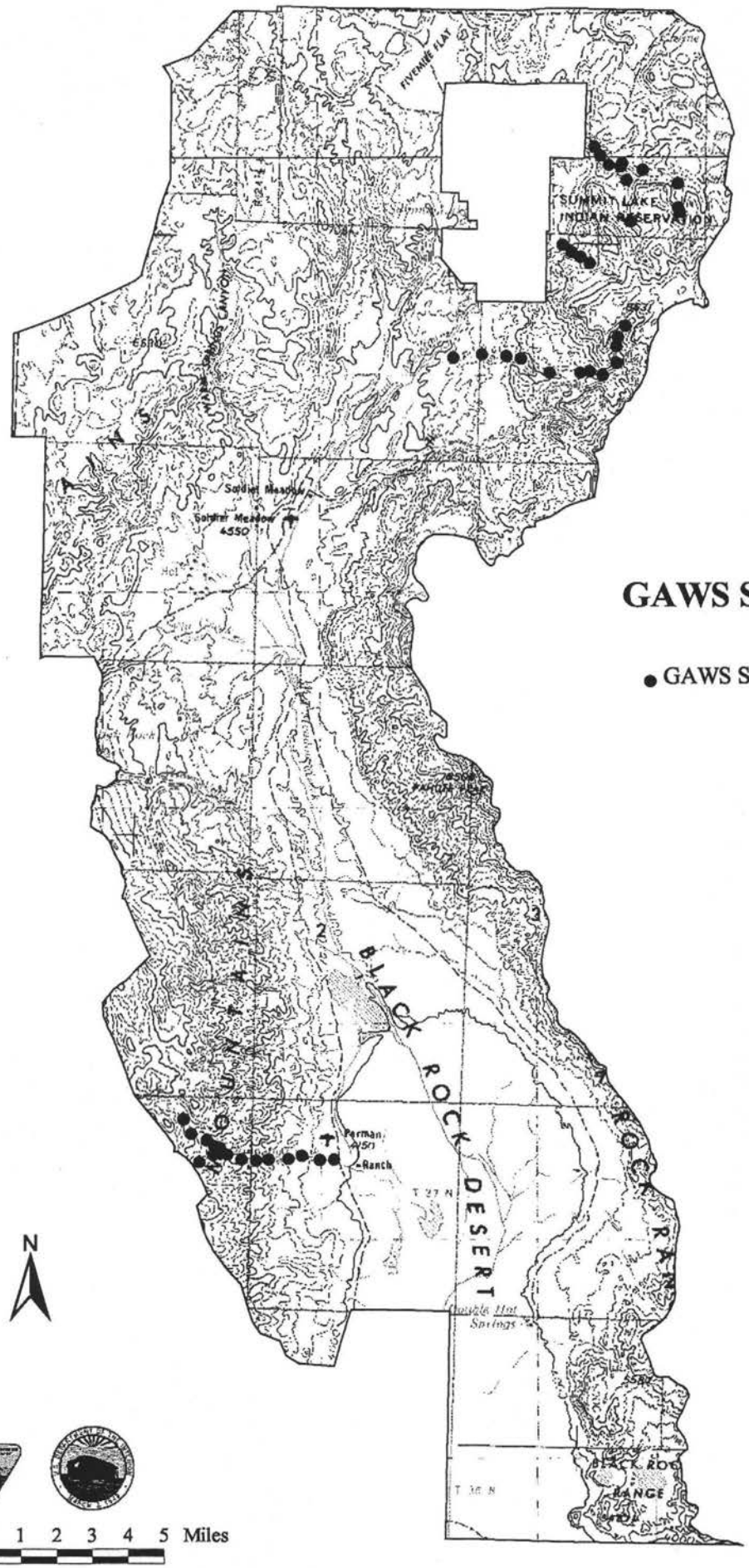



# Riparian Functionality

Riparian Functionality
PFC
FAR
NF

*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 22 - STREAM SURVEY STATIONS

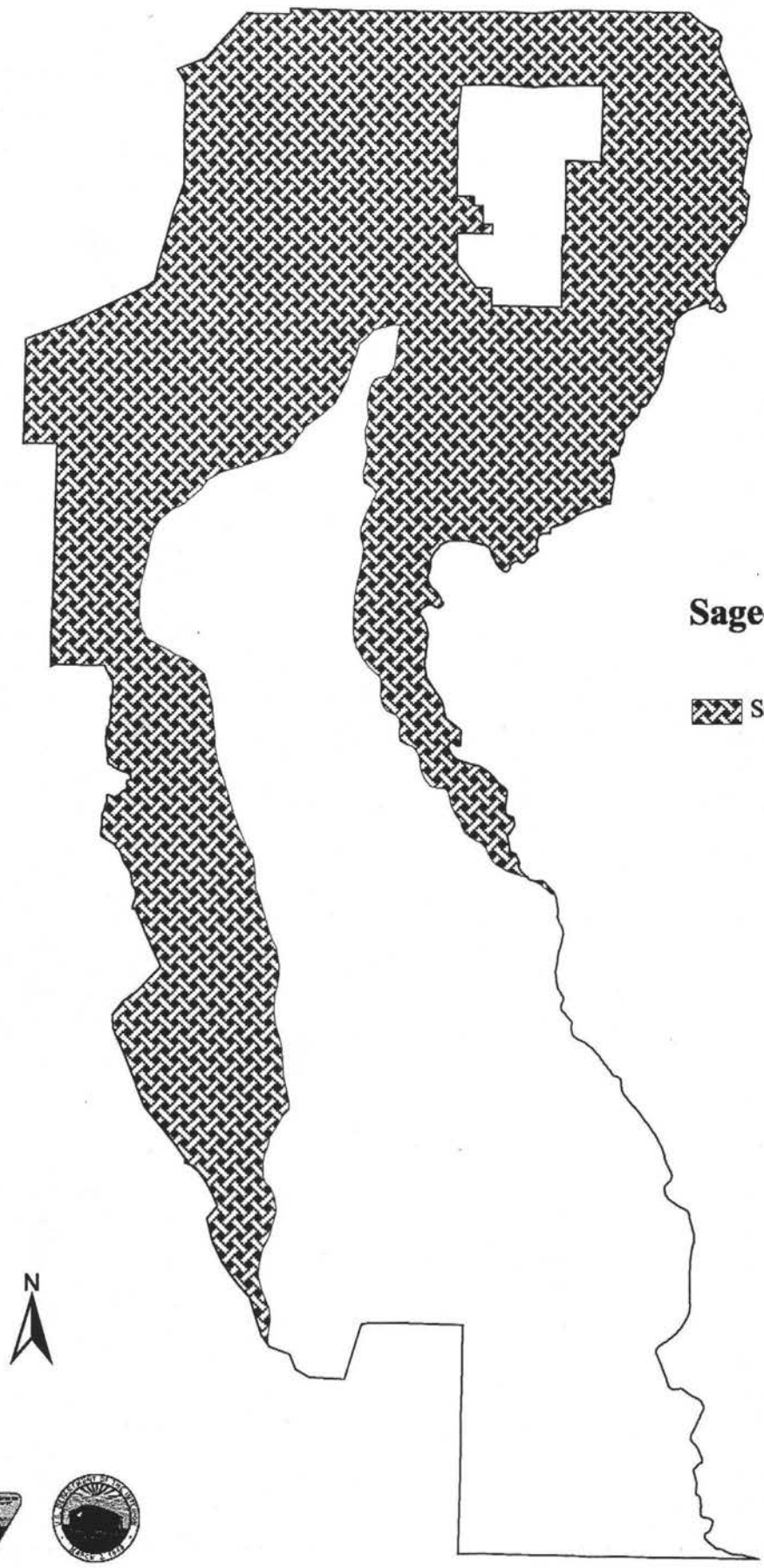



# GAWS Stream Survey Stations

● GAWS Stream Survey Stations

*No warranty is made by the BLM as to the accuracy, reliablility, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 23- SAGE GROUSE HABITAT MAP



## Sage-Grouse

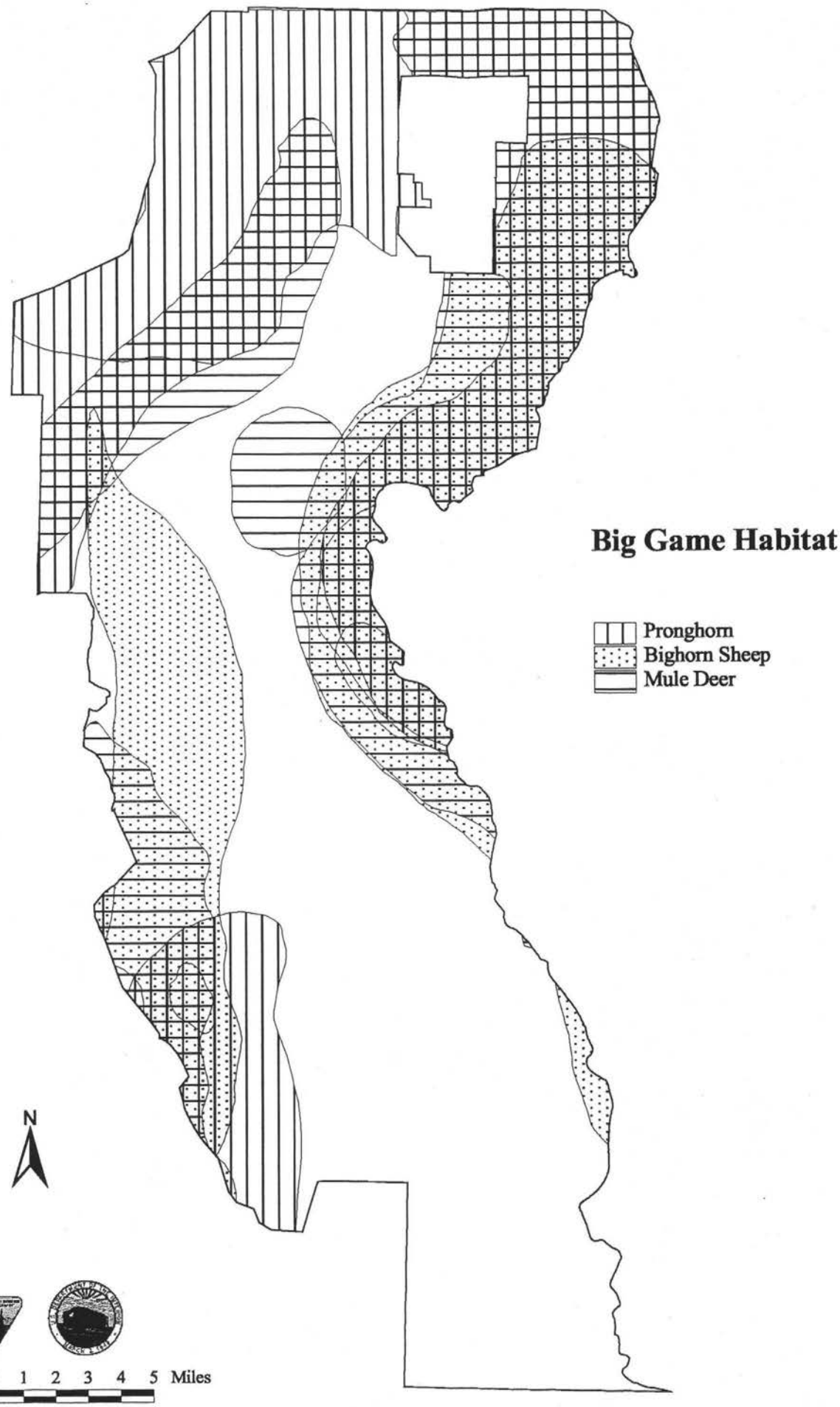
Sage-Grouse Nesting Habitat

N

1 0 1 2 3 4 5 Miles

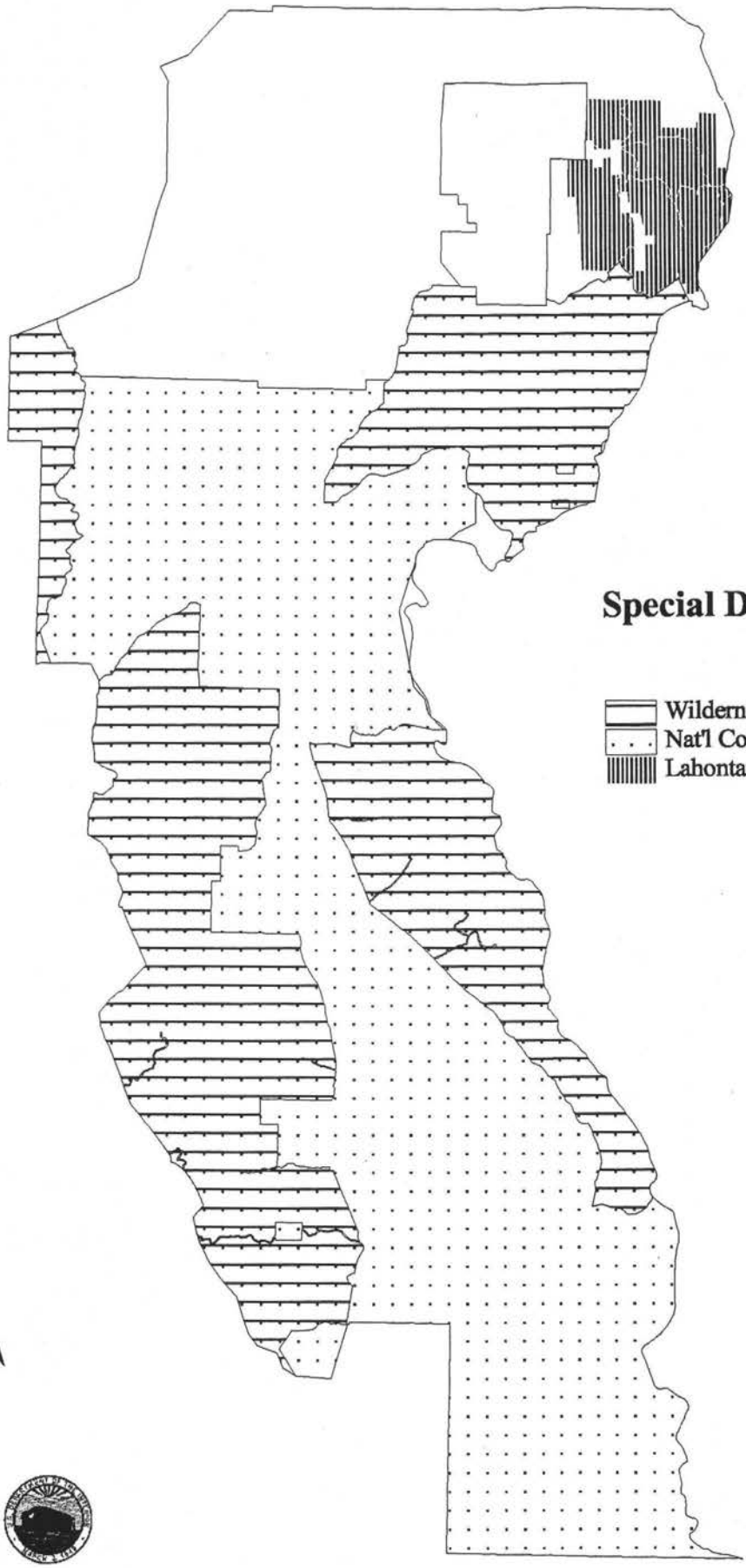
*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 24 - BIG GAME HABITAT MAPS




*No warranty is made by the BLM as to the accuracy, reliablility, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 25 - SPECIAL DESIGNATIONS MAP



## Special Designations

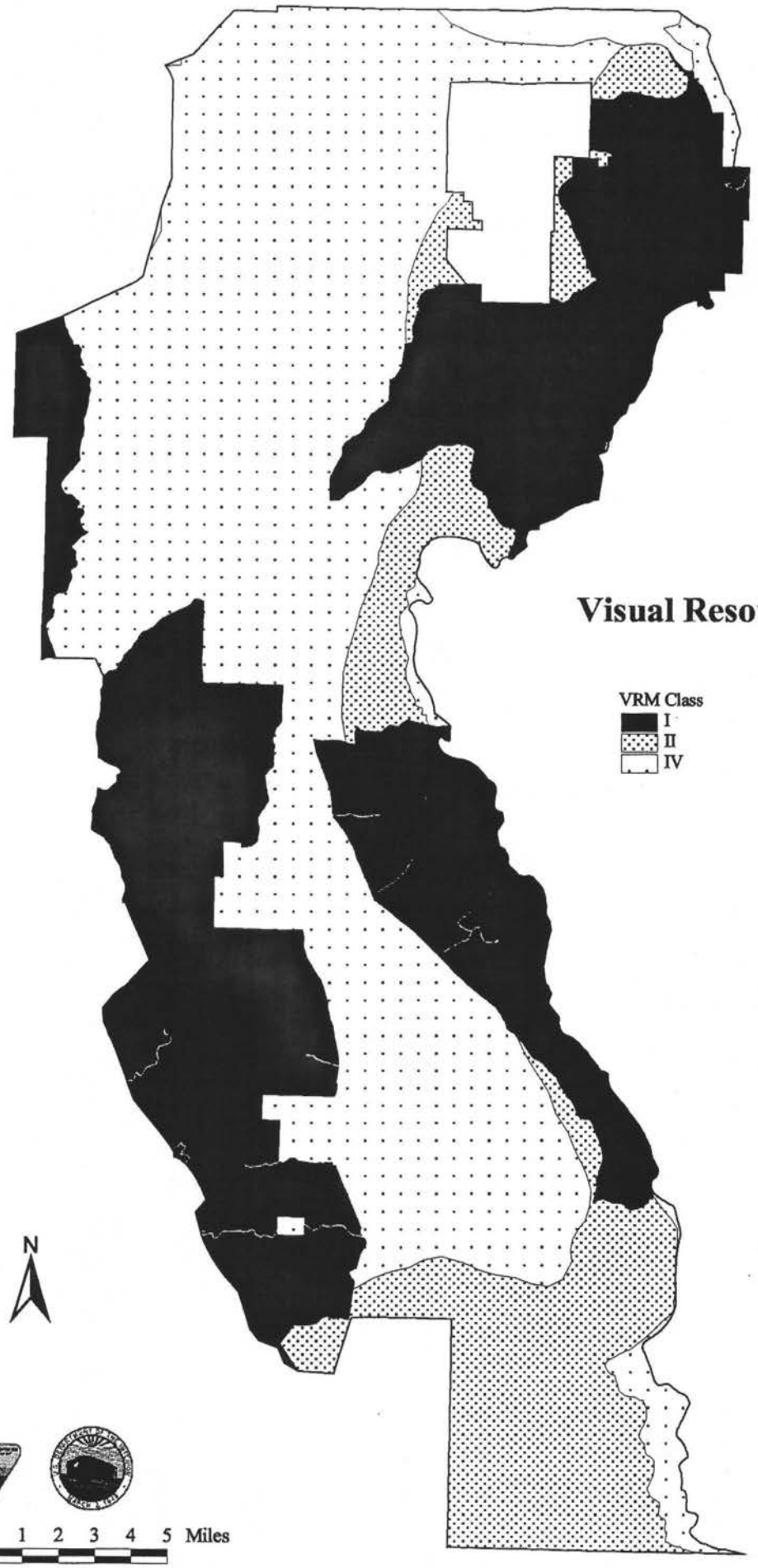
- Wilderness Areas
- Nat'l Convervation Area
- Lahontan Cutthroat Trout Instant Study Area

N

1 0 1 2 3 4 5 Miles

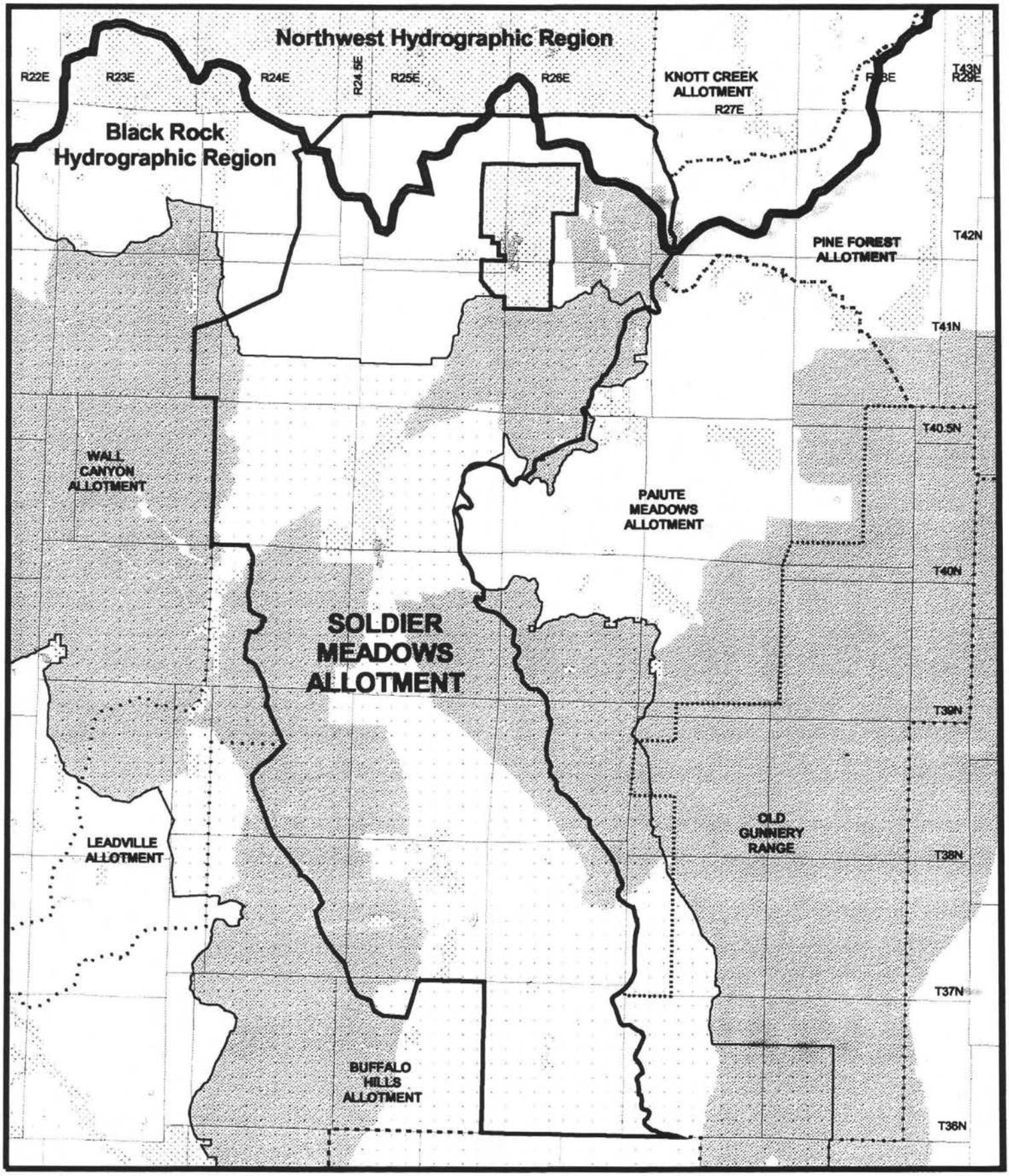
*No warranty is made by the BLM as to the accuracy, reliablility, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 26 - VISUAL RESOURCES MANAGEMENT CLASS MAP




*No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.*

# APPENDIX 27 - CUMULATIVE IMPACTS ANALYSIS AREA MAP




**Soldier Meadows Allotment - Cumulative Impact Analysis Area**

- Soldier Meadows Allotment
- Other Allotments
- Hydrographic Region
- Wilderness or Instant Study Area
- National Conservation Area (NCA)
- Non - BLM Lands

N

3 0 3 6 Miles

1:350000