DOI BLM

ENVIRONMENTAL ASSESSMENT
LIVESTOCK GRAZING AUTHORIZATION

Calcutta Allotment

Surprise Field Office
DOI-BLM-CA-N070-2009-0008-EA
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Contents

CHAPTER 1: INTRODUCTION

This Environmental Assessment (EA) is prepared to disclose and analyze the environmental consequences of re-authorizing a livestock grazing permit/lease for 10-years as proposed on the Calcutta Allotment. The EA is a site-specific analysis of potential impacts that could result with the implementation of one of the alternatives. The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in compliance with other laws and policies affecting the alternatives. If the decision maker determines that this project has "significant" impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a grazing decision will be issued along with a Finding of No Significant Impact (FONSI) statement, documenting the reasons why implementation of the selected alternative would not result in "significant" environmental impacts.

Background

The Calcutta Allotment is located approximately twenty-three (23) air miles east of Fort Bidwell, California, in northern Washoe County, Nevada (T45N, R20E). The eastern edge of the allotment borders the Little Sheldon Unit of the Sheldon National Wildlife Refuge. The Calcutta Allotment consists of 10,204 acres of public land, and 361 acres of private land for a total of 12,565 acres. One permittee (Hapgood Ranch) currently holds active preference on the Calcutta Allotment, permitted for a total of 76 cattle from April 16 to October 31, for a total use of 497 public AUMs annually. This permit was issued under the Appropriations Act; therefore requires renewal prior to FY2010.

The Calcutta Allotment was previously part of the Horse Lake Allotment. In July, 1979; a wildfire resulted in a crested wheatgrass seeding, and a fire protection fence. The fire protection fence divided the affected area into two separate allotments (Horse Lake and Calcutta Allotments). The Calcutta Allotment was then managed as two pastures; one native pasture, and one pasture containing 1,390 acres of crested wheatgrass seeding. These pastures are referred to as the Native pasture and the Jeep Fire (Seeded) Pasture. Inside the Seeded Pasture is a 189 acre gathering field. A map depicting the pastures in the Calcutta Allotment can be found in Map 1 in Appendix 1. The allotment carrying capacity was estimated in 1981 by the Technical Review Team (TRT) at 230 AUMs in the native pasture (4,615 acres at 20 acres/AUM), and 548 AUMs in the seeded pasture (1,390 seeded at 4 acres/AUM and 4,255 unseeded at 21 acres/AUM), giving an total 778 AUMs for the allotment.

Since very shortly after the allotment's formation, the Calcutta Allotment has been managed under the Cowhead/Massacre Management Framework Plan (MFP), approved in 1981 and as further amended for Northeast California and Northwestern Nevada Rangeland Health Standards and Guidelines for Livestock Grazing (July 2000). In April of 1981 a Technical Review Team was organized by the Modoc-Washoe Experimental Stewardship Committee to examine the Calcutta Allotment for the purpose of developing management recommendations for livestock grazing. The allotment recommendations were implemented by a Proposed Grazing Decision in November of 1981, and a Final Grazing Decision was issued in January 1982. This Grazing Decision established a Coordinated Grazing Plan for the Calcutta Allotment and the Little Sheldon Grazing Unit on Fish and Wildlife Service Lands. The grazing plan established a three

pasture rest rotation system, with one of the pastures being on the Little Sheldon.

In 1993, the Little Sheldon was closed to livestock grazing, along with other allotments within the Sheldon National Wildlife Refuge and since then the Calcutta Allotment has still been managed under the Coordinated Grazing Plan.

The Calcutta Allotment is categorized as "I" (improve), which is defined in the Surprise Field Office Resource Management Plan (RMP) and Record of Decision of April 2008 as; "Allotments generally having the potential for increasing resource production or conditions, but are not producing at that potential. There may be conflicts or controversy involving resource conditions or uses, but there are realistic opportunities to enhance resource conditions."

Current Permitted Use

Current Mandatory Terms and Conditions are listed in below table:

Table 1. Current Mandatory Terms and Conditions for the Calcutta Allotment.

Allotment/ Permittee	Livestock		Grazing Period		% Public Land	AUMs		
	Number	Class	Begin	End		Active	Suspended	Total
Hapgood Ranch	76	cattle	April 16	October 31	100%	497*	123	620

*Actual use on the Calcutta Allotment is not accurately reflected by the mandatory terms and conditions. Actual use on the Calcutta Allotment has included temporary non-renewable AUMs since 1982, as per TRT recommendations.

Table 2. Current Pasture Management

Pasture	Number	Kind	On date	Off date	AUMs
Seeded	76	Cattle	4/16	5/15	75
Native	76	Cattle	5/16	8/30	267
Seeded	76	Cattle	9/01	10/31	152
*Gathering Field	40	Cattle	11/01	11/15	30

* The 189 acre gathering field has not been included in the current management plan. When fall gathering occurs, roughly half the cattle are taken directly to the home ranch, and the other half remain in the gathering field for 2 or 3 weeks.

Trailing

The home ranch is between Lake City and Fort Bidwell, in Surprise Valley, California. The ranch is approximately 23 miles west/southwest of the Calcutta Allotment, necessitating several

days of trailing both out to the allotment in the spring, and home in the fall.

Listed below are other field office Terms and Conditions currently included on all permits to ensure compliance with meeting Land Use Plan objectives and Rangeland Health Standards.

1. Grazing use offered or authorized by BLM is subject to all provisions of the grazing regulations (43 CFR Parts 4100) and other applicable law and regulation. Grazing use will be in accordance with the Rangeland Health Standards and Guidelines for California and Northwestern Nevada Final EIS approved by the Secretary of the Interior on July 13, 2000. Grazing use authorization may be modified in accordance with regulation to attain progress towards achieving rangeland health standards (subpart 4180.1 and 4180.2 Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration).

2. Salt and/or mineral supplements will be placed no closer than ¼ mile from any public water source, aspen stand, or meadow.

3. Grazing flexibility can be requested by the livestock operators to run increased numbers for a shorter season. Any changes in grazing use cannot exceed Active AUMs, and must be approved in advanced by a BLM authorized officer.

4. All range improvements must be maintained to standards prior to livestock turnout. All assigned fence maintenance must be completed annually, even if your permit is not activated. Failure to complete assigned fence maintenance may result in suspension of your grazing authorization.

Listed below are other Terms and Conditions currently included on the Calcutta Allotment permit to ensure compliance with meeting Land Use Plan objectives and Land Health Standards.

1. All use will be in accordance with the Calcutta-Little Sheldon Grazing Plan. Billing will be based on actual use reports submitted 15 days following the last authorized take off date for your permit. Actual use report will be submitted no later than November 15.

2. Any increases or extensions in grazing use must receive prior approval from the authorized officer.

3. Flexibility is provided to the livestock operators to adjust actual dates of use (± two weeks) after receiving approval of the BLM authorized officer, as needed, based on forage, stockwater conditions, and degree of utilization.

4. Flexibility to turn out on the Jeep Fire Seeding Pasture on 4/01 is contingent on range and soil readiness, and turnout may be delayed if soil conditions are not suitable at that time.

5. Gates into adjacent pastures may be opened up to five days ahead of the planned pasture move in order to facilitate livestock gathering. Pastures must be 95% clean of livestock within 5 days of the pasture move, and 100% clean within 10 days.

Temporary Non-Renewable Use

Due to the decisions reached by the TRT, yearly Temporary Non-Renewable (TNR) AUMs have been requested and approved since 1982 on the Calcutta Allotment, so use on the allotment is not reflected in the AUMs on the permit held for the allotment. Actual use reports have been turned in yearly since 1982, providing accurate representation of yearly use on the Calcutta Allotment. The exception to accurate use records is the 189 acre gathering field, which has been treated as a private field and has never had use reported.

Prior to 1997, the Calcutta Allotment was managed mainly as a basic rest rotation system, with either the seeding or the native pasture being (mostly) rested every year. In 1997 the pasture move dates changed, with the result being; use of the Seeded Pasture first, for 7 or 8 weeks (average of 271 AUMs), then all cattle were moved to the Native Pasture where they remained for 8 or 9 weeks (average 352 AUMs). After the Native Pasture use, all cattle are moved back to the Seeded pasture for the remaining time, between 7 to 12 weeks (average 272 AUMs). Pasture moves and allotment use has been similar since 1997, before which time the BLM and permittee were still adjusting management to accommodate the closing of the Little Sheldon. Actual use has fluctuated between 645 and 1092, with an average of 894 actual use AUMs being used yearly since 1997. The actual use is detailed in the Calcutta Allotment Evaluation.

An allotment evaluation has been completed for the Calcutta Allotment. This document provides more detailed actual use information as well as climate data. These data, along with other monitoring data summarized in the evaluation were used to conduct a carrying capacity analysis. The data and findings of this allotment evaluation are incorporated into this environmental assessment by reference and specific portions of this evaluation will be referenced throughout this document to aid in the analysis.

Purpose and Need for the Action

(1) To Consider Permit/Lease Renewal

The purpose of the action is to authorize livestock grazing use on the Calcutta Allotment. The need for the action is to ensure that issuance of a grazing authorization is in conformance with National Environmental Policy Act (NEPA), the Surprise Field Office Resource Management Plan and Record of Decision of April 2008 (RMP), and the Northeastern California and Northwestern Nevada, Standards for Rangeland Health and Guidelines for Livestock Grazing Management 2000.

The Surprise Field Office RMP applicable goals and objectives for livestock grazing, as noted on page 2-34 and 2-35 include the following:1) Sustainable, ecologically sound, and economically viable livestock grazing opportunities would be provided, where suitable, in the Surprise Field Office management area, 2) Adequate forage would be produced to support sustainable levels of livestock grazing where compatible with objectives for other resources and resource users, 3) Continue to modify and adjust grazing management within individual grazing allotments to ensure that a vigorous plant community is sustained in combination with livestock grazing.

Washington Office Instruction Memorandum No. 2003-071, calls for all grazing permits to be fully processed by the end of FY 2009, using the information from the land health standards evaluations as needed to complete environmental impact analysis and documentation. In accordance with that policy, the Surprise Field Office has fully processed and proposes to issue a livestock grazing permit to a qualified applicant for the Calcutta Allotment. All grazing permits are issued in accordance with 43 CFR 4100. Grazing permits must be consistent with the provisions of the Taylor Grazing Act, Public Rangelands Improvement Act, and Federal Land Policy and Management Act.

The grazing permit or authorization (including crossing or trailing permits) will include the type and level of use authorized, including the kind and number of livestock, the period of use, and the amount of active use in animal unit months (AUMs), and terms and conditions for grazing use.

Plan Conformance

- The proposed action is in conformance with the Proposed Surprise Field Office Resource Management Plan and final environmental impact statement issued in May 2007 as adopted by the Record of Decision approved in April 2008.

- The proposed action is in conformance with the Northeast California Northwest Nevada Rangeland Health Standards and Guidelines for Livestock Grazing of 2000.

Scoping and Issues

A scoping letter was sent to 66 interested publics on January 17, 2008. Western Watersheds Project and Nevada Department of Wildlife contributed comments, and all comments received were carefully considered. In addition, scoping has been conducted at meetings with the permittee through 2007, 2008, and 2009. Permittees were consulted in March 2007, March and June 2008, and throughout March and April 2009.

The Modoc-Washoe Experimental Stewardship Program was actively included in the process, and was provided updates on permit renewal processes.

A Draft Allotment Evaluation was sent to the interested publics, and comments were received from Western Watersheds Project, and Nevada Department of Wildlife. Based on these comments the Final Allotment Evaluation was updated and clarified.

Summary of Issues Received During Scoping

As a result of the scoping process, the following general issues were identified: Sage grouse habitat, pygmy rabbit habitat, Rangeland Health Assessment, monitoring, carrying capacity, range improvements, and riparian areas.

Prevention of Unnecessary or Undue Degradation:

In addition to the management prescriptions discussed in this EA, including all terms and

conditions, BLM may use its authority to close an area of the allotment to grazing use or take other measures to protect resources at any time, if needed. Therefore, issuance of a grazing lease with appropriate terms and conditions is consistent with BLM's responsibility to manage the public's use, occupancy, and development of the public lands and prevent unnecessary or undue degradation of the lands. (43 USC 1732(b)).

Relationship to Statutes, Regulations, and Plans

Cultural Resources

The BLM has explicit responsibility to manage cultural resources on public lands consistent with applicable procedures and agreements.

To comply with the National Historic Preservation Act the BLM is required to assess the condition of cultural resources on each grazing allotment prior to the renewing of grazing allotment permits. The BLM in consultation with the California and Nevada State Historic Preservation Offices (SHPO) has developed a protocol for the assessment procedures. The protocol allows for the renewal of grazing permits prior to the completion of the cultural resource assessments under a number of conditions and stipulations. Each grazing allotment assessment will be completed on a specified date. The results of the assessments may be used to modify grazing permits. If cultural resources are identified as receiving impacts as a result of livestock management or grazing on a specific allotment, the stipulations of the grazing permit will be modified to reflect compliance with the Bureau's responsibility to manage and protect cultural resources. Consultation regarding affected cultural resources will take place with the appropriate Native American tribe and the California and/or Nevada State Historic Preservation Office(s).

All cultural resource sites will be subject to review and evaluation for listing in the National Register of Historic Places. Pursuant to the Nevada and California SHPO protocol, supporting documentation will be submitted to the California and/or Nevada SHPO for review and concurrence for submission to the Keeper of the National Register. All cultural resources will be afforded protection consistent with law and policy, including appropriate mitigation measures.

Agreement between State Director and State Historic Preservation Officer Protocol Amendment for Renewal of Grazing Permit and Leases.

In August 2004, the State Director, California Bureau of Land Management and the California State Historic Preservation Officer (SHPO) addressed the issue of the National Historic Preservation Act (NHPA) Section 106 compliance procedures for processing grazing permit lease renewals for livestock as defined in 43 CFR 4100.0-5. The State Director and the SHPO amended the 2004 State Protocol Agreement between California Bureau of Land Management and The California State Historic Preservation Officer with the 2004 Grazing Amendment, Supplemental Procedures for Livestock Grazing Permit/Lease Renewal. This amendment allows for the renewal of existing grazing permits prior to completing all NHPA compliance needs as long as the 2004 State Protocol direction, the BLM 8100 Series Manual Guidelines, and specific

amendment direction for planning, inventory methodology, tribal and interested party consultation, evaluation, effect, treatment, and monitoring stipulations are followed.

Rangeland Health

The field rangeland health assessment (RHA) for the Calcutta Allotment was completed from April 2008 to July 2008. The Rangeland Health Standards determination was completed in August 2008, and revised in May 2009. A copy of the land health standards assessment and determinations for the Calcutta Allotment is available in the allotment files at the Surprise Field Office. The determination is posted on the Surprise Field Office homepage at http://www.blm.gov/ca/st/en/fo/surprise/grazing_permit_renewals.html.

The below table summarizes the outcome of the 2008 RHA.

Table 3. Rangeland Health Standards Determination

Rangeland Health Standard	Meets Standard	Does Not Meet Standard	Current livestock are the causal factor for not meeting Yes or No	Remarks (locations, etc.)
Upland Soils	✓			Soil Site Stability rated as stable and Hydrologic Function rated as functioning for all 4 evaluation sites in the RHA. The Soil Stability Test rated appropriately for all samples within the range of 3 - 6 for the reference site.
Stream Health				N/A
Riparian/ Wetland		✓	Yes	Several seeps and springs were found to be Functional at Risk with no apparent trend.
Water Quality				N/A
Biodiversity		✓	No	Most native vegetative communities are diverse and have the vigor and seedbanks to take advantage of favorable events. The dry floodplain site does not meet biodiversity standards. No largescale invasive infestations are known within this allotment, however components of cheatgrass are present. Juniper is actively encroaching within areas of the allotment.

CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

Table 4. Brief description of alternative components presented in Chapter 2.

Alternatives	Mandatory Terms and Conditions	Total AUMs / % Public Land	New Terms and Conditions	Pasture Rotation	Trailing	Proposed Range Improvements	Monitoring
1-Proposed Action	140 Cattle, 4/16 – 10/01 70 cattle 10/02 – 10/15	778 / 96%	Yes	Yes, Every other year, deferred use of seeding, 3 pasture moves	Yes	2 exclosure fences, 2 troughs, 1 stock pond	Utilization, photo points, cover data
2- No Action*	76 Cattle, 4/16 – 10/31 40 cattle 11/01 – 11/15	497 / 96%	No	Yes, same yearly, 3 pasture moves	Yes	None	Utilization, photo points, cover data
3- Reinstate Suspended AUMs	95 Cattle, 4/16 – 10/31 46 cattle 11/01 – 11/15	620 / 96%	Yes	Yes, same yearly, 3 pasture moves	Yes	2 exclosure fences, 2 troughs, 1 stock pond	Utilization, photo points, cover data
4- Deferred Use	140 Cattle, 4/16 – 10/01 70 cattle 10/02 – 10/15	778 / 96%	Yes	Yes, every other year, 2 pasture moves	Yes	2 exclosure fences, 2 troughs, 1 stock pond	Utilization, photo points, cover data
5- No Grazing	No Cattle	0	N/A	N/A	N/A	N/A	Photo points, cover data

*No Action Alternative includes 648 annual TNR AUMs.

Table 5. Comparison of grazing schedules and actual use history since 1997 for the alternatives for the Calcutta Allotment

	Allotment Total (AUM)	Period of use (months)	Jeep Sdg total AUMs	Jeep Seeding Total months	Jeep Seeding Early Use months	Jeep Seeding Early Use AUMs	Jeep Seeding Late months	Jeep Seeding Late AUMs	Native months	Native AUMs	Gathering Field months	Gathering Field AUMs
Actual use 1997-2008 (average)	894	5.25	432	3.3	1.5	160.5	1.8	272	2	352	.5	40
Alternative 1 (proposed action	778	7	508	3.75	1.5 E* 2.5 O*	203 E 340 O	2.25 E 1.25 O	305 E 163 O	1.75	239	.5	31
Alternative 2 (no action)	497	6.5	256	3.5	1.5	110	2	146	3	218	.5	19
Alternative 3	620	7	412	4.5	2	181	2.5	231	2	186	.5	22
Alternative 4	782	6	508	3.75	NA	NA	NA	NA	1.75	239	.5	31
Alternative 5 (no grazing	--	--	--	--	--	--	--	--	--	--	--	--

*E = even year, O = Odd year (in pasture rotation schedule)

Management common to all Alternatives except No Grazing Alternative

Administrative Changes

- A new grazing permit would be issued.
- The Gathering Field would be recognized as a pasture and billed accordingly.
- The percent public land base for fee calculation purposes would be corrected from 100% public land to 96% public land, in order to recognize the unfenced private lands within the allotment.

Trailing

The home ranch is between Lake City and Fort Bidwell, in Surprise Valley, California. The ranch is approximately 25 miles west/southwest of the Calcutta Allotment, necessitating several days of trailing to the allotment in the spring, and home in the fall.

Annual trailing use consists of:

- From the Home Ranch, they drive all cattle that are to be turned out on BLM range in one group. They start by heading to the east of Lake City, to the south of the Upper Alkali Lake, over the immigrant trail. They spend the 1st night at the Sand Creek holding field.
- They then move the cattle along Nevada Highway 8A, and spend the 2nd night in Vya.
- From Vya they head north along Highway 34 and arrive in Calcutta on the 3rd day.

Other Permit Terms and Conditions

1. Grazing management in the Calcutta Allotment will be in conformance with this decision; (the AMP and all other past documents governing livestock use are suspended).
2. After receiving written approval from the authorized officer, the livestock operator may turn out up to two weeks early (4/1) as determined by soil moisture criteria. Soil moisture is deemed dry enough when a pickup can be driven to the Calcutta Ranch House without leaving greater than 2 inch ruts.
3. Livestock permittee may adjust move dates to the next scheduled pasture in the rotation up to fifteen days earlier throughout the scheduled grazing use period without prior approval based on forage, water and utilization conditions. All subsequent pasture move dates would be adjusted accordingly, not to exceed actual use AUMs.
4. Any adjustments in move dates or numbers must be communicated to BLM within 7 days of the change and shall be recorded accurately on the actual use report.

5. Additional adjustments in livestock use may be required by BLM annually based on utilization, drought, water availability or other conditions.

6. Pastures must be 95% clean of livestock within 5 days of the move date and 100% clean within 10 days of the move.

7. Gates into adjacent pastures may be opened to facilitate livestock movement to the next scheduled use area up to five days ahead of the planned move.

8. To improve livestock distribution, salt and mineral supplements may be used in the allotment. These must not be located closer than ¼ mile from any natural or artificial water source, archaeological site, aspen stand or riparian area.

9. Protein supplements are not authorized in the allotment.

10. Range improvements assigned to you must be maintained prior to livestock turnout and inspected and maintained periodically throughout the period of scheduled use to ensure compliance with the Annual Operating Plan.

11. Utilization of Crested Wheatgrass in the Jeep Fire Seeding Pasture shall not exceed 60% of current year's growth as measured at the end of the growing season.

12. Utilization of upland grass species excluding the Dry Floodplain Ecological Site in the Native Pasture sites shall not exceed 60% at the end of the grazing period.

13. Utilization of upland grass species in the Dry Floodplain Ecological Site in the Native Pasture shall not exceed 40% at the end of the grazing period.

14. Utilization of upland browse species shall not exceed 50% of annual growth at the end of the grazing period.

15. Utilization of key herbaceous riparian plant species at Antelope, and Dog Springs in the Seeded pasture and Unnamed Spring in the Native Pasture shall be managed so as to provide a minimum of 4 inches of stubble height at the end of the growing season. Key riparian plant species shall be identified cooperatively by the permittee and the BLM. If riparian monitoring identifies stubble heights less than 2 inches in any one year, use in that pasture will be adjusted before the next years scheduled use.

D. Range Improvements

The proposed improvements are needed for meeting rangeland health riparian standards and to implement the livestock management section described above. A map depicting the locations of the projects can be found as Map 2 in Appendix 1.

Listed below are new improvements proposed to maintain or achieve rangeland health. Existing projects are contained in the Surprise FO allotment files.

Table 6. New improvements that are necessary to maintain or achieve rangeland health on the Calcutta Allotment. Proposed projects start date is summer 2010.

Project Name	Location Township/Range/ Section	Mitigation Description (indicate resource benefit of improvement)
Antelope Spring Exclosure Fence	T45N, R20E, Sec. 10	Exclosure will benefit the spring source and wildlife.
Antelope Spring Trough Replacement/ Movement	T45N, R20E, Sec. 10	Will provide water outside of the spring exclosure for wildlife and livestock.
Dog Spring Exclosure	T45N, R20E, Sec. 3 NWNE	Fence spring source and riparian on Dog Spring to mitigate impacts. 5-10 acres
Dog Spring development	T45N, R20E, Sec. 3 NWNE	Pipe spring water to a trough outside exclosure.
Dispersion Pit Reservoir	T46N, R20E, Sec. 34 NWNW	Create more water sources to disperse cattle, especially necessary later in season.

The following Standard Operating Procedures will be adopted for all necessary range improvement projects:

1. An archaeological inventory will be conducted in compliance with 36 CFR 800.4 through 800.5 prior to the survey, design, or construction of the identified range improvement projects.

2. Any cultural resource sites located within project corridors will be avoided. With the exception of pit reservoirs that must be built in specific locations. If cultural resources are discovered in proposed pit reservoir locations, a determination of National Register significance will be made in consultation with the Nevada State Historic Preservation Office. If cultural resource sites are found to be not eligible to the National Register of Historic Places (NRHP) then the reservoir may be constructed, otherwise all NRHP eligible sites will be avoided.

3. Appropriate water rights or other permits would be secured before construction begins.

4. Follow recommendations in Vya PMU sage-grouse strategy for construction/maintenance of spring developments as follows:"

1. Construct new spring developments to maintain their free-flowing nature and wet meadow characteristics, install wildlife escape ramps in new water troughs, retrofit existing troughs with wildlife escape ramps".

2. Construct new livestock facilities (troughs, fences, corrals) at least 0.6 miles (1 km) from leks, restrict new water developments. Construct future livestock exclosures large enough to minimize raptor predation.

3. If projects are within 0.6 of a lek, any new fences will use steel pipe for corners panels and gates. Steel pipe with have domed caps to reduce wildlife entrapment and discourage raptor perching. The top wire will be secured above the cross brace to discourage perching.

5. New fences would be built to pronghorn specifications. Top wires will be flagged the first year following construction to increase visibility and reduce the possibility for wildlife collision.

6. Maintenance of new range improvements will be assigned to the permittee and cooperative agreements will be completed before construction.

7. Soil removed during construction of reservoirs will be mounded and shaped to reduce erosion and bare soils will be seeded with an approved mix to discourage weed establishment.

8. Equipment used for construction will be washed before entering the construction site to reduce the possibility of introducing weeds.

9. Blading (removal) of vegetation or other ground disturbance is not authorized outside of the immediate reservoir area.

10. New roads will not be established to sites. Any disturbed access routes will be reclaimed at the conclusion of the construction phase.

11. Any adjustments in boundaries or "footprints" not larger than 500 feet are considered in this alternative to be within the scope of this alternative and the succeeding analysis.

E. Monitoring

Utilization data would be collected from the seeded and native pastures after pasture moves and final take-off date yearly. Utilization would be read on all major ecological sites, and resulting data would be used to create use pattern maps.

Trend sites (established in 1983 and 1987) are placed throughout the Calcutta Allotment. These sites had vegetation data collected at date of inception, as well as in 2008. Vegetation species cover data would be read at these sites every decade to ensure continued vegetative health and upward trend. All monitoring would be performed in accordance to BLM policy following protocols from BLM approved manuals and technical references.

Trend photo points were established in 1982 throughout the crested wheatgrass seeding. These sites have been re-photographed intermittently since inception, and would continue to be used as photographic reference sites, for the purpose of showing the native vegetation changes in the Jeep Fire in the future.

Long Term (to be accomplished by 2019) and Short Term Objectives (measurable yearly)

Long Term –

- In the Claypan 10-14" ecological site increase canopy cover of native deep rooted perennial grasses from 9% to 12%.
  Short Term –
  - Annual utilization of native perennials (key species = *Idaho Fescue, Bluebunch Wheatgrass and Thurber's needlegrass*) in the Native Pasture does not exceed 60% at end of grazing period.

Long Term –

- In the Dry Floodplain ecological site increase canopy cover of native deep rooted perennial grasses from 3% to 5%.
  Short Term –
  - Annual utilization of native perennials (key specie = *Great Basin Wildrye*) in the Dry Floodplain site of the Native Pasture does not exceed 40% at end of grazing period.

Long Term –

- In the Loamy 10-12" ecological site increase canopy cover of native deep rooted perennial grasses from 10% to 12%.
- In the Loamy 10-12" ecological site maintain the presence of crested wheatgrass at over 20% cover.
  Short Term –
  - Annual utilization of perennials (key species = *Crested Wheatgrass*) in the Jeep Seeding Pasture does not exceed 60% at end of grazing period.

Long Term –

- In the Sodic Terrace 8-10" ecological site increase canopy cover of native perennial grasses from 18% to 22%.
- In the Sodic Terrace 8-10" ecological site increase canopy cover of crested wheatgrass from 3% to 6%.
  Short Term –
  - Annual utilization of perennials (key species = *Crested Wheatgrass, Saltgrass, Squirreltail, Great Basin Wildrye*) in the Jeep Seeding Pasture does not exceed 60% at end of grazing period.

Long Term –

- Maintain or improve bitterbrush communities with a form class rating not exceeding 2.5.
  Short Term –
  - Annual utilization of bitterbrush does not exceed 60% of current years' leader growth at the end of the growing season.

Long Term –

- Reduce juniper encroachment in sagebrush ecological sites to less than 15%, prioritizing treatments around springs and seeps, aspen stands, and important sage grouse habitat areas.
  Short Term –
  - Identify areas within the Calcutta Allotment that have the highest site potential for juniper removal.
  - Project initiation by 2013.

Long Term –

- Achieve PFC on Antelope Springs, Dog Springs and Unnamed Spring in the Native Pasture .
  Short Term –
  - Utilization of key herbaceous riparian plant species at Antelope, and Dog Spring in the Seeded pasture and Unnamed Spring in the Native Pasture shall be managed so as to provide a minimum of 4 inches of stubble height at the end of the growing season.
  - If riparian monitoring identifies stubble heights less than 2 inches in any one year, use in that pasture will be adjusted before the next years scheduled use.
  - There should be no more than 20% utilization on key riparian trees and shrub species in those areas where the presence of woody riparian species is necessary to meet standards.

Monitoring Objectives

1. Review current key areas with permittee and other affected interests to confirm they are appropriately located to continue being used and/or establish new key areas within two years.

2. Collect updated trend data for all key areas by 2012.

Alternative 1 - Proposed Action

This permit would specify a total of 778 AUMs of livestock use as active preference (773 AUMs in odd years). Under this alternative, 123 suspended AUMs would be reactivated, and an additional 158 AUMs of livestock use would be scheduled/permitted. Grazing use would be organized around a three pasture grazing system which includes the incorporation of the gathering field into the rotation as a new pasture. The number of cattle run would increase active preference from 76 to 140 head. The season of use would decrease by 1 month from the current use system. A partial deferred rotation grazing system would be implemented which would alternate use of the Jeep Seeding to reduce the amount of return fall use in alternating years. Terms and conditions, including Allotment specific short and long term objectives, would be added to ensure grazing use conforms to the RMP and Land Health Standards. Desired plant community objectives would be established. Five essential range improvement projects would be constructed. The following tables summarize the mandatory terms and conditions, and proposed grazing system.

Table 7. Mandatory Terms and Conditions for Proposed Alternative

Allotment/ Permittee	Livestock		Grazing Period		% Public Land	AUMs		
	Number	Class	Begin	End		Active	Suspended	Total
Calcutta #01100	140	Cattle	4/16	10/01	96	747	0	747
Hapgood Ranch	70	Cattle	10/02	10/15	96	31	0	31

Table 8. Pasture Management – two year- partial deferred rotation

Year	Pasture	Number	Kind	On date	Off date	AUMs
Even	Seeded	140	Cattle	4/16	5/31	203
	Native	140	Cattle	6/01	7/24	239
	Seeded	140	Cattle	7/25	10/01	305
Odd	Seeded	140	Cattle	4/16	7/01	340
	Native	140	Cattle	7/02	8/25	239
	Seeded	140	Cattle	8/26	10/01	163
Every year	Gathering Field	70	Cattle	10/02	10/15	31

Alternative 2 - Current Management (No Action)

Current active preference use would be continued but annual authorization of additional AUMs above the active preference would no longer be approved without completing annual appropriate Temporary Non-Renewable (TNR) authorizations. Current active preference is 497 AUMs, and 123 AUMs are held in suspension. The TNR use would not be scheduled and permittee would be required to annually apply for TNR use. Separate grazing decisions would be issued for any TNR authorizations. Grazing use would continue to be managed with two existing pastures (Native and Jeep Seeding). These pastures would be used annually during the same time periods, including return fall use in the seeding each year. The gathering field would not be incorporated into the grazing system as an official pasture, however unlike the current management; livestock use in this field would be accounted for and included with active preference. Scheduled herd size would remain at 76 head. The overall period of use would be expanded to document a removal date of 11/15 (currently 4/16 and 10/31 each year). No new range improvements would be constructed. Existing terms and conditions would be carried forward and new short and long term allotment specific objectives would not be established. There would be no Desired Plant Community objectives defined. The following tables summarize the mandatory terms and conditions, and grazing system for the No Action Alternative.

Table 9. Mandatory Terms and Conditions for Alternative 2

Allotment/ Permittee	Type Preference	Livestock		Grazing Period		% Public Land	AUMs		
		Number	Class	Begin	End		Active	Suspended	Total
Calcutta #01100 Hapgood Ranch	Active	76	Cattle	4/16	11/15	100	497	123	620

Table 10. Pasture Management - basic rotation

Pasture	Number	Kind	On date	Off date	AUMs
Seeded	76	Cattle	4/16	5/15	75
Native	76	Cattle	5/16	8/30	267
Seeded	76	Cattle	9/01	10/31	152
Gathering Field	40	Cattle	11/01	11/15	19

Alternative 3 – Reinstate Suspended AUMs

Active preference would be increased from 497 AUMs to 620 AUMs by activating the 123 AUMs currently held in suspension. The number of cattle run would increase from 76 to 95 head. New terms and conditions including Allotments specific short and long term objectives would be added to ensure grazing use conforms to the RMP and Land Health Standards. Desired plant community objectives would be established. Five essential range improvement projects would be constructed. The following table summarizes the Alternative 3 mandatory terms and conditions, and grazing system.

Table 11. Mandatory Terms and Conditions for Alternative 3

Allotment/ Permittee	Livestock		Grazing Period		% Public Land	AUMs		
	Number	Class	Begin	End		Active	Suspended	Total
Calcutta #01100	95	Cattle	4/16	10/31	96	598	0	598
Hapgood Ranch	46	Cattle	11/01	11/15	96	22	0	22

Table 12. Pasture Management -basic rotation

Pasture	Number	Kind	On date	Off date	AUMs
Seeded	95	Cattle	4/16	6/14	181
Native	95	Cattle	6/15	8/15	186
Seeded	95	Cattle	8/16	10/31	231
Gathering Field	46	Cattle	11/01	11/15	22

Alternative 4 – Deferred Use System

Under this alternative, a grazing permit would be issued to authorize annually up to 778 AUMs in three pastures. Under this alternative, 123 suspended AUMs would be reactivated, and an additional 158 AUMs of livestock use would be scheduled/permitted. Annual livestock use would occur in all three pastures. A two year deferred rotation system would be established, and return fall use would be suspended in the Jeep Seeding. The number of cattle run would increase from 76 to 140 head. The season of use would decrease by 1 month from the current use system. Terms and conditions including allotment specific short and long term objectives would be added to ensure grazing use conforms to the RMP and Land Health Standards. Desired plant community objectives would be established. Five essential range improvement projects would be constructed. The following tables summarize the Alternative 4 mandatory terms and conditions, and grazing system.

Table 13. Mandatory Terms and Conditions for Alternative 4

Allotment/ Permittee	Livestock		Grazing Period		% Public Land	AUMs		
	Number	Class	Begin	End		Active	Suspended	Total
Calcutta #01100	140	Cattle	4/16	10/1	96	747	0	747
Hapgood Ranch	70	Cattle	10/02	10/15	96	35	0	31

Table 14. Pasture management - deferred rotation

Year	Pasture	Number	Kind	On date	Off date	AUMs
Even	Seeded	140	Cattle	4/16	8/08	508
	Native	140	Cattle	8/09	10/01	239
Odd	Native	140	Cattle	4/16	6/08	239
	Seeded	140	Cattle	6/09	10/01	508
Every Year	Gathering Field	70	Cattle	10/02	10/17	35

Alternative 5 - No Grazing

This alternative would cancel the permit on the Calcutta Allotment. As a result, grazing would not be authorized on this allotment. Under this alternative, BLM would initiate the process in accordance with the 43 CFR parts 4100 and 1600 to eliminate grazing on the allotment and amend the resource management plan.

Alternatives Considered but Dismissed from Further Analysis

Other Alternatives considered included grazing use with no trailing component which would require the livestock operator to truck cattle to and from the allotment. This alternative was dismissed due to the financial impact that it would have on the operator, as well as the fact that trailing occurs on established roads, and therefore has minimal environmental impact, and the impact that does occur is concentrated on already disturbed road right of ways. Cattle are held over-night in designed holding fields, or on private lands.

CHAPTER 3: ENVIRONMENTAL ANALYSIS

SUPPLEMENTAL AUTHORITIES OF THE HUMAN ENVIRONMENT

The following supplemental authorities of the human environment are specifically required by statute, regulation, and executive order and must be considered in the Proposed Action and Alternatives. These authorities have either been analyzed in the Environmental Assessment or are not present or not affected by the Proposed Action or Alternatives.

Table 15. List of supplemental authorities, and whether they are present and will be discussed in the EA.

Consideration of Supplemental Authorities	Supplemental Authorities Review		
	N/A or Not Present*	Applicable or Present, No Impact*	Discussed in EA
Air Quality		✓	
Areas of Critical Environmental Concern	✓		
Cultural Resources			✓
Environmental Justice (E.O. 12898)	✓		
Farm Lands (prime or unique)	✓		
Floodplains	✓		
Native American Religious Concerns			✓
Invasive, Non-Native Species			✓
Threatened or Endangered Species	✓		
Wastes, Hazardous Substances or Solid Wastes	✓		
Water Quality	✓		
Wetlands/Riparian Zones			✓
Wild and Scenic Rivers (Eligible)	✓		
Wilderness	✓		
Other Elements Considered			
Wild Horses and Burros	✓		
Wildlife			✓
Recreation	✓		
Soils			✓
Vegetation			✓
Livestock Management			✓

***** The following supplemental authorities and other elements are either not present or will not be affected by proposed action or any of the alternatives and will not be discussed further in this EA.

CULTURAL RESOURCES (Supplemental Authority)

A. Affected Environment

There have been two archaeological inventories conducted on the Calcutta allotment. The first inventory was conducted in preparation for the Cowhead/Massacre Planning Unit Environmental Impact Statement and was 640 acres in size. The survey strategy implemented for this project was Class II, or greater than 30 meter transects, and was approved by the Nevada State Historic Preservation Office. Eight prehistoric archaeological sites associated with limited resource processing activities were recorded during this inventory. None of the eight sites were evaluated for National Register of Historic Places (NRHP) eligibility. Although all eight of the sites were noted as undergoing natural erosion and sheet wash activity, cattle grazing were not affecting the sites at the time of recordation.

The second archaeological inventory on this allotment was completed for the Jeep Fire rehabilitation projects and was 2,200 acres in size. Eleven prehistoric archaeological sites were recorded within the project area. Four of the sites are fairly large with complex artifact components. Two of the four large sites constitute large temporary camps or base camps. One of the smaller sites recorded also appears to be a small base camp. The remaining six sites are small diffuse lithic scatters, one of which appears to be a small hunting station. None of the eleven sites have been formally evaluated for NRHP eligibility. However, two of the eleven sites appear to be NRHP eligible. At the time of recordation no cattle grazing impacts were noted, but natural erosion was noted in addition to some fire effects.

Three of the previously recorded sites were visited in 2008 to assess impacts of the proposed action. One site which was recorded in 1979 is associated with a spring. This site has been impacted by previous range management activities and is not eligible to the NRHP. The second site visited was not being affected by range management activities. The third site visited is one of the large sites assumed to be NRHP eligible. Only one-third of the site is located on public land. The site has been impacted by historic range management activities, but it appears to remain eligible to the NRHP. The BLM was unable to determine whether range management activities are continuing to affect the public portions of the site. Therefore, portions of the site on public lands will be fully recorded and monitoring will be conducted two times per year, at the beginning and end of each grazing season, until a determination can be made regarding any impacts to the archaeological site. If range management activities are affecting the site then proper mitigation will be developed.

Incomplete or Unavailable Information

The condition of the remainder of the previously recorded sites within the Calcutta Allotment is unknown at this time. The remaining sites within the Calcutta Allotment will be assessed in 2011 in accordance with the Supplemental Procedures Developed for the Livestock Grazing Permit Renewals, An Amendment to the Protocol between the Bureau of Land Management and the California and Nevada State Historic Preservation Offices. In accordance with the protocol the permit may be renewed prior to the cultural resource assessment being completed.

B. Environmental Consequences

1. Impacts of Proposed Action

Under the Proposed Action cultural resource sites have the potential to be affected by range management activities including cattle grazing. Sites that are located in areas where cattle tend to congregate are most vulnerable to livestock impacts. Areas of congregation tend to occur at both developed and undeveloped watering locations, salting locations, along fence lines, and in areas where shade is provided. The types of impacts that can occur are: trailing, which can displace and/or break artifacts, and denude vegetation thereby destabilizing the soil causing erosion; wallowing, which causes subsurface disturbance to cultural resources containing buried deposits thereby compromising stratigraphic integrity of a site; and trampling, which causes artifact displacement and breakage.

Livestock numbers are higher under the Proposed Alternative therefore impacts to archaeological sites located in areas of heavy use would be greater.

Under this alternative, installation of the Dispersion Pit Reservoir may disperse cattle into other areas of the Native Pasture, which can reduce impacts that may be occurring to sites that may be located within the vicinity of current watering areas. However, the dispersion of cattle into areas that have had little to no grazing use in the past may create new impacts to cultural resources that might be located in these areas. In addition, cattle trails leading to the Dispersion Pit Reservoir would be established possibly affecting cultural resources that may be located along the trailing paths.

The Dog Spring exclosure may provide protection to cultural resources, if any are located adjacent to the spring, by excluding cattle from the site.

2. Impacts of Current Management (No Action)

Under the Current Management potential impacts to cultural resources from range management activities including cattle grazing are the same as under the Proposed Action Alternative. Under this alternative livestock numbers are lower therefore impacts to archaeological sites located in areas of heavy use would be less than under the Proposed Action Alternative.

Dispersion Pit Reservoir would not be constructed, which would benefit any archaeological sites that may have been located in the vicinity of the proposed reservoir. Conversely, by not constructing the reservoir archaeological sites that may be located in the vicinities of current watering areas would continue to receive the same amount of pressure from cattle. Dog Spring exclosure would not be built; therefore no protection would be afforded to any cultural resource that may be located adjacent to the spring.

3. Impacts of Reinstating Suspended AUMs

Under this alternative, potential impacts to cultural resources would be the same as under the Proposed Action Alternative, with one exception: The proposed numbers of cattle are lower and cattle impacts to archaeological sites located in areas of heavy use would be slightly less than under the Proposed Action Alternative, but more than under the Current Management Alternative.

4. Impacts of Deferred Use System

Under this alternative, potential impacts to cultural resources would be the same as under the Proposed Alternative.

5. Impacts of No Grazing

Under this alternative there would be no impacts to cultural resource from range management activities.

NATIVE AMERICAN CULTURAL VALUES (Supplemental Authority)

A. Affected Environment

The Calcutta Grazing Allotment is within the territorial boundaries of the *Kidütökadö* band of the Northern Paiute. Many members of the *Kidütökadö* continue to reside at the Fort Bidwell Reservation. The BLM Surprise Field Office conducted consultation with the Fort Bidwell Tribal Council regarding the Calcutta Grazing Permit Renewal, in addition to other projects, on January 10, 2009. No concerns were expressed by the tribe regarding the renewal of the Calcutta Allotment Grazing Permit.

INVASIVE, NON-NATIVE SPECIES (Supplemental Authority)

A. Affected Environment

Weeds are defined in this EA as plants that are exotic or non-native plants. Non-native weeds have the ability to out-compete and replace native plants, often creating their own monotypic plant community. Uncontrolled noxious weed infestations result in decreases of native vegetation diversity, reductions in forage and wildlife habitat, and declines in agricultural crop values. Once exotic weeds become established it is extremely difficult to eradicate them and bring back the native communities that have been displaced.

The Calcutta Allotment has been surveyed for the presences of noxious weeds since 1999 to present by the Surprise BLM Cooperative Weed Management Area noxious weed crew. To date no invasive or noxious weeds have been identified within the Calcutta Allotment.

B. Environmental Consequences

1. Impacts of Proposed Action:

Livestock grazing in this allotment has not resulted in the establishment of any noxious weed sites to date. Livestock grazing in general represents a low risk of introduction and spread of noxious and invasive weed species. Continued livestock use would be expected to produce similar low weed risks as have been verified by on-going inventory efforts. Noxious and invasive weeds which are introduced or become established in the allotment would be expected to be detected early with continued vigilance, and these sites would be expected to be treated under the current weed management program. Project construction under the proposed action would also represent an opportunity for weeds to become introduced into the project area. However, the cleaning of construction vehicles would reduce or eliminate this possibility. Watering sites used by livestock or other areas where the soil is trampled are open to entry by

invasive and noxious weeds. However, there have been no known introductions of weeds in the existing sites to date; therefore it is not likely that weeds would be introduced to the new sites.

2. Impacts of Current Management (No Action)

Impacts would be the same as for the proposed action except there would be no increased risk of weed introduction or spread associated with new project development.

3. Impacts of Reinstating Suspended AUMs

Impacts would be the same as for the proposed action.

4. Impacts of Deferred Use System

Impacts would be the same as for the proposed action.

5. Impacts of No Grazing

Under the no grazing alternative, there would be no impacts to noxious and invasive weeds.

C. Maps

Data for existing locations of noxious weeds around the Calcutta Allotment are found in the Surprise CWMA GIS database.

WETLANDS/RIPARIAN ZONES (Supplemental Authority)

A. Affected Environment

The Calcutta Allotment has several springs and one short segment of flowing stream (Table 5). The 2008 Calcutta RHA and Allotment Evaluation contain detailed descriptions of each site.

Table 16. Springs present on the Calcutta Allotment, location, current rating and a brief description of developments.

Spring Name	Size	Existing Developments	Fencing	Year of PFC rating	PFC rating	Location	Pasture
Antelope Spring (Reach 1)	1 acre	2 troughs	At pasture fence	2008	FAR, no apparent trend	SW ¼ SE ¼ Sec 10 R45N R20E	Seeded
Antelope Spring (Reaches 2, 3, & 4)	13 acres	3 stock ponds	Downstream of Jeep fire Reservoir 3	2008	PFC	Sec 10 & 11 T45N R20E	Seeded & Gathering Field
Dog	1 acre	pit	None	2008	FAR, no apparent trend	NW ¼ NE ¼ Sec 3 T45N R20E	Seeded
Boiler	0.2 acres	2 troughs	Fenced exclosure	2008	PFC	NW ¼ NW ¼ Sec 2 T45N R20E	Native
Moshaw	0.5 acres	pit	Allotment boundary fence downstream of stock pond	2008	PFC	NW ¼ NW ¼ Sec 26 T46N R20E	Native
Unnamed #1	5 acres	None	None	2008	FAR, no apparent trend	NE ¼ Sec 4 T45N R20E	Native
Unnamed #2	1 acre	None	Fenced into gathering field	2008	PFC	NE ¼ SW ¼ Sec 2 T45N R20E	Gathering Field
Unnamed #3, North of Boiler Spring	0.1 acres	None	None	2008	FAR, no apparent trend	SW ¼ Sec 35 T46N R20E	Native

Note: The riparian and wetland standard does not apply to structural facilities constructed for livestock, and wildlife water sources, such as reservoirs, water developments, or riparian wetland sites located on private lands within the allotment.

B. Environmental Consequences

1. Impacts of Proposed Action

The construction of the proposed projects would have a positive impact to riparian resources in the allotment. By protecting the wetlands around the spring sites at Antelope and Dog Springs and moving the troughs, the proposed action would improve conditions and allow these systems to progress toward properly functioning condition. The use of the standard operating procedures, including ensuring that water diversions maintain free flowing surface water at wetland sites, will ensure that potential impacts from water diversion would be reduced or eliminated.

The lower reaches of Antelope Spring, Moshaw Spring and Boiler Spring in the Jeep Seeding and the unnamed spring in the Gathering Field would be expected to continue to be properly functioning. Conditions at the unnamed spring in the Native pasture would be expected to improve slightly as a result of the reduced use and alternating year deferment.

Although the duration of use is 2 weeks longer in the fall on even years than past actual use, it is 2 weeks shorter in the fall in odd years. This would mean that roughly 80 AUMs more are used in the fall on even years, but 150 less AUMs would be used in the fall in odd years, when compared to the actual use in the Jeep Seeding since 1997. This should allow the riparian areas one year of lighter fall use every other year, providing opportunity for improvement in riparian vigor. The amount of use in the Gathering Field and the associated riparian vegetation would be reduced as compared to actual use since 1997.

Compared to the No Action Alternative, almost twice the livestock will be in the Native Pasture. However, the amount of use will be similar and period of use will be shorter, and will not be as late into the season. Riparian habitat below the Boiler Spring exclosure in the Native Pasture could receive more use in even years and negative impacts could result.

2. Impacts of Current Management (No Action)

Under this alternative, the number of livestock and the total amount of use would be reduced. There would be no deferment of use in the Native Pasture or in the Jeep Seeding Pasture in the fall. There would be no new projects constructed to protect riparian areas. Impacts to riparian resources would continue, and progress toward achievement of proper functioning condition would not be realized. Riparian conditions could further deteriorate in some areas.

3. Impacts of Reinstating Suspended AUMs

Under this alternative, impacts to riparian resources would be similar to the proposed action. Total amount of use in the Jeep Seeding and Native Pasture would be less than for the proposed action and actual use since 1997, but more than under the no action alternative. Construction of the projects would be similar to those described for the proposed action.

4. Impacts of Deferred Use System

Under this alternative, impacts to riparian resources would be similar to those described for the proposed action. The earlier livestock removal date, however, minimizes possible negative impacts of late season use. Use in the Native Pasture is 1 week shorter and use in the Seeded pasture is 3 weeks shorter than in the proposed alternative. The elimination of the return fall use in the Jeep Seeding results in longer continuous period of livestock use in the Jeep Seeding. This could potentially increase the impacts to remaining portions of riparian areas which are not fenced in the Jeep Seeding particularly in odd years; however the effects of this are minimized by the earlier livestock removal date. The effects to remaining unfenced riparian areas would be similar to the seeding in even years as a result of the late summer period of use. This effect would be somewhat mitigated however, by the deferment which would provide the riparian resource in the Native Pasture growing season rest in odd years, as well as by the earlier livestock removal date.

5. Impacts of No Grazing

Under this alternative, there would be no adverse impacts to riparian areas. There is a remote possibility that flows at What a View, Sorry, and Jeff's Jeep Spring sites, could increase in frequency and duration over the long term as a result of more infiltration, and that wetland characteristics could develop.

C. Maps

A map of the natural and developed water sources can be found as Map 1 in Appendix 1.

WILDLIFE/THREATENED AND ENDANGERED SPECIES (T&E Supplemental Authority)

A. Affected Environment

Sagebrush communities dominate the vegetation within the Calcutta Allotment (Table 17). Sagebrush obligates found on the allotment include: Greater sage-grouse, pygmy rabbit (both BLM sensitive) and sage-sparrow. Pygmy rabbit are only known from the lower slopes of the allotment within the upland herbaceous/salt influenced community. Sage-grouse sign is found scattered throughout the allotment but no known active or historic leks occur within the allotment. Three active leks occur within approximately 3.25 miles of the allotment on various low sagebrush communities. The proximity of these important sage-grouse breeding areas as well as presence of big sagebrush (see table 17) indicates that nesting and brood rearing likely occurs within the allotment.

Much of the allotment is considered summer or fall/transition habitat for mule deer and summer habitat for pronghorn antelope. Only small amounts of bitterbrush are found on the allotment however scattered western juniper provides important winter deer cover. Pronghorn antelope are found on the open, low sagebrush habitats that occur in the middle and lower slopes of the allotment. California bighorn sheep (*Ovis canadensis californa*) use occurs in the northern and western portions of the allotment. Because bighorn are not well adapted to deep snow, most use probably occurs in the spring to fall months. Other wildlife known to inhabit the allotment include: coyote, waterfowl, golden eagle (BLM sensitive), ground squirrel, black-tailed jackrabbit, cottontail, and bat (*Myotis* sp.).

Table 17-Summary of Major Vegetative Communities in the Calcutta Allotment

COMMUNITY	ACRES
Low sagebrush, including early, Lahontan, and black sagebrush and rabbitbrush	4376.95
Combination of big sagebrush and low sagebrush	466.13
Upland herbaceous, salt influenced	1267.6
Combination of greasewood and herbaceous vegetation	1122.39
Seasonally wet, no salt influence	19.78
Unvegetated areas (rock, water, playa, etc)	1739.99
Big sagebrush (including mountain, Wyoming, and basin)	742.36

Threatened and Endangered Species

There are no federally listed or federal candidate species, which are known to use the allotment. Although some saltgrass was found in the allotment, the lack of nectar sources indicates that the allotment is not suitable for Carson wandering skipper (Federally Endangered). Saltgrass areas within the allotment are more than 500 feet above the known elevation limit for Carson wandering skipper and approximately 100 air miles from the closest known Carson wandering skipper populations in Lassen County, California. Surveys for Carson wandering skipper within the boundaries of the Surprise Field Office were negative.

B. Environmental Consequences

Threatened and Endangered Species

There are no federally listed, proposed for listing, or federal candidate species known to use the allotment. Therefore, no federally listed, proposed for listing, or federal candidate species will be considered further in this document.

1. Impacts of Proposed Action

As compared to actual use since 1997, the long-term, indirect effects to wildlife as a result of the proposed action are anticipated to be beneficial due to increases in forage and hiding cover, and riparian plant diversity and structure. Both unpublished information collected in the 1970's on the Surprise Field Office and recent research (Coates & Delehanty, 2008) indicates that direct trampling of nests and nest abandonment due to cattle can be a threat to sage-grouse. Sage-grouse and other ground nesting sagebrush obligate species would be expected to benefit from residual and new grass cover as a result of partial grazing deferment. Direct impacts from cattle grazing would be much less in odd years than in even since almost all nesting by ground nesting birds is over before 1 August. However, in pastures used late, residual grass cover for the next year would be less. In even years, more residual grass cover would be left for the next year but direct impacts during the grazing year, if any, would be greater. Under the proposed action, residual grass cover should provide adequate hiding and thermal cover and should reduce predation by reducing the need for sage-grouse hens to leave their nests for water. The bulk of hiding cover around pygmy rabbit burrows and winter foraging areas is from sagebrush. Grasses and forbs make up a larger percentage of their diet in the summer (Thines, Shipley, & Sayer, 2004). While increases in native vegetation would benefit pygmy rabbit summer foods, pygmy rabbits in Nevada are generally found in areas with less understory (Larrucea & Brussard, 2008). Due to the location of most burrows directly underneath sagebrush there should be little to no impact to burrows from possible cattle trampling.

The protection of two additional riparian sites and corresponding relocation of water troughs would improve riparian habitat by reducing late season grazing especially in the Jeep Seeding and Gather pastures which have greater amounts of riparian habitat. Benefits to riparian habitat include increases in the amount of woody species and over time greater structural and species diversity, increased nesting opportunities, and hiding cover for wildlife seeking ground water.

Depending on the size of the exclosures, and the proximity of the fence to the edge of the riparian zone, there could be a possibility of collision with the fences by birds including sage grouse and bats foraging near or flying over these areas (Taylor & Tuttle, 2007). Fence posts and braces can also create perches for raptors potentially increasing predation (Connelly et al. 2000). The implementation of standard operating procedures for fence construction including wire spacing and the use of flagging on the top wire of the fences, positioning of top wires on braces, and metal posts with domed caps would reduce the possibility of these impacts.

The construction of the Dispersion Pit Reservoir would expand livestock use into areas of the allotment not currently receiving regular use. The loss of vegetation in the immediate area around this site is expected to result. This would reduce the quality of habitat in these altered areas for small birds and rodents. This impact would be reduced with distance from the

reservoir. The addition of this water source would be expected to provide only minor benefits to wildlife due to the fact that native species are, for the most part, adapted to drier conditions. Larger animals like antelope and bighorn would be expected to benefit more from a new reservoir and depending on the final size, waterfowl and bats use could be expected to increase in the area.

The establishment of herbaceous stubble height and woody species use thresholds on three riparian springs and management of livestock use to ensure attainment of these objectives would benefit wildlife by improving habitat conditions.

Grazing use in the Jeep Seeding under this alternative, particularly late season use, would be reduced as compared to actual use since 1997. This reduced use would be expected to result in more residual stubble and litter, and proportionally higher quantities of fall green-up for pronghorn, sage grouse, and other wildlife species which turn to green-up in the fall. Alternating early heavy with fall heavy use will provide more spring green-up for pronghorn mule deer and potentially bighorn sheep during the spring when these species shift from predominately shrub to grass diets. Birds and other rodents which feed on the seeds of grasses in the late summer and fall would experience an increase in forage availability in some years as compared to actual use since 1997. Like the seeding, habitat conditions in the Native Pasture would be expected to improve as a result of growing season deferment of livestock use in odd years.

2. Impacts of Current Management (No Action)

The No Action Alternative would substantially reduce livestock use over actual use levels since 1997, in comparison to the proposed action. Forage temporarily available would be processed as a separate authorization and wildlife needs would be considered before a decision is issued regarding the temporary use. Riparian fencing would not occur, and it is unlikely that the permittee could comply with specific utilization standards for livestock use that would be necessary to progress toward or to meet rangeland health standards.

While total use in the Jeep Seeding and Native pastures would be dramatically reduced, heavy use of riparian sites would be expected to continue to have negative effects on riparian vegetation. Sage grouse brood-rearing habitat would be particularly affected. These effects would be most pronounced in very dry years when sage-grouse as well as other wildlife use riparian habitats earlier and for longer periods of time. Habitat for big game, ground nesting birds, and rodents would improve as a result of lower use and increasing residual litter and cover. The increased quantity of residual biomass would be expected to increase the probability of wildfire in the area.

3. Impacts of Reinstating Suspended AUMs

As compared to the proposed action and actual use since 1997, impacts to wildlife resources under this alternative would be slightly less. Higher amounts of forage and hiding cover would be available for wildlife in any given year. Higher amounts of grass would increase the chances of wildfire occurrence. Wildfire size would also be expected to increase, though not to the same level as under the No Action Alternative.

Impacts to riparian habitat would be the same as for the proposed action.

4. Impacts of Deferred Use System

This alternative would provide yearly benefits to wildlife by reducing the likelihood of direct competition for resources every other year. In "even years", livestock use of the Native Pasture would occur outside of peak nesting periods for sage-grouse and other ground birds. Impacts to riparian areas are expected to be less than for the proposed action, due to the earlier livestock removal date.

5. Impacts of No Grazing

This alternative would have the greatest positive impact to wildlife habitats and wildlife by reducing competition for food and increasing hiding, thermal, and nesting cover. Depending on the time it took to realize any population increases in wildlife and immigration into the area some negative impacts could occur to plant nutrition since less grazing by cattle over the entire allotment would reduce plant nutrition. After any increases in large game species, these impacts would be reduced.

SOILS

A. Affected Environment

The soil classification for the Calcutta Allotment is contained in the Soil Survey of Washoe County, Nevada, North Part. The soil survey was updated by the Natural Resources Conservation Service (NRCS), Reno State Office in 1999, and can be found on the NRCS web site.

The soils are generally a mix of very cobbly and very gravelly loam along the west to a stony loam and very gravelly sandy loam on the steeper slopes. Fine sandy loam, silt loam, and silty clay loam are found in the basins. All SMUs tested for soil stability in the 2008 Rangeland Health Assessment were found to be meeting standards for soil stability.

B. Environmental Consequences

1. Impacts of Proposed Action

Under the proposed livestock numbers, season-of-use and turn-out criteria, grazing is not expected to negatively affect the soil health within the allotments. Livestock are not turned out on the allotment until April 16th and are off the allotment by October 15th. Grazing use in the Seeding and the Native Pasture is deferred, and livestock use in a given area would be expected to vary by year according to annual fluctuations in vegetation. The term and condition limiting actual livestock turn-out until soils are stable would further limit the impacts to soils.

The proposed action includes construction of one new 100'X100'X10' pit type reservoirs, two exclosure fences, and two trough developments (one at Antelope Spring, one at Dog Spring) are proposed for the Calcutta Allotment.

Access to the project sites at Antelope Spring would be along Highway 34, and then along the jeep trail leading past Antelope Spring. Access to the project sites at Dog Spring would be along Highway 34, and then along the jeep trail leading past Antelope Spring, however there would be

a small distance of overland travel north of the jeep trail to access Dog Spring with equipment. Access to the pit reservoir site would be along Highway 34, then along a jeep trail that leads through the south end of the Nevada Coleman Allotment, and then drops down into the north end of the Calcutta Allotment.

Construction of the pit reservoir would require removal of approximately 2,000 cubic feet of soil. The excavated soil would be recontoured and left on the site. Disturbed areas including soil stockpiles would be seeded, so impacts to soils would be reduced over the approximate 2 acres of disturbance.

Use of vehicles and equipment required to construct the exclosure fences should not disturb the soil, as the majority of ingress and egress would be done on established roads, however minimal cross country disturbance would occur to access Dog Spring for both the exclosure construction and trough installation. In addition, use of a trench digger to lay the pipe needed for the troughs and complete trough construction would not disturb more than 500 square feet of soil for both troughs. Cross-country travel to project sites would be minimized and in locations where compaction of soils occurs, ripping of the ground surface would be completed to increase infiltration and roughen the soil surface.

2. Impacts of Current Management (No Action)

Under this alternative, livestock numbers and the amount of use would be reduced over actual levels since 1997 and in comparison to the proposed action. Impacts from livestock use would be expected to be reduced proportionally. With exception to the impacts from the construction of projects, other impacts would be the same as for the proposed action.

3. Impacts of Reinstating Suspended AUMs

Impacts would be the same as for the proposed action.

4. Impacts of Deferred Use System

Impacts would be the same as for the proposed action.

5. Impacts of No Grazing

In the short term, plant cover and litter would be expected to increase over most areas. This would improve soil protection from raindrop impacts and increase infiltration and soil moisture retention. Increasing organic matter on the soil surface would result in more nutrients being available for incorporation into the soil profile. Over the long term as maximum plant cover and density is achieved, plant productivity would be expected to slow. In some areas where plant distribution and density has declined below ecological thresholds as a result of historic heavy livestock use, long term conditions would be expected to remain largely unchanged. No new projects would be constructed.

C. Maps

A map depicting soil mapping units on the Calcutta Allotment is included as Map 2 in Attachment 1. Watershed information for the Calcutta Allotment is available on the Surprise CWMA GIS database.

VEGETATION

A. Affected Environment

Short and long term monitoring has been completed in the Calcutta Allotment, and data is available from 1977, 1987, and 2008. This data was provided in the allotment evaluation and rangeland health assessment. The summaries below are taken from the allotment evaluation or RHA. Data collection methods varied over the years, so direct comparisons were not possible, however general trends were apparent in some sites.

The Claypan 10-14" ecological site constitutes the largest portion on the allotment (45%). Forbs were very abundant in 1987 and 2008. Portions of this site burned in 2005. Sandberg's bluegrass has been identified in the ecological site since 1977. That data suggests that this species has increased in amount since 1977. Thurber's needlegrass, Idaho fescue, squirreltail, and bluebunch wheatgrass were recorded in 1977, and are still present on the site in comparable amounts. Cheatgrass has remained in small amounts since recorded in 1977, , and has not become a major component of the vegetative community.

The Dry Floodplain ecological site constitutes about 13% of the allotment. Monitoring data indicates that Squirreltail, great basin Wildrye, and Basin big sage quantities are similar throughout the 31 years of data collection. According to ecological site descriptions, Wildrye should be the dominate grass throughout the site. Records from 1987 document a lack of Wildrye on the site. This condition was confirmed in 2008. Bluegrass was not recorded as a vegetative component in the 1977 transects, however it was recorded in 1987 and was more prevalent in 2008. Rabbitbrush and greasewood were not recorded in 1977; however they were both recorded in 1987 and 2008 in similar amounts. This ecological site was identified as not meeting biodiversity standards during the 2008 Rangeland Health Assessment (RHA). Based on utilization records, and a review of available photographic and other information, current livestock use was not a contributing factor for this condition.

In the Sodic Terrace 8-10" site (7% of the allotment), similar amounts of annual forbs were present in 2008 as compared to 1987. The data indicates cheatgrass has declined in this range site since 1987, and this was confirmed by photographic records. Wildrye was present in only trace amounts in 1987 and 2008. Crested wheatgrass was more abundant in 1987 than 2008. Saltgrass and bluegrass was recorded in 2008 but was absent from the 1987 data. The abundance of Squirreltail has changed little between 1987 and 2008. Rabbitbrush, spiny hopsage and greasewood were recorded in 2008 but not in 1987. This is typical plant succession following the 1979 wildfire, as these shrubs tend to sprout following burning.

The Loamy 10-12" ecological site occupies about 7% of the allotment. Portions of this site burned in 1979, and were reseeded to crested wheatgrass. In 2008 this ecological site is still dominated by crested wheatgrass. Secondary species include Poa and Thurber's needlegrass. Cheatgrass was more common in 1987 than in 2008. Squirreltail and Wildrye occur in trace amounts within this ecological site and seem to have changed little since 1987. Lupine was the most common forb species observed on this ecological site. This differs from 1987 measurements which recorded a larger diversity of species.

B. Environmental Consequences

1. Impacts of Proposed Action:

The pasture rotation system is designed to maintain the crested wheatgrass seeding and maintain and increase the native vegetation. Thurber's needlegrass has high crude protein (CP) content in April, and decreases marginally by mid-July (Ganskopp, 1998). Most other native bunchgrasses provide high quality forage until late spring/early summer (later than crested wheatgrass). Idaho fescue has been shown to retain its CP content into late summer/early fall (Holechek & Herbel, Seasonal Suitability Grazing in the Western United States, 1982). Crested wheatgrass has a high CP content in May and June, and it is suggested to have a crested wheatgrass stand fully and uniformly utilized by July, because it may develop unpalatable culms that diminish future grazing (Holechek, Livestock Grazing Impacts on Public Lands: A Viewpoint, 1981). During early phenological stages (vegetative and anthesis), cattle often select crested wheatgrass over native bunchgrasses, therefore minimizing early and mid season pressures on native grasses. However, after grasses enter quiescence the cattle become much less selective and appear to choose all forages equally (Cruz & Ganskopp, 1998).

Under this alternative livestock use in the Jeep Seeding would occur during two of three key growth periods (spring green-up and flower, and seed production and maturation). Use in the spring could impact grasses by removing top growth which was produced from root reserves during a time when large nutrient demands for flower and seed production are taking place. This could result in lower seed production, and less recruitment. However, use in the spring in the Jeep Seeding will be concentrated on the Crested Wheatgrass, which is adapted to an early grazing season.

These impacts are similar to those under the no action alternative and actual use since 1997. Under this alternative, potential impacts from spring use would be proportionally increased in odd years in the Seeded Pasture, as the amount of forage consumed would be 340 AUMs (compared to 203 AUMs in even years, 75 AUMs in No Action, and 270 AUMs in actual use). In even years, the impacts to plants during fall use would be similarly multiplied, with use of 305 AUMs in the Seeded Pasture (compared to 163 AUMs in odd years, 152 AUMS in No Action, and 271 in actual use). The alternating year deferment of use would mitigate for the impacts to plant species by providing reduced use during an important growth period every other year. The amount of AUMs consumed under this alternative would be roughly 100 AUMs less than actual use since 1997, but roughly 281 AUMs more than under the No Action Alternative.

Impacts to vegetation in the Native Pasture would be similar under the proposed action as compared to actual use since 1997 as related to AUMs consumed. The grazing season is one month shorter than in the no action alternative. Additionally, this alternative allows 239 AUMs of utilization in the Native Pasture yearly, however the one month shift in season would benefit the native grasses by affording them rest during spring green-up, flower, and seed production in odd years. This is an improvement over impacts from the no action alternative and actual use since 1997 which utilized the Native Pasture during this important time every year. As a result of the proposed action, increases in plant density and distribution would be likely over time.

Carrying Capacity was analyzed in 1981 and 2008 and is summarized in the allotment

evaluation. Both of these analyses concluded that additional use proposed under this alternative was present on a sustained yield basis.

The projects proposed under this alternative would increase the distribution of water and reduce use in sensitive riparian areas. The proposed projects would be expected to allow for improvement in riparian conditions and progress toward achieving the standards for rangeland health. The development of new terms and conditions for the allotment would establish measurable expectations for the vegetation resource on the allotment and allow the BLM to more thoroughly evaluate livestock and other uses on the allotment.

2. Impacts of Current Management (No Action)

Under this alternative, vegetation would experience a substantial reduction in intensity of use as related to the actual use since 1997. Forage use in the allotment overall and particularly in the seeding would be dramatically reduced. Based on carrying capacity analysis and utilization records which are summarized in the allotment evaluation, vegetation would not be expected to respond significantly to this reduced pressure. The utilization which resulted from actual use since 1997 clearly showed that even under those higher stocking levels, plants were not being heavily utilized and were correspondingly not being exposed to survival pressures associated with use. Increases in litter would be expected under this alternative, and there could be some long term plant response as soil moisture retention is enhanced and organic material is incorporated into the soils. However this would be expected to be a very long term effect. Some species of grasses have been shown to actually reduce productivity over time when large accumulations of biomass are present. Overall grazing impacts from this alternative as compared to the proposed action would be similar in scope but with a reduced intensity as a result of lower overall use, and a smaller herd size.

The lack of new terms and conditions under this alternative would reduce the ability of the BLM and permittee to monitor long term progress and short term performance. Without new projects, negative riparian conditions would proliferate and progress would not be made toward achievement of the standards for rangeland health.

3. Impacts of Reinstating Suspended AUMs

Under this alternative impacts to vegetation would be the same as for the proposed alternative except that the impacts would be proportionally reduced by the lower number of AUMs harvested, and somewhat smaller herd size. However, cattle remain on the allotment 1 month longer than in the proposed alternative. The relationship of impacts between this alternative and the no action alternative and the actual use since 1997 would likewise be similar to those described for the proposed alternative. Carrying capacity analyses conducted in 1981 and 2008 confirm the availability, on a sustained yield basis, of additional forage as proposed under this alternative.

4. Impacts of Deferred Use System

Under this alternative, use in the Jeep Seeding would be restricted to one entry per year. Amount and duration of use would be roughly the same as for the Proposed Alternative. The period of use every other year (odd) in the Jeep Seeding would be during late flower and seed production and maturation phases. There would be no use on the seeding in the late fall green-up during

even years, or early spring during green-up and early flower phases during odd years. This would be a net positive for the grass species in the seeding. Plants which are or become recruited into the stand would be generally more healthy and vigorous.

In the Native pasture, the amount and duration of use would be the same as the Proposed Alternative, and the amount of use would be 113 AUMs less than actual use since 1997. The period of use in this pasture would alternate between early spring and late summer/fall use. This would benefit most of the upland native species on the allotment by providing alternating years of unimpeded seed production. In odd years however, when the Native Pasture is used later, this alternative would increase the use on bitterbrush and other browse species, as well as riparian species. This potential for increased use would be largely minimized by the 10/01 off date. The construction of the proposed projects would mitigate for this impact on riparian areas.

As with the proposed action the level of use proposed under this alternative is supported by the carrying capacity analyses conducted in both 1981 and 2008.

5. Impacts of No Grazing

Under this alternative, most palatable species on the allotment would likely increase in cover, distribution and density. However, depending on the species and its current status in the community, not all species would improve at the same rate. Some species which are currently at low levels as a result of heavy past grazing would not be expected to increase.

C. Maps

Data for all ecological sites in the Calcutta Allotment can be found in the Surprise CWMA GIS database, or is available from the NRCS website.

LIVESTOCK MANAGEMENT

A. Affected Environment

As noted in the background section and expanded on in the Calcutta Allotment Evaluation, TNR AUMs have been used since 1982, but only with the current regular pattern since 1997. This TNR use was compared to yearly precipitation and utilization data in the Allotment Evaluation, in order to assess the impacts of use in years with variations in rainfall. This comparison has shown that forage has been available in years with below average rainfall, and that utilization even during those years has not exceeded 60% in more than 10% of a given pasture (Except in 1988 when the seeded pasture was used from 4/01 – 10/29 for a total of 1,290 AUMs and in 1990 when the seeded pasture was used from 4/01 – 10/21 for a total of 1,245 AUMs). The greater use takes place on the seeding and around water sources. The utilization data is summarized in the Calcutta Allotment Evaluation, and was found to support the availability of sustainable forage for 778 AUMs while still meeting utilization requirements.

B. Environmental Consequences

1. Impacts of Proposed Action

The proposed action would allow 140 cattle to graze on the allotment from 4/16 – 10/01 yearly and 70 cattle to graze on the allotment from 10/02 – 10/15, and a total of 778 AUMs of use. Any AUMs above this amount would have to be applied for yearly, and the application would be reviewed by the BLM office according to agency procedures. Grazing management in the allotment would use a modification of the 1997 pasture rotational system. The Seeded Pasture is used first, followed by Native pasture, then a return to the seeding. However the modification of the 1997 pasture rotation incorporates a deferred component to the pasture management, allowing the same amount of AUMs to be consumed in each pasture yearly, however the Native pasture is used 1 month later in odd years. Finally, the herd would be gathered, sorted, and a smaller number of livestock would remain in the Gathering Field.

The Proposed Alternative will require additional herding from the operator, since they will have to gather the cattle one extra time in odd years in order to brand calves. They had always gathered and branded calves while moving cattle to the Native Pasture under the current management.

Allotment wide, the total number of AUMs harvested under the proposed action would be roughly 100 AUMs less than that documented by the actual use records since 1997, but 61% more than under the no action alternative. Livestock herd size would increase from 76 under the no action alternative, to 140 head under the proposed action, but about 30 less than the average between 1997 and 2008.

The amount of total use in the seeding would be 508AUMs (503 in odd years). The proposed use in the Jeep Seeding under this alternative would be 76 AUMs more than actual use since 1997.

Under the Proposed Alternative, the duration of return fall use in the Jeep Seeding would be 3 weeks shorter in odd years, and one week longer in even years as compared the no action alternative. The amount of proposed fall use is approximately twice that of the no action alternative in even years and about 35 AUM less than the no action alternative in odd years. As compared to actual use since 1997, the proposed fall use is about 35 AUMs more than actual use in even years and more than 100 AUMs less in odd years. Returning cattle in the fall to the seeding would provide a recovery period for livestock coming off of native plants affording them the opportunity to recover or reduce weight lost foraging over more open and dispersed vegetation.

The duration of early use in the Jeep Seeding under the proposed action would be two weeks longer than the no action alternative and actual use since 1997 in even years and approximately six weeks longer in odd years. The amount of early use in the Jeep Seeding under the proposed action would be about 128 AUMs greater in even years and about 265 AUMs greater in odd years as compared to the no action alternative. As compared to the actual use since 1997, the amount of early use under the proposed action would be about 70 less in even years and about 70

more AUMS in odd years. Livestock use in the seeding in odd years would potentially increase gains as they would be on grazing crested wheat for longer during its most nutritious period.

In the native pasture, the duration of use under the proposed action would be about one month less than under both the no action alternative and the actual use since 1997. The amount of use in the native pasture under the proposed action would be approximately 30 AUMs less than the no action and 120 AUMs less than actual use since 1997. Later use in the native pasture in odd years would provide cattle a selection of native forage that matures later, mitigating late season weight loss associated with native range.

Carrying capacity calculations conducted in the allotment evaluation demonstrate the availability of additional AUMs in the allotment. Increasing the amount of use in the allotment would recognize the availability of additional forage and stabilize the grazing permit of the permittee at a sustainable and reliable number for business and planning purposes. Increasing the cattle herd affords the permittee the opportunity to increase his herd more reliably than under current conditions. The incorporation of additional terms and conditions, including allotment specific objectives for use, will allow the permittee a greater ability to monitor his use by more specifically defining the expectations for the allotment, and provide a more objective basis for determining needed changes during preseason meetings in the event objectives are being exceeded. The proposed action would alleviate the discrepancy between the AMP and the current situation which developed following the retirement of grazing on the Sheldon Wildlife Refuge. Construction of the proposed projects would increase the quality and distribution of forage and water and mitigate current riparian issues on the allotment allowing him to more efficiently utilize the forage base.

2. Impacts of Current Management (No Action)

The No Action alternative would authorize up to 497AUMs annually on the allotment. The TNR authorizations approved since 1997 without full documentation would be discontinued. TNR would be subject to annual application by the permittee and review by BLM. Grazing decisions would be issued regarding the applications. Current terms and conditions would be carried forward with no changes and no new range improvements would be constructed. The percent public land calculation would be revised and grazing use in the gathering field would be billed. Herd size would remain at 76 head.

Under this alternative, the livestock permittee would not experience a decrease in permitted use, but would realize a large net reduction in annual use as a result of discontinuing automatic TNR. The permittee would need to apply for and receive authorization for any additional forage. His herd size would be reduced over that which he has managed since 1997. The billing for use in the gathering field would slightly reduce the overall duration of use in the allotment, as these AUMs would be counted against permitted use. The duration of use in the seeding would be roughly the same as actual use since 1997, however total amount of use would be reduced by roughly 80%. The duration of use in the Native Pasture would be extended under this alternative by about one month, however the amount of use would be reduced by more than 50% over 1997 to present actual use. The continuation of current terms and conditions would limit the ability of the permittee to recognize and monitor the performance of his livestock as it relates to achievement of the objectives for the allotment. The current riparian conflicts on the allotment would not be mitigated by construction of projects forcing the permittee to invest more time and

resources in keeping livestock use in these areas down. The likelihood for further reductions as a result of non-attainment of the riparian standards would be increased. This would destabilize the grazing operation. Permittees have reported that a reduction from actual use levels down to permitted use including the reduction in authorized herd size would result in their business failing.

Alternative 3. Impacts of Reinstating Suspended AUMs

This alternative would authorize 95 cattle to graze on the allotment from 4/16 – 10/31 yearly and 46 cattle to graze on the allotment from 11/01 – 11/15. Annually, up to 620 AUMs of grazing use would be licensed. This alternative would activate the 123 AUMs currently held in suspension Additional forage temporarily available on an annual basis would be applied for and the BLM would conduct an analysis and issue a decision. This alternative would continue utilizing the pasture rotational system that has been used since 1997. Pasture rotation would continue to use the Seeded Pasture first, followed by the Native Pasture. The cattle would return to the seeding, and finally after sorting, some cattle would be turned into the Gathering Field. New terms and conditions would be implemented and range improvements would be constructed.

The impacts from a reduced herd size and a reduced amount of available use as compared to the actual use since 1997 would impact livestock management by reducing the grazing operation of the permittee. There would be no impacts from the grazing season of use under this alternative. The incorporation of new terms and conditions and construction of range improvements would benefit the livestock operator similarly to the proposed action.

Alternative 4. Impacts of Deferred Use System

Impacts of the Deferred Rotation Grazing System would include annual adjustments by the livestock operators to turn out in a different pasture. On years where the native pasture is used first, turnout is likely to be delayed. Soils are not sufficiently dry until 5/15 in many years.

The Deferred Rotation Grazing System would require the development of water in the Native Pasture, as the water currently existing in the Native Pasture is insufficient. The water becomes less reliable later in the season, indicating that successful use of the Native Pasture until 10/01 would require additional reliable water sources.

Alternative 5. Impacts of No Grazing

Under this alternative, there would be no grazing authorization issued.

Impacts under this alternative would be catastrophic to the livestock permittee. The BLM would be required to complete a land use plan amendment.

C. Maps

An allotment map that identifies areas where livestock concentrate can be found as Map 3 in Appendix 1.

SOCIAL AND ECONOMIC VALUES

A. Affected Environment

Surprise Valley is a rural area where ranching is the dominant element of the local economy and social values still promote agricultural pursuits. The permittees of the Calcutta Allotment are a small family ranch that relies on their cattle income. Livestock grazing on this allotment therefore provides necessary income to a local ranch family. In addition to the direct economic gain to this family, the community experiences indirect economic gain through taxes and other incomes from permitted livestock grazing on this allotment, and other allotments. Businesses in the Surprise Valley area that make their living servicing agricultural interest would experience a decline in economic activity.

B. Environmental Consequences

1. Impacts of Proposed Action

The proposed action would have an overall positive effect on social and economic values by creating a reliable forage base for the operator. There would be an increase in the amount of permitted AUMs on the Calcutta Permit, but a decrease in actual use as compared to the actual use since 1997 (average of 894 actual use AUMs yearly since 1997). This slight decline in yearly AUMs authorized will cause a slight decrease in cattle numbers run on the allotment and subsequent decrease in revenue for the permittee. This decrease may be offset, however, by the benefit of a consistent forage base for the permittee, and improved forage conditions are expected to benefit the operator by having better conditioned cows, and larger calves to sell. The decreased duration of time (1 month less in the Native and Seeded Pastures) on the allotment has provided the possibility to turnout 140 cattle.. Although fewer cattle will be run yearly than they have run in the past, they will have a dependable permitted use level.

2. Impacts of Current Management (No Action)

The no action alternative would have a negative effect on social and economic values because ranching practices related to cattle turnout numbers could vary substantially from year to year. The former method of allowing TNR on the Calcutta Allotment is not consistent with current BLM policy and regulations. Therefore relying on TNR AUMs is not feasible economically, due to the possibility of not receiving any TNR AUMs in any given year. It would be difficult for the operator to run their operation without knowledge of how many cattle they could have on public land on any given year. There would not be enough time prior to turnout to establish stocking rates yearly, and that would create a hardship for the operator, since they would have to change their operation yearly with little or no advance knowledge of that years grazing allowances.

3. Impacts of Reinstating Suspended AUMs

The reinstating of suspended AUMs would have an overall positive impact on the social and economic values by creating greater reliability for the operator than current management provides. There would be an increase in the amount of permitted AUMs on the Calcutta Permit. While increasing the permitted AUMs, it will be decreasing AUMs used in many years, as Calcutta has received an average of 894 actual use AUMs yearly since 1997. This slight decline in yearly AUMs will cause a slight decrease in cattle run on the allotment and subsequent decrease in revenue for the permittee. This decrease is somewhat offset, however, by the benefit

of a slightly more consistent grazing operation for the permittee. However, there would also be negative impact by creating a dependency on TNR AUMs that is not feasible economically, due to the possibility of not receiving any TNR AUMs in any given year. It would be difficult for the operator to run their operation without knowledge of how many cattle they could have on public land on any given year. There would not be enough time prior to turnout to establish stocking rates yearly, and that would create a hardship for the operator, since they would have to change their operation yearly without any advance knowledge of that years grazing allowances.

4. Impacts of Deferred Use System

The deferred rest rotation alternative would have positive and negative effects for the operator. The delayed turnout on the Native Pasture (in wet years) has the potential to be lengthy, in many years turnout could be delayed by 1 month. This delayed turnout could create hardships for the operator to continue providing hay for the cattle during that time. There would be an increase in the amount of permitted AUMs on the Calcutta Permit, which would have a positive effect on the operator. While increasing the permitted AUMs, it will be decreasing AUMs used in many years, as Calcutta has received an average of 894 actual use AUMs yearly since 1997. This slight decline in yearly AUMs will cause a slight decrease in cattle run on the allotment and subsequent decrease in revenue for the permittee. The decreased duration of time (1 month less in the Native and Seeded Pastures) on the allotment has provided the possibility to have 140 cattle, which will likely benefit the operator by having larger calves to sell, as result of improved forage conditions. There will be greater management inputs required by the livestock operator until the cattle learn the new rotational system. Negative impacts to the operator maybe offset, by the benefit of a consistent forage base, although less cattle will be run yearly than some previously years.

5. Impacts of No Grazing

If livestock grazing were eliminated, the local family that relies on utilization of the allotment would have negative economic impacts, as they would have to find other land to run their cattle. The availability of other land is unknown, but is likely to cost the operator significantly more.

Cumulative Impacts

Cumulative impacts are the "incremental impacts of a proposal when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes them" (40 Code of Federal Regulations 1508.7)

Table 18. Cumulative Effects Expected to Resources from Each Alternative Compared to Existing Conditions.

-=Negative Impact, --=Most Negative Impact, 0=No Expected Impacts, +=Positive Impacts, ++=Most Positive Impacts					
Resource	Alternative 1- Proposed	Alternative 2- No Action	Alternative 3- Reinstate Suspended	Alternative 4- Deferred Rotation	Alternative 5- No Grazing
Cultural Resources	+	-	+	+	
Invasive, Non-Native Speices	0	0	0	0	
Wetlands/Riparian Zones	+	-	+	+	++
Wildlife/Federally Listed/Threatened and Endangered Species	+	+	+	+	++
Social and Economic Values	+	-	-	+	--
Rangeland Vegetation	+	0	+	+	
Livestock Management	-	+	+	-	

Past and Present Actions

On the basis of aerial photographic data current GIS records and analysis, the following past and present actions have been identified within the cumulative assessment area: maintaining and using roads and trails (transportation and access), wildfire rehabilitation activities, Dispersed recreational activities, and livestock grazing management.

Livestock Grazing Management

Livestock grazing has had a long history in the region dating back to the late 1800's. Today, it remains the dominant use in the cumulative impact assessment area. Throughout its history, ranching has remained a dispersed activity characterized by localized areas of more intensive use. In order to support the management of the Calcutta Allotment, a variety of range improvement projects have been implemented through the years. These include fences, cattleguards, wells, spring developments, reservoirs, water pipelines, and corrals.

Transportation and Access

Past and present actions within the assessment area are supported by a transportation system which includes 10.86 miles of roads. Washoe County currently maintains approximately 5.23 miles of roads, and approximately 5.63 miles of roads are either private or unimproved roads or dirt roads and two-tracks on public lands. Most of these roads have their origin in ranching access, and few are regularly maintained.

Dispersed Recreational Activities

Dispersed recreation occurs within the assessment area and includes: wildlife viewing, rock hounding, hunting, off-highway vehicle use and camping.

Wildfire Rehabilitation

The Jeep wildfire burned 2,191 acres in 1979, and was seeded to crested wheatgrass. The Barrel wildfire burned 538 acres in 2005, and natural recovery of the soils and vegetation is occurring.

Reasonable Foreseeable Future Actions

Since the life of the proposed action is ten years, the time frame is considered to be most appropriate for considering the incremental effect of reasonably foreseeable future actions. Many of the past and present actions discussed above are expected to persist through this time frame, though the relative intensity of these actions could vary depending on a variety of economic factors.

Vegetation management including hazardous fuel reduction treatments and habitat improvement. Juniper thinning is expected to occur throughout the Claypan 10-14" site.

Recreational use is expected to increase throughout the 10 year period.

There are no planned or proposed mineral exploration or wind energy test sites.

Cumulative Impacts to Affected Resources

Impacts associated with past, present, and reasonably foreseeable future actions are generally created by ground or vegetation-disturbing activities that affect natural and cultural resources in various ways. Of particular concern is the accumulation of these impacts over time. This section of the EA considers the nature of the cumulative effect and analyzes the degree to which the proposed action and alternatives contribute to the collective impact. Inter-related resources with similar impacts have been grouped together for the cumulative impact analysis.

Cultural Resources

Impacts from the Past and Present Actions

Since many Great Basin prehistoric sites are surface or near surface sites, any ground disturbing activities destroy site integrity, spatial patterning and site function. Datable organic features are either destroyed or contaminated. Previous localized grazing, range improvements, road construction/maintenance and gravel pits have caused these types of impacts to cultural resources.

Grazing has probably affected a larger number of sites than is documented. Looting sometimes occurs but inadvertent actions from recreation, rock hounding and other off-road activities affect cultural resources as well. This allotment has been subjected to at least one substantial wildfire which directly and physically affected an unknown number of cultural resources. Direct and indirect impacts may have occurred to cultural resources through the rehabilitation process, as well.

Impacts from Reasonably Foreseeable Future Actions

Recreational use is expected to increase and these activities sometimes coincide with sensitive cultural resources causing displacement and mixed deposits of prehistoric/historic and modern debris. Vegetation management activities could increase the visibility of cultural sites potentially exposing them to increased looting. Inventories associated with planning for vegetation management would increase the state of knowledge concerning the local and regional cultural setting.

Cumulative Impact

Alternative 1 (Proposed):

The cumulative effects of the proposed action on cultural resources should be an incremental reduction in the rate of disturbance to site integrity, special patterning, and site function. Impacts to datable organic features would also be reduced. This reduction in impacts would be a result of the expected improvement in ecological condition over an extended period of time as concentrated grazing in sensitive riparian zones is reduced. Local and regional knowledge regarding the cultural setting would be increased as a result of implementation of the standard operating procedures which would require that all projects be preceded by inventory and site evaluation. The completion of inventories and evaluations would result in incorporation of mitigation measures which would act to further reduce long term cumulative impacts.

Alternative 2:

The cumulative effects of this alternative on cultural resources would be a proportionally larger decrease in the rate of disturbance to sites and organic features as a result of the reduced stocking levels under this alternative as compared to the proposed action. The failure to construct riparian exclosures and relocate water troughs under this alternative would allow on-going impacts to cultural resources at riparian areas.

Alternative 3:

Cumulative impacts to cultural resources under Alternative 3 would be similar to the Proposed Action but proportionally more positive as a result of the slightly lower amount of use as.

Alternative 4:

Cumulative impacts to cultural resources under Alternative 4 would be similar to the Proposed Action.

Alternative 5:

The cumulative impacts to cultural resources under this alternative should be an incremental improvement in ecological condition as a result of the complete elimination of one source of impacts to cultural resources.

Invasive, Non-native Species

Impacts from Past and Present Actions

Past impacts from road maintenance, livestock grazing, agriculture, recreation and other ground disturbing activities have introduced and spread non-native species such as cheatgrass throughout the allotment. However, based on monitoring information cheatgrass is a minor component of the plant communities. There are currently no known populations of noxious weeds on the Calcutta Allotment.

Impacts from Reasonably Foreseeable Future Actions

Future increases in recreation are likely to increase the spread of invasive species throughout the Resource Area and continue the risk of introduction of noxious weeds. The recreation that occurs on the Calcutta Allotment is not likely to be concentrated enough to increase the rate of spread of invasive species in any measurable amount. Project development in the Calcutta Allotment has the potential to increase invasive species spread and expose the allotment to introduction of noxious weeds, however through cleaning equipment prior to use, the threat of noxious and invasive species is reduced. Vegetation treatments including Juniper removal should release the native understory, making it more resilient in the event of disturbance, thereby decreasing the ability of noxious and invasive species to invade the site.

Cumulative Impact

Alternative 1 (Proposed):

The cumulative effects of the proposed action on noxious and invasive species would be neutral to slightly positive. Exposure in the allotment to increases of existing invasive, nonnative species and introduction of noxious weed species would continue, however improvements in vegetative conditions expected under this alternative would slightly reduce the potential for these species to spread.

Alternative 2:

Under this alternative, the cumulative effects to noxious and invasive weed species would be incrementally reduced as compared to the proposed action and actual use since 1997. The large reduction in livestock use would result in incrementally stronger or more rapid responses by upland vegetation and reduced possibility of species spreading from the site of introduction. The exposure of the resources on the allotment to the introduction of noxious weeds and spread invasive species would continue. Non-construction of the riparian projects and the failure to move water troughs from sensitive riparian sites would result in continuing susceptibility of these areas to introduction of unwanted species.

Alternative 3:

Cumulative impacts to invasive, non-native species under Alternative 3 would be similar to the Proposed Action.

Alternative 4:

Cumulative impacts to invasive, non-native species under Alternative 4 would be similar to the Proposed Alternative.

Alternative 5:

The cumulative effect of this alternative on noxious weed and invasive non-native species would be similar to alternative 2, but incrementally less. This would be as a result of the elimination of one vector for establishment and spread of weeds.

Wildlife Including Sage Grouse/Federally Listed Threatened and Endangered Species

Impacts from Past and Present Actions

Minor to moderate amounts of displacement have resulted from disturbances to habitat for wildlife, including sage grouse, associated with livestock grazing management, transportation and access management, and dispersed recreation use. There are no known federally listed Threatened or Endangered Species in the allotment. Wildlife habitat within the cumulative effects area has been impacted by wildfire rehabilitation which has contributed to the spread of invasive annual grasses and resulted in the introduction of crested wheatgrass. Long term benefits to wildlife have been realized as burned areas have been rehabilitated and vegetation and watershed conditions have been stabilized. This has been as a result of the replacement of lost vegetation by plant species which are more desirable than invasive and noxious weed and which are more effective at stabilizing watershed conditions.

Impacts from Reasonably Foreseeable Future Actions

Livestock management, dispersed recreation, and transportation and access would continue displacing wildlife in areas immediately adjacent to these activities. Livestock management activities would benefit wildlife by improving water distribution and availability. Vegetation management would benefit wildlife as treatments reduce juniper competition, and restore vegetative conditions and diversity. Wildfire rehabilitation would produce similar effects to vegetation management.

Cumulative Impact

Alternative 1 (Proposed):

There would be an incremental reduction in cumulative effects as a result of implementation of the Proposed Action as compared to actual use since 1997. This would be as a result of the deferment of livestock use, establishment of utilization objectives, and construction of identified range improvements.

Alternative 2:

The cumulative effects under this alternative would be substantially reduced as compared to the

proposed action and all other alternatives except alternative 5. Most wildlife habitat areas in the cumulative effects area would benefit from the major reduction in livestock use. However riparian areas would continue to be negatively affected and habitat conditions could continue to decline. Continuing livestock management may mitigate this effect somewhat, as livestock use would continue to change in response to the riparian conditions. Additional range improvements would be likely.

Alternative 3:

Cumulative effects to wildlife and sage grouse would be similar to those for the proposed action. However there would be an incremental improvement in habitat conditions as compared to the proposed alternative, as there would be decreased numbers of cattle on the allotment. These improved habitat conditions would be expected to reduce the cumulative impact of displacement as a result of the reasonably foreseeable future activities as cover increased.

Alternative 4:

The cumulative effects to wildlife and sage grouse under this alternative would be further reduced as compared to the proposed action and alternative 3, but would be proportionally greater than under alternatives 2 and 5. This would be as a result of the implementation of the full deferred grazing system, and the elimination of return fall use in the Jeep Seeding.

Alternative 5:

Under the No Grazing Alternative grazing management would be eliminated as a reasonably forseeable future action. There would be a proportional and potentially large reduction in the cumulative effects to wildlife and sage grouse habitat in the analysis area.

Wetlands and Riparian Zones

Impacts from Past and Present Actions

Wetlands and riparian areas prior to the mid-1980's were considered "sacrifice areas", areas which were expected to be used severely in order to achieve proper use of the uplands. As a result, wetlands and riparian areas did not receive management emphasis except in relation to their ability to provide needed water for domestic animal use.

In 1991 the BLM initiated the "Riparian – Wetland Initiative for the 1990's which, for the first time, established national goals and objectives for management of riparian and wetland resources on BLM administered public lands. Chief among these objectives was the mandate that 75 percent or more are in proper functioning condition by 1997. Since the launching of this initiative, the BLM has provided management focus on achieving this goal, and many areas were improved. Some areas continue to not achieve the goal of properly functioning condition. Livestock use is one of the activities which can negatively impact wetlands and riparian areas. As riparian zones decline, riparian vegetation is less capable of dissipating energy and filtering sediment. Erosion increases and water storage capacity is reduced. In the Calcutta Allotment, some wetlands and riparian areas are properly functioning and some are not. Current and past grazing use in the allotment has contributed to some of the gains and continues to prevent improvements in wetland riparian conditions since.

Impacts from Reasonably Foreseeable Future Actions

Future activities from livestock grazing management, dispersed recreation and transportation and access would continue to impact wetlands and riparian areas within the assessment area. Impacts from livestock grazing management would be expected to reduce under all alternatives with more intensive and continued adjustment. Impacts to wetland riparian areas from dispersed recreation and transportation and access would also be expected to continue in some areas, with some reductions over time. There would not be any expected impacts to wetlands and riparian areas from vegetation management and wildfire rehabilitation activities.

Cumulative Impact

Alternative 1 (Proposed):

The cumulative effects of this alternative on wetlands and riparian areas would be expected to be reduced as a result of the proposed construction of protective fences and relocation of water troughs. Some sites could experience short term negative impacts if water developments, which are designed to leave water at the source, malfunction, for example if float valves fail. The result would be short term reduction or elimination of water within the wetland areas. Vegetation in these areas would die or go dormant. Flow conditions at other sites may be improved as troughs are relocated and updated and improved plumbing is installed which leaves more water at the source, for example if float valves are installed at sites where there aren't any. Under this circumstance, riparian vegetation could increase in vigor or expand in coverage as a result. In addition, the earlier removal date will decrease the late season use in the riparian areas, further contributing to improved riparian conditions.

Alternative 2:

Under this alternative, the cumulative impacts to wetlands and riparian areas would initially be a continuation of current negative consequences. Under current policy livestock management which results in non-attainment of the standards for rangeland health, in this case the riparian standard, could not be tolerated. It would be expected that improvements in wetland riparian conditions would moderately improve over time, though not at the same pace as the other alternatives.

Alternative 3:

Cumulative impacts under this alternative would be similar to the proposed alternative.

Alternative 4:

Cumulative impacts under this alternative would be similar to the proposed alternative.

Alternative 5:

Under this alternative, the cumulative impacts to wetlands and riparian areas would be incrementally reduced as livestock grazing use and management would be removed as a factor affecting riparian health. It would be expected that existing water developments would be removed, and natural flow patterns and conditions would re-establish.

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CHAPTER 4: REFERENCES

Works Cited

Coates, P. S., & Delehanty, D. J. (2008). Effects of Environmental factors on incubation patterns of greater sage-grouse. *The Condor* , 627-638.

Connelly, J. W., Schroeder, M. A., Sonds, A. R., & Braun, C. E. (2000). Guidelines to manage sage-grouse populations and their habitats. *Wildlife Society Bulletin* , 967-985.

Cruz, R., & Ganskopp, D. (1998). Seasonal preferences of steers for prominent northern Great Basin grasses. *Journal of Range Management* , 557-565.

Ganskopp, D. (1998). Thurber needlegrass: Seasonal defoliation effects on forage quantity and quality. *Journal of Range Management* , 276-281.

Holechek, J. L. (1981). Livestock Grazing Impacts on Public Lands: A Viewpoint. *Journal of Range Management* , 251-254.

Holechek, J. L., & Herbel, C. H. (1982). Seasonal Suitability Grazing in the Western United States. *Rangelands* , 252-255.

Larrucea, E. S., & Brussard, P. F. (2008). Habitat Selection and Current Distribution of the Pygmy Rabbit in Nevada and California, USA. *Journal of Mammology, 89(3)* , 691-699.

Sneva, F., & Britton, C. M. (1983). Adjusting and Forecasting Herbage Yeilds in the Intermountain Big Sagebrush Region of the Steppe Province. *Agricultural Experimental Station Oregon State University, Corvallis in cooperation with Agricultural Research Service U.S. Department of Agriculture. Station Bulletin 659* .

Taylor, D. A., & Tuttle, M. D. (2007). Water for Wildlife - A handbook for ranchers and range managers. Bat Conservation International.

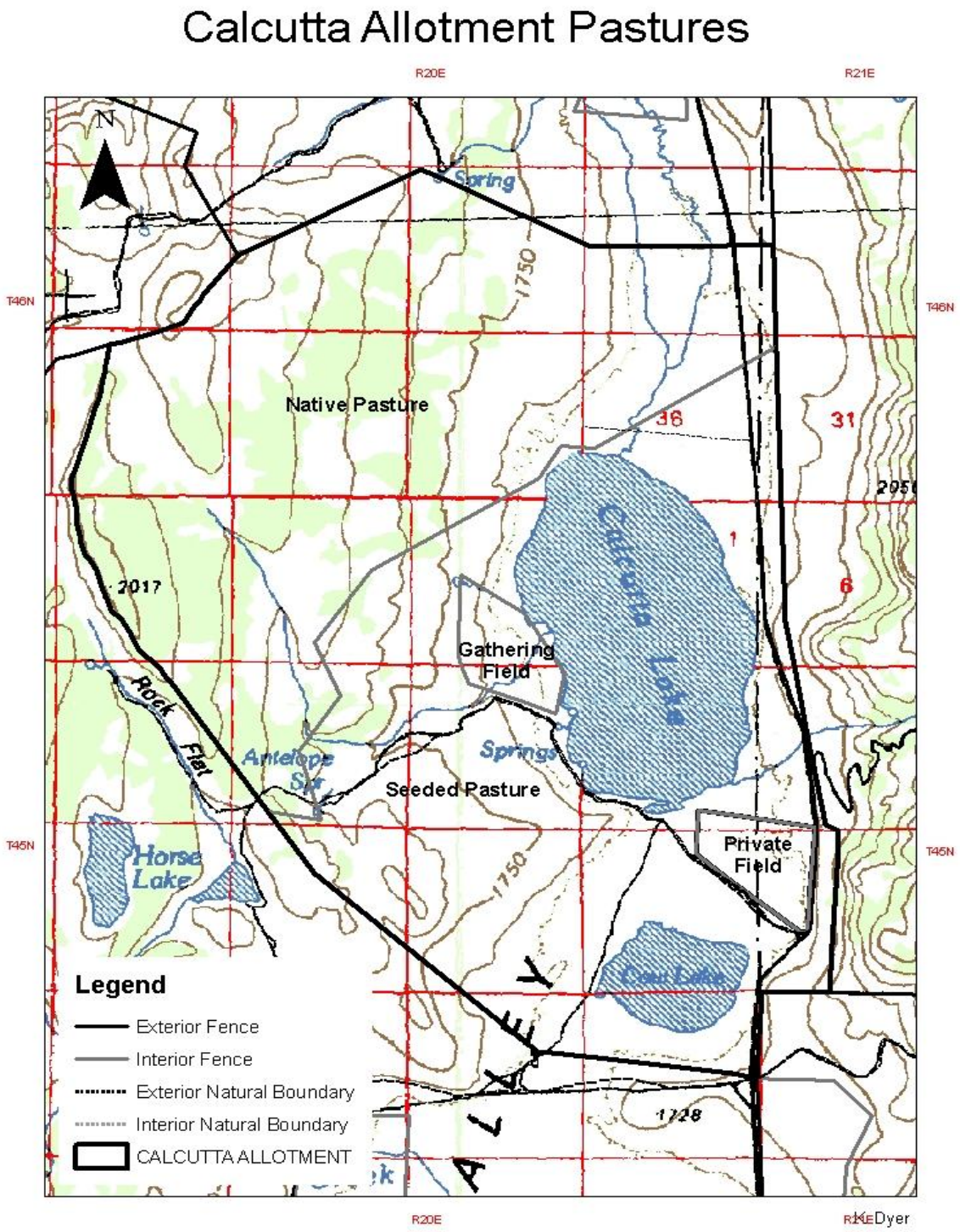
Taylor, D., & Tuttle, M. D. (2007). *Water for Wildlife- A handbook for ranchers and range managers.* Bat Conservation International.

Thines, N. J., Shipley, L. A., & Sayer, R. D. (2004). Effects on cattle grazing on ecology and habitat of Columbia Basin pygmy rabbits (Brachylagus idahoensis). *Biological Conservation 119* , 525-534.

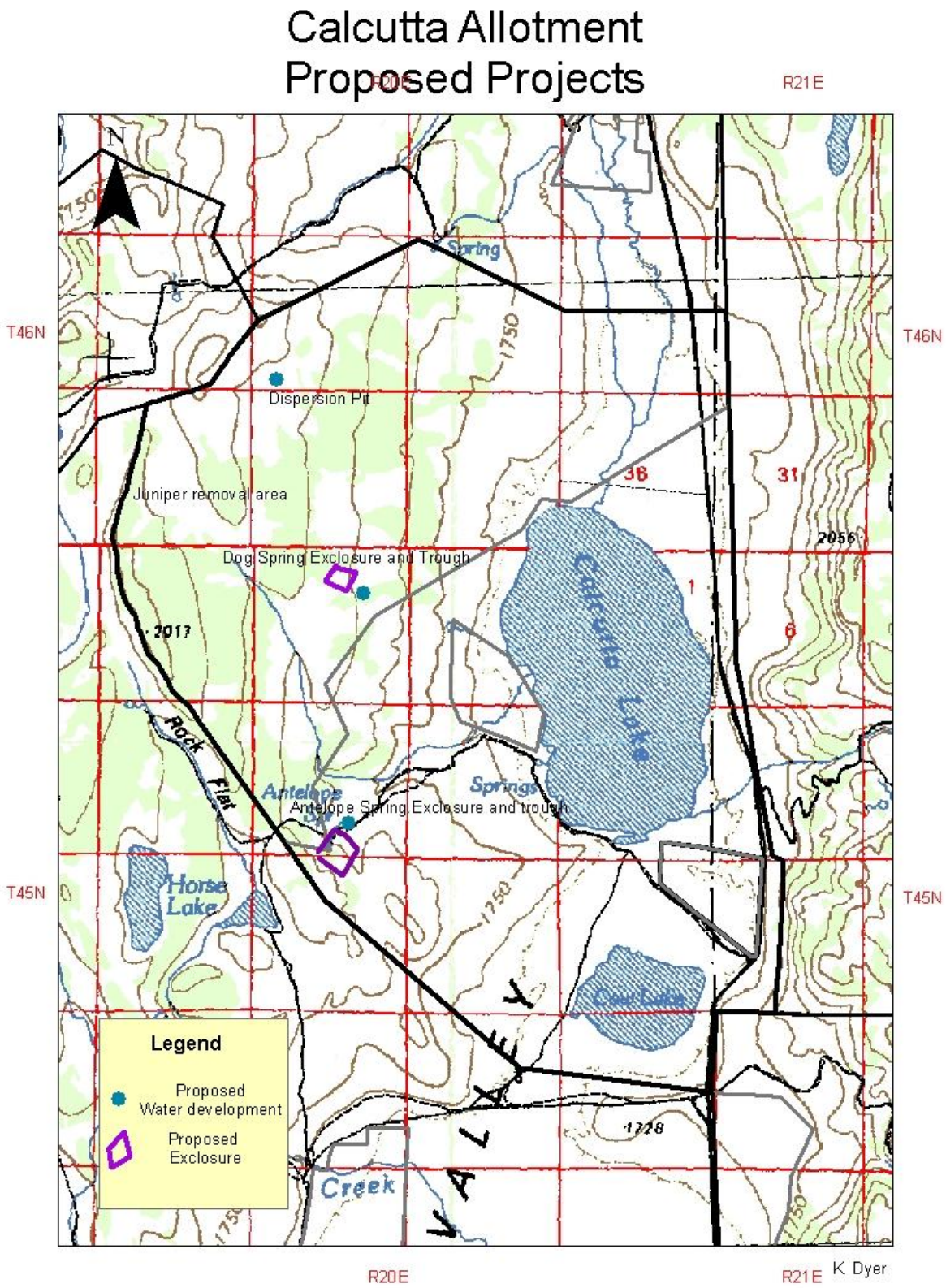
Young, J. A., & Clements, C. D. (2002). *Purshia: The wild and bitter roses.* Reno: University of Nevada Press.

Appendix A

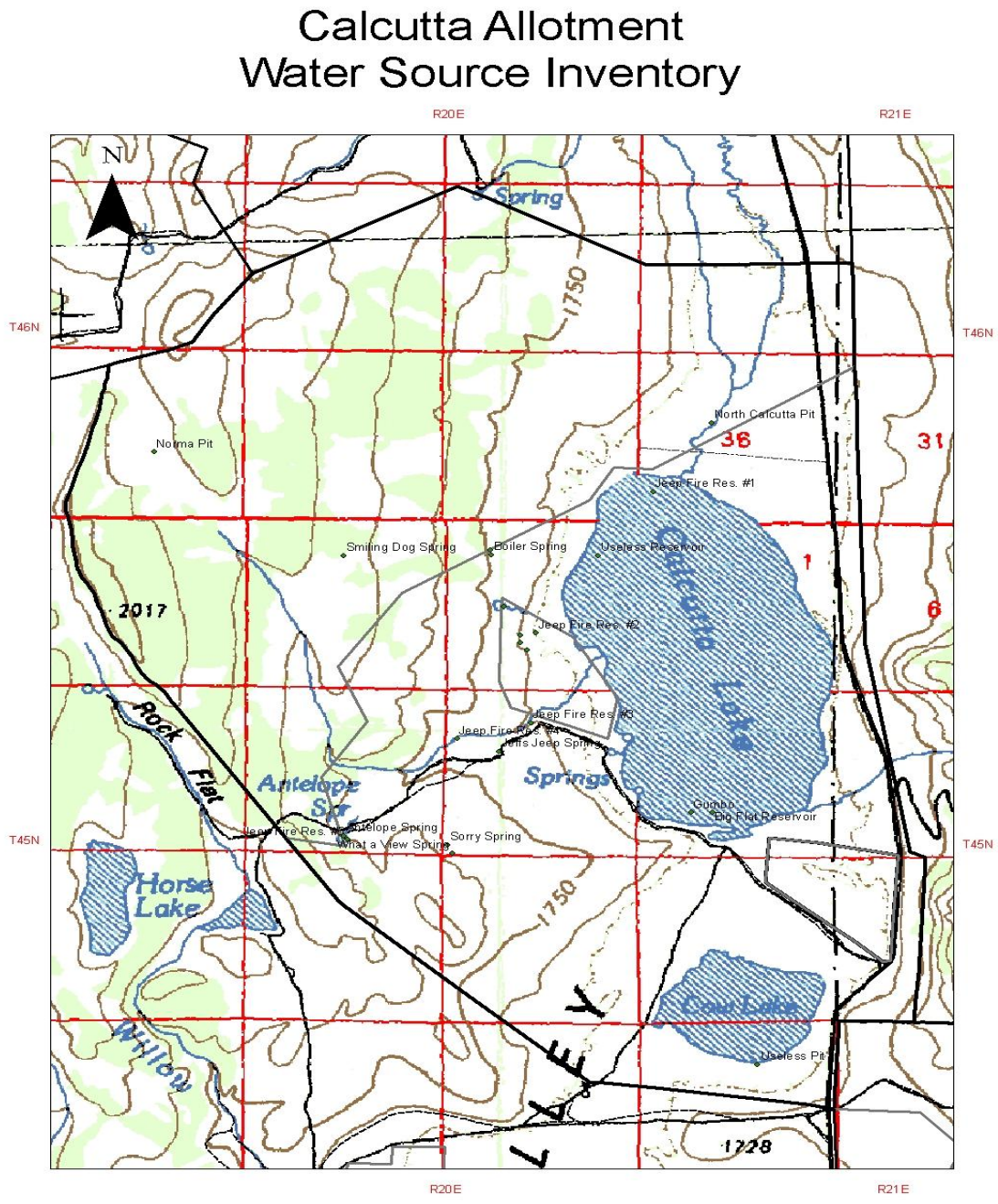
Map 1. Pastures in the Calcutta Allotment.



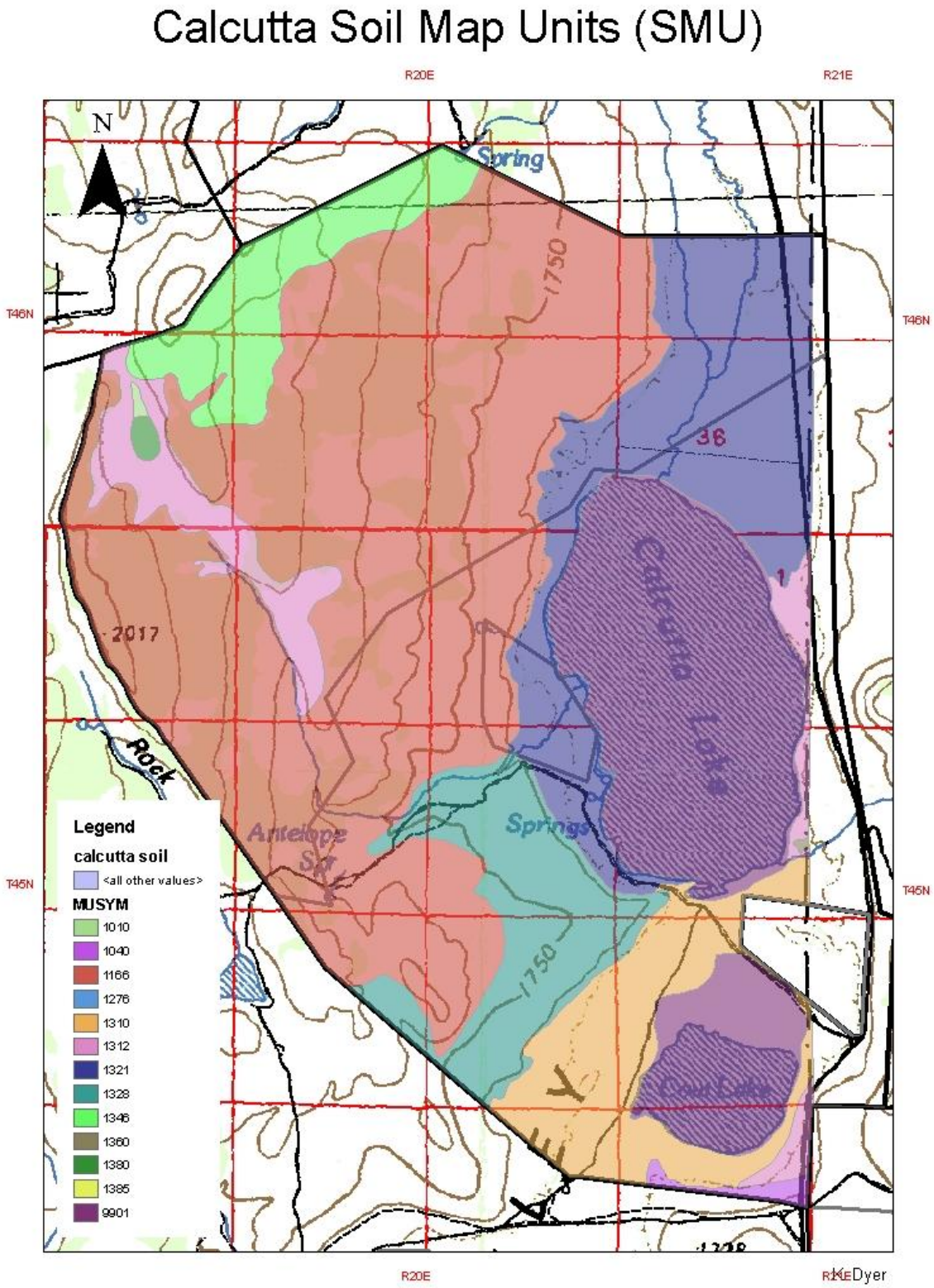
Map 2. Proposed Range Improvements for the Calcutta Allotment.



Map 3. Calcutta Allotment Water Source Inventory.



Map 4. Calcutta Allotment Soil Map Units (SMU).



Map 5. Areas where cattle concentrate.