# Preliminary Environmental Assessment

DOI-BLM-NV-W010-2012-0055-EA

## Owyhee Complex Herd Management Area Gather

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*Prepared by:*


U.S. Bureau of Land Management
Winnemucca District Office
5100 E. Winnemucca Blvd.
Winnemucca NV 89445-2921

U.S. Bureau of Land Management
Elko District Office
3900 Idaho Street
Elko, Nevada 89801-4211


BLM

Humboldt River Field Office/Nevada

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DOI-BLM-NV-W010-2012-0055-EA

# Contents

Page

Figures ..... i
Tables ..... i
Acronyms ..... ii
Chapter 1. Introduction ..... 1
1.1 Background ..... 3
1.2 Purpose and Need for Action ..... 7
1.3 Decision to be Made ..... 8
1.4 Scoping, Public Involvement and Issues ..... 8
Chapter 2. Action Alternatives ..... 10
2.1 Actions Common to Alternatives A-C ..... 10
2.2 Alternative A. Phased-in Gather, Selective Removal, and Population Growth Control. ..... 13
2.3 Alternative B. Selective Removal of Excess Wild Horses to Low AML and Population Growth Control ..... 13
2.4 Alternative C. Remove Excess Wild Horses to within AML without Population Growth Control ..... 14
2.5 Alternative D. No Action Alternative ..... 14
2.6 Alternatives Considered but not Analyzed in Detail ..... 15
2.6.1 Use of Bait and/or Water Trapping Only ..... 15
2.6.2 Field Darting PZP Treatment ..... 15
2.6.3 Gathering the Owyhee Complex to High AML ..... 15
2.6.4 Control of Wild Horse Numbers by Natural Means ..... 16
2.6.5 Raising the Appropriate Management Levels for Wild Horses ..... 16
2.6.6 Remove or Reduce Livestock within the Owyhee Complex ..... 17
2.6.7 Control of Wild Horse Numbers by Fertility Control Treatment Only ..... 18
2.6.8 Make Individualized Excess Wild Horse Determinations Prior to Removal ..... 18
2.6.9 Use of Alternative Capture Techniques Instead of Helicopter Capture ..... 20
2.6.10 Designation of the HMAs to be Managed Principally for Wild Horses. ..... 20
2.7 Conformance ..... 20
2.8 Relationship to Laws, Regulations and other Plans ..... 21
2.9 Conformance with Rangeland Health Standards and Guidelines ..... 22
Chapter 3. Affected Environment: ..... 23
3.1 General Description of the Affected Environment ..... 23
3.2 Supplemental Authorities ..... 23
3.2.1 Cultural Resources ..... 24

3.2.2 Invasive, Nonnative Species ..... 24
3.2.3 Migratory Birds ..... 25
3.2.4 Native American Religious Concerns ..... 26
3.2.5 Threatened and Endangered Species ..... 27
3.2.6 Water Quality (Surface) ..... 31
3.2.7 Wetlands and Riparian Zones ..... 31
3.3 Additional Affected Resources ..... 33
3.3.1 Fisheries ..... 33
3.3.2 Public Health and Safety ..... 34
3.3.3 Rangeland Management ..... 35
3.3.4 Recreation ..... 40
3.3.5 Soils ..... 40
3.3.6 Special Status Species ..... 41
3.3.7 Vegetation ..... 43
3.3.8 Wild Horses ..... 45
3.3.9 Wilderness Study Areas ..... 53
3.3.10 Wildlife ..... 55
Chapter 4. Environmental Effects ..... 57
4.1 Cultural Resources ..... 57
4.1.1 Impacts from Actions Common to Alternatives A-C ..... 57
4.1.2 Impacts from Alternative A ..... 57
4.1.3 Impacts from Alternative B ..... 57
4.1.4 Impacts from Alternative C ..... 58
4.1.5 Impacts from Alternative D ..... 58
4.2 Invasive, Nonnative Species ..... 58
4.2.1 Impacts from Actions Common to Alternatives A-C ..... 58
4.2.2 Impacts from Alternative A ..... 59
4.2.3 Impacts from Alternative B ..... 59
4.2.4 Impacts from Alternative C ..... 59
4.2.5 Impacts from Alternative D ..... 59
4.3 Migratory Birds ..... 59
4.3.1 Impacts from Actions Common to Alternatives A-C ..... 59
4.3.2 Impacts from Alternative A ..... 60
4.3.3 Impacts from Alternative B ..... 60
4.3.4 Impacts from Alternative C ..... 60
4.3.5 Impacts from Alternative D ..... 61
4.4 Native American Religious Concerns ..... 61
4.4.1 Impacts from Actions Common to Alternatives A-C ..... 61

4.4.2 Impacts from Alternative A ..... 61
4.4.3 Impacts from Alternative B ..... 61
4.4.4 Impacts from Alternative C ..... 61
4.4.5 Impacts from Alternative D ..... 62
4.5 Threatened and Endangered Species ..... 62
4.5.1 Impacts from Actions Common to Alternatives A-C ..... 62
4.5.2 Impacts from Alternative A ..... 63
4.5.3 Impacts from Alternative B ..... 63
4.5.4 Impacts from Alternative C ..... 63
4.5.5 Impacts from Alternative D ..... 63
4.6 Water Quality (Surface) ..... 64
4.6.1 Impacts from Actions Common to Alternatives A-C ..... 64
4.6.2 Impacts from Alternative A ..... 64
4.6.3 Impacts from Alternative B ..... 65
4.6.4 Impacts from Alternative C ..... 65
4.6.5 Impacts from Alternative D ..... 65
4.7 Wetlands and Riparian Zones ..... 66
4.7.1 Impacts from Actions Common to Alternatives A-C ..... 66
4.7.2 Impacts from Alternative A ..... 66
4.7.3 Impacts from Alternative B ..... 67
4.7.4 Impacts from Alternative C ..... 67
4.7.5 Impacts from Alternative D ..... 68
4.8 Fisheries ..... 68
4.8.1 Impacts from Alternatives A-C ..... 68
4.8.2 Impacts from Alternative D ..... 68
4.9 Public Health and Safety ..... 69
4.9.1 Impacts from Alternatives A-C ..... 69
4.9.2 Impacts from Alternative D ..... 69
4.10 Rangeland Management ..... 69
4.10.1 Impacts from Actions Common to Alternatives A-C ..... 69
4.10.2 Impacts from Alternative A ..... 70
4.10.3 Impacts from Alternative B ..... 70
4.10.4 Impacts from Alternative C ..... 70
4.10.5 Impacts from Alternative D ..... 70
4.11 Recreation ..... 70
4.11.1 Impacts from Actions Common to Alternatives A-C ..... 70
4.11.2 Impacts from Alternative A ..... 71
4.11.3 Impacts from Alternative B ..... 71

4.11.4 Impacts from Alternative C ..... 71
4.11.5 Impacts from Alternative D ..... 71
4.12 Soils ..... 72
4.12.1 Impacts from Alternatives A-C ..... 72
4.12.2 Impacts from Alternative D ..... 72
4.13 Special Status Species ..... 72
4.13.1 Impacts from Actions Common to Alternatives A-C ..... 72
4.13.2 Impacts from Alternative A ..... 73
4.13.3 Impacts from Alternative B ..... 73
4.13.4 Impacts from Alternative C ..... 74
4.13.5 Impacts from Alternative D ..... 74
4.14 Vegetation ..... 74
4.14.1 Impacts from Alternatives A-C ..... 74
4.14.2 Impacts from Alternative D ..... 75
4.15 Wild Horses ..... 75
4.15.1 Impacts from Actions Common to Alternatives A-C ..... 75
4.15.2 Impacts from Alternative A ..... 81
4.15.3 Impacts from Alternative B ..... 85
4.15.4 Impacts from Alternative C ..... 85
4.15.5 Impacts from Alternative D ..... 85
4.16. Wilderness Study Areas ..... 87
4.16.1 Impacts from Actions Common to Alternatives A-C ..... 87
4.16.2 Impacts from Alternative C ..... 87
4.16.3 Impacts from Alternative D ..... 88
4.17 Wildlife ..... 88
4.17.1 Impacts from Actions Common to Alternatives A-C ..... 88
4.17.2 Impacts from Alternative A ..... 88
4.17.3 Impacts from Alternative B ..... 88
4.17.4 Impacts from Alternative C ..... 89
4.17.5 Impacts from Alternative D ..... 89
Chapter 5. Cumulative ..... 90
5.1. Past and Present Actions ..... 90
5.1.1. Livestock Grazing ..... 90
5.1.2. Lands and Realty ..... 91
5.1.3. Mining ..... 91
5.1.4. Recreation ..... 91
5.1.5. Wild Horses ..... 91
5.1.6. Wilderness Study Areas ..... 92

5.1.7. Wildfires ..... 92
5.2. Reasonably Foreseeable Future Actions ..... 95
5.2.1. Livestock Grazing ..... 95
5.2.2. Recreation ..... 95
5.2.3. Wild Horses ..... 95
5.2.4. Wildfires ..... 95
5.3. Cumulative Impacts ..... 95
5.3.1. Cultural Resources ..... 95
5.3.2. Invasive, Nonnative Species ..... 97
5.3.3. Migratory Birds, Threatened and Endangered Species, Special Status Species, and Wildlife ..... 99
5.3.4. Native American Religious Concerns ..... 102
5.3.5. Water Quality (Surface) and Wetland Riparian Zones ..... 102
5.3.6. Fisheries ..... 105
5.3.7. Public Health and Safety ..... 105
5.3.8. Rangeland Management ..... 106
5.3.9. Recreation ..... 107
5.3.10. Soils ..... 108
5.3.11. Vegetation ..... 109
5.3.12. Wild Horses ..... 110
5.3.13 Wilderness Study Areas ..... 114
Chapter 6. Monitoring ..... 116
Chapter 7. Tribes, Individuals, Organizations, or Agencies Consulted ..... 116
7.1 Endangered Species Act Consultation ..... 116
7.2 Native American Consultation ..... 116
Chapter 8. List of Preparers ..... 117
Winnemucca District ..... 117
Elko District ..... 117
Chapter 9. Literature Cited ..... 118
Appendix A. Standard Operating Procedures for Wild Horse Gathers ..... 125
Appendix B. Owyhee Complex Wild Horse Observation Protocol ..... 132
Appendix C. Standard Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments ..... 134
Appendix D. Nevada Noxious Weed List ..... 136
Appendix E. Owyhee Complex Population Modeling ..... 138
Appendix F. Wildlife Species List – North-central Nevada ..... 146

# Figures

Page

**Figure 1.** Owyhee Complex and Gather Area Map ..... 2
**Figure 2.** Conditions at a reservoir within the Spring Creek fire rehabilitation area in the Little Owyhee HMA on May 9, 2012 (left) and August 1, 2012 (right). ..... 6
**Figure 3.** Conditions at Little Mud Springs within Little Owyhee HMA on May 9, 2012 (left) and August 1, 2012 (right). ..... 6
**Figure 4.** Wild horse trails within the Little Owyhee HMA leading to Little Mud Springs (left) and the North Fork Little Humboldt River Canyon (right) at one of the few access points..... 7
**Figure 5.** Sage Grouse PPH and PGH Map ..... 30
**Figure 6.** Little Mud Springs (left) and Whiskey Springs (right) ..... 32
**Figure 7.** Water gap at Rodear Flat (left) and Snowstorm Flat Spring (right)..... 32
**Figure 8.** Grazing Allotments Map ..... 36
**Figure 9.** The Desert Ranch Reservoir taken in August 2012. The reservoir is expected to be dry by October 1, 2012. ..... 46
**Figure 10.** Wilderness Study Areas Map ..... 54
**Figure 11.** Fire History Map ..... 94

# Tables

Page

**Table 1.** Owyhee Complex Information..... 1
**Table 2.** AML Decision Documents ..... 4
**Table 3.** Supplemental Authorities..... 24
**Table 4.** Additional Affected Resources ..... 33
**Table 5.** HMA Acres within Allotments ..... 35
**Table 6.** Livestock AUMs ..... 37
**Table 7.** AUMs Allocated to Livestock and Wild Horses ..... 39
**Table 8.** Grazing Use (AUMs) by Year ..... 39
**Table 9.** Owyhee Complex Gather History..... 46
**Table 10.** WSAs Acreage Summary ..... 55
**Table 11.** Wildfire Acreage Summary since 2005 ..... 93

## Acronyms

| | |
|---|---|
| AML | Appropriate Management Level |
| ARPA | Archaeological Resources Protection Act of 1979 |
| AUM | Animal Unit Month |
| AVMA | American Veterinary Medical Association |
| BLM | Bureau of Land Management |
| CAA | Cumulative Assessment Area |
| CFR | Code of Federal Regulations |
| CRMP | Coordinated Resource Management Plan |
| EA | Environmental Assessment |
| FAA | Federal Aviation Administration |
| FLPMA | Federal Land Policy and Management Act |
| FMUD | Final Multiple Use Decision |
| HA | Herd Area |
| HMA | Herd Management Area |
| HRFO | Humboldt River Field Office |
| IBLA | Interior Board of Land Appeals |
| LCT | Lahontan cutthroat trout |
| LTP | long-term pasture |
| NDOW | Nevada Department of Wildlife |
| NEPA | National Environmental Policy Act |
| NGB-RAC | Northeastern Great Basin Resource Advisory Council |
| NHPA | National Historic Preservation Act of 1966 as Amended |
| NNHP | Nevada Natural Heritage Program |
| OHV | off-highway vehicle |
| PD-MFP | Paradise-Denio Management Framework Plan |
| PGH | Preliminary General Habitat (sage grouse) |
| PMU | Population Management Unit (sage grouse) |
| PPH | Preliminary Priority Habitat (sage grouse) |
| PZP | Porcine Zona Pellucida fertility control agent |
| RMP | Resource Management Plan |
| ROD | Record of Decision |
| SFNGB-RAC | Sierra Front-Northwestern Great Basin Resource Advisory Council |
| SOP | Standard Operating Procedure |
| TFO | Tuscarora Field Office |
| TGA | Taylor Grazing Act of 1934 |
| USFWS | U.S. Fish and Wildlife Service |
| WFRHBA | Wild Free Roaming Horses and Burros Act of 1971 |
| WH&B | wild horse and burro |
| WSA | Wilderness Study Area |

# Chapter 1. Introduction

This Preliminary Environmental Assessment (EA) has been prepared to analyze the Bureau of Land Management's (BLM) Winnemucca District, Humboldt River Field Office (HRFO), and Elko District, Tuscarora Field Office (TFO), proposal to conduct a wild horse gather in the Little Humboldt, Little Owyhee, Owyhee, Rock Creek, and Snowstorm Mountains Herd Management Areas (HMA) – collectively called the Owyhee Complex. The proposed gather would include removing excess wild horses from inside and outside the Owyhee Complex; adjusting sex ratios to favor males; and treating mares with a fertility control agent. The Little Owyhee and Snowstorm HMAs are managed by the HRFO. The Owyhee, Rock Creek, and Little Humboldt HMAs are managed by the TFO. Based on current conditions and monitoring data, the Owyhee Complex has been identified as experiencing an escalating situation due to unforeseen drought conditions combined with excessive wild horse populations.

This EA is a site-specific analysis of the potential impacts that could result from implementation of the any of the Action Alternatives. The EA assists the HRFO and TFO in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any significant impacts could result from the Action Alternatives. An EA provides analysis for determining whether to prepare an Environmental Impact Statement or a statement of Finding of No Significant Impact.

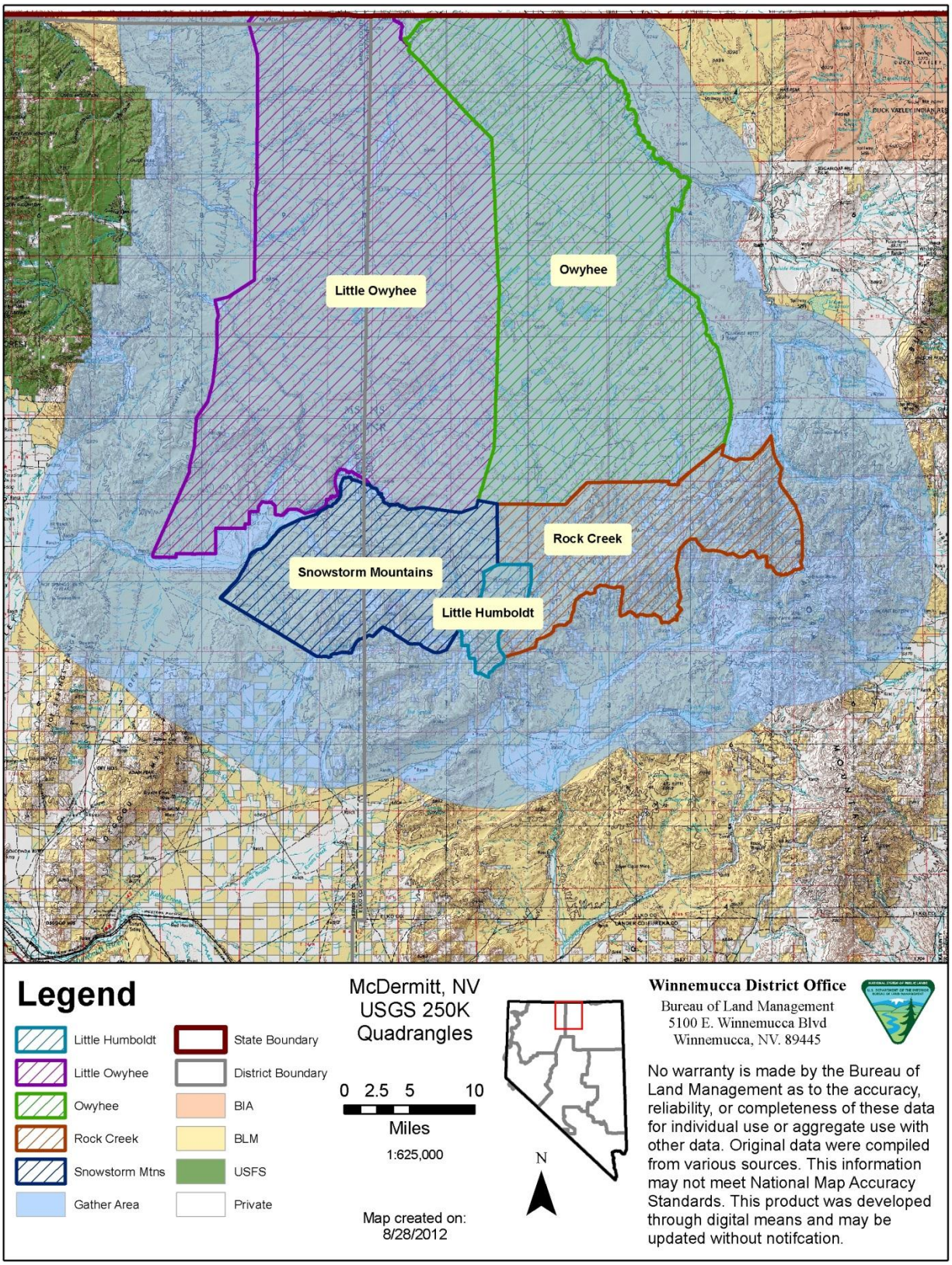
The Owyhee Complex consists of approximately 1,055,023 total acres (Table 1), but the gather area consists of approximately 2,047,281 acres (Figure 1), which encompasses additional lands where wild horses are residing outside of the Owyhee Complex. Wild horses have moved outside of the HMAs in search of forage, water, and space due to the current over-population of wild horses in this area as well as the current drought conditions.

**Table 1.** Owyhee Complex Information

| HMA Name | Acreage | | | AML Range |
|---|---|---|---|---|
| | Public Land | Private Land | Total | |
| Little Humboldt | 15,734 | 1,417 | 17,151 | 48-80 |
| Little Owyhee | 454,416 | 5,811 | 460,227 | 194-298 |
| Owyhee | 336,252 | 2,851 | 339,103 | 139-231 |
| Rock Creek | 98,169 | 23,264 | 121,433 | 150-250 |
| Snowstorm | 103,644 | 13,465 | 117,109 | 90-140 |
| **Owyhee Complex Total** | **1,008,215** | **46,808** | **1,055,023** | **621-999** |

The Owyhee Complex Wild Horse Gather is planned to occur in November 2012 and is expected to take approximately 45 days. In the event that weather or other factors (budget constraints, holding space limitations, etc.) prevent a gather at this time, the operation would be conducted as soon as scheduling permits.

**Figure 1.** Owyhee Complex and Gather Area Map



## 1.1 Background

The HMAs in the Winnemucca and Elko District planning areas were designated as suitable for the long-term maintenance of wild horses. For the Winnemucca District the HMAs were designated in the approved Paradise-Denio Management Framework Plan (PD-MFP) (1982). HMA terminology did not exist at the time the PD-MFP was developed. The PD-MFP referred to HMAs as Herd Use Areas. The PD-MFP Record of Decision (1982) established the multiple use balance between livestock, wild horses, and wildlife based on the analysis of alternative allocations between these uses, and set initial forage allocations for wild horses.

The Elko Resource Management Plan (RMP) Record of Decision (ROD) dated March 11, 1987 provided for four wild horse herd areas (HAs) and "gatherings as needed to maintain numbers." In 2003, the Elko RMP was amended for wild horse management to establish four current HMAs (Diamond Hills North, Little Humboldt, Owyhee, and Rock Creek) and their boundaries, to identify the Appropriate Management Levels (AML) for the four HMAs within the Elko Resource Area, and to establish a process for modifying AMLs for wild horses through monitoring, evaluation, and Herd Management Area Plans. Table 2. AML Decision Documents lists the NEPA documents which supported the initial AMLs and established or re-affirmed AMLs on the basis of available monitoring data.

The AML is defined as the number of wild horses that can be sustained within a designated HMA which achieves and maintains a "thriving natural ecological balance" in keeping with the multiple-use management concept for the area. The Interior Board of Land Appeals (IBLA) defined the goal for managing wild horse (or burro) populations in a thriving natural ecological balance as follows:

> As the court stated in Dahl v. Clark, 600 F. Supp. 585, 594 (D. Nev. 1984), "the benchmark test" for determining the suitable number of wild horses on the public range is "thriving ecological balance." In the words of the conference committee which adopted this standard: "[T]he goal of wild horse and burro management * * * should be to maintain a thriving ecological balance between wild horse and burro populations, wildlife, livestock, and vegetation, and to protect the range from the deterioration associated with overpopulation of wild horses and burros." (Animal Protection Institute of America v. Nevada BLM 1989).

Changes to the AML are appropriate only if multiple use allocations are being adjusted through the land-use planning process, or if monitoring data demonstrates that the AML is either set too high or too low within the existing multiple use allocations and after BLM conducts the appropriate environmental analyses and provides opportunities for public input through a public decision-making process. BLM manages wild horses at the established AMLs and removes animals in excess of the established AML range. Establishing AML as a population range allows for the periodic removal of excess animals to the low range of AML and allows for subsequent population growth up to the high range of AML between removals (gathers).

The AML for the combined Owyhee Complex is a population range of 621-999 wild horses (Table 2. AML Decision Documents). The current population of wild horses within the HMA is approximately 2,252 wild horses based on surveys conducted in early May 2011. Another survey is scheduled for early September 2012. The current wild horse population is estimated to exceed

the low AML by approximately 1,631 wild horses and is about 4 times the low AML or about 2 times the high AML. Refer to Section 3.3.8 Wild Horses for more information regarding population counts and growth rates.

The last gather within the Owyhee Complex occurred in the summer of 2010 when 1,065 excess wild horses were removed from the range in and around the HMAs managed by the TFO. During this gather a total of 1,224 wild horses were captured, 65 mares were treated with a 2 year PZP fertility control agent and returned to the HMA, 61 stallions were also released. Five branded horses were turned over to the State of Nevada and 28 died or were euthanized due to both non-gather and gather related injuries.

**Table 2.** AML Decision Documents

| **PLANNING DOCUMENTS** | | |
|---|---|---|
| **Name** | **Decision** | **AML (wild horses)** |
| Elko RMP | Record of Decision (1987) | 330 (which includes North Diamonds, Little Humboldt, Owyhee, and Rock Creek HAs) |
| Elko RMP Wild Horse Amendment | Record of Decision (October 14, 2003) | 561 (which includes Little Humboldt, Owyhee, and Rock Creek HMAs) |
| **FMUDs** | | |
| **Grazing Allotment** | **Number/Decision** | **AML** |
| Little Humboldt Allotment Evaluation and Stipulation to Modify Decision and Dismiss Appeals | June 24, 2002 | 48-80 (Little Humboldt HMA) |
| Little Owyhee Final Multiple Use Decision | March 26, 1993 | 194-298 (Little Owyhee HMA) |
| Owyhee Allotment Evaluation/Multiple Use Decision | April 19, 2002 | 139-231 (Owyhee HMA) |
| Bullhead Final Multiple Use Decision | August 25, 1994 | 90-140 (Snowstorm Mountains HMA) |
| **GATHER PLAN DECISIONS** | | |
| Owyhee Desert-Snowstorm Mountains Wild Horse Management Capture Plan | | EA# NV 010-0-19<br>Decision Record 1980 |
| Elko District Office Wild Horse Management Removal Plan and Environmental Assessment | | EA# NV-010-0-19<br>Decision Record 1981 |
| Little Humboldt, Rock Creek, and Spruce/Pequop Wild Horse Removal Plan and Environmental Assessment | | EA# NV-010-7-036<br>Decision Record 1987 |
| Owyhee Herd Management Area Wild Horse Removal Plan and Environmental Assessment Drought Emergency | | EA# BLM/EK/PL-2000-026<br>Decision Record June 7, 2000 |
| Owyhee Herd Management Area Wild Horse Removal Plan and Environmental Assessment | | EA# BLM/EK/PL -2002038<br>Decision Record 2002 |
| Rock Creek Herd Management Area Emergency Capture Plan and Environmental Assessment | | EA# BLM/EK/PL2002/032<br>Decision Record 2002 |
| Little Humboldt Herd Management Area Emergency Capture Plan Environmental Assessment | | EA# BLM/EK/PL2002/036<br>Decision Record 2002 |
| Buffalo and Ranch Wildland Fire Emergency Wild Horse Gather and Removal | | EA# BLM/EK/PL-2002-002<br>Decision Record 2002 |
| Rock Humboldt Complex Wild Horse Removal Plan and Environmental Assessment | | EA# BLM/EK/PL/2004/24<br>Decision Record 2004 |
| Little Owyhee Complex Gather Plan and Environmental Assessment | | EA# NV-020-04-22<br>Decision Record August 9, 2004 |
| Winters Fire Emergency Stabilization Plan and Rehabilitation Plan Environmental Assessment | | EA# BLM/EK/PL-2006/026<br>Decision Record XXXXXXXX |
| Owyhee, Rock Creek, and Little Humboldt Herd Management Areas Gather Plan and Environmental Assessment | | EA# DOI-BLM-NV-N020-2010-0014<br>Decision Record June 7, 2010 |

The last gather within the HRFO managed HMAs occurred in 2006 in the Snowstorms Mountains HMA due to the Winters Fire Emergency. During this gather 43 wild horses were gathered; 24 wild horses were removed; 14 mares were treated with PZP-22 and released; one stud was released; and four wild horses died or were euthanized. The last gather within the Little Owyhee HMA occurred in 2004 when 465 excess wild horses were removed from the range 63 mares were treated with PZP-22 and released and 35 studs were released back to the HMA.

In August 2012 the Willow fire burned 43,717 acres of public and private lands within the Squaw Valley Allotment. Although only a small portion of the Rock Creek HMA was burned as a result of this fire, extensive areas adjacent to the HMA burned intensively. Based on inventory flights of the Rock Creek HMA in September 2012, approximately 100 wild horses were observed in the area around the Willow fire, wild horses were also known to be using the area prior to the fire. Significant parts of both the Rock Creek and Little Humboldt HMAs were also burned in the 2006 Winters fire.

BLM has determined that approximately 1,631 excess wild horses (adults and foals of the year) are currently present within the Owyhee Complex gather area and need to be removed in order to be in compliance with the Wild Free Roaming Horses and Burros Act of 1971 (WFRHBA) by achieving the established AMLs, restoring a thriving natural ecological balance, and preventing degradation of rangeland resources resulting from an overpopulation of wild horses. This assessment is based on factors including, but not limited to, the ongoing drought conditions combined with excessive wild horse populations that have created an escalating situation prompting the removal of excess wild horses to prevent death of individual wild horses.

In addition to degradation within the Owyhee Complex, wild horses have moved outside of the Owyhee Complex onto private and public lands that fall outside of designated HMA boundaries, as observed by BLM staff in 2011 and 2012. As the overpopulation of wild horses increases within the Owyhee Complex, this results in wild horse movement beyond the HMA boundaries in search of forage, water, and space. Under regulations at 43 CFR § 4710.4, BLM is required to manage wild horses within their HMAs and to remove wild horses that take up residence outside of HMA boundaries.

With the exception of the Rock Creek HMA, water is a very limited resource within the Owyhee Complex therefore water becomes a limiting factor when wild horse populations exceed high AML. There are springs, seeps, and perennial streams in the Owyhee Complex, however due to current drought conditions these water sources have decreased flows and some have dried completely. Wild horses within the Owyhee Complex tend to rely on small ephemeral catch basins or reservoirs that are currently dry or are estimated to dry out within the next two months. Range improvements are present in the Owyhee Complex but most are wells requiring pumping and the water rights are not possessed by the BLM. Currently the natural water sources available within the Complex are insufficient for numbers of wild horses exceeding the AML. The Figures 2 and 3 illustrate the worsening conditions around water sources in the Owyhee Complex.

**Figure 2.** Conditions at a reservoir within the Spring Creek fire rehabilitation area in the Little Owyhee HMA on May 9, 2012 (left) and August 1, 2012 (right).

**Figure 3.** Conditions at Little Mud Springs within Little Owyhee HMA on May 9, 2012 (left) and August 1, 2012 (right).

The HRFO has been hauling and pumping water to four separate locations since the beginning of August 2012 to ensure wild horses have access to adequate water (DOI-BLM-NV-W010-2012-0053-CX). Due to wild horses concentrating near limited available water sources the range resource is being negatively impacted. This is reflected in degraded range conditions in and outside the Owyhee Complex and declining wild horse health. Based on the current situation, removal of excess wild horses is necessary to ensure their health and welfare as well as to reduce the competition for the limited water supplies. Although the BLM has been hauling and pumping water, this is not sufficient to maintain the overall health of the herds at their current population levels.

Currently, vegetation is being heavily impacted by wild horse use within approximately 2 miles of water sources. This radius is growing as additional wild horse use increases in proximity to available water. Additionally, trailing into water sources (Figure 4) is creating extreme dust conditions which is presumably contributing to respiratory illness and recently observed deaths

among the wild horses. Although there was a short duration of spring growth in these areas this vegetation has been consumed and the horses are relying on residual growth from the spring of 2011. In several areas residual growth is limited or non-existent due to last year's fire activity.

**Figure 4.** Wild horse trails within the Little Owyhee HMA leading to Little Mud Springs (left) and the North Fork Little Humboldt River Canyon (right) at one of the few access points.

Since the passage of the WFRHBA, knowledge regarding management of wild horse population levels has increased. For example, population data shows that wild horses are capable of increasing their numbers by 18% to 25% annually (Wolfe 1980, Garrott and Taylor 1990, Eberhardt et al. 1982), resulting in the doubling of wild horse populations about every 4 years. This has resulted in the BLM shifting program emphasis beyond just establishing AML and conducting wild horse gathers to include a variety of management actions that further facilitate the achievement and maintenance of stable wild horse populations and a thriving natural ecological balance. Management actions resulting from this shifting program emphasis include: increasing fertility control, adjusting sex ratio, and collecting genetic baseline data to support genetic health assessments.

## 1.2 Purpose and Need for Action

The purpose of the Action Alternatives is to conduct a gather to remove excess wild horses in and around the Owyhee Complex to manage wild horses at the established AML ranges, to reduce the wild horse population growth rate in order to maintain AML ranges over longer periods, prevent undue or unnecessary degradation of the public lands by protecting rangeland resources from deterioration associated with excess population of wild horses within and outside the Owyhee Complex boundaries, and to restore a thriving natural ecological balance and multiple use relationship on the public lands.

The need for the Action Alternatives is based on BLM's obligations established by the provisions of Section 1333 (a) of the WFRHBA which mandates management of wild horses in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands and to prevent the unnecessary death of wild horses resulting from conditions due to drought and lack of forage.

## 1.3 Decision to be Made

The authorized officer for each participating Field Office would make the determination of whether or not to implement the gather of excess wild horses and population control measures.

The decision to be made would not set or adjust AMLs, which were set by previous planning-level decisions as identified in Table 2. AML Decision Documents and are still viable. Future decisions regarding long-term management within the Owyhee Complex would continue to be accomplished through a Herd Management Area Plan or other activity level management plans specific to the Complex. Additionally, the decision would not adjust livestock use, which has been established through prior planning-level decisions which have complied with NEPA requirements and provided opportunity for public review and input identified in Table 2. AML Decision Documents.

A decision to select the No Action Alternative for implementation would be contrary to the requirement under the WFHBA that the Secretary remove excess wild horses from the range and to manage wild horse populations within identified boundaries of HMAs. It would also not be in conformance with regulatory provisions for management of wild horses as set forth at 43 CFR § 4700.

## 1.4 Scoping, Public Involvement and Issues

Internal scoping was conducted by an interdisciplinary team on August 21, 2012 that identified the following potential issues if the Action Alternatives where to be implemented:

- How would cultural or historic resources be affected?
- How would sage grouse habitat be affected?
- How would water quality be affected?
- How would a reduction in wild horse numbers impact riparian habitats?
- How would fisheries habitat be affected?
- How would livestock grazing be affected?
- Would recreationists or hunters be affected?
- What would be the effect to the vegetation communities and associated soils in the gather area
- How would ESR/wildland fire restoration areas be affected?
- How would wild horses in the Willow Fire area be affected?
- Would Wilderness Study Areas be affected?

A Notice of Proposed Action was sent to the Wilderness Interested Publics mailing list when BLM sent the preliminary EA for this wild horse gather plan out for review on September 7, 2012.

Letters requesting consultation meetings on the Action Alternative were sent out on August 24, 2012 to the following tribes: Battle Mountain Band Tribal Council, Fort McDermitt Paiute and Shoshone, Shoshone-Bannocks Tribe, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, and Te-Moak Tribal Council.

# Chapter 2. Action Alternatives

This chapter of the EA describes the Action Alternatives, including any that were considered but eliminated from detailed analysis. Alternatives analyzed in detail include the following:

**Alternative A.** Phased-in Gather, Selective Removal of Excess Wild Horses to Low End AML, and Population Growth Control using fertility control treatments (PZP-22 or most current formulations), and sex ratio adjustments.

**Alternative B.** Gathers and Selective Removal of Excess Wild Horses to Low End AML, Population Growth Control using fertility control treatments (PZP-22 or most current formulations) and sex ratio adjustments.

**Alternative C.** Gathers and Removals of Excess Animals to within AML range without Fertility Control or Sex Ratio Adjustment.

**Alternative D.** No Action Alternative.

The Action Alternatives A, B, and C were developed to achieve the established AML so as to ensure a thriving natural ecological balance, remove excess wild horses from the range, prevent further deterioration to the range, and ensure the long-term health of wild horses within the Owyhee Complex. Fertility control treatments and adjustments to the sex ratios when releasing animals would slow population growth. The No Action Alternative would not achieve the identified Purpose and Need; however, it is analyzed in this EA to provide a basis for comparison with the other action alternatives, and to assess the effects of not conducting a gather at this time.

## 2.1 Actions Common to Alternatives A-C

Due to escalating conditions of drought and excess wild horses, resulting in a continued decline in wild horse health, as well as an extremely large operational area, a helicopter gather would be the primary gather mechanism. The contractor would be required to conduct all helicopter operations in a safe manner and in compliance with Federal Aviation Administration (FAA) regulations 14 CFR § 91.119 and BLM IM No. 2010-164.

The use of roping from horseback could also be used when necessary.

A sufficient number of wild horses would be gathered primarily from heavily concentrated areas within the gather area to reduce resource impacts in the most heavily impacted areas.

All wild horses residing in areas adjacent to the Owyhee Complex (outside established HMA boundaries) would be gathered and removed during each phase of the gather.

All wild horses within the Squaw Valley Allotment would be gathered and removed due to the 2012 Willow fire. There are no fences to prevent wild horses from moving into the burned area and the recovery of Lahontan cutthroat trout (LCT) streams are an important focus for Emergency Stabilization Efforts.

Multiple gather sites (trap sites) would be used to gather wild horses both from within and outside the HMA. The BLM would make every effort to place gather sites in previously disturbed areas and in areas that have had an inventory for cultural resources with negative results. If a new gather site is needed, a cultural inventory would be completed prior to using the new gather site. If cultural resources were to be encountered, the location would not be utilized unless the trap or holding site configuration could be repositioned to avoid impacts to cultural resources. No trap or holding sites would be set up near greater sage-grouse leks, known populations of sensitive species, or in riparian areas, cultural resource sites, or within Wilderness Study Areas. The BLM would make every effort to place gather sites outside of areas known to contain noxious species. All gather and handling activities would be conducted in accordance with Standard Operating Procedures (SOPs) in Appendix A. Standard Operating Procedures for Wild Horse Gathers.

If gather efficiencies utilizing helicopter drive-trapping do not achieve the desired goals of the alternative selected, or if a helicopter gather cannot be scheduled, water or bait trapping may be utilized during the time period analyzed in this EA to remove sufficient numbers of wild horses to achieve the management targets, to relieve resource concerns, and/or concentrated groups of wild horses both inside and adjacent to the gather area. Any water/bait trapping activities would be scheduled during time periods that would be most effective to gather sufficient numbers of animals to achieve management targets. Existing watering sites would be preferred. In rare instances new troughs may be used, they would be subject to the Standards and Guidelines for Nevada's Sierra Front-Great Basin Area and Northeastern Great Basin Area (e.g. installation of bird ladders). Locations of water/bait trap sites are subject to the same criteria discussed above for gather (trap) sites.

Gathered and removed wild horses would be transported to BLM holding facilities where they would be prepared for adoption and/or sale to qualified individuals who can provide them with a good home or for transfer to long-term grassland pastures.

Maintenance gathers to reapply fertility control and to remove adoptable wild horses would be conducted for the next 10 years following the date of the decision.

Public observation of the gather activities on public lands would be allowed, but would be subject to observation protocols intended to minimize potential for harm to members of the public, to government and contractor staff, and to the wild horses being gathered, and would be consistent with BLM IM No. 2010-164 and in compliance with Owyhee Complex Wild Horse Observation Protocol found in Appendix B. Owyhee Complex Wild Horse Observation Protocol. Public observation sites would be established in locations that reduce safety risks to the public (e.g., from helicopter-related debris or from the rare helicopter crash landing, or from the potential path of gathered wild horses), to the wild horses (e.g., by ensuring observers would not be in the line of vision of wild horses being moved to the gather site), and to contractors and BLM employees who must remain focused on the gather operations and the health and well-being of the wild horses.

The Owyhee Complex Wild Horse Gather Observation Protocol found in Appendix B. Owyhee Complex Wild Horse Observation Protocol provides the public with the opportunity to safely observe the gather operations. Every attempt would be made to identify one or more observation

sites at the gather location that offer good viewing opportunities, although there may be circumstances (flat terrain, limited vegetative cover, private lands, etc.) that require viewing locations to be at greater distances from the gather site due to public visitor access or to ensure safe gather operations.

No motorized vehicles (other than helicopters) would be used in Wilderness Study Areas in association with gather operations unless such use is consistent with the minimum requirements for management of Wilderness and is pre-approved by the authorized officer (refer to Section 2.7 Conformance).

Herd health and characteristics data would be collected as part of continued monitoring of the wild horse herds. Other data, including sex and age distribution, condition class information (using the Henneke rating system), color, size and other information may also be recorded for all gathered wild horses.

Hair samples would be collected during the proposed gather and sent to Dr. E. Gus Cothran at Texas A&M University for genetics analysis to determine current genetic health of the population. Following analysis of samples collected in 2012, if necessary, the Winnemucca and Elko Districts would work with Dr. Gus Cothran's recommendations to develop plans to maintain and further improve genetic health.

A BLM contract veterinarian, Animal and Plant Health Inspection Service veterinarian, or other licensed veterinarian would be on site during the gather to examine animals and make recommendations to BLM for care and treatment of wild horses. BLM staff would also be present on the gather at all times to observe animal condition and ensure humane treatment. Additionally, animals transported to BLM holding facilities are inspected by facility staff and on-site contract veterinarians to observe health and ensure the animals are being cared for humanely.

Decisions to humanely euthanize animals in field situations would be made in conformance with BLM policy (Washington Office IM 2009-041). Conditions requiring humane euthanasia occur infrequently and are described in more detail in Section 3.3.8 Wild Horses. Current policy reference:
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-041.html.

Current water resources concerns that are being monitored would continue to be monitored before and after the proposed gather operation to address any potential concerns.

Noxious weed monitoring at trap sites and temporary holding facilities would be conducted in the spring and summer of 2013 by BLM. Treatment would be provided, if necessary, following guidance from the Noxious Weed Control EA# NV-020-02-19, Decision August 27, 2002. In order to minimize noxious weed spread, on-road use would be promoted and off-road travel would be limited.

Monitoring of forage condition and utilization, water availability, aerial population inventories, and animal health would continue.

## 2.2 Alternative A. Phased-in Gather, Selective Removal, and Population Growth Control.

Alternative A would implement a long term management strategy designed to address large scale wild horse gathers while still achieving BLM's management goals of attaining AML, reducing population growth rates, and obtaining a thriving natural ecological balance on the range as identified within the WFRHBA and the Director's Strategy.

All wild horses identified to remain in the Owyhee Complex population would be selected to maintain a diverse age structure, herd characteristics, and body type (conformation).

Population inventories and routine resource/habitat monitoring would be completed between gather cycles to document current population levels, growth rates, and areas of continued resource concern (wild horse concentrations, riparian impacts, over-utilization, etc.) prior to any follow-up gather. Funding limitations and competing priorities may require delaying the follow-up gathers and population control components of this Alternative.

By completing the gather in the proposed fashion, the BLM would be able to decrease the population and with each successive gather treat an increased number of mares with fertility control (PZP-22 or most current formulation). To help reduce population growth rates, selected stallions would be released to adjust the sex ratio of the population to a 60% male sex ratio to help reduce the number of breeding mares in the population. All mares released back to the Owyhee Complex would be treated with fertility control (PZP-22 or most current formulation). The procedures to be followed for application of PZP-22 or most current formulation are detailed in Appendix C. Standard Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments. The combination of these actions should lower the population growth rate within the Owyhee Complex.

Under Alternative A, the BLM would gather approximately 1,800 wild horses, remove approximately 950 wild horses, treat and release approximately 295 mares with PZP-22 and release approximately 555 stallions to adjust sex ratios to 60% in favor of males in the initial 2012 gather. Since the first phase of Alternative A would only allow for the removal of approximately 950 excess wild horses and would not achieve the desired low AML, two to three follow-up gathers over a period of ten years is proposed. After the first gather, the target removal number would be adjusted accordingly utilizing data from population inventories for the Owyhee Complex. The principal management goal for the Owyhee Complex would be to retain a breeding population of 621 wild horses (low AML) and implement population suppression techniques. The subsequent follow-up phases of the gather activities would be conducted during the period of July through February and in a manner consistent with those described under the Actions Common to Alternatives A-C. If fertility control is to be used then gathers would attempt to be targeted around the November to February timeframe which is identified as the period of maximum effectiveness of fertility control application.

## 2.3 Alternative B. Selective Removal of Excess Wild Horses to Low AML and Population Growth Control.

Under the Alternative B, the BLM would gather and remove approximately 1,253 to 1,631 excess wild horses within the proposed gather area to return the population levels to the lower limit of the AML range. Under this alternative, the BLM would also attempt to gather a

sufficient number of wild horses in addition to the excess wild horses to be removed, to apply fertility control treatments and allow for adjusting the sex ratio of animals on the range following the gather to favor males (60% stallions) in the initial 2012 gather. The sex ratio of potential released animals would be dependent on the sex ratio of gathered wild horses. Approximately 65% or more of all released wild horses would likely be stallions to achieve a 60% male sex ratio on the range (including animals not gathered).

Due to the terrain and vegetative cover, gather efficiency may be less than optimal. Population gather projections show that greater than approximately 73% gather efficiency is necessary to achieve the management goals for this alternative. If gather efficiency is less than 73%, an insufficient number of wild horses would be gathered to allow for adjusting the sex ratio, or to achieve the low AML (approximately 621 wild horses). If gather efficiencies do not allow for the attainment of the management goals at the initial gather, this alternative would include returning to the HMA every two to three years to gather a sufficient number of wild horses to achieve and maintain the low range of AML as well as to allow the BLM to implement the population control component of the alternative. Any follow-up gather activities during the subsequent phase for this alternative would be conducted in a manner consistent with those described under the Actions Common to Alternatives A-C.

Population inventories and routine resource/habitat monitoring would be completed between gather cycles to document current population levels, growth rates, and areas of continued resource concern (wild horse concentrations, riparian impacts, over-utilization, etc.) prior to any follow-up gather. Funding limitations and competing priorities might also require delaying the follow-up gather and sex ratio adjustment component of the alternative for at least two to three fiscal years. All wild horses identified to remain in the Owyhee Complex population would be selected to maintain a diverse age structure, herd characteristics, and body type (conformation).

### 2.4 Alternative C. Remove Excess Wild Horses to within AML without Population Growth Control

Alternative C would be similar to Alternative B. However, once a sufficient number of excess wild horses to achieve low AML are gathered and removed (approximately 1,631 wild horses), the gather would conclude. No wild horses would be released to adjust sex ratios to slow the rate of wild horse population growth and no application of PZP would occur. If projected numbers of wild horses are not gathered at the initial gather, the BLM proposes to return to the area after two to three years from this gather to remove the remaining excess wild horses and achieve AML. Subsequent phases for this alternative would be conducted in a manner consistent with those described under Actions Common to Alternatives A-C.

### 2.5 Alternative D. No Action Alternative

Under the No Action Alternative, a gather to remove excess wild horses would not occur in 2012. There would be no active management to control the size or growth of the wild horse population or to bring the wild horse population to AML at this time.

## 2.6 Alternatives Considered but not Analyzed in Detail

### *2.6.1 Use of Bait and/or Water Trapping Only*

An alternative considered but eliminated from detailed analysis was use of bait and/or water trapping as the primary or sole gathering method. The use of bait and water trapping, though effective in specific areas and circumstances, would not be timely, cost-effective or practical as the primary gather method for this HMA. However, water or bait trapping may be used as a supplementary approach to achieve the desired goals of Alternatives A-C if gather efficiencies are too low using a helicopter or a helicopter gather cannot be scheduled. This alternative was dismissed from detailed study as a primary or sole gather method for the following reasons:

1. The project area is too large to effectively use this gather method as the primary or sole method;

2. Road access for vehicles to potential trapping locations necessary to get equipment in/out as well as safely transport gathered wild horses is limited, particularly in the wilderness study areas;

3. The large numbers of horses proposed to be gathered would make water or bait trapping as a sole means impossible within a reasonable time frame.

### *2.6.2 Field Darting PZP Treatment*

BLM would administer PZP in the one year liquid dose inoculations by field darting the mares. This method is currently approved for use and is being utilized by BLM in other HMAs. This alternative was dismissed from detailed study for the following reasons:

1. The size of the gather area is too large to use this method;

2. The number and phenotypic characteristics of wild horses in the Owyhee Complex makes it unrealistic to be able to clearly identify all mares targeted for treatment;

3. Large wild horse population size within the Owyhee Complex which exceeds AML and treatment alone would not lower population to the desired AML range within a reasonable period of time;

4. The area is too remote and access too limited (wilderness study area and limited roads) to implement this method successfully either by foot or vehicle; and

5. Limited ability to approach the target wild horses.

The logistics of implementing this method in tandem with bait and/or water trapping is also impractical for the reasons listed above.

### *2.6.3 Gathering the Owyhee Complex to High AML*

Gathering wild horses to achieve a post-gather population size at the upper level of the AML would result in AML being exceeded with the next foaling season (spring 2013). This would be problematic for several reasons.

The upper levels of the AML established for a HMA represent the maximum population for which a thriving natural ecological balance can be maintained. The lower level represents the number of animals that should remain in the HMA following a wild horse gather in order to allow for a periodic gather cycle of approximately every four years and to prevent the population from exceeding the established AML between gathers. The need to gather below the upper range of AML has been recognized by the IBLA, which has held that:

> . . . the term AML within the context of the statute to mean[s] that "optimum number" of wild horses which results in a thriving natural eco- logical balance and avoids a deterioration of the range (Animal Protection Institute of America v. Nevada BLM. 1989b).
>
> 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 damage. Removal of horses before range conditions deteriorate ensures that horses enjoy adequate forage and an ecological balance is maintained (Animal Protection Institute of America et al. v. Rock Springs District BLM 1991).

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

### *2.6.4 Control of Wild Horse Numbers by Natural Means*

This alternative would use natural means, such as natural predation and weather, to control the wild horse population. This alternative was eliminated from further consideration because it would be contrary to the WFRHBA which requires the BLM to protect the range from deterioration associated with an overpopulation of wild horses. The alternative of using natural controls to achieve a desirable AML has not been shown to be feasible in the past. Wild horse populations in the Owyhee Complex are not substantially regulated by predators, as evidenced by the 15-25% annual increase in the wild horse populations within these HMAs. In addition, wild horses are a long-lived species with documented foal survival rates exceeding 95% and are not a self-regulating species. This alternative would result in a steady increase in the wild horse populations which would continue to exceed the carrying capacity of the range and would cause increasing damage to the rangelands until severe range degradation or natural conditions that occur periodically – such as blizzards or extreme drought – cause a catastrophic mortality of wild horses in the Owyhee Complex.

### *2.6.5 Raising the Appropriate Management Levels for Wild Horses*

This alternative was not brought forward for detailed analysis because it would be outside of the scope of the analysis, and would be inconsistent with the WFRHBA which directs the Secretary to immediately remove excess wild horses and with multiple use management. This gather document and subsequent Decision Record is not the appropriate mechanism for adjusting the AML of an HMA.

### *2.6.6 Remove or Reduce Livestock within the Owyhee Complex*

This alternative would involve no removal of wild horses and instead address the excess wild horse numbers through the removal or reduction of livestock within the Owyhee Complex. This alternative was not brought forward for analysis because it would be inconsistent with the current land use plans and/or Final Multiple Use Decisions (FMUDs) for the Owyhee Complex and with multiple use management. This gather document and subsequent Decision Record is not the appropriate mechanism for adjusting the authorized livestock use within the allotments associated with the Complex.

The proposal to reduce livestock would not meet the purpose and need for action identified in Section 1.2 Purpose and Need for Action:

> "to remove excess wild horses from within and outside the HMA, to manage wild horses at the established AML ranges for the HMA, to reduce the wild horse population growth rate in order to prevent undue or unnecessary degradation of the public lands by protecting rangeland resource from deterioration associated with excess population of wild horses within and outside the HMA boundaries, and to restore a thriving natural ecological balance and multiple use relationship on the public lands…
>
> 1333(a) of the Wild Free-Roaming Horses and Burros Act of 1971 which mandates management of wild horses in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands."

This alternative would also be inconsistent with the WFRHBA, which directs the Secretary to immediately remove excess wild horses. Livestock grazing can only be reduced or eliminated if BLM follows regulations at 43 CFR § 4100 and must be consistent with multiple use allocations set forth in the land-use plan. Such changes to livestock grazing cannot be made through a wild horse gather decision, and are only possible if BLM first revises the land-use plans to allocate livestock forage to wild horses and to eliminate or reduce livestock grazing.

Furthermore, re-allocation of livestock AUMs to increase the wild horse AMLs would not achieve a thriving natural ecological balance. Unlike livestock which can be confined to specific pastures, limited periods of use, and specific seasons-of-use so as to minimize impacts to vegetation during the critical growing season or to riparian zones during the summer months, wild horses are present year-round and their impacts to rangeland resources cannot be controlled through establishment of a grazing system, such as for livestock. Thus, impacts from wild horses can only be addressed by limiting their numbers to a level that does not adversely impact rangeland resources and other multiple uses.

While the BLM is authorized to remove livestock from HMAs "if necessary to provide habitat for wild horses or burros, to implement herd management actions, or to protect wild horses or burros from disease, harassment or injury" (43 CFR§ 4710.5), this authority is usually applied in cases of emergency and not for general management of wild horses since it cannot be applied in a manner that would be consistent with the existing land-use plans.

For the reasons stated above, this alternative was dropped from detailed analysis. For long-term management, changes in forage allocations between livestock and wild horses would have to be re-evaluated and implemented through the appropriate public decision-making processes to determine whether a thriving natural ecological balance can be achieved at a higher AML and in order to modify the current multiple use relationship established in the land-use plans.

### *2.6.7 Control of Wild Horse Numbers by Fertility Control Treatment Only*

An alternative to gather a significant portion of the existing population (95%) and implement fertility control treatments only regardless of currently accepted formulation used, without removal of excess wild horses was modeled using a three-year gather/treatment interval over an 11 year period. Based on this modeling, this alternative would not result in attainment of the AML range for the Owyhee Complex and the wild horse population would continue to have an average population growth rate of 0.7% to 10.6%, adding to the current wild horse overpopulation, albeit at a slower rate of growth. Over the next 11 years, on average 9,597 wild horses would need to be gathered. Of those 3,832 wild horses would have been treated, and the resulting population would be 3,490 which is still 2,491 wild horses over (and more than 3.5 times) high AML. It is important to understand that in this scenario, each time a wild horse is gathered it is counted, even though the same wild horse may be gathered multiple times during the 11 year period. And that each time a wild horse is treated with PZP-22, it is counted even though the same wild horse may be treated multiple times over the 11 year period.

This alternative would not bring the wild horse population to AML and would allow the wild horse population to continue to grow even further in excess of AML and resource concerns would escalate. Implementation of this alternative would result in increased gather and fertility control costs without achieving a thriving natural ecological balance and resource management objectives. This alternative would not meet the purpose and need and therefore was eliminated from further consideration.

### *2.6.8 Make Individualized Excess Wild Horse Determinations Prior to Removal*

An alternative whereby BLM would make on-the-ground and individualized excess wild horse determinations prior to removal of wild horses from any HMA was recommended during the public review process conducted during the development of multiple NEPA documents pertaining to gathering of wild horses across the country. Under the view set forth by some commenters during public commenting for wild horse gathers nationwide, a tiered or phased removal of wild horses from the range is mandated by the WFRHBA. Specifically, this alternative would involve a tiered gather approach, whereby BLM would first identify and remove old, sick or lame animals in order to euthanize those animals on the range prior to gather. Second, BLM would identify and remove wild horses for which adoption demand exists, e.g., younger wild horses or wild horses with unusual and interesting markings. Under the WFRHBA(1333(b)(2)(iv)(C)), BLM would then destroy any additional excess wild horses for which adoption demand does not exist in the most humane and cost effective manner possible, although euthanasia has been limited by Congressional appropriations.

This proposed alternative could be viable in situations where the project area is contained, the area is readily accessible and wild horses are clearly visible, and where the number of wild horses to be removed is so small that a targeted approach to removal can be implemented. Under the conditions present within the gather area of the Alternative A, however, this proposed

alternative is impractical, if not impossible, as well as less humane for a variety of reasons. First, BLM does euthanize old, sick or lame animals on the range when such animals have been identified. This occurs on an on-going basis and is not limited to wild horse gathers. During a gather, if old, sick or lame animals are found and it is clear that an animal's condition requires the animal to be put down, that animal is separated from the rest of the group that is being herded so that it can be euthanized on the range. However, wild horses that meet the criteria for humane destruction because they are old, sick or lame usually cannot be identified as such until they have been gathered and examined up close, e.g., so as to determine whether the wild horses have lost all their teeth or are club footed. Old, sick and lame wild horses meeting the criteria for humane euthanasia are also only a small fraction of the total number of wild horses to be gathered, comprising on average about 0.5% of gathered wild horses. Thus, in a gather of over 1,000 wild horses, potentially about five of the gathered wild horses might meet the criteria for humane destruction over an area of over three quarters of a million acres. Due to the size of the gather area, access limitations associated with topographic and terrain features and the challenges of approaching wild horses close enough to make an individualized determination of whether a wild horse is old, sick or lame, it would be virtually impossible to conduct a phased culling of such wild horses on the range without actually gathering and examining the wild horses.

Similarly, rounding up and removing wild horses for which an adoption demand exists, before gathering any other excess wild horses, would be both impractical and much more disruptive and traumatic for the animals. Recent gathers have had success in adopting out approximately 30% of excess wild horses removed from the range on an annual basis. The size of the gather area, terrain challenges, difficulties of approaching the wild horses close enough to determine age and whether they have characteristics (such as color or markings) that make them more adoptable, the impracticalities inherent in attempting to separate the small number of adoptable wild horses from the rest of the herd, and the impacts to the wild horses from the closer contact necessary, makes such phased removal a much less desirable method for gathering excess wild horses. This approach would create a significantly higher level of disruption for the wild horses on the range and would also make it much more difficult to gather the remaining excess wild horses. Furthermore, if BLM plans to apply any population controls to gathered wild horses prior to release, it would be necessary to gather more than just the excess wild horses to be removed, making this type of phased approach completely unnecessary and counter-productive.

Making a determination of excess as to a specific wild horse under this alternative, and then successfully gathering that individual wild horse would be impractical to implement (if not impossible) due to the size of the gather area, terrain challenges and difficulties approaching the wild horses close enough to make an individualized determination. This tiered approach would also be extremely disruptive to the wild horses due to repeated culling and gather activities over a short period of time. Gathering excess wild horses under this alternative would greatly increase the potential stress placed on the animals due to repeated attempts to capture specific animals and not others in the band. This in turn would increase the potential for injury, separation of mare/foal pairs, and possible mortality. This alternative would be impractical to implement (if not impossible), would be cost-prohibitive, and would be unlikely to result in the successful removal of excess wild horses or application of population controls to released wild horses. This approach would also be less humane and more disruptive and traumatic for the wild horses. This alternative was therefore eliminated from any further consideration.

### *2.6.9 Use of Alternative Capture Techniques Instead of Helicopter Capture*

An alternative using capture methods other than helicopters to gather excess wild horses has been suggested through the public review process conducted during the development of multiple NEPA documents pertaining to gathering of wild horses across the country. As no specific alternative methods were suggested, the BLM identified chemical immobilization, net gunning, and wrangler/horseback drive trapping as potential methods for gathering wild horses. Net gunning techniques normally used to capture big game animals also rely on helicopters. Chemical immobilization is a very specialized technique and strictly regulated. Currently the BLM does not have sufficient expertise to implement either of these methods and it would be impractical to use given the size of the project area, access limitations, and difficulties in approachability of the wild horses.

Use of wrangler on horseback drive-trapping to remove excess wild horses can be fairly effective on a small scale. However, given the number of excess wild horses to be removed, the large geographic size of the Owyhee Complex gather area, access limitations, and difficulties in approaching the wild horses this technique would be ineffective and impractical. Horseback drive-trapping is also very labor intensive and can be very dangerous to the domestic horses and the wranglers used to herd the wild horses. Domestic horses can easily be injured while covering rough terrain and the wrangler could be injured if he/she falls off. For these reasons, this alternative was eliminated from further consideration.

### *2.6.10 Designation of the HMAs to be Managed Principally for Wild Horses.*

Designate the Owyhee Complex as "Wild Horse and Burro Range" was proposed by public comments conducted during the development of multiple NEPA documents pertaining to gathering of wild horses across the country. This action under 43 CFR 4710.3-2 would require amendment of the PD-MFP and Elko RMP which would be outside the scope of this EA. Only the BLM Director or Assistant Director (as per BLM Manual 1203: Delegation of Authority), may establish a Wild Horse and Burro Range after a full assessment of the impact on other resources through the land-use planning process. Wild Horse and Burro Range is not an "exclusive" designation. Designation would not necessarily exclude livestock use; therefore, levels of livestock grazing permitted could remain the same.

## 2.7 Conformance

The Action Alternatives are in conformance with the Paradise-Denio Environmental Impact Statement and the associated ROD for the PD-MFP (July 9, 1982). The wild horse and burro section of the PD-MFP ROD states:

4. Wild horse and burro herds would be maintained in the areas described in the Livestock Reduction/Maximizing Wild Horse and Burro Alternative. However, numbers would be determined by the following criteria: Existing/current WH&B numbers (as of July 1, 1982) would be used as a starting point for monitoring purposes except where one of the following exists:

   a. Numbers are established by adequate and supportable resource data.

b. Numbers are established through the CRMP [Coordinated Resource Management Plan] process as documented in CRMP recommendations and agreed to by the District Manager.

c. Numbers are established by formal signed agreement between affected interests.

d. Numbers are established through previously developed interim capture/management plans. Plans are still supportable by parties consulted in the original plan. EA's (EAR's) were prepared and are still valid.

e. Numbers are established by court order.

The following is Wild Horse and Burro Objective 1 from the PD-MFP:

> **WHB-1:** Maintain wild horses and burros on public lands, where there was wild horse or burro use as of December 15, 1971, and maintain a natural ecological balance on the public lands.

The Action Alternatives are in conformance with the Resource Objective as stated in the Elko 2003 RMP Wild Horse Amendment: Manage for a wild horse herd size within a designated wild horse HMA to maintain a thriving ecological balance consistent with other multiple uses.

## 2.8 Relationship to Laws, Regulations and other Plans

The Action Alternatives are in conformance with the WFRHBA, applicable regulations at 43 CFR § 4700, and BLM policies, including the BLM Director Salazar's Caring for America's Wild Horses and Burros Fundamental Reforms – An Overview, February 2011 (Director's Strategy). Included are:

43 CFR § 4710.4 Constraints on Management

> Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas. Management shall be at the minimum level necessary to attain the objectives identified in approved land use plans and herd management area plans.

43 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.

43 CFR § 4740.1 Use of motor vehicles or aircraft

> (a) Motor vehicles and aircraft may be used by the authorized officer in all phases of the administration of the Act, except that no motor vehicle or aircraft, other than helicopters, shall be used for the purpose of herding or chasing wild horses

or burros for capture or destruction. All such use shall be conducted in a humane manner.

(b) Before using helicopters or motor vehicles in the management of wild horses or burros, the authorized officer shall conduct a public hearing in the area where such use is to be made.

## 2.9 Conformance with Rangeland Health Standards and Guidelines

The Sierra Front-Northwestern Great Basin Resource Advisory Council (SFNGB-RAC) Standards and Guidelines for Rangeland Health were approved by the Secretary of the Interior in 1997. RAC Standards and Guidelines for the Management of Wild Horses and Burros were later approved by the BLM's Nevada State Director in 2007. The SFNGB-RAC Standards and Guidelines can be accessed at http://www.blm.gov/nv/st/en/res/resource_advisory/sierra_front-northwestern.html.

The Northeastern Great Basin Resource Advisory Council (NGB-RAC) Standards and Guidelines for Rangeland Health were approved by the Secretary of the Interior in 1997. The Standards and Guidelines for Wild Horse & Burros were approved in 2000. The NGB-RAC Standards and Guidelines can be accessed at http://www.blm.gov/nv/st/en/res/resource_advisory/northeastern_great/s_gs/wild_horses.html.

Alternatives A, B, and C are in conformance with both the Standards and Guidelines for Rangeland Health and for Management of Wild Horses and Burros.

# Chapter 3. Affected Environment:

## 3.1 General Description of the Affected Environment

The Owyhee Complex is located 50 miles north east of Winnemucca, in the northeast corner of Humboldt County and the northwest corner of Elko County, Nevada. The entire gather area spans a distance of approximately 48 miles long and 40 miles wide. The Owyhee Complex total approximately 1,055,023 acres in size, with 1,008,215 acres of public lands and 46,808 acres of private land (see Table 1). This is considered the primary gather area, although the total gather area is approximately 2,047,281 acres to encompass wild horses residing in non-HMA areas in their search for water, forage and space (Figure 1).

The Owyhee Complex is located in the Owyhee Desert area within the Columbia Plateau and Great Basin physiographic regions. These regions are located in the Great Basin which is one of the largest deserts in the world. It is characterized by a high rolling plateau underlain by basal flows covered with thin loess and alluvial mantel. On many of the low hills and ridges that are scattered throughout the area, the soils are underlain by bedrock. The Owyhee Complex is occasionally cut by deep, vertically walled canyons and steep rugged mountains. Elevations range from about 4,570 feet to 7,737 feet. Climate within the Owyhee Complex is characterized by warm dry days, cool nights and low yearly precipitation that range from 4 inches at lower elevations to approximately 16 inches at higher elevations. Most precipitation occurs as winter snow and spring rains.

In the Great Basin high desert of Nevada the average annual precipitation is often less than 11 inches (which defines the term desert). Drought conditions occur as frequently as 6 out of every 10 years. Drought is defined by the Society for Range Management as "…prolonged dry weather when precipitation is less than 75% of the average amount" (SRM 1989).

## 3.2 Supplemental Authorities

***(Formerly referred to as Critical Environmental Elements of the Human Environment)***

To comply with the NEPA, the following elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be considered.

Critical elements identified as present and potentially affected by the Action Alternatives (Alternatives A-C) and/or the No Action Alternative include: Cultural Resources, Invasive, Nonnative Species, Migratory Birds, Native American Religious Concerns, Threatened & Endangered Species, Water Quality (surface), and Wetlands and Riparian Zones (see Table 3). Additional discussion is included in the following sections.

**Table 3.** Supplemental Authorities

| Supplemental Authorities | Present | Affected | Rationale |
|---|---|---|---|
| Air Quality | YES | NO | The proposed gather area would not be within an area of non-attainment or areas where total suspended particulates exceed Nevada air quality standards. Areas of disturbance would be small and temporary. |
| Areas of Critical Environmental Concern (ACECs) | NO | NO | Not present. |
| Cultural Resources | YES | YES | Discussed below. |
| Environmental Justice | NO | NO | Not present. |
| Invasive, Nonnative Species | YES | YES | Discussed below. |
| Migratory Birds | YES | YES | Discussed below. |
| Native American Religious Concerns | YES | YES | Discussed below. |
| Prime or Unique Farmlands | NO | NO | Not present. |
| Threatened & Endangered Species | YES | YES | Discussed below. |
| Wastes, Hazardous or Solid | NO | NO | Not present. |
| Water Quality (Surface/Ground) | YES | YES | Surface water would be affected and is discussed below. Ground water would not be affected. |
| Wetlands and Riparian Zones | YES | YES | Discussed below. |
| Wild and Scenic Rivers | NO | NO | Not present. |
| Wilderness | NO | NO | Not present. |

### *3.2.1 Cultural Resources*

A range of prehistoric and historic sites are located within the Owyhee Complex and adjoining territory. The Owyhee Complex contains a complex array of cultural resources representing the remains of human habitation dating from perhaps 10,000 years ago to recent historic times. In addition to the vast depth of time represented by these resources, a wide breadth of prehistoric and historic behaviors are also indicated including hunting and gathering, trade and exchange, mining, ranching, and transportation. While archaeologists have studied some aspects of these activities, many more are not well understood.

The evaluation of known archaeological sites indicates that many contain information that can be used to address questions that can aid in our understanding of these lesser-known aspects of past human behavior. Further inventory would undoubtedly reveal the existence of many more properties of important research value. In most cases, these sites are the only sources of information available to archaeologists in their efforts to understand the past and are, thus, valuable non-renewable resources.

Many of the cultural sites in the gather area were initially recorded decades ago. Recently, a major project in the Snowstorms Range resulted in recording of an additional 216 sites. Many additional sites remain to be discovered and recorded in the future. All National Register of Historic Places eligible or unevaluated sites would be avoided under all alternatives. .

### *3.2.2 Invasive, Nonnative Species*

Several federal laws, regulations, and policies guide BLM management activities to control noxious weeds and invasive non-native species on public lands. Laws applicable to control invasive vegetation include: the Federal Land Policy and Management Act (FLPMA) 1976; Carlson-Foley Act of 1968; Plant Protection Act of 2000; Federal Noxious Weed Act of 1974;

The Federal Insecticide, Fungicide and Rodenticide Act of 1972; and the Noxious Weed Control Act of 2004. To comply with these Laws, BLM policy directs the agency to inventory and control invasive vegetation utilizing integrated weed control management techniques.

Nevada Revised Statutes, Chapter 555.05 defines "noxious weeds" and mandates landowners and land management agencies to include control of noxious weeds on lands under their jurisdiction.

Nevada has listed 47 non-native invasive plant species that require control; see Appendix D, Noxious Weed List. These weeds usually occur in a variety of habitats including road side areas, rights-of-way, wetland meadows, as well as undisturbed upland rangelands. Hoary cress (*Cardaria draba*) and perennial pepperweed (*Lepidium latifolium*) have been chemically treated within the gather area.

Infestations of exotic annual forbs and grasses are present primarily in areas that have been previously overgrazed or have burned from wildfire. Forb species include clasping pepperweed (*Lepidium perfoliatum*), tumble mustard (*Sisymbrium altissimum*), halogeton (*Halogeton glomerata*), and Russian thistle (*Salsola tragus*). Cheatgrass (*Bromus tectorum*) is the dominant annual grass in the gather area; approximately eighty-five percent of the area of concern has less than twenty percent cheatgrass coverage (Peterson 2006). However, the entire project area has not been inventoried for the presence of invasive non-native species.

### *3.2.3 Migratory Birds*

Neo-tropical migrant bird species are those species that breed in the temperate portions of North America and winter in the tropics in either North or South America. They are protected by international treaty and additional emphasis on maintaining or improving their habitats is provided by Executive Order #13186. Within the Great Basin and the project area, quality riparian habitats and healthy sagebrush communities with inclusions of trees and shrubs are required for healthy neo-tropical migrants' populations. A migratory bird inventory has not been completed for the entire gather area. However, the Nevada Department of Wildlife has created the *Wildlife Species List – North-central Nevada – Elko/Humboldt/Lander/Eureka Counties - Units 051, 066, 067, 068* (Appendix X) to show documented or potential species richness relative to habitat types. Migratory bird species that may occur in the habitat types of the HMAs are shown below relative to habitat types.

Montane riparian areas may include the following migratory bird species: MacGillivray's warbler (*Oporornis tolmiei*), Wilson's warbler (*Wilsonia pusilla*), warbling vireo (*Vireo gilvus*), Lewis' woodpecker (*Melanerpes lewis*), red-naped sapsucker (*Sphyrapicus nuchalis*), Virginia's warbler (*Vermivora virginiae*), calliope hummingbird (*Stellula calliope*), broad-tailed hummingbird (*Selasphorus platycercus*), orange-crowned warbler (*Vermivora celata*), fox sparrow (*Passerella iliaca*), song sparrow (*Melospiza melodia*), dark-eyed junco (*Junco hyemalis*), Lincoln's sparrow (*Melospiza lincolnii*), wouldow flycatcher (*Empidonax traillii*), dusky flycatcher (*Empidonax oberholseri*), brown-headed cowbird (*Molothrus ater*), American robin (*Turdus migratorius*), house finch (*Carpodacus mexicanus*), and Cassin's finch (*Carpodacus cassinii*) (GBBO 2003).

Lowland riparian areas may include: American robin (*Turdus migratorius*), bank swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), Bewick's wren (*Thryomanes bewickii*), black-chinned hummingbird (*Archilochus alexandri*), black-headed grosbeak (*Pheucticus melanocephalus*), broad-tailed hummingbird (*Selasphorus platycercus*), brown-headed cowbird (*Molothrus ater*), downy woodpecker (*Picoides pubescens*), housefinch (*Carpodacus mexicanus*), house wren (*Troglodytes aedon*), lazuli bunting (*Passerina amoena*), lesser goldfinch (*Carduelis psaltria*), northern flicker (*Colaptes auratus*), northern mockingbird (*Mimus polyglottos*), Bullock's oriole (*Icterus bullockii*), northern rough-winged swallow (*Stelgidopteryx serripennis*), song sparrow (*Melospiza melodia*), spotted sandpiper (*Actitis macularia*), tree swallow (*Tachycineta bicolor*), violet-green swallow (*Tachycineta thalassina*), warbling vireo (*Vireo gilvus*), western kingbird (*Tyrannus verticalis*), western wood-pewee (*Contopus sordidulus*), wouldow flycatcher (*Empidonax traillii*), yellow-breasted chat (*Icteria virens*), and yellow warbler (*Dendroica petechia*) (GBBO 2003).

Sagebrush and salt desert shrub areas may include: black-throated sparrow (*Amphispiza bilineata*), Brewer's blackbird (*Euphagus cyanocephalus*), Brewer's sparrow (*Spizella breweri*), canyon wren (*Catherpes mexicanus*), gray flycatcher (*Empidonax wrightii*), green-tailed towhee (*Pipilo chlorurus*), loggerhead shrike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), western meadowlark (*Sturnella neglecta*), and vesper sparrow (*Pooecetes gramineus*) (GBBO 2003).

Several species of raptors may also utilize the project area including golden eagle (A*quila chrysaetos*), burrowing owl (*Athene cunicularia*), peregrine falcon (*Falco peregrinus*), northern goshawk (*Accipiter gentilis*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), and Cooper's hawk (*Accipiter cooperii*).

BLM Tuscarora Field Office has been using the 1999 Partners in Flight Conservation Plan lists to identify "Priority Species" for management. The 1999 Nevada Partners in Flight Bird Conservation Plan identifies the following priority species associated with the Lake (Playas) habitat:

> Obligates (PIF-listed as Wetlands/Lakes): White-faced Ibis, Snowy Plover, American Avocet, and Black Tern
>
> Other (PIF-listed as Wetlands/Lakes): Sandhill Crane, Long-billed Curlew, and Short-eared Owl
>
> Other Associated Species (Wetlands/Lakes): American bittern, Great Egret, Snowy Egret, Cattle Egret, Black-crowned Night Heron, Marsh Wren, Common Yellowthroat, and Yellow-headed Blackbird

The burrowing owl, golden eagle, northern goshawk, peregrine falcon, Brewer's sparrow, loggerhead shrike, and sage thrasher are BLM designated sensitive species and are discussed in Section 3.3.6 Special Status Species.

### *3.2.4 Native American Religious Concerns*

Numerous laws and regulations require consideration of Native American concerns. These include the National Historic Preservation Act of 1966 as Amended (NHPA), the American

Indian Religious Freedom Act of 1978 as amended, Executive Order 13007 (Indian Sacred Sites), Executive Order 13175 (Consultation and Coordination with Tribal Governments), the Native American Graves Protection and Repatriation Act of 1990, the Archaeological Resources Protection Act of 1979 (ARPA), as well as NEPA and FLPMA.

Horses are believed to have been introduced into the Paiute and Shoshone societies from trade with the Comanche and other Plains groups (Shimkin 1986). By the mid-19th century, the horse had a substantial impact on the political organization of the Paiute and Shoshone, plus their subsistence and trade. The ethnographic literature presents no clear cut trend on whether horses were used as food by the Northern Paiutes and Shoshone. Some Native Americans argue though that the wild horse has always been in Nevada since time immemorial.

Native Americans utilize a variety of plants for medicinal and other uses. They also consider all water to be sacred. There are multiple springs located within the gather area. Both of these resources can be adversely affected by domestic and wild horses. There are no known traditional cultural properties or sacred sites in the identified trap site/holding areas.

Letters requesting consultation meetings on the Action Alternatives were sent out on August 24, 2012 to the following tribes: the Battle Mountain Band Tribal Council, Fort McDermitt Paiute and Shoshone, Shoshone-Bannocks Tribe, Shoshone-Paiute Tribes of the Duck Valley, and the Te-Moak Tribal Council.

### *3.2.5 Threatened and Endangered Species*

A list of federally listed, proposed or candidate species was requested from the U.S. Fish and Wildlife Service (USFWS) for the proposed gather area on August 27, 2012. The USFWS responded that the following species may be found within the proposed project area: 1) Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) (LCT) as a threatened species, 2) Greater sage-grouse (*Centrocercus urophasianus*) as a candidate species, and 3) Columbia spotted frog (*Rana luteiventris*) as a candidate species. There are no other known Threatened or Endangered Species in the proposed project area.

<u>Lahontan cutthroat trout (Elko and Winnemucca Districts)</u>

LCT is a federally listed threatened species since 1975 (Federal Register Vol. 40, p. 29864). The project area contains 15 streams that were identified in the 1995 USFWS LCT Recovery plan or in the 2004 Nevada Department of Wildlife (NDOW) Species Management Plan for LCT in the Upper Humboldt River Drainage Basin as priority streams for LCT recovery (Sevon et al. 1999).

LCT occur in streams adjacent to the Little Humboldt HMA, while certain springs and stream channels inside the HMA drain into waters occupied by LCT. LCT streams in or near the Little Humboldt HMA include Oregon Canyon Creek and the upper reaches of the South Fork of the Little Humboldt River. Drainages inside the HMA which enter LCT streams include the upper reaches of Oregon Canyon Creek and several intermittent drainages including Brush Creek on the eastern side of the South Fork of the Little Humboldt River. Although data are somewhat inconclusive, LCT populations in the South Fork Little Humboldt River appear to be increasing with improving habitat conditions (Jenne 2010 personal comm).

LCT occurs in streams adjacent to or in the vicinity of the Rock Creek HMA including Toe Jam, Rock, Frazer, Willow, Lewis and Nelson creeks. Intermittent and perennial drainages as well as channels associated with springs within the Rock Creek HMA also drain into waters supporting LCT. Studies conducted by NDOW and Trout Unlimited show small but viable populations of LCT persisting in these streams prior to 2012 (BLM files). In 2012, the upper Willow Creek drainage including Lewis and Nelson Creeks and portions of the Rock and Toe Jam Creeks burned during the Willow Fire. Lewis and Nelson Creeks were severely damaged and LCT in these streams are at significant risk of extirpation (Michael Starr, NDOW fishery biologist and Chad Mellison, USFWS fishery biologist, personal communication with Carol Evans, 2012).

LCT occurs in streams within the Snowstorm Mountains HMA including South Fork of the Little Humboldt River, First Creek, Snowstorm Creek, Winters Creek, and Pole Creek. Fish population surveys that were conducted by NDOW on these streams showed that three age classes were found of LCT in the South Fork of the Little Humboldt River, Snowstorm Creek, and Pole Creek (Starr 2010). Occupied habitat for First Creek and Winters Creek is estimated at 0.5 miles in each stream, while both streams have the potential to increase in occupied area (NDOW 1997).

Greater sage-grouse (Elko and Winnemucca Districts)

The Greater sage-grouse is currently listed as a candidate species by the USFWS. This species is considered an "umbrella species" where positive or negative impacts to their habitat generally affect the habitat for other sagebrush-obligate species or other species that utilize similar upland and riparian/meadow habitat on a seasonal or yearlong basis (Rowland et al. 2006).

The Owyhee Complex falls within the Desert, Santa Rosa, and Tuscarora Sage Grouse Population Management units (PMUs) in Nevada. These PMUs are being considered under the Governor's Nevada Sage Grouse Conservation Strategy by the Northeastern Nevada Stewardship Group and North Central Working Group as part of sage grouse conservation planning efforts underway for the Winnemucca and Elko Districts (BLM 2000). Shrub cover and associated herbaceous plants in the understory is vital as a forage and cover component for sage grouse. Evaluation of habitat values and the possibilities to improve them are considered through these conservation efforts.

The gather area contains approximately 1,724,522 acres of summer habitat, 963,358 acres of nesting habitat and 1,851,225 acres of winter habitat. Approximately 380,365 acres of generally important habitat for sage-grouse, known as preliminary general habitat (PGH), has been identified. Approximately 1,318,763 acres of particularly important habitat for sage-grouse, known as preliminary priority habitat (PPH), has been identified. See Figure 5 for a map of PGH and PPH areas in and around the Owyhee Complex

There are 53 known leks within the Owyhee Complex and 141 known leks within the total gather area. Leks are communal breeding ground for sage-grouse and are commonly considered to be the center of nesting activity. A high percentage of the leks on the Rock Creek and Little Humboldt HMAs have been affected by wildfires, and intensive rehabilitation efforts have also been completed on thousands of acres. Collectively, these lek areas provide core breeding habitat for some of the highest historic sage grouse population densities in Nevada.

The HMAs provide key sage grouse habitat including fall-winter, nesting, early (upland) and late (meadow-riparian) brood habitat. Sage-grouse require large expanses of sagebrush with good under stories of forbs and grasses. Sagebrush provides nesting and hiding cover and forage for much of the year. Forbs provide spring nutrition and grasses provide visual screening for nests. Additionally wet meadows are needed to provide green forbs when other sites dry out, and to provide water and insects for the chicks during the hot summer months. Forbs are an essential part of the diet of young sage grouse. Hen sage grouse move their broods considerable distances seeking riparian/meadow areas that provide succulent forbs. On the Elko District, it is highly likely that brood movements occur from the Owyhee HMA to the Rock Creek and Little Humboldt HMAs. These latter HMAs are the closest areas that provide a relative abundance of late brood-rearing habitat. Sage grouse use of some riparian habitat has been affected by the poor condition of some areas in the HMAs, as discussed below in Section 3.2.7. In addition, information on the condition of riparian/meadow habitat in and adjacent to the HMAs on the Elko District is summarized in detail in a recent BLM EA (2010, pages 34-40).

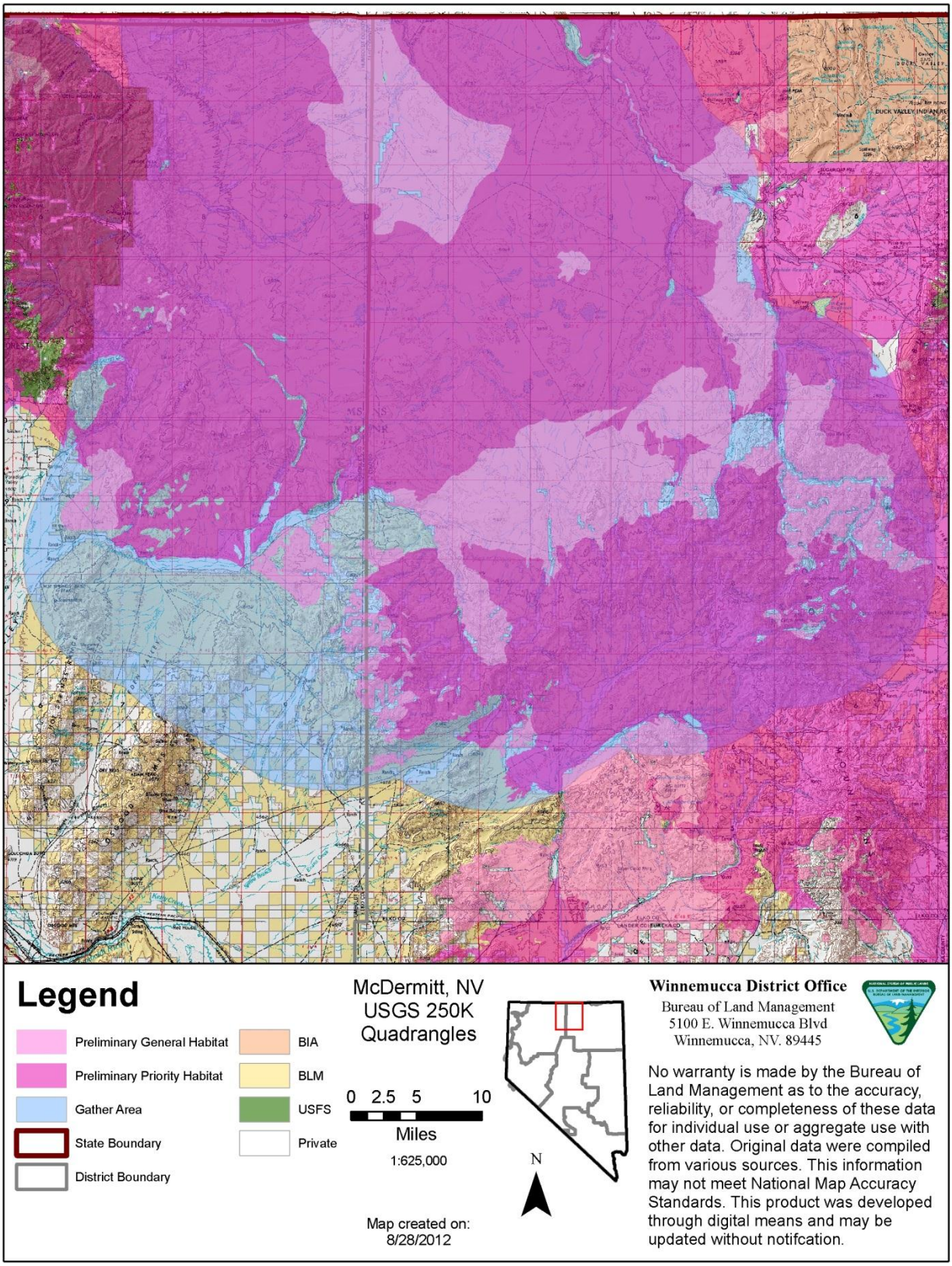
Recent wildfires, mainly from 2005, 2006, and 2012, have negatively impacted hundreds of thousands of acres of sage grouse habitat on the grazing allotments/associated HMAs and adjoining allotments. However, a high percentage of these same burn areas have been artificially-seeded with native shrub, grass and forb species as part of wildlife habitat rehabilitation efforts and still provide suitable habitat.

Columbia spotted frog (Elko District)

The Columbia spotted frog is currently listed as a candidate species by the USFWS.

Although Columbia spotted frogs (*Rana luteiventris*) a federal candidate species for listing, has not been documented in the Little Humboldt and Rock Creek HMAs, this species has been found recently in Willow and Nelson Creeks upstream from Willow Creek reservoir (BLM files). The Willow Creek drainage occurs outside the Rock Creek HMA and has been used regularly by wild horses in recent years (Jesse Braatz, Squaw Valley Ranch, personal communication, 2011, BLM 2010).

**Figure 5.** Sage Grouse PPH and PGH Map



### *3.2.6 Water Quality (Surface)*

The Owyhee Complex falls within an area of northern Nevada which has received much less precipitation (as either rain or snow) during the current water year than average. Snow packs in the region are far below average and would likely support a shorter period of snowmelt fed springs, flows in streams, and at shallow source springs during the 2012 calendar year than normal. To date, snow pack levels within the lower Humboldt River Basin are at 13% of average and only 74% of average water (NRCS 2012).

Data for water quality in lentic (non-flowing) water sources are not available. Persistence of surface water is highly variable annually depending on climatic variations.

### *3.2.7 Wetlands and Riparian Zones*

Few riparian systems exist throughout the West and they are important centers for biodiversity where they survive. They often provide the only available source of water for many miles, and are used by wild horses, livestock, birds, and many types of wildlife. Although the Taylor Grazing Act of 1934 (TGA) established some control over grazing practices for domestic livestock, wild horses are not regulated under this legislation and continue destructive grazing habits in riparian areas where access is granted, in ways similar to unmanaged livestock.

The Owyhee HMA has one perennial water source, whereas the Rock Creek and the Little Humboldt HMAs contains numerous springs ranging in size from a few feet to large enough to form small drainages. Information on condition of wetlands and riparian zones in and adjacent to the Little Humboldt, Rock Creek and Owyhee HMAs is summarized in detail in the Owyhee, Rock Creek, and Little Humboldt Herd Management Areas Gather Plan and Environmental Assessment and is here incorporated by reference (BLM 2010).

Riparian areas include seeps, springs, aspen stands and perennial and intermittent drainages. Generally, riparian habitat conditions are good or improving where prescriptive livestock grazing protocols have been employed including most parts of the Squaw Valley Allotment, the South Fork of the Little Humboldt River basin in the Little Humboldt Allotment and where access by grazing animals is limited by topography (the South Fork of the Owyhee River in the Owyhee Allotment). Where livestock have access to riparian areas including seeps, springs and streams, conditions are generally degraded. Most impacts from wild horses occur to seeps and springs in the form of overutilization of riparian plants and soil compaction from trampling. Horses outside the Rock Creek HMA have caused repeated damage to livestock management fences around the Upper Willow Creek drainage making control of livestock more difficult in areas managed specifically for LCT (Gregg Simonds, Squaw Valley Ranch Manager, personal communication, 2012).

Riparian areas are limited within the Little Owyhee and Snowstorm Mountain HMAs and are generally associated with springs and small creeks that include: Milligan Creek, Twin Valley Springs, Kelly Creek Spring, Pole Creek, Little Mud Springs, Whiskey Springs, and the North and South Forks of the Little Humboldt River. Resource degradation including over-utilization of riparian forage, trailing, bank erosion, trampling, and soil movement caused by wild horses is currently occurring at most springs. Animals are known to utilize winter snow for water in this area and often dig for water at undeveloped springs during the dry summer months. During the 2012 water year this area has received less than half of its normal precipitation, the

aforementioned springs and creeks have reduced to no flow left and water is being hauled to Little Mud Springs, Rodear Flats near the South Fork Little Humboldt River, and pumped by the permittee at Button Lake Well.

Visual inspections and photo-monitoring have been completed by BLM staff during July and August of 2012. These inspections indicate that a mild 2011-2012 winter has allowed for continued utilization of high elevation riparian areas and reduced spring flow and water availability (Figure 6 and 7).

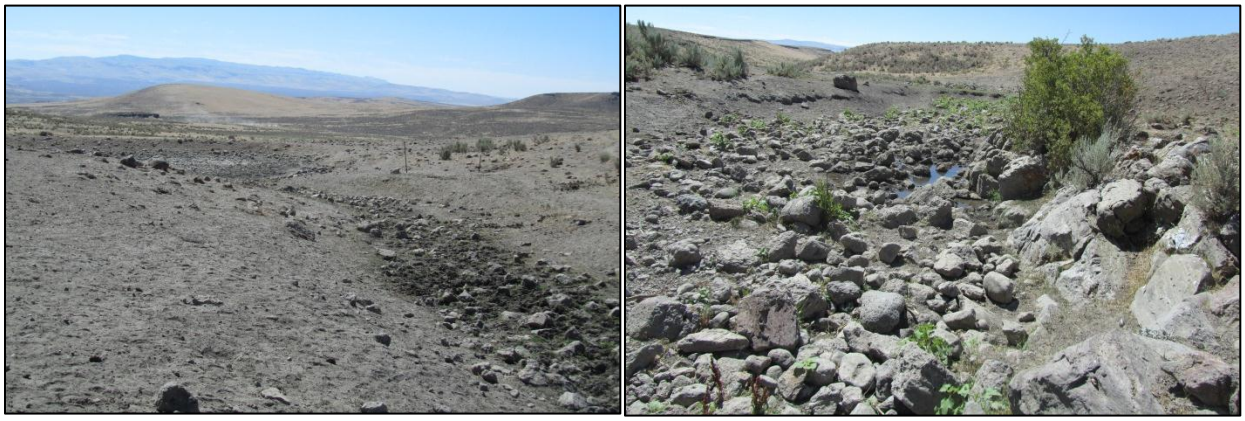


**Figure 6.** Little Mud Springs (left) and Whiskey Springs (right)

In general, degradation at lentic riparian areas within the Owyhee Complex is caused by over utilization of vegetation and excessive trampling of wetland soils by cattle and/or wild horses. Riparian sites are heavily utilized especially when the water flow is low as occurs during droughts.

**Figure 7.** Water gap at Rodear Flat (left) and Snowstorm Flat Spring (right)

These photos demonstrate soil alteration and vegetation utilization. Cattle and wild horses both use these areas. These photos were taken in August 2012. Wild horses have been observed during the winter months and during the aerial population surveys conducted in March 2011.

Riparian areas within the Owyhee Complex may no longer be considered healthy because of their reduced vegetation and high degree of disturbance (Belsky et al. 1999). Loss of vegetation

and compaction of soils in these areas has led to flashy run-off (higher peak flows over shorter periods of time). This flashiness increases soil erosion and decrease groundwater recharge. Perennial streams and springs in the HMA are dependent on annual groundwater recharge. Loss of this recharge results in less water availability throughout the summer and fall.

Where the riparian area is grazed and vegetative cover is greatly reduced, stream bank stability is weakened from loss of vegetation and damaged from wild horses and livestock repeatedly and continuously entering and exiting the water source.

## 3.3 Additional Affected Resources

In addition to the supplemental authorities above, Table 4 includes a list of resources which may be affected by the Action Alternatives (Alternatives A, B and C) and/or the No Action Alternative:

**Table 4.** Additional Affected Resources

| Additional Affected Resources | Present | Affected | Rationale |
|---|---|---|---|
| Fisheries | YES | YES | Discussed below. |
| Paleontology | NO | NO | There are no known vertebrate paleontological resources; most of the project area is low to moderate probability. No appreciable effects to paleontological resources are foreseen from the Action Alternatives, therefore this resource is dismissed from further analysis. |
| Public Health and Safety | YES | YES | Discussed below. |
| Rangeland Management | YES | YES | Discussed below. |
| Recreation | YES | YES | Discussed below. |
| Soils | YES | YES | Discussed below. |
| Special Status Species | YES | YES | Discussed below. |
| Vegetation | YES | YES | Discussed below. Including wildland fire rehabilitation projects. |
| Wild Horses | YES | YES | Discussed below. |
| Wilderness Study Areas | YES | YES | Discussed below. |
| Wildlife | YES | YES | Discussed below. |

### *3.3.1 Fisheries*

In addition to LCT, populations of redband trout, a BLM sensitive species, also occur in parts of the Owyhee Complex. Within the Owyhee HMA, fisheries habitat is limited to a portion of the South Fork Owyhee River. However, redband trout are only very rarely documented in the river (Johnson 2010 personal comm). A number of non-game native fish species also occur in most perennial drainages throughout the Owyhee Complex, including suckers, red-side shiners and Lahontan speckled dace.

The Rock Creek HMA and adjacent area supports fisheries habitat for native interior redband trout in streams associated with the Snake/Columbia River Basin watershed including Red Cow, Chino (Fourmile) and Big Cottonwood Canyon creeks

### *3.3.2 Public Health and Safety*

In recent gathers, members of the public have increasingly traveled to the public lands to observe BLM's gather operations. Members of the public can inadvertently wander into areas that put them in the path of wild horses that are being herded or handled during the gather operations, creating the potential for injury to the wild horses, to the BLM employees and contractors conducting the gather and/or handling the wild horses as well as to the public themselves. Because these horses are wild animals, there is always the potential for injury when individuals get too close or inadvertently get in the way of gather activities.

The helicopter work is done at various heights above the ground, from as little as 10-15 feet (when herding the animals the last short distance to the gather corral) to several hundred feet (when doing a recon of the area). While helicopters are highly maneuverable and the pilots are very skilled in their operation, unknown and unexpected obstacles in their path can impact their ability to react in time to avoid members of the public in their path. These same unknown and unexpected obstacles can impact the wild horses being herded by the helicopter in that they may not be able to react and can be potentially harmed or caused to flee which can lead to injury and additional stress. When the helicopter is working close to the ground, the rotor wash of the helicopter is a safety concern by potentially causing loose vegetation, dirt, and other objects to fly through the air which can strike or land on anyone in close proximity as well as cause decreased vision. Though rare, helicopter crashes and hard landings can and have occurred (approximately 10) over the last 30+ years while conducting wild horse gathers which necessitates the need to follow gather operations and visitor protocols at every wild horse gather to assure safety of all people and animals involved. Flying debris caused by a helicopter incident poses a safety concern to BLM and contractor staff, visitors, and the wild horses.

During the herding process, wild horses could try to flee if they perceive that something or someone suddenly blocks or crosses their path. Fleeing wild horses can go through wire fences, traverse unstable terrain, and go through areas that they normally would not travel in order to get away, all of which can lead them to injure people by striking or trampling them if they are in the animal's path.

Disturbances in and around the gather and holding corral have the potential to injure the government and contractor staff who are trying to sort, move and care for the wild horses by causing them to be kicked, struck, and possibly trampled by the animals trying to flee. Such disturbances also have the potential for similar harm to the public themselves.

The BLM is committed to allowing access by interested members of the public to the fullest possible degree without compromising safety or the success of operations. To minimize risks to the public from helicopter operations, a gather Contractor is required to conduct all helicopter operations in a safe manner, and to comply with FAA regulations 14 CFR § 91.119 and BLM IM No. 2010-164. At recent gathers, public observers have ranged in number from only a handful of individuals to a maximum of between 15-25 members of the public. At these numbers, BLM has determined that the current level of public visitation to gather operations falls below the threshold of an "open air assembly" under 14 CFR § 91.119.

The Owyhee Complex Wild Horse Gather Observation Protocol found in Appendix B. Owyhee Complex Wild Horse Observation Protocol provides the public with the opportunity to safely observe the gather operations.

### *3.3.3 Rangeland Management*

Based on escalating drought conditions, all permittee's in the Elko and Winnemucca Districts have been notified this is a drought year and they should prepare for temporary changes to their grazing use. Permittee's have been asked to continue to observe conditions and speak with their Rangeland Management Specialist on a regular basis to help mitigate the effects of drought. Many of the permittee's that have allotments within the Owyhee Complex are aware of the current situation and have been voluntarily making livestock adjustment throughout the 2012 grazing year.

The Bullhead, Little Humboldt, Little Owyhee, Owyhee, Spanish Ranch, and Squaw Valley Allotments are managed for livestock grazing but portions of these allotments also overlap with HMA boundaries and those overlapping areas are consequently managed concurrently for wild horses. Figure 8 shows all allotments in and around the Owyhee Complex gather area. Table 5. HMA Acres within Allotments identifies the amount of overlap between grazing allotments and the Owyhee Complex. As shown, allotments acreages do not correspond with HMA acreages, as these areas do not share identical boundaries. The HMA acreage comprises 63% of the total allotment acres.

**Table 5.** HMA Acres within Allotments

| Allotment | Allotment Acres (Public & Private) | HMA Acres (Public & Private) | % Allotment overlapped by HMA |
|---|---|---|---|
| Bullhead | 168,974 | 117,109 | 69% |
| Little Humboldt | 97,904 | 17,159 | 18% |
| Little Owyhee | 580,340 | 460,227 | 79% |
| Owyhee | 374,545 | 339,103 | 91% |
| Spanish Ranch | 189,183 | 108,876 | 58% |
| Squaw Valley | 273,748 | 12,506 | 5% |
| **Total:** | **1,684,694** | **1,054,980** | **63%** |

There are a total of seven livestock operators (permittees) currently authorized to graze livestock in these allotments annually. The total permitted use for these permittees is a combined total of 127,029 Animal Unit Months (AUMs) yearly in the 6 allotments (including on non-HMA lands). An AUM is the amount of forage needed to sustain one cow or its equivalent for one month (43 CFR 4100). All of these allotments consist of various pastures that are grazed seasonally following established grazing systems; however, the season of use may vary (by one to two weeks) annually based upon forage availability, drought conditions and other management criteria.

The PD-MFP and Elko RMP identified the level of livestock grazing authorized for the allotments within the gather area. Since that time there have been several management decisions that have guided the multiple use management of the allotments in the gather area. The allotment specific FMUDs established the AML for wild horses in the allotments in the gather area.

**Figure 8.** Grazing Allotments Map

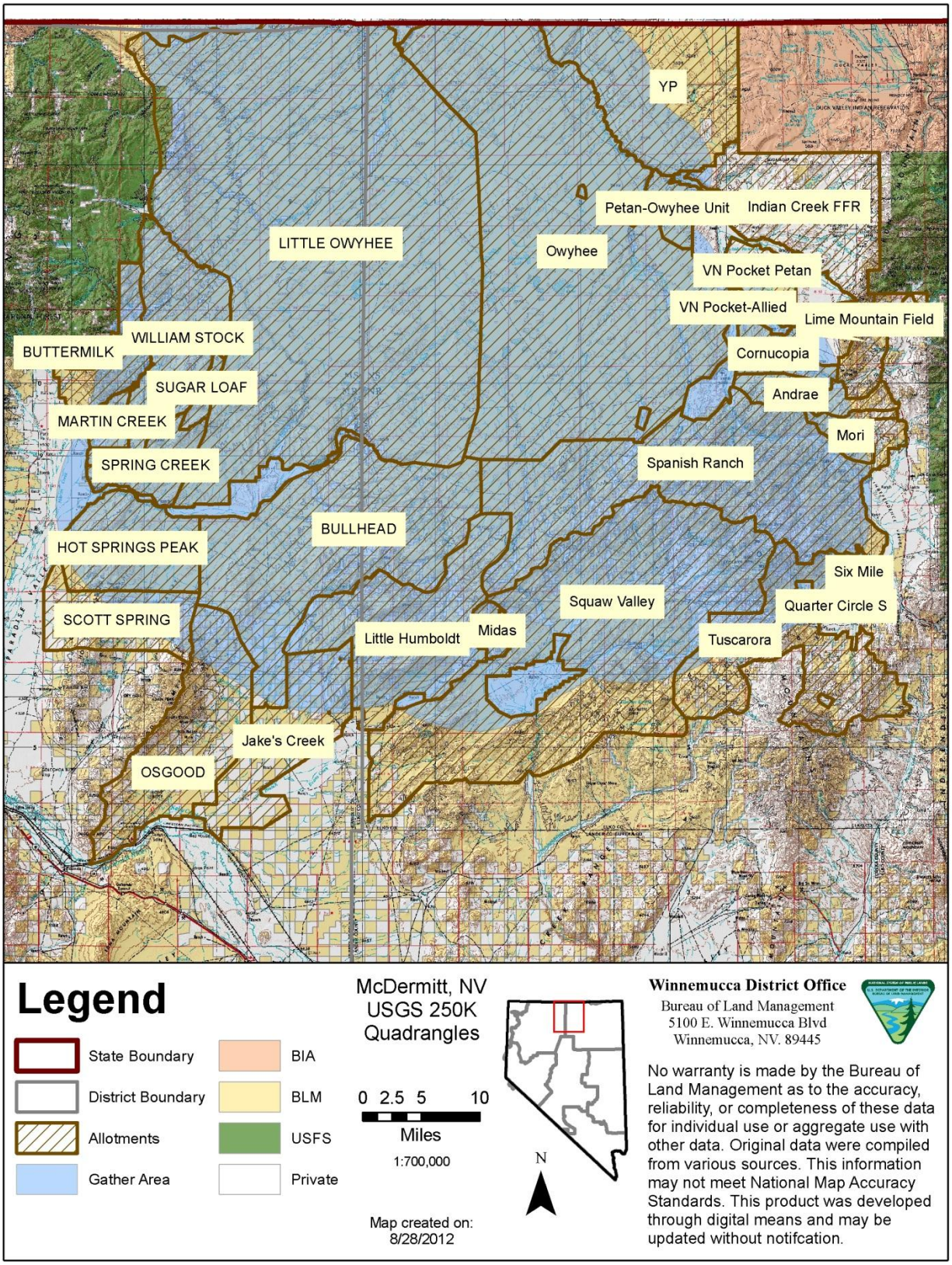


Table 6. Livestock AUMs illustrates the livestock AUMs authorized by the PD-MFP in 1982 and Elko RMP in 1987 compared to the current authorized grazing use.

**Table 6.** Livestock AUMs

| Allotment | Original AUMs | 2012 Authorized AUMs |
|---|---|---|
| Bullhead | 19,283[1] | 12,050 |
| Little Humboldt | 7,656[2] | 8,279 |
| Little Owyhee | 47,463[1] | 27,800 |
| Owyhee | 30,225[2] | 29,903 |
| Spanish Ranch | 48,997[2,3] | 26,796 |
| Squaw Valley | | 22,201 |
| **Totals** | **153,624** | **127,029** |

[1]PD-MFP 1982 [2]Elko RMP 1987

[3] In 1987 the Spanish Ranch and Squaw Valley Allotments were identified as the Rock Creek Allotment. The allotment was split into the Spanish Ranch and Squaw Valley Allotments in 1988.

Owyhee Allotment

The Owyhee HMA lies within the Owyhee Allotment (Figure 8). The entire Owyhee HMA is within the Owyhee Allotment. The Chimney Creek, Dry Creek and Star Ridge Pastures make up the Owyhee HMA. One permittee is authorized to graze cattle in the allotment. The permitted season of use for the Owyhee Allotment is 3/15 to 12/15. Livestock grazing also occurs in areas immediately adjacent to the Owyhee HMA. Due to the limited number of natural water sources throughout the Owyhee Allotment, the livestock permittee hauls water to existing watering locations and pumps existing wells to distribute livestock use. The Dry Creek and Star Ridge Pastures are grazed under an every other year rest rotational grazing system. The Chimney Creek Pasture is used early in year one and again in late fall of the same year and then used during the hot season in year two of the grazing rotation. This grazing system was adopted in 2006 under a Final Grazing Management Decision issued following the completion of the Sensitive Bird Species Environmental Impact Statement for the Owyhee Allotment.

Spanish Ranch and Squaw Valley Allotments

The Rock Creek HMA includes portions of the Spanish Ranch and Squaw Valley Allotments. Ninety percent of the Rock Creek HMA is within the Spanish Ranch Allotment and ten percent of the Rock Creek HMA is within the Squaw Valley Allotment. The Burner Hills Pasture, Winters Pasture, Red Cow Creek use areas within the Spanish Ranch Allotment and the Soldier Field Pasture within Squaw Valley Allotment make up the Rock Creek HMA (Figure 8). Permitted livestock grazing includes both sheep and cattle use within the Rock Creek HMA, and the season of use for the Spanish Ranch Allotment is 3/25 to 10/31, and for the Squaw Valley Allotment is 3/1 to 2/28. However, it should be noted that both the Squaw Valley and Spanish Ranches have made large scale changes in livestock management operations in recent years for the purpose of improving upland and riparian habitats. The Squaw Valley Ranch has rested

significant portions of their allotment while intensifying management and improvement of their private lands for the purpose of reducing use on public lands and particularly in areas supporting LCT. Where domestic sheep have been trailed through the Squaw Valley Allotment, herding practices to prevent overuse of riparian areas have been employed. Similarly, the Spanish Ranch is using riders and recently constructed water developments on private lands to reduce livestock use of streams and springs. The BLM is currently in the process of completing standards and guidelines assessments and developing allotment management plans for the Spanish Ranch and Squaw Valley allotments. This process would include looking at carrying capacities for livestock and wild horses as well as implementing livestock grazing management practices which are consistent with good upland and riparian habitat conditions.

Little Humboldt Allotment

The Little Humboldt HMA coincides with the Castle Ridge Pasture of the Little Humboldt Allotment (Figure 8). All of the Little Humboldt HMA is within the Little Humboldt Allotment. Permitted livestock grazing includes cattle use within the Little Humboldt HMA, and the season of use for the Little Humboldt Allotment is 4/16 to 11/30. The portion of the Little Humboldt Allotment which supports LCT (the South Fork Little Humboldt River Basin) is outside the HMA and is fenced separately. This area is currently managed under an intensive rotational grazing system in cooperation with NDOW and the permittee**.** The grazing system, which was implemented in 2002, provides for periods of rest and limits hot season grazing by cattle.

Little Owyhee Allotment

The current grazing system for the Little Owyhee allotment was implemented through a FMUD in 1999, season of use for the allotment is year round with a rest rotation system that is broken out into four seasons of use; spring, additional spring, summer and fall/winter. Two livestock operators run cattle on the Little Owyhee Allotment with a total authorized grazing preference of 27,800 AUMs (23,700 and 4,100 AUMs respectively). There are a total of nine grazing pastures in the Little Owyhee allotment, but only three pastures are within the Little Owyhee HMA. Livestock season of use in the pastures within the HMA is approximately 03/01 to 06/30 and 09/01 to 02/28.

Bullhead Allotment

The current grazing system for the Bullhead allotment was implemented through a FMUD in 1997, season of use for the allotment is year round with a rest rotation system that is broken out into three seasons of use; spring, summer and winter. One livestock operator runs livestock on the Bullhead allotment with a total authorized grazing preference of 12,050 AUMs. The Bullhead allotment has a total of twelve grazing pastures, all but one is within the Snowstorm HMA. One of these eleven pastures within the HMA only has a portion of the HMA in it the other ten are completely within the HMA. The permittee is required to perform necessary riding (herding) to ensure compliance and to limit livestock drift in certain pastures that are within the HMA. Most of the creeks and streams that are located within the HMA boundary have trigger points for riparian utilization which put in motion livestock movement from one pasture to the next if monitoring determines that the trigger points have been reached.

Table 7. AUMs Allocated to Livestock and Wild Horses shows the approximate AUMs allocated to livestock for each allotment and wild horses for the Owyhee Complex. This table also shows

AUMs allocated to livestock outside of the HMA. Wild horse AMLs were converted to AUMs to make the AUMs more comparable within the HMA and allotment.

**Table 7.** AUMs Allocated to Livestock and Wild Horses

| Grazing Allotment | % HMA w/in Allotment | Active Livestock AUMs | Wild Horse AML Range | Wild Horse AML Range in AUMs | Estimated (adult) Wild Horse Population | Estimated Wild Horse use Expressed in AUMs |
|---|---|---|---|---|---|---|
| Spanish Ranch | 90% | 22,201 | 150-250 | 1,805-3,008 | 346 | 4,163 |
| Squaw Valley | 10% | 26,796 | | | | |
| Owyhee | 100% | 29,903 | 139-231 | 1,673-2,780 | 180 | 2,166 |
| Bullhead | 69% | 12,050 | 90-140 | 1,080-1,680 | 500 | 6,000 |
| Little Owyhee | 79% | 27,800 | 194-298 | 2,328-3,576 | 1,200 | 14,400 |
| Little Humboldt | 18% | 8,279 | 48-80 | 578-963 | 26 | 313 |
| | **Total:** | **127,029** | **621-999** | **7,464-12,007** | **2,252** | **27,042** |

Based on BLM population surveys, the current adult wild horse population is approximately 2,252 wild horses for the Owyhee Complex. This equates to 27,042 AUMs, which is 15,035 AUMs higher than the HMA carrying capacity of 12,007 AUMs designated for wild horse use.

Livestock water developments (e.g., wells, troughs and dirt reservoirs) authorized by the BLM are maintained under a cooperative agreement with the livestock permittees. These water developments are important sources of water for wild horses and wildlife as well as livestock. However, in the past these developed water sources have also been insufficient to maintain excess numbers of wild horses.

**Table 8.** Grazing Use (AUMs) by Year

| Allotment | Actual Use 2009[1] | Actual Use 2010[1] | Actual Use 2011[1] | Estimated Actual Use 2012 |
|---|---|---|---|---|
| Spanish Ranch | 3,486 | 12,676 | 11,956 | 12,367[2] |
| Squaw Valley | 10,352 | 21,341 | 16,950 | 11,587[2] |
| Owyhee | Nonuse | 6,529 | 7,583 | Not Available |
| Bullhead | 8,134 | 7,069 | 6,593 | 7,000[4] |
| Little Owyhee | 8,659 | 7,446 | 5,972 | 8,000[4] |
| Little Humboldt | 1,421[3] | 3,902[3] | 3,609[3] | 6,846[2] |
| **Total** | **32,052** | **58,963** | **52,663** | **45,800** |

[1] Based on paid bills or submitted actual use for each year.
[2] Planned use for 2012 is subject to change as operators have been adjusting livestock number throughout the spring and summer. It is anticipated that this will continue during the fall as well.
[3] Castle Ridge Pasture AUMs based on paid bills only.
[4] Permittees for these allotments are on actual use billing which means they pay for the AUMs used once the season is complete.

### *3.3.4 Recreation*

Recreation resources that exist in the area are mainly dispersed outdoor recreation, wildlife watching/photography, wild horse watching/photography, rock hounding, off-highway vehicle use (outside of wilderness study areas), and hunting for both large and small game. Use levels range from extremely low in winter, low to moderate in the summer, and peak in the fall during hunting seasons with season opening weekends having the highest visitation of the year.

The gather area falls within four NDOW Hunt Units: units 051, 066, 067, and 068. From November 2012 through January 2013 there are four big game hunting seasons that would be in progress:

Units 051, 066, 067, & 068 – Antlered mule deer rifle hunt from October 21 through November 5.

Units 066, 067, & 068 – Two separate bull elk rifle hunts from October 22 through November 5 and November 6 through November 20.

Units 066, 067, & 068 – Cow elk rifle hunt from November 22 through January 1, 2013.

The upland game season for chukar, Hungarian partridge, and quail is scheduled to begin October 13th and runs through February 3rd. The upland game season for blue and ruffed grouse is scheduled to begin September 1st and runs through December 31st (NDOW 2011).

### *3.3.5 Soils*

The majority of soils in all the Owyhee Complex are desert soils developed under low precipitation with minimal topsoil development – Aridisols and Entisols. The soils are mostly fine textured with severe erosion potentials when disturbed. These soils typically have a mesic or frigid temperature regime and aridic soil moisture regime. Isolated patches of hydric soils may be present near water resources. Loss of topsoil from these desert soils leads to an irreplaceable loss in soil productivity, and thus ability to regain natural plant communities if lost. Detailed information for these soils can be found in applicable U.S. Department of Agriculture soil survey publications and are available at http://websoilsurvey.nrcs.usda.gov/app/homepage/htm.

A specific analysis of soil quality for this project has not been completed, but due to the large geographic area encompassed, it can be assumed that a wide variety of soil quality conditions exist. These soils are impacted by a variety of natural and anthropogenic influences.

Trailing and hoof action by wild horses has the potential of accelerating erosion following intense storms or snow melt in areas of increased activities due to the higher numbers of wild horses. Current monitoring indicates heavy and increasing trailing by wild horses between limited water sources and foraging areas. Examples of increased soil erosion are most apparent in the vicinity of small spring meadows currently experiencing high levels of disturbance and bare ground from the current excess wild horses. Excessive wild horse utilization and trailing is occurring in the HMA and is reducing vegetative cover and vigor, in particular, those in areas immediately adjacent to water sources. The reduction of vegetative cover and increased trampling has led to increased soil compaction leading to accelerated run off and subsequent soil erosion.

Areas occupied by wild horses have a significantly higher soil penetration resistance than areas without wild horses (Beever and Herrick 2006). This can affect a variety of other ecosystem processes, such as decreasing water infiltration rates, inhibiting digging by burrowing mammals, limiting plant establishment, and restricting root growth (Beever et al. 2003).

The relative quantity of vegetative cover removed by grazing also affects soil properties. In general, vegetative cover provides shading for soils, which increases their ability to retain moisture, reduces soil erosion by intercepting precipitation and reducing surface wind velocities, and provides organic input into the soil (Beever and Herrick 2006).

### *3.3.6 Special Status Species*

Both Threatened and Endangered Species (addressed in Section 3.2.5 Threatened and Endangered Species) and Sensitive Species (addressed below) are considered Special Status Species. The Nevada Natural Heritage Program (NNHP) database (August 2012) and the NDOW Diversity database (August 2012) were consulted for the possible presence of endangered, threatened, candidate and/or sensitive plants or animal species. NDOW data show observations of northern goshawk, golden eagle, peregrine falcon, silver haired bat (*Lasionycteris noctivagans*), loggerhead shrike, and Brewer's sparrow within the proposed gather area. The NNHP data show observations of Owyhee prickly phlox (*Leptodactylon glabrum*), Columbia spotted frog and LCT (last two species addressed in Section 3.2.5 Threatened and Endangered Species).

The following designated BLM sensitive animal or plant species are described, as they have either been seen in the gather area or the area contains habitat characteristics conducive to these species.

Silver Haired Bat (and other bat species)

Several species of bats may occur in this area – see Appendix F. Most bats in Nevada are year-round residents. In general terms, bats eat insects and arthropods during the warmer seasons and hibernate in underground structures during the cooler seasons. The cliffs, talus, shallow caves; rock crevices (including those surrounding some of the vegetated playas); trees; ephemeral, intermittent and perennial drainages, and mine shafts and adits provide potential bat roost sites within the Owyhee Complex. Bats may eat flies, moths, beetles, ants, scorpions, centipedes, grasshoppers, and crickets. Bats thrive where the plant communities are healthy enough to support a large population of prey (Bradley et al. 2006). Healthy riparian communities with high water tables and tall vegetation leading to high flying insect populations creates favorable foraging habitat for bats.

Western Burrowing Owl

Western burrowing owls are known to occur within the Owyhee Complex. Burrowing owls prefer open, arid, treeless landscapes with low vegetation. They are dependent upon burrowing mammal populations for maintenance of nest habitat and choose nesting areas based on burrow availability (Floyd et al. 2007). These birds are highly adaptable and readily nest in open disturbed areas such as golf courses, runways, and industrial areas that border suitable habitat (Neel 1999). Dense stands of grasses and forbs within owl home ranges support populations of rodent and insect prey. Urbanization is the biggest threat to this species as suitable habitat is converted to non-habitat for human use (Floyd et al. 2007).

Pygmy Rabbit

In the Great Basin, the pygmy rabbit is typically restricted to sagebrush-grass communities located on deep loamy soils, however, they may also occur in areas of large dense rabbitbrush and greasewood. Preferred locations for burrows include broad valley floors, drainage bottoms, alluvial fans, and other areas with friable soils. A dietary study of pygmy rabbits showed dependence on sagebrush year round. Sagebrush made up about 51% of the diet in summer and 99% in the winter. Grasses and forbs were also consumed in the summer (Green and Flinders 1980).

Although no formal surveys have been completed on the HMAs, they have either been observed, or their active burrows have been observed in recent years by BLM personnel on the Star Ridge and Dry Creek pastures on the Owyhee HMA within habitat characterized by the Wyoming big sagebrush vegetation type. Pygmy rabbits have also been documented by NDOW personnel immediately south of the Rock Creek HMA on the Trout Creek drainage area within the Tuscarora Range. They have also been documented in close proximity to the Willow Creek drainage approximately six miles south of the Rock Creek HMA boundary. It is likely pygmy rabbit habitat was severely impacted during the 2012 Willow Fire since the fire burned intensively in areas typically favored by this species (tall dense stands of sagebrush in deep soils).

Raptors

Golden eagle, peregrine falcon, and northern goshawk have been observed in the gather area.

Golden eagles are primarily cliff nesters and would utilize the area to nest and forage for prey species such as jackrabbits and other small mammals. Golden eagles are protected under the Bald and Golden Eagle Protection Act. Nevada's Golden eagle population is thought to be stable to increasing. They are widespread and frequently encountered (Floyd et al. 2007).

The peregrine falcon may be found in various open situations from tundra, moorlands, steppe, and seacoasts, especially where there are suitable nesting cliffs, to mountains, open forested regions, and human population centers. Nests typically are situated on ledges of vertical rocky cliffs, commonly with a sheltering overhang. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey. Substitute man-made sites include tall buildings, bridges, rock quarries, and raised platforms. (NatureServe 2012)

The Northern goshawk is an opportunistic hunter, preying on a wide variety of vertebrates and, occasionally, insects. Prey is taken on the ground, in vegetation, or in the air. It forages in both heavily forested and relatively open habitats. In Nevada, it forages in open sagebrush (Artemisia spp.) adjacent to riparian aspen stands. It nests in a wide variety of forest types including deciduous, coniferous, and mixed forests. Western birds also nest in deciduous forests dominated by aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), or wouldow. (NatureServe 2012)

Brewer's Sparrow

The Brewer's sparrow may be found in this area since it typically inhabits sagebrush communities. The Brewer's sparrows tend to favor areas dominated by shrubs rather than grass. They thrive where extensive areas of sagebrush habitat are maintained with shrubs occurring in

tall, clumped, and vigorous stands. They place their nests low in sagebrush (preferred), other shrubs, or cactus, from a few centimeters to about one meter from ground. They would also place nests higher in taller sagebrush (Rich 1980). The Brewer's sparrow mainly forages for insects on the ground.

Loggerhead Shrike

Loggerhead shrikes may be found in sagebrush/bunchgrass and salt desert scrub vegetative communities, so it is possible that they occur on these allotments. Loggerhead shrikes tend to favor arid, open country with just a few perches or lookouts. They nest in isolated trees and large shrubs and feed mainly on small vertebrates and insects. The species is relatively common and well distributed across the state (Neel 1999). These birds benefit from habitat with a diverse structure and species composition. Healthy sagebrush communities provide these habitat characteristics. According to Paige and Ritter (1999), "Long-term heavy grazing may ultimately reduce prey habitat and degrade the vegetation structure for nesting and roosting. Light to moderate grazing may provide open foraging habitat".

Sage Thrasher

Sage thrashers may be found in the project area as well. They thrive where sagebrush habitat is maintained, with shrubs occurring in tall, clumped, and vigorous stands. They tend to prefer tall shrubs for nesting or song perches. Primarily a ground forager, foraging success may be reduced by continuous cover of crested wheatgrass, cheatgrass or other non-native grasses (Paige and Ritter 1998).

Owyhee Prickly Phlox

This species can be found in Nevada and Idaho, in crevices in steep to vertical, coarse-crumbling volcanic canyon walls at 2600-4000 m elevation. It is intolerant of water paths or seeps that may form in the rock crevices. It is a shrubby, highly branched, perennial herb, 2-3 dm tall, with deeply lobed leaves and funnel-shaped flowers which appear in May-June (NatureServe 2012).

Bighorn Sheep (*Ovis canadensis*)

Approximately 123,781 acres of occupied bighorn habitat is within the gather area, on the Owyhee Complex. Bighorn sheep occur in mesic to xeric, alpine to desert grasslands or shrub-steppe in mountains, foothills, or river canyons. Access to mineral licks may be important for Rocky Mountain and desert bighorns, especially in spring. Topography is the primary source of cover for bighorns. Suitable escape terrain (cliffs, talus slopes, etc.) is an important feature of the habitat. Bighorns are primarily grazers of grass and forbs, but diet can also include significant amounts of shrubs (NatureServe 2012). Three characteristics are common to quality forage: abundance, continuous distribution, and low stature. Grasses have high importance in bighorn sheep diets, but forbs and shrubs are also important. Desirable bighorn habitat consists of sagebrush/bunchgrass communities, wet meadows, and riparian areas adjacent to rock outcrops and rimrock.

### *3.3.7 Vegetation*

The primary vegetation in the Owyhee Complex is big sagebrush-bunchgrasses and low sagebrush-bunchgrasses. The major plant associations are dominated by big sagebrush (*Artemisia tridentata*), low sagebrush (*A. arbuscula*), shadscale (*Atriplex confertifolia*), spiny hopsage (*Grayia spinosa*), bud sage (*Picrothamnus desertorum*), rabbit brush (*Chrysothamnus*

spp.), and winterfat (*Eurotia lanata*) respectively. Major bunchgrass species include bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), indian ricegrass (*Achnatherum hymenoides*),Thurber's needlegrass (*Achnatherum thurberianum* and bottlebrush squirreltail (*Elymus elymoides*). Forbs include arrowleaf balsamroot (*Balsamorhiza sagittata*), lupine (*Lupinus* spp.), phlox (*Phlox* spp.), and aster (*Aster* spp.).

The perennial grass community includes: bluebunch wheatgrass (*Pseudoroegneria spicata* ), Idaho fescue *(Festuca idahoensis)*, Sandbergs bluegrass, needle-and-thread grass (*Hesperostipa comata* ), Thurber's needlegrass, bottlebrush squirreltail, Indian ricegrass, and basin wildrye *(Leymus cinereus)*, and some seeded species that include streambank wheatgrass (*Elymus lanceolatus* ), Sherman's big bluegrass (*Poa ampla*), and Snake River wheatgrass (*Elymus wawawaiensis*). The forb community includes: arrowleaf balsamroot, lupine spp., phlox spp., aster spp., hawksbeard (*Crepis spp.)*, prickly lettuce (*Lactuca serriola*), wild onion (*Allium spp*.) and death camas (*Zigadenus spp.).*

In 2006, 17% of the Owyhee HMA burned in the Winters fire, 95% of the Rock Creek HMA burned in the Winters and Amazon fires, and over 90% of the Little Humboldt HMA burned in the Winters fire. The Amazon and Winters fires burned a total of 108,563 and 238,462 acres respectively. Since 2006, 3% of the Little Owyhee HMA and 4% of the Snowstorm HMA have burned. The current vegetation communities have therefore been altered from the historic communities due to these large wildfires and subsequent native vegetation release and fire rehabilitation efforts. These fires have resulted in scattered patches of cheatgrass and other annual non-native species.

In 2012, the Willow fire burned 43,271 acres of private and public lands adjacent to the Rock Creek HMA. BLM, NDOW, Natural Resource Conservation Service, USFWS, stake holders, and private land owners are working together to develop an Emergency Stabilization and Rehabilitation Plan for recovery of the burned area.

Increasing wild horse utilization and trailing due to accelerating numbers is occurring in the Owyhee Complex and is reducing vegetative cover and vigor, particularly, in those areas immediately adjacent to water sources. The reduction of vegetative cover and increased trampling resulting from higher wild horse numbers has led to increased soil compaction and surface disturbance leading to potential accelerated run off and subsequent soil erosion.

The relative quantity of vegetative cover removed by grazing also affects soil properties. In general, vegetative cover provides shading for soils, which increases their ability to retain moisture, reduces soil erosion by intercepting precipitation and reducing surface wind velocities, and provides organic input into the soil (Beever and Herrick 2006).

Wild horses are uneven grazers, meaning that they do not always graze an area in its entirety before moving on to another. Areas where they do graze have been noted to have a lower abundance of cover grasses, lower shrub cover, lower total vegetative cover, lower species richness, and less continuous shrub canopy (Beever and Herrick 2006).

### *3.3.8 Wild Horses*

Wild Horse & Burro HMA AMLs were established in order to ensure a thriving natural ecological balance and multiple-use relationship within the HMA. BLM manages wild horses at the established AMLs and removes animals in excess of the established AML range. Changes to the AML are appropriate only if multiple use allocations are being adjusted through the land-use planning process, or if monitoring data demonstrates that the AML is either set too high or too low within the existing multiple use allocations and after BLM conducts the appropriate environmental analyses and provides opportunities for public input through a public decision-making process. Available data does not presently indicate that the AML could be increased and still maintain rangeland and wild horse health.

Elko District HMAs

The Little Humboldt, Owyhee, and Rock Creek HMAs were designated within the ROD for the Elko RMP Wild Horse Amendment (2003).

*Owyhee HMA*

The appropriate management level (AML) for the Owyhee HMA was established as a population range of 139-231 wild horses through the Owyhee Allotment Evaluation/Multiple Use Decision process in 2002 following an in-depth analysis of monitoring data collected over several years.

The existing HMA boundary and the herd original HA have matching boundaries as established by the Elko Resource Management Plan (RMP) Wild Horse Amendment in 2003. Establishing the AML as a population range allows for the periodic removal of excess animals (to the low range) and subsequent growth (to the high range) between removals (gathers). The AML was based on considerations of forage availability and water availability. The AMLs represent the wild horse population range at which a thriving natural ecological balance can be maintained, and reflect the balance between wild horse and other multiple uses of the public rangelands established through prior planning decisions. The AML for the Owyhee HMA was established at a level BLM determined would ensure a thriving natural ecological balance and multiple-use relationship within the Owyhee HMA. The FMUD establishing the AML and supporting documentation are available for public review at the Elko District Office. The decision was reaffirmed in the October 30, 2006, EIS and "Final Grazing Management Decision and Record of Decision for the Sheep Complex, Big Springs and Owyhee Grazing Allotments".

Wild horse population growth rates average 15-25% in the Owyhee HMA. An aerial population inventory flight conducted in March 2011 in the Owyhee HMA observed 150 wild horses within the HMA. The Owyhee HMA is primarily known for its roans, duns, and greys (Star Ridge). The population inventory flights have also provided information pertaining to: population numbers, distribution, and herd health. The estimated September 2012 population is 180 wild horses, which includes the estimated 2012 year's foal crop.

Hundreds of wild horses have grazed the Owyhee HMA over the past two decades and throughout this period the lack of water has been the limiting factor for wild horse herd management. To achieve and maintain AML, BLM has conducted four (two emergency gathers and two AML gathers) removals in the Owyhee HMA in the last 20 years and approximately 2,062 wild horses have been removed during these management operations. Emergency gathers as a result of drought or fire were also conducted in 2000 and 2006 to prevent the death of

individual animals from thirst or starvation. Please refer to Table 9. Owyhee Complex Gather History for the Owyhee HMA gather history.

In the Star Ridge portion of the Owyhee HMA, wild horses can be found in large concentrations on Star Valley ridge. The ridge is close to a series of stock tanks (ephemeral reservoirs). When water is not available in the stock tanks, all of the wild horses must obtain water at the "pipeline" crossing in the South Fork Owyhee River, which is at a distance of 9-10 miles from the stock tanks. In the Star Ridge Pasture, supplemental water for wild horses has been provided in the past by permittees in order to meet the watering needs for their livestock as well as numbers of wild horses in excess of the current established AML. In the Chimney Creek Pasture, wild horses obtain water at the Desert Ranch Reservoir, which has gone dry in past dry years (Figure 9).

**Figure 9.** The Desert Ranch Reservoir taken in August 2012. The reservoir is expected to be dry by October 1, 2012.

**Table 9.** Owyhee Complex Gather History

| Year | HMA(s) Gathered | Gathered | Removed | Released | Died or Euthanized |
|---|---|---|---|---|---|
| 1977 | Little Owyhee | 1,065 | 1,065 | 0 | 0 |
| 1981 | Elko District (Little Humboldt, Owyhee, & Rock Creek) | 751 | 741 | 0 | 10 |
| 1981 | Little Owyhee & Snowstorm Mountains | 548 | 548 | 0 | 0 |
| 1983 | Little Owyhee & Snowstorm Mountains | 768 | 768 | 0 | 0 |
| 1984 | Little Owyhee & Snowstorm Mountains | 686 | 686 | 0 | 0 |
| 1985 | Little Owyhee & Snowstorm Mountains | 984 | 984 | 0 | 0 |
| 1987 | Little Humboldt and Rock Creek, | 132 | 132 | 0 | 0 |
| 1992 | Little Owyhee (Drought Emergency Gather) | 831 | 691 | 136 | 4 |
| 1999 | Snowstorm Mountains (Emergency Fire Rehabilitation) | 170 | 115 | 50 | 5 |
| 2000 | Owyhee | 622 | 617 | 5 | 5 |
| 2001 | Little Owyhee (Drought Emergency Gather) | 761 | 510 | 240 | 11 |
| 2002 | Little Humboldt, Owyhee, & Rock Creek | 2,382 | 2,120 | 242 | 20 |
| 2004 | Little Owyhee & Snowstorm Mountains | 892 | 728 | 162 | 2 |
| 2004 | Little Humboldt & Rock Creek | 1,652 | 1,482 | 154 | 16 |
| 2006 | Snowstorms Mountains (Emergency Fire Rehabilitation) | 43 | 24 | 15 | 4 |
| 2010 | Little Humboldt, Owyhee, and Rock Creek | 1,224 | 1,069 | 126 | 29 |
| | **Total** | **13,511** | **12,280** | **1,130** | **106** |

Wild horse use patterns within the Owyhee HMA are dependent on the available waters. Wild horses in the Dry Creek Pasture can normally be found in the vicinity of the seasonal playas and small reservoirs. When water is not available at these ephemeral sources, the bands of wild horses move south to man-made stock tanks and Bookkeeper Spring, which is located on private land and is normally dry. When the seasonal playas, small reservoirs, man-made stock tanks and Bookkeeper Spring is dry wild horses have to travel long distances to the South Fork of the Owyhee River to water. Wild horses could travel up to 20 miles or more to the river or move outside the Owyhee HMA into neighboring HMAs to find water.

*Rock Creek HMA*

The AML for the Rock Creek HMA was established as a population range of 150-250 wild horses by the Elko RMP (2003). The AML for the Rock Creek HMA was established at a level that would ensure a thriving natural ecological balance and multiple-use relationship within the Rock Creek HMA. The Rock Creek HMA and HA boundaries are different and portions of the HA were not designated as the HMA due the presence and potential for continued degradation of habitat for the LCT. The RMP establishing the AML is available for public review at the TFO.

Wild horse population growth rates average 20% in the Rock Creek HMA. An aerial population inventory flight conducted in May 2011 observed 288 wild horses of all age classes of which over 30% were outside of the Rock Creek HMA. The estimated August population of wild horses in and outside the Rock Creek HMA is estimated to be 346 wild horses, which includes the estimated 2012 year's foal crop. Additionally, field observations and the 2011 population inventory documents show that over 30 percent or 104 wild horses of the Rock Creek herd are permanently residing outside the Rock Creek HMA in non-HMA areas that are not designated for wild horse management. These non-HMA areas currently occupied by wild horses were not identified for long-term use by wild horses because they include streams that have LCT or have been identified for the possible re-introduction of LCT.

Over time, the Rock Creek HMA has been documented with more than a thousand wild horses several times. During these times, excess numbers of wild horses within the HMA have caused wild horses to move outside of the HMA in search of forage and to avoid competition from other wild horse bands. To achieve and maintain AML, the Rock Creek HMA has undergone six removals equaling approximately 3,500 wild horses from within and outside the HMA. This includes emergency gathers as a result of drought or fire which were conducted in 1996, 2000, 2002 and 2006 to prevent the death of individual wild horses from thirst or starvation due to excess wild horse numbers, drought conditions and lack of forage due to wildfires. Please refer to Table 9. Owyhee Complex Gather History for the Rock Creek HMA gather history.

*Little Humboldt HMA*

The AML for the Little Humboldt HMA was established as a population range of 48-80 through the Little Humboldt Allotment Evaluation and Stipulation to Modify Decision and Dismiss Appeals dated June 2002. The Little Humboldt HMA is located within the Castle Ridge Pasture of the Little Humboldt Allotment.

An aerial population inventory flight conducted in May 2011 in the Little Humboldt HMA observed 22 wild horses of all age classes within the HMA. Based on current population inventory data from May 2011 it is estimated that the August population within the Little

Humboldt HMA will be around 26 wild horses, which includes the estimated 2012 year's foal crop. These population inventory flights have also provided information pertaining to: population numbers, distribution, and herd health. The decrease in wild horses into the Little Humboldt HMA can be attributed to ingress and egress of wild horses between the adjacent HMAs.

To achieve and maintain AML, BLM has removed excess wild horses from the Little Humboldt HMA in five removals in the last 20 years with approximately 625 wild horses removed. This includes emergency gathers as a result of drought or fire which were conducted in 2002, 2004, and 2006. Please refer to Table 9. Owyhee Complex Gather History for the Little Humboldt HMA gather history.

Winnemucca District HMAs

The Little Owyhee HMA and the Snowstorms HMA were designated as herd use areas within the ROD for the PD-MFP (1982) for the long-term management of wild horses.

*Little Owyhee HMA*

The AML for the Little Owyhee HMA was established as 194-298 wild horses in the Little Owyhee FMUD and affirmed in subsequent EAs Table 2. AML Decision Documents.

These decisions were based on Allotment Evaluations that analyzed resource monitoring data and allowed for public involvement and input into the decision-making process. Establishing AML as a population range allows for the periodic removal of excess animals (to the low range) and subsequent population growth (to the high range) between removals (gathers).

Please refer to Table 9. Owyhee Complex Gather History for the Little Owyhee HMA gather history.

*Snowstorms HMA*

The appropriate management level (AML) of wild horses within the Snowstorm Mountains HMA was established at a range of 90-140 wild horses in the Bullhead Final Multiple Use Decision, August 25, 1994. The AML was again affirmed in subsequent EAs Table 2. AML Decision Documents.

These decisions were based on Allotment Evaluations that analyzed resource monitoring data and allowed for public involvement and input into the decision-making process. Establishing AML as a population range allows for the periodic removal of excess animals (to the low range) and subsequent population growth (to the high range) between removals (gathers).

Please refer to Table 9. Owyhee Complex Gather History for Snowstorms Mountains HMA gather history.

Owyhee Complex

*Current Population*

The estimated population of wild horses within the Owyhee Complex is approximately 2,252 wild horses based on recent inventories, historic recruitment, and ground observations.

The expected foal crop was added to the wild horse populations because the gather is scheduled starting in November 2012 after the foaling season. Typically foals are not counted in the total population until January 1, when they become yearlings. Since the gather and removal numbers would include the foals it is more representative to include them in the current population estimates.

The expected wild horse population exceeds the low range AML by 1,631 wild horses and is about 4 times the low AML (approximately 621 wild horses) or about 2 times high AML (approximately 999 animals wild horses). This equates to 27,024 AUMs, which is 15,036 AUMs higher than the HMA carrying capacity of 11,988 AUMs designated for wild horse use.

*Population Dynamics and Demography*
Wild horses usually produce one offspring per year, with an observed or projected annual herd rate of increase between 18 and 25% (Wolfe 1980, Eberhardt et al. 1982, Eberhardt 1985, Wolfe et al. 1989, Garrott and Taylor 1990, Garrott et al. 1991). A herd with a 20% rate of annual increase would more than double in four years.

Herd rate of increase is influenced by adult survival rate, foaling rate, and foal mortality. Adult wild horse survival is usually very high, estimated between and 80 and 97%, and may be the key determinant of wild horse population increases (Wolfe 1980, Eberhardt et al. 1982, Garrott and Taylor 1990). Most foals are born between April and June. Foal mortality is highest within the first year and has been recorded as between 2 and 10% (McCort 1984). Causes of foal mortality include weaknesses at birth, severe winter/spring weather, rejection or inattentiveness of the mare, and separation from mares.

Foaling rates vary by year and differ between herds as well as being dependent on weather, available resources, and herd size. Peak foaling rates in mares occur between ages 8 and 20, after which reproduction is possible but much less likely. Some mares may be able to foal at age 2, but most females begin reproducing at age 3 (Eberhardt et al. 1982, Garrott and Taylor 1990).

Sex ratios of adult wild horse herds are nearly always skewed toward females. Experts cite three main reasons for this: differential survival of adult males and females, removal of a disproportionate number of males, and skewed foal sex ratios (Garrot and Taylor 1990). Higher mortality in male wild horses may be due to injuries acquired during fights for mates or under conditions of food shortage and being unable to obtain sufficient nutrients since male wild horses naturally need more nutrients than females (Siniff et al. 1986).

*Social Interactions*
It is widely agreed that wild horses have three major types of social groups: harem groups, multiple male and female groups, and bachelor male groups. A harem group consists of one adult male and several adult females and their offspring, ranging from 2 total individuals to more than 20 (McCort 1984). Harems are stable groups, and are the type of wild horse group most often described by authors. Harem females mate almost exclusively with the harem male, however genetic testing has shown that nearly one-third of foals are sired by stallions other than the harem stallion (Bowling and Touchberry 1990). Many young wild horses leave their natal group at sexual maturity, so there is movement of wild horses between harems or groups, making inbreeding rare in wild horse populations.

Multiple male and female groups generally have more than one adult male and several adult females and their offspring. These group compositions are not stable, and differ from harems in mating behavior and dominance structure. In such groups, one male is most likely dominant over the others. This male prevents subordinate males from interacting with the adult females in the group and plays the dominant role during interactions with other groups (Salter and Hudson 1982). The most common male wild horse interactions include olfactory investigation and fecal marking. Fecal marking of the same location repeatedly by various males is common and can become very large. These stud piles are used throughout the year, commonly for 1-3 years, and are often located in highly visible areas such as the edges of trails or roads or beneath lone trees in a grassy area (Salter and Hudson 1982, McCort 1984). Occasionally, more than one in the same general location is noted.

Bachelor male groups are composed entirely of male wild horses and are generally unstable in composition. These groups are formed by young males forced out of their family groups or older wild horses who have lost membership in a harem or multiple male and female groups. Group sizes have been observed as ranging from a single lone stallion to 16 wild horses.

*Aerial Population Counts and Growth Rates*
A population survey flight was completed in early May 2011 to confirm the approximate numbers of wild horses within the gather area and to confirm the extent to which wild horses have moved outside of the HMA boundaries to find forage, water and space. This flight utilized the best management practices recommended in IM No. 2010-057. The results of this survey showed that horses have moved outside of HMA boundaries on the Winnemucca and Elko Districts and that the population for the Complex was approximately 1,800 wild horses.

Rates of wild horse population increase are compiled to take into account both mortality and foaling and are estimates used to project population growth during years when an aerial population count is not completed. The rate of increase for the Owyhee Complex is approximately 20-25% per annum. This number was derived through analysis of the numbers of foals captured during previous gathers in relation to the number of adults, as well as number of foals observed during aerial population counts.

Wild horses are not a self-regulating species, they have few predators within the Owyhee Complex which is evidenced by their current population numbers and if excess wild horses are not removed, would continue to reproduce until their habitat could no longer support them. Severe habitat damage and declining animal health generally precede abrupt and substantial death losses in wild horse populations.

A post-gather survey would also be coordinated and conducted to reaffirm the number of wild horses remaining in the HMA after the initial proposed gather.

*Genetic Analysis and Herd History*
Wild horses are primarily descendants of ranch horses and cavalry remounts. The dominant colors in the Owyhee Complex are gray, bay, black, brown, and roan. 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 and Zeigenfuss 2000). Based on past gather and field observations, there are no signs of inbreeding

which suggests that the Owyhee Complex wild horses are genetically diverse. The AML within the Owyhee Complex (621-999) is at a level that supports genetic diversity. The wild horse population size at AML should promote adequate conditions for genetic health even after excess wild horses are removed.

Genetic samples were collected from wild horses during the 2002 and 2010 gathers to develop genetic baseline data (e.g. genetic diversity, historical origins of the herd, unique markers). The samples were analyzed by a geneticist (E. Gus Cothran) at the Department of Veterinary Integrative Bioscience Texas A&M University College Station, TX to determine the degree of heterozygosity for the herd. Results showed good genetic diversity and are available at the Elko District Office. Past gathers in the Owyhee, Rock Creek, and Little Humboldt HMAs have not resulted in genetic diversity problems. This data would be incorporated into a Herd Management Area Plan(s) in the future. At this time, there is no evidence to indicate that the Owyhee, Rock Creek, and Little Humboldt HMAs wild horses suffer from reduced genetic fitness at the established AMLs.

Genetic samples were also collected in from the Snowstorm Mountains HMA in 1994, 1996 and 2004 and the Little Owyhee HMA in 1992 and 2004 these samples revealed high genetic diversity. The *Genetic Analysis of the Little Owyhee and Snowstorm Mountains, NV feral horse herds* February 29, 2008 by E. Gus Cothran, Department of Veterinary Integrative Bioscience Texas A&M University College Station, TX states, "Genetic variability with the Little Owyhee herds is above the average for feral herds. Overall genetic diversity in these herds is high."

The Owyhee, Rock Creek, and Little Humboldt HMAs in the Elko District as well as the Little Owyhee, and Snowstorm Mountains HMAs within the Winnemucca District are all contiguous and generally separated only by fencing. Movement does occur (and has been observed) between these HMAs through open gates and crossings, but no formal research has been completed to determine the extent of this movement. Management of the wild horses in these HMAs at the established AML ranges and as an interacting population regardless of boundaries (i.e., as an HMA Complex) would ensure continued genetic diversity and health. Even slight movement helps to diversify and contribute to heterozygosity of the herds. Samples would again be collected during the proposed gather for genetics analysis.

*Diet/Dietary Overlap with Other Species*

Numerous studies identify dietary overlap of preferred forage species and habitat preference between horses, cattle, and wildlife species in the Great Basin ecosystems for all seasons (Ganskopp 1983, Ganskopp and Vavra 1986, Ganskopp and Vavra 1987, McInnis 1984, McInnis and Vavra 1987, Smith et al. 1982, Vavra and Sneva 1978). A strong potential exists for exploitative competition between wild horses and cattle under conditions of limited forage, water, and space availability (McInnis et al. 1987).

Wild horses also compete with wildlife species for various habitat components, especially when populations exceed AML and/or habitat resources become limited (i.e. reduced water flows, low forage production, dry conditions, etc.). Smith determined that elk and bighorn sheep were the most likely to negatively interact with wild horses (1986). Hanley and Hanley compared the diets of wild horses, domestic cattle and sheep, pronghorn antelope, and mule deer and found that wild horse and cattle diets consisted mostly of grasses, pronghorn and mule deer diets consisted

mostly of shrubs (>90%) and sheep diets were intermediate (1982). Due to different food preferences, diet overlap between wild horses, deer, and pronghorn rarely reaches above20% (Hubbard and Hansen 1976, Hansen et al. 1977, Meeker 1979, Hanley and Hanley 1982).

The dietary overlap between wild horses and cattle is much higher, and averages between 60 and 80% (Hubbard and Hansen 1976, Hansen et al. 1977, Hanley 1982, Krysl et al. 1984, McInnis and Vavra 1987). Horses are cecal digesters while most other ungulates including cattle, pronghorn, and others are ruminants (Hanley and Hanley 1982, Beever 2003). Cecal digesters do not ruminate, or have to regurgitate and repeat the cycle of chewing until edible particles of plant fiber are small enough for their digestive system. Ruminants, especially cattle, must graze selectively, searching out digestible tissue (Olsen and Hansen 1977).

Although horses and cattle are often compared as grazers, wild horses have been cited as more destructive to the range than cattle due to their digestive system and grazing habits. Horses, however, are one of the least selective grazers in the West because they can consume high fiber foods and digest larger food fragments (Hanley and Hanley 1982, Beever 2003). Wild horses can exploit the high cellulose of graminoids, or grasses, which have been observed to make up over 88% of their diet (McInnis and Vavra 1987, Hanley 1982). However, this lower quality diet requires that wild horses consume 20-65% more forage than a cow of equal body mass (Hanley 1982, Menard et al. 2002). With more flexible lips and upper front incisors, both features that cattle do not have, wild horses trim vegetation more closely to the ground (Symanski 1996, Menard et al. 2002, Beever 2003). As a result, areas grazed by wild horses may retain fewer plant species than areas grazed by other ungulates. A potential benefit of a wild horse's digestive system may come from seeds passing through system without being digested but the benefit is likely minimal when compared to the overall impact wild horse grazing has on vegetation in general. However, this potential for seed dispersal could also result in the widespread dispersal of viable non-native invasive annual grass seed such as cheatgrass seed.

*Water*

For wildlife and domestic species living in arid environments, the availability and location of water is critical not only for survival but for habitat utilization. Wild horses have been observed to travel great distances to and from water daily, and during dry summer months when less water is available from seasonal sources, wild horses remain slightly closer to perennial water sources than in the winter and spring (Ganskopp and Vavra 1986, Hansen et al. 1977). They prefer to drink during the first part of daylight or the last and were not observed to linger at the water source (Ganskopp and Vavra 1986).

Horses have been found to have some effect on the frequency of use of a water source by other wildlife in arid environments. One study found that in areas where bighorn sheep and wild horse water sources overlapped, the higher the frequency of wild horse use led to lower frequency of bighorn sheep use, and vice versa (Ostermann-Kelm 2009). The presence of wild horses at water sources is believed to deter the use of that water by pronghorn antelope until the wild horses leave the area.

Competition with wildlife for water at artificial pit reservoirs and water catchments, or natural catchments/ponds, could be keen. Based on data from the Merck Veterinary Manual regarding water consumption by horses and potential competition with wildlife, an average wild horse uses

around 10 gallons of water a day at isolated to limited scattered sources during the heat of the summer (Kahn et al. 2012). For the Owyhee Complex, the current population of 2,252 wild horses uses approximately 157,640 gallons of water in one week compared to what a low AML population of 621 would use – 43,470 gallons in one week – a difference of 114,170 gallons. More water would be available for a longer period of time for the AML number of horses and wildlife species dependent on the same source(s).

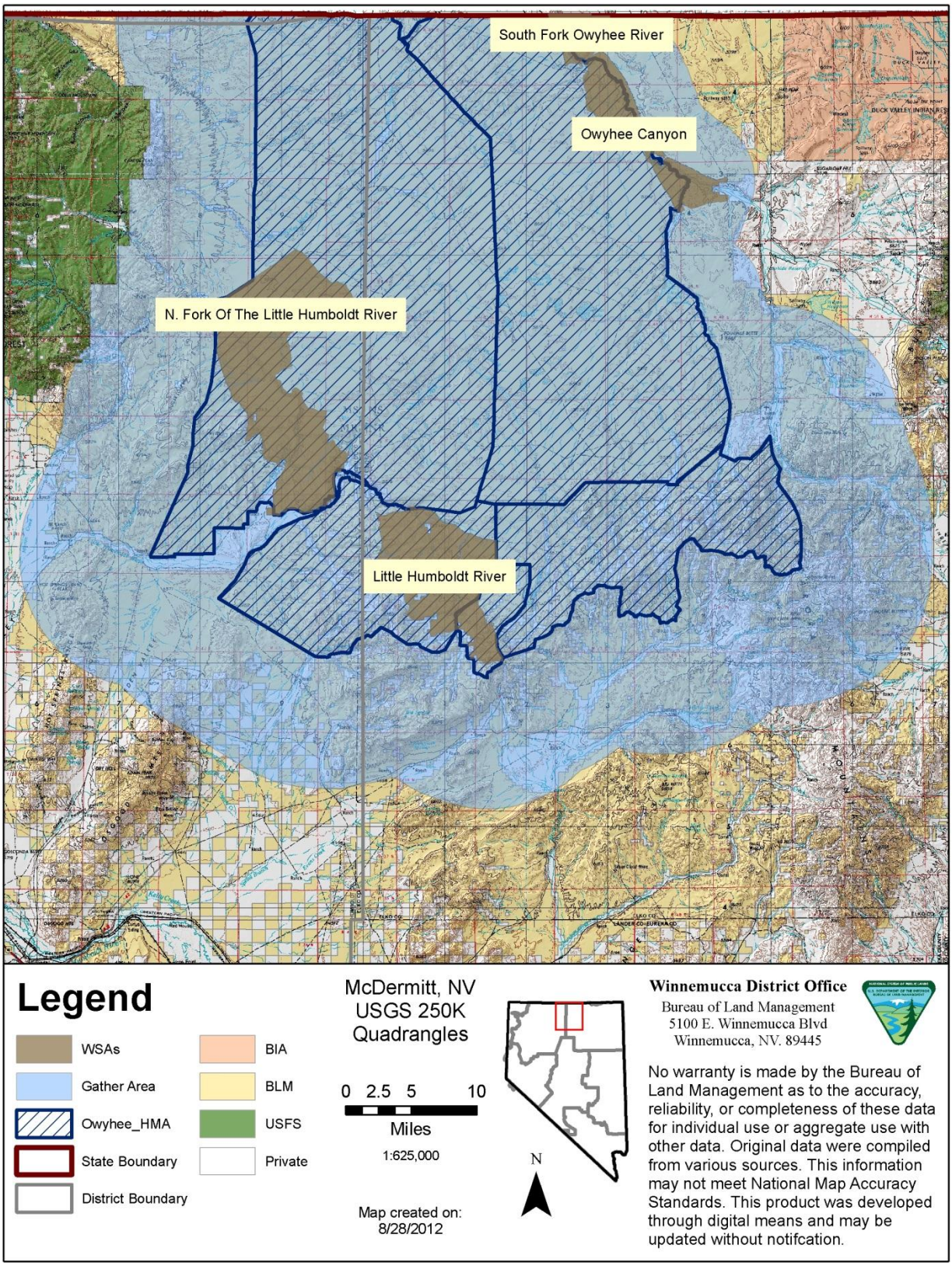
*Home Range/Habitat*
Wild horses generally move widely both daily, usually between water sources, as well as seasonally, seeking higher elevations during summer months and at times when it is necessary to minimize threats to their safety by enhancing their view of the surrounding area (Ganskopp and Vavra 1986, Beever and Herrick 2006).

*Current Herd Health*
Monitoring shows current wild horse conditions are declining. The competition for resources is reflected in declining health and wounds from increased fighting. Lactating mares and foals are showing a greater decline in body condition. Although water hauling and pumping is being conducted, the lack of available forage within the distance wild horses would travel away from water is taking a toll on the wild horse health. Wild horses are starting to browse on shrubs in the area rather than consuming grasses due to their absence. Digesting shrubs consumes more energy than digesting grasses and this too is leading to declining health. In addition, the extreme dry conditions are creating trails of powdered dust the horses utilize to travel from water to forage. The dust is easily inhaled and has in the past caused wild horses and livestock respiratory distress that has led to dust pneumonia. The current drought situation is expected to continue and there is no expectation that range conditions or wild horse health would improve in the foreseeable future. The water resources in the area are not expected to recover until substantial precipitation is received and even then springs, seeps, streams and reservoirs can take an extended amount of time to recharge. Due to limited numbers of water sources the wild horses are concentrated in smaller areas and are impacting the other available resources heavily. With the lack of vegetation growth this year there is also a concern that there will be a lack of forage for wild horses this fall and winter.

### *3.3.9 Wilderness Study Areas*
While there are no officially designated wilderness areas within the project area, there are four Wilderness Study Areas (WSA). The BLM's management policy is generally to continue resource uses on lands designated as WSAs in a manner that maintains the area's suitability for preservation as wilderness. The BLM's policy would protect the wilderness characteristics of all WSAs in the same or better condition than they were on October 21, 1976, until Congress determines whether or not they should be designated as wilderness. See Figure 10 for a map and Table 10 for a summary of WSA acres within the Complex HMAs and gather area.

The Little Humboldt River WSA lies within the Little Humboldt and Snowstorm Mountains HMAs. A land of deep canyons and drainages, volcanic mesas, high rocky ridges and wide undulating planes, the elevation in this WSA ranges from 5,079 to 7,772 feet. The area is a transition zone between the cold, sagebrush desert of the Owyhee plateau and the milder aspen forests of the basin and range.

**Figure 10.** Wilderness Study Areas Map



The North Fork of the Little Humboldt River Wilderness Study Area lies within the Little Owyhee HMA (see map). This WSA lies within the central Little Owyhee Desert and straddles 14 miles of the North Fork of the Little Humboldt River Gorge. The area is a high, Great Basin desert landscape with gently rolling to flat terrain. The uniform desert landscape is interrupted by a deeply cut basalt river gorge that runs north-south through the WSA.

The Owyhee Canyon WSA and South Fork Owyhee River WSA lie partially within the Owyhee HMA. These WSAs are a land of desert canyon, high plateau and whitewater. The western part of this WSA is gently-rolling country blanketed with sagebrush, bitterbrush and bunchgrass. The eastern third is a basin cut by over 20 miles of 100-to-300 foot deep canyons, including 18 miles of the South Fork Owyhee River. Walls of the narrow, meandering canyons are mostly vertical. Canyon depth creates a tremendous sense of seclusion from the rest of the world.

**Table 10.** WSAs Acreage Summary

| WSA Name | Acreage | | |
|---|---|---|---|
| | Total | Within HMA | Within Total Gather Area |
| Little Humboldt River | 41,206 | 41,206 | 41,206 |
| North Fork of the Little Humboldt River | 69,604 | 69,079 | 69,604 |
| Owyhee Canyon | 21,484 | 13,174 | 21,484 |
| South Fork Owyhee River | 8,098 | 2,269 | 8,098 |
| **Total** | **140,392** | **125,728** | **140,392** |

### *3.3.10 Wildlife*

Terrestrial wildlife resources in the Owyhee Complex are typical of the Northern Great Basin (see Appendix F). A wide variety of wildlife species common to the Great Basin ecosystem and several types of vegetative communities can be found here (See Section 3.3.7 Vegetation). Common wildlife species include coyote, black-tail jackrabbit, desert cottontail, bobcat, and numerous raptors, reptiles, and other small mammal species. Mule deer and pronghorn antelope are common big game species in the area. Elk are common in the Rock Creek HMA and a small number of elk (estimated at less than 200 in total) inhabit the Owyhee HMA area primarily during the winter period near Desert Ranch Reservoir. California bighorn sheep are discussed in Section 3.3.6 Special Status Species.

An important and often overlooked indirect effect of grazing on ecosystems, including those grazed by wild horses, is the effect on small mammal communities and reptiles. Mammals provide many ecologic services that are intimately linked to the plant community, including seed dispersal and predation, herbivory, and soil perturbation (Beever and Brussard 2004). Although abundance of mammals in areas grazed by wild horses may not differ from that of areas not grazed by wild horses, greater species richness has been observed in Great Basin ecosystems where wild horses have been removed (Beever and Brussard 2004).

Many species of reptile are important links between higher and lower trophic levels, but soil compaction and decreases in vegetative cover resulting from wild horse grazing may contribute to decreased prey, in turn affecting the abundance and diversity of reptiles. Beever and Brussard

noted greater abundance and greater species richness of reptiles in areas without wild horse grazing than in areas with wild horse grazing (2004).

Mule Deer

The gather area contains approximately 836,018 acres of mule deer habitat. Deer are generally classified as browsers, with shrubs and forbs making up the bulk of their annual diet. The diet of mule deer is quite varied; however, the importance of various classes of forage plants varies by season. In winter, especially when grasses and forbs are covered with snow, their entire diet may consist of shrubby species.

Wild horses have little dietary overlap with mule deer. Wild horses almost exclusively graze while mule deer mostly browse; however, forage competition can occur when desirable grass forage for wild horses becomes limited due to degraded range conditions, drought, or overuse and they must subsist on a diet of forbs and shrubs. Competition between wild horses and mule deer exists primarily at water sources.

Pronghorn Antelope

The gather area contains approximately 1,986,353 acres of pronghorn antelope habitat. Pronghorn use open country with few trees and short shrubs. Antelope diets consist of forbs and grasses during the spring and early summer and shrub browse the remainder of the year. Wet meadows associated with spring meadows provide succulent green forage during hot dry summer months. These are the habitats that wild horses also prefer during this period of the year. Heavy wild horse utilization of spring meadows removes the succulent forage that antelope depend on during the hot summer months as well as causing degradation of these important habitats.

Rocky Mountain Elk

Elk numbers have increased over the past several years with groups observed by BLM specialists on the proposed gather area, particularly, within NDOW hunt unit 067 on the Tuscarora Range. The spring 2012 “pre-calving” population estimate for the 062, 064, 066, 067 and 068 unit group is 800 elk compared to 550 in 2011. This unit group area encompasses the entire northwestern portion of Elko County and northern Lander and Eureka counties.

# Chapter 4. Environmental Effects

Direct impacts are those that result from the management actions while indirect impacts are those that exist once the management action has occurred.

## 4.1 Cultural Resources

### *4.1.1 Impacts from Actions Common to Alternatives A-C*

The following common actions would have little to no impact to cultural resources: helicopter activity, roping from horseback, transportation of gathered horses, observers and observation sites during gathering operations, and post gather treatments for invasive, non-native species. Trap sites, including bait/water trapping sites if needed, and holding areas are the locations that could potentially impact cultural resources. Direct impacts to cultural resources would not be anticipated because gather sites, temporary holding facilities, or bait/water traps would be placed in previously disturbed areas, previously inventoried areas with negative results for cultural resources, or would be inventoried for cultural resources prior to construction. Trap or holding sites should avoid any naturally occurring water sources due to the high probability that these locations would have cultural resources. Any location where cultural resources are encountered would not be utilized unless the trap or holding site configuration could be repositioned to avoid impacts to cultural resources.

### *4.1.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*

There would be no direct impact from gathering operations apart from those described above pertaining to trap sites and holding corrals. Areas in the vicinity of permanent and intermittent water sources (i.e., riparian areas) have the highest potential for cultural resource sites. Since wild horses concentrate in these areas, soils are most likely to be compacted, increasing runoff and subsequently increasing erosion. Under the Alternative A, the removal of excess wild horses would lead to incremental improvements to such areas as permanent and intermittent water sources. Each successive gather would adjust the population until it was at the low AML. This would incrementally reduce indirect impacts to cultural resources and slowly alleviate potential damage in riparian zones where concentrations of wild horses can lead to damage and displacement of artifacts and features as well as erosion of surface cultural deposits containing valuable information. Initially, this reduction of indirect impacts would be less than under Alternative B due to the initial lower number of wild horses proposed to be gathered. However, over time the population growth rate under Alternative A would be the slowest compared to Alternatives B, C, or D, thus there turn of impacts to cultural resources based on concentrations of wild horses would take the longest under this alternative. The proposed population control measures should allow for longer intervals between gathers as the results are realized in the field setting.

### *4.1.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*

This alternative would bring the wild horse population to low AML (approximately 621 wild horses) during the initial gather and should slightly reduce the reproductive rate (if the proposed gather efficiencies could be met). This would lead to an immediate reduction of indirect impacts to cultural resources in riparian zones. This alternative should also reduce the time before the

population would increase to levels above AML. When the population reaches high AML, and exceeds high AML, indirect impacts to cultural resources would increase.

#### *4.1.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*

Impacts to cultural resources from gather operations under Alternative C would be the same as those described under Alternative B. However, there would be no attempt made to slow population growth which would result in normal reproduction rates and a quicker achievement of high AML. This alternative would lead to further indirect impacts to cultural resources

#### *4.1.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

There would be no direct impacts under this alternative. Indirect impacts to cultural resources resulting from wild horses trampling as described above may increase as wild horse populations continue to increase and concentrate at riparian areas. These impacts would be realized sooner than under Alternatives A-C.

### 4.2 Invasive, Nonnative Species

#### *4.2.1 Impacts from Actions Common to Alternatives A-C*

Areas most vulnerable to establishment of invasive vegetation are heavily disturbed areas, such as trap sites and temporary holding facilities. These areas would be prioritized for follow up inventory and treatment reducing the potential for establishment and spread. Setting trap sites and holding facilities outside of areas known to contain noxious or non-native species would limit the potential to spread invasive vegetation.

Increases in vehicle use along roads within the assessment area by observers, transportation of wild horses, and transportation of support personnel could potentially introduce weed seed into the area. These areas would be prioritized for follow up inventory and treatment to reduce the potential for establishment and spread. Promoting on-road use and limiting off-road travel would also prevent the spread of non-native species into areas that were not previously infested.

In areas where perennial vegetation is sparse, helicopter use could cause the removal of vegetation around landing zones; these areas would be susceptible to erosion and invasive species establishment. Using sites with established perennial vegetation likely to withstand helicopter pressure would limit the potential for vegetation removal and spread. Selecting landing zones outside of areas known to contain noxious or non-native species would also limit the potential to spread invasive vegetation.

Rangeland not heavily disturbed from gather operations contain native shrubs, understory grasses, and forbs that remain intact and would serve to compete with the invasive annual species. Following BLM policy, integrated weed management practices including continued treatments throughout the area, would help control the spread of invasive vegetation along roadsides and other areas used during gather operations.

#### *4.2.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*
Direct impacts to invasive, non-native species from gathering activities under Alternative A would be the same as those described under Impacts from Actions Common to Alternatives A-C.

Indirect impacts to invasive, non-native species from gathering wild horses and implementing population control measures would, over time, reduce areas of bare ground caused from concentrated wild horse grazing and hoof action thereby decreasing the areas available for weed infestation. In the short term some of these areas may re-establish with invasive vegetation. However, as land health improves, less soil compaction and soil erosion would occur. These conditions would promote the re-establishment of native vegetation in the long term. While the removal of excess wild horses and fertility control would make areas more resilient to infestation by invasive species, other activities within the assessment areas that spread invasive species would still continue

#### *4.2.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*
Direct and indirect impacts to invasive, non-native species from actions under Alternative B would be similar to those described under Alternative A except that pre-gather conditions would return sooner than under Alternative A because the population growth rate would be higher.

#### *4.2.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*
Direct impacts from gather operations under Alternative C would be the same as those described under Alternatives A and B. As wild horse populations increase over time without the population control efforts described in Alternatives A or B, and once they exceed high AML, indirect impacts from Alternative C would resemble the No Action Alternative. High AML would be reached and exceeded in a shorter period of time than under Alternatives A or B.

#### *4.2.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*
There would be no direct impacts expected under this alternative.

As a result of the increasing wild horse over-population within the gather area, wild horses would continue to trail farther out from limited waters to foraging areas, subsequently broadening the areas receiving heavy grazing or trailing use. Indirect impacts would include increased competition for forage among multiple-users of the range as wild horse populations continue to increase. Forage utilization would exceed the capacity of the range, resulting in a loss of desired forage species from plant communities as plant health and watershed conditions deteriorate. Abundance and long-term production potential of desired plant communities may be compromised and become irreversible, potentially creating areas for invasive, non-native species to establish.

### 4.3 Migratory Birds

#### *4.3.1 Impacts from Actions Common to Alternatives A-C*

The project area contains riparian and sagebrush habitats, therefore potential impacts to neo-tropical migrants may be expected. The action alternatives would not directly impact migratory

bird populations. The gather would occur when migratory species are not expected to be present within the Complex. Small areas of migratory bird habitat would be impacted by trampling at trap sites and holding facilities. This impact would be minimal (generally less than 0.5 acre/trap site), temporary, and short-term (two weeks or less) in nature. Indirect impacts would be related to wild horse densities and patterns of use. The reduction in the current wild horse populations would provide opportunity for vegetative communities to progress toward achieving a thriving natural ecological balance. The action alternatives would support a more diverse vegetative composition and structure through improvement and maintenance of healthy populations of native perennial plants. Habitat improvements would result for migratory bird species including loggerhead shrikes, Brewer's sparrows, sage thrashers, burrowing owls and migratory and resident raptor species. According to Paige and Ritter (1999), "Long–term heavy grazing may ultimately reduce prey habitat and degrade the vegetation structure for nesting and roosting. Light to moderate grazing may provide open foraging habitat."

Competition between wild horses and wildlife species for water was discussed under Section 3.3.8 Wild Horses. Competition with wildlife for water at artificial pit reservoirs and water catchments, or natural catchments, would be drastically reduced. For example, if the AML for a given HMA is 48 horses, and a population of 200 horses used10 gallons per day per horse at these isolated to limited scattered sources during the heat of the summer, approximately 14,400 gallons in a month would be consumed if AML is achieved instead of 60,000 gallons at the population level before gather. More water would be available for a longer period of time for the number of horses at AML and wildlife species dependent on the same source(s).

### *4.3.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*
After the initial gather, the wild horse population would be reduced to high-AML (approximately 999 animals). Impacts to migratory bird habitat would still occur, but to a lesser degree. With the population controls and follow-up gathers proposed by Alternative A, improved habitat conditions would be maintained for a longer period of time before wild horse populations, once again, increase to high AML or above.

### *4.3.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*
This alternative would have similar impacts to Alternative A but the beneficial impacts would occur sooner if the wild horse population can be successfully reduced to low AML (approximately 621 wild horses). With the population controls improved habitat conditions would be maintained for a longer period of time before horse populations, once again, increase to high AML or above.

### *4.3.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*
Impacts to migratory bird habitats would be as described in Impacts from Actions Common to A-C but beneficial impacts from improved native perennial plants would be shorter-lived since the wild horse population would increase faster without sex ratio adjustment and the treatment of mares with PZP.

#### *4.3.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

There would be no direct impacts from gather operations. However, the continued over-population of wild horses within the gather area would lead to indirect impacts due to the increasing inability of rangelands to support healthy populations of native perennial plants. These indirect impacts to vegetative communities would increase each year that a gather is postponed.

## 4.4 Native American Religious Concerns

The Owyhee Complex and gather area lies within the traditional territory of Northern Paiute and the Northern and Western Shoshone peoples. With previous wild horse gatherers, the Fort McDermitt Paiute and Shoshone tribe have expressed objections to having a gather. In previous consultation meetings, the Shoshone-Paiute Tribes of Duck Valley have opposed any wild horse gathers and have argued that the BLM does not consider the genetic health of the wild horse populations, nor does it set appropriate sex ratios.

The Battle Mountain Band Tribal Council, Fort McDermitt Paiute and Shoshone, Shoshone-Bannocks Tribe, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, and Te-Moak Tribal Council have been contacted via notification letter to elicit any concerns that they may have relative to the proposed action and alternatives. Responses to these contacts are pending.

#### *4.4.1 Impacts from Actions Common to Alternatives A-C*

No direct impacts to areas of Native American concern would occur because trap sites and holding areas would be placed in previously disturbed areas and/or in areas where there are no known Native American concerns.

#### *4.4.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*

Indirect impacts to plants in riparian zones used by Native Americans for medicinal and other purposes would be reduced under Alternative A as the wild horse populations would be is brought back to AML over time through the use of proposed population control measures.

#### *4.4.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*

Impacts would be similar as those described under Alternative A except that the immediate reduction of impacts to plants would be greater due to the greater number of wild horses initially gathered. However, the population growth rate under this alternative would be higher than that proposed under Alternative A and impacts to plants in riparian zones would return sooner.

#### *4.4.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*

Immediate impacts associated with gathering activities would be the same as those described under Alternative B. As wild horse populations increase over time and if they exceed high AML, indirect impacts from Alternative C would resemble those under the No Action Alternative and high AML would be reached and exceeded in a shorter period of time than under Alternatives A or B.

### *4.4.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

There would be no new direct impacts under this alternative. Horses would continue to impact riparian areas and vegetation as described in Section 4.7 Wetlands and Riparian Zones and Section 4.14 Vegetation.

## 4.5 Threatened and Endangered Species

### *4.5.1 Impacts from Actions Common to Alternatives A-C*

Direct impacts to LCT and Columbia spotted frogs would be minimal, due to the short term duration of the wild horse gather. Although horses may cross streams during gather operations causing some trampling in riparian areas and stream banks, any impacts would be short-term and minor. The stream banks could receive greater impacts than under normal wild horse movement crossing a stream when being herded by the helicopter. No direct impacts would occur to LCT and Columbia spotted frogs from trap/holding sites, observers, or increased traffic associated with gather operations since construction of these areas on or near springs, meadows or streams is prohibited

See Section 4.3.1 Migratory Birds in regards to positive effects on wildlife species that would occur with the reduction of water use as a result of wild horse numbers at AML.

Indirect effects of the proposed action to LCT and spotted frogs would be beneficial and would include reduced use of riparian areas by horses as well as improved opportunities for control and management of livestock. Increases in riparian vegetation at springs, seeps and along perennial and intermittent waterways would lead to reduced erosion rates and improved habitat conditions for LCT in adjacent drainages. This is especially critical for streams affected by the 2012 Willow Fire. Even small amounts of riparian vegetation left along stream courses will provide critical ash and sediment buffering functions in the short-term. Actions which reduce opportunities for horse damage to fencing around these streams will also indirectly benefit LCT and spotted frogs since livestock can be more effectively controlled as part of the post-fire recovery process over the long-term.

The wild horses utilize the creeks as a source of drinking water. Since the onset of the drought, the flows in the creeks have been greatly reduced and the habitat for LCT and it is now limited to the remaining deep pools of water. When the wild horse populations are above AML, there is a higher consumption of water by the wild horses and the pools on which the LCT depend on for survival grow smaller each day. Removal of the wild horses to within AML would ensure that the populations of LCT in the creeks are maintained.

During proposed gather dates, sage grouse would have completed chick-rearing activities and would have moved to their wintering habitats. Temporary disturbance to sage grouse activities associated with helicopter over flights and cowboys on horseback may occur but would have no measurable impacts. Therefore, no direct impacts are anticipated.

Increased herbaceous cover would occur due to decreased harvest of forage by wild horses. Herbaceous cover is needed for screening of sage-grouse nests and to provide sage-grouse with forage plants on breeding and summer habitats. Wild horses are affecting sage-grouse habitat

through heavy utilization of upland grasses and meadows used by sage-grouse for nesting and summer brood rearing. Increased herbaceous cover on spring meadows would improve summer brooding habitats by increasing the availability of high quality herbaceous vegetation and increasing the availability of insects associated with riparian meadows.

### *4.5.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*
Indirect impacts with the reduction of the wild horse herd size would be reduced long-term impacts from stream bank trampling to the occupied and recovery LCT habitat. Following the initial gather with follow-up gathers, and as population control measures are applied, achievement of the established AML would be reached and this would provide the best opportunity for conservation, protection and preservation of identified species and their habitats (USFWS 1995).

### *4.5.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*
Impacts to LCT and sage-grouse habitat would be similar to Alternative A but the beneficial impacts would occur sooner under this Alternative if the wild horse population can be successfully reduced to low AML (approximately 621 wild horses) during the first gather attempt. Achievement of AML within the HMA would indirectly benefit sage-grouse, LCT and their habitat through improvements in habitat conditions.

### *4.5.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*
Direct and indirect effects would be similar to Alternatives A and B but beneficial impacts from improved native perennial plants would be shorter-lived since the wild horse population would increase faster without sex ratio adjustment and the treatment of mares with PZP. Riparian areas previously impacted by wild horses would continue to improve over the short-term, but would decline over the long-term as horse numbers grow at a faster rate (relative to Alternatives A and B). Potential for damage to livestock management fences could also increase over the long-term as horse numbers increase.

### *4.5.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*
Since the water in some of the LCT creeks are low, the No Action Alternative would have a direct impact to LCT populations within these creeks. There would be continued consumption of water by wild horses from the creeks at a higher rate which would ultimately deplete the pools which are harboring the LCT during the low flow period. Indirect impacts would be related to the wild horse population size. The larger population could impact LCT through stream bank trampling, increased sedimentation, reduced vegetation (herbaceous and woody) cover, and overall reduced riparian/stream habitat condition. Growing horse populations would also cause increased damage to fences making it more difficult for BLM to protect burned areas or to implement prescriptive livestock grazing systems for the benefit of fisheries and riparian resources.

No direct impacts are expected under this alternative to Greater sage-grouse. Maintaining the existing wild horse over-population, which would increase with each successive foal crop, would

result in continued to impacts to candidate species populations and habitats. Wild horse populations would increase (about 15-25%) each year that a gather is postponed. Upland habitats would continue to see locally heavy levels of utilization associated with wild horse use, which areas of heavy use would continue to expand as wild horse populations continue to grow. The associated decrease in herbaceous vegetation would reduce sage grouse nesting quality. Continued heavy grazing would occur on spring meadow systems. Sage grouse brooding habitats would continue to be degraded. Insect production, important for sage grouse, would continue to be substantially less than potential.

## 4.6 Water Quality (Surface)

### *4.6.1 Impacts from Actions Common to Alternatives A-C*

All action alternatives would result in identical types of direct and indirect impacts to water quality. The degree and timing of these impacts would vary under each alternative. Effects from direct impacts would likely be negligible relative to variations in the affected environment or would be of such short duration that they would not be measurable and would not remain any longer than the gather activities themselves. These effects include increased sediment loading to streams occurring when wild horses cross streams or springs as they are herded to temporary gather sites. This impact would be temporary and relatively short-term in nature. Effects from indirect impacts would be related to wild horse population size. Use of riparian areas by wild horses during non-gather periods leads to increased sediment loading from hoof action and reduction of vegetation as well as the introduction of excess nutrients and bacteria from feces and urine. Loss of vegetation can also lead to increased surface water temperatures due to decreased shade. All alternatives would aim to reduce the total number of wild horses in the HMA which would reduce utilization pressure at all surface water sources. Reduced use is anticipated to allow regeneration of riparian vegetation which would lead to a restored hydrologic function over time. This would reduce sediment loading through reduced erosion and keep water temperatures low via increased shading.

### *4.6.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*

Alternative A would be expected to reduce the number of wild horses from approximately 2,252 to 621. This would reflect a reduction in utilization of water resources and would slow the increase of use of each source and increase the time required between gathers. It is difficult to quantify the impacts to water resources from Alternative A. However, it is assumed that a phased gather plan with more frequent population management actions would lead to a more consistent degree of impact to water resources as a whole when compared to the other Alternatives including the No Action Alternative. Less dramatic population variation would allow the BLM to gain a better understanding of how water resources respond to wild horse numbers between low and high AML(approximately 621-999 wild horses).

Effects would include reduced introduction of excess nutrients and bacteria to as well as reduced consumption of surface water sources by wild horses. The degree of the impact would be proportionate to the difference between current wild horse numbers and wild horse numbers realized under Alternative A.

### *4.6.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*

Under this alternative, a population of 621 wild horses would remain after the initial gather. The adjusted sex ratio would result in a somewhat decreased population growth rate (somewhere between the growth rates of Alternative A and Alternative C). This would result in the wild horse herd exceeding high AML within three or four years. A second gather would occur after high AML was reached and reduce the herd to 621 wild horses once more. It is difficult to quantify the impacts to water resources from Alternative B. However, immediate reduction of the wild horse herd to low AML (approximately 621 wild horses) would have a greater positive impact to water resources than Alternative A immediately after implementation. Over the period of analysis, however, impacts to water resources would be similar depending on actual gather return dates and actual herd population growth rates.

Effects would include reduced introduction of excess nutrients and bacteria to as well as reduced consumption of surface water sources by wild horses. The degree of the impact would be proportionate to the difference between current wild horse numbers and wild horse numbers realized under Alternative A.

### *4.6.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*

Under this alternative, a population of 621 wild horses would remain after the proposed gather. No efforts would be taken to reduce reproduction rates. With this, high AML would be exceeded within three or four years. No additional gathers would be planned. This would allow the wild horse population to reach current numbers in as little as nine years. It is difficult to quantify the impacts to water resources from Alternative C. However, immediate reduction of the wild horse herd to low AML (approximately 621 wild horses) would have a greater positive impact to water resources than Alternative A immediately after implementation. Over the period of analysis, however, wild horse numbers would continue to increase leading to a continued increase in effects to surface water sources.

Effects would initially include reduced introduction of excess nutrients and bacteria to as well as reduced consumption of surface water sources by wild horses. Within as little as nine years the effects on surface water sources would be identical to those currently observed. The degree of the impact would be proportionate to the difference between current wild horse numbers and wild horse numbers realized under Alternative A.

### *4.6.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

Under this alternative, the wild horse population within the HMA would not be reduced. Increased competition at currently utilized surface water sources would lead to increased introduction of excess sediment, nutrients, and bacteria. Increasing wild horse numbers would encourage individual wild horses to travel further in search of available water sources leading to an increased number of surface water sources being impacted by wild horse use.

## 4.7 Wetlands and Riparian Zones

### *4.7.1 Impacts from Actions Common to Alternatives A-C*

All action alternatives would result in identical types of direct and indirect impacts to wetlands and riparian zones. The degree and timing of these impacts would vary under each alternative. Effects from direct impacts would likely be negligible relative to variations in the affected environment or would be of such short duration that they would not be measurable and would not remain any longer than the gather activities themselves. These effects include trampling of vegetation and alteration of sediments when wild horses cross streams or springs as they are herded to temporary gather sites. Effects from indirect impacts would be related to wild horse population size. Yearlong use of riparian areas by wild horses leads to utilization of riparian vegetation which is not regulated like use by cattle and alteration of soil and hydrologic function due to punching, shearing, and compaction of soft sediments. Loss of vegetation can also lead to increased erosion and, therefore, loss of riparian soils and organic material. All alternatives would aim to reduce the total number of wild horses in the HMA which would reduce utilization pressure at all wetland and riparian zones. Reduced use is anticipated to allow regeneration of riparian vegetation which would lead to decreased erosion and restored hydrologic function over time.

In the case of riparian habitats impacted by the 2012 Willow Fire, removal of wild horses outside the Rock Creek HMA is especially critical. Grazing of narrow strips of riparian vegetation along burned streams by either cattle or wild horses will limit effectiveness these areas to provide buffering and filtering functions.

### *4.7.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*

Alternative A would be expected to reduce the number of wild horses from approximately 2,252 to 621. Direct impacts would include trampling of riparian areas if wild horses cross streams or springs during gather operations, causing short-term loss of riparian plant species and possible increases in sedimentation to stream channels. However, these impacts would be short-term in nature and minor. No direct impacts to riparian areas are expected to occur as a result of temporary holding facilities since construction of these areas on or near springs, meadows or streams is prohibited

Previously degraded riparian zones are able to recover when utilization is dramatically reduced and functioning riparian zones can recover annually from wild horse and cattle use. It is unknown, however, if the planned reduction of wild horses described under Alternative A would represent a great enough reduction of use on wetland and riparian zones to provide an opportunity for restoration of previously degraded habitats. If the reduction is great enough to allow recovery, riparian vegetation would exhibit greater ground coverage and vigor, soil alterations would heal, and hydrologic function would be restored allowing for expansion of riparian areas. If the reduction is not great enough, a slight improvement of riparian vegetative communities would be observed, however the restoration of soils and hydrologic function would not likely occur.

High numbers of wild horses also cause damage to livestock management fences, making control and management of livestock more difficult. Fewer numbers of wild horses following removal

of excess wild horses would result in less damage to fences and a greater likelihood that existing or proposed riparian-friendly livestock grazing management practices would be successful.

### *4.7.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*
Under this alternative, a population of 621 wild horses would remain after an initial gather. Direct impacts would be the same as in Alternative A. The adjusted sex ratio would result in a somewhat decreased population growth rate. This would result in the wild horse herd exceeding high AML within three or four years. A second gather would occur after high AML was reached and reduce the herd to 621 wild horses once more.

Previously degraded riparian zones are able to recover when utilization is dramatically reduced and functioning riparian zones can recover annually from wild horse and cattle use. It is unknown, however, if the planned reduction of wild horses described under Alternative B would represent a great enough reduction of use on wetland and riparian zones to provide an opportunity for restoration of the functionality of previously degraded habitats. If the reduction is great enough to allow recovery, riparian vegetation would exhibit greater ground coverage and vigor, soil alterations would heal, and hydrologic function would be restored allowing for expansion of riparian areas. If the reduction is not great enough, a slight improvement of riparian vegetative communities would be observed, however the restoration of soils and hydrologic function would not likely occur. Because Alternative B represents a greater initial reduction of wild horses, recovery of wetland and riparian zones would be more likely to occur than under Alternative A. Increased use due to less frequent population management and decreased population growth management would, near the end of the analysis period, lead to increased utilization of riparian zones, relative to Alternative A, which would have the potential to reverse any positive effects realized immediately after the initial gathers.

High numbers of wild horses also cause damage to livestock management fences, making control and management of livestock more difficult. Fewer numbers of wild horses following removal of excess wild horses would result in less damage to fences and a greater likelihood that existing or proposed riparian-friendly livestock grazing management practices would be successful.

### *4.7.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*
Under this alternative, a population of 621 wild horses would remain after the proposed gather. No efforts would be taken to reduce reproduction rates. With this, high AML would be exceeded within three or four years. No additional gathers would be planned. This would allow the wild horse population to reach current numbers in as little as nine years. Direct impacts would be the same as in Alternative A. It is difficult to quantify the indirect impacts to wetland and riparian zones from Alternative C.

Previously degraded riparian zones are able to recover when utilization is dramatically reduced and functioning riparian zones can recover annually from wild horse and cattle use. It is unknown, however, if the planned reduction of wild horses described under Alternative C would represent a great enough reduction of use on wetland and riparian zones to provide an opportunity for restoration of the functionality of previously degraded habitats. If the reduction is great enough to allow recovery, riparian vegetation would exhibit greater ground coverage and

vigor, soil alterations would heal, and hydrologic function would be restored allowing for expansion of riparian areas. If the reduction is not great enough, a slight improvement of riparian vegetative communities would be observed, however the restoration of soils and hydrologic function would not likely occur. Because Alternative C represents a greater initial reduction of wild horses, recovery of wetland and riparian zones would be more likely to occur than under Alternative A. Increased use due to non-repeated population management and no population growth management would, within approximately three years relative Alternative A, lead to increased utilization of riparian zones which would have the potential to reverse any positive effects realized immediate after the initial gathers. Within nine years the impacts to wetland and riparian zones would be identical to those currently observed.

#### *4.7.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

Under this alternative, the wild horse population within the HMA would not be reduced. Increased competition at currently utilized wetland and riparian zones would lead to continued loss of vegetative, soil, and hydrologic functionality. Increasing wild horse numbers would encourage individual wild horses to travel further in search of available water sources leading to an increased number of wetland and riparian zones being impacted by wild horse use.

High numbers of wild horses also cause damage to livestock management fences, making control and management of livestock more difficult. Higher numbers of wild horses due to no gather would result in more damage to fences and a greater likelihood that existing or proposed riparian-friendly livestock grazing management practices would not be successful.

### 4.8 Fisheries

#### *4.8.1 Impacts from Alternatives A-C*

Direct impacts to fisheries would be minimal, due to the short term duration of the wild horse gather and the minimal fisheries habitat that would be crossed by wild horses during the gather operations. If streams are crossed by the wild horses during the gather, the stream banks could receive greater impacts than under normal wild horse movement crossing a stream due to the speed at which the wild horses might cross the stream when being herded by the helicopter. Indirect impacts with the reduction of the wild horse herd size and from bringing the population to AML would be a reduction in the long-term impacts of stream bank trampling to the fisheries habitat. The reduction of wild horse herd size would also lead to increased riparian vegetation which in turn would lead to increased stream cover and streambank stabilization.

See Section 4.3.1 Migratory Birds in regards to positive effects on wildlife species that would occur with the reduction of water use as a result of wild horse numbers at AML.

#### *4.8.2 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

With the No Action Alternative, there would be no direct impacts on fisheries from gather operations. Indirect impacts resulting from the continued over-population of wild horses would persist. This larger population could impact fisheries through stream bank trampling, increased sedimentation, reduced vegetation (herbaceous and woody) cover, and overall reduced riparian/stream habitat condition.

## 4.9 Public Health and Safety

### *4.9.1 Impacts from Alternatives A-C*

Public safety as well as the safety of the BLM and contractor staff is always a concern during gather operations and is addressed through the implementation of Owyhee Complex Gather Observation Protocol (see Appendix B. Owyhee Complex Wild Horse Observation Protocol) that has been used in recent gathers to ensure that the public remains at a safe distance and does not impede gather operations. Appropriate BLM staffing (public affair specialists and law enforcement officers) would be present to assure compliance with visitation protocols at the site. These measures minimize the risks to the health and safety of the public, BLM staff and contractors, and to the wild horses themselves during the gather operations.

When the helicopter is working close to the ground, the rotor wash of the helicopter is a safety concern for members of the public by potentially causing loose vegetation, dirt, and other objects to fly through the air, and can strike or land on anyone in close proximity as well as cause decreased vision. Should a helicopter crash or have a hard landing it is possible that pieces of the helicopter can travel significant distances through the air, which can strike or land on anyone in close proximity. All helicopter operations must therefore be in compliance with distance restrictions set forth in 14 CFR § 91.119.

During the herding process, wild horses would try to flee if they perceive that something or someone suddenly blocks or crosses their path. Fleeing wild horses can go through wire fences, traverse unstable terrain, and go through areas that they normally do not travel in order to get away, all of which can lead them to injure people by striking or trampling them if they are in the animal's path.

Disturbances in and around the gather and holding corral have the potential to injure the government and contractor staff who are trying to sort, move and care for the wild horses by causing them to be kicked, struck, and possibly trampled by the animals trying to flee such disturbance. Such disturbances also have the potential to harm members of the public if they are in too close a proximity to the wild horses.

### *4.9.2 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

There would be no gather related safety concerns for BLM employees, contractors or the general public as no gather activities would occur.

## 4.10 Rangeland Management

### *4.10.1 Impacts from Actions Common to Alternatives A-C*

The livestock are currently experiencing direct competition by wild horses for available forage and water, both within and outside the HMA boundaries in areas that are not designated for wild horse management. The direct and indirect impacts from a gather would increase forage availability and quality, reduce competition for water and forage between livestock and wild horses, and improve vegetative resources, thereby leading to a thriving ecological condition.

### *4.10.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*

Under this alternative, removal of approximately 75% of the wild horse population and proposed fertility control measures would provide an opportunity for water and vegetative resources to recover over a longer period of time than provided by Alternative B, C, or D due to the removal of wild horses. There would be less competition between wild horses and livestock within the allotments for both water and forage.

### *4.10.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*

Under this alternative the proposed removal percentage and proposed fertility control measures would provide an opportunity for water and vegetative resources to recover for a moderate amount of time, more time than the No Action Alternative and Alternative C, but less than Alternative A. Under this alternative wild horse numbers would be fairly stable immediately after the gather and for a year or two, but then begin increasing more quickly than Alternative A. This would allow for a shorter recovery of water and vegetative resources. Competition between wild horses and livestock would ensue more quickly for these resources than under Alternative A.

### *4.10.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*

Under this action the high range AML would be reached and exceeded in a shorter period of time than under Alternative A or B. This would cause continued resource deterioration resulting from competition between wild horses and livestock for water and forage reduced quantity and quality of forage, and undue hardship on the livestock operators, due to the inability to graze livestock on public lands within the grazing allotments as a result of competition for limited waters or the consumption by excess wild horses of forage allocated to livestock under the operative land-use plans and prior multiple use decisions.

### *4.10.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

There would be no direct impacts to livestock from gather operations under the No Action Alternative. Utilization by authorized livestock would continue to be directly impacted by the overpopulation of wild horses, both inside and outside the HMAs. The indirect impacts of the No Action Alternative would consist of continued resource deterioration resulting from competition between wild horses and livestock for water and forage, reduced quantity and quality of forage, and undue hardship on the livestock operators, due to the inability to graze livestock on public lands within the grazing allotments as a result of competition for limited waters or the consumption by excess wild horses of forage allocated to livestock under the operative land-use plans and prior multiple use decisions.

## 4.11 Recreation

### *4.11.1 Impacts from Actions Common to Alternatives A-C*

Activities associated with the wild horse gather would impact recreational opportunities directly and indirectly. Dates of the 2012 gather and future gathers would determine the amount of impact to visitors as use levels range from extremely low in winter, low to moderate in the

summer, and peak in the fall during hunting seasons with season opening weekends having the highest visitation of the year. Tourism revenues to the local community from recreationists would follow this trend as well.

Hunters would be directly impacted by wildlife movements if the gather occurs during their hunts. Two of the big game (elk and mule deer) hunting seasons are scheduled to end at the beginning of the proposed gather and two (both elk seasons) are scheduled to begin during the proposed gather, which could cause an impact to hunters. The upland game (blue and ruffed Grouse, chukar, and Hungarian partridge) hunting season will be open during the proposed gather.

Recreationists in the wilderness study areas wanting the opportunities of solitude and naturalness would be affected during helicopters herding activities (see Section 3.3.9 Wilderness Study Areas). Individuals wanting to view/photograph wild horses would also be impacted indirectly by the gather since wild horses would have a heightened response to human presence following the gather and might be more difficult to observe for a period following the gather. Even though the density of wild horses in the area would be reduced, it would still be possible to view/photograph wild horses.

#### *4.11.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*
Indirectly, hunters would benefit from the reduction in wild horse populations following the gather by reducing the competition with wildlife for forage and water resources. Under Alternative A this impact would continue for a longer period of time due to the slower population growth rate.

#### *4.11.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*
Impacts would be similar to those described under Alternative A; however, the reduction in competition for forage would be higher after the initial gather since Alternative B proposes to remove a greater number of wild horses. Over time, the reduction of competition for forage would not last as long as the population growth rate under this alternative would be higher than Alternative A.

#### *4.11.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*
Impacts would be similar to those describe under Alternative B except that the population of wild horses within the HMA would increase at a growth rate similar to Alternative D and AML would be exceeded in a shorter period of time than under Alternatives A and B.

#### *4.11.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*
No direct impacts would occur under this alternative. However, without a gather to remove excess wild horses, recreational values would continue to be impacted since the overpopulation of wild horses results in competition with wildlife for resources, which in turn reduces hunting and wildlife viewing opportunities (see Section 4.17 Wildlife).

Recreationists may also be indirectly impacted at camping locations from the continued overpopulation of wild horses. Preferred camping locations are typically located next to a water source. As wild horse populations increase, competition for water resources also increases. The growing wild horse population would increasingly use water sources next to camp locations, and manure piles are unsightly to some users.

## 4.12 Soils

### *4.12.1 Impacts from Alternatives A-C*

Direct impacts associated with the action alternatives would consist of disturbance to soil surfaces immediately in and around the temporary gather site(s) and holding facilities. Impacts would be created by vehicle traffic and hoof action as a result of concentrating wild horses, and could be locally high in the immediate vicinity of the gather site(s) and holding facilities. Generally, these sites would be small (less than one half acre) in size. Any impacts would remain site specific and isolated in nature. Impacts would be minimal as herding would have a short-term duration.

In addition, most gather sites and holding facilities would be selected to enable easy access by transportation vehicles and logistical support equipment. Normally, these gather sites are located near or on roads, pullouts, water haul sites, gravel pits, or other flat areas, which have been previously disturbed. These common practices would minimize the potential impacts to soils.

Indirect impacts of implementing the action alternatives would be reduced concentrations of wild horses, respective to alternatives chosen, leading to reduced soil erosion on soils most frequented in this HMA by wild horses. This reduction in soil erosion would be most notable and important in the vicinity of small spring meadows and water developments experiencing high levels of disturbance and bare ground from the current excess numbers of wild horses.

### *4.12.2 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

No direct impacts are expected under this alternative. In the absence of a wild horse gather, however, soil loss from wind and water vulnerability to erosion, particularly in the vicinity of small spring meadows and water developments, would be expected to accelerate. The increasing over-utilization of vegetation and heavy trailing and subsequent soil compaction through hoof action due to an over-population of wild horses, would continue the loss of perennial native bunchgrasses, forbs and shrubs exposing larger areas to potential soil loss. This loss again would be most notable in the vicinity of small spring meadows and other water sources which attract high levels of wild horse use.

## 4.13 Special Status Species

### *4.13.1 Impacts from Actions Common to Alternatives A-C*

See Section 4.3.1 Migratory Birds in regards to positive effects on wildlife species that would occur with the reduction of water use as a result of wild horse numbers at AML.

Sensitive Migratory Birds and Raptors
Impacts to sensitive migratory birds (including raptors) would be the same as those discussed under Section 4.3 Migratory Birds.

Silver Haired Bat (and other bat species)
These alternatives would also have positive indirect impacts to bats that depend upon flying insects primarily associated with riparian zones. Flying insect populations would be expected to increase as riparian meadows become more productive and stubble heights increase, creating favorable micro sites for insects. Increased insect production would be expected to provide increased foraging opportunities for resident and migratory bats. No direct impacts are expected for bats under these alternatives.

Pygmy Rabbit
A slight chance of damage to pygmy rabbits and their burrows could occur due to trampling by wild horses. Rabbit behavior may be disrupted due to noise from the low-flying helicopter and running wild horses. Potential indirect impacts to pygmy rabbits would include increased herbaceous cover under existing stands of big sagebrush used as pygmy rabbit habitats. Decreased wild horse numbers would decrease physical damage to tall sage-brush plants that screen rabbit burrows and decrease hoof damage to burrows.

Owyhee Prickly Phlox
Impacts to this sensitive plant are not expected. This species grows in in crevices in steep to vertical, coarse-crumbling volcanic canyon walls which are not utilized by wild horses.

Bighorn Sheep
Impacts to bighorn sheep may include disturbance during feeding and watering. Removal of excess wild horses would decrease competition for available cover, space, forage, and water between wild horses and bighorn sheep. Decreased wild horse levels would reduce conflicts between wild horses and wildlife at limited water sources. Reduced harvest of vegetation would result in increased plant vigor, production, seedling establishment, and ecological health of important wildlife habitat. Bighorn sheep would benefit from an increase in forage availability, vegetation density, and structure.

### *4.13.2 Impacts from Alternative A*
*Phased-in Gather, Selective Removal, & Population Growth Control*
Under Alternative A, the wild horse population would be reduced to low AML (approximately 621 wild horses) over a period of several years. Impacts to special status species habitat would still occur, but to a lesser degree. With the population controls and follow-up gathers proposed by Alternative A, improved habitat conditions would be maintained for a longer period of time before wild horse populations, once again, increase to high AML or above.

### *4.13.3 Impacts from Alternative B*
*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*
This alternative would have similar impacts to Alternative A but the beneficial impacts would occur sooner if the wild horse population can be successfully reduced to low AML (approximately 621 wild horses) during the initial gather attempt. With the population controls

improved habitat conditions would be maintained for a longer period of time before horse populations, once again, increase to high AML or above.

#### *4.13.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*

Short-term impacts to special status species from the gather are expected to be the same as was discussed under Alternative A but the beneficial long-term impacts would be to a lesser extent since without sex ratio adjustment and the use of PZP, the wild horse population would increase to high AML or above at a faster rate.

#### *4.13.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

No direct impacts to special status species are expected under this alternative, with the exception of the windloving buckwheat, which may be grazed by wild horses at higher population levels. Maintaining the existing excess wild horse numbers within the gather area, which would continue to increase as a result of population growth, would result in continued indirect impacts to sensitive species populations and habitats. Wild horse populations would increase approximately 15-25% each year that the gather is postponed. Upland habitats would continue to see locally heavy levels of utilization associated with wild horse use which would expand as wild horse populations continue to grow.

If excess wild horses are not removed, continued heavy grazing would occur on spring meadow systems that serve important habitat functions for sensitive species. Sage-grouse brooding habitats would continue to be degraded. Insect production, important for bats and sage-grouse, would continue to be substantially less than potential. Other beneficial impacts, as discussed under Alternatives A, B and C would not be realized.

### 4.14 Vegetation

#### *4.14.1 Impacts from Alternatives A-C*

Direct impacts associated with the action alternatives would consist of disturbance to vegetation immediately in and around the temporary, public viewing areas, gather site(s) and holding facilities. Human impacts would be created by vehicle traffic to, around and from temporary gather sites and public viewing areas. Wild horse impacts as a result of herding concentration could be substantial in the immediate vicinity of the gather site(s) and holding facilities. Generally, these sites would be small (less than one half acre) in size. Any impacts would remain site specific and isolated in nature. These impacts would include trampling of vegetation. Long term impacts would be minimal as herding would have a short-term duration.

In addition, most gather sites and holding facilities would be selected to enable easy access by transportation vehicles and logistical support equipment. Normally, they are located near or on roads, pullouts, water haul sites, gravel pits, or other flat areas, which have been previously disturbed. These common practices would minimize the short and long-term effects of these impacts.

Indirect impacts would be realized through the implementation of the action alternatives which would reduce the current wild horse populations, providing the opportunity for impacted

vegetation communities to achieve increased resiliency to environmental disturbance and improved ecological function. Competition for forage among wild horses, wildlife, and livestock would be reduced as utilization levels decrease, allowing impacted vegetation conditions to improve.

### *4.14.2 Impacts from Alternative D*

*No Action – Defer Gather and Removal*
There would be no direct impacts expected under this alternative.

As a result of the increasing wild horse over-population within the Owyhee Complex, wild horses would continue to trail farther out from limited waters to foraging areas, subsequently broadening the areas receiving heavy to severe grazing or trailing use. Indirect impacts include increased competition for forage among multiple-users of the range as wild horse populations continue to increase. Forage utilization would continue to exceed the capacity of the range, resulting in a loss of desired forage species from plant communities as plant health and watershed conditions deteriorate. Abundance and long-term production potential of desired plant communities may be compromised and become irreversible, potentially precluding the return of these vegetation communities to their full potential as identified in ecological site descriptions published by the Natural Resource Conservation Service.

Indirect impacts are similar to those described in Section 4.7 Wetlands and Riparian Zones and would consist of increasing degradation to riparian vegetation as the wild horse population increases each year that a gather is postponed.

## 4.15 Wild Horses

### *4.15.1 Impacts from Actions Common to Alternatives A-C*

Impacts to wild horses under Alternatives A-C would be both direct and indirect, occurring on both individual animals and populations as a whole.

Capturing Wild Horses
The BLM has been gathering excess wild horses from public lands since 1975 and has been using helicopters for such gathers since the late 1970s. Refer to Appendix A. Standard Operating Procedures for Wild Horse Gathers for information about methods that are utilized to reduce injury or stress to wild horses during gathers. Since 2004, BLM Nevada has gathered over 40,000 excess animals. Of these, gather related mortality has averaged 0.5%, which is very low when handling wild animals. Another 0.6% of the animals captured were humanely euthanized due to pre-existing conditions and in accordance with BLM policy. This data affirms that the use of helicopters and motorized vehicles are a safe, humane, effective and practical means for gathering and removing excess wild horses from the range.

Injuries sustained by wild horses during gathers include nicks and scrapes to legs, face, or body from brush or tree limbs while being herded to the trap corrals by the helicopter. Rarely, wild horses may encounter barbed wire fences and receive wire cuts. These injuries are generally not fatal and are treated with medical spray at the holding corrals until a veterinarian can examine the animal. During the actual herding of wild horses with a helicopter, injuries are rare, and consist of scrapes and scratches from brush, or occasionally broken legs from wild horses

stepping into a rodent hole. Serious injuries requiring euthanasia could be anticipated to occur in 1-2 wild horses per every 1,000 captured based on prior gather statistics. If a gather were to be implemented additional care and monitoring would be planned to ensure pregnant mares and foals were appropriately cared for.

Though some members of the public have expressed the view that helicopter gathers are not humane, most injuries occur once the wild horses are captured, and similar injuries would also be sustained if wild horses were captured through a more passive gather method such as bait trapping, as the animals would still need to be sorted, aged, transported and otherwise handled.

Environmental Stressors

Gathering wild horses during the summer months can potentially cause heat stress, although this can occur during any gather, especially in older or weaker animals. Adherence to the SOPs and techniques used by the gather contractor help minimize the risks of heat stress. Heat stress does not occur often, but if it does, death can result. Most temperature related issues during a gather can be mitigated by adjusting daily gather times to avoid the extreme hot or cold periods of the day. The BLM and the contractor would be pro-active in controlling dust in and around the holding facility and the gather corrals to limit the wild horses' exposure. Electrolytes can be administered to the drinking water during gathers that involve animals in weakened conditions or during summer gathers. Additionally, BLM staff maintains supplies of electrolyte paste if needed to directly administer to an affected animal.

As described in Alternative A, water resources would continue to be monitored through the drought to address any potential concerns before and after the proposed gather operations. As necessary, BLM would provide water for wild horses as a temporary measure until wild horse populations are within the AML as well as during periods of critical need. Any watering of wild horses would be separately evaluated under NEPA.

Wild horses have been observed outside the Owyhee Complex in large numbers and trailing into water sources in abnormally large groups. This has been attributed to the overpopulation of wild horses. Moderate to severe forage utilization within 2 miles of the current water sources has been observed throughout the summer months. In order to ensure the health and well-being of the wild horses in the Owyhee Complex and outlying areas it is imperative to remove excess animals as soon as possible. Gathering the wild horses as they are concentrating around limited water sources should reduce the distance traveled during gather activities reducing stress. In addition, the helicopter pilot routinely allows wild horses to travel slowly at their own pace. The minimal spring vegetation growth, diminishing residual vegetation from the previous year's forage crop and reduced spring, seep, and stream flows as well as dry reservoirs are reflected in the wild horses through the reduction of wild horse overall health.

The Owyhee Complex and gather area would be gathered to minimize movement of wild horses and to reduce stress from competition for severely limited resources and multiple gather attempts.

Sorting and Transporting Wild Horses

Most injuries are sustained once the wild horse has been captured and is either within the trap corrals or holding corrals, or during transport between the facilities and during sorting. These

injuries result from kicks and bites, and from animals making contact with corral panels or gates. Transport and sorting is completed as quickly and safely as possible to reduce the occurrence of fighting and to move the wild horses into the large holding pens where they can settle in with hay and water. Injuries that may be experienced by wild horses during transport and sorting consist of superficial wounds of the rump, face, or legs. Despite precautions, occasionally a wild horse may rear up or make contact with panels hard enough to sustain a fatal neck break, though such incidents are rare. There is no way to reasonably predict any of these types of injuries. On many gathers, no wild horses are injured or die. On some gathers, due to the genetic background of the wild horse, they are not as calm and injuries are more frequent. Overall, however, injuries and death are not frequent and usually average less than 0.5%.

Through the capture and sorting process, wild horses are examined for health status, injury and other defect. Decisions to humanely euthanize animals in field situations would be made in conformance with BLM policy. BLM Euthanasia Policy IM-2009-041 is used as a guide to determine if animals meet the criteria and should be euthanized (refer to Appendix A. Standard Operating Procedures for Wild Horse Gathers). Animals that are euthanized for non-gather related reasons include those with old injuries (broken hip, leg) that have caused the animal to suffer from pain or prevents them from being able to travel or maintain body condition; old animals that have lived a successful life on the range, but now have few teeth remaining (dental regression or breakage), are in poor body condition, or are weak from old age; and wild horses that have congenital (genetic) or serious physical defects such as club foot, or sway back and would not be successfully adopted, or should not be returned to the range.

Wild Horses Response to Handling

Impacts to individual animals may occur as a result of handling stress associated with the gathering, processing, and transportation of animals. The intensity of these impacts varies by individual animal and is indicated by behaviors ranging from nervous agitation to physical distress. Mortality to individuals from handling is infrequent but does occur in 0.5% to 1% of wild horses gathered in a given gather. Other impacts to individual wild horses include separation of members of individual bands of wild horses and removal of animals from the population.

The wild horse is a very adaptable animal and assimilates into the environment with new members quite easily. Observations made following completion of gathers shows that captured wild horses acclimate quickly to the holding corral situation, becoming accustomed to water tanks and hay, as well as human presence.

Indirect individual impacts are those impacts which occur to individual wild horses after the initial stress event, and may include spontaneous abortions in mares, and increased social displacement and conflict in stallions. 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 among older stallions following sorting and release into the stallion pen, which lasts less than a few minutes and ends when one stallion retreats. Traumatic injuries usually do not result from these conflicts. These injuries typically involve a bite and/or kicking with bruises which do not break the skin. Like direct individual impacts, the frequency of occurrence of these impacts among a population varies with the individual animal.

Spontaneous abortion events among pregnant mares following capture is also rare, though poor body condition can increase the incidence of such events. Given the timing of this gather, spontaneous abortion is not considered to be an issue for the proposed gather.

Foals are often gathered that were orphaned on the range (prior to the gather) because the mother rejected it or died. These foals are usually in poor, unthrifty condition. Orphans encountered during gathers are cared for promptly and rarely die or have to be euthanized

Temporary Holding Facilities During Gathers

Wild horses that are gathered would be transported from the gather sites to a temporary holding corral within the Owyhee Complex in goose-neck trailers. At the temporary holding corral wild horses would be sorted into different pens based on sex. The wild horses would be aged and provided good quality hay and water. Mares and their un-weaned foals would be kept in pens together. At the temporary holding facility, a veterinarian, when present, would provide recommendations to the BLM regarding care, treatment, and if necessary, euthanasia of the recently captured wild horses. Any animals affected by a chronic or incurable disease, injury, lameness or serious physical defect (such as severe tooth loss or wear, club foot, and other severe congenital or developmental abnormalities) would be humanely euthanized using methods acceptable to the American Veterinary Medical Association (AVMA). Consider making a statement at horses are initially nervous in new surrounding which necessitates need to keep visitors and extra personnel at a safe distance from pens to allow the animals to settle down and to water/feed.

Transport, Short Term Holding, and Adoption Preparation

Wild horses removed from the range would be transported to the receiving short-term holding facility in a goose-neck stock trailer or straight-deck semi-tractor trailers. Trucks and trailers used to haul the wild horses would be inspected prior to use to ensure wild horses can be safely transported. Wild horses would be segregated by age and sex when possible and loaded into separate compartments. Mares and their un-weaned foals may be shipped together. Transportation of recently captured wild horses is limited to a maximum of 12 hours. During transport, potential impacts to individual wild horses can include stress, as well as slipping, falling, kicking, biting, or being stepped on by another animal. Unless wild horses are in extremely poor condition, it is rare for an animal to die during transport.

Upon arrival, recently captured wild horses are off-loaded by compartment and placed in holding pens where they are provided good quality hay and water. Most wild horses begin to eat and drink immediately and adjust rapidly to their new situation. At the short-term holding facility, a veterinarian provides recommendations to the BLM regarding care, treatment, and if necessary, euthanasia of the recently captured wild horses. Any animals affected by a chronic or incurable disease, injury, lameness or serious physical defect (such as severe tooth loss or wear, club foot, and other severe congenital or developmental abnormalities) would be humanely euthanized using methods acceptable to the AVMA. Wild horses in very thin condition or animals with injuries are sorted and placed in hospital pens, fed separately and/or treated for their injuries. Recently captured wild horses, generally mares, in very thin condition may have difficulty transitioning to feed. A small percentage of animals can die during this transition; however, some of these animals are in such poor condition that it is unlikely they would have survived if left on the range.

After recently captured wild horses have transitioned to their new environment, they are prepared for adoption or sale. Preparation involves freeze-marking the animals with a unique identification number, vaccination against common diseases, castration, and de-worming. During the preparation process, potential impacts to wild horses are similar to those that can occur during transport. Injury or mortality during the preparation process is low, but can occur.

At short-term corral facilities, a minimum of 700 square feet is provided per animal. Mortality at short-term holding facilities averages approximately 5% (USGAO 2008) including animals euthanized due to a pre-existing condition, animals in extremely poor condition, animals that are injured and would not recover, animals which are unable to transition to feed, and animals which die accidentally during sorting, handling, or preparation. As of February 2012, approximately 15,600 excess wild horses are being maintained within BLM's short-term holding facilities.

Adoption

Adoption applicants are required to have at least a 400 square foot corral with panels that are at least six feet tall. Applicants are required to provide adequate shelter, feed, and water. The BLM retains title to the wild horse for one year and the wild horse and facilities are inspected. After one year, the applicant may take title to the wild horse at which point the wild horse becomes the property of the applicant. Adoptions are conducted in accordance with 43 CFR § 5750.

Sale with Limitation

Buyers must fill out an application and be pre-approved before they may buy a wild horse. A sale-eligible wild horse is any animal that is more than 10 years old or has been offered unsuccessfully for adoption at least three times. The application also specifies that all buyers are not to sell to slaughter buyers or anyone who would sell the animals to a commercial processing plant. Sales of wild horses are conducted in accordance with the WFRHBA and congressional limitations.

Long-Term Grassland Pastures

Since fiscal year 2008, the BLM has removed over 37,400 excess wild horses from the Western States. Most animals not immediately adopted or sold have been transported to long-term grassland pastures in the Midwest.

Potential impacts to wild horses from transport to adoption, sale or long-term grassland pastures (LTP) are similar to those previously described. One difference is that when shipping wild horses for adoption, sale or LTP, animals may be transported for up to a maximum of 24 hours. Immediately prior to transportation, and after every 24 hours of transportation, animals are offloaded and provided a minimum of 8 hours on-the-ground rest. During the rest period, each animal is provided access to unlimited amounts of clean water and two pounds of good quality hay per 100 pounds of body weight with adequate bunk space to allow all animals to eat at one time. The rest period may be waived in situations where the anticipated travel time exceeds the 24-hour limit but the stress of offloading and reloading is likely to be greater than the stress involved in the additional period of uninterrupted travel.

LTPs are designed to provide excess wild horses with humane, and in some cases, life-long care in a natural setting off the public rangelands. There, wild horses are maintained in grassland pastures large enough to allow free-roaming behavior and with the forage, water, and shelter

necessary to sustain them in good condition. As of February 2012, about 31,400 wild horses that are in excess of the current adoption or sale demand (because of age or other factors such as economic recession) are currently located on private land pastures in Oklahoma, Kansas, and South Dakota. Establishment of LTPs was subject to a separate NEPA and decision-making process. Located in mid or tall grass prairie regions of the United States, these LTPs are highly productive grasslands compared to the more arid western rangelands. These pastures comprise about 256,000 acres (an average of about 10-11 acres per animal).

Mares and sterilized stallions (geldings) are segregated into separate pastures except at one facility where geldings and mares coexist. Although the animals are placed in LTP, they remain available for adoption or sale to qualified individuals; and foals born to pregnant mares in LTP are gathered and weaned when they reach about 8-12 months of age and are also made available for adoption. The LTP contracts specify the care that wild horses must receive to ensure they remain healthy and well-cared for. Handling by humans is minimized to the extent possible although regular on-the-ground observation by the LTP contractor and periodic counts of the wild horses to ascertain their well-being and safety are conducted by BLM personnel and/or veterinarians. A small percentage of the animals may be humanely euthanized if they are in very poor condition due to age or other factors. Although wild horses residing on LTP facilities live longer, on the average, than wild horses residing on public rangelands, natural mortality of wild horses in LTP averages approximately 8% per year, but can be higher or lower depending on the average age of the wild horses pastured there (USGAO 2008).

Euthanasia or Sale Without Limitation

While euthanasia and sale without limitation has been limited by Congressional appropriations, it is allowed under the WFRHBA. Neither option is available for wild horses under the Department of the Interior's fiscal year 2012 budgetary appropriations. Although the appropriations restrictions could be lifted in future appropriations bills, it would be contrary to Departmental policy to euthanize or sell without limitations healthy excess wild horses.

Water/Bait Trapping (if used)

Bait and/or water trapping generally requires a long window of time for success. Although the trap would be set in a high probability area for capturing excess wild horses residing within the area and at the most effective time periods, time is required for the wild horses to acclimate to the trap and/or decide to access the water/bait.

Trapping involves setting up portable panels around an existing water source or in an active wild horse area, or around a pre-set water or bait source. The portable panels would be set up to allow wild horses to go freely in and out of the corral until they have adjusted to it. When the wild horses fully adapt to the corral, it is fitted with a gate system. The acclimatization of the wild horses creates a low stress trap. During this acclimation period the wild horses would experience some stress due to the panels being setup and perceived access restriction to the water/bait source.

When actively trapping wild horses, the trap would be manually closed by BLM or contractor staff or if designed to allow the animals to self-trap using spring gates, the trap would be checked on a daily basis. Wild horses would be either removed immediately or fed and watered for up to

several days prior to transport to a holding facility. Existing roads would be used to access the trap sites.

Gathering of the excess wild horses utilizing bait/water trapping could occur at any time of the year and would extend until the target number of animals are removed to relieve concentrated use by wild horses in the area, reach AML, to implement population control measures, and to remove animals residing outside HMA boundaries. Generally, bait/water trapping is most effective when a specific resource is limited, such as water during the summer months. For example, in some areas, a group of wild horses may congregate at a given watering site during the summer because few perennial water resources are available nearby. Under those circumstances, water trapping could be a useful means of reducing the number of wild horses at a given location, which can also relieve the resource pressure caused by too many wild horses. As the proposed bait and/or water trapping in this area is generally a lower stress approach to gathering of wild horses, such trapping can continue into the foaling season without harming the mares or foals. Conversely, it has been documented that at times water trapping could be stressful to wild horses due to their reluctance related to approaching new, human structures or intrusions. In these situations, wild horses may avoid watering or may travel greater distances in search of other watering sources.

### *4.15.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*

Alternative A would decrease and then maintain the existing population of wild horses to the low range of AML in the course of successive helicopter gather operations over a 10 year period and stallions would be selected for release with the objective of establishing a 60% male ratio within AML range (621-999). All animals selected to remain in the population would be selected to maintain a diverse age structure, herd characteristics and body type (conformation). Alternative A would not reduce all of the associated impacts to the wild horses and rangeland resources as quickly as the other alternatives. Over the short-term, individuals in the herd would still be subject to increased stress and possible death as a result of continued competition for water and forage until the project area's population can be reduced to the AML range. The areas experiencing heavy and severe utilization levels by wild horses would likely still be subject to some excessive use and impacts to rangeland resources (concentrated trailing, riparian trampling, increased bare ground, etc.) throughout the HMA would be expected to continue until the project area's population can be reduced to the AML range and concentration of wild horses can be reduced.

Because it would take successive gather operations over a period of ten years to attain the areas wild horse population to low end of AML and then maintain it, bands of wild horses would continue to leave the boundaries of the HMAs and move into areas not designated for their use in search of forage and water. This would not achieve the stated objectives for wild horse herd management areas, to "prevent the range from deterioration associated with overpopulation", and "preserve and maintain a thriving natural ecological balance and multiple use relationship in that area" until such time as Alternative A has been completed.

Removal of excess wild horses would improve herd health. Decreased competition for forage and water resources would reduce stress and promote healthier animals. This removal of excess animals coupled with anticipated reduced reproduction (population growth rate) as a result of

fertility control and sex ratio adjustment should result in improved health and condition of mares and foals as the actual population comes into line with the population level that can be sustained with available forage and water resources, and would allow for healthy range conditions (and healthy animals) over the longer-term. Additionally, reduced population growth rates would be expected to extend the time interval between gathers and reduce disturbance to individual animals as well as to the herd social structure over the foreseeable future.

Bringing the wild horse population back to low range of AML and slowing its growth rate once Alternative A has been achieved would reduce damage to the range from the current overpopulation of wild horses and allow vegetation resources to start recovering, without the need for additional gathers in the interim. As a result, there would be fewer disturbances to individual animals and the herd, and a more stable wild horse social structure would be provided.

Impacts to individual animals may occur as a result of handling stress associated with the gathering, processing, and transportation of animals. The intensity of these impacts varies by individual animal and is indicated by behaviors ranging from nervous agitation to physical distress. Mortality to individual animals from these impacts is infrequent but does occur in 0.5% to 1% of wild horses gathered in a given gather. Other impacts to individual wild horses include separation of members of individual bands of wild horses and removal of animals from the population.

Indirect impacts can occur after the initial stress event, and may include increased social displacement or increased conflict between stallions. These impacts are known to occur intermittently during wild horse gather operations. Traumatic injuries may occur, and typically involve bruises from biting and/or kicking, which do not break the skin.

Population Control Measures

As described in Alternative A, all breeding age mares selected for release, including those previously treated with fertility control, would be treated/retreated with a two-year Porcine Zona Pellucida (PZP-22) or similar vaccine and released back to the range. Immuno-contraceptive treatments would be conducted in accordance with the approved standard operating and post-treatment monitoring procedures (Appendix A. Standard Operating Procedures for Wild Horse Gathers). Mares would be selected to maintain a diverse age structure, herd characteristics and conformation (body type).

When injected, PZP (antigen) causes the mare's immune system to produce antibodies; these antibodies bind to the mare's eggs and effectively block sperm binding and fertilization (SCC 2000). PZP is relatively inexpensive, meets BLM requirements for safety to mares and the environment, and can easily be administered in the field. In addition, among mares, PZP contraception appears to be completely reversible. One-time application at the capture site would not affect normal development of a fetus should the mare already be pregnant when vaccinated, and does not affect hormone health of the mare or behavioral responses to stallions(Kirkpatrick et al. 1995). The vaccine has also proven to have no apparent effect on pregnancies in progress, the health of offspring, or the behavior of treated mares (Turner et al. 1997).

The treatment would be controlled, handled, and administered by a trained BLM employee (Appendix A. Standard Operating Procedures for Wild Horse Gathers and Appendix C. Standard

Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments). Mares receiving the vaccine would experience slightly increased stress levels associated with handling while being vaccinated and freeze-marked. Serious injection site reactions associated with fertility control treatments are rare in treated mares. Any direct impacts associated with fertility control, such as swelling or local reactions at the injection site, would be minor in nature and of short duration. Most mares recover quickly once released back to the HMA, and none are expected to experience long term impacts from the fertility control injections. Mares treated and released during the previous gathers were freeze-marked on the hip or neck with two 4 inch letters for future identification. These identifiers would be recorded along with age and health of the mare for future analysis. Additional letters could be added for future tracking purposes. Newly captured mares that do not have markings associated with previous fertility control treatments would be similarly marked for tracking purposes. This information would also be used to determine the number of mares captured that were not previously treated and to provide additional insight into gather efficiencies.

Ransom et al. (2010) found no differences in how PZP-treated and control mares allocated their time between feeding, resting, travel, maintenance, and social behaviors in three populations of wild horses, which is consistent with Powell's (1999) findings in another population. Likewise, body condition of PZP-treated and control mares did not differ between treatment groups (Ransom et al. 2010). Turner and Kirkpatrick (2002) found that PZP-treated mares had higher body condition than control mares in another population, presumably because energy expenditure was reduced by the absence of pregnancy and lactation.

In two studies involving a total of four wild horse populations, both Nunez et al. (2009) and Ransom et al. (2010) found that PZP-treated mares were involved in reproductive interactions with stallions more often than control mares, which is not surprising given the evidence that PZP-treated females of other mammal species can regularly demonstrate estrus behavior while contracepted (Shumake and Wilhelm 1995, Heilmann et al. 1998, Curtis et al. 2002). Ransom et al. (2010) found that control mares were herded by stallions more frequently than PZP-treated mares, and Nunez et al. (2009) found that PZP-treated mares exhibited higher infidelity to their band stallion during the non-breeding season than control mares. Madosky et al. (2010) found this infidelity was also evident during the breeding season in the same population that Nunez et al. (2009) studied, resulting in PZP-treated mares changing bands more frequently than control mares. Long-term implications of these changes in social behavior are currently unknown.

The highest efficacy for fertility control has been achieved when applied during the time frame of November through March. Refer to Appendix C. Standard Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments for more information about fertility control research procedures. The efficacy for the application of the two-year PZP vaccine based on winter application is as follows:

The one-time application of PZP, applied at the capture site, would not affect normal development of the fetus, hormone health of the mare or behavioral responses to stallions, should the mare already be pregnant when vaccinated (Kirkpatrick 1995). The vaccine has also proven to have no apparent effects on pregnancies in progress, the health of offspring, or the behavior of treated mares (Turner et al. 1997). Mares would foal normally in the first year of application.

Refer to Appendix C. Standard Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments for detailed information about fertility control treatment and results of the WinEquus horse population modeling in Appendix F, Owyhee Complex Population Modeling.

Under Alternative A, stallions would be selected for release to increase the post-gather sex ratio to approximately 60% stallions in the remaining herds in an effort to further reduce growth rates in combination with fertility control. Stallions would be selected to maintain a diverse age structure, herd characteristics and body type (conformation). It is expected that releasing additional stallions to reach the targeted sex ratio of 60% males would result in smaller band sizes, larger bachelor groups, and some increased competition for mares. With more stallions involved in breeding it is expected that there would be increased genetic exchange and improvement of genetic health within the herd.

Wild Horses Remaining or Released into the HMA following Gather

The primary effects to the wild horse population as a direct result of this proposed gather would be to alter herd population dynamics, age structure or sex ratio, and subsequently reduction of the growth rates and population size over time. Reducing population size would also ensure that the remaining wild horses remain healthy and vigorous, and that the wild horses in the HMA are not at risk of death or suffering as a result of starvation due to insufficient forage and/or water as a result of frequent drought conditions.

The wild horses that are not captured may be temporarily disturbed and may move into another area during the gather operations. With the exception of changes to herd demographics, direct population-wide impacts from a gather have proven, over the last 30 years, to be temporary in nature with most if not all impacts disappearing within hours to several days of when wild horses are released back into the area. No observable effects associated with these impacts would be expected within one month of release, except for a heightened awareness of human presence.

As a result of lower density of wild horses across the HMA following the removal of excess wild horses, competition for resources would be reduced, allowing wild horses to utilize preferred, quality habitat. Forage and water resources would be allowed to improve in quality and quantity. Improved range condition and increased forage availability would promote healthy, viable populations of wild horses. A thriving natural ecological balance between wild horses and other resource values would be achieved throughout the HMA, and deterioration of the range from an over-population of wild horses would be temporarily alleviated or prevented. 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, and increasing the long-term success of these herds.

Removal of excess wild horses would improve herd health. Decreased competition for forage and water resources would reduce stress and promote healthier animals. This removal of excess animals, coupled with anticipated reduced reproduction (population growth suppression) as a result of fertility control and sex ratio adjustment, should result in improved health and condition of mares and increased foal survival rates. Additionally, reduced population growth rates would

be expected to extend the time interval between gathers and reduce disturbance to individual animals as well as to herd social structure over the foreseeable future.

Under Alternative A and B, band size would be expected to decrease, competition for mares would be expected to increase, genetic exchange would be expected to increase with additional stallions breeding, 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 sex ratio ranges. Conversely, a selection criterion, which leaves more mares than stallions, would be expected to result in fewer and smaller bachelor bands, increased reproduction on a proportional basis with the herd, and larger band sizes.

It is not expected that genetic health would be impacted by Alternatives A or B. The AML range of 621-999 wild horses would provide adequate opportunity for genetic health. Following analysis of samples that would be collected in 2012, the Winnemucca and Elko Districts would work with Dr. Gus Cothran's recommendations to develop plans to maintain and further improve genetic health.

The wild horses that remain in the HMA following the gather would maintain their social structure and herd demographics (age and sex ratios). No observable effects to the remaining population would be expected except a heightened shyness toward human contact.

#### *4.15.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*
Under this alternative, excess wild horses would be removed to the lower range of the AML. Impacts from this Alternative would be similar to the Alternative A; however this Alternative would not phase-in the removal of excess wild horses as in Alternative A. Alternative B would remove excess wild horses within the HMA and outside the HMA boundaries. Successful implementation of this alternative would be dependent on gathering greater than 73% of the current wild horse population. Due to the terrain and vegetative cover, gather efficiency is likely to be approximately 80% since historically this has been the average for the Owyhee Complex. Follow up gathers would be needed to maintain the population within ML and to continue the management actions proposed to slow the wild horse population growth rate. Follow-up gathers would occur every 2-3 years to continue population suppression activities.

#### *4.15.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*
Impacts from this alternative would be similar to Alternative B; however there would be no wild horses released because only enough animals would be gathered to reduce the population to the low end of AML, sex ratios would not be adjusted and fertility control would not be applied. AML would be achieved but would most likely exceed the high end of AML sooner than Alternative B. Follow-up gathers would occur every 2-3 years to continue managing wild horses within AML.

#### *4.15.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*
Under the No Action alternative, AML would not be achieved within the HMA and excess wild horses would not be removed from areas within or outside of the designated HMA. There would

be no active management to control the size of the population at this time. Wild horse populations would continue to increase at an average rate of 15-25% per year. Without a gather and removal now, the wild horse population in the Owyhee Complex would exceed 5,598 wild horses within 5 years and 13,931 wild horses within 10 years based on population annual reproduction rate estimates. These population levels would continue to exceed the carrying capacity of the range.

AML is the maximum population at which a thriving natural ecological balance would be maintained and that avoids deterioration of the rangeland. The increasing population of wild horses even further in excess of AML under the No Action alternative would over-extend and deplete water and forage resources. Excessive utilization, trampling, and trailing by wild horses would further degrade the vegetation, prevent improvement of range that is already in less than desirable or in degraded condition, would degrade currently healthy rangelands, and would not allow for sufficient availability of forage and water for either wild horses or other ungulates, especially during drought years or severe winter conditions.

Throughout the HMAs administered by the Winnemucca and Elko Districts, few predators exist to control wild horse populations. Some mountain lion predation occurs, but does not appear to be substantial. Coyote are not prone to prey on wild horses unless wild horses are very young or extremely weak. Other predators such as wolf or bear do not exist.

Wild horses are a long-lived species with documented foal survival rates exceeding 95%. Survivability rates collected through research efforts are as follows:

> Pryor Mountain Wild Horse Range, Montana: >95%; 15 years and younger, except for foals, both sexes: 93%;
>
> Granite Range HMA, Nevada: >95%; 15 years and younger, except for male foals: 92%;
>
> Garfield Flat HMA, Nevada: > 95%; 24 years and younger, except both foals, both sexes: 92%.

Wild horses are not a self-regulating species and would continue to reproduce until their habitat can no longer support them. Usually the habitat is severely, if not irreversibly, damaged before the wild horse population is abruptly impacted and experiences substantial death loss. Once the vegetative and water resources are at these critically low levels due to excessive utilization by an over population of wild horses, the weaker animals, generally the older animals and the mares and foals, are the first to be impacted. It is likely that a majority of these animals would die from starvation and dehydration. The resultant population would be heavily skewed towards the stronger stallions which would lead to substantial social disruption in the HMA. Fighting among stud wild horses would increase as they protect their position at scarce water sources, and injuries and death to all age classes of animals would be anticipated. Substantial loss of the wild horses in the HMA due to starvation or lack of water would have obvious consequences to the long-term viability of the herd. By managing the public lands in this way, the vegetative and water resources would be impacted first and to the point that they have no potential for recovery.

This degree of resource impact would lead to management of wild horses at a greatly reduced level if BLM is able to manage for wild horses at all on the HMA in the future.

Trampling and trailing damage by wild horses in/around riparian areas would also be expected to increase, resulting in larger, more extensive areas of bare ground. Continued decline of rangeland health and irreparable damage to vegetative, soil and riparian resources, would have obvious impacts to the future of the HMA and all other users of the range's resources. Competition for the available water and forage between wild horses, domestic livestock, and native wildlife would increase. Continued decline of rangeland health and irreparable damage to vegetative, soil and riparian resources, would have obvious impacts to the future of the HMA 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 wild horse population, and would not promote a thriving natural ecological balance.

As populations increase beyond the capacity of the habitat to sustain them, more bands of wild horses would leave the boundaries of the HMA in search of forage and water. This alternative would also result in increasing numbers of wild horses in areas not designated for their use, and would not achieve the stated objectives for wild horse herd management areas, to "prevent the range from deterioration associated with overpopulation", and "preserve and maintain a thriving natural ecological balance and multiple use relationship in that area".

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). Allowing excess wild horses to remain ungathered would be inconsistent with the mandates of the WFRHBA and implementing regulations.

## 4.16. Wilderness Study Areas

### *4.16.1 Impacts from Actions Common to Alternatives A-C*

In the short-term, the sight and noise of helicopters would be noticeable throughout the wilderness study areas during the gather and would reduce opportunities for solitude. Dates of the gather would determine the amount of impact to visitors as use levels range from extremely low in winter, low to moderate in the summer, and peak in the fall during hunting seasons. Visitor use levels are generally highest the opening weekends of the hunting seasons.

Under Alternatives A and B, the gather would decrease trampling, trailing, hedging, and forage utilization of native grasses over the long term thereby maintaining vegetative cover and preventing further degradation of natural conditions.

### *4.16.2 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*

Not utilizing fertility control or sex ratio adjustment would result in more frequent gather activities than Alternatives A and B with corresponding increases to reduction in opportunities for solitude.

### *4.16.3 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

The No Action Alternative would not result in direct impacts to solitude from gather operations. The indirect impacts from the current over-population of wild horses would include removal of natural vegetation, damage to water sources, and increased erosion. These impacts represent continued and accelerating degradation of the quality of the natural conditions, scenic qualities, and conservation aspects of wilderness. Expansion of invasive plant species due to removal of vegetation from trampling and overgrazing would result in long-term degradation of the naturalness and untrammeled conditions. Control of non-native species and reintroduction of native species (if possible) would be costly and reduce opportunities for solitude while crews were working.

## 4.17 Wildlife

### *4.17.1 Impacts from Actions Common to Alternatives A-C*

In addition to direct impacts previously analyzed for Migratory Bird and Special Status Species, direct impacts would consist primarily of disturbance and displacement to wildlife by the low-flying helicopter, running wild horses and construction of temporary trap/holding facilities. Typically, the natural survival instinct of wildlife to this type of disturbance is to flee from the perceived danger. These impacts would be minimal, temporary, and of short duration. There is a slight possibility that non-mobile or site-specific animals would be trampled.

Indirect impacts would be related to wild horse densities. Bringing the wild horse population to AML would decrease competition for available cover, space, forage, and water between wild horses and other wildlife. Decreased wild horse levels would reduce conflicts between wild horses and wildlife at limited water sources. Reduced harvest of vegetation would result in increased plant vigor, production, seedling establishment, and ecological health of important wildlife habitat. Resident populations of mule deer and pronghorn antelope would benefit from an increase in forage availability, vegetation density, and structure.

See Section 4.3.1 Migratory Birds in regards to positive effects on wildlife species that would occur with the reduction of water use as a result of wild horse numbers at AML.

### *4.17.2 Impacts from Alternative A*

*Phased-in Gather, Selective Removal, & Population Growth Control*

Under Alternative A, the wild horse population would be reduced to low-AML over the next several years. Impacts to wildlife habitat would still occur, but to a lesser degree than if wild horse populations were to remain at current populations. With the population controls and follow-up gathers proposed by Alternative A, improved habitat conditions would be maintained for a longer period of time before wild horse populations, once again, increase to high AML or above.

### *4.17.3 Impacts from Alternative B*

*Selective Removal of Excess Wild Horses to Low AML and Population Growth Control*

This alternative would have similar impacts to Alternative A but the beneficial impacts would occur sooner if the wild horse population can be successfully reduced to low AML (approximately 621 wild horses) during the first gather attempt With the population controls

improved habitat conditions would be maintained for a longer period of time before horse populations, once again, increase to high AML or above.

### *4.17.4 Impacts from Alternative C*

*Remove Excess Wild Horses to within AML*

Beneficial long-term impacts would be to a lesser extent than with Alternative B since without sex ration adjustment and the use of PZP, the wild horse population would increase to high AML or above at a faster rate.

### *4.17.5 Impacts from Alternative D*

*No Action – Defer Gather and Removal*

No direct impacts are expected under this alternative. Maintaining the current numbers of excess wild horses on the range and augmented by yearly population growth, would result in continued impacts to wildlife populations and habitats. Wild horse populations would increase by about 15-25%. Upland habitats would continue to see locally heavy levels of utilization associated with wild horse use which would expand as wild horse populations continue to grow. The associated decrease in herbaceous vegetation would reduce wildlife forage availability and quality, decreasing population levels. Wildlife habitat would also continue to be impacted by the physical action of wild horse movement.

Continued heavy grazing or trampling would occur on spring meadow systems. The result would be to decrease water availability, leading to increased competition for this critical resource. Habitats associated with wetland and riparian areas would remain degraded due to removal of residual stubble height and compaction, leading to increased disturbance and levels of bare ground. Based on spring inventory assessments, increasing wild horse populations would continue to concentrate and trample riparian areas, thereby degrading riparian habitats and the important functions these sites represent for many wildlife species.

# Chapter 5. Cumulative

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

The Cumulative Assessment Area (CAA) for the purpose of this analysis is the Owyhee Complex gather area (Figure 1).

## 5.1. Past and Present Actions

On the basis of aerial photographic data, agency records, GIS, and BLM Legacy Rehost 2000 database (which records lands and mineral actions) the following past and present actions, which have impacted the assessment area to varying degrees, have been identified within the cumulative assessment area: livestock grazing, lands and realty, mining, recreation, wild horses, wilderness study areas, and wildfires.

### *5.1.1. Livestock Grazing*

Forage utilization during the 1900s was high when thousands of cattle, sheep, and horses grazed lands in northern Nevada. In the 1930s when overgrazing threatened to reduce Western rangelands to a dust bowl, Congress approved the TGA of 1934, which for the first time regulated grazing on public lands. The TGA required ranchers who grazed horses or livestock on public lands to have a permit and to pay a grazing fee, but by that time, thousands of wild horses roamed the Nevada desert unbranded and unclaimed.

Prior to the TGA, livestock grazing practices resulted in major impacts to soil resources and the vegetation communities they supported. As a result, historic livestock grazing activities prior to the TGA had significant impacts on the vegetation resources within the impact assessment area by eliminating or greatly reducing the primary understory plants. Cheat grass was introduced into the area in the early 1900s.

Prior to the TGA, livestock grazing practices also significantly impacted wetland and riparian zones. Wetland and riparian zones declined, riparian vegetation was insufficient to dissipate energy or to filter sediments, thereby increasing erosion and destabilizing stream banks and meadows. Destabilization of streams and meadows led to incised channels and gullies resulting in lowered water tables. In an effort to prevent adverse impacts to rangeland health and to support and better distribute livestock on the public range, a variety of range improvement projects have been implemented through the years dating back to the 1930s.

A series of livestock grazing decisions since the TGA have resulted in reductions in livestock numbers and changes in seasons of use and in grazing management practices to promote rangeland health within grazing allotments. Through various grazing decisions, the current level of permitted livestock grazing use has been reduced to less than half (48%) of the level of grazing permitted in 1982. Refer to Table 6. Livestock AUMs and Table 8. Grazing Use (AUMs) by Year. Other management changes have also resulted in restrictions on when, where, and how long livestock can graze, to minimize potential impacts to rangeland health.

The present livestock grazing system and efforts to manage the wild horse population within AML has helped reduce past historic soil impacts and has improved current soil resource conditions.

### *5.1.2. Lands and Realty*

According to BLM records, LR 2000,GIS data, past and present lands actions that have impacted the cumulative assessment area to varying degrees are: transportation and access (use and maintenance of roads and trails), development of utilities (power lines, natural gas line, fiber optic lines, communication sites), water pipelines, and easements across private lands.

Transportation and access – Past and present actions within the assessment area are supported by an extensive transportation system. Most of these roads originated from mining exploration or ranching access and few are regularly maintained.

Utilities -Power lines, and other various land authorizations identified above, traverse the assessment area and have been in place for many years. Periodic maintenance to the existing facilities has resulted in some temporary vegetation removal and short term disturbance to wild horses due to human presence.

### *5.1.3. Mining*

There is one mining operation within the CAA: Snowstorm Exploration LLC is in the process of obtaining an exploration plan to expand disturbances around the Chimney Creek area. Roads are currently being maintained and created by Snowstorm Exploration LLC south and east of Chimney Reservoir.

### *5.1.4. Recreation*

Recreation resources that exist in the area are mainly outdoor recreation, wildlife watching/photography, wild horse watching/photography, rock hounding and hunting for both large and small game. Visitor use levels range from extremely low in winter, low to moderate in the summer, and peak in the fall during hunting seasons with season opening weekends having the highest visitation of the year.

### *5.1.5. Wild Horses*

Refer to Section 3.3.8 Wild Horses for more information on AML establishment, current population, aerial population counts, growth rates, genetic analysis and herd history, gather history, and wild horse use and habitat health.

In 1971 Congress passed the Wild Free-Roaming Horses and Burros Act which placed wild and free-roaming horses that were not claimed for individual ownership under the protection of the Secretaries of Interior and Agriculture. In 1976 the FLPMA gave the Secretary the authority to use motorized equipment in the capture of wild free-roaming horses as well as continued authority to inventory the public lands. In 1978, the Public Range Improvement Act was passed which amended the WFRHBA to provide additional directives for BLM's management of wild free-roaming horses on public lands.

The HMAs in the Winnemucca and Elko District planning areas were designated as suitable for the long-term maintenance of wild horses. For the Winnemucca District the HMAs were designated in the approved Paradise-Denio Management Framework Plan (PD-MFP) (1982).

HMA terminology did not exist at the time the PD-MFP was developed. The PD-MFP referred to HMAs as Herd Use Areas. The PD-MFP Record of Decision (1982) established the multiple use balance between livestock, wild horses, and wildlife based on the analysis of alternative allocations between these uses, and set initial forage allocations for wild horses.

The Elko Resource Management Plan (RMP) Record of Decision (ROD) dated March 11, 1987 provided for four wild horse herd areas (HAs) and "gatherings as needed to maintain numbers." In 2003, the Elko RMP was amended for wild horse management to establish four current HMAs (Diamond Hills North, Little Humboldt, Owyhee, and Rock Creek) and their boundaries, to identify the Appropriate Management Levels (AML) for the four HMAs within the Elko Resource Area, and to establish a process for modifying AMLs for wild horses through monitoring, evaluation, and Herd Management Area Plans. Table 2. AML Decision Documents lists the NEPA documents which supported the initial AMLs and established or re-affirmed AMLs on the basis of available monitoring data.

The actions which have influenced the wild horse populations in existence today are primarily wild horse gathers, which resulted in the capture of some 13,511 wild horses, the removal of 12,280 excess wild horses and release of 1,130 wild horses back into Owyhee Complex. Refer to Table 9. Owyhee Complex Gather History in Section 3.3.8 Wild Horses.

#### *5.1.6. Wilderness Study Areas*

There are four WSAs within the project area. See Table 10 for a summary of WSA acres within the Complex HMAs and gather area. Since designation, the areas have been managed to protect and enhance their wilderness character including naturalness and outstanding opportunities for solitude and primitive recreation. As only Congress can change wilderness designation, this management would be expected to continue.

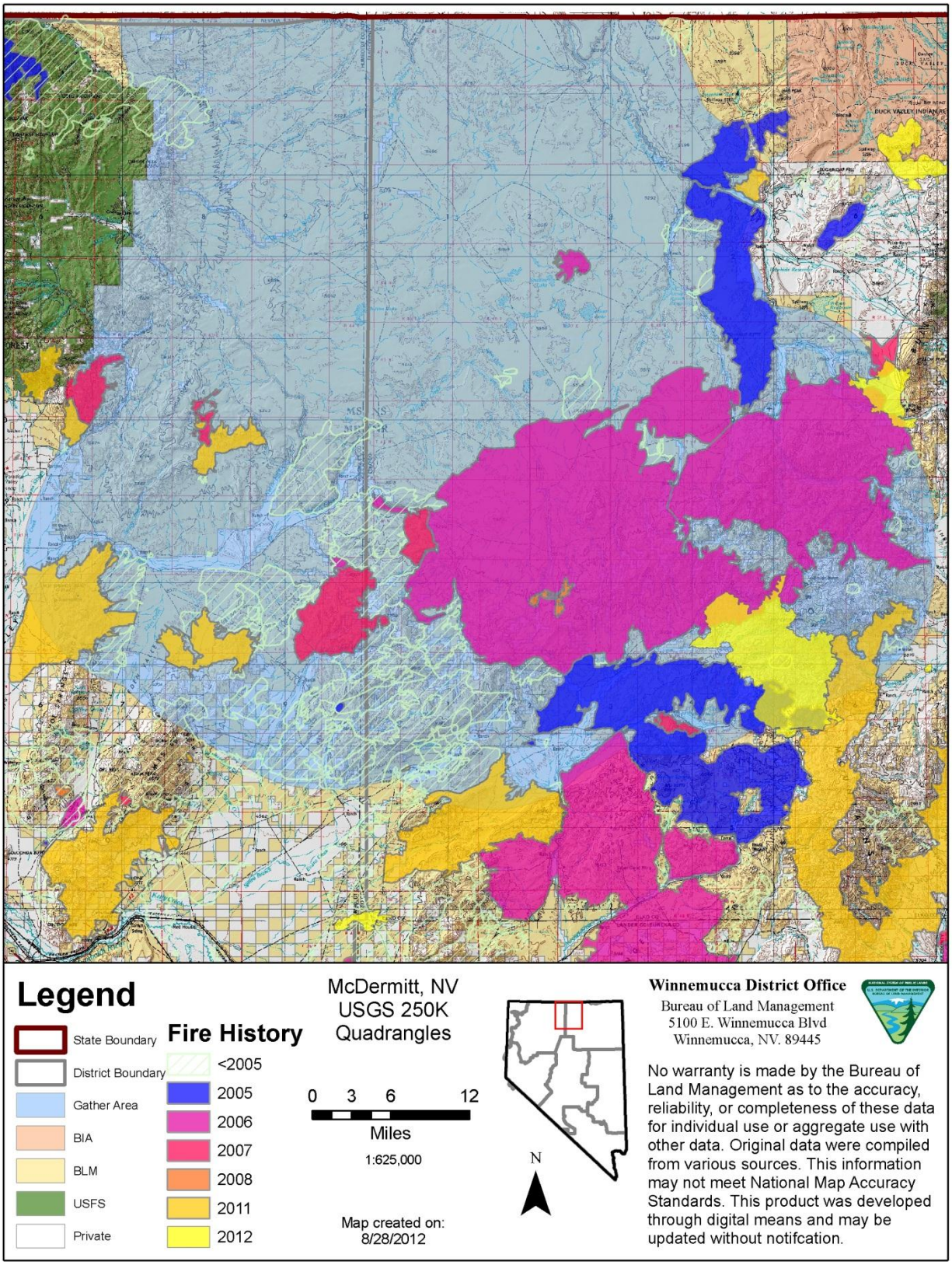
#### *5.1.7. Wildfires*

Since 2001, approximately 441,340 acres have been burned by wildfire in the cumulative impact assessment area. The two largest fires, the Winters and Amazon fires, occurred in 2006 consuming 238,461 and 108,566 acres respectively almost entirely within the Rock Creek HMA. Burned areas were rehabilitated or allowed to recover naturally with varying degrees of success. Table 11 contains an acreage summary of the fire history within the Owyhee Complex Gather Area since 2005. Figure 11 depicts the fire history of the area since 2005.

**Table 11.** Wildfire Acreage Summary since 2005

| Wildfire Name | Year | Acreage | | |
|---|---|---|---|---|
| | | Total | Within Gather Area | Within Complex |
| Esmeralda | 2005 | 96,986 | 52,662 | 0 |
| Kelly Creek | 2005 | 123 | 123 | 0 |
| Mint | 2005 | 442 | 442 | 0 |
| North Jake | 2005 | 307 | 307 | 0 |
| Rawhide | 2005 | 13,453 | 8,983 | 0 |
| Stage | 2005 | 158 | 158 | 0 |
| Wilson | 2005 | 35,749 | 33,392 | 2 |
| Amazon | 2006 | 108,567 | 108,555 | 32,934 |
| Fairbanks | 2006 | 82 | 82 | 82 |
| Humboldt | 2006 | 542 | 543 | 543 |
| Rodear | 2006 | 1,011 | 1,011 | 1,011 |
| Sheep | 2006 | 150,270 | 3,878 | 0 |
| Silver Lake | 2006 | 2,540 | 2,540 | 2,540 |
| Winters | 2006 | 238,462 | 238,462 | 191,067 |
| Castle Place | 2007 | 4,621 | 4,621 | 4,621 |
| Kelly Creek | 2007 | 18,807 | 18,807 | 18,182 |
| Martin Creek | 2007 | 7,838 | 7,382 | 0 |
| Petan-Wilson | 2007 | 3,330 | 949 | 0 |
| Red Hills | 2007 | 3,100 | 3,100 | 2,414 |
| Wilkinson | 2007 | 5 | 5 | 0 |
| Willow Creek | 2007 | 1,730 | 1,730 | 0 |
| Burn Canyon | 2008 | 1,629 | 1,629 | 0 |
| Green Monster | 2008 | 887 | 887 | 887 |
| Little One | 2008 | 585 | 585 | 585 |
| Bluffs | 2010 | 16 | 16 | 0 |
| Poverty | 2010 | 0 | 0 | 0 |
| Big Antelope | 2011 | 11,606 | 11,606 | 0 |
| Clover | 2011 | 69 | 69 | 0 |
| Hardscrabble | 2011 | 314 | 314 | 212 |
| Hot Springs | 2011 | 33,794 | 25,178 | 0 |
| Indian Creek | 2011 | 111,738 | 12,231 | 0 |
| Izzenhood | 2011 | 38,191 | 8,958 | 0 |
| Martin | 2011 | 2,524 | 2,227 | 0 |
| Spring Creek | 2011 | 6,000 | 6,000 | 6,000 |
| Sugarloaf | 2011 | 2,293 | 1,559 | 0 |
| Willow | 2012 | 42,781 | 37,040 | 0 |
| Lime | 2012 | 7,590 | 5,314 | 0 |

**Figure 11.** Fire History Map



## 5.2. Reasonably Foreseeable Future Actions

All past and present actions discussed in Section 5.1 are expected to continue into the foreseeable future.

### *5.2.1. Livestock Grazing*

Livestock grazing is expected to continue at similar stocking rates

### *5.2.2. Recreation*

Recreational use is expected to increase, approximately five percent annually, as a result of population growth and family oriented activities. Some activities, such as hunting and off-road vehicle use would likely continue and/or increase over time (Winnemucca RMP AMS, 2005). The assessment area includes four NDOW Hunt Units: units 051, 066, 067, and 068. The big game (elk and mule deer) hunting seasons are scheduled to open October 21, October 22, November 6, and November 22. The upland game (blue and ruffed grouse, chukar, quail and Hungarian partridge) season is scheduled to begin the first weekend in October.

### *5.2.3. Wild Horses*

Wild horse population is expected to continue to increase. The rate of increase would be dependent on the alternative chosen and would be lowest under Alternatives A and B and highest under Alternatives C and D. If necessary BLM would provide water for wild horses until wild horse populations are within AML or in periods of critical need. Water hauling actions would be evaluated under National Environmental Policy Act at that time.

### *5.2.4. Wildfires*

Wildfire Emergency Stabilization and Rehabilitation efforts would continue as the needs are identified and actions are approved.

## 5.3. Cumulative Impacts

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

Due to the similar cumulative impacts to Migratory Birds, Threatened and Endangered Species, Special Status Species and Wildlife, these resources are lumped into one section for analysis in this chapter.

### *5.3.1. Cultural Resources*

5.3.1.1. Impacts from Past and Present Actions

Past actions have been known to damage or destroy cultural resources where the actions have occurred in areas of high cultural resource sensitivity. Previous grazing, range improvements, fire suppression activities, road construction/maintenance and accompanying gravel pits, and off-highway vehicle (OHV) use have caused these types of impacts to cultural resources. Since many Great Basin prehistoric sites are surface or near surface sites, any ground disturbing activities destroy site integrity, spatial patterning and site function. Datable organic features are either destroyed or contaminated. This kind of damage and contamination can result from

concentration of grazing animals (livestock and wild horses), use and maintenance of roads and trails, development and maintenance of utilities (power lines, natural gas lines, fiber optic lines, communication sites, water pipelines), and recreational activities such as off-highway vehicle use. These types of impacts have generally been mitigated through avoidance, controlled excavation, and monitoring. Cultural resources located within wilderness areas are indirectly protected due to wilderness management protocols. Wildfire can impact cultural resources by destroying wooden or other flammable artifacts and features. A fire of sufficient heat intensity can even shatter prehistoric lithic artifacts.

Looting of cultural resources has also heavily impacted sites in the past. Artifacts have been removed and the synchronic context of some sites has been destroyed. Passage of the NHPA of 1966, the NEPA of 1969, the FLPMA of 1976 and the ARPA of 1979 and an improved level of cooperation between federal law enforcement officers, agency fire fighters, and archaeologists has led to increased protection of cultural resource and reduced impacts to these resources as a result of the actions just described, although OHV use and looting are exacerbated by current population growth trends.

5.3.1.2. Impacts from Reasonably Foreseeable Future Actions

Impacts to cultural resources described under Impacts from Past and Present Actions would continue. The foreseeable lands and realty action of the access road right-of-way could directly or indirectly impact cultural resources if present through ground disturbing activities. Like impacts from past actions, the reasonably foreseeable future actions would be subject to mitigation or avoidance to minimize impacts. Increase in recreational use, particularly OHV traffic, is especially destructive to cultural resources through direct ground disturbance or by increasing erosion. Looting and vandalism (intentional or accidental) may also occur more often as the population grows and as access and recreational activities increase.

Implementation of laws and regulations, continuing improvement in consultation between fire officials and archaeology staff and increasing awareness of potential impacts that may result from certain wild horse management practices should minimize impacts to cultural resources from authorized activities on public lands.

5.3.1.3. Cumulative Impacts

No cumulative impacts from activities proposed under Common to Alternatives A-C are expected

*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*

Previous land management practices and other human activities as described above have contributed to the overall condition of cultural resources in the Owyhee Complex. However, wild horse population management goals as outlined in Alternative A should result in improved vegetation.

No direct cumulative impacts are expected as a result of Alternative A. Indirectly, the removal of excess wild horses and controlling the population growth through sex ratio adjustment and application of fertility control would incrementally reduce indirect impacts further than what has been, and would be, provided by mitigation, avoidance, and monitoring from past, present, and

reasonably foreseeable actions. Initially, this reduction of impacts would be less than what would be expected under Alternative B or C due to the fact that fewer wild horses would be gathered. However, in the long term, the population growth suppression measures proposed in Alternative A leading to the slowest growth rate among the alternatives would extend the reduction of impacts to cultural resources over a longer period of time.

Alternative A would not affect foreseeable increases in OHV use and site looting as discussed above. Since there would be a slight improvement to the ecological condition over time, the health and vigor of certain plants used by Native Americans would improve accordingly.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*
Direct and indirect cumulative impacts would be similar to those described for Alternative A except that the reduction of impacts would be greater after the initial gather, but the length of time of the reduction of impacts would not be as long.

*Cumulative Impacts form Alternative D. No Action and Defer Gather and Removal*
This alternative, along with the past, present, and reasonable foreseeable future actions, would incrementally increase damage to cultural resources. Wild horse populations would not be controlled; substantial increases in wild horse numbers would lead to over grazing and possibly exacerbate natural erosional processes, which, in turn, could impact cultural sites. This alternative would not affect foreseeable increases in OHV use and site looting of cultural resources.

### *5.3.2. Invasive, Nonnative Species*

5.3.2.1. Impacts from Past and Present Actions
Past impacts from road maintenance, grazing, recreation, wild fires, and other ground disturbing activities have introduced and spread invasive species throughout the assessment area. Cattle, sheep, and horse grazing during the 1900s caused high forage utilization which led to the degradation of the soil medium needed to maintain the desired native perennial understory. These areas of high disturbance caused a decrease competition of perennial herbaceous grasses and forbs which was exacerbated by the introduction of cheatgrass and other non-native species. Since these non-native species are capable of out-competing most perennial seedlings, increased distribution and abundance of invasive species resulted. Cattle-trailing was and continues to be a catalyst in distributing invasive species across the landscape. The TGA of 1934, ongoing grazing management projects and practices to promote rangeland health have eased the pressure on perennial vegetation; however, areas that were previously invaded by non-native species would likely remain in a dominated state. With correct management, continued livestock grazing within the project area should maintain current conditions. Above AML-range use of the project area by wild horses has and continues to adversely impact soil and vegetative health, promoting establishment and spread of non-native species.

The establishment roads, trails, fiber optic lines, communication sites, water pipelines in past and current lands and realty projects within the CAA result in varying degrees of ground disturbance. Disturbances that are not re-vegetated with native species create opportunities for non-native establishment, and spread. Past and current implementation of best management practices

including treatments on ground disturbing activities have been occurring on public and private land within the assessment area and reduce the spread of invasive species.

Past and current recreational activities including OHV use have provided corridors for weed transportation and establishment, as well as site specific infestations. In areas with approved OHV routes and recreation sites, past and current implementation of best management practices including treatments have been occurring on public and private land; these have reduced the spread of invasive species within the assessment area. OHV use in unauthorized areas has and would continue to increase the spread of invasive species and introduce new infestations in these areas.

The spread of invasive species (especially grasses and forbs) following the severe overgrazing that occurred in the 1900s also affected the fire regime. These non-natives contributed to high levels of fine fuel loading, resulting in more frequent fires. Without rehabilitation, burn areas have and would continue to be extremely susceptible to invasive species dominance. Existing areas dominated with invasive species would continue to be susceptible to wildfire ignition.

5.3.2.2. Impacts from Reasonably Foreseeable Future Actions

With correct management, continued livestock grazing within the project area should maintain current conditions. Above AML-range use of the project area by wild horses would continue to adversely impact soil and vegetative health, promoting establishment and spread of non-native species in the future. Water-hauling activities associated with increasing wild horse populations would also provide conduits for invasive species spread within the area.

Disturbances that are not re-vegetated with native species create opportunities for non-native establishment, and spread. Future implementation of best management practices including treatments on ground disturbing activities have been occurring on public and private land within the assessment area and reduce the spread of invasive species.

In areas with approved OHV routes and recreation sites, past and current implementation of best management practices including treatments have been occurring on public and private land; these have reduced the spread of invasive species within the assessment area. Increased OHV use in unauthorized areas in the future would increase the spread of invasive species and introduce new infestations in these areas.

Areas dominated with invasive species would continue to be susceptible to wildfire ignition. New infestations, as well as increased OHV use could increase the probability of ignition.

5.3.2.3. Cumulative Impacts

*Cumulative Impacts from Actions Common to Alternatives A-C*

Establishing trap sites leading to wild horses congregating in specific locale, the impacts associated with helicopter landing zones, transportation, and observation in the gather area would exacerbate soil and vegetative stresses that resulted from past grazing pressures and on degraded soils. However, these stresses would be short-term. The cumulative impacts of Alternatives A-C would positively affect long term management goals to maintain rangeland health and healthy wild horse populations, which would reduce trailing; this would reduce the probability of

invasive species being transported to new locations. The reduction would also reduce the amount of herbivory of native perennial species which compete with invasive species.

*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*
ThecumulativeimpactsofAlternativeAwouldpositivelyaffectlongtermmanagement goals to maintain rangeland health by promoting sustainable wild horse populations, which would reduce trailing; this would reduce the probability of invasive species being transported to new locations. This alternative would reduce areas of bare ground caused from concentrated wild horse grazing and hoof action there by decreasing the areas available for weed infestation. The reduction would also reduce the amount of herbivory of native perennial species which compete with invasive species. While Alternative A would remove less wild horses during the first phase of implementation, it would achieve the most effective overall reduction in invasive/non-native species establishment and spread because of its duration. This, addition to existing mitigation associated with federal actions (such as authorizing right-of-ways) and post-fire rehabilitation efforts would promote re-establishment of native vegetation in the long term.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*
The direct cumulative impacts would be similar to Alternative A; however, the effects would be more effective initially with Alternative B as the initial gather proposes to gather to low AML (approximately 621 wild horses).

*Cumulative Impacts from Alternative C. Removal of Excess Animals to within AML*
Incremental impacts would be the same as those discussed above in Cumulative Impacts from Actions Common to Alternatives A-C. A reduction in numbers after the initial gather would reduce the amount of impacts being caused by the wild horses. However, despite the removal, the population would continue to increase at the historic rate of 15-25% and impacts associated with wild horse grazing would continue.

*Cumulative Impacts from Alternative D. No Action-Defer Gather and Removal*
Impacts from the continuous growth and overpopulation of the wild horses would add to the impacts from past, present and future actions resulting in large areas that would be susceptible to establishment and spread of invasive species.

### *5.3.3. Migratory Birds, Threatened and Endangered Species, Special Status Species, and Wildlife*

5.3.3.1. Impacts from Past and Present Actions
Wildlife and their habitats have been impacted through wildfire and various multiple uses such as livestock grazing, lands and realty, recreation, wild horses, wilderness designation and associated roads and trails. Human activities have also increased the introduction and spread of weeds.

Livestock and wild horses continue to utilize vegetation and impact riparian vegetation, soils and water quality. These impacts can especially pronounced during times of below average precipitation. Forage and water availability can become limited, and negatively affect wildlife

health and fitness. The impacts to the important riparian and stream habitats from these past and present actions, in general, include: loss of streamside vegetation, increased sedimentation, increased stream channel width, and loss of undercut stream bank habitat.

Projects, such as fences and water developments have been installed over the last several decades and continue to be used and maintained for the purpose of livestock grazing management.

Fences and water projects will continue to have impacts to wildlife. The use of fencing limits access and can help reduce adverse impacts to habitat from livestock, wild horse and human use. They can also allow implementation of livestock grazing systems which have a beneficial impact to wildlife habitat by providing periodic rest from grazing. Negative impacts can result from injuries or death to wildlife from entanglement or from alteration of natural movement. Fences may also provide unnatural, advantageous perch sites for avian predators. Additional water sources can increase populations by providing water where it would not naturally occur. This may be beneficial to some species and detrimental to others. For instance, insect numbers may increase and provide a greater abundance of food for birds and bats but may also increase the incidence of disease (e.g. West Nile virus) transmission to some species of wildlife.

Realty actions have added to impacts to wildlife through authorization of access and permitting of structures and activities in the assessment area. Consequently, the need for roads and trails is increased. Since some species are reluctant to go near or cross roads or trails, fragmentation of habitats can result. Such actions result in more human activity, noise, and disturbance to wildlife habitat.

Recreation activities affect wildlife in similar ways as does realty actions. Cross country OHV use in addition to use of existing trails, can injure wildlife, disrupt their activities, disturb soil and vegetation, and spread weeds.

Wilderness study areas result in reduced noise and disturbance to wildlife due to the limited activities allowed. There habilitation of roads has also reduced the level of fragmentation, allowing more natural movement of wildlife.

5.3.3.2. Impacts from Reasonably Foreseeable Future Actions

Impacts from livestock grazing and associated projects are expected to remain at the current level. The removal of excess numbers of wild horses is expected to reduce impacts, as described in Section 5.3.3.1, to upland and riparian habitats.

The future realty action of the access road right-of-way would result in additional noise, fragmentation and disturbance to wildlife and habitat. Recreational activities are expected to increase in the future (Section 5.2.2 Reasonably Foreseeable Future Actions – Recreation), resulting in a proportionate increase of impacts as described in Section 5.3.3.1. Impacts to wildlife and habitat from Wilderness Study Area management is expected to remain at current levels.

If it becomes necessary to provide additional water to wild horses, this would benefit birds and wildlife since they are also negatively affected when water is not in adequate supply.

Reasonably foreseeable future actions for wild horse and livestock grazing, road maintenance, and recreation use would impact LCT habitats. The expected impacts to the LCT habitat would be similar to the past and present actions to include: loss of streamside vegetation, increased sedimentation, increased stream channel width, and loss of undercut stream bank habitat.

Impacts to sage grouse from future actions are expected to be similar to but less than described in Section 5.3.3.2. Due to new BLM management actions, impacts to sage grouse from multiple uses would be lessened in an effort to prevent their listing under the Endangered Species Act.

5.3.3.3. Cumulative Impacts

*Cumulative Impacts from Actions Common to Alternatives A-C*

The Actions Common to Alternatives A-C would add slightly to impacts discussed in Section 5.3.3.2 through wild horse gather activities. Disturbance to migratory birds and other wildlife from the helicopter and wild horses could occur but would be short-term and minimal. Damage to vegetation at trap sites would be on a small scale and would not have a measurable impact. Human presence at trap sites would disrupt wildlife activities. Beneficial short and long-term impacts would result from reducing wild horse numbers within the assessment area. The removal of excess wild horses would provide immediate benefit to wildlife through less competition for forage and water and would allow gradual improvement of upland and riparian health.

*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*

Cumulative impacts specific to this alternative would be beneficial in nature and would be longer lasting than the other alternatives since improved habitat conditions would be maintained for a longer period of time before wild horse populations, once again, increase to high AML or above.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*

Cumulative impacts from this alternative are very similar to those under Alternative A, except the beneficial impacts would be more immediate since more wild horses would be removed in 2012.

*Cumulative Impacts from Alternative C. Removal of Excess Animals to within AML*

As with Alternative B, this alternative would have more immediate beneficial impacts since more wild horses would be removed in 2012 but the benefits would diminish even sooner without sex ratio adjustment and the use of PZP.

*Cumulative Impacts from Alternative D. No Action-Defer Gather and Removal*

Negative impacts such as disturbance and possible injury to birds would not occur under this alternative, therefore resulting in less cumulative negative impacts. Beneficial impacts to bird and wildlife habitats would not be realized and wild horse numbers in excess of AML would result in continuing decline of habitat condition and viability of bird and wildlife populations.

### *5.3.4. Native American Religious Concerns*

5.3.4.1. Impacts from Past and Present Actions
From contacts with settlers, disease and alcohol have decimated Northern Paiute and Shoshone population groups. Further, past historical actions ranging from mining and gravel extraction, grazing, home building, and road construction, have served to drive the Northern Paiutes off the land, confine them to reservations, and further destroy their culture. Only in the past 50 years has an attempt been made by the federal and state governments to undo some of these actions.

5.3.4.2. Impacts from Reasonably Foreseeable Future Actions
Impacts to Native American Religious Concerns described under Impacts from Past and Present Actions would continue. The foreseeable lands and realty action of the access road right-of-way could directly or indirectly impact Native American spiritual sites if present through ground disturbing activities. Like impacts from past actions, the reasonably foreseeable future actions would be subject to mitigation or avoidance to minimize impacts. Increase in recreational use, particularly OHV traffic, is especially destructive to cultural resources through direct ground disturbance or by increasing erosion. Looting and vandalism of archaeological sites, which are considered to be sacred by many tribes, (intentional or accidental) may also occur more often as the population grows and as access and recreational activities increase.

5.3.4.3. Cumulative Impacts
*Cumulative Impacts from Alternative A through C*
Under Alternatives A through C removal of excess wild horses would reduce direct and indirect impacts of the wild horses on vegetation and riparian areas. These impacts would be reduced for a limited time, dependent on how many wild horses are removed and how fast their population reaches high AML again.

*Cumulative Impacts from Alternative D. No Action-Defer Gather and Removal*
Not gathering wild horses would increase their impacts on vegetation and riparian areas.

### *5.3.5. Water Quality (Surface) and Wetland Riparian Zones*

5.3.5.1. Impacts from Past and Present Actions
Impacts to water resources from past and present management of wild horses and grazing have largely led to the conditions which describe the affected environment for water resources and wetland and riparian zones. One hundred percent of these resources within the HMA that occur on land managed by the BLM have been affected by grazing from wild horses and cattle. This has led to continued use of riparian vegetation and alteration of wetland and riparian soils. This has led to hummocking, compaction, and erosion. Loss of vegetation and alteration of soils also degrades the hydrologic function of these areas either by altering surface flow patterns or by reducing the ability of these habitats to retain water from rain or snowmelt events. Erosion and use of water sources and riparian areas also increases sediments, nutrients, and bacteria within surface waters.

Designation of portions of the Owyhee Complex as wilderness study areas has led to the protection of perennial, intermittent, and ephemeral streams and of the riparian habitat within the

Complex. These protections have included decreased disturbance by recreation activities, especially OHV use.

Impacts to water resources and wetland and riparian zones related to realty action come primarily from recreational use of transportation routes. Where roads cross streams or meadows, degradation of vegetation and soil/ hydrologic function can occur. These impacts can be of short or long duration depending on the frequency of the impact. Additionally, introduction of excess sediment and pollution can occur where road cross surface water sources even when the sources only flow for a portion of the year. These effects are generally short lived and of low severity which allows the impacts to dilute or recover soon after the impact occurs.

From 1985 to 2006, very few water or riparian resources within the Owyhee Complex had been affected by fire. The remainder of burned stream miles that would be associated with riparian habitat within the Complex has burned from 2006 to present. These fires would include Esmeralda (2005),Winters (2006), Amazon (2006), Kelly (2007), Castle Place (2007), Red Hills (2007), Spring Creek (2011), Big Antelope (2011), and Willow (2012) fires to name a few. It is likely, though that any fires that occurred within the Owyhee Complex lead to some temporary increases in sediment and nutrient loading to surface waters along with short term impacts to riparian vegetation. The resilient nature of riparian habitats would most likely have led to the rehabilitation of any impacts caused by fire.

5.3.5.2. Impacts from Reasonably Foreseeable Future Actions

Impacts to water resources and wetland and riparian zones from future wild horse and livestock grazing are expected to be identical in type and distribution to those observed currently. Any variation from current impacts would likely be a benefit to water resources and wetland and riparian zones. In general, the BLM strives to manage wild horses and livestock to maintain or improve habitat functionality for multiple uses. Grazing permit stipulations would be in favor of managing utilization of riparian and wetland zones to promote maintenance or improvement of soil, vegetative, and hydrologic functionality. If attainment of proper functioning could not be achieved under permitted use, and wild horse populations are within the AML range, livestock grazing practices could be adjusted to provide opportunity for riparian zones to recover. However, wild horse management requires season long use. In order for these areas to recover from wild horse use, wild horses would have to be excluded from the areas by the use of fences and providing alternative water sources.

The reasonably foreseeable future action related to lands and realty is not expected to impact water quality or wetland and riparian zones.

Recreation increases would tend to increases the number of times that water or riparian resources would be impacted, however the severity and type of impacts would not likely change. Because of the instantaneous nature of the impacts to water and riparian resources from recreation, general increases in use would not likely lead to measurable changes in the condition of the resources.

It is expected that fire will continue to be a major cause for impacts to water quality or wetland and riparian zones. The severity of future fire impacts to this area is not predictable, being reliant

on existing riparian and wetland conditions, weather, fuel loads and accessibility to suppression activities.

5.3.5.3. Cumulative Impacts

*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*

Implementation of Alternative A would have a countervailing impact to the degradation of water resources and wetland and riparian zones caused by impacts that have occurred and are expected to occur from wild horses and livestock grazing management. Removal of animals that put disruptive or consumptive pressure on these resources would decrease the overall degradation of these resources and may lead to improvement if the number of animals removed is sufficient. This countervailing impact would affect 100% of the water resources and wetland and riparian zones within the HMA.

Implementation of Alternative A would have an additive impact to the rehabilitation of degraded water resources and wetland and riparian zones caused by protections afforded by the designation of a portion of the HMA as wilderness study areas.

Implementation of Alternative A would have a countervailing impact on any degradation to water resources and wetland and riparian zones caused by transportation routes. Even if stream or meadow crossings continue to be impacted by transportation activities, these impacts would be diminished if the functionality of the remainder of the habitat is restored.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*

Impacts to water resources and wetland and riparian zones would be identical in type and distribution as those described under Alternative A. All impacts would be greater than those described under Alternative A after the initial gather due to a smaller wild horse population in the HMA. At some point after the second gather, however, all impacts would begin to diminish as wild horse numbers exceeded those anticipated under Alternative A. All impacts would be expected to remain, at least partially, throughout the period of analysis.

*Cumulative Impacts from Alternative C. Removal of Excess Animals to within AML*

Impacts to water resources and wetland and riparian zones would be identical in type and distribution as those described under Alternative A. All impacts would be greater than those described under Alternative A after the initial gather due to a smaller wild horse population in the HMA. Impacts would begin to diminish as wild horse numbers would increase annually. Within approximately nine years, all impacts would be reduced to zero and the impacts from wild horses would be roughly identical to those currently observed.

*Cumulative Impacts from Alternative D No Action-Defer Gather and Removal*

Selection of the No Action Alternative would have a compounding impact to the degradation of water resources and wetland and riparian zones caused by impacts that have occurred and are expected to occur from wild horse and livestock grazing management. Wild horse numbers would continue to increase, leading to increased use pressure to water resources and riparian zones. Additionally the number of water sources and riparian areas that would be utilized by both wild horses and cattle would increase.

Selection of the No Action Alternative would have a countervailing impact to the rehabilitation of degraded water resources and wetland and riparian zones caused by protections afforded by the portion of the HMA within the Wilderness Study Areas. Continued increase of wild horse numbers would put greater use pressure on water sources and riparian areas within the Wilderness Study Areas where it is more difficult for BLM to monitor and manage these resources.

Selection of the No Action Alternative would have a compounding impact on any degradation to water resources and wetland and riparian zones caused by transportation routes. Increased use of these areas by increasing numbers of wild horses would reduce the ability of these habitats to absorb or offset the effects from road crossings.

### *5.3.6. Fisheries*

5.3.6.1. Impacts from Past and Present Actions

Past and present actions have caused impacts to fishery habitats from wild horse and livestock grazing, recreation and road construction/maintenance. The impacts to the fishery habitats from these past and present actions, in general, include: loss of streamside vegetation, increased sedimentation, increased stream channel width, and loss of undercut stream bank habitat. These impacts to fisheries have been reduced through implementation of mitigation measures. Recreation use has removed streamside vegetation and increased stream sedimentation due to OHV use in and around streams. Past actions from road construction and transportation have caused impacts to fishery habitats with increased sedimentation and loss of streamside vegetation at the road/stream crossings.

5.3.6.2. Impacts from Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions for wild horse and livestock grazing, road maintenance, and recreation use would impact fisheries. The expected impacts to the fishery habitat would be similar to the past and present actions to include: loss of streamside vegetation, increased sedimentation, increased stream channel width, and loss of undercut stream bank habitat. Implementation of mitigation measures would reduce these impacts.

5.3.6.3. Cumulative Impacts

*Cumulative Impacts from Alternative A through C*

There should be an incremental improvement in the riparian and aquatic habitat conditions over an extended period of time.

*Cumulative Impacts from Alternative D No Action-Defer Gather and Removal*

If the no action is chosen, impacts to fisheries described in the past, present, and reasonably foreseeable future sections could increase from habitat lost due to the increase in size of the wild horse population in this HMA.

### *5.3.7. Public Health and Safety*

As defined by 40 CFR 1508.7, the cumulative impact is the impact which results from the incremental impact of the action, decision, or project when added to the other past, present, and reasonably foreseeable future actions. No impacts to public health and safety have been

identified from past, present, or reasonably foreseeable future actions; therefore, cumulative impacts to public health and safety are not expected.

### *5.3.8. Rangeland Management*

5.3.8.1. Impacts from Past and Present Actions

Past and present activities have affected livestock grazing through the removal of forage within disturbed areas related to realty and transportation activities. Transportation and access improvements and activities have also provided livestock operators better access to portions of their allotments to better check and care for the livestock on the allotments. Recreational activities have caused impacts due to damage or vandalism of range improvements and difficulties in managing livestock from fences being cut/broken or gates being left open. Past wildfire events have removed large areas of forage and restricted access to forage. Fire rehabilitation projects have re-established vegetation in some areas and mitigated some of the effects associated with wildfire events. Past and present wild horse use has impacted livestock grazing by creating competition between wild horses and livestock for forage and water resources, especially when wild horses are above AML. In the past livestock operators have removed cattle from the rangeland earlier or ran fewer numbers than they are allowed due to wild horses being above AML. Wilderness Study Area management activities have also impacted livestock grazing and rangeland management by removing access routes into areas making it more difficult for livestock operators to reach existing range improvements and livestock.

5.3.8.2. Impacts from Reasonably Foreseeable Future Actions

Impacts to livestock grazing from reasonably foreseeable future actions would remain similar to those analyzed under the past and present actions.

5.3.8.3. Cumulative Impacts

*Cumulative Impacts from Actions Common to Alternatives A-C*

Cumulative impacts from activities proposed under Common to Alternatives A-C would be potential trampling of forage from activities around trap sites, both human and animal. In addition to any disturbance to livestock from past, present, or reasonably foreseeable future actions listed above, livestock in areas outside of the critical area of concern may be frightened and leave the area due to helicopter, traffic, and human interactions.

*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*

The removal of excess wild horses and controlling the population through sex ratio adjustment and application of fertility control would reduce competition between livestock and wild horses for forage and water resources. Immediate reductions to wild horse numbers would be less than what is proposed under Alternative B or C, however; under this alternative the competition between the two species would be reduced for a greater length of time allowing the rangeland a greater recovery period. Impacts from wild horse use would be reduced over a longer period of time than under Alternatives B, or C or under Alternative D deriving a more long term benefit.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*
Direct and indirect cumulative impacts would be similar to those described for Alternative A except that the reduction of impacts would be greater after the initial gather, but the length of time of the reduction of impacts would not be as long.

*Cumulative Impacts from Alternative C. Removal of Excess Animals to within AML*
Direct and indirect cumulative impacts would be similar to those described for Alternatives A and B; however, the length of time of the added reduction of impacts would be non-existent. Without population controls the wild horse population within the gather area would continue increase within the year, and continue to increase. Overtime, incremental impacts would become the same as those under Alternative D.

*Cumulative Impacts from Alternative D. No Action-Defer Gather and Removal.*
This alternative, along with the past, present, and reasonable foreseeable future actions, would incrementally increase damage to rangeland ecosystems. With unchecked population growth and no planned wild horse gathers, rangeland resources would become degraded at an accelerated rate. Livestock numbers would be continually reduced to accommodate the increasing wild horse numbers.

### *5.3.9. Recreation*

5.3.9.1. Impacts from Past and Present Actions
Since Wilderness Study Area designation, the area has been managed to provide outstanding opportunities for solitude and primitive recreation. Livestock grazing and wild horses have caused unsightly manure piles, trailing impacts near waterways and campsites, and unsightly degradation to spring sites that hikers like to visit. Wildfires temporarily remove vegetation supporting wildlife that has supported hunting activities. Livestock and wild horses have also competed for forage used by wildlife. Lands and realty actions identified in Section 5.1.2 Past and Present Actions – Lands and Realty would have little to no impact to recreational values.

5.3.9.2. Impacts from Reasonably Foreseeable Future Actions
Past and present actions are expected to continue.

5.3.9.3. Cumulative Impacts
*Cumulative Impacts from Alternative A through C*
Impacts associated with any of the action Alternatives would not cumulatively impact recreational values. Impacts from wild horses would be reduced as excess wild horses are removed from the gather area; however, the impacts caused by livestock and the remaining wild horses would continue.

*Cumulative Impacts from Alternative D No Action-Defer Gather and Removal*
This alternative, along with the past, present, and reasonable foreseeable future actions, would incrementally increase impacts to recreational resources through continued grazing and population increases of wild horses.

### *5.3.10. Soils*

5.3.10.1. Impacts from Past and Present Actions

Forage utilization during the 1900s was high when thousands of cattle, sheep, and horses grazed lands in northern Nevada. In the 1930s when overgrazing threatened to reduce Western rangelands to a dust bowl, Congress approved TGA of 1934, which for the first time regulated grazing on public lands. The TGA required ranchers who grazed horses or livestock on public lands to have a permit and to pay a grazing fee, but by that time, thousands of wild horses roamed the Nevada desert unbranded and unclaimed.

Prior to the TGA, livestock grazing practices resulted in significant major impacts to soil resources. The soil tolerance was exceeded and the soil medium for plant growth was not maintained. As a result, historic livestock grazing activities prior to the TGA had significant impacts on soil resources within the impact assessment area. A series of livestock grazing decisions since the TGA have resulted in reductions in livestock numbers and changes in seasons of use and in grazing management practices to promote rangeland health within grazing allotments. While the present livestock grazing system and efforts to manage the wild horse population within AML has helped reduce past historic soil impacts and has improved current soil resource conditions, the current overpopulation of wild horses is resulting in areas of heavy vegetative utilization, trailing and trampling damage, and prevents BLM from managing public lands within the Owyhee Complex for rangeland health and for a thriving natural ecological balance.

5.3.10.2. Impacts from Reasonably Foreseeable Future Actions

Multiple-use activities would continue to have similar to present impacts on soils within the CAA, with slight increases expected from recreational activities.

5.3.10.3. Cumulative Impacts

*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*

No direct cumulative impacts are expected as a result of Alternative A. Indirectly, the removal of excess wild horses and controlling the population through sex ratio adjustment and application of fertility control would incrementally reduce indirect impacts further than what has been, and would be, provided by mitigation, avoidance, and monitoring from past, present, and reasonably foreseeable actions. This reduction of impacts would be less than what would be expected under Alternative B or C due to the fact that fewer wild horses would be gathered initially. However, in the long term, the population control measures proposed in Alternative A leading to the slowest growth rate among the alternatives would extend the reduction of impacts to soil and vegetation resources over a longer period of time.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*

Direct and indirect cumulative impacts would be similar to those described for Alternative A except that the reduction of impacts would be greater after the initial gather, but the length of time of the reduction of impacts would not be as long.

*Cumulative Impacts from Alternative C. Removal of Excess Animals to within AML*
Direct and indirect cumulative impacts would be similar to those described for Alternatives A and B; however, the length of time of the added reduction of impacts would be non-existent. Without population controls the wild horse population within the gather area would continue increase within the year, and continue to increase. Overtime, incremental impacts would become the same as those under Alternative D.

*Cumulative Impacts from Alternative D No Action-Defer Gather and Removal*
This alternative, along with the past, present, and reasonable foreseeable future actions, would incrementally increase damage to soil resources.

### *5.3.11. Vegetation*

5.3.11.1. Impacts from Past and Present Actions
Prior to the TGA, livestock grazing practices resulted in significant major impacts to the rangeland vegetation . As a result, historic livestock grazing activities prior to the TGA had significant impacts on the vegetation resources within the impact assessment area by eliminating or greatly reducing the primary understory plants. Cheat grass was introduced into the area in the early 1900s.

A series of livestock grazing decisions since the TGA have resulted in reductions in livestock numbers and changes in seasons of use and in grazing management practices to promote rangeland health within grazing allotments.

While the present livestock grazing system and efforts to manage the wild horse population within AML has helped reduce past historic impacts and has improved current resource conditions, the current overpopulation of wild horses is resulting in areas of heavy vegetative utilization, trailing and trampling damage, and prevents BLM from managing public lands within the Owyhee Complex for rangeland health and for a thriving natural ecological balance.

5.3.11.2. Impacts from Reasonably Foreseeable Future Actions
Multiple-use activities would continue to have similar to present impacts on vegetation within the CAA, with slight increases expected from recreational activities.

5.3.11.3. Cumulative Impacts
*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*
No direct cumulative impacts are expected as a result of Alternative A. Indirectly, the removal of excess wild horses and controlling the population through sex ratio adjustment and application of fertility control would incrementally reduce indirect impacts further than what has been, and would be, provided by mitigation, avoidance, and monitoring from past, present, and reasonably foreseeable actions. This reduction of impacts would be less than what would be expected under Alternatives B or C due to the fact that fewer wild horses would be gathered initially. However, in the long term, the population control measures proposed in Alternative A leading to the slowest growth rate among the alternatives would extend the reduction of impacts to soil and vegetation resources over a longer period of time.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*
Direct and indirect cumulative impacts would be similar to those described for Alternative A except that the reduction of impacts would be greater after the initial gather, but the length of time of the reduction of impacts would not be as long.

*Cumulative Impacts from Alternative C. Removal of Excess Animals to within AML*
Direct and indirect cumulative impacts would be similar to those described for Alternatives A and B; however, the length of time of the added reduction of impacts would be non-existent. Without population controls the wild horse population within the gather area would continue increase within the year, and continue to increase. Overtime, incremental impacts would become the same as those under Alternative D.

*Cumulative Impacts from Alternative D No Action-Defer Gather and Removal*
This alternative, along with the past, present, and reasonable foreseeable future actions, would incrementally increase damage to vegetation resources.

### *5.3.12. Wild Horses*

5.3.12.1. Impacts from Past and Present Actions
Impacts to wild horses from past actions include establishment of wild horse HMAs, establishment of AMLs for wild horses, wild horse gathers, livestock grazing, and recreational activities throughout the areas. Impacts associated with lands and realty actions, such as right-of-way developments, include disruption of wild horses' daily activities, such as foraging and watering, small reduction in available habitat, disruptions to herd movements along construction routes, and wild horse/vehicular accidents, and are due to habitat disturbance, construction activities and increased human presence. The majority of these impacts have been short-lived and temporary in nature.

5.3.12.2. Impacts from Reasonably Foreseeable Future Actions
In the future, the BLM would manage wild horses within HMAs that have suitable habitat for an AML range that maintains genetic diversity, age structure, and targeted sex ratios. Current policy is to express all future wild horse AMLs as a range, to allow for regular population growth, as well as to better management of populations rather. Future wild horse management in the BLM's Winnemucca and Elko Districts would focus on an integrated ecosystem approach. This process would identify actions associated with habitat improvement within the HMA. The BLM would continue to conduct monitoring to assess progress toward meeting rangeland health standards. Wild horses would continue to be a component of the public lands, managed within a multiple use concept.

While there is no anticipation for amendments to WFRHBA, any amendments may change the management of wild horses on the public lands. The Act has been amended three times since 1971; therefore there is potential for amendment as a reasonably foreseeable future action.

As the BLM achieves AML on a national basis, gathers should become more predictable due to facility space. Fertility control should also become more readily available as a management tool, with treatments that last between gather cycles reducing the need to remove as many wild horses

and possibly extending the time between gathers. The combination of these factors should result in an increase in stability of gather schedules and longer periods of time between gathers.

The CAA contains a variety of resources and supports a variety of uses. Any alternative course of wild horse management has the opportunity to affect and be affected by other authorized activities ongoing in and adjacent to the area. Future activities which would be expected to contribute to the cumulative impacts of implementing Alternative A include: future wild horse gathers, continuing livestock grazing in the allotments within the area, new or continuing infestations of invasive plants, noxious weeds, and pests and their associated treatments, and continued native wildlife populations and recreational activities historically associated with them.

5.3.12.3. Cumulative Impacts

*Cumulative Impacts from Actions Common to Alternatives A-C*

A gather would ultimately benefit wild horses, wildlife, range, livestock and water resources. A gather would ensure wild horses are provided adequate feed and water at temporary and short term holding when captured and would also allow for reduced competition for the remaining wild horses within the Owyhee Complex of limited resources on the range. Removal of excess wild horses would ensure that individual animals do not perish due to starvation, dehydration, or other health concerns related to insufficient feed and water and extreme dust conditions. Additionally, a gather would remove excess wild horses while they remain in adequate health to transition to feed.

All Action Alternatives address the need for recurring gathering and removal of wild horses from the Owyhee Complex. Additionally, each would address attainment and maintenance of a thriving natural ecological balance. Achieving AML and removal of all wild horses residing outside the Owyhee Complex would be addressed. Direct impacts to the wild horse population would be a decrease in population resulting in reduced competition for scarce resources within the Owyhee Complex such as water, forage and space. Improved health would be experienced by the remaining wild horse population in the Owyhee Complex. There would be increased opportunities for wild horses to utilize higher quality habitat related to a reduction in competition in these areas and to lessened pressure on the habitat itself. Reduced wild horse densities would result in less competition between bands resulting in fewer injuries and a reduced risk of disease outbreak. Genetic health would be assessed under all action alternatives.

Under each Action Alternative excess wild horse populations would be managed. Maintaining wild horse populations within the AML would reduce competition with livestock and wildlife for the limited and previously allocated forage and water resources in the gather area. This would be beneficial for wild horses, wildlife, livestock and range conditions. Additionally, these management actions would increase the potential for successful reclamation of surface disturbing actions such as rights-of-ways or other related permitted uses within the Owyhee Complex.

Managing the Owyhee Complex wild horse population within AML would also offer improved recreational opportunities by maintaining healthy rangeland resources and offering the public healthy herds of wild horses for viewing opportunities rather than deteriorating herds in poor health due to overpopulations and scarce or unavailable resources.

Gather activities may increase the potential for new or continuing infestations of invasive plants, and/ornoxiousweedsinthelocalizedareaswheretrapsorholdingfacilitiesarelocated. However, removing the excess wild horse populations would decrease long term and wide spread potential for new or continuing infestations of invasive plants, and/or noxious weeds by promoting healthy rangelands.

*Cumulative Impacts from Alternative A. Phased-in Gather, Selective Removal, & Population Growth Control*

Wild horse populations would remain above AML initially. The benefits of a lower population would be realized only to a reduced degree. Competition for optimal habitat, water, forage and space would continue on a smaller scale. The other resources present in the Owyhee Complex would continue to be impacted by excess wild horse populations until the gather plan could be fully implemented over a period of approximately 10 years.

Population control measures should reduce overall population growth rates reducing the frequency of gathers and reducing the number of animals removed from the range. This would directly impact the BLM's short term holding and long term pastures by decreasing the number of animals that would need to be maintained at these facilities.

Under Alternative A other resources in the Owyhee Complex would continue to be impacted by excess wild horses albeit to a lesser degree in the short term. However, after the gather plan was fully implemented and wild horse populations were managed within the AML impacts to livestock grazing, wildlife, recreation and realty actions would be minimal as referenced in Cumulative Impacts Common to Alternatives A-C.

*Cumulative Impacts from Alternative B. Selective Removal of Excess Animals to within AML and Population Growth Control*

This action would address the need to remove excess wild horses while bringing the population on the range to low AML (approximately 621 wild horses). This action would address attainment and maintenance of a thriving natural ecological balance within the first gather. Direct impacts to the wild horse population would be the decreased population to low AML resulting in reduced competition for scarce resources within the Owyhee Complex such as water, forage and space. Improved body condition would be experienced by the remaining wild horse population in the Owyhee Complex. There would be increased opportunities for wild horses to utilize higher quality habitat related to a reduction in competition in these areas and to lessened pressure on the habitat itself. Reduced wild horse densities would result in less competition between bands resulting in fewer injuries and a reduced risk of disease outbreak.

This alternative would directly impact the BLM's Wild Horse Program's short term holding and long term pasture facilities. Currently the BLM is facing very limited available space to hold excess wild horses. Due to drought and other National issues the available space at these facilities may be needed for other higher priority removals. However, the 60% male sex ratio adjustment should slow population growth over the long term and result in greater intervals between gathers and fewer excess wild horses being removed and sent to short term holding and long term pasture facilities.

Under Action Alternative B impacts to livestock grazing, wildlife, recreation and realty actions would be minimal almost immediately after the initial gather. The population growth rate should be slightly higher under this alternative than with Alternative A and so the population should increase at a higher rate resulting in more frequent gathers and more animals being removed over time. More frequent gathers would increase the potential for direct conflicts during gather activities involving livestock, wildlife, recreation and realty.

*Cumulative Impacts from Alternative C. Removal of Excess Animals to within AML*
Much like Alternative B this action would address the need to remove excess wild horses while bringing the population on the range to the low AML (approximately 621 wild horses). This action would address attainment and maintenance of a thriving natural ecological balance within the first gather. Direct impacts to the wild horse population would be the decreased population to low AML resulting in reduced competition for scarce resources within the HMA such as water, forage and space. Improved body condition should be experienced in the short term by the remaining wild horse population in the Owyhee Complex. There would be increased opportunities for wild horses to utilize higher quality habitat related to a reduction in competition in these areas and to lessened pressure on the habitat itself. Reduced wild horse densities should result in less competition between bands resulting in fewer injuries and a reduced risk of disease outbreak.

This alternative would directly impact the BLM's Wild Horse Program's short term holding and long term pasture facilities. Currently the BLM is facing very limited available space to hold excess wild horses. Due to drought and other National issues the available space at these facilities may be needed for other higher priority removals. This action would not address population control on the range by reducing population growth and would not slow population growth over the long term or result in greater intervals between gathers or fewer excess wild horses being removed and sent to short term holding and long term pasture facilities.

Under Action Alternative C impacts to livestock grazing, wildlife, recreation and realty actions would be minimal almost immediately after the initial gather much like Alternative B. However, the population growth rate should be moderately higher under this alternative than with Alternatives A and B and so the population should increase at a higher rate resulting in more frequent gathers and many more animals being removed over time. More frequent gathers would increase the potential for direct conflicts during gather activities involving livestock, wildlife, recreation and realty.

*Cumulative Impacts from Alternative D No Action-Defer Gather and Removal*
Deferral of removing excess wild horses and/or applying population control measures in the Owyhee Complex would further exacerbate deterioration of range conditions and wildlife habitat. The action would not be conformance with existing law and regulation which requires the authorized officer to remove the animals immediately upon determination that excess wild horses are present.

This action would not address population control on the range by reducing population growth and would not slow population growth over the long term or result in greater intervals between gathers or fewer excess wild horses being removed and sent to short term holding and long term pasture facilities. In fact deferring the gather would likely cause a sharp rise in the wild horse

population and result in a larger number of excess wild horses being removed in the future and sent to short term and long term pasture facilities. When a gather was implemented to remove the excess wild horses, the animals would likely be in poor condition due to extreme competition for very limited resources and the animal's health would likely be compromised.

Deferral of gather activities would continue to cause impacts to the other resources and uses within and around the Owyhee Complex. Livestock grazing could be suspended, wildlife habitat devoid, recreational opportunities severely limited and realty actions compromised. All of these impacts would be contrary to the BLM's multiple use mission as well as many other laws, regulations and policies pertaining to wild horses and the resources being impacted. As wild horse populations continue to expand beyond the HMA boundaries these impacts would continue to expand and compound.

### *5.3.13 Wilderness Study Areas*

5.3.13.1. Impacts from Past and Present Actions

While there are no officially designated wilderness areas within the project area, there are four WSAs. The BLM's management policy is generally to continue resource uses on lands designated as WSAs in a manner that maintains the area's suitability for preservation as wilderness. The BLM's policy would protect the wilderness characteristics of all WSAs in the same or better condition than they were on October 21, 1976, until Congress determines whether or not they should be designated as wilderness. See Table 10 for a summary of WSA acres within the Owyhee Complex and gather area.

Since designation, the areas have been managed to protect and enhance their wilderness character including naturalness and outstanding opportunities for solitude and primitive recreation. Authorized grazing by cattle has largely remained stable with usage comparable to that occurring at designation. These developments have reduced the naturalness, undeveloped nature, and untrammeled nature of the wilderness areas. Small wildfires have occurred and been suppressed. These have protected the naturalness of the areas while reducing the untrammeled quality.

5.3.13.2. Impacts from Reasonably Foreseeable Future Actions

Continued management for the protection and enhancement of wilderness values with in each Wilderness Study Area would continue to protect habitat for wildlife including special status species. Grazing is expected to continue in both the areas including maintenance of range developments such as water troughs and fences. These developments would continue to reduce the naturalness, undeveloped nature, and untrammeled nature of the Wilderness Study Areas. Wildfires and their suppression are expected to continue in the future.

5.3.13.3. Cumulative Impacts

*Cumulative Impacts from Alternative A through C*

Cumulative impacts would be the same under Alternatives A through C. Increased human activity associated with gather activities would increase the percentage of time the Wilderness Study Areas have human use, reducing opportunities for solitude. There would be incremental increase in the amount of trammeling of the area. Removal of excess wild horses, along with fire

suppression and route restoration would increase the naturalness and vegetation quality of the areas.

*Cumulative Impacts from Alternative D No Action-Defer Gather and Removal*
Over-utilization of vegetation and other habitat resources would degrade the natural vegetative community allowing invasive non-native species to dominate. Increased frequency of repairs of range developments damaged by excess wild horses would decrease opportunities for solitude.

# Chapter 6. Monitoring

The BLM Contracting Officer Representative and Project Inspectors assigned to the gather would be responsible for ensuring contract personnel abide by contract specifications and SOPs. Ongoing rangeland, riparian, and wild horse monitoring would continue, including periodic aerial population counts.

Under the Action Alternative A fertility control monitoring of treated mares would be conducted in accordance with the SOPs outlined in Appendix C. Standard Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments and routine monitoring of the herd health would continue.

# Chapter 7. Tribes, Individuals, Organizations, or Agencies Consulted

Public hearings are held annually on a state-wide basis regarding the use of motorized vehicles, including helicopters and fixed-wing aircraft, in the management of wild horses. During these meetings, the public is given the opportunity to present new information and to voice any concerns regarding the use of the motorized vehicles. The Ely District Office hosted the state-wide meeting on June 15, 2011; the current gather operation SOPs were reviewed in response to the concerns expressed and no changes to the SOPs were identified. Additionally, the Carson District Office held a public hearing on May 29, 2012, providing the public an opportunity to comment. There were no substantive comments presented at this meeting.

On-going consultation with Resource Advisory Councils, NDOW, USFWS, livestock operators and others, underscores the need for BLM to maintain wild horse populations within AML.

## 7.1 Endangered Species Act Consultation

Section 7 consultation is in progress with the USFWS. A species list was requested on August 27, 2012, and received September 4, 2012 from the USFWS in Reno, Nevada.

## 7.2 Native American Consultation

Letters requesting consultation meetings on Alternative A were sent out on August 24, 2012 to the following tribes: Battle Mountain Band Tribal Council, Fort McDermitt Paiute and Shoshone, Shoshone-Bannocks Tribe, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, and Te-Moak Tribal Council.

# Chapter 8. List of Preparers

## Winnemucca District

| Name | Title | Responsible for the Following Section(s) of this Document |
|---|---|---|
| Wes Barry | Rangeland Management Specialist | Rangeland Management |
| Derek Messmer | Supervisory Fire Management Specialist | Invasive, Non-native species (plants and animals); Fire History |
| Rob Burton | Natural Resource Specialist | Water Quality; Wetlands and Riparian; Soils; Vegetation |
| Joey Carmosino | Outdoor Recreation Planner | Recreation |
| Amanda DeForest | Assistant Field Manager | Migratory Birds; Threatened and Endangered Species; Special Status Species; Wildlife |
| Mark Hall | Native American Coordinator | Native American Religious Concerns |
| Patrick Haynal | Archeologist | Cultural Resources; Paleontology |
| Greg Lynch | Fisheries Biologist | Threatened and Endangered Fish Species; Fisheries |
| Sarah McGuire | Land Law Examiner | Minerals |
| Julie McKinnon | Realty Specialist | Lands and Realty |
| Bonnie Million | Assistant Field Manager | Document Editor |
| Melanie Mirati | Wild Horse & Burro Specialist | Wild Horses |
| Zwaantje Rorex | Planning and Environmental Coordinator | National Environmental Policy Act Compliance |
| Kristine Struck | Wilderness Specialist | Wilderness Study Areas |

## Elko District

| Name | Title | Responsible for the Following Section(s) of this Document |
|---|---|---|
| Casey Addy | Rangeland Management Specialist | Rangeland Management; Vegetation |
| Jerrie Bertola | Rangeland Management Specialist | Invasive, Non-native species (plants and animals); Rangeland Management; Vegetation |
| Carol Evans | Fisheries Biologist | Threatened and Endangered Fish Species; Wetlands and Riparian; Fisheries, |
| Bruce Thompson | Wild Horse & Burro Specialist | Wild Horses |
| Ken Wilkinson | Wildlife Biologist | Migratory Birds; Threatened and Endangered Species; Special Status Species; Wildlife |

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# Appendix A. Standard Operating Procedures for Wild Horse Gathers

Gathers are conducted by utilizing contractors from the Wild Horse Gathers-Western States Contract or BLM personnel. The following standard operating procedures (SOPs) for gathering and handling wild horses 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 Aviation Management Handbook (January 2009).

Prior to any gathering operation, the BLM would provide for a pre-gather evaluation of existing conditions in the gather area(s). The evaluation would include animal conditions, prevailing temperatures, drought conditions, soil conditions, road conditions, and a topographic map with wilderness boundaries, the location of fences, other physical barriers, and acceptable gather locations in relation to animal distribution. The evaluation would determine whether the proposed activities would necessitate the presence of a veterinarian during operations. If it is determined that a large number of animals may need to be euthanized or gather operations could be facilitated by a veterinarian, these services would be arranged before the gather would proceed. The contractor would be apprised of all conditions and would be given instructions regarding the gather and handling of animals to ensure their health and welfare is protected.

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

The primary gather methods used in the performance of gather operations include:

1. Helicopter Drive Gathering. This gather method involves utilizing a helicopter to herd wild horses into a temporary gather site.

2. Helicopter Assisted Roping. This gather method involves utilizing a helicopter to herd wild horses to ropers.

3. Bait Trapping. This gather method involves utilizing bait (e.g., water or feed) to lure wild horses into a temporary gather site.

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

**A. Gather Methods used in the Performance of Gather Contract Operations**
The primary concern of the contractor is the safe and humane handling of all animals gathered. All gather attempts shall incorporate the following:

1. All gather sites and holding facilities locations must be approved by the Contracting Officer's Representative (COR) and/or the Project Inspector (PI) prior to construction. The Contractor may also be required to change or move gather locations as determined by the COR/PI. All gather sites and holding facilities not located on public land must have prior written approval of the landowner.

2. The rate of movement and distance the animals travel shall not exceed limitations set by the COR who would consider terrain, physical barriers, access limitations, weather, extreme temperature ( high and low), condition of the animals, urgency of the operation (animals facing drought, starvation, fire rehabilitation, etc.) and other factors. In consultation with the contractor the distance the animals travel would account for the different factors listed above and concerns with each HMA.

3. All gather sites, wings, and holding facilities shall be constructed, maintained and operated to handle the animals in a safe and humane manner and be in accordance with the following:

    a. Gather sites and holding facilities shall be constructed of portable panels, the top of which shall not be less than 72 inches high for horses and 60 inches high for burros, and the bottom rail of which shall not be more than 12 inches from ground level. All gather sites and holding facilities shall be oval or round in design.

    b. All loading chute sides shall be a minimum of 6 feet high and shall be fully covered, plywood, metal without holes larger than 2"x4".

    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 above ground level for burros and 1 foot to 6 feet for horses. The location of the government furnished portable fly chute to restrain, age, or provide additional care for the animals shall be placed in the runway in a manner as instructed by or in concurrence with the COR/PI.

    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, plastic 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.

    e. All pens and runways used for the movement and handling of animals shall be connected with hinged self-locking or sliding gates.

4. No modification of existing fences would be made without authorization from the COR/PI. The Contractor shall be responsible for restoration of any fence modification which he has made.

5. When dust conditions occur within or adjacent to the gather site or holding facility, the Contractor shall be required to wet down the ground with water.

6. Alternate pens, within the holding facility shall be furnished by the Contractor to separate mares or jennies with small foals, sick and injured animals, estrays or other animals the COR determines need to be housed in a separate pen 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 would 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 may be necessary and would be provided by the government.

Alternate pens shall be furnished by the Contractor to hold animals if the specific gathering requires that animals be released back into the gather area(s). In areas requiring one or more satellite gather site, and where 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 and later segregation would be at the discretion of the COR.

7. The Contractor shall provide animals held in the gather sites and/or holding facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Animals held for 10 hours or more in the gather site or holding facilities shall be provided good quality hay at the rate of not less than two pounds of hay per 100 pounds of estimated body weight per day. The contractor would supply certified weed free hay if required by State, County, and Federal regulation.

8. An animal that is held at a temporary holding facility through the night is defined as a horse/burro feed day. An animal that is held for only a portion of a day and is shipped or released does not constitute a feed day.

9. It is the responsibility of the Contractor to provide security to prevent loss, injury or death of gathered animals until delivery to final destination.

10. The Contractor shall restrain sick or injured animals if treatment is necessary. The COR/PI would determine if animals must be euthanized and provide for the destruction of such animals. The Contractor may be required to humanely euthanize animals in the field and to dispose of the carcasses as directed by the COR/PI.

11. Animals shall be transported to their final destination from temporary holding facilities as quickly as possible after gather unless prior approval is granted by the COR 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 COR. Animals shall not be held in gather sites and/or temporary holding facilities on days when there is no work being conducted except as specified by the COR. The Contractor shall schedule shipments of animals to arrive at final destination between 7:00 a.m. and 4:00 p.m. No shipments shall be scheduled to arrive at final destination on Sunday and Federal holidays; unless prior approval has been obtained by the COR. Animals shall not be allowed to remain standing on trucks while not in transport for a combined period of greater than three (3) hours in any 24 hour period. Animals that are to be released back into the gather area may need to be transported back to the original gather site. This determination would be at the discretion of the COR/PI or Field Office Wild Horse & Burro Specialist.

**B. Gather Methods That May Be Used in the Performance of a Gather**

1. Gather attempts may be accomplished by utilizing bait (feed, water, mineral licks) to lure animals into a temporary gather site. If this gather method is selected, the following applies:

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

b. All trigger and/or trip gate devices must be approved by the COR/PI prior to gather of animals.

c. Gather sites shall be checked a minimum of once every 10 hours.

2. Gather attempts may be accomplished by utilizing a helicopter to drive animals into a temporary gather site. If the contractor selects this method the following applies:

a. A minimum of two saddle-horses shall be immediately available at the gather site to accomplish roping if necessary. Roping shall be done as determined by the COR/PI. Under no circumstances shall animals be tied down for more than one half hour.

b. The contractor shall assure that foals shall not be left behind, and orphaned.

3. Gather attempts may be accomplished by utilizing a helicopter to drive animals to ropers. If the contractor, with the approval of the COR/PI, selects this method the following applies:

a. Under no circumstances shall animals be tied down for more than one hour.

b. The contractor shall assure that foals shall not be left behind, or orphaned.

c. The rate of movement and distance the animals travel shall not exceed limitations set by the COR/PI who would consider terrain, physical barriers, weather, condition of the animals and other factors.

**C. Use of Motorized Equipment**

1. All motorized equipment employed in the transportation of gathered animals shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of animals. The Contractor shall provide the COR/PI, if requested, 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 gathered 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 gather 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 floor. Single deck tractor-trailers 40 feet or longer shall have at least two (2) partition gates providing at least three (3) compartments within the trailer to separate animals. Tractor-trailers less than 40 feet shall have at least one partition gate providing at least two (2) compartments within the trailer to separate the 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 a minimum 5 foot wide swinging gate. The use of double deck tractor-trailers is unacceptable and shall 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 all trailers must be strong enough so 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 COR/PI.

5. Floors of tractor-trailers, stock trailers and loading chutes shall be covered and maintained with wood shavings to prevent the animals from slipping as much as possible during transport.

6. Animals to be loaded and transported in any trailer shall be as directed by the COR/PI 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 per adult horse (1.4 linear foot in an 8 foot wide trailer);
    - 8 square feet per adult burro (1.0 linear foot in an 8 foot wide trailer);
    - 6 square feet per horse foal (0.75 linear feet in an 8 foot wide trailer);
    - 4 square feet per burro foal (0.5 linear feet in an 8 foot wide trailer).

7. The COR/PI shall consider the condition and size of the animals, weather conditions, distance to be transported, or other factors when planning for the movement of gathered animals. The COR/PI shall provide for any brand and/or inspection services required for the gathered animals.

8. If the COR/PI determines that dust conditions are such that the animals could be endangered during transportation, the Contractor would be instructed to adjust speed.

**D. Safety and Communications**

1. The Contractor shall have the means to communicate with the COR/PI and all contractor personnel engaged in the gather of wild horses utilizing a VHF/FM Transceiver or VHF/FM portable Two-Way radio. If communications are ineffective the government would 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 contracting officer or COR/PI violate contract rules, are unsafe or otherwise unsatisfactory. In this event, the Contractor would 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 Contracting Officer or his/her representative.

3. The Contractor shall obtain the necessary FCC licenses for the radio system

4. All accidents occurring during the performance of any task order shall be immediately reported to the COR/PI.

5. Should the contractor choose to utilize a helicopter the following would apply:

    a. The Contractor must operate in compliance with Federal Aviation Regulations, Part 91. Pilots provided by the Contractor shall comply with the Contractor's Federal Aviation Certificates, applicable regulations of the State in which the gather is located.

    b. Fueling operations shall not take place within 1,000 feet of animals.

**E. Site Clearances**

1. No personnel working at gather sites may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage or otherwise alter or deface any archaeological resource located on public lands or Indian lands.

2. Prior to setting up a gather site or temporary holding facility, BLM would conduct all necessary clearances (archaeological, T&E, etc.). All proposed site(s) must be inspected by a government archaeologist. Once archaeological clearance has been obtained, the gather site or temporary holding facility may be set up. Said clearance shall be arranged for by the COR, PI, or other BLM employees.

3. Gather sites and temporary holding facilities would not be constructed on wetlands or riparian zones.

**F. Animal Characteristics and Behavior**

Releases of wild horses would be near available water when possible. If the area is new to them, a short-term adjustment period may be required while the wild horses become familiar with the new area.

**G. 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 considerations would be to protect the health, safety and welfare of the animals being gathered and the personnel involved. The public must adhere to guidance from the on-site BLM representative. It is BLM policy that the public would not be allowed to come into direct contact with wild horses being held in BLM facilities. Only authorized BLM personnel or contractors may enter the corrals or directly handle the animals. The general public may not enter the corrals or directly handle the animals at any time or for any reason during BLM operations.

**H. Responsibility and Lines of Communication**

- Contracting Officer's Representative/Project Inspector: Melanie Mirati

- Contracting Officer's Representative/Project Inspector: Alan Shepherd

The Contracting Officer’s Representatives (CORs) and the project inspectors (PIs) have the direct responsibility to ensure the Contractor’s compliance with the contract stipulations. The Field Managers for the Humboldt River and Tuscarora Field Offices would take an active role to

ensure the appropriate lines of communication are established between the field, Field Office, District Office, State Office, National Program Office, and BLM Holding Facility offices. All employees involved in the gathering operations would keep the best interests of the animals at the forefront at all times.

All publicity, formal public contact and inquiries would be handled through the Field Manager and District Public Affairs Officer. These individuals would be the primary contact and would coordinate with the COR/PI on any inquiries.

The COR would coordinate with the contractor and the BLM Corrals to ensure animals are being transported from the gather site in a safe and humane manner and are arriving in good condition.

The contract specifications require humane treatment and care of the animals during removal operations. These specifications are designed to minimize the risk of injury and death during and after gather of the animals. The specifications would be vigorously enforced.

Should the Contractor show negligence and/or not perform according to contract stipulations, he would be issued written instructions, stop work orders, or defaulted.

# Appendix B. Owyhee Complex Wild Horse Observation Protocol

BLM recognizes and respects the right of interested members of the public and the press to observe wild horse gather operations. At the same time, BLM must ensure the health and safety of the public, BLM's employees and contractors, and America's wild horses. Accordingly, the BLM developed these rules to maximize the opportunity for reasonable public access to the gather while ensuring that BLM's health and safety responsibilities are fulfilled. Failure to maintain safe distances from operations at the gather and temporary holding sites could result in members of the public inadvertently getting in the path of the wild horses or gather personnel, thereby placing themselves and others at risk, or causing stress and potential injury to the wild horses. The BLM and the contractor's helicopter pilot must comply with 14 CFR Part 91 of the Federal Aviation Regulations, which determines the minimum safe altitudes and distance people must be from the aircraft. To be in compliance with these regulations, the viewing location at the gather site and holding corrals must be approximately 500 feet from the operating location of the helicopter at all times. The viewing locations may vary depending on topography, terrain and other factors.

**Daily Visitor Protocol**

- A Wild Horse Gather Information Phone Line would be set up prior to the gather so the public can call for daily updates on gather information and statistics. Visitors are strongly encouraged to check the phone line the evening before they plan to attend the gather to confirm the gather and their tour of it is indeed taking place the next day as scheduled (weather, mechanical issues or other things may affect this) and to confirm the meeting location.
- Visitors must direct their questions/comments to either their designated BLM representative or the BLM spokesperson on site, and not engage other BLM/contractor staff and disrupt their gather duties/responsibilities - professional and respectful behavior is expected of all. BLM may make the BLM staff available during down times for a Q&A session on public outreach and education days. However, the contractor and its staff would not be available to answer questions or interact with visitors.
- Observers must provide their own 4-wheel drive high clearance vehicle, appropriate shoes, winter clothing, food and water. Observers are prohibited from riding in government and contractor vehicles and equipment.
- Gather operations may be suspended if bad weather conditions create unsafe flying conditions.
- BLM would establish one or more observation areas, in the immediate area of the gather and holding sites, to which individuals would be directed. These areas would be placed so as to maximize the opportunity for public observation while providing for a safe and effective wild horse gather. The utilization of such observation areas is necessary due to the use and presence of heavy equipment and aircraft in the gather operation and the critical need to allow BLM personnel and contractors to fully focus on attending to the needs of the wild horses while maintaining a safe environment for all involved. In addition, observation areas

would be sited so as to protect the wild horses from being spooked, startled or impacted in a manner that results in increased stress.

- BLM would delineate observation areas with yellow caution tape (or a similar type of tape or ribbon).
- Visitors would be assigned to a specific BLM representative on public outreach and education days and must stay with that person at all times.
- Visitors are NOT permitted to walk around the gather site or temporary holding facility unaccompanied by their BLM representative.
- Observers are prohibited from climbing/trespassing onto or in the trucks, equipment or corrals, which is the private property of the contractor.
- When BLM is using a helicopter or other heavy equipment in close proximity to a designated observation area, members of the public may be asked to stay by their vehicle for some time before being directed to an observation area once the use of the helicopter or the heavy machinery is complete.
- When given the signal that the helicopter is close to the gather site bringing wild horses in, visitors must sit down in areas specified by BLM representatives and must not move or talk as the wild horses are guided into the corral.
- Individuals attempting to move outside a designated observation area would be requested to move back to the designated area or to leave the site. Failure to do so may result in citation or arrest. It is important to stay within the designated observation area to safely observe the wild horse gather.
- Observers would be polite, professional and respectful to BLM managers and staff and the contractor/employees. Visitors who do not cooperate and follow the rules would be escorted off the gather site by BLM law enforcement personnel, and would be prohibited from participating in any subsequent observation days.
- BLM reserves the right to alter these rules based on changes in circumstances that may pose a risk to health, public safety or the safety of wild horses (such as weather, lightening, wildfire, etc.).

**Public Outreach and Education Day**

- The media and public are welcome to attend the gather any day, and are encouraged to attend on public outreach and education days. On this day, BLM would have additional interpretive opportunities and staff available to answer questions.
- The number of public outreach and education days per week, and which days they are, would be determined prior to the gather and would be announced through a press release and on the website. Interested observers should RSVP ahead through the BLM-Winnemucca District Office number (TBD). A meeting place would be set for each public outreach and education day and the RSVP list notified. BLM representatives would escort observers on public outreach and education days to and from the gather site and temporary holding facility.

# Appendix C. Standard Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments

**22-Month Time-Release Pelleted Porcine Zona Pellucida (PZP) Vaccine:**
The following implementation and monitoring requirements are part of any Action Alternative which involves the use of PZP:

1. PZP vaccine would be administered only by trained BLM personnel or collaborating research partners.

2. The fertility control drug is administered with two separate injections: (1) a liquid dose of PZP is administered using an 18-gauge needle primarily by hand injection; (2) the pellets are preloaded into a 14-gauge needle. These are delivered using a modified syringe and jab-stick to inject the pellets into the gluteal muscles of the mares being returned to the range. The pellets are designed to release PZP over time similar to a time-release cold capsule.

3. Mares that have never been treated would receive 0.5 cc of PZP vaccine emulsified with 0.5 cc of Freund's Modified Adjuvant (FMA) and loaded into darts at the time a decision has been made to dart a specific mare. Mares identified for re-treatment receive 0.5 cc of the PZP vaccine emulsified with 0.5 cc of Freund's Incomplete Adjuvant (FIA).

4. Delivery of the vaccine would be by intramuscular injection into the gluteal muscles while the mare is restrained in a working chute. With each injection, the liquid or pellets would be injected into the left hind quarters of the mare, above the imaginary line that connects the point of the hip (hook bone) and the point of the buttocks (pin bone).

5. In the future, the vaccine may be administered remotely using an approved long range darting protocol and delivery system if or when that technology is developed.

6. All treated mares would be freeze-marked on the hip or neck HMA managers to positively identify the animals during the research project and at the time of removal during subsequent gathers.

**Monitoring and Tracking of Treatments:**
1. At a minimum, estimation of population growth rates using helicopter or fixed-wing surveys would be conducted before any subsequent gather. During these surveys it is not necessary to identify which foals were born to which mares; only an estimate of population growth is needed (i.e. # of foals to # of adults).

2. Population growth rates of herds selected for intensive monitoring would be estimated every year post-treatment using helicopter or fixed-wing surveys. During these surveys it is not necessary to identify which foals were born to which mares, only an estimate of population growth is needed (i.e. # of foals to # of adults). If, during routine HMA field monitoring (on-the-ground), data describing mare to foal ratios can be collected, these data should also be shared with the NPO for possible analysis by the USGS.

3. A PZP Application Data sheet would be used by field applicators to record all pertinent data relating to identification of the mare (including photographs if mares are not freeze-marked) and date of treatment. Each applicator would submit a PZP Application Report and accompanying narrative and data sheets would be forwarded to the NPO (Reno, Nevada). A copy of the form and data sheets and any photos taken would be maintained at the field office.

4. A tracking system would be maintained by NPO detailing the quantity of PZP issued, the quantity used, disposition of any unused PZP, the number of treated mares by HMA, field office, and State along with the freeze-mark(s) applied by HMA and date.

# Appendix D. Nevada Noxious Weed List

*Nevada Administrative Code (effective 10-31-05)*
555.10 1. The following weeds are designated noxious weeds:

DEFINITIONS

Category ”A”: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations

Category "B": Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur.

Category "C": Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer

| **Common Name** | **Scientific Name** |
|---|---|
| ***Category A Weeds:*** | |
| African Rue | *Peganum harmala* |
| Austrian fieldcress | *Rorippa austriaca* |
| Austrian peaweed | *Sphaerophysa salsula / Swainsona salsula* |
| Camelthorn | *Alhagi camelorum* |
| Common crupina | *Crupina vulgaris* |
| Dalmation Toadflax | *Linaria dalmatica* |
| Dyer’s woad | *Isatis tinctoria* |
| Eurasian water-milfoil | *Myriophyllum spicatum* |
| Giant Reed | *Arundo donax* |
| Giant Salvinia | *Salvinia molesta* |
| Goats rue | *Galega officinalis* |
| Houndstongue | *Cynoglossum officinale* |
| Hydrilla | *Hydrilla verticillata* |
| Iberian Star thistle | *Centaurea iberica* |
| Klamath weed | *Hypericum perforatum* |
| Leafy spurge | *Euphorbia esula* |
| Malta Star thistle | *Centaurea melitensis* |
| Mayweed chamomile | *Anthemis cotula* |
| Mediterranean sage | *Salvia aethiopis* |
| Purple loosestrife | *Lythrum salicaria, L.virgatum* and their cultivars |
| Purple Star thistle | *Centaurea calcitrapa* |
| Rush skeletonweed | *Chondrilla juncea* |
| Sow Thistle | *Sonchus arvensis* |
| Spotted Knapweed | *Centaurea masculosa* |

| | |
|---|---|
| Squarrose star thistle | *Centaurea virgata Lam. Var. squarrose* |
| Sulfur cinquefoil | *Potentilla recta* |
| Syrian Bean Caper | *Zygophyllum fabago* |
| Yellow Starthistle | *Centaurea solstiltialis* |
| Yellow Toadflax | *Linaria vulgaris* |

***Category B Weeds:***

| | |
|---|---|
| Carolina Horse-nettle | *Solanum carolinense* |
| Diffuse Knapweed | *Centaurea diffusa* |
| Medusahead | *Taeniatherum caput-medusae* |
| Musk Thistle | *Carduus nutans* |
| Russian Knapweed | *Acroptilon repens* |
| Sahara Mustard | *Brassica tournefortii* |
| Scotch Thistle | *Onopordum acanthium* |
| White Horse-nettle | *Solanum elaeagnifolium* |

***Category C Weeds:***

| | |
|---|---|
| Black henbane | *Hyoscyamus niger* |
| Canada Thistle | *Cirsium arvense* |
| Green Fountain grass | *Pennisetum setaceum* |
| Hoary cress | *Cardaria draba* |
| Johnson grass | *Sorghum halepense* |
| Perennial pepperweed | *Lepidium latifolium* |
| Poison Hemlock | *Conium maculatum* |
| Puncture vine | *Tribulus terrestris* |
| Salt cedar (tamarisk) | *Tamarix spp* |
| Water Hemlock | *Cicuta maculata* |

# Appendix E. Owyhee Complex Population Modeling

To complete the population modeling for the Owyhee Complex, version 1.40 of the WinEquus program, created April 2, 2002, was utilized.

**Objectives of Population Modeling**

Review of the data output for each of the simulations provided many useful comparisons of the possible outcomes for each alternative. Some of the questions that need to be answered through the modeling include:

- Do any of the Alternatives "crash" the population?
- What effect does fertility control have on population growth rate?
- What effects do the different alternatives have on the average population size?
- What effects do the different alternatives have on the genetic health of the herd?

**Population Data, Criteria, and Parameters utilized for Population Modeling**

All simulations used the survival probabilities, foaling rates, and sex ratio at birth that was supplied with the WinEquus population model for the Garfield HMA.

Sex ratio at Birth:
58% Males
42% Females

The following percent effectiveness of fertility control was utilized in the population modeling:

Year 1: 94%, Year 2: 82%, Year 3: 68%

The following table displays the contraception parameters utilized in the population model:

Contraception Criteria (Alternative I):

| Age | Percentages for Fertility Treatment |
|---|---|
| Foal | 0% |
| 1 | 100% |
| 2 | 100% |
| 3 | 100% |
| 4 | 100% |
| 5 | 100% |
| 6 | 100% |

| Age | Percentages for Fertility Treatment |
|---|---|
| 7 | 100% |
| 8 | 100% |
| 9 | 100% |
| 10-14 | 100% |
| 15-19 | 100% |
| 20+ | 100% |

**Population Modeling Criteria**

The following summarizes the population modeling criteria that are common to all Action Alternatives:

- Starting Year: 2012
- Initial gather year: 2012
- Gather interval: regular interval of three years
- Gather for fertility treatment regardless of population size: No
- Continue to gather after reduction to treat females: Yes
- Sex ratio at birth: 58% males
- Percent of the population that can be gathered: 80%
- Minimum age for long term holding facility horses: Not Applicable
- Foals are not included in the AML
- Simulations were run for 10 years with 100 trials each

The following table displays the population modeling parameters utilized in the model:

Population Modeling Parameters:

| Modeling Parameter | Alternative A | Alternative B | Alternative C. | Alternative D |
|---|---|---|---|---|
| Management by removal, 60:40 adjustment in sex ratio, and fertility control | Yes | Yes | No | N/A |
| Management by removal only | No | No | Yes | N/A |
| Threshold Population Size following Gathers | 999 | 999 | 999 | N/A |
| Target Population Size Following Gathers | 621 | 621 | 621 | N/A |
| Gather for fertility control regardless of population size | No | No | No | N/A |
| Gathers continue after removals to treat additional females | Yes | Yes | No | N/A |
| Effectiveness of Fertility Control: year 1 | 94% | 94% | N/A | N/A |
| Effectiveness of Fertility Control: year 2 | 82% | 82% | N/A | N/A |
| Effectiveness of Fertility Control: year 3 | 68% | 68% | N/A | N/A |

**Results of WinEquus Population Modeling**

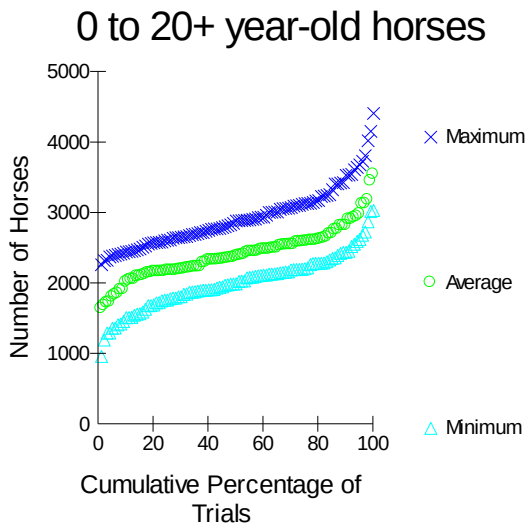
Population modeling was completed for the proposed action and the alternatives. One hundred trials were run, simulating population growth and herd demographics to determine the projected herd structure. The computer program used simulates the population dynamics of wild horses. It was written by Dr. Stephen H. Jenkins, Department of Biology, University of Nevada, Reno,

under a contract from the National Wild Horse and Burro Program of the Bureau of Land Management and is designed for use in comparing various management strategies for wild horses.

To date, one herd has been studied using the 2-year PZP vaccine. The Clan Alpine study, in Nevada, was started in January 2000 with the treatment of 96 mares. The test resulted in fertility rates in treated mares of 6% year one and 18% year two.

**Results – Alternative A – Phased-in Gather and Fertility Control and 60% Male Sex Ratio**

Population Size:




Population Sizes in 11 Years*

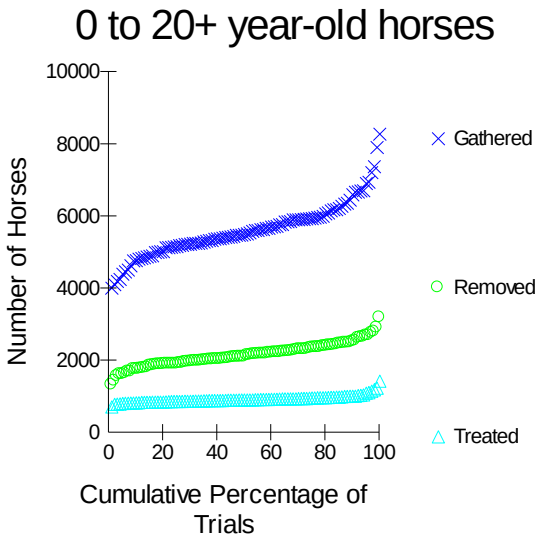
| | Minimum | Average | Maximum |
|---|---|---|---|
| Lowest Trial | 967 | 1642 | 2268 |
| 10th Percentile | 1518 | 2031 | 2453 |
| 25th Percentile | 1776 | 2183 | 2620 |
| Median Trial | 2014 | 2390 | 2891 |
| 75th Percentile | 2217 | 2598 | 3140 |
| 90th Percentile | 2453 | 2865 | 3540 |
| Highest Trial | 3038 | 3547 | 4416 |

* 0 to 20+ year-old horses

*Explanation*

In 11 years and 100 trials, the lowest number of 0 to 20+ year old horses ever obtained was 967 and the highest was 4,416. In half the trials, the minimum population size in 11 years was less than 2,014 and the maximum was less than 2,891. The average population size across 11 years ranged from 1,642 to 3,547.

Gathers:

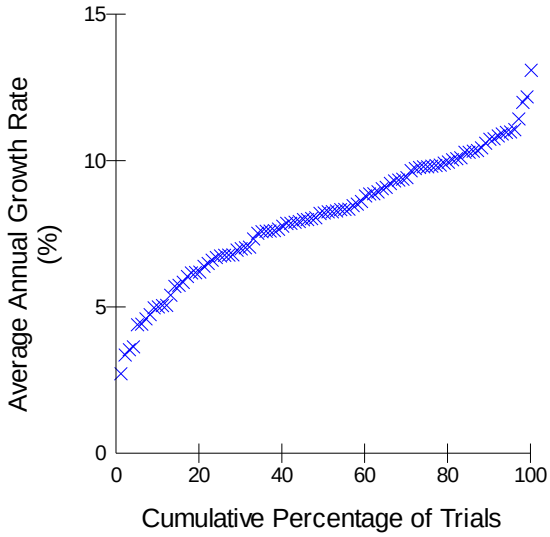



Totals in 11 Years*

| | Gathered | Removed | Treated |
|---|---|---|---|
| Lowest Trial | 4017 | 1329 | 725 |
| 10th Percentile | 4802 | 1766 | 837 |
| 25th Percentile | 5183 | 1920 | 873 |
| Median Trial | 5516 | 2126 | 915 |
| 75th Percentile | 5954 | 2363 | 969 |
| 90th Percentile | 6641 | 2541 | 1020 |
| Highest Trial | 8290 | 3194 | 1436 |

* 0 to 20+ year-old horses

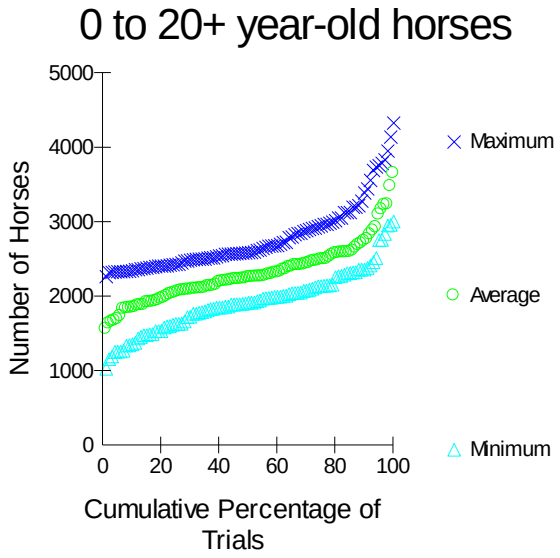
Growth Rate:




| Average Growth Rate in 10 Years | |
|---|---|
| Lowest Trial | 2.7% |
| 10th Percentile | 5.1% |
| 25th Percentile | 6.8% |
| Median Trial | 8.3% |
| 75th Percentile | 9.8% |
| 90th Percentile | 10.8% |
| Highest Trial | 13.1% |

**Results –Alternative B – Selective Removal to AML (621 horses), Fertility Control and 60% Male Sex Ratio**

Population Size:




Population Sizes in 11 Years*

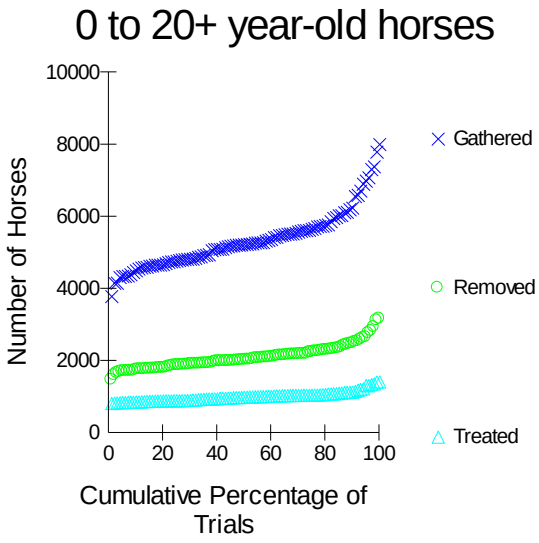
| | Minimum | Average | Maximum |
|---|---|---|---|
| Lowest Trial | 1035 | 1563 | 2273 |
| 10th Percentile | 1372 | 1854 | 2358 |
| 25th Percentile | 1636 | 2061 | 2436 |
| Median Trial | 1920 | 2259 | 2595 |
| 75th Percentile | 2145 | 2498 | 2964 |
| 90th Percentile | 2378 | 2757 | 3423 |
| Highest Trial | 3010 | 3658 | 4336 |

* 0 to 20+ year-old horses

*Explanation*

In 11 years and 100 trials, the lowest number of 0 to 20+ year old horses ever obtained was 1,035 and the highest was 4,336. In half the trials, the minimum population size in 11 years was less than 1,920 and the maximum was less than 2,595. The average population size across 11 years ranged from 1,563 to 3,658.

Gathers:

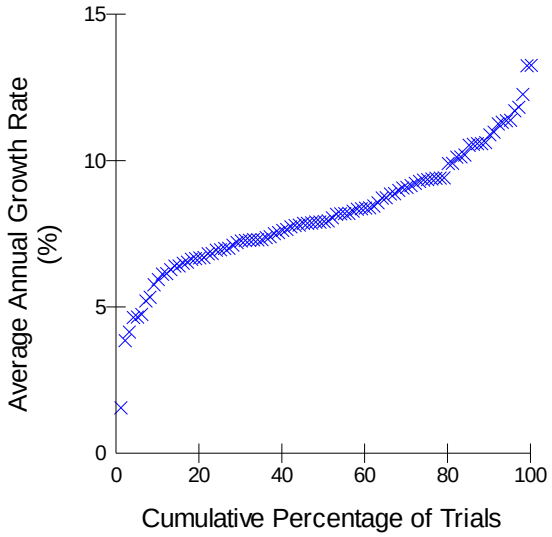



Totals in 11 Years*

| | Gathered | Removed | Treated |
|---|---|---|---|
| Lowest Trial | 3792 | 1473 | 827 |
| 10th Percentile | 4534 | 1758 | 866 |
| 25th Percentile | 4785 | 1877 | 902 |
| Median Trial | 5234 | 2026 | 1000 |
| 75th Percentile | 5670 | 2250 | 1058 |
| 90th Percentile | 6406 | 2502 | 1149 |
| Highest Trial | 8007 | 3167 | 1427 |

* 0 to 20+ year-old horses

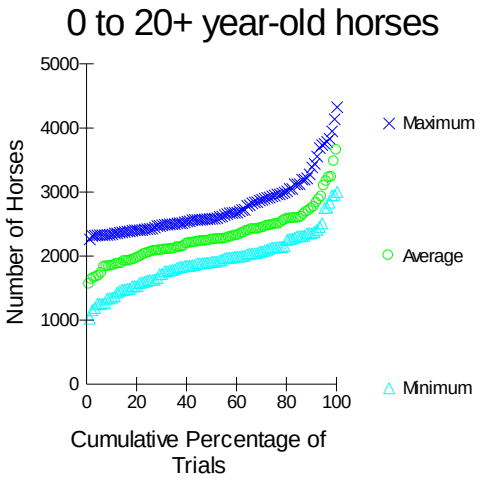
Growth Rate:




| Average Growth Rate in 10 Years | |
|---|---|
| Lowest Trial | 1.6% |
| 10th Percentile | 6.1% |
| 25th Percentile | 7.0% |
| Median Trial | 8.0% |
| 75th Percentile | 9.4% |
| 90th Percentile | 11.0% |
| Highest Trial | 13.3% |

**Results –Alternative C – Removal to Low AML (621 horses) without 60% Male Sex Ratio or Fertility Control**

Population Size:




Population Sizes in 11 Years*

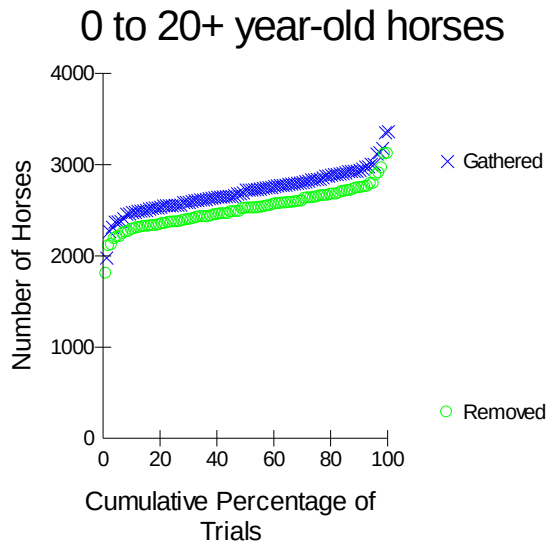
| | Minimum | Average | Maximum |
|---|---|---|---|
| Lowest Trial | 646 | 1146 | 2276 |
| 10th Percentile | 756 | 1210 | 2310 |
| 25th Percentile | 789 | 1227 | 2364 |
| Median Trial | 843 | 1254 | 2435 |
| 75th Percentile | 887 | 1292 | 2598 |
| 90th Percentile | 908 | 1325 | 2698 |
| Highest Trial | 962 | 1384 | 3191 |

* 0 to 20+ year-old horses

*Explanation*

In 11 years and 100 trials, the lowest number of 0 to 20+ year-old horses ever obtained was 646 and the highest was 3,191. In half the trials, the minimum population size in 11 years was less than 843 and the maximum was less than 2,435. The average population size across 11 years ranged from 1,146 to 1,384.

Gathers:

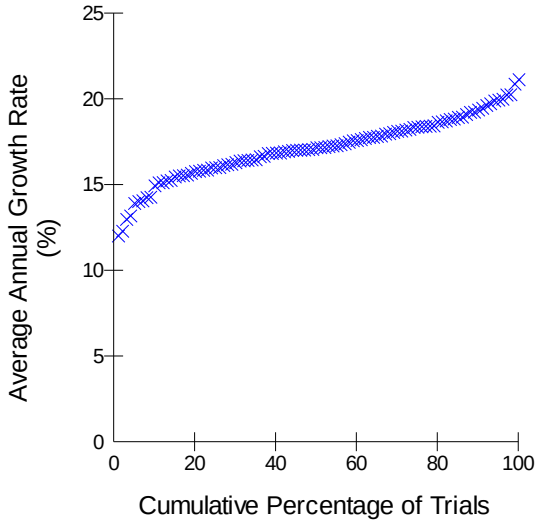



Totals in 11 Years*

| | Gathered | Removed | Treated |
|---|---|---|---|
| Lowest Trial | 1986 | 1808 | N/A |
| 10th Percentile | 2486 | 2292 | N/A |
| 25th Percentile | 2565 | 2372 | N/A |
| Median Trial | 2730 | 2521 | N/A |
| 75th Percentile | 2848 | 2648 | N/A |
| 90th Percentile | 2954 | 2747 | N/A |
| Highest Trial | 3371 | 3120 | N/A |

* 0 to 20+ year-old horses

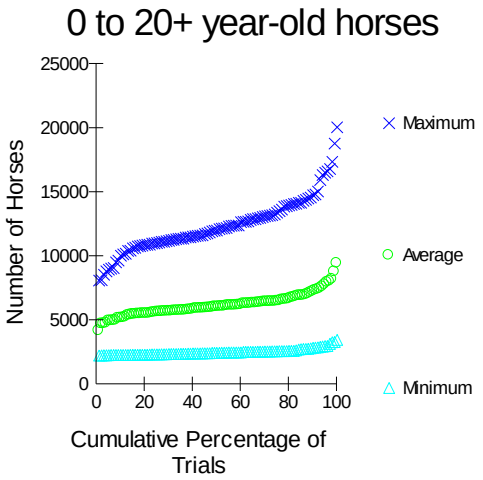
Growth Rate:




| Average Growth Rate in 10 Years | |
|---|---|
| Lowest Trial | 12.1% |
| 10th Percentile | 15.1% |
| 25th Percentile | 16.0% |
| Median Trial | 17.2% |
| 75th Percentile | 18.4% |
| 90th Percentile | 19.4% |
| Highest Trial | 21.2% |

**Results – Alternative D - No Action Alternative**

Population Size:




Population Sizes in 11 Years*

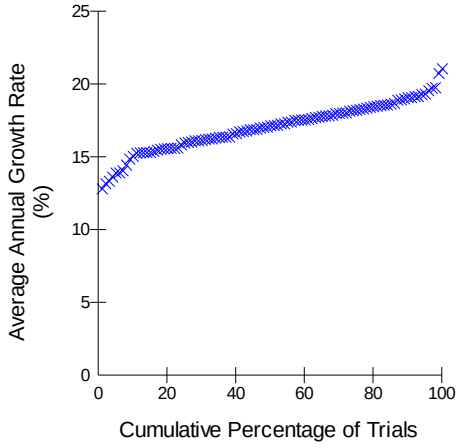
| | Minimum | Average | Maximum |
|---|---|---|---|
| Lowest Trial | 2258 | 4176 | 8117 |
| 10th Percentile | 2304 | 5172 | 10111 |
| 25th Percentile | 2353 | 5648 | 11073 |
| Median Trial | 2468 | 6055 | 12086 |
| 75th Percentile | 2599 | 6497 | 13478 |
| 90th Percentile | 2872 | 7289 | 14815 |
| Highest Trial | 3489 | 9435 | 20082 |

* 0 to 20+ year-old horses

*Explanation*

In 11 years and 100 trials, the lowest number of 0 to20+ year-old horses ever obtained was 2,258 and the highest was 20,080. In half the trials, the minimum population size in 11 years was less than 2,468 and the maximum was less than 12,086. The average population size across 11 years ranged from 4,176 to 9,435.

Growth Rate:




| Average Growth Rate in 10 Years | |
|---|---|
| Lowest Trial | 12.8% |
| 10th Percentile | 15.2% |
| 25th Percentile | 16.0% |
| Median Trial | 17.2% |
| 75th Percentile | 18.3% |
| 90th Percentile | 19.1% |
| Highest Trial | 21.1% |

# Appendix F. Wildlife Species List – North-central Nevada

This list is a combination of wildlife sight record data and NDOW's best effort to predict what wildlife species live within Elko, Humboldt, Lander, and Eureka Counties – NDOW Hunt Units 051, 066, 067, 068 – in all seasons and under optimum habitat conditions.

With the exception of the European Starling, House Sparrow, Eurasian Collared-Dove, Ringed Turtle-Dove and Rock Dove, all birds are protected in Nevada by either the International Migratory Bird Treaty Act, Endangered Species Act or as game species. Several mammal, reptile and amphibian species are also protected as either game, sensitive, threatened or priority species.

Habitats- (Sagebrush Steppe, Mountain Brush, Subalpine deciduous forest and Wetland / Riparian/ Lake Habitats)

L.E. = Locally Extirpated

Updated: 5/2009 - Peter V. Bradley - Nevada Department of Wildlife - Elko, Nevada.

## *Birds*

### Order: *Gaviiformes* (Diver/Swimmers)

**Family: *Gaviidae* (Loons)**

| | |
|---|---|
| Common Loon | *Gavia immer* |

### Order: *Podicipediformes* (Flat-toed Divers)

**Family: *Podicipedidae* (Grebes)**

| | |
|---|---|
| Pied-billed Grebe | *Podilymbus podiceps* |
| Horned Grebe | *Podiceps auritus* |
| Eared Grebe | *Podiceps nigricollis* |
| Western Grebe | *Aechmophorus occidentalis* |
| Clark's Grebe | *Aechmophorus clarkii* |

### Order: *Pelecaniformes* (Four-toed Fisheaters)

**Family: *Pelecanidae* (Pelicans)**

| | |
|---|---|
| American White Pelican | *Pelecanus erythrorhynchos* |

**Family: *Phalacrocoracidae* (Cormorants)**

| | |
|---|---|
| Double-crested Cormorant | *Phalacrocorax auritus* |

### Order: *Ciconiiformes* (Long-legged Waders)

**Family: *Ardeidae* (Bitterns, Herons, Egrets)**

| | |
|---|---|
| American Bittern | *Botaurus lentiginosus* |
| Least Bittern | *Ixobrychus exilis* |
| Great Blue Heron | *Ardea herodias* |
| Great Egret | *Ardea alba* |
| Snowy Egret | *Egretta thula* |
| Cattle Egret | *Bubulcus ibis* |
| Green Heron | *Butorides virescens* |
| Black-crowned Night Heron | *Nycticorax nycticorax* |

**Family: *Threskiornithidae* (Ibises)**

| | |
|---|---|
| White-faced Ibis | *Plegadis chihi* |

**Family: *Cathartidae* (New World Vultures)**

| | |
|---|---|
| Turkey Vulture | *Cathartes aura* |
| California Condor | *Gymnogyps californianus(L.E.)* |

## Order: *Anseriformes* (Waterfowl)

### Family: *Anatidae* (Ducks, Geese, Swans)

| | |
|---|---|
| Greater White-fronted Goose | *Anser albifrons* |
| Snow Goose | *Chen caerulescens* |
| Canada Goose | *Branta canadensis* |
| Tundra Swan | *Cygnus columbianus* |
| Wood Duck | *Aix sponsa* |
| Gadwall | *Anas strepera* |
| American Wigeon | *Anas americana* |
| Eurasian Wigeon | *Anas penelope* |
| Mallard | *Anas platyrhynchos* |
| Blue-winged Teal | *Anas discors* |
| Cinnamon Teal | *Anas cyanoptera* |
| Northern Shoveler | *Anas clypeata* |
| Northern Pintail | *Anas acuta* |
| Green-winged Teal | *Anas crecca* |
| Canvasback | *Aythya valisinaria* |
| Redhead | *Aythya americana* |
| Ring-necked Duck | *Aythya collaris* |
| Greater Scaup | *Aythya marila* |
| Lesser Scaup | *Aythya affinis* |
| Long-tailed Duck | *Clangula hyemalis* |
| Bufflehead | *Bucephala albeola* |
| Common Goldeneye | *Bucephala clangula* |
| Barrow's Goldeneye | *Bucephala islandica* |
| Hooded Merganser | *Lophodytes cucullatus* |
| Common Merganser | *Mergus merganser* |
| Red-breasted Merganser | *Mergus serrator* |
| Ruddy Duck | *Oxyura jamaicensis* |

## Order: *Falconiformes* (Diurnal Flesh Eaters)

### Family: *Accipitridae* (Hawks, Eagles, Osprey)

| | |
|---|---|
| Osprey | *Pandion haliaetus* |
| Bald Eagle | *Haliaetus leucocephalus* |
| Northern Harrier | *Circus cyaneus* |
| Sharp-shinned Hawk | *Accipiter striatus* |
| Cooper's Hawk | *Accipiter cooperii* |
| Northern Goshawk | *Accipiter gentilis* |
| Red-shouldered Hawk | *Buteo lineatus* |
| Broad-winged Hawk | *Buteo platypterus* |
| Swainson's Hawk | *Buteo swainsoni* |
| Red-tailed Hawk | *Buteo jamaicensis* |
| Ferruginous Hawk | *Buteo regalis* |
| Rough-legged Hawk | *Buteo lagopus* |
| Golden Eagle | *Aquila chrysaetos* |

### Family: *Falconidae* (Falcons)

| | |
|---|---|
| American Kestrel | *Falco sparverius* |
| Merlin | *Falco columbarius* |
| Gyrfalcon | *Falco rusticolus* |
| Peregrine Falcon | *Falco perigrinus* |
| Prairie Falcon | *Falco mexicanus* |

## Order: *Galliformes* (Chicken Relatives)

### Family: *Phasianidae* (Grouse, Partridge)

| | |
|---|---|
| Chukar | *Alectoris chukar* |
| Gray Partridge | *Perdix perdix* |
| Ring-necked Pheasant | *Phasianus colchicus* |
| Ruffed Grouse | *Bonasa umbellus* |
| Greater Sage-Grouse | *Centrocercus urophasianus* |
| C. Sharp-tailed Grouse | *Tympanuchus phasianellus col. (L.E.)* |

### Family: *Odontophoridae* (New World Quail)

| | |
|---|---|
| California Quail | *Callipepla californica* |
| Mountain Quail | *Oreortyx pictus* |

## Order: *Gruiformes* (Cranes and Allies)

### Family: *Rallidae* (Rails, Coots)

| | |
|---|---|
| Virginia Rail | *Rallus limicola* |
| Sora | *Porzana carolina* |
| Common Moorhen | *Gallinula chloropus* |
| American Coot | *Fulica americana* |

### Family: *Gruidae* (Cranes)

| | |
|---|---|
| Greater Sandhill Crane | *Grus canadansis tabida* |

## Order: *Charadriiformes* (Wading Birds)

### Family: *Charadriidae* (Plovers)

| | |
|---|---|
| Black-bellied Plover | *Pluvialis squatarola* |
| Snowy Plover | *Charadrius alexandrinus* |
| Semi-palmated Plover | *Charadrius semipalmatus* |
| Killdeer | *Charadrius vociferus* |
| Mountain Plover | *Charadrius montanus* |

### Family: *Recurvirostridae* (Avocets)

| | |
|---|---|
| Black-necked Stilt | *Himantopus mexicanus* |
| American Avocet | *Recurvirostra americana* |

### Family: *Scolopacidae* (Sandpipers, Phalaropes)

| | |
|---|---|
| Greater Yellowlegs | *Tringa melanoleuca* |
| Lesser Yellowlegs | *Tringa flavipes* |
| Solitary Sandpiper | *Tringa solitaria* |
| Willet | *Catoptrophorus semipalmatus* |
| Spotted Sandpiper | *Actitus macularia* |
| Long-billed Curlew | *Numenius americanus* |
| Marbled Godwit | *Limosa fedoa* |
| Western Sandpiper | *Calidris mauri* |
| Least Sandpiper | *Calidris minutilla* |
| Long-billed Dowitcher | *Limnodromnus scolopaceus* |
| Wilson's Snipe | *Gallinago gallinago* |
| Wilson's Phalarope | *Phalaropus tricolor* |
| Red-necked Phalarope | *Phalaropus lobatus* |

**Family: *Laridae* (Gulls, Terns)**

| | |
|---|---|
| Franklin's Gull | *Larus pipixcan* |
| Bonaparte's Gull | *Larus philadelphia* |
| Ring-billed Gull | *Larus delawarensis* |
| California Gull | *Larus californicus* |
| Herring Gull | *Larus argentatus* |
| Caspian Tern | *Sterna caspia* |
| Forster's Tern | *Sterna forsteri* |

## Order: *Columbiformes* (Pigeons and Allies)

**Family: *Columbidae* (Doves)**

| | |
|---|---|
| Rock Dove | *Columba livia* |
| White-winged Dove | *Zenaida asiatica* |
| Mourning Dove | *Zenaida macroura* |
| Eurasian Collared-Dove | *Streptopelia decaocto* |
| Ringed Turtle-Dove | *Streptopelia risoria* |

## Order: *Cuculiformes* (Cuckoos and Allies)

**Family: *Cuculidae* (Cuckoos andRoadrunners)**

| | |
|---|---|
| Yellow-billed Cuckoo | *Coccyzus americanus (L.E.)* |

## Order: *Strigiformes* (Nocturnal Flesh Eaters)

**Family: *Tytonidae* (Barn Owls)**

| | |
|---|---|
| Barn Owl | *Tyto alba* |

**Family: *Strigidae* (Owls)**

| | |
|---|---|
| Flammulated Owl | *Otus flammeolus* |
| Western Screech-Owl | *Otus kennicottii* |
| Great Horned Owl | *Bubo virginianus* |
| Snowy Owl | *Nyctea scandiaca* |
| Northern Pygmy-Owl | *Glaucidium gnoma* |
| Burrowing Owl | *Athene cunicularia* |
| Long-eared Owl | *Asio otus* |
| Short-eared Owl | *Asio flammeus* |
| Northern Saw-whet Owl | *Aegolius acadicus* |

## Order: *Caprimulgiformes* (Night Jars)

**Family: *Caprimulgidae* (Goatsuckers)**

| | |
|---|---|
| Common Nighthawk | *Chordeiles minor* |
| Common Poorwill | *Phalaenoptilus nuttallii* |

## Order: *Apodiformes* (Small Fast Fliers)

**Family: *Apodidae* (Swifts)**

| | |
|---|---|
| White-throated Swift | *Aeronautes saxatalis* |

**Family: *Trochilidae* (Hummingbirds)**

| | |
|---|---|
| Black-chinned Hummingbird | *Archilochus alexandri* |
| Calliope Hummingbird | *Stellula calliope* |
| Broad-tailed Hummingbird | *Selasphorus platycercus* |
| Rufous Hummingbird | *Selasphorus rufus* |

## Order: *Coraciiformes* (Cavity Nesters)

**Family: *Alcedinidae* (Kingfishers)**

| | |
|---|---|
| Belted Kingfisher | *Ceryle alcyon* |

## Order: *Piciformes* (Cavity Builders)

**Family: *Picidae* (Woodpeckers)**

| | |
|---|---|
| Lewis' Woodpecker | *Melanerpes lewis* |
| Red-naped Sapsucker | *Sphyrapicus nuchalis* |
| Downy Woodpecker | *Picoides pubescens* |
| Hairy Woodpecker | *Picoides villosus* |
| Northern Flicker | *Colaptes auratus* |

## Order: *Passeriformes* (Perching Birds)

**Family: *Tyrannidae* (Flycatchers)**

| | |
|---|---|
| Western Wood-Pewee | *Contopus sordidulus* |
| Willow Flycatcher | *Epidonax traillii* |
| Hammond's Flycatcher | *Epidonax hammondii* |
| Gray Flycatcher | *Epidonax wrightii* |
| Dusky Flycatcher | *Epidonax oberholseri* |
| Cordilleran Flycatcher | *Epidonax occidentalis* |
| Say's Phoebe | *Sayornis saya* |
| Ash-throated Flycatcher | *Myiarchus cinerascens* |
| Western Kingbird | *Tyrannus verticalis* |
| Eastern Kingbird | *Tyrannus tyrannus* |

**Family: *Laniidae* (Shrikes)**

| | |
|---|---|
| Loggerhead Shrike | *Lanius ludovicianus* |
| Northern Shrike | *Lanius excubitor* |

**Family: *Vireonidae* (Vireos)**

| | |
|---|---|
| Plumbeous Vireo | *Vireo plumbeus* |
| Warbling Vireo | *Vireo gilvus* |

**Family: *Corvidae* (Jays)**

| | |
|---|---|
| Western Scrub-Jay | *Aphelocoma californica* |
| Clark's Nutcracker | *Nucifraga columbiana* |
| Black-billed Magpie | *Pica pica* |
| American Crow | *Corvus brachyrhynchos* |
| Common Raven | *Corvus corax* |

**Family: *Alaudidae* (Larks)**

| | |
|---|---|
| Horned Lark | *Eremophila alpestris* |

**Family: *Hirundinidae* (Swallows)**

| | |
|---|---|
| Tree Swallow | *Tachycineta bicolor* |
| Violet-green Swallow | *Tachycineta thalassina* |
| Bank Swallow | *Riparia riparia* |
| N. Rough-winged Swallow | *Stelgidopteryx serripennis* |
| Cliff Swallow | *Petrochelidon pyrrhonota* |
| Barn Swallow | *Hirundo rustica* |

**Family: *Paridae* (Chickadees, Titmice)**

| | |
|---|---|
| Black-capped Chickadee | *Poecile atricapillus* |
| Mountain Chickadee | *Poecile gambeli* |

**Family: *Aegithalidae* (Bushtits)**

| | |
|---|---|
| Bushtit | *Psaltriparus minimus* |

**Family: *Troglodytidae* (Wrens)**

| | |
|---|---|
| Rock Wren | *Salpinctes obsoletus* |
| Canyon Wren | *Catherpes mexicanus* |
| Bewick's Wren | *Thyromanes bewickii* |
| House Wren | *Troglodytes aedon* |
| Winter Wren | *Troglodytes troglodytes* |
| Marsh Wren | *Cistothorus palustris* |

**Family: *Cinclidae* (Dippers)**

| | |
|---|---|
| American Dipper | *Cinclus mexicanus* |

**Family: *Turdidae* (Thrushes)**

| | |
|---|---|
| Western Bluebird | *Sialia mexicana* |
| Mountain Bluebird | *Sialia currucoides* |
| Townsend's Solitaire | *Myadestes townsendi* |
| Swainson's Thrush | *Catharus ustulatus* |
| Hermit Thrush | *Catharus guttatus* |
| American Robin | *Turdus migratorius* |
| Varied Thrush | *Ixoreus naevius* |

**Family: *Mimidae* (Thrashers, Mockingbirds)**

| | |
|---|---|
| Northern Mockingbird | *Mimus polyglottos* |
| Sage Thrasher | *Oreoscoptes montanus* |

**Family: *Sturnidae* (Starlings)**

| | |
|---|---|
| European Starling | *Sturnus vulgaris* |

**Family: *Motacillidae* (Pipits)**

| | |
|---|---|
| American Pipit | *Anthus rubescens* |

**Family: *Bombycillidae* (Waxwings)**

| | |
|---|---|
| Bohemian Waxwing | *Bombycilla garrulus* |
| Cedar Waxwing | *Bombycilla cedrorum* |

**Family: *Parulidae* (Wood Warblers)**

| | |
|---|---|
| Orange-crowned Warbler | *Vermivora celata* |
| Nashville Warbler | *Vermivora ruficapilla* |
| Virginia's Warbler | *Vermivora virginae* |
| Yellow Warbler | *Dendroica petechia* |
| Yellow-rumped Warbler | *Dendroica coronata* |
| MacGillivray's Warbler | *Oporornis tolmiei* |
| Common Yellowthroat | *Geothlypis trichas* |
| Wilson's Warbler | *Wilsonia pusilla* |
| Yellow-breasted Chat | *Icteria virens* |

**Family: *Thraupidae* (Tanagers)**

| | |
|---|---|
| Western Tanager | *Piranga ludoviciana* |

**Family: *Emberizidae* (Sparrows, Towhees, Juncos)**

| | |
|---|---|
| Green-tailed Towhee | *Pipilo chlorurus* |
| Spotted Towhee | *Pipilo maculatus* |
| American Tree Sparrow | *Spizella arborea* |
| Chipping Sparrow | *Spizella passerina* |
| Brewer's Sparrow | *Spizella breweri* |
| Vesper Sparrow | *Pooecetes gramineus* |
| Lark Sparrow | *Chondestes grammacus* |
| Sage Sparrow | *Amphispiza belli* |
| Savannah Sparrow | *Passerculus sandwichensis* |
| Grasshopper Sparrow | *Ammodramus bairdii* |
| Fox Sparrow | *Passerella iliaca schistacea* |
| Song Sparrow | *Melospiza melodia* |
| Lincoln's Sparrow | *Melospiza lincolnii* |
| White-throated Sparrow | *Zonotrichia albicollis* |
| Harris' Sparrow | *Zonotrichia querula* |
| Gambel'sWhite-crownedSparrow | *Zonotrichia leucophrys gambelii* |
| Mountain W-crowned Sparrow | *Zonotrichia leucophrys oriantha* |
| Golden-crowned Sparrow | *Zonotrichia atricapilla* |
| Dark-eyed Junco*(Oregon)* | *Junco hyemalis therburi* |
| Dark-eyed Junco(*Gray-headed*) | *Junco hyemalis caniceps* |
| Lapland Longspur | *Calcarius lapponicus* |

**Family: *Cardinalidae* (Grosbeaks, Buntings)**

| | |
|---|---|
| Black-headed Grosbeak | *Pheucticus melanocephalus* |
| Lazuli Bunting | *Passerina amoena* |
| Indigo Bunting | *Passerina cyanea* |

**Family: *Icteridae* (Blackbirds, Orioles)**

| | |
|---|---|
| Bobolink | *Dolichonyx oryzivorus* |
| Red-winged Blackbird | *Agelaius phoeniceus* |
| Western Meadowlark | *Sturnella neglecta* |
| Yellow-headed Blackbird | *Xanthocephalus xanthocephalus* |
| Brewer's Blackbird | *Euphagus cyanocephalus* |
| Great-tailed Grackle | *Quiscalus mexicanus* |
| Brown-headed Cowbird | *Molothrus ater* |
| Bullock's Oriole | *Icterus bullockii* |

**Family: *Fringillidae* (Finches, Grosbeaks)**

| | |
|---|---|
| Gray-crowned Rosy-Finch | *Leucosticte tephrocotis* |
| Black Rosy-Finch | *Leucosticte atrata* |
| Cassin's Finch | *Carpodacus cassinii* |
| House Finch | *Carpodacus mexicanus* |
| Common Redpoll | *Carduelis flammea* |
| Pine Siskin | *Carduelis pinus* |
| Lesser Goldfinch | *Carduelis psaltria* |
| American Goldfinch | *Carduelis tristis* |
| Evening Grosbeak | *Coccothraustes vespertinus* |

**Family: *Passeridae* (Old World Sparrows)**

| | |
|---|---|
| House Sparrow | *Passer domesticus* |

## *Mammals*

### Order: *Insectivora* (Insect Eaters)

#### Family: *Soricidae* (Shrews)

| | |
|---|---|
| Merriam's Shrew | *Sorex meriammi* |
| Dusky Shrew | *Sorex monticolus* |
| Vagrant Shrew | *Sorex vagrans* |
| Northern Water Shrew | *Sorex palustris* |
| Preble's Shrew | *Sorex preblei* |

### Order: *Chiroptera* (Bats)

#### Family: *Vespertilionidae* (Plainnose Bats)

| | |
|---|---|
| California Myotis | *Myotis californicus* |
| Western Small-footed Myotis | *Myotis ciliolabrum* |
| Long-eared Myotis | *Myotis evotis* |
| Little Brown Bat | *Myotis lucifugus* |
| Fringed Myotis | *Myotis thysanodes* |
| Long-legged Myotis | *Myotis volans* |
| Yuma Myotis | *Myotis yumanensis* |
| Western Red Bat | *Lasiurus blossvellii* |
| Hoary Bat | *Lasiurus cinereus* |
| Silver-haired Bat | *Lasionycteris noctivagans* |
| Western Pipistrelle | *Pipistrellus hesperus* |
| Big Brown Bat | *Eptesicus fuscus* |
| Townsend's Big-eared Bat | *Corynorhinus townsendii* |
| Spotted Bat | *Euderma maculatum* |
| Pallid Bat | *Antrozous pallidus* |

#### Family: *Molossidae* (Freetail Bats)

| | |
|---|---|
| Brazilian Free-tailed Bat | *Tadarida brasiliensis* |

### Order: *Lagomorpha* (Pikas, Hares, Rabbits)

#### Family: *Leporidae* (Hares, Rabbits)

| | |
|---|---|
| White-tailed Jackrabbit | *Lepus townsendi* |
| Black-tailed Jackrabbit | *Lepus californicus* |
| Mountain Cottontail | *Sylvilagus nuttalli* |
| Desert Cottontail | *Sylvilagus audubonii* |
| Pygmy Rabbit | *Brachylagus idahoensis* |

### Order: *Rodentia* (Rodents)

#### Family: *Sciuridae* (Squirrels)

| | |
|---|---|
| Yellow-pine Chipmunk | *Tamias amoenus* |
| Least Chipmunk | *Tamias minimus* |
| Uinta Chipmunk | *Tamias umbrinus* |
| Yellow-bellied Marmot | *Marmota flaviventris* |
| White-tailed Antelope Squirrel | *Ammospermophilus leucurus* |
| Great Basin Ground Squirrel | *Spermophilus mollis* |
| Belding's Ground Squirrel | *Spermophilus beldingi* |
| Wyoming Ground Squirrel | *Spermophilus elegans* |
| Golden-mantled Ground Squirrel | *Spermophilus lateralis* |

#### Family: *Geomyidae* (Gophers)

| | |
|---|---|
| Botta's Pocket Gopher | *Thomomys bottae* |
| Northern Pocket Gopher | *Thomomys talpoides* |
| Townsend's Pocket Gopher | *Thomomys townsendii* |

#### Family: *Heteromyidae* (Kangaroo Rodents)

| | |
|---|---|
| Little Pocket Mouse | *Perognathus longimembris* |
| Great Basin Pocket Mouse | *Perognathus parvus* |
| Dark Kangaroo Mouse | *Microdipodops megacephalus* |

#### Family: *Heteromyidae* (Kangaroos cont.)

| | |
|---|---|
| Ord Kangaroo Rat | *Dipodomys ordii* |
| Chisel-toothed Kangaroo Rat | *Dipodomys microps* |

#### Family: *Castoridae* (Beavers)

| | |
|---|---|
| American Beaver | *Castor canadensis* |

#### Family: *Cricetidae* (Mice, Rats, Voles)

| | |
|---|---|
| Western Harvest Mouse | *Reithrodontomys megalotis* |
| Canyon Mouse | *Peromyscus crinitus* |
| Deer Mouse | *Peromyscus maniculatus* |
| Northern Grasshopper Mouse | *Onychomys leucogaster* |
| Desert Woodrat | *Neotoma lepida* |
| Bushy-tailed Woodrat | *Neotoma cinerea* |
| Mountain Vole | *Microtus montanus* |
| Long-tailed Vole | *Microtus longicaudus* |
| Sagebrush Vole | *Lemmiscus curtatus* |
| Muskrat | *Ondatra zibethica* |

#### Family: *Zapodidae* (Jumping Mice)

| | |
|---|---|
| Western Jumping Mouse | *Zapus princeps* |

#### Family: *Erethizontidae* (New World Porcupines)

| | |
|---|---|
| North American Porcupine | *Erethizon dorsatum* |

### Order: *Carnivora* (Flesh-Eaters)

#### Family: *Canidae* (Dogs)

| | |
|---|---|
| Coyote | *Canis latrans* |
| Gray Wolf | *Canis lupus (L.E.)* |
| Kit Fox | *Vulpes velox* |
| Red Fox | *Vulpes vulva* |

#### Family: *Procyonidae* (Racoons and Allies)

| | |
|---|---|
| Common Raccoon | *Procyon lotor* |

**Family: *Mustelidae* (Weasels and Allies)**

| | |
|---|---|
| Short-tailed Weasel | *Mustela erminae* |
| Long-tailed Weasel | *Mustela frenata* |
| Mink | *Mustela vison* |
| Northern River Otter | *Lontra canadensis* |
| American Badger | *Taxidea taxus* |
| Striped Skunk | *Mephitis mephitis* |
| Western Spotted Skunk | *Spilogale gracilis* |

**Family: *Felidae* (Cats)**

| | |
|---|---|
| Mountain Lion | *Felix concolor* |
| Bobcat | *Lynx rufus* |

## Order: *Artiodactyla* (Hoofed Mammals)

**Family: *Cervidae* (Deer)**

| | |
|---|---|
| Rocky Mountain Elk | *Cervus canadensis* |
| Mule Deer | *Odocoileus hemionus* |

**Family: *Antilocapridae* (Pronghorn)**

| | |
|---|---|
| Pronghorn | *Antilocapra americana* |

**Family: *Bovidae* (Bison, Sheep, Goats)**

| | |
|---|---|
| California Bighorn Sheep | *O. c. californiana* |

# *Reptiles*

## Order: *Squamata* (Lizards, Snakes)

**Family: *Iguanidae* (Iguanas and Allies)**

| | |
|---|---|
| Common Zebra-tailed Lizard | *Callisaurus draconoides* |
| Long-nosed Leopard Lizard | *Gambelia wislizenii* |
| Desert Spiny Lizard | *Sceloporus magister* |
| Western Fence Lizard | *Sceloporus occidentalis* |
| Sagebrush Lizard | *Sceloporus graciosus* |
| Side-blotched Lizard | *Uta stansburiana* |
| Pigmy Short-horned Lizard | *Phrynosoma douglassii* |
| Greater Short-horned Lizard | *Phrynosoma hernadesi* |
| Desert Horned Lizard | *Phrynosoma platyrhinos* |

**Family: *Scincidae* (Skinks)**

| | |
|---|---|
| Great Basin Skink | *Eumeces skiltonianus utahensis* |

**Family: *Teiidae* (Whiptails)**

| | |
|---|---|
| Western Whiptail | *Cnemidophorus tigrus* |

**Family: *Boidae* (Boas, Pythons)**

| | |
|---|---|
| Rubber Boa | *Charina bottae* |

**Family: *Colubridae* (Solid-toothed Snakes)**

| | |
|---|---|
| Ringneck Snake | *Diadophis punctatus* |
| Striped Whipsnake | *Masticophis taeniatus* |
| Western Yellow-bellied Racer | *Coluber constrictor mormon* |
| Great Basin Gopher Snake | *Pituophis cantenifer deserticola* |
| Common Kingsnake | *Lampropeltis getulus* |
| Long-nosed Snake | *Rhinocheilus lecontei* |
| Western Terrestrial Garter | *Thamnophis elegans* |
| Ground Snake | *Sonora semiannulata* |
| Night Snake | *Hypsiglena torquata* |

**Family: *Viperidae* (Vipers)**

| | |
|---|---|
| Great Basin Rattlesnake | *Crotalus viridis lutosus* |

# *Amphibians*

## Order: *Anura* (Frogs and Toads)

**Family: *Pelobatidae* (Spadefoots)**

| | |
|---|---|
| Great Basin Spadefoot Toad | *Spea intermontana* |

**Family: *Ranidae* (True Frogs)**

| | |
|---|---|
| Columbia Spotted Frog | *Rana luteiventris* |
| Northern Leopard Frog | *Rana pipiens* |
| Bullfrog | *Rana catesbeiana* |

**Family: *Bufonidae* (Toads)**

| | |
|---|---|
| Western Toad | *Bufo boreas* |

**Family: *Hylidae* (Treefrogs)**

| | |
|---|---|
| Pacific Chorus Frog | *Pseudacris regilla* |

# *Fish*

## Order: *Salmoniformes*

**Family: *Salmonidae* (Salmon and Trout)**

| | |
|---|---|
| Chinook Salmon | *Oncorhynchus tshawytscha(L.E.)* |
| Rainbow Trout | *Oncorhynchus mykiss* |
| Redband Trout | *Oncorhynchus mykiss gairdneri* |
| Lahontan cutthroat trout | *Oncorhynchus clarki henshawi* |
| Brook Trout | *Salvelinus fontinalis* |
| Mountain Whitefish | *Prosopium williamsoni* |
| Brown Trout | *Salmo trutta* |

## Order: *Scorpaeniformes*

**Family: *Cottidae* (Sculpins)**

| | |
|---|---|
| Paiute Sculpin | *Cottus beldingii* |

## Order: *Cypriniformes*

### Family: *Cyprinidae* (Carps and Minnows)

| | |
|---|---|
| Chiselmouth | *Acrocheilus alutaceus* |
| Northern Pikeminnow | *Ptychochelus oregonensis* |
| Longnose Dace | *Rhinicthys cataractae* |
| Speckled Dace | *Rhinicthys osculus* |
| Redside Shiner | *Richrdsonius balteatus* |
| Tui Chub | *Gila bicolor* |
| Asiatic Carp | *Cyprinus carpio* |

### Family: *Catastomidae* (Suckers)

| | |
|---|---|
| Mountain Sucker | *Catostomus platyrhynchus* |
| Tahoe Sucker | *Catastomus tahoensis* |

## Order: *Siluriformes*

### Family: *Ictaluridae* (Catfish)

| | |
|---|---|
| Channel catfish | *Ictalurus punctatus* |

## Order: *Perciformes*

### Family: *Percidae* (Walleye)

### Family: *Centrarchidae* (Bass and allies)

| | |
|---|---|
| Largemouth Bass | *Micropterus salmoides* |
| Bluegill | *Lepomis macrochirus* |
| Crappie | *Pomoxis nigromaculatus* |