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**Battle Mountain Field Office
50 Bastian Road
Battle Mountain, NV 89820**

Shoshone Complex Wild Horse Gather Environmental Assessment NV062-EA07-104

**For the Bald Mountain and South Shoshone
Herd Management Areas**



South Shoshone HMA, April, 2007.

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1. Background Information

The purpose of this Environmental Assessment (EA) is to evaluate the impacts associated with completion of a wild horse gather within the Shoshone Complex to achieve the Appropriate Management Level (AML) and restore a thriving natural ecological balance to the range. The Shoshone Complex includes the Bald Mountain and South Shoshone Herd Management Areas (HMAs) administered by the Battle Mountain Field Office (BMFO).

Description of the proposed gather area

Both HMAs are within the Carico Lake Allotment, which is located approximately 25 miles south of Battle Mountain, Nevada in Lander County. The Bald Mountain HMA is located in the eastern half of the Carico Lake Allotment, at the northern tip of the Toiyabe Range, south of Cortez Canyon, and is approximately 139,879 acres in size.

The South Shoshone HMA is located in the central portion of the Carico Lake Allotment, just west of the Bald Mountain HMA and covers approximately 133,099 acres of the Shoshone Mountain Range, east of SR 305. A small portion of this HMA (approximately 11%) exists within the Austin Allotment.

The gather area would include areas within both HMAs and areas outside of HMA boundaries within the Carico, Grass Valley, and Austin Allotments.

Few physical boundaries exist between the HMAs to restrict regular interchange and movement, therefore the area is managed as a Complex. Refer to Maps 1-2, for HMA boundaries, livestock grazing allotments and proposed gather area.

Appropriate Management Level (AML)

The Appropriate Management Levels (AMLs) for both HMAs were established through the Final Multiple Use Decision (FMUD) issued by the BMFO September 30, 2005 following completion of the Carico Lake Allotment Evaluation and Rangeland Health Assessment and EA #NV062-EA05-61. The AML for the Austin Allotment portion of the HMA was established at zero wild horses in a 1995 FMUD.

An AML range was established for the HMAs within the Complex, in which the upper number represents the maximum population for which thriving natural ecological balance would be maintained. The lower range represents the number of animals to remain in the Complex following a wild horse gather in order to allow for an anticipated four-year gather cycle, and prevent the population from exceeding the established AML between gathers. “We interpret the term AML...to mean that “optimum number” of wild horses which results in a thriving natural ecological balance (TNEB) and avoids a deterioration of the range” (109 IBLA 119 API 1989¹).

1. U.S. Department of the Interior, Internal Board of Land Appeals (IBLA), Animal Protection Institute (API).

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The following table displays the AMLs that have been established for the HMAs within the Shoshone Complex gather area.

Table 1. Established AML by HMA and Allotment

HMA	Allotment	Decision	AML (wild horses)	2007 Estimated Population ²
Bald Mountain	Carico Lake	FMUD 2005	129-215	379
South Shoshone	Carico Lake	FMUD 2005	60-100	336
	Austin	FMUD 1995	0	3
Total			189-315	718

The AMLs established through FMUDs were determined to be the level of use by wild horses, which would provide for a thriving natural ecological balance and prevent deterioration of the range³. The AMLs were also determined to be the levels, which would provide for viable populations within the capacity of the habitat to provide forage and water. AMLs determined through FMUDs were determined following the collection, analysis, and interpretation of many years worth of monitoring data, which included precipitation, use pattern mapping, trend, production, census/inventory, and carrying capacity analysis. In the case of the Austin Allotment portion of the South Shoshone HMA, an AML of zero was established because this small, fenced area is not suitable to maintain a sound, viable population of wild horses. Water is also lacking in the area.

1.1. Purpose and Need for Action

The purpose of the Proposed Action is to prevent degradation of the range through removal of excess wild horses to achieve the AMLs determined in the 2005 FMUD for the Carico Lake Allotment. The purpose of the Proposed Action is also to remove wild horses from horse-free areas (including the Austin Allotment), collect information on herd characteristics, and maintain a healthy and viable wild horse population. The purpose and need of this EA is not to evaluate, modify or increase wild horse AMLs, or evaluate or modify livestock uses within the HMAs.

As indicated in the above table, the 2007 population for the Complex is estimated to be 718 wild horses, which exceeds the established AML range of 189-315 wild horses. Through the interdisciplinary evaluation process and analysis of monitoring data, it was determined that when wild horse populations exceed the established AML, utilization levels exceed management objectives, leading to over-utilization of rangeland vegetation and degradation of the rangeland resources. As a result, it has been determined that an excess population of wild horses exists within the Complex.

2. 2007 populations are based on the results from the March 2005 helicopter census and estimated 12% average annual increase for Bald Mountain and South Shoshone HMAs.
3. Refer to the documents at Section 1.4 for the Carico Lake Allotment.

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The current population of wild horses in the Complex is negatively impacting rangeland vegetation condition and riparian resources as indicated by monitoring data and field observations⁴.

The proposed wild horse gather is needed to remove excess wild horses in order to achieve the established AMLs, and promote a thriving natural ecological balance between wild horse populations, livestock, wildlife, rangeland vegetation, and water availability; and protect the range from further degradation by wild horses (refer to Section 1.4 below).

1.2. Issues

Prior to completion of this Environmental Assessment, scoping letters dated April 11, 2006, and March 15, 2007 were mailed to the interested public list for the area encompassed by the Shoshone Complex.

One response was received from the Nevada State Clearinghouse, stating support for the proposed gather from the Division of State Lands and the State Historic Preservation Office.

Through the evaluation process and consultation with the interested public, the following issues have been identified:

- ◆ Current population levels of wild horses are causing damage to rangeland vegetation and riparian areas within the Complex.
- ◆ The current population of wild horses exceeds the established AMLs.
- ◆ Distribution within both HMAs is not uniform, and concentrations of wild horses exist in certain areas.

1.3. Conformance with Existing Land Use Plans

The Proposed Action is in conformance with the Shoshone-Eureka Resource Area Management Plan (RMP) Objectives (Shoshone-Eureka RMP Record of Decision dated 1986 and Shoshone-Eureka RMP Amendment, Record of Decision dated 1987).

Wild Horse & Burro Management Objectives:

- 1) To manage viable herds of sound, wild horses in a wild and free roaming state.
- 2) To initially manage wild horse populations at existing numbers based on the 1982 aerial counts and determine if this level of use can be maintained.
- 3) To manage wild horses within the areas which constituted their habitat at the time of the Wild and Free-Roaming Horse and Burro Act became law in 1971.

1.4. Relationship to Statutes, Regulations, Policy, Plans or Other Environmental Analysis

The Proposed Action is in conformance with the Wild Free-Roaming Horses and Burros Act of 1971 (Public Law 92-195, as amended) the Code of Federal Regulations (CFR) at 43 CFR §4700, and policies.

4. Refer to the documents at Section 1.4 for the Carico Lake Allotment.

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Section 2 (f) of the Wild Free-Roaming Horses and Burros Act defines excess animals as follows: *"excess animals" means wild free-roaming horses or burros (1) which have been removed from an area by the Secretary pursuant to application law or, (2) which must be removed from an area in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area.*

Furthermore, 3 (b) (2) of the Act states:

"Where the Secretary determines on the basis of (i) the current inventory of lands within his jurisdiction; (ii) information contained in any land use planning completed pursuant to section 202 of the Federal Land Policy and Management Act of 1976; (iii) information contained in court ordered environmental impact statements as defined in section 2 of the Public Rangelands Improvement Act of 1978; and (iv) such additional information as becomes available to him from time to time, including that information developed in the research study mandated by this section, or in the absence of the information contained in (i-iv) above on the basis of all information currently available to him, that an overpopulation exists on a given area of the public lands and that action is necessary to remove excess animals, he shall immediately remove excess animals from the range so as to achieve appropriate management levels. Such action shall be taken . . . until all excess animals have been removed so as to restore a thriving natural ecological balance to the range, and protect the range from the deterioration associated with overpopulation".

Applicable regulatory requirements at 43 CFR §4700 are as follows:

CFR 4700.06 Policy.

- a. *Wild horses and burros shall be managed as self- sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat.*

CFR 4720.1 Removal of excess animals from public lands.

Upon examination of current information and a determination by the authorized officer that an excess of wild horses or burros exists, the authorized officer shall remove the excess animals immediately in the following order.

- a. *Old, sick, or lame animals shall be destroyed in accordance with subpart 4730 of this title;*
- b. *Additional excess animals for which an adoption demand by qualified individuals exists shall be humanely captured and made available for private maintenance in accordance with subpart 4750 of this title; and*

This EA analyzes the impacts of gathering wild horses, which has been analyzed previously through numerous Gather Plan/Environmental Assessments issued by the Battle Mountain

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Field Office. In addition, Multiple Use Evaluations, Rangeland Health Assessments, and EAs have been completed in the process of establishing AML for wild horses. This EA tiers to these existing documents and will incorporate relevant portions of the EAs, Gather Plans and Evaluations, Final Multiple Use Decisions (FMUDs) by reference, where applicable. These documents include the following:

- ◆ *Carico Lake Allotment Final Multiple Use Decision, September, 2005,*
- ◆ *Carico Lake Allotment Rangeland Health Assessment, EA #NV062-05-61, September, 2005,*
- ◆ *Carico Lake Allotment Conformance Determination, September, 2005,*
- ◆ *Carico Lake Allotment Rangeland Health Assessment, July, 2005,*
- ◆ *Callaghan Herd Management Area Wild Horse Gather Plan and Environmental Assessment # NV062-02-41, May, 2002,*
- ◆ *Multiple Use Decision for the Austin Allotment, January, 1995.*

The Proposed Action of attaining AML is also consistent with the following:

- ◆ *South Shoshone and Bald Mountain HMA Wild Horse Objectives (Appendix A),*
- ◆ *Standards and Guidelines for Rangeland Health as developed by the Northeastern Great Basin RAC (Appendix A),*
- ◆ *Management Guidelines for Sage Grouse and Sagebrush Ecosystems In Nevada (BLM, 2000),*
- ◆ *Guidelines to Manage Sage Grouse Populations and Their Habitats (Connelly et. al. 2000) also known as the Western Association of Fish and Wildlife Agencies (WAFAWA) Guidelines for Sage Grouse Management,*
- ◆ *Wild Horse Revised Nevada Tactical Plan (BLM, 2001),*
- ◆ *Strategic Plan for Management of Wild Horses and Burros on Public Lands (BLM, 1992).*

2. Description of the Proposed Action and Alternatives

The following section details the Proposed Action and Alternatives that will be analyzed in this EA, as well as alternatives considered, but not carried forward for analysis. No additional alternatives were identified through scoping with the interested public. The following Alternatives will be analyzed:

- ***Proposed Action: Gather the Complex to low range of the AML***
- ***Alternative 1: Gather the Complex to low range of the AML, releasing a larger proportion of studs than mares.***
- ***Alternative 2: No Action Alternative: No Wild Horse Gather***

The Proposed Action and Alternative 1 were developed to achieve the established AML, remove excess animals from the range, prevent further deterioration to the range, and ensure the long-term success of the HMAs within the Complex. Modification of sex ratios of released studs and mares would be analyzed to assess the effectiveness of slowing population growth for the Bald Mountain HMA. The No Action Alternative is in violation of the Wild Free-Roaming Horses and Burros Act, of 1971 (PL-195, as amended) and is not in

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conformance with BLM wild horse and burro management requirements contained in 43 CFR §4700. The No Action Alternative would not achieve the identified Purpose and Need, however, it is provided as a basis for comparison with the two action alternatives, and to assess the affects of not conducting a gather at this time.

2.1. Actions common to the Proposed Action and Alternative 1

The Battle Mountain Field Office proposes to complete a wild horse gather to achieve the established AMLs in accordance with this EA, Wild Horse Gather Plan, and Standard Operating Procedures.

- Helicopter census flight for both HMAs would be conducted prior to the gather to obtain current population size and distribution of the wild horses.
- Gather operations would be conducted in accordance with the Gather Plan and Standard Operating Procedures (Appendix A).
- Animals selected for release back to both HMAs would be transported to within the HMA boundary as near to an available water source as transportation allows.
- As a priority, wild horses would be removed from outside of HMA boundaries and from areas where concentrations of wild horses currently exist.
- Excess wild horses removed from the range would be transported to BLM wild horse and burro facilities to be prepared for the National Wild Horse and Burro Adoption Program or for long-term holding.
- The gather would be accomplished by helicopter drive trapping and would not occur during peak foaling season (March 1-June 30). The Complex could be gathered during July 2007.
- Animals released could be identified by an implanted microchip and freezemark brand on the left hip.
- Blood would be drawn for genetics analysis as described in Appendix A.
- A trapsite adoption event could be planned to occur in conjunction with the gather activities in which selected wild horses would be adopted to qualified applicants at the gather location (refer to Gather Plan, Appendix A for more information).

The objective for a gather to be conducted under the Proposed Action and Alternative 1 would be the achievement of the low range of AML for the Complex. The goal would be to reduce the population of the Complex to approximately 189 wild horses, ensuring a genetically viable population would exist within the Complex. Additionally, the population may not exceed the upper range of the established AML (315 wild horses) until the third or fourth year in which a maintenance gather would occur based on funding, population growth and site-specific qualifiers.

The Bald Mountain and South Shoshone HMAs would be reduced to 129 and 60 wild horses respectively. An objective for the gather would be to first gather areas where larger concentrations of wild horses exist and areas of low concentrations as a last priority for gather and removal to improve the distribution of wild horses within the two HMAs.

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The following table displays estimated populations, and gather and removal numbers for a Summer 2007 gather of the Shoshone Complex:

Table 2. Population, Gather Numbers–Shoshone Complex

HMA	2007 Estimated Population	Summer 2007 Gather Numbers ⁵	Summer 2007 Removal Numbers	Estimate Un-gathered	Estimate Release	Post gather Population
Bald Mountain	379	360	250	19	110	129
South Shoshone	336	319	276	17	43	60
South Shoshone/Austin Allotment	3	3	3	0	0	0
Total	718	682	529	36	153	189

Wild horse and burro specialists would avoid selection of release animals that would favor certain age groups (such as all older animals), and chose release animals that are comprised of diverse age groups, while adhering to the National Selective Removal Policy to the extent possible (refer to Wild Horse Gather Plan). It is anticipated that most wild horses 0-5 years of age would be removed from both HMAs. Many of the mares and studs ages 6-9 would be released. Older mares and studs (15-19 years of age and primarily those 20+ years of age) would be released to avoid the stress of transportation and handling to these older horses. If deemed appropriate, additional older horses may be released above the minimum AML, if it would be too stressful to ship them. Most foals would be removed from the range and transported to BLM wild horse and burro facilities with their mothers. In certain circumstances, some foals could be selected to be released with their mothers if it is determined that the foals are too young to travel safely or if the mother has been selected for release and the foal should not be weaned.

2.2. Actions that differ among the Proposed Action and Alternative

2.2.1. Proposed Action: Gather the Complex to low range of the AML

Under the Proposed Action, wild horses would be captured through helicopter drive trapping and helicopter-assisted roping according to the Gather Plan and SOPs identified in Appendix A. Released animals could be implanted with an electronic microchip and corresponding freemarked brand on the hip for future identification from the ground and during future census flights and gathers. The objective would be for a post gather population of 60 wild horses within the South Shoshone HMA and 129 wild horses within the Bald Mountain HMA. The desired sex ratio of the animals remaining on the range would be 50% mares and 50% studs. Following the gather, populations would increase at the average estimated rate of 12% until the next scheduled gather in approximately three to four years depending upon funding, population growth increases, and site-specific qualifiers.

5. Estimated gather numbers are based on 95% gather efficiency. Actual gather efficiency may be lower due to wild horse behavior, tree cover/terrain, and determinations made by the COR at the time of the gather.

2.2.2. Alternative 1: Release larger proportion of studs back to the Bald Mountain HMA.

Under Alternative 1, the gather would occur as described under the Proposed Action (Sections 2.1 and 2.2.1) with the exception that the objective for the sex ratio of the post gather population would be 60% studs and 40% mares within the Bald Mountain HMA. This would involve the release of 66-78 studs and up to 52 mares back to the range, depending upon the number of animals determined to be ungathered.

2.2.3. Alternative 2: No Action Alternative (No Wild Horse Gather)

Under the No Action Alternative, a wild horse gather would not be conducted within the Shoshone Complex. Wild horse populations would not be actively managed at this time, and wild horses would not be removed from horse-free areas. The current population of 718 wild horses would continue to increase at an estimated rate of 12% annually. The AML of 189-315 wild horses would continue to be exceeded.

2.3. Alternatives Considered but Eliminated from Detailed Analysis

2.3.1. Gather the Complex to low range of the AML and implement Fertility Control within the Bald Mountain and South Shoshone HMAs

This Alternative would have involved treating 100% of the mares released into the Bald Mountain and South Shoshone HMAs with an immunocontraceptive vaccine, Porcine Zona Pellucidae (PZP), for fertility control research. Approximately 60-65 mares would be treated for the Bald Mountain HMA, and approximately 25-30 mares treated for the South Shoshone HMA.

The efficacy for the application of the two-year PZP vaccine based on summer application is as follows:

<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Normal	94%	82%	Normal

This alternative was analyzed through the WinEquus Population Model (refer to Appendix C), to determine potential affects to the population size as a result of fertility control. The model analysis indicated that the affect to population size within 6 years would be minimal. The results of the modeling for the implementation of fertility control on the South Shoshone HMA were very similar to the results for the Proposed Action. In fact, the average population sizes in 6 years differed by only 2-3 wild horses.

Additionally, the model indicated that the modification of sex-ratios for released animals could have a greater influence on population growth rates than the implementation of fertility control. Because the results were very similar for the two alternatives, the option of fertility control was not identified in this analysis.

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Summer implementation of fertility control has not shown to be as effective as winter application. Not only is the drugs efficacy reduced from winter gathers, but during summer gathers, it is often difficult to achieve 100% capture of mares within the HMAs due to high elevation, tree cover etc. Therefore, a number of mares usually exist within the HMA that would not have been inoculated with fertility control. Particularly in small herds where only 30-40 mares would be released, fertility control research is often not practical.

Data would be collected during the proposed gather and blood drawn for genetics testing. Analysis of this data and completion of an Herd Management Area Plan (HMAP) in future years may result in reconsideration of fertility control research of this herd during future gathers.

2.3.2. Gathering the Complex to upper range of AML

This alternative was considered and not brought forward for further consideration. A post-gather population size at the upper level of the AML would result in AML being exceeded following the next foaling season (Spring 2008). This would be unacceptable for several reasons.

“We interpret the term AML within the context of the statute to mean to mean that ‘optimum’ number of wild horses which results in a thriving natural ecological balance and avoids a deterioration of the range” (109 IBLA 119 API 1989). The upper range of the AMLs established for the HMA within the Complex represent the maximum population for which thriving natural ecological balance would be maintained. The lower range represents the number of animals to remain in the Complex following a wild horse gather in order to allow for an anticipated four-year gather cycle, and prevent the population from exceeding the established AML between gathers. “Proper range management dictates removal of horses before the herd size causes damage to the range land. Thus, the optimum number of horses is somewhere below the number that would cause resource damage” (118 IBLA 75).

Additionally, gathering to the upper range of AML, would result in the need to follow up with another gather within one year, and could result in overutilization of vegetation resources and damage to the rangeland. For these reasons, this alternative did not receive further consideration in this document.

2.3.3. Fertility control only to control the population size of the Complex

Because an alternative to implement fertility control without gathering to AML would not result in AML being achieved, and would result in increased gather and fertility control costs, this alternative was not considered further.

The WinEquus Population Model was utilized to assess the potential feasibility of this alternative (refer to Appendix C). The average population levels for 100 of the trials for South Shoshone HMA were 541 and Bald Mountain HMA 597 wild horses.

Additionally, the model indicated that the numbers of horses that could be gathered and treated in 6 years far exceeded the numbers to gather with removals for both HMAs. The results of the population model for fertility control only (no removal) for the Bald Mountain

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HMA were between 758-1058 wild horses gathered and 326-471 treated with fertility control in six years. According to the model, the gather only (no fertility control) scenario would result in 337-583 gathered for the Bald Mountain HMA. The simulation for a gather of the Bald Mountain HMA in conjunction with fertility control indicated 338-620 gathered and 49-95 treated over a six-year period.

Summer implementation of fertility control has not shown to be as effective as winter application. For example, the Diamond Complex was gathered in 2004 and 74% of the 116 wild horses released consisted of mares inoculated with fertility control. The summer of 2006 would have been the 1st year of effectiveness of the vaccine. During a helicopter census flight conducted in September 2006, 12.8% of the population observed was foals. Normally percentage of foals would average 15-20%. Though the percentage observed is lower than the expected average, it is not as low as would have been expected with the inoculation of 85 mares with fertility control. Other factors could be influencing these figures, such as underestimated numbers of ungathered wild horses in 2004.

More information about the population modeling completed for this EA is detailed in Appendix C.

2.3.4. Remove or Reduce Livestock within the HMAs

This alternative would involve no removal of wild horses and removal or reduction of livestock within the HMAs. This alternative was not brought forward for analysis because it is outside of the scope of the analysis, inconsistent with the SERA RMP objectives, and inconsistent with multiple use management. The HMAs within the Carico Lake Allotment were recently evaluated for Rangeland Health (2005), and conformance with the Northeastern Great Basin Resource Advisory Council (RAC) Standards and Guidelines. This process resulted in extensive data interpretation, and carrying capacity analysis, which determined the number of AUMs to be allocated to wildlife, wild horses, and livestock. These management actions (including determination of wild horse AML and objectives) were analyzed within an Environmental Assessment, and finalized within a Final Multiple Use Decision following public comment (see Section 1.4). For these reasons, this Gather Plan and EA would not involve reductions of permitted livestock or increases of the established AMLs. Allocations to livestock or wild horses would be re-evaluated in future years and implemented through appropriate decision and environmental analysis documents.



South Shoshone HMA, December 2000

3. Affected Environment and Environmental Consequences

Resources listed in the following tables, including the fifteen “critical elements” whose review is mandated by law or regulation, have been reviewed for the Proposed Action and Alternatives. Those marked as not affected would not be impacted by Proposed Action, or are not present in the area of the Proposed Action. Discussion of expected impacts to affected resources follows the tables. Direct impacts are those that result from the actual gather and removal of wild horses from the Carico Complex. Indirect impacts are those impacts that occur once the excess animals are removed.

Table 3a: Critical Elements Checklist

CRITICAL ELEMENTS	Present	Affected	Rationale
ACECs	NO	NA	Resource is not present
Air Quality	YES	NO	The proposed gather area is not within an area of non-attainment, or areas where total suspended particulate matter exceed Nevada air quality standards. Areas of disturbance would be small and temporary.
Cultural Resources	YES	NO	Known cultural resources would be avoided during the gather. Trapsites and holding facilities located in areas that have not been surveyed would be surveyed prior to use as described in the Gather Plan Appendix A to prevent any effects to cultural resources.
Environmental Justice	NO	NA	The Proposed action or alternatives would have no effect on minority or low-income populations.
Floodplains	NO	NA	Resource is not present.
Waste (Hazardous or Solid)	NO	NA	Not Present.
Invasive, Non-Native Species	YES	YES	Discussed in detail below.
Native American Religious Concerns	YES	NO	There are no known Native American concerns.
Migratory Birds	YES	YES	Discussed below under Wildlife.
Prime or Unique Farmlands	NO	NA	Resource not present.
Riparian-Wetland Zones	YES	YES	Discussed in detail below.
Special Status Plant and Animal Species	YES	YES	Discussed below under Wildlife.
Water Quality	YES	YES	Discussed below under Riparian-Wetland.
Wild and Scenic Rivers	NO	NA	Resource not present.
Wilderness	NO	NO	Resource is not present.

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Table 3b. Checklist of other Resources

OTHER RESOURCES	Present	Affected	Rationale
Fire Management	YES	NO	Resource is not affected by the proposed action or alternatives.
Forestry and Woodland	YES	NO	Resource is not affected by the proposed action or alternatives.
Land Use Authorizations	YES	NO	Resource is not affected by the proposed action or alternatives.
Livestock Management	YES	YES	Discussed below.
Minerals	YES	NO	Resource is not affected by the proposed action or alternatives.
Paleontology	YES	NO	Resource is not affected by the proposed action or alternatives.
Rangeland Vegetation Resources	YES	YES	Discussed in detail below.
Recreation	YES	NO	Resource is not affected by the proposed action or alternatives.
Socioeconomics	YES	NO	Resource is not affected by the proposed action or alternatives.
Soils	YES	YES	Discussed in detail below.
Visual Resources	YES	NO	Resource is not affected by the proposed action or alternatives.
Wild Horse and Burros	YES	YES	Discussed in detail below.
Wildlife	YES	YES	Discussed in detail below.
Wilderness Study Area	YES	NO	Traps or holding facilities would not be constructed within the boundaries of Wilderness Study Areas.

The Affected Environment for the Carico Complex gather area and analysis of Environmental Consequences relating to wild horse gathers is described in detail in the documents identified in Section 1.4. Extensive information pertaining to the Affected Environment, condition of rangeland resources and history of the area is discussed within the Carico Lake Allotment Rangeland Health Assessment and Conformance Determination.

3.1. Cultural Resources (and Paleontology)

Affected Environment

The Carico Lake Allotment contains approximately 599,303 acres. Over the past thirty years approximately 60,689 total acres or 10 percent has been inventoried for cultural resources. Within the Carico Lake Allotment approximately 882 cultural sites are recorded which include historic and prehistoric sites, and 151 sites eligible to the National Register of Historic Places. Sites in the Complex include mining sites, charcoal manufacturing sites and ranches/farms that developed to provided food and fodder for the mines, and habitation and task sites representing hunting and gathering subsistence.

Environmental Consequences

Proposed Action and Alternative 1:

There is a potential for cultural resource sites to be affected primarily through ground disturbing activities associated with construction of temporary holding facilities, and trap corrals, use of vehicles and horse trailers to transport wild horses, and hoof action by wild horses in the process of being gathered and loaded for transport. Through adherence of the SOPs (Appendix A), potential impacts would be minimized. Archeological clearance of trap sites, holding corrals and others areas of potential effects would occur prior to construction. If cultural resources were encountered, those locations would not be utilized unless impacts could be avoided. Due to the inherent nature of wild horse gathers, trap sites and holding corrals would be identified just prior to use in the field. As a result, Cultural Resource staff would coordinate with Wild Horse and Burro personnel to inventory proposed locations as they are identified, and complete required documentation.

Potential benefits through the proposed gather would include reduced disturbance to springs, where archeological resources are often found. It is expected that through the Proposed Action and Alternative 1, that disturbance to springs and riparian areas as a result of an overpopulation of wild horses would decrease, thus reducing potential impacts to cultural resources by wild horses at these locations. The affects to cultural resources would be similar under both alternatives.

No Action Alternative (No Wild Horse Gather):

Impacts to cultural resources would be expected to continue at the same level as in the past, which could include trampling of soils and cultural resources near springs and other water sources. Impacts to cultural resources could increase as the wild horse population increases. According to the population modeling, within 6 years, the populations could exceed 400-600% of the established AMLs.

3.2. Invasive, Non-Native Species

Affected Environment

Some invasive plant, noxious weed, and pest inventory has been completed throughout the Complex, and some treatment of invasive species has been completed in limited areas.

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White-top (*Cardaria draba*), scotch thistle (*Onopordum acanthium*) and musk thistle (*Carduus nutans*) are present within the Carico Lake Allotment. Undesirable species including cheatgrass (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*) are present throughout the allotment. Invasive weeds typically establish in disturbed and high traffic areas. Any surface disturbance activity can create a potential environment for invasive species.

Environmental Consequences

Proposed Action and Alternative 1:

The proposed wild horse gather may result in the direct spread of existing populations of invasive non-native species. Precautions would be taken prior to setting up trap sites and holding facilities to avoid areas where invasive non-native species exist to lessen the chance of invasion or spread. The Contracting Officers Representative (COR), Project Inspector (PI), or other qualified specialist would examine proposed holding facilities and traps sites prior to construction to determine if noxious weeds were present. If noxious weeds were found, a different location would be selected.

Indirect impacts of the Proposed Action and Alternative 1 would be related to wild horse population size as it affects ground disturbance and rangeland health. Invasive non-native species can increase with overuse of the range by grazing animals or through surface disturbance. Maintenance of healthy populations of native perennial plant species minimizes the establishment of invasive non-native weeds. It is expected that implementation of the proposed wild horse gather and achievement of the established AMLs would result in improved condition of native rangeland and riparian areas throughout both the Bald Mountain and South Shoshone HMAs. These effects would be similar under both the Proposed Action and Alternative 1. As a result, the risk of spread by invasive species across the Shoshone Complex would be reduced.

No Action Alternative (No Wild Horse Gather):

Native rangeland resources would be subject to continued increases in the populations of wild horses, which would result in heavy and severe utilization of the vegetation. Rangeland vegetation that is currently in low ecological status or is disturbed would be vulnerable to invasive weeds. Current infestations of invasive weeds would be expected to spread and continue to increase as a result of continued degradation by wild horses. Wild horse impacts to vegetation resources would increase with increases in the population size over time, resulting in growing opportunities for invasion and spread of non-native, undesirable plant species.

3.3. Livestock Management

Affected Environment

The majority of the gather area is within the Carico Lake Allotment. The Carico Lake Allotment Rangeland Health Assessment analyzed monitoring data collected within the allotment. Monitoring data was collected to determine whether current livestock management practices, grazing systems and existing wild horse populations in the allotment

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were meeting the Shoshone Eureka Resource Management Plan (SERA RMP) objectives, Northeastern Great Basin RAC Standards for Rangeland Health, and multiple use objectives. Studies including Utilization, Ecological Site Inventory, Trend, Riparian Functioning Condition and other data were analyzed for attainment of Standards for Rangeland Health. The evaluation was sent to the interested public July 22, 2005 for review and comment.

Following the analysis, interpretation, and evaluation of monitoring data, it was determined, that SERA RMP objectives, Standards for Rangeland Health, multiple use objectives and allotment specific objectives as identified in the evaluation were not being met within the allotment. The evaluation also concluded that significant progress was not being made towards attainment of the standards. As a result of the evaluation of the monitoring data, Selected Management Actions were developed and documented through the Final Multiple Use Decision issued September 30, 2005 to ensure that Standards for Rangeland Health and multiple use objectives continue to be met, and that significant progress is made towards those that are not currently met.

These actions included establishment of livestock use areas, reductions in livestock AUMs⁶, and implementation of grazing systems (as well as establishment of wild horse AML). In many cases, the grazing season was reduced to eliminate grazing during the critical growth period for perennial plants, or to eliminate hot season grazing of riparian areas. Overall, the permitted livestock AUMs within the Carico Lake Allotment were reduced by approximately 25% through issuance of the FMUD. One of the more notable changes implemented through the FMUD was the conversion of over 6,400 AUMs from cattle to sheep within the west half of the Carico Lake Allotment, which includes portions of the South Shoshone HMA.

There are seven permittees within the Carico Lake Allotment. Five of these currently have livestock permits within portions of the South Shoshone and Bald Mountain HMAs. The following table depicts the estimated livestock AUMs that are permitted within the proposed gather area.

Table 4. Permitted Livestock AUMs within the Bald Mountain and South Shoshone HMAs

Permit	Use Area within the HMAs	Current AUMs Permitted	Class of Livestock Period of use	HMA affected
C-Ranches	Toiyabe Flat ⁷	6,313 AUMs	Cattle 4/01-11/15	Bald Mountain
	Toiyabe Mountain			Bald Mountain
	Shoshone Mountain ⁸			South Shoshone
Dolby George LLC	Shoshone Mountain	295 AUMs	Sheep 4/01-6/30	South Shoshone
Ellison Ranching Company	Shoshone Mountain	5,250 AUMs	Sheep 3/01-6/30	South Shoshone

6. 43 CFR 4100.0-5 defines Animal Unit Month (AUM) as the amount of forage necessary for the sustenance of one cow or its equivalent for 1 month.

7. The west ½ of the Toiyabe Flat use area is within the Bald Mountain HMA.

8. The west portion of this use area is within the South Shoshone HMA.

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Permit	Use Area within the HMAs	Current AUMs Permitted	Class of Livestock Period of use	HMA affected
(Ellison continued)	Cedars Pasture ⁹	2,499 AUMs (minus the Antelope Pasture)	Cattle 12/01-2/28, 3/01-4/30	South Shoshone
	Wood Canyon Pasture ¹⁰			South Shoshone
	Cedars North and South			South Shoshone
	Moss Fire Use Area ¹¹			South Shoshone
	Harry Canyon ¹²	1,153 AUMs	Sheep 11/01-2/28	South Shoshone
Tomera Ranches	Shoshone Range	914 AUMs	Sheep 3/01-5/31	South Shoshone
Silver Creek Ranches	Toiyabe Mountain	884 AUMs	Sheep 4/01-6/30	Bald Mountain

The above use area boundaries do not coincide with HMA boundaries, and in many cases, only a portion of the use area is located within the HMA (refer to footnotes).

Approximately 11% of the South Shoshone HMA is included within the Cedar’s Pasture portion of the Austin allotment. This area is currently permitted to Silver Creek Ranches for 906 AUMs from 3/01-2/28 annually. A very small portion of the Grass Valley Allotment may be gathered if wild horses are encountered outside HMA boundaries south east and east of the Bald Mountain HMA. Refer to Map 2, which displays the allotments within the gather area.

Environmental Consequences

Proposed Action and Alternative 1:

The proposed gather would not directly impact livestock operations within the Carico or Austin Allotments. Operations involved in removing wild horses may temporarily cause some disturbance to livestock present during the removal process. Livestock owners within the area of impact would be notified prior to removing wild horses enabling them to take precautions and avoid conflict with livestock.

Implementation of the Proposed Action or Alternative 1 would indirectly impact livestock operations by improving the quality and quantity of forage available through achievement of the established AMLs. The effects of wild horse populations on livestock, wildlife, and vegetation resources are largely functions of dietary and spatial overlap between species. Implementing and maintaining the established AML ranges identified for the Bald Mountain and South Shoshone HMAs would promote a thriving natural ecological balance between

9. The east ½ of these use areas is within the South Shoshone HMA.

10. The east ½ of this use area is within the South Shoshone HMA.

11. The east ½ of this use area is within the South Shoshone HMA.

12. The east ½ of this use area is within the South Shoshone HMA.

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wild horses and other resource values, and improved rangeland health. The Proposed Action and Alternative 1 would provide similar opportunities for range resources to improve.

No Action Alternative (No Wild Horse Gather)

Without the achievement of AML, wild horse populations would continue to increase and exceed the capacity of the habitat to provide forage and water. Within 6 years, the populations could exceed 400-600% of the established AMLs without completion of a wild horse gather. Uncontrolled increases in the wild horse populations would result in heavy and severe use of vegetation resources leading to further degradation of plant communities and susceptibility of invasive species to degraded rangeland. It is expected that high populations of wild horses would result in continued downward trends of key perennial species and deterioration of ecological condition. This would result in poor soil stability, reduced production levels, and reduced forage availability to wildlife, livestock, and wild horses. Under the No Action Alternative, these trends would continue and worsen as the wild horse populations continue to increase on an annual basis within the Bald Mountain and South Shoshone HMAs.

3.4. Rangeland Vegetation Resources

Affected Environment

Elevations within the Bald Mountain HMA range from 5,150 feet in Carico Lake Valley, to 8,541 at the top of Bald Mountain. South Shoshone HMA elevations range from approximately 5,500 feet at the valley bottoms on the east and west sides of the HMA to over 8,400 feet at the top of the Shoshone Range. Vegetation types are distributed according to topography, elevation, and precipitation. Lower elevations receive as little as 4-8 inches of precipitation annually and support salt desert shrub vegetation such as basin wildrye, black greasewood, saltbush, rubber rabbitbrush, shadscale, saltgrass and bottlebrush squirreltail.

Foothills and low mountains within the Complex support bottlebrush squirreltail, Indian ricegrass, shadscale, bluebunch wheatgrass, Thurber needlegrass and Wyoming big sagebrush.

The upper elevational zones on moderately steep locations (mountains) receive 10-30 inches of annual precipitation. These plant communities include Idaho fescue, Thurber needlegrass, black sagebrush, Indian ricegrass, bluebunch wheatgrass, mountain big sagebrush, single-leaf pinyon pine, and Utah juniper.

Quaking aspen communities are located in the Cottonwood Basin (Elephant Head Basin) of the Carico Lake Allotment. These are remnant stands of very limited extent, are associated with riparian zones, and occupied much larger areas in the past. Most of these ecosystems have historically been heavily impacted by livestock grazing (primarily cattle) and to a much lesser extent, wild horses (Kay, 2001).

In 2002, a number of large fence enclosures were constructed in and outside of the basin according to guidelines provided by Dr. Kay to protect these fragile aspen communities from large ungulates, thus enhancing regeneration and recruitment.

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The condition of the rangeland vegetation throughout the Complex varies considerably, and has been negatively impacted by current and historic levels of wild horses and past use by livestock. Throughout the Bald Mountain and South Shoshone HMAs, many of the Resource Advisory Council (RAC) Standards for Rangeland Health are not being met. Wild horse populations have been determined as contributing to standards not being met in many cases. Throughout the Bald Mountain and South Shoshone HMAs, wild horse populations have been concentrated in specific areas, leading to increased use of the vegetation resources. Refer to the Carico Lake Allotment Rangeland Health Assessment, Conformance Determination, and FMUD for more detailed information.

Environmental Consequences

Proposed Action, and Alternative 1:

Disturbance would occur to native vegetation in and around temporary trap sites and holding facilities due to the use of vehicles and concentration of horses in an isolated area (less than 1 acre). Trap sites and holding facility locations are usually selected in areas easily accessible to livestock trailers and standard equipment, often utilizing roads, gravel pits or other previously disturbed sites. Based on typical wild horse gather operations, it is estimated that approximately 6-8 trap-sites and 1-2 sets of holding corrals would be needed within the Complex.

Through the Multiple Use Decision process, it was determined that the Appropriate Management Level of wild horses would result in utilization levels consistent with multiple use objectives. Achievement of AML would be expected to improve vegetation resources by reducing concentrated, year round grazing by high numbers of wild horses.

Removing excess wild horses from the Complex would prevent future over utilization of forage species and the resulting reduction in vegetative ground cover. Improved forage availability, vegetation density, increased plant vigor, seed production, seedling establishment, and forage production would be possible over current conditions. The Proposed Action should also have positive impacts to aspen vegetation communities. Through the reduction in wild horse numbers, damaging physical effects to the aspen communities and associated riparian zones should proportionally be lessened.

Benefits to the vegetation resources would be similar under both the Proposed Action and Alternative 1. Increased benefits could be realized within the Bald Mountain HMA under Alternative 1, which could result in 5-10% lower population after 6 years, and up to 20% lower growth rates than the Proposed Action. Improved distribution of wild horses, reduced utilization levels, and improved rangeland health would contribute to significant progress being made towards the Standards for Rangeland Health and Allotment Specific Objectives.

No Action Alternative (No Wild Horse Gather)

The current levels of wild horses in the Bald Mountain and South Shoshone HMAs are negatively impacting vegetation resources. Many of the RAC Standards for Rangeland Health are not being met throughout the HMAs, and wild horses have been identified as a contributing factor.

Under the No Action Alternative, wild horses would continue to increase in population size beyond the capacity of the habitat to provide water and forage. According to the population modeling, within 6 years, the populations could exceed 400-600% of the established AMLs, and degradation of vegetation resources by wild horses would continue. Heavy and severe use of vegetation resources by wild horses would continue and increase, resulting in further depletion of native plant communities and susceptibility to invasive species. Continued downward trends in key perennial species would be expected in conjunction with reductions in ecological condition and soil stability. Vegetation would also experience reduced production resulting in reduced forage availability to wildlife, livestock, and wild horses. Significant progress towards attainment of RAC Standards for Rangeland Health would not occur.

3.5. Riparian-Wetland Resources and Water Quality

Affected Environment

Riparian-wetland areas are the most productive and valuable resources found on public land. These areas play a significant role in restoring and maintaining the chemical, physical, and biological integrity of the nation's water. Wildlife use riparian-wetland areas disproportionately more than any other type of habitat. In the Great Basin, approximately 69 different species of wildlife are found within riparian areas.

Riparian Condition Assessments were completed and baseline water quality data collected on many of the streams, springs, and meadow complexes within the Carico Lake Allotment between 1999 and 2004. The majority of sites were found to be in poor or extremely poor physical condition as identified in the riparian function assessment. Over 90% of the springs were rated Functional at Risk – downward trend or Non-Functional. Over 55% of the 13 miles of stream assessed were also rated Functional at Risk – downward trend or Non-Functional. These areas were characterized by the presence of significant hoof trampling, hummocking, feces, bank slumping/undercutting, and over-utilization of riparian and herbaceous vegetation. It was established that cattle and to a lesser extent, wild horses were the main causative agents.

Consistently high single fecal coliform and turbidity values were found for many of the springs and streams within the Bald Mountain and South Shoshone HMAs. At all sampling locations, which exhibited higher concentrations of fecal coliform bacteria, turbidity, and temperature; it was observed and documented that these sites were being regularly utilized by cattle and to a much lesser extent, wild horses.

Bald Mountain HMA records indicate that wild horses have concentrated near Hot Springs Point causing deterioration of the resources. Records from the 1980's state that wild horses primarily use water at the hot springs in the summer months. Little use by wild horses has been documented at Summit Spring. Wild horses have heavily depended upon Sheep Corral Spring, and have utilized Dead Ox Canyon Spring, Red Mountain Springs, and Dry Canyon Spring. Riparian Proper Functioning Condition Assessment specifically identified wild horse

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use and hoof action as contributing to negative impacts and poor ratings on Wenban Spring Complexes, Copper Canyon (north), and Dead Ox East Spring.

Within the South Shoshone HMA, census and distribution flights and documented patterns of wild horses suggest that most springs and riparian areas in the northern portion of the HMA have been infrequently utilized and minimally impacted by wild horses. However, most springs and perennial springs are located within the northern portion of the HMA. Water sources are not as plentiful in the southern portion of the HMA where the majority of the wild horse concentration occurs. Wild horses have also been identified as contributing to negative impacts on Cottonwood Creek. Even after the 2005 FMUD changed livestock grazing within the allotment, substantial utilization of meadow and spring vegetation, and vegetation outside of exclosures has been noted by wild horses. More than 60 wild horses have been observed within the basin during one time.

In the southern portion of the HMA, the Cedars Springs located north of Wood Canyon is used by wild horses. Riparian Proper Functioning Condition Assessment specifically identified wild horse use and hoof action as contributing to negative impacts and poor ratings on these springs.

The Conformance Determination for the Carico Lake Allotment issued in 2005 determined that RAC Standard 2, Riparian and Wetland Sites, was not being met, and that significant progress was not being made. Current and historical heavy livestock and wild horse impacts to riparian-wetlands especially during the hot season in the allotment were determined to be the causal factors for non-attainment of the standard. Wild horses and livestock were stated as being significant causal factors. Since the 2005 FMUD was issued, changes have been made to livestock grazing management within the allotment which includes reduction in permitted use and conversion of substantial AUMs from cattle to sheep. Field observations since then indicate that improvements are occurring; however, wild horses continue to negatively impact these areas through trampling and utilization.

For a more in-depth discussion of the assessment of perennial waters of the Carico Lake Allotment, refer to the Carico Lake Allotment Rangeland Health Assessment and Conformance Determination.

Environmental Consequences

Proposed Action, and Alternative 1:

The proposed wild horse gather would not have any direct impacts to riparian wetland zones or water quality within the Carico Complex because trap sites and holding corrals are not constructed near riparian areas.

The proposed gather would indirectly impact riparian wetland zones and water quality due to decreased utilization and trampling by wild horses in these sensitive areas allowing for riparian wetland areas to improve through natural processes. Since implementation of livestock changes through the 2005 FMUD, improvements to riparian areas have been observed. Implementation of the established AMLs through the proposed gather would

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further the improvements and prevent future degradation by wild horses where it is currently occurring.

In most cases, wild horses visit water sources briefly. The exception may include large open springs or meadow complexes. High wild horse population and density of animals in relation to limited water sources may result in degradation of water sources. Achievement of the established AMLs would ensure that wild horse populations are in balance with the forage and water availability, providing for optimal dispersion of wild horses and reduction of impacts to riparian resources. Achievement of AML would ensure that short and long-term objectives are met and contribute to improvement of riparian resources.

Benefits to the riparian and water resources within the Complex would be similar under both the Proposed Action and Alternative 1. Improved distribution of wild horses and decreased competition for water, would alleviate pressures exerted on riparian habitat due to wild horses congregating around these sensitive areas. Increased benefits could be realized within the Bald Mountain HMA under Alternative 1, which could result in 5-10% lower population after 6 years, and up to 20% lower growth rates than the Proposed Action.

No Action Alternative (No Wild Horse Gather)

Wild horse population size would continue to increase in excess of the established AML. Within 6 years, the populations could exceed 400-600% of the established AMLs according to population modeling analysis. As a result, riparian areas currently rated at Proper Functioning Condition (PFC), could experience downward trends caused by utilization of riparian vegetation and browse, and trampling by populations of wild horses in excess of AML. Riparian areas rated below PFC (Functional at Risk and Non-Functional) would not improve, and downward trends could continue.

Water quality throughout the Complex would continue to be affected by high populations of wild horses using the limited water sources throughout the Complex.

3.6. Soils

Affected Environment

Soils in the Carico Lake Allotment are very typical of types found throughout the Great Basin and Nevada. The geophysical configuration of the Carico Lake Allotment consists primarily of north-south trending mountain ranges with intervening valleys and playas. Most of Nevada's mountains were originally formed from either volcanism or related, plate tectonic processes.

Microbiotic crusts are composed of living organisms (plants and animals) and their by-products creating a surface crust of soil particles up to 10 cm in depth and are bound by organic materials. These associations are made up of cyanobacteria and cyanolichens and sometimes include mosses, microfungi, liverworts, green algae and bacteria. These innocuous communities are very important because they stabilize soil surfaces, reduce water and wind erosion, fix nitrogen, increase water infiltration and provide nutrients for other plant species. Microbiotic crusts are found throughout the Great Basin, Nevada.

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Soils within the Carico Lake Allotment vary widely in their physical and organic characteristics. They are described in very broad taxonomic classifications as aridisols (lower elevations) or mollisols (higher elevations). Refer to the Carico Lake Allotment Rangeland Health Assessment, Conformance Determination, and the Soil Survey of Lander County (Soil Conservation Service, 1992) for more detailed information about the soils within the gather area.

Environmental Consequences

Proposed Action, and Alternative 1:

Direct impacts such as soil displacement and compaction would occur at trap sites (less than 1 acre in size) during the construction phase and gather operations. Trap sites are ideally located in areas of previous disturbance, gravel pits or along roadsides. Procedures identified in the Gather Plan and SOPs (Appendix A) would be followed to minimize impacts to soils during gather operations. Based on typical gather operations, it is estimated that 6-8 trap-sites and 1-2 holding corrals would be necessary to complete the gather.

Achievement of AML and management of wild horses in balance with the capacity of the habitat would further result in improvements to vegetation communities, reduced trailing, and concentrations around water sources and promote general improvements to soils throughout areas used by wild horses. Achievement of AML would help improve or maintain biological crusts, where present, due to reduced hoof action by wild horses.

Benefits to soils would be similar under both the Proposed Action and Alternative 1 resulting in lower concentrations of wild horses that could impact soils through trails, use of riparian areas and improved rangeland health. However, increased benefits could be realized within the Bald Mountain HMA under Alternative 1 which could result in 5-10% lower population after 6 years, and up to 20% lower growth rates than the Proposed Action.

No Action Alternative (No Wild Horse Gather)

Current soil disturbance trends would continue and increase as wild horse populations continue to increase. Without a gather to achieve the established AMLs, populations would increase at an estimated 12% per year, and could exceed 400-600% of the established AMLs within 6 years according to analysis through the WinEquus population model. Increased disturbance to soils through trailing and concentrated use on vegetation and water resources could result in increased soil erosion and reductions in ecological status, lowered production of deep rooted perennial vegetation, reduced production of litter and reduced soil stability.

3.7. Wild Horses and Burros

Affected Environment

The Shoshone Complex gather area is comprised of the Bald Mountain and South Shoshone HMA, and areas outside of HMA boundaries. The total gather area is in excess of 480,000 acres and is located primarily south of Battle Mountain and Crescent Valley, Nevada. Approximately 43% of the Carico Lake Allotment is designated as Herd Management Area.

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The Bald Mountain HMA is approximately 139,879 acres in size, and covers an area that is 15 miles wide and 22 miles long. The southern boundary of the Carico Lake Allotment serves as the southern boundary of the HMA, which borders the Callaghan HMA to the south. The HMA is also in close proximity to the Rocky Hills HMA to the east, and South Shoshone HMA to the west. Refer to Map 1 for an overview of the HMAs.

The South Shoshone HMA covers 133,099 acres of the Shoshone Mountain Range. At the widest points, the HMA is over 30 miles long and 13 miles wide. Approximately 11% of the HMA exists within the Austin Allotment south of the Bob Town Fence, which serves as the southern boundary of the Carico Lake Allotment. The area is known as the Cedars Pasture, and has an AML of 0 wild horses established through Final Multiple Use Decision in 1995. A total of 118,662 acres of the HMA fall within the Carico Lake Allotment.

The original Herd Area (HA) boundaries are limited to areas of the public lands identified as being habitat utilized by wild horses and/or burros at the time of the passage of the Wild Free-Roaming Horse and Burro Act of 1971. The Bald Mountain and South Shoshone HMA boundaries are nearly identical to the original Herd Area boundaries.

Table 5. Carico Complex Current Population Estimates

Gather Area	AML Range	Summer 2007 population estimate
Bald Mountain HMA	129-215	379
South Shoshone HMA	60-100	336
Cedar's Pasture	0	3
Total	189-315	718

Refer to Appendix B for more in depth information about the characteristics and history of these HMAs, as well as the Rangeland Health Assessments and Gather Plan/EAs listed in Section 1.4. The attached Wild Horse Gather Plan and Standard Operating Procedures (SOPs) located in Appendix A provides complete, comprehensive gather procedures, as well as photos of recent gather activities conducted by the BMFO.

Environmental Consequences

Effects Common to Proposed Action, and Alternative 1:

Impacts to wild horses under the Proposed Action and Alternative 1 would be both direct and indirect, occurring on both individuals and populations as a whole.

The BLM has been actively conducting wild horse gathers since the mid 1970's within the Battle Mountain District. Through this time, methods and procedures have been identified throughout the western states to minimize stress and impacts to wild horses during implementation of wild horse gathers. The SOPs outlined in Appendix A would be implemented to ensure a safe and humane gather occurred, minimizing potential stress and injury to wild horses. The peak foaling period for wild horses is March 1 to June 30, and gather activities are suspended during this time.

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Over the past 30 years, various impacts to wild horses from wild horse gathers have been observed. Individual, direct impacts to wild horses include stress associated with the gather from capture, sorting, handling, and transportation. These impacts include: handling stress associated with the roundup, capture, sorting, animal handling, and transportation of the animals. The intensity of these impacts varies by individual, and is indicated by behaviors ranging from nervous agitation to physical distress. Mortality from these impacts is infrequent but may occur in less than one half to one percent of the wild horses gathered.

Special precautions would be taken during a summer gather to avoid heat related stress, and would include the administration of electrolytes, cooling with water and avoidance of gathering during the hottest part of the day. However, a small percentage of wild horses could experience stress from heat and dry conditions in conjunction with the gather operation, and though typically rare, death could occur as a result. During summer gathers, foals are young (less than 6 months of age). Summer gather operations typically result in less than one percent of orphan foals, which must be placed with a qualified adopter for care.

Indirect individual impacts are those impacts which occur to individual horses after the initial stress event, and may include spontaneous abortions in mares, and increased social displacement and conflict in studs. These impacts, like direct individual impacts, are known to occur intermittently during wild horse gather operations. An example of an indirect individual impact would be the brief skirmish which occurs with most older studs following sorting and release into the stud pen which lasts less than two minutes and ends when one stud retreats. Traumatic injuries usually do not result from these conflicts. These injuries typically involve a bite and/or kicking with bruises, which don't break the skin. Like direct individual impacts, the frequency of occurrence of these impacts among a population varies with the individual. Spontaneous abortion events among mares following capture is very rare.

Population wide direct impacts are immediate effects which would occur during or immediately following implementation of the Proposed Action or Alternative 1. They include the displacement of bands during capture and the associated re-dispersal, which occurs following release, the modification of herd demographics (age and sex ratios), the temporary separation of members of individual bands of horses, the reestablishment of bands following releases, and the removal of animals from the population. With exception of changes to herd demographics, direct population wide impacts have proven, over the last 20 years, to be temporary in nature with most if not all impacts disappearing within hours to several days of release. No observable effects associated with these impacts would be expected within one month of release except a heightened awareness of human presence.

The effect of band displacement on a population as a result of gather operations has been observed in several HMAs following releases. Observations have been made of individual and population wide horse response following releases from both the trapsite where particular animals were captured and from the central holding facility where all captured animals were held. Most horses relocated themselves from the release site back to their home ranges within 12 to 24 hours and at times much faster. This redistribution occurred following a brief "reorientation swing" involving horses ranging out from the release site in a

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curving arc until their bearings were apparently restored. Following this initial random travel, most horses lined out and headed off in a particular direction often without deviating from that line until they disappeared into the mountain or over the horizon. Assertions that horses are simply taking the most direct route away from humans are not accurate, as instances where horses reverse their original direction crossing back in front of the release trailer or holding area are fairly common following the re-orientation swing.

Specialists have also observed horse behavior, following releases, as it relates to bands, which are separated at capture. While the affinity of individual animals to their band would be expected to vary, it was a very common observation that mares or studs broke from the group they were released with (unexpected behavior for a social animal exercising the flight response) and headed toward a particular animal or group of animals. Following this activity, the pair or trio of horses continue the re-orientation swing and then lined out together in a common direction. In some cases, individual groups were observed later together in a new area presumed to be the site of their original home range. Some specialists have noted individual mares re-associated with specific studs or mare groups following capture.

All horses like a regular routine with little change. The removal, separation, and holding of wild horses is expected to stress the animals. However, the horse is a very adaptable animal and would assimilate into the environment with new members quite easily. Observations made through completion of gathers shows that many of the wild horses captured acclimate quickly to the holding corral situation, becoming accustomed to water tanks and hay, as well as human presence. The wild horses that are not captured may be temporarily disturbed and move into another area during the gather operations.

The effect of removing wild horses from the population is expected to minimally impact herd population dynamics, age structure or sex ratio, as long as the selection criteria for the removal maintains the social structure and breeding integrity of the herd. The National Selective Removal Criteria of selecting wild horses for release (described in the Wild Horse Gather Plan, Appendix A) would be followed to the extent possible. A normal age structure is expected for both the Bald Mountain and South Shoshone HMAs due to the lack of gather history, or other activities that would have influenced the age structure. The estimated age structures are displayed in Appendix B.

Effects resulting from successive removals causing shifts in age dynamics away from normal ranges are likewise, fairly obvious. Herd shifts favoring older age horses (over 15 years) have been observed resulting in a favoring of studs over mares in some herds. Explanations include sex-based differences in reproductive stress (relative demand for individual contributions to reproduction) and biological stress (timing the most physically demanding period of the annual cycle).

For studs, reproductive stress is based on dominance in the herd and by definition is confined to a fairly narrow period in their lifespan when they are capable of defending a mare group. For mares, recurrent reproductive stress starts as early as age 2 and continues until as late as age 15 or 16, and sometimes as late as 20. Biological stress in wild horses tends to indicate a

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selection against mares. Biological stress is based on the degree, duration, and timing of biologically demanding activities during the annual reproductive cycle.

For mares, the greatest biological stress is during pregnancy and lactation. In wild horse populations, this occurs in late winter or early spring when forage availability is at its lowest level, and body condition is at its poorest. For studs, biological stress is at its peak during the breeding season. This peak biological demand is in the late spring and early summer and is more suited to a rapid recovery and a lower energy deficit than for mares.

The susceptibility of the older herd to extreme climatic events would depend on the age of the dominant class in the group. Generally, survival rates of horses are very high (exceeding 98%) for mature animals and lower for very young. This survivability declines again at some older age. Similarly, reproductive success also declines at some age. The threshold age at which susceptibility to extreme events and reproductive senescence has not been established. It is reasonable to conclude that the older the population, the more prone it would be to a catastrophic die-off as a result of reduced resistance to disease, lowered body condition, and/or reduced reproductive capacity.

The effects of successive removals on populations causing shifts in herd demographics favoring younger horses (under 15 years) would also have direct consequences on the population. These impacts are not thought of typically as adverse to a population. They include development of a population, which is expected to be more biologically fit, more reproductively viable, and more capable of enduring stresses associated with traumatic natural and artificial events.

For more information regarding wild horse behavior, biology and population dynamics, the reader is referred to *Wild Horses of the Great Basin* (Berger, 1986) which describes the results of over 8,000 hours of observational data collected on the Granite Range wild horses through a five-year study.

It is not expected that genetic health would be impacted by the Proposed Action, or Alternative 1. Smaller, isolated populations (< 200 total census size) are particularly vulnerable when the number of animals participating in breeding drops below a minimum needed level (Coates-Markle, 2000). Most wild horse herds sampled have high genetic heterozygosity, genetic resources are lost slowly over periods of many generations, and wild horses are long-lived with long generation intervals (Singer, 2000). Blood samples from seven other HMAs managed by the BMFO have been evaluated for genetic data. The results of three of those areas have been received (the others are still being processed and will be received in the future). The results of the analysis indicate high genetic variability with no indication of inbreeding.

The genetic variability of the Bald Mountain and South Shoshone HMAs is unknown at this time. Baseline genetic data would be collected during the proposed gather. Establishing a genetic baseline for the population would allow for future monitoring of the HMAs to ensure that the genetic health of the horses would not be compromised during future gathers or other management activities. The Callaghan HMA adjoins the southern boundary of the Bald

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Mountain HMA. In 2002, this HMA was gathered, and samples from 52 released wild horses analyzed for genetic variability by Dr. Gus Cothran at the Department of Veterinary Sciences, University of Kentucky. Conclusions of the genetic analysis were that the herd demonstrated high genetic variability and allelic diversity from a herd of mixed origins. There were no concerns expressed to the long-term genetic health of the herd.

The Callaghan HMA wild horses frequently mix with the Bald Mountain HMA, and were at one time, the same wild horse herd. Many pinto horses have been observed in both HMAs, and distinct banding of wild horses near the shared boundary, which has been fenced since 1976. The genetic analysis of the South Shoshone HMA is likewise expected to reflect high variability and may indicate that the wild horses of the South Shoshone and Bald Mountain HMAs are genetically similar, as well as genetically similar to the Callaghan HMA.

Because of the degree of movement between Callaghan and Bald Mountain HMAs, compensatory wild horse distribution fluctuations are expected in which wild horses from Callaghan HMA would emigrate into Bald Mountain HMA after the Bald Mountain population is reduced to AML. This phenomenon was also observed after the 2002 Callaghan HMA gather, which resulted in over 800 wild horses being removed from the HMA and an estimated post gather population of 201 wild horses. Census flight conducted in March 2005 observed 150-200 more wild horses within Callaghan HMA than expected, and 100-150 fewer than expected were observed within Bald Mountain HMA during the same census flight. It is highly likely that wild horses moved into Callaghan from Bald Mountain HMA after the 2002 gather reduced the population, and competition for resources.

As a result, it is expected that indirect impacts of the Bald Mountain HMA gather would be increased populations of wild horses due to movement from Callaghan HMA within the next year. Callaghan HMA is currently scheduled to be gathered winter 2007/2008, at which time low AML could be achieved and the populations within both HMAs would equalize. Future objectives would include gather of Bald Mountain and Callaghan HMAs together at a Complex, with or without the South Shoshone HMA. This would be analyzed in a Herd Management Plan in future years to determine the most appropriate long-term management for all of the HMAs.

Achieving the established AMLs within the HMAs would allow forage and water resources to improve, thereby improving the habitat within the Complex for the wild horses and other users. Improved range condition and increased forage availability would promote healthy viable, self-sustaining populations of wild horses able to achieve the genetic potential of the herd. Through maintenance of AML, RAC Standards for Healthy Wild Horses, and the Herd Management Area Objectives (Appendix A) would be achieved. A thriving natural ecological balance between wild horses and other resource values would be met throughout the Complex, and future deterioration of the range would be avoided. Managing wild horse populations in balance with the habitat and other multiple uses would ensure that the populations are less affected by drought or other climate fluctuations, and that emergency gathers are either avoided or minimized, thus reducing stress to the animals.

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Effects that differ between the Proposed Action, and Alternative 1:

Under the Proposed Action, the objective for the gather would include the release of mares and studs to allow for a post gather sex ratio of 50% mares and 50% studs.

Alternative 1 would involve the release of wild horses to achieve a post gather population of 60% studs and 40% mares. Under this selection criterion band size would be expected to decrease, competition for mares would be expected to increase, recruitment age for reproduction among mares would be expected to decline, and size and number of bachelor bands would be expected to increase. These effects would be slight, as the proposed sex ratio is not an extreme departure from normal age structure ranges. A selection criterion, which leaves more mares than studs, would be expected to result in fewer and smaller bachelor bands, increased reproduction on a proportional basis with the herd, lengthening of the time after birth when individual mares begin actively reproducing, and larger band sizes.

Population Modeling Discussion

To analyze the potential effects that could occur to the wild horse populations between the Proposed Action and Alternative 1, the WinEquus wild horse population model was utilized. Modeling was completed to analyze release of a 50/50 sex ratio, and for release of a 60/40 sex ratio favoring studs for a gather to occur during the summer of 2007. The gather scenario was also modeled for the application of fertility control for both the Bald Mountain and South Shoshone HMAs, and for a fertility control only simulation as well as the No Action Alternative. Refer to Appendix C for more detailed information about the WinEquus program and the results of the population modeling completed for the Complex.

Of 100 trials over 5 years, the typical trial results of the model indicate that the release of 60% studs under Alternative 1 could result in 10% lower population than the Proposed Action (20 animals). However, all of the results of the model indicate that differences between the Proposed Action and Alternative 1 would be minimal.

This is also reflected in the results of the model for number of wild horses that would need to be gathered and removed under each alternative. The analysis through the model shows that releasing 60% studs would result in the need to gather of anywhere from 6 more wild horses, to 16 fewer wild horses than the Proposed Action during future gathers. The numbers of animals needing to be removed were also very similar between the alternatives, reflecting less than 5% difference between the release of 60% studs, and the Proposed Action. Of the 100 trials, the growth rates observed for release of 60% studs were approximately 20% lower than for implementation of the Proposed Action (16.2% vs. 19.9% growth rates). Growth rates did not vary greatly among any of the alternatives.

The model also displayed projected number of gathers that would likely occur under each alternative. Under the Proposed Action, 98% of the trials resulted in 2 gathers being conducted in 6 years, and 2% of the trials reflecting only one gather occurring. The results for Alternative 1 were 99% of the trials resulted in 2 gathers being required in 6 years. The model showed that under the Proposed Action, 84% of the trials resulted in a gather taking place in year 4 (2011), and 72% of the trials resulting in a gather in year 4 under the

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Alternative 1. Therefore, 12% more of the trials reflected a gather occurring in year four with the release of 50% studs, than if 60% studs were released.

Even though a fertility control alternative was not brought forward for analysis, there are many proponents of its use, and so the results of the modeling for fertility control will be briefly discussed in this section. Detailed information about all of the simulations from the model is available in Appendix C.

The results of the model showed that implementation of fertility control for the Bald Mountain HMA would result in approximately 5% smaller population of wild horses within 6 years than without fertility control (10 animals). Fertility control actually reflected the need to gather more animals (30-80) over 6 years, likely as a result of the need to capture additional animals to implement the vaccine during gathers. Growth rates for a fertility control application were slightly lower than the Proposed Action and slightly higher than the Alternative 1. With fertility control 99% of the trials required 2 gathers within the 6 years, similar to the results for Alternative 1.

The results of the modeling for fertility control implementation on the South Shoshone HMA were very similar to the results for Gather Only. In fact, the average population sizes in 6 years only differed by 2-3 wild horses.

The following tables display the results of the modeling for the Bald Mountain and South Shoshone HMAs.

Table 6. Population Modeling Results for the Bald Mountain HMA

Year	Proposed Action		Alt 1: 60% studs		No action
	% of trials with a gather	Typical Trial Population	% of trials with a gather	Typical Trial Population	Typical Trial Population
Year 1 - 2008	100	379	100	379	437
Year 2 - 2009	0	180	0	174	512
Year 3 - 2010	0	221	0	210	609
Year 4 - 2011	84	260	72	247	718
Year 5 - 2012	12	168	20	151	773
Year 6 - 2013	2	191	7	171	910
100 Trial Avg.	--	198	--	192	621

Table 7. Bald Mountain HMA, Average Growth Rate in 5 Years

Trial	Alternative			
	Proposed Action	Alt 1--60% Studs	No Action	Fertility Control
Lowest Trial	3.4	7.5	5.7	7.2
10 th Percentile	12.9	12.5	15.0	14.1
25 th Percentile	16.6	14.1	16.7	17.4

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Trial	Alternative			
	Proposed Action	Alt 1--60% Studs	No Action	Fertility Control
Median Trial	19.9	16.2	18.8	20.1
75 th percentile	22.2	18.8	20.8	22.1
90 th percentile	24.3	20.7	23.1	23.9
Highest Trial	28.7	25.2	26.1	26.4

The model automatically increases the population for foaling in year 1. Since the proposed gathers are planned to occur in July, it was not desirable to allow the model to reflect the additional foals during the same year as the gather. Year 1 reflects the pre-gather population as currently estimated. The model was set to reflect an exact number rather than a random number to better focus the potential effects of the alternatives on the population. Year 2 reflects the population estimates in 2009 following two foaling seasons.

Half of the trials have growth rates less than the median and half have a growth rate greater than the median. Only 10% of the trials would have entailed growth rates lower than shown in the row of the table labeled "10th percentile", while 10% of the trials would have entailed growth rates higher than shown in the row labeled "90th percentile". In other words, 80% of the time one could expect growth rates between these 2 values, given the assumptions about survival probabilities, foaling rates, initial age-sex distribution, and management options made for a particular simulation

The No Action typical trial reflects continued average growth rates of 5.7-26.1% with a year 6 typical trial population exceeding 900 wild horses.

Table 8. Population Modeling Results for the South Shoshone HMA

Year	Proposed Action		No action
	% of trials with a gather	Typical Trial Population	Typical Trial Population
Year 1 - 2008	100	336	356
Year 2 - 2009	0	94	451
Year 3 - 2010	0	118	539
Year 4 - 2011	98	139	650
Year 5 - 2012	2	73	649
Year 6 - 2013	0	83	627
100 trial average	--	101	545

Table 9. South Shoshone HMA, Average Growth Rate in 5 Years

Trial	Alternative		
	Proposed Action and Alternative 1	No Action	Fertility Control
Lowest Trial	13.0	9.6	5.6
10 th Percentile	15.6	15.2	14.1
25 th Percentile	19.5	16.9	17.9
Median Trial	22.1	19.5	21.5
75 th percentile	24.9	21.5	24.2
90 th percentile	27.2	22.5	26.7
Highest Trial	31.6	24.9	31.4

Population Modeling Summary

To summarize the results obtained by simulating the range of alternatives for the Shoshone Complex wild horse gather, the following questions can be addressed.

- Do any of the Alternatives “crash” the population?
None of the alternatives indicate that a crash is likely to occur to the population. Minimum population levels and growth rates are all within reasonable levels, and adverse impacts to the population are not likely.
- What effect does fertility control have on population growth rate?
The implementation of fertility control when compared to the Proposed Action or the Alternative 1 was indicated through the model to have very similar results for population sizes, growth rates and number of animals removed from the range during future gathers. Differences ranged from 3-5% between the Proposed Action and a simulation for fertility control. The small differences obtained are likely due to the small number of mares that would be treated, the inability to capture 100% of the mares for treatment, and the lowered efficacy of summer treatment verses winter treatment. Differences were slightly larger between the Proposed Action and the Alternative 1 (release of 60% studs), averaging 5-10% differences for growth rates, population sizes and numbers of animals removed from the range during the modeled time period.
- What effect do the different alternatives have on the average population size?
The natural variation reflected by the various model trial years appears to be more of an influence to the population size than fertility control or modification of sex ratios, as there are minimal differences within the population sizes and growth rates. The largest differences in growth rates and population sizes were primarily noted for the alternative to modify the sex ratio, rather than to implement fertility control.

Even though the results are similar between the Proposed Action and Alternative 1, a post gather population comprised of 60% studs, could result in 5-10% lower population after 6 years, and up to 20% lower growth rates than the Proposed Action. It is possible that implementation of Alternative 1 could result in the need for fewer wild horse gathers or

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increased frequency between wild horse gathers while moving towards the attainment of Resource Advisory Council Standards and Herd Management Area objectives.

No Action Alternative (No Wild Horse Gather)

Under the No Action alternative, AML would not be achieved within the HMAs and wild horses would not be removed from horse free areas outside of the boundaries of designated HMAs. There would be no active management to control the size of the population at this time, and wild horse populations would continue to increase at an average rate of 12% per year. This alternative would result in a steady increase in wild horse numbers, which would greatly exceed the carrying capacity of the habitat to support wild horses.

Of 100 trials simulated through the population model, the most typical trial reflected a population in excess of 900 wild horses within the Bald Mountain HMA after 6 years, and a population in excess of 627 wild horses within the South Shoshone HMA within 6 years. The 100 trial average population over 6 years was 621 and 545 for the Bald Mountain and South Shoshone HMAs respectively. These figures represent 400-600% of the established AMLs for these HMAs. The results of the modeling for the No Action Alternative are also displayed in Appendix C.

AML is the maximum population for which thriving natural ecological balance would be maintained and avoid deterioration of the rangeland. The increasing population of wild horses in excess of AML would compete for the available water and forage resources. The areas closest to the water would experience severe utilization and degradation of the range resource. Additionally, excessive utilization by wild horses would impede vegetation recovery, and would not allow for sufficient availability of forage and water during drought years. Uncontrolled increases in the wild horse population, depletion of forage and water resources and degradation of plant communities would result in decline of the body condition, and health of the wild horse population, ultimately resulting in catastrophic losses to the herd, which would be a function of the available forage and water and the degradation of the habitat.

Significant loss of the wild horses in the HMAs due to starvation and disease would have obvious consequences to the long-term viability of the herd. Irreparable damage to the resources, which would include primarily vegetative, soil and riparian resources, would have obvious impacts to the future of the Shoshone Complex and all other users of the resources, which depend upon them for survival. As a result, the No Action Alternative would not ensure healthy rangelands that would allow for the management of a healthy, self-sustaining wild horse population.

The No Action Alternative would not be acceptable to the BLM nor many members of the public and would violate the Wild Free-Roaming Horses and Burros Act, Federal Regulations, BLM policy and Resource Advisory Council Standards and Guidelines. The BLM realizes that some members of the public advocate “letting nature take its course”, however allowing horses to die of dehydration and starvation would be inhumane treatment and clearly indicates that an overpopulation of horses exists in the HMAs. The Wild Free-Roaming Horses and Burros Act of 1971 mandates the Bureau to “*protect the range from the*

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deterioration associated with overpopulation”, “remove excess animals from the range so as to achieve appropriate management levels”, and “to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area”.

Promulgated Federal Regulations at Title 43 CFR 4700.0-6 (a) state “*Wild horses shall be managed as self- sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat*” (emphasis added).

Comparison of all Alternatives

The following table displays the results obtained for the typical trials for the Proposed Action, Alternative 1 and the No Action Alternative.

Table 10. Typical Trial Wild Horse Populations and Gathers

Alternative by HMA	Comparison Criteria	Year 1 2007/2008	Year 2 2009	Year 3 2010	Year 4 2011	Year 5 2012	Year 6 2013
Bald Mountain HMA Proposed Action	% of trials with a gather	100%	0%	0%	84%	12%	2%
	Typical Trial Population	379	180	221	260	168	191
Bald Mountain HMA Alternative 1: Release of 60% studs	% of trials with a gather	100%	0%	0%	72%	20%	7%
	Typical Trial Population	379	174	210	247	151	171
South Shoshone HMA, Proposed Action and Alternative 1	% of trials with a gather	100%	0%	0%	98%	2%	0%
	Typical Trial Population	336	94	118	139	73	83
No action - Bald Mountain HMA	Typical Trial Population	437	512	609	718	773	910
No action - South Shoshone HMA		356	451	539	650	649	627

3.8. Wildlife (Including Threatened & Endangered Species, Sensitive Species, and Migratory Birds)

Affected Environment

A variety of wildlife species inhabits the Bald Mountain and South Shoshone HMAs. These areas support several species of mammals, birds, and reptiles. Big game species present include mule deer, and pronghorn. Fur bearing species include coyote, bobcat, mountain lion, and badger. Upland species include chukar, gray partridge, blue grouse, and sage grouse. A variety of non-game mammals, birds, and reptiles also exist within the Complex. More detailed information about the wildlife that occurs within the proposed gather area is located within the Carico Lake Allotment Rangeland Health Assessment.

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Any ground clearing or other vegetation-disturbing action during the migratory bird nesting season (roughly, April through August) risks a violation of the Migratory Bird Treaty Act by destroying the eggs or young of common shrub-nesting birds such as the sage thrasher, sage sparrow, Brewer's sparrow, horned lark and meadow lark.

The Threatened and Endangered Species Act of 1973 requires BLM to analyze the impacts of all proposed activities on threatened, endangered, or proposed species. The Bald Eagle (*Haliaeetus leucocephalus*) is the only Threatened or Endangered species that may occur within the Complex. Although these threatened birds do not commonly nest in Nevada, low densities of bald eagles winter in, and migrate through, the state from November through March.

In addition to federally listed species, BLM also protects by policy (see 6840 section of the BLM Manual), other *special status* plant and animal species. The list includes certain species designated by the state of Nevada, as well as species designated as "sensitive" by the Nevada BLM State Director. Refer to the Carico Lake Allotment Rangeland Health Assessment for listings of BLM Sensitive Species whose range or migration routes are known or believed to occur within the gather area.

One of the more prominent sensitive species known to occur within the gather area is the greater sage grouse. Sage grouse have largely been extirpated from the western slope of the Shoshone Range where it traverses the Carico Lake Allotment, probably due to a combination of range fires, an electrical transmission line that facilitates raptor and raven perching and hunting, and livestock over-use. Sage grouse dependence on riparian habitats for brood rearing increases during drought, when riparian areas become especially important sources of insects and forbs that are unavailable in upland habitats. Riparian areas throughout the Carico Lake Allotment are in degraded condition and lack herbaceous plant and insect diversity.

The Carico Lake Allotment falls primarily within the Shoshone PMU. The Shoshone PMU is under the oversight of the South Central Nevada Sage Grouse Conservation Planning Group. The Shoshone PMU was rated by the Planning Group as being at somewhat lower risk than some other population management units within the planning area. The Planning Group has tentatively identified pinyon-juniper encroachment, habitat quality and livestock grazing as the factors contributing most to that risk.

Environmental Consequences

Proposed Action and Alternative 1:

Removing wild horses from the Carico Complex would have minimal, short-term direct impacts to wildlife. Some wildlife present in or near trap sites or holding facilities could be temporarily displaced.

The possibility exists that special status plant and animal species could be disturbed during the gather activities. However, trap sites would typically be located in areas that have previously been disturbed (i.e. gravel pits), and for short periods of time (1-3 days). Should

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it be determined necessary by a qualified biologist, trap sites would be inventoried prior to selection to determine the presence of sensitive species. If potential impacts could not be mitigated, these areas would be avoided.

Gather activities would not conflict with nesting periods for most bird species. Refer to the Gather Plan/Standard Operating Procedures in Appendix A for avoidance measures would be utilized to minimize impacts to Sage Grouse and Ferruginous hawk.

Wildlife and wildlife habitat would be indirectly affected by the Proposed Action as it pertains to resulting improvements in resource health from current management. Reduction of the current wild horse population and achievement of the established AMLs provides the best opportunity for conservation, protection, and preservation of identified species and their habitats. Implementing the proposed gather within the Complex would reduce utilization on key forage species, improving the quantity and quality of forage available to wildlife and decrease competition for water sources. Riparian areas and aspen stands within the Complex provide vital habitat to wildlife. Habitat conditions in riparian areas, aspen stands, and uplands are expected to improve to the benefit of most wildlife, migratory birds, and special status species, including sage grouse. Management for healthy rangelands and achievement of RAC Standards would benefit sensitive species such as sage grouse and pygmy rabbits as well as most other wildlife species. Benefits to wildlife could be greatest under the Alternative 1 which could result in reduced growth rates and slightly lower population levels over time.

No Action Alternative (No Wild Horse Gather)

Within the Complex, rangeland vegetation currently receiving heavy, critical growth period or repeated use by wild horses, would continue to be impacted, and short-term allotment specific objectives would not be achieved.

Through the analysis of potential population increases through the WinEqqus population model, it was determined that within 6 years, populations could exceed 900 and 600 wild horses within the Bald Mountain and South Shoshone HMAs respectively. These increases equate to 400-600% of the established AMLs for these HMAs. Wild horse populations would exceed the capacity of the habitat, resulting in heavy and severe use of vegetation resources, degradation of plant communities including riparian areas, and increases of invasive species. Across both HMAs, and horse free areas, downward trends in key perennial species would be expected in conjunction with reductions in ecological condition. As this occurs, vegetation would also experience reduced production levels resulting in reduced forage availability to wildlife, livestock, and wild horses, and reduced soil stability. Important habitat utilized by sage grouse is already being impacted by wild horses, in addition to riparian area, aspen communities, and meadow complexes valuable to many species of wildlife. Further degradation would be likely, and could be irreversible if the proposed gather does not occur to achieve the AMLs and thriving natural ecological balance.

4. Cumulative Impact Analysis

National Environmental Policy Act (NEPA) regulations (40 CFR 1508.7) define cumulative impacts as the impacts on the environment that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The Cumulative Effects Study Area (CESA) for this project is the proposed gather area boundary displayed on Maps 1 and 2, which includes the South Shoshone and Bald Mountain HMAs, and portions of the Carico, Austin and Grass Valley grazing allotments. The time period for the analysis is from the passage of the Wild Free-Roaming Horses and Burros Act of 1971 to 2017, ten years past the proposed gather which is a reasonable time frame to consider potential future actions within this analysis.

4.1. Past, Present, and Reasonably Foreseeable Actions

The past, present, and reasonably foreseeable future actions applicable to the assessment area are identified in the following table:

Table 11. Past, Present and Reasonably Foreseeable Actions within the Shoshone Complex

Project -- Name or Description	Status (x)		
	Past	Present	Future
Rangeland Health Assessments and resulting adjustments to permitted livestock use.	x		x
Livestock grazing	x	x	x
Wildfire suppression	x	x	x
Wildfire rehabilitation/vegetation rehabilitation	x	x	x
Electrical transmission lines, communication sites, road construction	x		x
Wild Horse Gathers	x	x	x
Mining and Mineral Exploration	x	x	x
Geothermal exploration	x	x	x
Geothermal development			x
Recreation, hunting and Off Highway Vehicle (OHV) use	x	x	x
OHV Management Plan			x
Spring development (fencing water sources)/Well Drilling	x	x	x
Woodcutting, pine nut harvesting	x	x	x
Wildlife guzzler construction	x	x	x
Invasive weed inventory/treatments	x	x	x
Wildland Urban Interface Fuels Reduction Projects			x

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Project -- Name or Description	Status (x)		
	Past	Present	Future
Wild Horse AML adjustments (increase or decrease)	x		x
Wild Horse management decisions and Herd Management Area Plans	x	x	x
Wild Horse Fertility Control Research			x
Wild Horse relocation/herd augmentation			x

Any future proposed projects within the Complex would be analyzed in an appropriate environmental document following site specific planning. Future project planning would also include public involvement.

4.2. Affected Resources

Resources that would possibly be impacted cumulatively by the Proposed Action and future actions include the following:

- Cultural Resources
- Livestock Management
- Rangeland Vegetation Resources
- Water Quality, Wetland and Riparian Resources
- Soils
- Wild Horses
- Wildlife, Threatened, Endangered, Sensitive Species and Migratory Birds

4.3. Cumulative Impacts

According to the 1994 BLM *Guidelines for Assessing and Documenting Cumulative Impacts*, the cumulative analysis should be focused on those issues and resource values identified during scoping that are of major importance. Accordingly, the issues of major importance that are analyzed are maintaining rangeland health and proper management of wild horses within the established boundaries of an HMA.

Scoping for this project did not identify any need to exhaustively list individual past actions or analyze, compare, or describe the environmental effects of individual past actions in order to complete an analysis, which would be useful for illuminating, or predicting the effects of the proposed action.

For purposes of this analysis, each potential affected resource has been discussed below in terms of past, present and reasonably foreseeable future actions which have or will have an affect in conjunction with the Proposed Action, Alternative 1 and the No Action Alternative.

4.3.1. Cultural Resources

Mineral exploration, recreation, and other activities such as woodcutting and water or vegetation projects have likely impacted some cultural resources within the project area since the Battle Mountain, Austin, and Crescent Valley areas were settled over 100 years ago.

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However, the period for the purposes of this analysis is from 1971 forward to 2017. Future impacts could include cultural resources being disturbed or destroyed through human activities associated with these projects. Livestock grazing and wild horse use have also historically occurred in the project area and may have impacted cultural resources through trampling and effects to soil stability, especially near water locations.

Since the 1960's, BLM has conducted cultural resource inventories throughout the project area. Cultural inventories will be continued to be conducted to evaluate any cultural properties that could be adversely affected by future proposed projects and related activities. During the implementation of any project, if any significant materials are encountered they will not be collected, removed, or modified until a qualified cultural resource specialist provides a determination of historical significance or effect.

Implementation of the Proposed Action or Alternative 1 in conjunction with past, present and reasonably foreseeable actions would lessen impacts to cultural resources, proportional to the size of the wild horse populations in areas such as springs, where cultural resources could be located. These would primarily include reduced use or overuse of riparian areas by large ungulates, which would reduce potential future impacts to cultural resources. Mineral and geothermal exploration, electric transmission line construction, road construction and other similar activities result in isolated and relatively minor soil disturbance, and potential disturbance to cultural resources. The Proposed Action and Alternative 1 would contribute minor amounts of disturbance. Mining, exploration and OHV use would be expected to result in soil disturbance throughout the assessment area.

The No Action alternative would contribute to continued use of riparian areas and potential impacts to Cultural Resources in conjunction with other past, present and reasonably foreseeable actions.

4.3.2. Livestock Management

The project area has been utilized by domestic livestock since northern Nevada was settled over 100 years ago. However, the BLM has only administered the domestic livestock use of the public lands since the 1960's. Since 1971, the BLM has been tasked with management of wild horses; however, only two partial wild horse gathers have been completed within the Complex (1981, 2002). Since the 1980's BLM has conducted analysis and evaluations followed by decisions to adjust or reduce permitted livestock numbers, and will continue to do so in the future in addition to implementing grazing management systems, modifying seasons of use or implementing range improvement projects such as fences, vegetation improvement or water development projects.

Much of the rangeland within the project area is considered arid and produces sparse forage for domestic livestock. Wild horse and domestic livestock use and over use have contributed to non-attainment of RAC Standards for Rangeland Health within the project area. Recreation, mining, exploration, and invasive weed treatment have had, and are expected to continue to have negligible impacts to grazing management within the project area. The most recent and potentially noteworthy action that has affected grazing management was the Carico Lake Allotment Rangeland Health Assessment and Final Multiple Use Decision,

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which modified livestock grazing levels and season of use within the allotment. The grazing levels were reduced by 25% allotment-wide, and over 6,400 AUMs converted from cattle to sheep.

The Proposed Action and Alternative 1 are expected to result in indirect impacts that would further contribute to improved rangeland health within the project area in conjunction with the aforementioned livestock changes as well as vegetation rehabilitation projects, spring exclosures and other rangeland improvement projects. As future wild horse decisions are implemented and future gathers conducted to achieve the AML, these impacts are expected to continue and contribute further to cumulative improvements to the forage availability and therefore grazing management as well.

In the long term, the Proposed Action and Alternative 1 would result in similar improvements to rangeland health and grazing management through reduced wild horse concentrations and achievement of AML. Improvement could be increased under Alternative 1 which could result in reduced utilization levels between gathers.

The No Action Alternative would not result in any long-term cumulative benefits to grazing management. Continued range deterioration and loss of water sources and riparian habitat in conjunction with any reasonably foreseeable projects or other management actions would not improve forage utilized by permitted livestock. Projects such as vegetation rehabilitation would not offset the further degradation caused by excess populations of wild horses. In the long term, the No Action Alternative could result in further reductions of livestock numbers or elimination of domestic livestock grazing within the project area.

4.2.3. Rangeland Vegetation Resources

Past actions that have affected vegetation within the project area primarily include livestock grazing, mining and wild horse use. Other activities which may have and will continue to impact vegetation include recreation such as OHV use, mineral and geothermal exploration and development, wild land urban interface fuels reduction projects, grazing management decisions and wild horse gathers. Because the project area is characterized by very low precipitation levels and rugged terrain, vegetation is sparse in nature, and required long time periods to recover from disturbance or degradation.

Impacts to vegetation resources within the project area have accumulated primarily from the direct and indirect effects of livestock and wild horse grazing. Historical livestock grazing and use by wild horses has contributed to rangeland vegetation that does not reflect the potential natural community, and is not achieving RAC Standards for Rangeland Health. The 2005 FMUD implemented livestock grazing decisions, which will result in long term improvements to vegetation resources and rangeland health. Conversions from cattle to sheep, modifications to grazing seasons and reductions in permitted use will result in improvements to vegetation condition and ensure that significant progress is made toward RAC Standards for Rangeland Health.

OHV use mining and exploration activities have resulted in scattered and isolated areas of ground disturbance, which may or may not have been reclaimed. As a result, these areas are

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vulnerable to erosion and invasion by non-native species. Future OHV use may result in adverse impacts to vegetative communities. An OHV Management Plan is currently being completed that may involve the development of a trail system, trailheads, and creation of new trails within the South Shoshone HMA. Some vegetative loss would be associated with the OHV use and may result in the establishment of invasive species along the trail system.

The Proposed Action and Alternative 1 would contribute to isolated areas of disturbed vegetation through the gather activities. In the long term, however, the achievement of AML in conjunction with past grazing management changes, and other rangeland or habitat improvement projects would contribute to improved vegetative resources. Excessive utilization by wild horses could be eliminated or minimized with maintenance of the AML. Key forage species would improve in health, abundance, and robustness, and be more likely to set seed and reproduce, which in turn would contribute to improvements in rangeland health. The proposed gather and other foreseeable actions would begin to offset past negative trends in habitat modification by allowing for attainment of rangeland health standards and allotment specific objectives.

The No Action Alternative would allow continued degradation of vegetation by wild horses, which in the long term would cause native vegetation to be replaced by non-native plant species and annual plants. Improvements resulting from livestock management decisions could be negated. Past impacts would not be offset, and downward trends would occur.

4.2.4. Water Quality/Wetlands and Riparian Resources

Water quality and riparian health have historically been impacted by water development projects, and use by livestock and wild horses. Some riparian areas may have also been impacted by recreational users, and historic mining and exploration activities. Currently, many of the riparian areas within the project area are degraded and past and current wild horse use has been identified as one of the causal factors. In the future, livestock grazing and wild horse use would likely be the primary impacts to water quality and riparian health, in addition to construction of riparian exclosures, recreation, and increases in OHV use.

Achievement of AML within the Bald Mountain and South Shoshone HMAs in conjunction with the recent livestock grazing management decisions, and future construction of riparian exclosures would lead to improvement in water quality and progress towards proper functioning condition. Future wild horse gathers to maintain AML would further improve riparian health.

Accordingly, long-term impacts of the No Action Alternative would be further degradation of riparian areas that is already occurring, with reduced water quality and quantity available as these areas are excessively utilized by increasing wild horse populations. This would have the effect of negating any improvements that could have been realized by past or future actions.

4.2.5. Soils

Historically, soils within the Complex have been impacted by mineral exploration and development, road building, and OHV/Recreation. These activities will continue and

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possibly increase into the future throughout the Complex. Wild horse and livestock use have also affected soils through utilization of vegetation and trails, which has increased susceptibility to erosion and affected rangeland health.

The 2005 FMUD implemented livestock grazing decisions, which will result in long-term improvements to soil resources and rangeland health. Conversions from cattle to sheep, modifications to grazing seasons and reductions in permitted use will result in improvements to soils through reductions in trailing, and utilization levels.

The proposed wild horse gather would contribute minor amounts of soil disturbance within the Complex, which would likely be offset by improvements to rangeland health that should result from attainment of AML. The Proposed Action and Alternative 1 would result in similar improvements to soils in the long term through reduced density of wild horses within the Bald Mountain HMA and subsequent reductions in soil disturbance, vegetation utilization levels, and erosion.

Continued degradation of vegetation by wild horses would occur under the No Action alternative, with resultant disturbance to soils and increased soil instability and erosion. Improvements resulting from livestock management decisions could be negated. Other ongoing and future activities would continue to contribute to soil disturbance as well, resulting in overall increases in soil disturbance through the Complex.

4.2.6. Wild Horses and Burros

Wild horses have existed within the South Shoshone and Bald Mountain HMAs since prior to the passage of the Wild Free Roaming Horses and Burros Act in 1971. Herd Areas were established based on the presence of wild horses within these areas in 1971, and later designated as Herd Management Areas in the Shoshone-Eureka RMP (refer to Section 1.3). The current HMA boundaries are nearly identical to the original Herd Area boundaries. The habitat within the project area is droughty, and characterized by low production of quality native forage, and limited water supplies.

Two partial BLM wild horse gathers have been conducted within the Complex. Between July 1981 and January 1982, 364 wild horses were removed from the Bald Mountain HMA. In 2002, 46 wild horses were removed from the Cedar's Pasture of the South Shoshone HMA. Illegal shootings between 1987-1989 in the Bald Mountain HMA and to a lesser extent, South Shoshone HMA also have impacted the overall size of the population (refer to Appendix B). Wild horse gathers within the Callaghan and Rocky Hills HMAs have also affected the population size and distribution of the Bald Mountain, and possibly South Shoshone HMAs (Refer to Appendix B). Fertility control has not been implemented in the past, and genetics testing has not been completed.

Other past activities, which may have affected wild horses within these HMAs, include livestock grazing, and OHV use through the impacts on vegetation condition and availability, as well as water quality and quantity. Mineral and geothermal exploration activities have had temporary and isolated impacts to the wild horses. Other impacts to wild horses have

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included wildfires, spring developments, road building, vegetation rehabilitation, recreation, and hunters.

Future activities, which could occur, include adjustments to livestock grazing levels or season of use, wildland urban interface projects, vegetation rehabilitation projects, water developments and spring exclosures, and increased OHV use. Continued mining exploration and development, and geothermal exploration and development could also affect wild horses. These activities would have cumulative impacts to forage quality and quantity, and water availability. Several of these activities could also have cumulative impacts to wild horse movement and over time could cause shifts in wild horse distribution, causing increased or decreased use of certain portions of the HMAs. Hot Springs Point on the east portion of the Bald Mountain HMA is currently being examined for geothermal resources. Future exploration and potential development could have impacts to wild horse distribution in that portion of the HMA. Likewise, several operational mines within the Carico Lake Allotment will continue to impact wild horse distribution patterns.

The future may also involve further adjustments to the South Shoshone and Bald Mountain HMA AMLs (increases or decreases), fertility control research and future gathers to achieve AML within both HMAs. Should the genetic analysis of either HMA indicate issues with genetic variability, specific removal or treatment protocols could be developed to address them. The objective for these actions would be for increased future herd health and thriving natural ecological balance within the herds in conjunction with other future actions.

Through the Proposed Action and Alternative 1, wild horse bands and herd dynamics would be disrupted. Distribution of the wild horses within both HMAs may change from that of the past as wild horse concentrations are reduced. In the long term, livestock decisions, AML adjustments, and future wild horse gathers would have the net effect of improvement of habitat quality for the wild horses within both HMAs, which would contribute to long-term health of the wild horses as indicated by improved body condition, healthier foals, and herd sustainability through drought years. An overall lower population and density of wild horses across the landscape would allow increased recovery of native vegetation that is currently degraded, as well as reduce or eliminate further degradation.

The herd's distribution, movement, genetic variability, and overall health would be monitored in the future and assessed in a Herd Management Area Plan. Fertility control efforts could be addressed in the future within the HMAP and following comment from the interested public.

Because the implementation of Alternative 1 could result in a 20% reduction in growth rates, and 5-10% lower population size over time, this alternative could also result in increased frequency of gathers, which would reduce impacts and disturbance to horses through future gathers.

Under the No Action Alternative, the degradation of the habitat by excessive populations of wild horses within the Bald Mountain and South Shoshone HMAs would continue into the long term, and improvement to the range would not be as apparent, despite the

implementation of any other activities, which may have resulted in benefits to the rangeland resource. If the populations were to increase unchecked, eventually emergency removal would be necessary to prevent catastrophic death of the herds. Irreparable damage to the arid habitat could result in the need to permanently remove all wild horses and burros from one or both of these HMAs, or to reduce AMLs in future decisions.

4.2.7. Wildlife (Including Threatened & Endangered Species, Sensitive Species, and Migratory Birds)

Cumulative impacts to wildlife, migratory birds, special status species from past, present, foreseeable actions result primarily from impacts to vegetation, and the resulting habitat alteration. Impacts to habitats within the project area have accumulated primarily from the direct and indirect effects of livestock and wild horse grazing, and to a lesser degree mining, exploration and OHV use, recreation and hunting.

Livestock decisions, riparian exclosures, wildlife guzzlers, and implementation of the Proposed Action or Alternative 1 would contribute to rangeland improvement and thereby have a potentially beneficial effect on the wildlife habitat in the gather area. Improvements could include reduced riparian utilization, reduced upland utilization, and reduced potential for direct competition between the introduced and native ungulates, as well as overall improvements to rangeland health and quality wildlife habitat.

A number of other ongoing and foreseeable human activities in the area, most notably OHV use, could result in adverse conditions that cumulatively affect wildlife, special status species, and migratory birds. These activities result in loss of habitat and disruption of movement patterns. The Proposed Action and Alternative 1 would not be expected to contribute to cumulative impacts associated with impediments to movement of wildlife.

Cumulative impacts associated with the Proposed Action and other human activities, such as construction of other water projects and invasive weed treatments would be beneficial for wildlife and wildlife habitat. These projects/activities would be implemented to enhance rangeland condition, which benefit wildlife species and associated habitat. The proposed gather would help to reverse negative cumulative impacts to most wildlife, migratory birds, and special status species. The proposed gather and other foreseeable actions would begin to offset past negative trends in habitat modification by allowing for attainment of rangeland health standards and allotment specific objectives.

In conjunction with past, present and future actions such as future wild horse gathers, adjustments to livestock grazing use, noxious weed treatment, recreation and mineral exploration, the Proposed Action or Alternative 1 would result in cumulative, long term improvements to wildlife habitat, including enhanced water sources, riparian habitats, and forage and cover availability.

The No Action Alternative would not result in any long-term cumulative benefits to any rangeland user. Uncontrolled increases in populations of wild horses across the Complex would result in continued deterioration of rangeland vegetation and important wildlife habitat, including loss of water sources and riparian habitat. These losses in conjunction with

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any reasonably foreseeable projects or other management actions would not improve habitat for wildlife, sensitive species, or other values.

5. Suggested Monitoring

The BLM would continue to conduct the necessary monitoring to periodically evaluate the effects of livestock grazing and use by wild horses and wildlife, and determine if progress is being made in the attainment of multiple use objectives and Standards for Rangeland Health. Monitoring would be in accordance with BLM policy as outlined in the *Nevada Rangeland Monitoring Handbook* and other BLM technical references.

The BMFO would continue to plan for periodic census flights to monitor the growth and distribution of the wild horse populations within the HMAs. Vegetation monitoring to consist of utilization, trend and other rangeland studies would continue to be completed.

6. Consultation, Coordination and List of Preparers

Prior to completion of this Environmental Assessment, scoping letter dated April 11, 2006, and March 15, 2007 were mailed to the interested public list for the area encompassed by the Carico Complex.

One response was received from the Nevada State Clearinghouse, expressing support for the proposed gather from the Division of State Lands and the State Historic Preservation Office.

Through the multiple use evaluation process, coordination with the interested public occurred during completion of the Rangeland Health Assessment for the Carico Lake Allotment that resulted in establishment of the AMLs for these HMAs.

This Environmental Assessment and Gather Plan is being sent to the interested public list for the gather area for review and comment. Comments received by April 18, 2007 would be incorporated into a final EA and Gather Plan, and issued to the interested public. The interested public list is included on page 48.

Carico Complex Environmental Assessment, List of Preparers

Doug Furtado	Assistant Field Manager, Renewable Resources
Duane Crimmins	Lead Natural Resource Specialist/Wildlife Biologist /Riparian Specialist
Shawna Richardson	Project Lead/Wild Horse and Burro Specialist
Angelica Ordaz	Planning and Environmental Coordinator
Christopher Worthington	Planning and Environmental Coordinator
Mike Stamm	Wildlife Biologist
Cliff Merriman	Rangeland Management Specialis
Michele McDaniel	Range Team Lead
Joe Ratliff	Soils/Forestry/Water Quality/Invasive Weeds
Chris Cook	Cultural Resources Specialist
Gerald Dixon	Native American Coordinator
Rob Perrin	Recreation/Wilderness/VRM Specialist

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References

- Berger, J. 1986. Wild Horses of the Great Basin, The University of Chicago Press, Chicago. 326 pp.
- Bureau of Land Management. 1986. Shoshone-Eureka Resource Area Record of Decision. Battle Mountain Field Office. Battle Mountain, Nevada.
- Bureau of Land Management. 1995. Area Managers Final "Full force and effect" Multiple Use Decision for the Austin Allotment. Battle Mountain Field Office. Battle Mountain, Nevada.
- Bureau of Land Management. 2001. Roberts Mountain Herd Management Area Wild Horse Gather Environmental Assessment # NV062-EA01-17. Battle Mountain Field Office. Battle Mountain, Nevada.
- Bureau of Land Management. 2002. Callaghan Herd Management Area Wild Horse Gather Plan and Environmental Assessment # NV062-EA02-41. Battle Mountain Field Office. Battle Mountain, Nevada.
- Bureau of Land Management. 2005. Carico Lake Allotment Final Multiple Use Decision. Battle Mountain Field Office. Battle Mountain, Nevada.
- Bureau of Land Management. 2005. Carico Lake Allotment Rangeland Health Assessment. Battle Mountain Field Office. Battle Mountain, Nevada.
- Bureau of Land Management. 2005. Carico Lake Allotment Rangeland Health Assessment Environmental Assessment # NV062-EA05-61. Battle Mountain Field Office. Battle Mountain, Nevada.
- Bureau of Land Management. 2002. 2001 Surface Water Inventory and Riparian Assessment for the Carico Lake Allotment, Battle Mountain Field Office. Battle Mountain, Nevada.
- Coates-Markle, L. 2000. Summary Recommendations, BLM Wild Horse and Burro Population Viability Forum April 1999, Ft. Collins, CO. Resource Notes 35:4pp.
- Garrot, R.A. 1991. Sex Ratios and Differential Survival of Feral Horses, Journal of Animal Ecology, Vol. 60, No. 3 (Oct.1991), 929-936.
- 109 Interior Board of Land Appeals 119 API 1989.
- Interior Board of Land Appeals 88-591, 88-638, 88-648, 88-679 at 127.
- 118 Interior Board of Land Appeals 75.
- Kirkpatrick, J.F., R. Naugle, I.K.M. Lui, J. W. Turner Jr., M. Bernoco. 1995. Effects of Seven Consecutive years of PZP Contraception on Ovarian Function in Feral Mares, Biology of Reproduction Monograph Series 1: Equine Reproduction VI: 411-418.
- Singer F.J., Zeigenfuss L. 2000. Genetic Effective Population Size in the Pryor Mountain Wild Horse Herd: Implications for conserving genetics and viability goals in wild horses. U.S. Geologic Survey, Midcontinent Ecological Science Center, Ft. Collins CO. Resource Notes 29: 2 pp.

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Soil Conservation Service, 1992, Soil Survey of Lander County.

Turner Jr , J.W., I.K.M. Lui, Rutberg, A., J.W., Kirkpatrick. 1997. Immunocontraception Limits Foal Production in Free Roaming Feral Horses in Nevada, J. Wildl. Manage. 61 (3):873-880.

Zoo Montana. 2000. Wildlife Fertility Control: Fact and Fancy. Zoo Montana Science and Conservation Biology Program, Billings, MT.

Interested Public

Katie Fite, Biodiversity Director, Western Watersheds Project

Lilly E. O'Toole, O'Toole Ranches

Rachel Buzzetti, Nevada Cattlemen's Association

Steve Foree, Supervisory Habitat Biologist, Nevada Department of Wildlife Eastern Region

Larry Teske, Biologist, Nevada Department of Wildlife

Mike Podborne, Nevada Department of Wildlife

Robert McQuiver, Nevada Department of Wildlife

Eureka County Commissioners

Lander County Commissioners

U.S. Fish and Wildlife Service

William J Gandolfo, Gandolfo Ranch

Carl Slagowski

Fennemore George, Cortez Gold Mines

Jim Baumann, Chairman, Natural Resources Advisory Commission

Mike Marvel, Mike Marvel Ranching

Doby George, LLC

Michael Young, Chair Battle Mountain Band Council

Rex Cleary, Resource Concepts, Inc

Clarinda Oppenheim, Chair Battle Mountain Band Council

Lynett Piffero, Chair, Elko Band Council

Alfred Lake, , Chair, Elko Band Council

Davis Gonzales, Te-Moak Tribal Council

Pat Stevens, Te-Moak Tribal Council

Dennis Bill, Yomba Shoshone Tribe

Kenny Smith, Yomba Shoshone Tribe

Kenneth Buckingham

Ken and Russell Conley, University Nevada Reno

Tom and Volina Connolly

Peter J.Damele, Dry Creek Ranch

Tommie G. Lancaster

JohnFilippini, C Ranches Inc

Henry Filippini Jr., Filippini Ranching Co.

Bill Hall, Ellision Ranching Co.

Paul Inchauspe, Silver Creek Ranch Inc.

Pete Tomera, Julian Tomera Ranches Inc

Cathy Barcomb, Nevada Commission for Preservation of Wild Horses

Dawn Lappin, Wild Horses Organized Assistance

Jim and Ida Gallagher

Krista Coulter, Nevada State Clearing House

Charles N. Saulisberry, Plant Science Services

Cindy MacDonald

Ryan Shane , Resource Concepts, Inc

D.J. Schubert, Wildlife Biologist, Animal Welfare Institute

National Mustang Association

American Horse Protection Assoc.

Appendix A: Wild Horse Gather Plan and Standard Operating Procedures

Bald Mountain and South Shoshone HMAs

I. Gather Plan

The purpose of the gather plan is to outline the methods and procedures for capturing approximately 682 wild horses from public lands administered by the Battle Mountain Field Office (BMFO). Achievement of the Appropriate Management Level (AML) would require the removal of approximately 529 wild horses and release of 153 wild horses back to the HMAs. A trap-site adoption event could also be scheduled to coincide with the gather activities (refer to Section E).

A. Gather Area

The gather area encompasses approximately 480,000 acres of public lands. The gather areas include the Bald Mountain and South Shoshone HMAs, as well as areas located adjacent to but outside of the HMA boundaries, which includes areas not designated for horse use. Refer to Map 1 and 2, which display the HMAs, grazing allotments and the gather area.

B. Administration of the Contract /Gather Operations

The National Wild Horse and Burro Gather Contract would be used to conduct the wild horse gather tentatively scheduled for summer 2006. BLM personnel would be responsible for overseeing the contract for the capture, care, aging, and temporary holding of wild horses and burros from the capture area. BLM Wild Horse and Burro Specialists would be present during all aspects of the gather activities.

Prior to the start of the contract, BLM plans to conduct an aerial census of the gather area to obtain current wild horse population and distribution data within the gather area.

Standard Operating Procedures (SOPs) described within this document would be utilized for the capture and handling of wild horses and burros. SOPs have been developed over time to ensure minimal impacts associated with gathering, handling, and transporting wild horses and burros, and collecting herd data.

It is estimated that between 6 and 8 trap-sites and 1 to 2 sets of central holding corrals would be necessary to complete the gather. Ideally, trap sites would be established in areas of previous soil or vegetation disturbance (such as gravel pits, roads etc.), to avoid impacts to unaltered vegetation and soils. A cultural resources investigation would be conducted prior to the construction of traps and temporary holding facilities. Refer to the SOPs, Part II for more detailed information.

A notice of intent to impound would be made public prior to the gather. Branded and/or claimed horses would be transported to a temporary holding facility. Ownership would be determined under the estray laws of the State of Nevada by a Nevada Brand Inspector. Collection of gather fees and any appropriate trespass charges would be collected per BLM policy and regulation.

A veterinarian would be on call for the duration of the gather to provide recommendations to Wild Horse and Burro Specialists for care and treatment of sick or injured wild horses. Consultation with the veterinarian would take place prior to the euthanasia of wild horses in accordance with Washington Office Instruction Memorandum (IM 2006-023). Refer to Part II for more information about the euthanasia policy.

Precautions would be taken to ensure that young or weak foals are safely gathered and cared for appropriately. If a foal were determined to be an orphan, qualified adopters would be contacted immediately to provide proper care for the foal. Milk replacer formula and electrolytes would be available to care for orphan foals if necessary.

During a summer gather, electrolytes would be added to the water and made available to the wild horses in the holding corrals. Electrolytes help alleviate heat stress.



Wild Horse Specialist gives electrolytes to a foal during the Silver Peak Gather in summer 2006

C. Selection Criteria

Wild Horse and Burro Specialists would determine sex, age, color and assess animal health (pregnancy/parasite loading/physical condition), sort individuals as to age, size, sex, temperament and/or physical condition, and select horses or burros to be released to the complex. The National Selective Removal Policy, *Washington Office, IM 2005-206, Gather Policy and Selective Removal Criteria for Wild Horses* would be adhered to, to the extent possible, when selecting wild horses to be released back to the HMA and selecting wild horses to be removed. This policy includes the following guidelines:

Age Class -Five Years and Younger: Wild horses five years of age and younger should be the first priority for removal and placement into the national adoption program.

Age Class - Six to Fifteen Years Old: Wild horses six to fifteen years of age should be removed last and only if management goals and objectives for the herd cannot be achieved through the removal of younger animals.

Animals encountered during gather operations should be released if, in the opinion of the Authorized Officer, they may not tolerate the stress of transportation, preparation, and holding but would survive if released. Older animals in acceptable body condition with significant tooth loss and/or excessive tooth wear should also be released. Some situations, such as removals from private land, total removals, or emergency situations require exceptions to this.

Age Class Sixteen Years and Older: Wild horses aged sixteen years and older should not be removed from the range unless specific exceptions prevent them from being turned back and left on the range.

The wild horse and burro populations within the gather area would be managed as healthy, self-sustaining populations in balance with multiple uses and the productive capacity of their habitat. Objectives were developed for these HMAs as part of the Carico Lake Allotment Rangeland Health Assessment and Final Multiple Use Decision in 2005. Data collected during the gather in conjunction with genetic analysis report will be incorporated into a Herd Management Area Plan (HMAP) in the future. The following details the current objectives for this area:

South Shoshone and Bald Mountain HMA WILD HORSE OBJECTIVES

- **Key Species:** All key perennial species as identified in the Key Management Area Objectives for those key areas located within the HMAs
- **In addition to those allotment specific short and long term objectives identified for each key area, the following management and monitoring objectives are proposed:**
 - Improve the forage component of wild horse habitat. Emphasize improving habitat as indicated by achieving desired plant community objectives within the HMA.
 - Manage the Bald Mountain and South Shoshone HMAs as a Complex with the Callaghan HMA for the purposes of census, evaluation and gathers to account for the inherent movement between the areas.
 - Manage the Bald Mountain and South Shoshone HMA population levels as a population range where the upper limit of the range is the level where the optimum number of wild horses can exist without causing resource degradation. The lower limit of the range would be based on the level to remain following a gather to allow for a normal gather cycle of 3-4 years.
 - Rangeland monitoring within the HMAs would be accomplished with the goal of obtaining data specific to areas utilized by wild horses that would be used to modify AML and propose future management actions.
 - Manage the Bald Mountain and South Shoshone HMAs populations to preserve and enhance physical and biological characteristics that are of historical significance to the herd, which would include conformation, coloring and size.
 - Maintain sex ratios and age structures, which will allow for the continued physical, reproductive and genetic health of the Bald Mountain and South Shoshone HMAs.

- Preserve and maintain a healthy and viable wild horse population that will survive and be successful within the HMAs during poor years when elements of the habitat are limiting due to severe winter conditions, drought, or other uncontrollable and unforeseeable environmental influences to the herd.
- Preserve the characteristic wild free-roaming behavior of wild horses within the Bald Mountain and South Shoshone HMAs by limiting management actions that would prohibit wild horse access to portions of the HMAs or restrict historical patterns of use.
 - Where fences are needed within HMAs to meet other resources objectives, fences will be planned so as to not restrict movement patterns of wild horses. An example would be the construction of carefully planned drift fences, which allow wild horses to maintain historic patterns of use within the HMA. Fences built within the HMA will include posts with white tops to provide visual warning and prevent injury and death to wild horses.

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STANDARD 5. HEALTHY WILD HORSE AND BURRO POPULATIONS:

Wild horses and burros exhibit characteristics of a healthy, productive, and diverse population. Age structure and sex ratios are appropriate to maintain the long term viability of the population as a distinct group. Herd management areas are able to provide suitable feed, water, cover and living space for wild horses and burros and maintain historic patterns of habitat use.

As indicated by:

Healthy rangelands that provide sufficient quantities and quality of forage and water to sustain the appropriate management level on a year long basis within a herd management area.

Wild horses and/or burros managed on a year-long basis for a condition class greater than or equal to five to allow them normal chances for survival in the winter (See glossary for equine body conditioning definitions).

Highly adoptable wild horses and burros that are readily available from herd management areas.

Wild horse and burro herds that exhibit appropriate age structure and sex ratio for short and long term genetic and reproductive health.

GUIDELINES:

5.1 Implement the objectives outlined in the Wild Free-Roaming Horses and Burros Tactical Plan for Nevada (May 1999).

5.2 Manage for wild horses and/or burros in herd management areas based on the capability of the HMA to provide suitable feed, water, cover and living space for all multiple uses.

5.3 Set appropriate Management Levels based on the most limiting habitat factor (eg.

available water, suitable forage, living space and cover) in the context of multiple use.

5.4 Manage herd management area populations to preserve and enhance physical and biological characteristics that are of historical significance to the herd.

5.5 Manage wild horse and burro herds for short and long term increases and to enhance adoptability by ensuring that wild horses and burros displaying desirable traits are preserved in the herd thus providing a reproductive base to increase highly adoptable horses and burros for future demands.

5.6 Identify and preserve historic traits and characteristics within the herd which have proven to be highly desirable by the adoption public to increase the long term availability of animals bearing these features.

5.7 Wild horse and burro selective removal criteria are modified on a per herd basis to correct deficiencies in population age and sex ratios which threaten short and long term genetic diversity and reproductive health.

D. Data Collection

Wild Horse and Burro Specialists would be responsible for collecting population data. The extent to which data is collected may vary among the field offices to meet specific needs pertaining to each HMA.

1) Blood Samples/Genetics Analysis

Blood samples would be collected and analyzed to establish genetic baseline data of wild horses and burros (genetic diversity, historical origins, unique markers, and norms for the population). The samples would be collected from the breeding population of the horses selected for release into the complex.

A minimum sample size of 25 blood samples would be collected for horses selected for release. A sample is defined as the collective blood for an individual animal (two tubes per horse). Blood would be drawn from both mares and studs in a ratio similar to the sex ratio released. Age would not be a defining factor in determining which animals to sample.

The blood test would examine 29 systems (17 typing and 12 DNA). The data would be compared to similar data from both domestic and other wild horse populations. The primary value of this initial data is a baseline against which future samples can be compared to identify genetic drift and any narrowing diversity through inbreeding. Blood samples would be sent to Dr. Gus Cothran of the Texas A&M University for analysis. A veterinarian or other qualified personnel would draw blood.

Blood samples may be taken for the purposes of furthering genetic ancestry studies and incorporation into the Herd Management Area Plans (HMAPs) or Population Management Plans (PMPs) which will be developed for each HMA.



APHIS Veterinarian Katie Blunk and Vet Student Patti Mussells draw blood from a wild horse for genetics testing during the Fish Creek Complex Gather, summer 2005.

2) Herd Health and Viability Data Collection

Data related to age, sex, color, overall health, pregnancy, or nursing status would be collected from each animal captured. The sex and age of each animal selected for release would be recorded during sorting procedures at the holding facility. An estimate of the number, sex and age of horses evading capture would also be recorded.

Information on reproduction and survival would be collected to the extent possible, through documentation of the wild horses captured during the gather, and the age of those released following the gather.

3) Characteristics

Color and size of the animals would be recorded. Any characteristics as to type (similarities to domestic breeds) would be noted, if determined. The genetic analysis would provide a comparison of domestic breeds with the wild horses sampled. Any incidence of negative genetic traits (parrot mouth, club foot etc.) or other abnormalities would be noted as well. A representative population of wild horses depicting historical and desired characteristics would be selected for release.

4) Condition Class

A body condition class score would be recorded based on the Henneke System. This would be recorded for the population in general and/or for specific animals if necessary.

E. Trapsite Wild horse Adoption

Interest has been received from the public for an adoption to be planned in conjunction with this proposed gather. Scheduling of an event would be contingent upon continued interest received, available budget, and personnel. A trapsite wild horse adoption would be completed in accordance with IM NV-2001-041, which outlines requirements for adoptions during gather operations.

Prior to the beginning of the gather, the BMFO would issue news releases and send flyers to previous adopters and the interested public announcing the proposed event. The event would also be posted on the National Wild Horse and Burro webpage. Coordination would take place with the

gather contractor in advance to prevent conflicts. Applications for adoption would be accepted by the BMFO until the day of the planned event. BMFO would evaluate applications received by potential adopters, and determine qualification to adopt. Adopters that do not submit applications by the event date would not have first priority for selection of animals. A public or viewing day may be scheduled the day before or the day of the event. The event type (first-come, first-served, competitive or lottery) would be based upon the interest received from potential adopters.

BLM staff would freezemark, de-worm and vaccinate all wild horses adopted. A veterinarian would be on-site to draw blood for coggins testing and complete health certificates. Adopted wild horses would be brand inspected by a qualified brand inspector. BLM staff would halter and load wild horses into approved stock trailers, and follow-up with compliance inspections and assistance as needed after the event.

II. Standard Operating Procedures for Wild Horse Gatherers

The following procedures for gathering and handling wild horses and burros apply whether a contractor or BLM personnel conduct a gather. For helicopter gathers conducted by BLM personnel, gather operations would be conducted in conformance with the Wild Horse and Burro Aviation Management Handbook (March 2000).

Prior to any gathering operation, the BLM would complete a pre-capture evaluation of existing conditions in the gather area(s), which would include animal condition, prevailing temperatures, drought conditions, soil conditions, road conditions, and a topographic map with wilderness boundaries, the location of fences, other physical barriers, and acceptable trap locations in relation to animal distribution. The evaluation will determine whether the proposed activities will necessitate the presence of a veterinarian during gather operations. If it is determined that capture efforts necessitate the services of a veterinarian, one would be obtained before capture would proceed. The contractor will be apprised of all conditions and will be given instructions regarding the capture and handling of animals to ensure their health and welfare is protected.

Trap sites and temporary holding sites would be located to reduce the likelihood of undue injury and stress to the animals, and to minimize potential damage to the natural resources of the area. These sites will be located on or near existing roads.



Trap set up on the road in Moore's Station during the Fish Creek Complex gather January, 2006.

The following procedures and stipulations would be followed to ensure the welfare, safety and humane treatment of wild horses and burros in accordance with the provisions of 43 CFR §4700, and safety of the public and government personnel.

A. Capture Methods That May Be Used in the Performance of a Helicopter Gather

1) Helicopter Drive Trapping

The Helicopter Drive Trapping method employed for wild horse capture operations requires that horses (or burros) be herded to a trap of portable panels and occasionally to ropers who, after roping the animal, will bring it to the trap or to a stock trailer for transport to the trap. Gathering would be conducted by using agency personnel or contractors experienced in the humane capture and handling of wild horses (or burros). The trap is constructed of portable steel panels consisting of round pipe. Wings are constructed from the ends of the panel trap to aid in funneling horses into the trap. The wings are constructed of natural jute, (or similar netting which will not injure a horse), which is hung on either trees or long steel posts. This type of wing forms a very effective visual barrier to the horses that they typically will not run through. When the trap is ready for use, a helicopter moves horses toward the trap and into the wings.

The following stipulations apply:

- a) A minimum of two saddle horses shall be immediately available at the trap site to accomplish roping if necessary. Roping shall be done as determined by the BLM. Under no circumstances shall animals be tied down for more than one hour.
- b) The Contractor shall assure that bands remain together, and that foals shall not be left behind and orphaned.
- c) Domestic saddle horses may be used as a pilot (i.e. parada) horse to lead the wild horses into the trap. Individual ground hazers may also be used to assist in the gather.

2) Helicopter Assisted Roping

This capture method involves utilizing a helicopter to herd wild horses or burros to ropers. The following stipulations apply:

- a) Under no circumstances shall animals be tied down for more than one hour.
- b) Roping shall be performed in such a manner that bands will remain together. Foals shall not be left behind or orphaned.
- c) Wild horses roped may be led to the trap or may be loaded into stock trailers in the field and transported to the trap or holding corrals.

Bait Trapping

This capture method involves utilizing bait (water or feed) to lure wild horses or burros into a temporary trap. The following stipulations apply:

- a) Finger gates shall not be constructed of materials that may be injurious to animals such as; "T" posts, sharpened willows, etc.

- b) All trigger and/or trip gate devices must be approved by the BLM prior to capture of animals.
- c) Traps shall be checked a minimum of once every 10 hours.



The Contractor and crew guide a wild stud to the Stock trailer after roping it. Fish Creek Complex gather, summer 2005.

B. Trapping and Care

The primary concern is for the safe and humane handling of all animals captured. All capture attempts shall incorporate the following:

- 1) All trap and holding facility locations must be approved by the BLM prior to construction. The Contractor may also be required to change or move trap locations as determined by the BLM.
- 2) All traps and holding facilities not located on public land must have prior written approval of the land owner. Prior to setting up a trap or temporary holding facility, BLM will conduct all necessary clearances (archaeological, T&E, etc.).
- 3) The rate of movement and distance the animals travel shall not exceed limitations set by the BLM, who will consider terrain, physical barriers, weather, condition of the animals, and other factors.
- 4) All traps, wings, and holding facilities shall be constructed, maintained and operated to handle animals in a safe and humane manner and be in accordance with the following:
 - a) Traps and holding facilities shall be constructed of portable panels, the top of which shall not be less than 72 inches for horses and 60 inches for burros, and the bottom rail of which shall not be more than 12 inches from ground level. All traps and holding facilities shall be oval or round in design.



One of the sets of Holding Corrals used during the Fish Creek Complex gather in January 2006. These corrals were located at a gravel pit on Highway 6 east of Tonopah.

- b) All loading chute sides shall be a minimum of 6 feet high and shall be fully covered with plywood or like material.
 - c) All runways shall be a minimum of 30 feet long and a minimum of 6 feet high for horses, and 5 feet high for burros, and shall be covered with plywood, burlap, plastic snow fence or like material a minimum of 1 foot to 5 feet for burros and 1 foot to 6 feet for horses. The location of the government furnished portable restraining chute used to restrain, age, or to provide additional care for animals shall be placed in the runway in a manner as instructed by or in concurrence with the BLM.
 - d) All crowding pens including the gates leading to the runways shall be covered with a material which prevents the animals from seeing out (plywood, burlap, snow fence etc.) and shall be covered a minimum of 1 foot to 5 feet above ground level for burros and 2 feet to 6 feet for horses. Eight linear feet of this material shall be capable of being removed or let down to provide a viewing window.
 - e) All pens and runways used for the movement and handling of animals shall be connected with hinged self-locking gates.
- 5) No fence modifications will be made without authorization from the BLM. The Contractor shall be responsible for restoration of any fence modification, which he has made.
- 6) When dust conditions occur within or adjacent to the trap or holding facility, the Contractor shall be required to wet down the ground with water.
- 7) Separate pens within the holding facility shall be furnished by the Contractor to separate mares or jennies with small foals, sick and/or injured animals, and strays from the other animals. Animals shall be sorted as to age, number, size, temperament, sex and condition when in the holding facility so as to minimize, to the extent possible, injury due to fighting and trampling. Under normal conditions, the government will require that animals be restrained for the purpose of determining an animal's age, sex or other necessary procedures. In these instances, a portable restraining chute will be provided by the government. Alternate

pens shall be furnished by the Contractor to hold animals selected to be released back into the wild. In areas requiring one or more trap sites, and when a centralized holding facility is utilized, the Contractor may be required to provide additional holding pens to segregate animals transported from remote locations so they may be returned to their traditional ranges. Either segregation or temporary marking for later segregation will be at the discretion of the BLM.

- 8) The Contractor shall provide animals held in the traps and/or holding facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Separate water troughs shall be provided at each pen where animals are being held. Water troughs shall be constructed of such material (e.g. rubber, galvanized metal with rolled edges, rubber over metal) so as to avoid injury to the animals. Animals held for 10 hours or more in the traps or holding facilities shall be provided good quality hay at the rate of not less than 2 pounds of hay per 100 pounds of estimated body weight per day.



Contractor's crew oversees loading preparations at the trap site. Simpson Park Mountains gather, December 2005.

- 9) It is the responsibility of the Contractor to provide security to prevent loss, injury, or death of captured animals until delivery to final destination.
- 10) The contractor/BLM shall restrain sick or injured animals for medical treatment, if necessary. A veterinarian may be called to make a diagnosis and final determination. Euthanasia shall be done by the most humane method available. Authority for humane euthanasia of wild horses or burros is provided by the Wild Free-Roaming Horse and Burro Act of 1971, Section 3(b)(2)(A), 43 CFR 4730.1, BLM Manual 4730 - Euthanasia of Wild Horses and Burros and Disposal of Remains, and is in accordance with BLM policy as expressed in Washington Office Instructional Memorandum No. 2006-023.

Any captured horses that are found to have the following conditions may be considered for humane euthanasia:

- a) displays a hopeless prognosis for life;

- b) suffers from a chronic or incurable disease, injury or serious physical defect; (includes severe tooth loss or wear, severe club feet, and other severe acquired or congenital abnormalities)
- c) would require continuous treatment for the relief of pain and suffering in a domestic setting;
- d) is incapable of maintaining a Henneke body condition score greater than two, in its present environment;
- e) has an acute or chronic injury, physical defect or lameness that would not allow the animal to live and interact with other horses, keep up with its peers or exhibit behaviors which may be considered essential for an acceptable quality of life constantly or for the foreseeable future;
- f) suffers from an acute or chronic infectious disease where State or Federal animal health officials order the humane destruction of the animal as a disease control measure.

Additionally, if an animal suffers from any of the conditions listed above, but is not in acute pain, the Authorized Officer (or designee) has the authority to euthanize the animal in a humane manner after consulting with a veterinarian and notifying the district or field office manager of the decision. The Authorized Officer (or designee) will prepare a written statement documenting the advice of the veterinarian and the action taken and will promptly notify the state office and the Wild Horse and Burro National Program Office. Older wild horses and burros encountered during gather operations should be released if, in the opinion of the Authorized Officer (or designee), the animals would not tolerate the stress of transportation, adoption preparation, or holding, but may survive if returned to the range. This may include older animals with significant tooth loss that have a Henneke body condition score greater than two.

The Authorized Officer (or designee) will determine if injured animals must be euthanized and provide for euthanasia of such animals. The contractor/BLM may be required to dispose of the remains as directed by the Authorized Officer.

The remains of animals that die or must be euthanized as a result of any infectious, contagious, or parasitic disease will be disposed of by burial to a depth of at least 3 feet.

The remains of animals that must be euthanized as a result of age, injury, lameness, or non-contagious disease or illness will be disposed of by removing them from the capture site or holding corral and placing them in an inconspicuous location to minimize visual impacts. Remains will not be placed in drainages regardless of drainage size or downstream destination.

- 11) Animals shall be transported to final destination from temporary holding facilities within 24 hours after capture unless prior approval is granted by the BLM for unusual circumstances. Animals to be released back into the HMA following gather operations may be held up to 21 days or as directed by the BLM. Animals shall not be held in traps and/or temporary holding facilities on days when there is no work being conducted except as

specified by the BLM. Animals shall not be allowed to remain standing on trucks while not in transport for a combined period of greater than three (3) hours. Animals that are to be released back into the capture area may need to be transported back to the original trap site. This determination will be at the discretion of the BLM.

- 12) Branded or privately owned animals captured during gather operations will be handled in accordance with state estray laws and existing BLM policy.

C. Motorized Equipment

- 1) All motorized equipment employed in the transportation of captured animals shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of animals. The Contractor shall provide BLM with a current safety inspection (less than one year old) for all motorized equipment and tractor-trailers used to transport animals to final destination.
- 2) All motorized equipment, tractor-trailers, and stock trailers shall be in good repair, of adequate rated capacity, and operated so as to ensure that captured animals are transported without undue risk or injury.
- 3) Only tractor-trailers or stock trailers with a covered top shall be allowed for transporting animals from trap site(s) to temporary holding facilities, and from temporary holding facilities to final destination(s). Sides or stock racks of all trailers used for transporting animals shall be a minimum height of 6 feet 6 inches from the vehicle floor. Single deck tractor-trailers 40 feet or longer shall have two (2) partition gates providing three (3) compartments within the trailer to separate animals. Tractor-trailers less than 40 feet shall have at least one partition gate providing two (2) compartments within the trailer to separate animals. Compartments in all tractor-trailers shall be of equal size plus or minus 10 percent. Each partition shall be a minimum of 6 feet high and shall have at the minimum a 5 foot wide swinging gate. The use of double deck trailers is unacceptable and will not be allowed.
- 4) All tractor-trailers used to transport animals to final destination(s) shall be equipped with at least one (1) door at the rear end of the trailer, which is capable of sliding either horizontally or vertically. The rear door(s) of tractor-trailers and stock trailers must be capable of opening the full width of the trailer. Panels facing the inside of all trailers must be free of sharp edges or holes that could cause injury to the animals. The material facing the inside of the trailer must be strong enough that the animals cannot push their hooves through the side. Final approval of tractor-trailers and stock trailers used to transport animals shall be held by the BLM.
- 5) Floors of tractor-trailers, stock trailers, and the loading chute shall be covered and maintained with wood shavings to prevent the animals from slipping.
- 6) Animals to be loaded and transported in any trailer shall be as directed by the BLM and may include limitations on numbers according to age, size, sex, temperament, and animal condition. The following minimum square feet per animal shall be allowed in all trailers:

11 square feet/adult horse (1.4 linear feet in an 8 foot wide trailer)
8 square feet/adult burro (1.0 linear feet in an 8 foot wide trailer)

6 square feet/horse foal (0.75 linear feet in an 8 foot wide trailer)
4 square feet/burro foal (0.50 linear feet in an 8 foot wide trailer)

- 7) The BLM shall consider the condition and size of the animals, weather conditions, distance to be transported, or other factors when planning for the movement of captured animals. The BLM shall provide for any brand and/or inspection services required for the captured animals.
- 8) If the BLM determines that dust conditions are such that the animals could be endangered during transportation, the Contractor will be instructed to adjust speed.

D. Special Stipulations

- 1) Private landowners or the proper administering agency(s) would be contacted and authorization obtained prior to setting up traps on any lands which are not administered by BLM. Wherever possible, traps would be constructed in such a manner as to not block vehicular access on existing roads.
- 2) Traps would be constructed so that no riparian vegetation is contained within them. No vehicles would be operated on riparian vegetation or on saturated soils associated with riparian/wetland areas.



Typical trap site constructed on a road in the Lucky C Allotment. Note the wings made of jute, and location of corral panels. Fish Creek Complex gather, Summer, 2005.

- 3) Gathers would not be conducted during peak foaling season which is March 1 to June 30 to reduce the chance of injury or stress to pregnant mares or mares with young foals.
- 4) The helicopter would avoid eagles and other raptors, and would not be flown repeatedly over any identified active raptor nests. No unnecessary flying would occur over big game on their winter ranges or active fawning/calving grounds during the period of use.

5) Standard operating procedures in the site establishment and construction of traps will avoid adverse impacts from trap sites, construction, or operation to wildlife species, including threatened, endangered, or sensitive species.

6) Archeological clearance by a BLM archaeologist or District Archeology Technician of trap sites, holding corrals, and areas of potential effects would occur prior to construction of trap sites and holding corrals. If cultural resources were encountered, those locations would not be utilized unless they could be modified to avoid impacts. Due to the inherent nature of wild horse gathers, trap sites and holding corrals would be identified just prior to use in the field. As a result, Cultural Resource staff would coordinate with Wild Horse and Burro personnel to inventory proposed locations as they are identified, and complete required documentation.

7) When gathering wild horses from within Wilderness Study Areas (WSAs), applicable policy will be strictly adhered to. Only approved roads will be traveled on. A Wilderness Specialist or designee would be present to ensure that only inventoried ways or cherry stemmed roads are traveled on by vehicles within the WSA.

8) Every effort will be made to construct trap sites outside of WSA boundaries. Should the need arise to construct a trap site within a WSA to safely and effectively gather wild horses, the trap corrals would be built in the road. Wings of the trap, constructed of jute netting and steel posts may extend into the WSA. No motorized or mechanized equipment would be used to construct the wings of the trap, and all materials would be carried, constructed, and deconstructed by hand.

9) Wildlife stipulations

The following stipulations would be applied as appropriate.

a. Sage Grouse

- i. Avoid active leks (strutting grounds) by 2 miles. March 1- May 15
- ii. Avoid nesting and brood rearing areas (especially riparian areas where broods concentrate beginning usually in June) by 2 miles. April 1 – August 15
- iii. Avoid sage grouse wintering areas by 2 miles while occupied. Most known wintering grounds in the Shoshone-Eureka Resource Area occur at high elevations and are not likely to be affected. Dates vary with severity of winter
- iv. Minimize and mitigate disturbance to the vegetation in all known sage grouse habitat.

b. Ferruginous Hawk: Avoid active nests by 2 miles. March 15- July 1

E. Safety and Communications

1) The Contractor shall have the means to communicate with the BLM and all contractor personnel engaged in the capture of wild horses and burros utilizing a VHF/FM Transceiver or VHF/FM portable Two-Way radio. If communications are ineffective, the government will take steps necessary to protect the welfare of the animals.

- 2) The proper operation, service, and maintenance of all contractor-furnished property is the responsibility of the Contractor. The BLM reserves the right to remove from service any contractor personnel or contractor-furnished equipment which, in the opinion of the BLM, violate contract rules, are unsafe or otherwise unsatisfactory. In this event, the contractor will be notified in writing to furnish replacement personnel or equipment within 48 hours of notification. All such replacements must be approved in advance of operation by the BLM.
- 3) All accidents occurring during the performance of any delivery order shall be immediately reported to the BLM.
- 4) The Contractor must operate in compliance with all applicable Federal, State, and Local laws and regulations.
- 5) Fueling operations shall not take place within 1,000 feet of animals.

F. Public Participation

Opportunities for public viewing (i.e. media, interested public) of gather operations would be made available to the extent possible; however, the primary consideration will be to protect the health and welfare of the animals being gathered. The public must adhere to guidance from the on site BLM representative. It is BLM policy that the public will not be allowed to come into direct contact with wild horses and burros held in a BLM facility. Only BLM or contractor personnel may enter the trap site or temporary holding facility corrals. The general public may not directly handle the animals at any time or for any reason during gather operations.

G. Responsibility and Lines of Communication

The Contracting Officer's Representative, and Project Inspectors from the Battle Mountain Field Office and Tonopah Field Station, will have the direct responsibility to ensure the Contractor's compliance with the contract stipulations. All employees involved in the gathering operation will keep the best interest of the animals at the forefront at all times.



Young foal safely released with it's mother back to the Fish Creek HMA, February 2006.

Appendix B: Wild Horse and HMA Background Information Bald Mountain and South Shoshone HMAs



Horses near Elephant Head, August 2006

South Shoshone and Bald Mountain History and Characteristics

Historical information indicates that the Bald Mountain HMA herd may have been influenced by a large gray imported English Thoroughbred released by the owners of the Grass Valley Ranch in the 1960's. The owner had a permit to graze horses on public land. The horses were known to be distributed across the Toiyabe Range north to Bald Mountain, as the Carico Lake/Grass Valley Allotment fence in that portion of the allotment was not constructed until 1976. When the HMA was gathered in 1981, the gather contractor noted that the grey horse was still present, estimated to be over thirty years of age, and was unable to trap the horse. During the 1974 inventory, grey and white horses were noted as well as black, sorrel, and bay. Today, white and grey horses are still observed in the HMA. Paint (pinto) horses are also observed in the HMA, and assumed to be a result of mixing with the Callaghan HMA to the south.

During the 1975 inventory of the South Shoshone Herd Area, the dominant color noted was bay, followed by sorrel, and brown. Wild horses with pinto markings have also been observed during census flights in recent years. Information regarding the origin of the wild horses in this HMA is limited. It is suspected that the domestic horses raised by the Grass Valley Ranch distributed throughout the Toiyabe Range could have easily influenced the South Shoshone herd because of the lack of fences to restrict movement at the time.

In past years, the wild horses within the Bald Mountain HMA have been noted to be in good body condition when compared to other HMAs such as South Shoshone and Callaghan; however, it was noted during the most recent flight in 2005, that the South Shoshone HMA wild horses were in the best condition of the three areas.

Wild Horse Gather History

Only one documented gather has been conducted by the BLM within the Bald Mountain HMA. Between July 1981 and January 1982, a total of 364 wild horses were removed from the HMA through a wild horse gather contract.

In 2002, 47 wild horses were removed from the South Shoshone HMA in the Cedar’s Pasture of the Austin Allotment south of the Carico Lake Allotment boundary in conjunction with a gather completed on the Callaghan HMA.

Estimated Age Structure and Sex Ratios

Estimated age structure and sex ratio was compiled based on the 1997 Diamond Complex gather in which 1,358 horses were gathered. This area had not previously been subjected to a gather and the age structure for this area is considered “typical” of ungathered or “natural” conditions within the HMAs managed by the BMFO. The following table displays this estimated age structure for the Complex.

Table 1. 2006 Estimated Age Structures and Sex Ratios – Shoshone Complex Gather

Age	Bald Mountain		South Shoshone		Totals		Totals%	
	Males	Females	Males	Females	Males	Females	Males	Females
Foal	24	24	19	18	43	42	6.01%	5.87%
1	15	13	16	13	31	26	4.34%	3.64%
2	25	17	22	15	47	32	6.57%	4.48%
3	24	18	21	16	45	34	6.29%	4.76%
4	19	17	17	15	36	32	5.03%	4.48%
5	16	13	14	12	30	25	4.20%	3.50%
6	12	8	10	8	22	16	3.08%	2.24%
7	9	10	8	9	17	19	2.38%	2.66%
8	9	9	8	8	17	17	2.38%	2.38%
9	9	12	9	11	18	23	2.52%	3.22%
10-14	15	22	13	18	28	40	3.92%	5.59%
15-19	10	16	10	14	20	30	2.80%	4.20%
20+	5	8	5	7	10	15	1.40%	2.10%
Total	192	187	172	164	364	351	51%	49%

Wild Horse Census

In 1974 and 1975 the first extensive wild horse aerial inventories were completed for select areas of the District where current inventory data was absent. During a July 1974 inventory of the Bald Mountain Herd Area, a total of 118 wild horses were observed. In February 1975 the South Shoshone Herd Area was inventoried, and 84 wild horses were observed.

The majority of census flights since 1974 were completed using helicopter. Fixed-wing aircraft was also used for some flights. Census reliability through the years varies due to many factors. Type of aircraft, number and experience of observers, weather, season of year and numbers of hours flown all impact the accuracy of the flight. Movement of wild horses in and out of areas also influence

census results. Ideally, census flights of the South Shoshone, Bald Mountain, and Callaghan HMAs should be scheduled concurrently to account for these inherent movement patterns. Gathers completed in adjoining HMAs also influenced population numbers. The Callaghan HMA has been gathered numerous times since 1987 when 471 wild horses were removed. In 1997 1,066 were removed from the Callaghan HMA and 333 removed from the Rocky Hills HMA. The Callaghan HMA was last gathered in 2002 when a total of 855 were removed. At this time, 47 wild horses were also removed from the Cedar’s Pasture of the South Shoshone HMA in the Austin Allotment.

The following is a breakdown, by HMA, of the numbers and adult/foal ratio of wild horses observed during the census flights completed for the Bald Mountain and South Shoshone HMAs.

Table 2. South Shoshone HMA Census History

Year	Month	Carico Lake Allotment Portion			Austin Allotment Portion			Foal%
		Adults	Foals	Total	Adults	Foals	Total	
1975	February	74	10	84	No Data			12%
1978	January	107	0	107	66	0	66	0%
1982	May	69	16	85	32	5	37	17%
1989	August	91	18	109	No Data			17%
1991	July	167	29	196	7	0	7	14%
1993	August	189	12	201	37	1	38	5%
1994 ¹³	April	97	12	109	No Data			11%
1995 ¹⁴	February	188	1	189	34	0	34	1%
1995	September	156	45	207	No Data			22%
1998	March	362	15	377	40	3	43	4%
2001	March	347	6	353	55	3	58	2%
2005	March	236	8	247	3	0	3	3%

Table 2. Bald Mountain HMA Census History

Bald Mountain HMA Inventory History					
Year	Month	Adults	Foals	Total	Foal%
1974	July	100	18	118	15%
1978	January	486	59	545	11%
1979	October	733	NA	733	20%
1980	November	553	138	691	20%
1981	June	567	119	686 ¹⁵	17%
1981	September	403	NA	403 ¹⁶	%

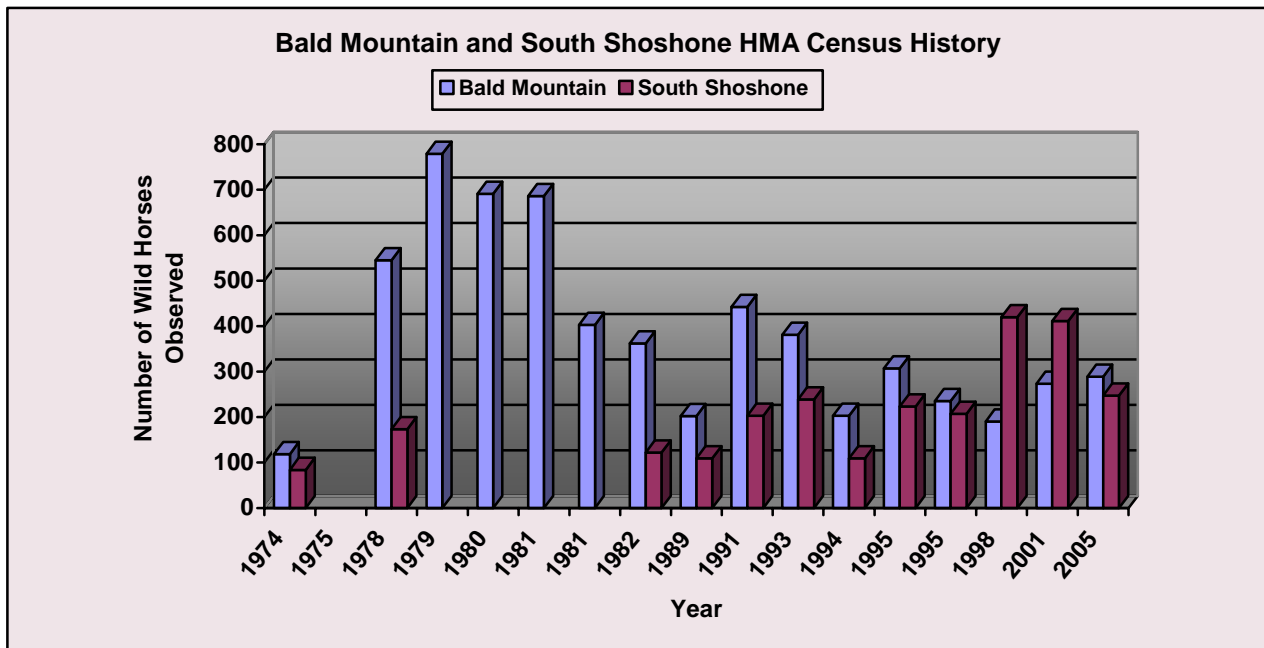
13. The 1994 flight was a “distribution” flight, and not recognized as a complete inventory of the HMA. It is included here for information only.

14. The February 1995 flight was a “distribution” flight, and not recognized as a complete inventory of the HMA. It is included here for information only.

15. This June 1981 flight was a pre-gather flight to document wild horse numbers and distribution.

16. This flight was conducted during the period when the HMA was being gathered. Foals and adults were not

Bald Mountain HMA Inventory History					
Year	Month	Adults	Foals	Total	Foal%
1982	September	326	36	362	10%
1989	August	162	40	202	20%
1991	July	366	76	442	17%
1993	August	332	49	381	15%
1994 ¹⁷	April	177	26	203	13%
1995 ¹⁸	February	303	4	307	1%
1995	September	185	50	235	21%
1998	March	183	7	190	4%
2001	March	266	7	273	3%
2005	March	270	19	289	7%



Wild Horse Distribution

Wild horse locations as observed during census and distribution flights since 1974 indicate significant fluctuations of wild horse distribution across both HMAs, which is likely a result of snow depth and other seasonal factors, water and forage availability, possible illegal activity and harassment of wild horses, and overall population size and density. Through interpretation of census

differentiated.

17. The 1994 flight was a “distribution” flight, and not recognized as a complete inventory of the HMA. It is included here for information only.

18. The February 1995 flight was a “distribution” flight, and not recognized as a complete inventory of the HMA. It is included here for information only.

and distribution flight data, some generalizations in distribution patterns can be made. These patterns are based on existing populations at the time the flights were conducted, and may not represent distribution following achievement of an appropriate management level (AML).

Bald Mountain HMA

Throughout the history of the Bald Mountain HMA, some patterns in wild horse distribution have been noted. Regardless of time of year or environmental conditions, many of the census flights and field observations reveal concentrations of wild horses in three different areas of the HMA. The primary concentration occurs on the far eastern side of the HMA in the vicinity of Bald Mountain, Copper Canyon, Hot Springs Point and Dry Creek Wash. The second location where concentration occurs is at the boundary fence with Grass Valley Allotment in the vicinity of Dead Ox Canyon. Throughout census and other HMA files, “banding” of the wild horses from the Callaghan and Bald Mountain HMAs has been documented in this location. The concentration of wild horses in the south east portion of the HMA has been documented as early as 1978. The third area of wild horse concentration is in the vicinity of the Red Mountain Springs.

The occurrence of clusters of wild horses in these areas appears to be most pronounced in the winter months, and observed during census flights were conducted in January, or March. This was notable during 1998 and 2001 census flights conducted in March, when 58-71% of the wild horses observed within the HMA were located on the east side of the HMA between Dry Canyon Wash and Bald Mountain in the vicinity of Hot Springs Point and Copper Canyon. During the March 2005 census, over 78% of the wild horses were located in these areas. Additionally, field observations have documented large numbers of wild horses in the vicinity of Dry Canyon, Copper Canyon, Ox Corral Canyon, Blue Mountain Spring, and Dead Ox Spring. This trend was also reflected in census flights during the 1980-1990’s.

In general, during winter months, wild horses will remain in lower elevations when snow cover prevents occupancy of higher elevations. However, wild horses have been observed utilizing south facing, snow free slopes as high as 8000’ elevation.

During summer and fall census flights, wild horses were more uniformly distributed into the higher elevations and wild horses were considered well scattered throughout the entire HMA. Precipitation levels through the year, and from year to year have likely influenced wild horse movement and distribution; however, patterns in the census maps are not apparent.

South Shoshone HMA

Similar distribution variances are revealed through analysis of the census maps for the South Shoshone HMA. Patterns of wild horse concentration have been documented in the southern portion of the HMA, with few wild horses documented in the northern portion of the HMA north of Elephant Head or Moss Creek. During the most recent census flights in March of 1998, 2001, and 2005, few horses were located on the eastern slopes of the Shoshone Range. Populations in this portion of the HMA have averaged 3-21% of the population during these flights. Also during these last three flights, 1-14% of the population has been located in the Cedars Pasture. In 2005 only 3 horses were located in this portion of the HMA.

The primary concentration of wild horses in this HMA is in the southwest portion. In 1998, 77% of wild horses were located on the valley bottom west of the Shoshone Range, south of Moss Creek. In 2001, 68% of the wild horses were located south of Elephant Head, particularly between the southern boundary of the Carico Lake Allotment (Bob Town Fence) and Wood Canyon. Similarly, 64% of the wild horses were observed in the southwest portion of the HMA during the March 2005 census.

Though the vicinity of Wood Canyon has typically been the predominant location for the concentration of wild horses since 1975, several census flights and field observations until 1995 documented wild horses residing on the east slope of the Shoshone Range in the vicinity of Rattlesnake Canyon and Stone Cabin Basin. As with the Bald Mountain HMA, wild horses appeared to be at their most uniform distribution during the summer flights when the higher elevations appear to be more frequently utilized; however, snow free slopes to 8000' feet are commonly utilized in winter. Current field observations indicate continued heavy presence of wild horses north and south of Wood Canyon on the west face of the Shoshone Range. Extensive trails and stud piles have been observed, as well as large numbers of wild horses. Numerous decomposed carcasses and skeletal remains have also been reported in the area.

Although precipitation patterns and drought have likely influenced herd distribution, patterns are not apparent from analysis of the census and distribution maps. It is possible that population fluctuations in the Bald Mountain HMA have influenced the population in the South Shoshone HMA, as fences do not separate the two HMAs.

One of the most reoccurring issues for the South Shoshone HMA concerns the Bob Town Fence and wild horses breaching it to enter the Cedar's Pasture in the Austin Allotment to the south. Though the fence was originally constructed in 1954, historic, well-used trails through the area exist and have continuously been used by wild horses. Problems wild horses crossing the fence, causing damage to the fence and lack of water for wild horses in the Cedar's Pasture have long been documented. Wild horses were pushed out of the pasture north into the Carico Lake Allotment in 1991 due to lack of water. In 2002, 47 wild horses were removed from the pasture in conjunction with the Callaghan HMA gather. During the most recent census flight February 2005, 3 wild horses were documented within the pasture.

Wild Horse Movement Patterns

Neither the Bald Mountain nor South Shoshone HMAs are fenced, and wild horse movement is unrestricted between the two HMAs. Because the boundaries are not fenced, wild horses are not prevented from moving outside of HMA boundaries. Historically, the majority of wild horses have been located within the HMA boundaries. Some wild horses move outside of the Bald Mountain HMA to the north and east. In recent years, wild horses have frequently been located outside of the South Shoshone HMA in the southwestern portion between the Shoshone Range and State Highway 305.

It is likely that wild horses move within the Carico Lake Allotment between the two HMAs. It is also likely that wild horses drift from Bald Mountain HMA east to Rocky Hills HMA. Wild Horse movement between the Bald Mountain and Callaghan HMAs is a frequent occurrence. Prior to construction of the Dead Ox Canyon allotment boundary fence in this portion of the allotment in

1976, movement north and south along the Toiyabe Range was unrestricted. Historically and currently, mixing of wild horses in the vicinity of the boundary fence has been documented during census flights. Wild horses move through breaks in the fence or through open gates. These movement patterns account for fluctuations in the Bald Mountain HMA population size following gathers that have taken place on Callaghan and Rocky Hills HMAs. It is possible that these gathers have also influenced the size of the South Shoshone population. Ideally, future wild horse gathers should involve gathering the Rocky Hills, Callaghan, Bald Mountain, and South Shoshone HMAs simultaneously.

Population Growth Rates

Bald Mountain

Foaling rates observed during summer and fall census flights since 1974 reveal a range of 10-21% foals each year, and an average of 17% foals over the history of post-foaling census flights. Foaling rates indicate the percent of the population comprised of foals less than a year of age at the time of the flight. In contrast, average annual rates of herd increase take into account growth of the herd through reproduction, as well as mortality. The average rate commonly utilized within the HMAs administered by the Battle Mountain Field Office is 17.5% annual increase of wild horse herds.

Analysis of the Bald Mountain HMA census data since 1974 revealed significant fluctuation of population size through time, and an annual rate of increase lower than the district average. Several reasons for this may exist. The only gather to take place in the Bald Mountain HMA was completed in 1981, when 364 wild horses were removed from an estimated population of 686.

Extensive illegal shooting of wild horses in northern Nevada occurred between 1987-1989, and no less than 266 carcasses were documented within the Bald Mountain HMA. Record snowfall in 1993, and below average precipitation during the early 1990's may have also increased mortality rates within the herd. Field office records from the early 1980's suggests an average rate of increase of 16%. Analysis of the census data between 1974 and 2005 suggests that during some periods of the history of the Bald Mountain HMA, herd increase may have averaged as little as 12.5%.

What has likely been the most significant influence to the Bald Mountain HMA population size is the gathers and removals of wild horses that have taken place in the Callaghan HMA. Gathers conducted in the Callaghan HMA in 1987, 1997 and 2002 have resulted in the removal of over 2,400 wild horses. Data from census flights indicates that populations numbers in the Bald Mountain HMA dropped in years following Callaghan HMA gathers, and it is believed that these horses temporarily or permanently emigrated into the Callaghan HMA when competition was reduced, resulting in this compensatory distribution fluctuation.

Despite the observed health of the herd, the 2005 census figures for the Bald Mountain HMA are lower than the current estimates based on the last census completed in March 2001. Between 1998 and 2001, the Bald Mountain HMA population increased by 79 animals which approximates a 13% annual rate of increase. Between 2001 and 2005 flights, the Bald Mountain HMA increased by 8 horses according to the census results, and is currently 150-200 wild horses short of estimated. The primary reason for this is likely the large gather that occurred in the Callaghan HMA in 2002. The

Callaghan HMA population is currently 150-200 wild horses larger than estimated according to the 2002 gather data and the 2005 census data.



Elephant Head area, South Shoshone HMA

South Shoshone HMA

The South Shoshone HMA data also reflects large fluctuations in population size. The average foaling rate computed from summer census flights completed since 1975 is 15%, and ranged between 12-21%. Between 1989 and 1993, rate of herd increase averaged 17%, which is close to the BMFO average utilized across all HMAs. Overall; however, between 1975-1997 the annual rate of increase in the HMA has averaged approximately 6-7%. Census data from 1975-2005 suggests gradual increase in the population size until 1991 when growth leveled out. The population rose again until 1998, then experienced a downward trend between 1998 and 2005. As with the Bald Mountain HMA, record snowfall events or drought years may have increased mortality rates within the herd. Mountain lion predation and illegal shootings may have also influenced the population. During the 1987-1989 shootings in northern Nevada, at least 7 carcasses were documented in the South Shoshone HMA.

Despite the observed health of the herd, the 2005 census figures for both South Shoshone are very much lower than the current estimates based on the last census completed in March 2001. Between 1998 and 2001, the census results reveal a reduction in the South Shoshone HMA of 15 animals. Between 2001 and 2005 flights, further reductions occurred in the South Shoshone HMA with the population falling by 111 animals to a pre-foaling 2005 population of 236. Between 1998 and 2000, the population declined at a rate of 1.5% per year. Between 2001 and 2004 the population declined at an average rate of 9% per year according to the 2005 census data.

The South Shoshone HMA population has never been reduced through a BLM wild horse gather. BMFO staff have not documented animals in poor condition or dying as a result of drought or harsh winters. Several scattered occurrences of skeletal remains were observed in each HMA from the helicopter during the 2005 census, but was not excessive. Most occurrences were noted in the southern portion of the South Shoshone HMA where the majority of the wild horses reside. For this reason, old skeletal remains are not unusual. In fact, the wild horses in South Shoshone appeared to

be very healthy in March, 2005, which is typically the leanest time of the year between winter and spring.

Mountain lion predation could also be affecting population growth; however, specific information is not available. Disease or congenital defects could also be causing increased death losses in the South Shoshone HMA; however, no information exists at this time. Data will be collected during the first scheduled gather in the future to determine any of these influences on the herd.

Both HMAs could have been influenced by illegal human activity. Anonymous reports have been received in past years of airplanes herding wild horses in the Bald Mountain and South Shoshone HMAs. It is possible that wild horses are being shot or killed by other human means, although carcasses have not been discovered. Over the years, field staff has located old skeletal remains of which cause of death was undeterminable. The Bald Mountain and South Shoshone HMAs are the only HMAs in the Shoshone-Eureka Planning area that exhibit a low or negative growth rate that cannot be explained by gather activities, fertility control or inherent movement patterns.

Illegal Activities

In 1980, dead wild horses were found in the Bald Mountain HMA and other nearby HMAs, which were determined to have been shot. In November 1980, 20 were located in Ox Corral Canyon, and in December, an additional 13 dead wild horses were located in the Bald Mountain HMA north of Corral Canyon. Between 1987-1989 over 500 wild horse carcasses were documented in Lander County. Investigators and veterinarians determined that the majority of animals had died from gun shot wounds. No less than 266 carcasses were discovered in Bald Mountain HMA, and 7 in South Shoshone HMA. Other HMAs involved included Augusta, Callaghan, and New Pass/Ravenswood.

Though several individuals were indicted for wild horse deaths in Lander and other Nevada counties, the cases were eventually dismissed due to insufficient evidence. Nonetheless, a significant number of wild horses were killed, which influenced the population sizes during that time. Today, groupings of wild horse skeletal remains are still discovered in both South Shoshone and Bald Mountain HMAs. As recently as winter 2000, 12 wild horse skeletons were located in close proximity of one another north of Corral Canyon in the Bald Mountain HMA. The grouping of the skeletons of apparently younger animals caused reason for suspicion; however, the carcasses were too decomposed to determine the cause of death. There have also been at least two anonymous reports received between 1990-1999 of small fixed wing aircraft pushing or herding wild horses. In one case, gunshots were heard, but follow-up investigation produced no findings of illegal activity.



Elephant Head area, August, 2006

Appendix C: Summary of Population Modeling

Population Model Overview

The WinEquus Feral Horse Population Model, developed by Dr. Steven Jenkins at the University of Nevada at Reno was designed to assist wild horse and burro specialists evaluate various management plans and possible outcomes for management of wild horses that might be considered for a particular area. The population model is not applicable for burros. Windows version 1.40 of the model is accessible at www.equinox.unr.edu/homepage/jenkins.

The model uses data on average survival probabilities and foaling rates of horses to simulate population growth for up to 20 years. The model accounts for year-to-year variation in these demographic parameters by using a randomization process to select survival probabilities and foaling rates for each age class from a distribution of values based on these averages. This aspect of population dynamics is called environmental stochasticity, and reflects the fact that future environmental conditions that may affect horse populations cannot be known in advance. Therefore, each trial with the model will give a different pattern of population growth. Some trials may include mostly “good years”, when the population grows rapidly; other trials may include a series of several “bad” years in succession. The stochastic approach to population modeling uses repeated trials to project a range of possible population trajectories over a period of years, which is more realistic than predicting a single specific trajectory.

The model incorporates both selective removal and fertility control treatment as management strategies. A simulation may include no management, selective removal, fertility control treatment, or both removal and fertility control treatment. Wild horse and burro specialists can specify many different options for these management strategies such as the schedule of gathers for removal or fertility control treatment, the threshold population size which triggers a gather, the target population size following a removal, the ages and sexes of horses to be removed, and the effectiveness of fertility control treatment.

More detailed information regarding the model, the parameters used, and the interpretation of the data is available in the Callaghan HMA Gather Plan/EA #NV062-EA02-41, June 2002.

Population modeling was completed for each HMA and for all alternatives including the No Action Alternative. Initial population age structures were developed for each HMA based on the age structure of the 1997 Diamond Complex gather data (refer to Appendix B). All simulations used the survival probabilities and foaling rates supplied with the WinEquus population model for the Garfield Flat HMA. Survival data was collected by M. Ashley and S. Jenkins at Garfield Flat, Nevada between 1993 and 1999. Foaling rate data was collected by M. Ashley and S. Jenkins at Garfield Flat, Nevada between 1993 and 1999.

These initial populations for the Complex were entered into the model and put through simulations that included 1). gather to AML, 2). modification of sex ratios for 60% studs, 3). fertility control with gather, 4). fertility control without gather, or 5). no management (no gather). The simulations were run for 100 trials for five years. For each simulation, a series of graphs and tables were

generated which included the “most typical” trial, population sizes, growth rates, and gather numbers, and minimum, average, and maximum population sizes.

Results of Population Modeling

The model was run for a period of five years from 2007/2008 to 2013, and gives output through 2013 (which is actually six years). These numbers are useful to make relative comparisons of the different alternatives, and potential outcomes under different management options. The lowest, median and highest trial are displayed for each simulation completed. This output, together with the time series and most typical trial graphs are useful representations of the results of the program in terms of assessing the effects of the management plan because it shows not only expected average results but also extreme results that might be possible. The minimum population size in general reflects the numbers that would remain following the gather or a possible negative growth rate as a result of fertility control. The maximum population size generally reflects the population that existed prior to the gather, and in many cases that figure would not be exceeded during the six years of the simulations. Half of the trials were greater than the median and half of them less than the median.

The median and the various percentiles given in the tables are useful to interpret the data. For the minimum population sizes for example, half of the trials have a minimum less than the median of the minima and half have a minimum greater than the median of the minima. If the user was concerned about applying a management plan that kept the population above some level, because the population might be at risk of losing genetic diversity if it were below this level, then one might look at the 10th percentile of the minima, and argue that there was only a 10% probability that the population would fall below this size in x years, given the assumptions about population data, environmental stochasticity, and management that were used in the simulation.

Another example, would be to examine the percentile figures. Only 10% of the trials would have entailed gathering fewer animals than shown in the row of the table labeled "10th percentile", while 10% of the trials would have entailed gathering more than shown in the row labeled "90th percentile". In other words, 80% of the time one could expect to gather a number of horses between these 2 values, given the assumptions about survival probabilities, foaling rates, initial age-sex distribution, and management options made for a particular simulation

Time Series Graph (Spaghetti Graph) and Most Typical Trial

The Spaghetti Graph shows how population size changes over time for each trial. Each colored line represents one of the 100 trials for the simulations completed for each alternative. The two horizontal lines located in the graphs represent the threshold for gather (upper range of AML) and the target population size (low range of AML). The Most Typical Trial graph includes a red line, which represents what the model has chosen as the trial with the most typical results. This trial closely matches the average of all 100 trials. The most typical trial is useful for making comparisons between alternatives, and for predicting what would be the probable results of the action.

Bald Mountain HMA Modeling

Population modeling for Bald Mountain HMA was completed for the Proposed Action, Alternative 1 (release of 60% studs), and the No Action Alternative. Simulations were also complete to assess

fertility control in conjunction with a gather, and fertility control only as a method to control population growth.

Of 100 trials over 5 years, the typical trial results of the model indicate that implementation of fertility control would result in approximately 5% smaller population of wild horses by 6 years than without fertility control (10 animals). The release of 60% studs (Alternative 1) reflected 10% lower population in the typical trial (20 animals) than the Proposed Action. Overall, the differences between releasing 50% studs, implementing fertility control or releasing 60% studs was very slight.

This is also reflected in the results of the model for number of wild horses that would need to be gathered and removed under each alternative. Releasing 60% studs reflected the future gather of anywhere from 6 more wild horses, to 16 fewer wild horses than the Proposed Action. The numbers of animals needing to be removed were also very similar between the alternatives, reflecting less than 5% difference between the release of 60% studs, and the Proposed Action. Of the 100 trials, the growth rates observed for release of 60% studs were approximately 20% lower than for implementation of the proposed action. Growth rates did not vary greatly among the alternatives.

The model also displayed projected number of gathers that would likely occur under each alternative. Under the proposed action, 98% of the trials resulted in 2 gathers being conducted in 6 years, and 2% of the trials reflecting only one gather occurring. With release of 60% studs, 99% of the trials required 2 gathers within the 6 years. The results for trials reflecting a gather taking place in year 4 (2011), are 72%, release of 60% studs and, 84% Proposed Action. Therefore, 12% more of the trials reflected a gather occurring in year four than if 60% studs were released.

Table 1 – Typical Trial Populations for the Bald Mountain HMA Modeling

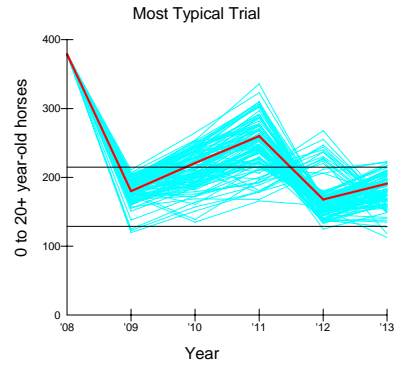
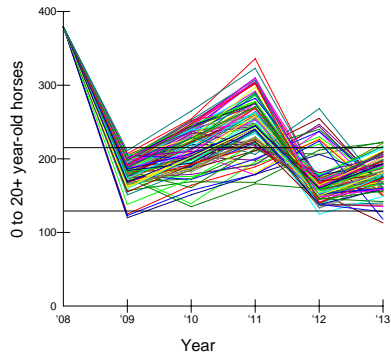
Year	Proposed Action		Fertility control		Alt 1: 60% studs		No action
	% of trials with a gather	Typical Trial Population	% of trials with a gather	Typical Trial Population	% of trials with a gather	Typical Trial Population	Typical Trial Population
Year 1 - 2008	100	379	100	379	100	379	437
Year 2 - 2009	0	180	0	191	0	174	512
Year 3 - 2010	0	221	0	211	0	210	609
Year 4 - 2011	84	260	88	260	72	247	718
Year 5 - 2012	12	168	9	153	20	151	773
Year 6 - 2013	2	191	2	181	7	171	910
100 Trial Avg.	--	198	--	200	--	192	621

The model automatically increases the population for foaling in year 1. Since the proposed gathers are planned to occur in July, it was not desirable to allow the model to reflect the additional foals during the same year as the gather. Year 1 reflects the pre-gather population as currently estimated. The model was set to reflect an exact number rather than a random number to better focus the potential effects of the alternatives on the population. Year 2 reflects the population estimates in

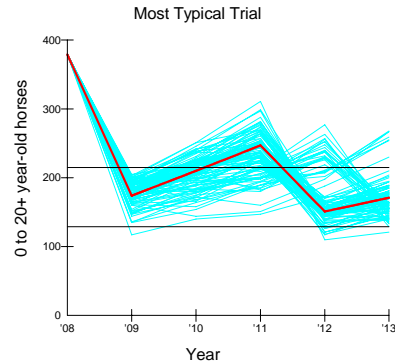
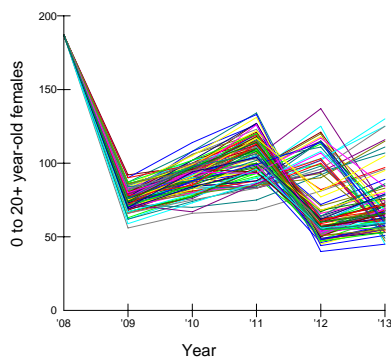
2009 following two foaling seasons or one foaling season plus one season of fertility control effectiveness in the case of a fertility control scenario

Bald Mountain HMA Proposed Action

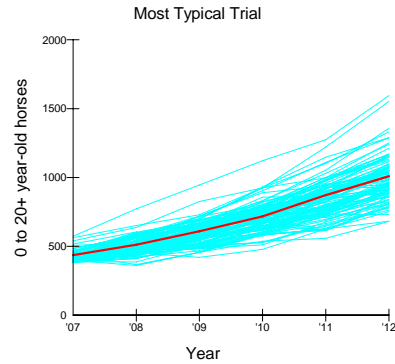
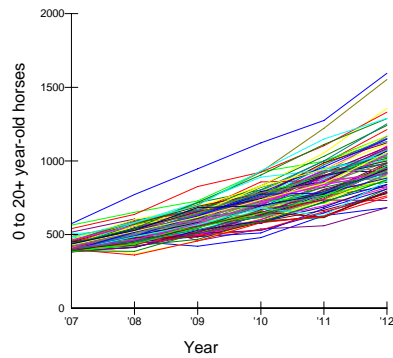
Population Size Spaghetti Graph and Most Typical Trial



Bald Mountain HMA Alternative 1, 60% Studs



Bald Mountain No Action Alternative



Bald Mountain HMA Population Sizes

The following tables display the Minimum, Average and Maximum population sized obtained through the modeling

Table 2. Bald Mountain HMA Population Sizes in 6 years – Minimum

Trial	Alternative		
	Proposed Action	Alt 1/60% Studs	No Action
Lowest Trial	113	110	361
10 th Percentile	136	130	386
25 th Percentile	146	140	394
Median Trial	157	148	410
75 th percentile	165	156	430
90 th percentile	171	164	460
Highest Trial	181	182	574

Table 3. Bald Mountain HMA Population Sizes in 6 years – Average

Trial	Alternative		
	Proposed Action/	Alt 1/60% Studs	No Action
Lowest Trial	197	194	514
10 th Percentile	216	214	575
25 th Percentile	221	218	621
Median Trial	228	223	678
75 th percentile	237	229	718
90 th percentile	242	232	771
Highest Trial	259	244	1047

Table 4. Bald Mountain HMA Population Sizes in 6 years – Maximum

Trial	Alternative		
	Proposed Action	Alt 1/60% Studs	No Action
Lowest Trial	379	379	682
10 th Percentile	379	379	809
25 th Percentile	379	379	892
Median Trial	379	379	968
75 th percentile	379	379	1074
90 th percentile	379	379	1170
Highest Trial	379	379	1595

The maximum populations for the Proposed Action and Alternative 1 are the pre-gather populations used by the model, as the model assumes that a gather will be triggered prior to the population exceeding this level.

Bald Mountain HMA Growth Rates

Through the model, average population growth rates were obtained for the Proposed Action, Alternative 1 and the No Action Alternative out of 100 trials. Growth rates are displayed for the lowest, median and highest trial in five years.

Table 5, Average Growth Rate in 5 Years

Trial	Alternative		
	Proposed Action	Alt 1/60% Studs	No Action
Lowest Trial	3.4	7.5	5.7
10 th Percentile	12.9	12.5	15.0
25 th Percentile	16.6	14.1	16.7
Median Trial	19.9	16.2	18.8
75 th percentile	22.2	18.8	20.8
90 th percentile	24.3	20.7	23.1
Highest Trial	28.7	25.2	26.1

Bald Mountain HMA, Gathers and Removals

Tables 6 and 7 reflect the differences among the alternatives for animals gathered, and removed from the HMA. Of 100 trials, the model indicated that of the lowest trials, 45 mares would be treated with fertility control, whereas with the highest trial, 101 mares would be treated.

Table 6, Totals in 6 Years – Gathered

Trial	Alternative		
	Proposed Action	Alt 1/60% Studs	No Action
Lowest Trial	337	337	0
10 th Percentile	450	456	0
25 th Percentile	468	474	0
Median Trial	494	494	0
75 th percentile	518	506	0
90 th percentile	548	532	0
Highest Trial	583	567	0

Table 7, Totals in 6 Years -- Removed

Trial	Alternative		
	Proposed Action	Alt 1/60% Studs	No Action
Lowest Trial	205	208	0
10 th Percentile	286	290	0
25 th Percentile	298	298	0
Median Trial	312	311	0
75 th percentile	330	324	0
90 th percentile	350	338	0
Highest Trial	382	363	0

South Shoshone HMA Modeling

The following tables display the results of the model for the Proposed Action/Alternative 1 and the No Action Alternative.

Table 8, South Shoshone HMA modeling results

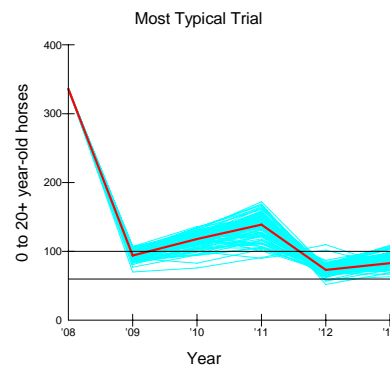
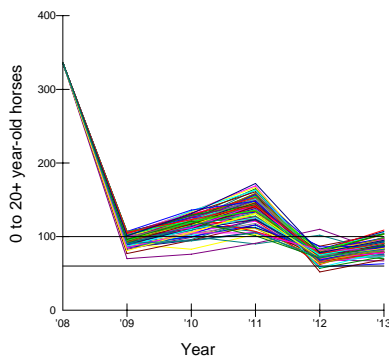
Year	Proposed Action		No action
	% of trials with a gather	Typical Trial Population	Typical Trial Population
Year 1 - 2008	100	336	356
Year 2 - 2009	0	94	451
Year 3 - 2010	0	118	539
Year 4 - 2011	98	139	650
Year 5 - 2012	2	73	649
Year 6 - 2013	0	83	627
100 trial average	--	101	545

Table 9, Average Growth Rate in 5 Years

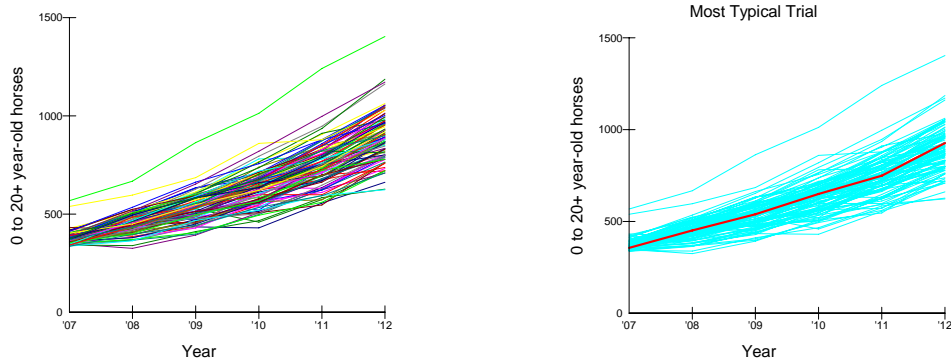
Trial	Alternative	
	Proposed Action	No Action
Lowest Trial	13.0	9.6
10 th Percentile	15.6	15.2
25 th Percentile	19.5	16.9
Median Trial	22.1	19.5
75 th percentile	24.9	21.5
90 th percentile	27.2	22.5
Highest Trial	31.6	24.9

South Shoshone HMA, Proposed Action/Alternative 1: Gather with No Fertility Control

Population Size Spaghetti Graph and Most Typical Trial



South Shoshone No Action Alternative



South Shoshone HMA Population Sizes

Tables 10-12 reflect the Minimum, Average and Maximum populations obtained through the model for the South Shoshone HMA.

Table 10, South Shoshone HMA, Population Sizes in 6 years – Minimum

Trial	Alternative	
	Gather	No Action
Lowest Trial	52	325
10 th Percentile	66	342
25 th Percentile	69	350
Median Trial	73	365
75 th percentile	76	382
90 th percentile	81	398
Highest Trial	87	568

Table 11, South Shoshone HMA, Population Sizes in 6 years – Average

Trial	Alternative	
	Gather	No Action
Lowest Trial	127	462
10 th Percentile	133	522
25 th Percentile	138	556
Median Trial	142	603
75 th percentile	146	641
90 th percentile	148	684
Highest Trial	152	960

Table 12, South Shoshone HMA, Population Sizes in 6 years – Maximum

Trial	Alternative	
	Gather	No Action
Lowest Trial	336	623
10 th Percentile	336	748
25 th Percentile	336	802
Median Trial	336	892
75 th percentile	336	968
90 th percentile	336	1044
Highest Trial	336	1404

Population Modeling Summary

To summarize the results obtained by simulating the range of alternatives for the Carico Complex wild horse gather, the following questions can be addressed.

To summarize the results obtained by simulating the range of alternatives for the Shoshone Complex wild horse gather, the following questions can be addressed.

- Do any of the Alternatives “crash” the population?

None of the alternatives indicate that a crash is likely to occur to the population. Minimum population levels and growth rates are all within reasonable levels, and adverse impacts to the population are not likely.

- What effect does fertility control have on population growth rate?

The implementation of fertility control when compared to the Proposed Action or the Alternative 1 was indicated through the model to have very similar results for population sizes, growth rates and number of animals removed from the range during future gathers. Differences ranged from 3-5% between the Proposed Action and a simulation for fertility control. Differences were slightly larger between the Proposed Action and the Alternative 1 (release of 60% studs), averaging 5-10% differences for growth rates, population sizes and numbers of animals removed from the range during the modeled time period.

- What effect do the different alternatives have on the average population size?

The natural variation reflected by the various model trial years appears to be more of an influence to the population size than fertility control or modification of sex ratios, as there are minimal differences within the population sizes and growth rates. The largest differences in growth rates and population sizes were primarily noted for the alternative to modify the sex ratio, rather than to implement fertility control.

Even though the results are similar between the Proposed Action and Alternative 1, A post gather population comprised of 60% studs, could result in 5-10% lower population after 6 years, and up to 20% lower growth rates than the Proposed Action.

Alternatives Considered but removed from further consideration

Fertility Control Only

A scenario was considered to implement fertility control on both HMAs through a wild horse gather, but not to remove any wild horses to achieve the AML. The results of the model are displayed in Tables 13-15.

Table 13, Population Sizes in 6 years – South Shoshone HMA

Trial	Growth Rates Average in 5 years	Fertility Control Only - South Shoshone HMA		
		Minimum Population	Average Population	Maximum Population
Lowest Trial	12.3	329	441	602
10 th Percentile	15.2	336	502	682
25 th Percentile	17.6	336	532	756
Median Trial	19.4	336	560	815
75 th percentile	21.7	336	593	898
90 th percentile	23.4	336	618	960
Highest Trial	26.0	336	674	1065

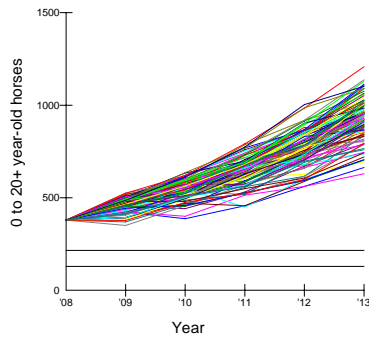
Table 14, Population Sizes in 6 years – Bald Mountain HMA

Trial	Growth Rates Average in 5 years	Fertility Control Only - Bald Mountain HMA		
		Minimum Population	Average Population	Maximum Population
Lowest Trial	10.7	351	478	630
10 th Percentile	14.7	379	544	752
25 th Percentile	17.6	379	591	852
Median Trial	19.7	379	626	933
75 th percentile	21.5	379	657	1003
90 th percentile	23.5	379	688	1090
Highest Trial	26.1	379	751	1208

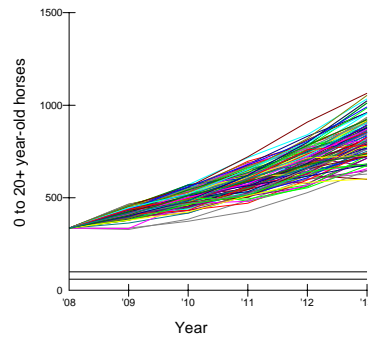
Table 15, Gathers in 6 years – Fertility Control Only

Trial	South Shoshone HMA		Bald Mountain HMA	
	Gathered	Treated	Gathered	Treated
Lowest Trial	695	301	758	326
10 th Percentile	758	321	829	362
25 th Percentile	795	338	889	379
Median Trial	837	354	938	402
75 th percentile	864	368	968	413
90 th percentile	903	382	1003	426
Highest Trial	960	417	1058	471

**Bald Mountain and South Shoshone HMA, Fertility Control Only
Spaghetti Graph**



Bald Mountain HMA



South Shoshone HMA

Summary – Fertility Control Only

- Without a gather to reduce the population to AML, the population levels continue to exceed AML. The average population levels for 100 of the trials for South Shoshone was 541 and for Bald Mountain 597 wild horses.
- Additionally, the numbers of horses that would be gathered and treated in 6 years far exceeds the numbers to gather with removals for both HMAs.
- For example, for the Bald Mountain HMA, with fertility control only, between 758-1058 would be gathered and 326-471 treated in six years. The gather only scenario would result in 337-583 gathered. Gather with fertility control indicated 338-620 gathered and 49-95 treated over a six year period.

Because an alternative to implement fertility control without gathering to AML would not result in AML being achieved, and would result in increased gather and fertility control costs, this alternative was not considered further.

Gather and Fertility Control

This simulation examined the potential results of implementing fertility control in conjunction with a gather for the both HMAs. The results are tabulated in the following tables.

Table 16, Population Sizes in 6 years – South Shoshone HMA

Trial	Growth Rates Average in 5 years	Fertility Control South Shoshone HMA		
		Minimum Population	Average Population	Maximum Population
Lowest Trial	5.6	51	124	336
10 th Percentile	14.1	60	130	336
25 th Percentile	17.9	69	136	336
Median Trial	21.5	72	140	336
75 th percentile	24.2	77	145	336
90 th percentile	26.7	82	148	336
Highest Trial	31.4	87	155	336

South Shoshone HMA, Gather with Fertility Control

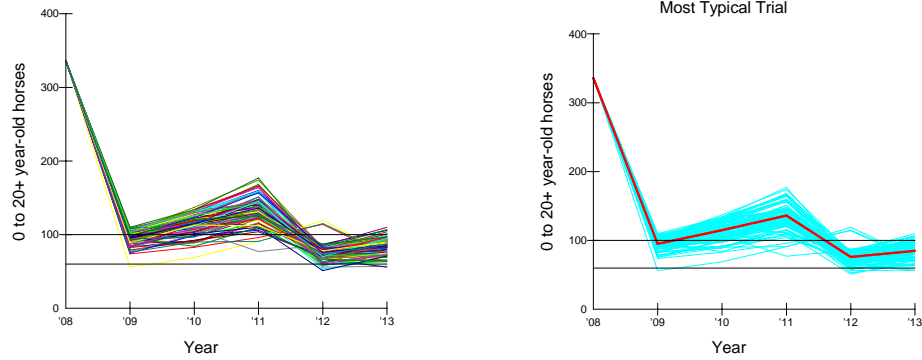
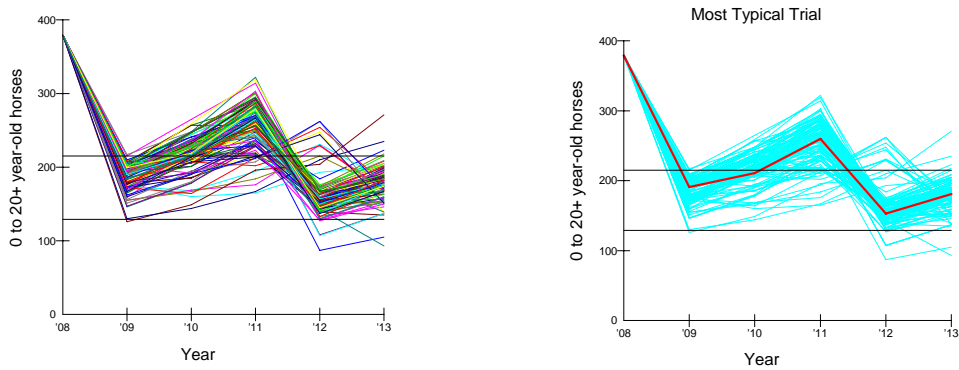


Table 17, Population Sizes in 6 years – Bald Mountain HMA

Trial	Growth Rates Average in 5 years	Fertility Control- Bald Mountain HMA		
		Minimum Population	Average Population	Maximum Population
Lowest Trial	7.2	87	205	379
10 th Percentile	14.1	131	215	379
25 th Percentile	17.2	144	223	379
Median Trial	20.1	153	230	379
75 th percentile	22.1	163	236	379
90 th percentile	23.9	168	242	379
Highest Trial	26.4	176	251	379

Bald Mountain HMA, Gather with Fertility Control



Summary – Fertility Control with Gather

The results of the modeling for fertility control implementation on the South Shoshone HMA were very similar to the results for Gather Only. In fact, the average population sizes in 6 years only differed by 2-3 wild horses.

Because the South Shoshone HMA has a relatively low AML, and has experienced a decline in the past it has been determined that it is not prudent to implement fertility control at this time. Data would be collected during the proposed gather and blood drawn for genetics testing. Analysis of this data and completion of an HMAP in future years may result in reconsideration of fertility control research of this herd implemented in future gathers.

Of 100 trials over 5 years, the typical trial results of the model indicate that implementation of fertility control for the Bald Mountain HMA would result in approximately 5% smaller population of wild horses by 6 years than without fertility control (10 animals).

Fertility control actually reflected the need to gather more animals (30-80) over 6 years, likely as a result of the need to capture additional animals to implement the vaccine during gathers. Growth rates did not vary greatly among the alternatives.

With fertility control 99% of the trials required 2 gathers within the 6 years. Of the 100 trials, 88% reflect a gather taking place in year 4 (2011) with the implementation of fertility control.



Elephant Head area, August, 2006