BLM

U.S. Department of the Interior
Bureau of Land Management

Preliminary Environmental Assessment

Cold Springs Herd Management Area
Population Management Plan

U.S. Department of the Interior
Bureau of Land Management
Vale District/Malheur Field Office
100 Oregon St., Vale, OR

NATIONAL SYSTEM OF PUBLIC LANDS

Table of Contents

Tables

POPULATON MANAGEMENT PLAN FOR THE
COLD SPRINGS HERD MANAGEMENT AREA
ENVIRONMENTAL ASSESSMENT DOI-BLM-OR-V040-2015-022-EA

1.0 Introduction, Purpose of, and Need for Action

1.1 Background

The Vale District Bureau of Land Management (BLM) proposes to gather and remove excess wild horses and implement population control measures on wild horses from the Cold Springs Herd Management Area (HMA) in order to achieve a thriving natural ecological balance and manage the wild horse population within Appropriate Management Level (AML) over a ten-year time frame. Various methods of gathering and removal of wild horses are available (i.e. helicopter drive trapping, bait/water trapping, and horseback drive trapping). The method(s) to be used would be determined by the authorized officer.

Cold Springs HMA is located in Malheur County, Oregon approximately 25 miles southwest of Harper, Oregon (Appendix A - Vicinity Map). The HMA contains 29,877 acres of BLM-managed land and approximately another 3,000 acres of interspersed private lands. AML in the Cold Springs HMA was established for 75-150 wild horses in the Southern Malheur Management Framework Plan (March, 1983) and was analyzed in the Southeast Oregon Resource Management Plan Final Environmental Impact Statement (SEORMP/FEIS, 2001).

1.2 Purpose of and Need for Action

The purpose of the action is to return and maintain the wild horse population within the established AML on Cold Springs HMA, protect rangeland resources from deterioration associated with overpopulation, and restore a natural ecological balance and multiple use relationship on public lands in the area consistent with the provisions of Section 1333(b) (2) of the Wild Free-Roaming Horse and Burro Act (WFRHBA) of 1971.

The need for action is to achieve a thriving natural ecological balance on public lands; manage wild horses in a manner that assures significant progress is made toward achieving Land Health Standards for upland vegetation and riparian plant communities, watershed function, and habitat quality for animal populations, as well as other site-specific or landscape-level objectives (discussed below), including those necessary to protect and manage Threatened, Endangered, and Sensitive Species (H-4700-1, 4.1.5). Wild horse herd health is promoted by achieving and maintaining a thriving natural ecological balance.

The Southeast Oregon Resource Management Plan (SEORMP) Record of Decision (ROD) (2002, pp. 55-57) identified objectives for Vale District's wild horse herds that include (1) maintaining and managing HMAs at AMLs to ensure a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values (75-150 for Cold Springs HMA), and (2) enhancing and perpetuating special and unique characteristics that distinguish the herd.

The 1993 North Star Mountain Allotment Management Plan (AMP) states a maximum utilization of 50% for native key forage species (including wild horse and wildlife use); this target aids in determining the need for action to maintain a thriving natural ecological balance. Based on utilization monitoring, excess wild horses are contributing to excessive utilization on herbaceous forage species within certain portions of the HMA. Specifically, utilization monitoring in known horse use areas and especially in previously burned areas indicate by fall 2015 horse use was >50%. This is contributing to conversion of burned areas to cheatgrass and medusahead.

1.3 Land Use Plan Conformance

The Proposed Action and all action alternatives are tiered to the goals, objectives, and management directions set forth in the SEORMP/FEIS (2001, Chapter 3 242-246) and are in conformance with decisions made in the SEORMP/ROD (2002, 55-57). Objectives identified for wild horse herds in these documents include (1) maintaining and managing HMAs at AMLs to ensure a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values, and (2) enhancing and perpetuating special and unique characteristics that distinguish the herd.

1.4 Relationship to Laws, Regulations, and Other Plans

The Proposed Action and all action alternatives have been designed to conform to State, Tribal, Federal and local land use plans, regulations, consultation requirements, and other authorities, which direct and provide the framework and official guidance for management of BLM lands within the Vale District:

- Wild Free-Roaming Horses and Burros Act of 1971 (Public Law 92-195) as amended.
- Wild Free-Roaming Horse and Burro Management (43 Code of Federal Regulations [CFR] 4700). The following are excerpts from the 43 CFR 4700.
  1) 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."
  2) 4710.3-1 – Herd Management Areas. "Herd Management Areas shall be established for maintenance of wild horse and burro herds."
  3) 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.
- BLM Wild Horses and Burros Management Handbook, H-4700-1 (June, 2010),
- National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347, 1970),
- BLM NEPA Handbook, H-1790-1 (January, 2008),

- Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1701, 1976), Section 302(b) of FLPMA, states "all public lands are to be managed so as to prevent unnecessary or undue degradation of the lands."
- Public Rangelands Improvement Act (43 U.S.C. 1901. 1978),
- Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the States of Oregon and Washington (1997),
- Greater Sage-grouse and Sagebrush-steppe Ecosystems Management Guidelines BLM (2001),
- BLM National Sage-grouse Habitat Conservation Strategy (2004) ,
- Greater Sage-grouse Conservation Assessment and Strategy for Oregon (Hagen, 2011).
- Oregon Greater Sage-Grouse Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (June, 2015)
- Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment and Record of Decision (September, 2015)
- Vale District 5-Year Weed Control Plan (EA-OR-030-89-19), 1989.
- Vegetation Treatment Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Final Environmental Impact Statement (2010) and Record of Decision (2010).
- North Star Mountain Allotment Management Plan, 1993.
- Oregon Department of Environmental Quality (ODEQ) Laws and Regulations
- State, local, and Tribal laws, regulations, and land use plans
- All other Federal laws that are relevant to this document, even if not specifically identified

1.5 Decision to be Made

The BLM Authorized Officer will decide whether or not to gather and remove excess wild horses, implement population control measures and what method(s) to use for each. The decision would affect wild horses within and those that have strayed outside the Cold Springs HMA. The BLM Authorized Officer's decision would not set or adjust AML nor would it adjust livestock use, as these were set through previous decisions.

1.6 Scoping and Identification of Issues

On May 12, 2015, the BLM mailed a scoping letter to interested individuals, groups, and agencies regarding the proposed removal of excess horses from the Cold Springs HMA. The scoping letter was also posted on the Vale District BLM Planning web page at www.blm.gov/or/districts/vale/plans/plans.php. Letters and e-mails were received from 6,069 individuals and groups during the 15-day comment period. The substantive issues identified in those letters and e-mails received along with issues identified during interdisciplinary team (IDT) meetings and contact with other agencies have been addressed by the BLM IDT.

1.7 Issues Considered but not Analyzed

Issues considered but not analyzed can be found in Appendix B.

2.0 Proposed Action and Alternatives

This section of the EA describes the Proposed Action and reasonable alternatives, including alternatives that were considered but eliminated from detailed analysis. Reasonable alternatives are practical or feasible from the technical and economic standpoint and using common sense. The Proposed Action and alternatives represent a reasonable range to cover the full spectrum of alternatives which meet the purpose and need. Five alternatives are considered in detail.

- Alternative 1. Proposed Action – Remove Excess Wild Horses and Apply Available and Approved Fertility Treatment (*Proposed Action*).
- Alternative 2. Alternative 1 *without* Applying Available and Approved Fertility Treatment.
- Alternative 3. Alternative 1 *plus* Geld Up to 15 Return Stallions.
- Alternative 4. Gate Cut Removal
- Alternative 5. No Action – Defer Gather and Removal

All Action Alternatives (1 through 4) were developed to respond to the identified resource issues and the Purpose and Need to differing degrees. Alternative 5, No Action, would not achieve the identified Purpose and Need. However, it is analyzed in this EA to provide a basis for comparison with all Action Alternatives, and to assess the effects of not conducting a gather. Alternative 5, No Action Alternative, does not conform to the WFRHBA which requires the BLM to immediately remove excess wild horses.

2.1 Management Actions Common to Alternatives 1-4

2.1.1 Project Design Features

The following design features would be used for all action alternatives (1-4).

- Time frame for comparison of all action alternatives is ten years.
- Helicopter drive gather and remove operations would take approximately 7 days to complete. Several factors such as animal condition, herd health, weather conditions, or other considerations could result in adjustments in the schedule.
- Helicopter gather operations would be scheduled any time between July 1 through February 28th in any year and would be conducted under contract.
- Trap sites would be selected within the pastures and areas where horses are located to the greatest extent possible.
  - Currently wild horses are known to reside in several pastures to the north, west, and south of the HMA. Horses have not recently resided east of the HMA, but they have been there in the past.
- Trap sites and temporary holding facilities would be located in previously used sites or other disturbed areas whenever possible. These areas would be seeded with a seed mix

appropriate to the specific site if bare soil exceeds more than ten square yards per location.

- Undisturbed areas identified as trap sites or holding facilities would be inventoried, prior to being used, for cultural and botanical resources. If cultural or botanical resources are encountered, these locations would not be utilized unless they could be modified to avoid effects to cultural resources.
- Trap sites and temporary holding facilities would be surveyed for noxious weeds prior to gather activities. Any weeds found would be treated using the most appropriate methods. All gather activity sites would be monitored for at least 2 years post-gather. Any weeds found would be treated using the most appropriate methods, as outlined in the 1989 Vale District Weed Management EA, or subsequent documents.
- All vehicles and equipment used during gather operations would be cleaned before and following implementation to guard against spreading of noxious weeds.
- Efforts would be made to keep trap and holding locations away from areas with noxious weed infestations.
- Gather sites would be noted and reported to range and weed personnel for monitoring and/or treatment of new and existing infestations.
- Maintenance may be conducted along roads accessing trap sites and holding facilities prior to the start of gather operations to ensure safe passage for vehicles hauling equipment and horses to and from these sites. Any gravel required for road maintenance is to be certified weed-free gravel. Road maintenance would be done in accordance with Vale District road maintenance policy.
- Gather and trapping operations would be conducted in accordance with the SOPs described in the Wild Horse and Burro Gathers: Comprehensive Animal Welfare Policy (IM No. 2015-151) which was created to establish policy and procedures to enable safe, efficient, and successful wild horse gather operations while ensuring humane care and treatment of all animals gathered (Appendix C).
- An Animal and Plant Health Inspection Service (APHIS) veterinarian would be onsite during the gather, as needed, to examine animals and make recommendations to BLM for care and treatment of the wild horses.
- Decisions to humanely euthanize animals in field situations would be made in conformance with BLM policy (Washington Office (WO) Instruction Memorandum (IM) 2009-041). Current policy reference: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-041.html
- On all horses gathered (removed and returned), data including sex and age distribution would be recorded. Additional information such as color, condition class information (using the Henneke, 1983, rating system), size, disposition of the animal and other information may also be recorded.
- Excess animals would be transported to Oregon's Wild Horse and Burro Corral Facility via semi-truck and trailer where they would be prepared (freeze marked, vaccinated and dewormed) for adoption, sale (with limitations) or long-term pasture.
- Hair samples would be collected to assess genetic diversity of the herd, as outlined in WO IM 2009-062 (Wild Horse and Burro Genetic Baseline Sampling). Hair samples would be collected from a minimum of 25 percent of the post gather population (approximately 20 horses).

- Public and Media Management during helicopter gather and bait trapping operations would be conducted in accordance with WO IM 2013-058 (Wild Horse and Burro Gather/s (WH&B): Public and Media Management). This IM establishes policy and procedures for safe and transparent visitation by the public and media at WH&B gather operations, while ensuring the humane treatment of wild horses and burros.
- Emergency gathers: BLM Manual 4720.22 defines emergency situations as an unexpected event that threatens the health and welfare of a wild horse or burro population, its habitat, wildlife habitat or rangeland resources and health. Emergency gathers may be necessary during this ten-year time frame for reasons including disease, fire, insect infestation, or other events of catastrophic and unanticipated natural events that affect forage and water availability for wild horses. Emergency gather operations would follow the project design elements described in this section.

2.1.2 Monitoring

The BLM Contracting Officer's Representative (COR) and Project Inspectors (PIs) assigned to the gather would be responsible for ensuring contract personnel abide by the contract specifications and the Gather SOPs outlined in the CAWP (Appendix C). (Applies to all action alternatives 1-4).

Ongoing monitoring of forage condition and utilization, water availability, aerial population surveys and animal health would continue on the Cold Springs HMA. (Applies to all alternatives).

Genetic monitoring would also continue following gathers and/or trapping. If genetic monitoring indicates a loss of genetic diversity, the BLM would consider introduction of horses from HMAs in similar environments to maintain the projected genetic diversity. (Applies to all action alternatives 1-4).

Fertility control monitoring would be conducted in accordance with the Population-level Fertility Control Treatments SOPs (Appendix D). (Applies to Alternatives 1 and 3).

2.2 Description of Alternatives Considered in Detail

2.2.1 Alternative 1. Proposed Action - Remove Excess Wild Horses and Apply Available and Approved Fertility Treatment *(Proposed Action)*

Alternative 1 is designed to manage wild horse populations over a ten-year time frame and would incorporate two to three gather cycles. Implementation of the Proposed Action would begin as soon as BLM's Washington D.C. Office gives authorization.

Based on the July 2014 census which counted 197 horses and assuming a 20% population growth rate (NAS Report, 2013), the estimated wild horse population by fall 2015 would be approximately 213 adult wild horses (plus 43 foals). The first portion of the proposed action would be to gather 90% of the total wild horse population and remove excess horses down to the low end of AML. Ninety percent of the herd is gathered in order to (1) select horses to return to the HMA to re-establish the low end of AML and (2) to remove excess wild horses that would be prepared for the adoption program. This would mean if horses were gathered in the fall of 2015,

approximately 230 horses, roughly 90 percent of the estimated herd size based on current estimates, would be gathered using the helicopter-drive method. Approximately 181 excess adult wild horses would be removed from the Cold Springs HMA, included those that have strayed outside the HMA boundary, to re-establish the herd size at the low end of AML (75 animals). For future helicopter gathers under this 10-year plan, the number of horses gathered and the excess removed would be adjusted based upon the estimated herd size at the time of the gather. Each helicopter gather would take approximately one week. BLM would plan to gather as soon as holding space becomes available and BLM's Washington D.C. Office gives authorization. The gather would be initiated following public notice on the Vale District web page http://www.blm.gov/or/districts/vale/index.php. No horses found outside of the HMA would be returned to the range.

Bait, water, horseback, and helicopter drive trapping would be used as tools to remove excess horses in areas where concentrations of wild horses are detrimental to habitat conditions or other resources within the HMA, to remove wild horses from private lands or public lands outside the HMA boundary, to selectively remove a portion of excess horses for placement into the adoption program, or to capture, treat, and release horses for application of fertility control. Bait, water, horseback, or helicopter drive trapping would be conducted as needed between normal helicopter drive gather cycles. Bait, water trapping, horseback, and helicopter drive trapping operations could take anywhere from one week to several months depending on the amount of animals to trap, weather conditions, or other considerations. Operations would be conducted either by contract or BLM personnel.

Site-specific removal criteria were never set for Cold Springs HMA; therefore, animals removed from the HMA would be chosen based on a selective removal strategy set forth in BLM Manual Section 4720.33. Wild horses would be removed in the following order: (1) First Priority: Age Class – Four Years and Younger; (2) Second Priority: Age Class – Eleven to Nineteen Years; (3) Third Priority: Age Class Five to Ten Years; and (4) Fourth Priority: Age Class Twenty Years and Older should not be permanently removed from the HMA unless specific exceptions prevent them from being turned back to the range. In general, this age group can survive in the HMA, but may have greater difficulty adapting to captivity and the stress of handling and shipping if removed. BLM Manual Section 4720.33 further specifies some animals that should be removed irrespective of their age class. These animals include, but are not limited to, nuisance animals and animals residing outside the HMA or in an area of an inactive HA. One caveat to these selective removal criteria would be the release of existing geldings back to the HMA. If recaptured during future gather operations, any geldings would be returned to the range regardless of age.

Captured wild horses would be released back into the HMA under the following criteria.

- Released horses would be selected to maintain a diverse age structure of 37 mares and 38 stallions (75 total = low AML); approximately a 50/50 sex ratio.
- Released horses would be selected to maintain herd characteristics, including the draft influence. The most common colors of grey, sorrel, buckskins bay, brown, black, and red roan would have higher priority over the less common colors present

- Post-gather, every effort would be made to return released horses to the same general area from which they were gathered.
- Approximately 28 mares (75 percent), age two or older, would be selected to be returned to the HMA after receiving fertility control treatment. PZP is currently the most common form of immunocontraception BLM is using in the field. This type and method of fertility control treatment may be used in the initial gather but may be adjusted as advancements are made with available and approved fertility control treatments and methods. PZP would be administered following IM No. 2009-090, Population-Level Fertility Control Field Trials: Herd Management Area (HMA) Selection, Vaccine Application, Monitoring and Reporting Requirements.

BLM proposes one to two future gathers, 4 to 5 years following the initial proposed gather, over a period of the next ten years, following the date on the Decision Record for this document. This ten-year timeframe enables BLM to determine the effectiveness of the proposed action at successfully maintaining population levels within AML in Cold Springs HMA. During the ten-year time frame helicopter gathers would be carried out under the same (or updated) (Standard Operating Procedures (SOP) as Appendix C and the same selective removal criteria, population control measures, release criteria and sex ratio adjustment strategies would be applied as described in the section above. Adaptive management would be employed that incorporates the use of the most promising methods of fertility control (as long as it is approved for use and available). Future gather dates and target removal numbers for gathers within the next ten years would be determined based on future population surveys and a determination that "excess" horses exist within the HMA. A notice to the public would be sent out 30 days prior to any future gather.

Following the initial proposed gather to return the population to within AML, adaptive management would be used to maintain a thriving natural ecological balance with periodic gathers within the HMA over the next ten years. "Adaptive management is about taking action to improve progress toward desired outcomes." (www.doi.gov/initiatives, 2007). Knowing that uncertainties exist in managing for sustainable ecosystems and healthy wild horse populations, adjustments to the location and populations of wild horses within the HMA would be implemented. To supplement helicopter drive trapping, bait, water or horseback drive trapping would be used to relocate or remove horses outside the HMA or to reduce wild horse numbers in areas experiencing heavy utilization levels or other documented resource damage due to excessive concentrations of wild horses. Bait, water, horseback, or helicopter drive trapping could also be used to apply fertility control to reduce the population growth rates between gathers.

2.2.2 Alternative 2: Alternative 1 ***without*** Applying Available and Approved Fertility Treatment.

Alternative 2 would follow the same actions proposed in Alternative 1 (*Proposed Action*) with the exception of applying fertility treatment. None of the animals returned to the HMA would have any fertility treatments conducted on them.

2.2.3 Alternative 3: Alternative 1 ***plus*** Geld Up to 15 Return Stallions.

BLM's 2011 Proposed Strategy for Future Management of America's Wild Horses and Burros set forth goals, objectives and management actions for sustainable herds. One objective was to "Use a wide range of fertility control and other population control measures to slow herd growth rates and better align the number of excess [wild horses] which need to be removed with the number of animals that can be placed in private care" (Proposed Strategy 2011). Action 4 developed to address this objective is to "Consider incorporating a non-reproducing component in a number of HMAs, while maintaining the remainder of the herd as a self-sustaining (reproductive) population (Proposed Strategy 2011).

Alternative 3 would be the same as Alternative 1 (Proposed Action) with the addition of the gelding of 15 stallions selected to be returned to the range. These 15 stallions would be gelded (castrated) and released back into the HMA to be managed as a non-reproductive component in the HMA. Under this alternative, 15 geldings, 30 mares, and 30 stallions would be released to the range following the gather. This non-reproductive component would allow horses to remain on the range with a 50/50 ratio of mares to stallions.

Stallions selected for gelding would meet the following requirements: five to 15 years of age, having a body condition score (Henneke 1983) of 4 or above, and fit the saddle horse conformation and color criteria discussed in the Proposed Action.

2.2.4 Alternative 4: Gate Cut Removal

Alternative 4 includes the same Gather SOPs (CAWP, 2013) as the Proposed Action, but would only gather excess horses down to the low AML (75 animals) and end the gather. A gate cut removal is generally done to limit any additional stress on the wild horses within a defined gather area. In this situation, wild horses would be gathered and removed regardless of age class, sex ratio, color or conformation to reach the post gather target number. All the animals captured would be removed from the HMA. Fertility control would not be applied and no changes to the herd's existing sex ratio would be made. Horses remaining in the HMA would not be managed to maintain the desirable characteristics of the Cold Springs herd.

2.2.5 Alternative 5: No Action – Defer Gather and Removal

Under Alternative 5, No Action Alternative, no gather would occur and no additional management actions would be undertaken to control the size or sex ratio of the wild horse population at this time. Current estimates of wild horses on the range indicate there are 213 adult horses within the HMA (summer 2015) and approximately 256 adult horses by summer 2016. Within one normal gather cycle, 4 years, wild horse numbers would increase to approximately 369 adult horses by fall 2018 under the no action alternative. Wild horses ranging outside the HMA would remain in areas outside the HMA not designated for their management.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

2.3.1 Closure of HMA to Livestock Use

This alternative was not brought forward for detailed analysis because it is outside the scope of this EA for analysis. Such an action would not be in conformance with the existing land use plan, the SEORMP/ROD, which authorizes AUMs wild horses (2002, 55-57) and for livestock grazing

(2002, 56-60) in the allotment within Cold Springs HMA. The closure of the HMA to livestock grazing without maintaining wild horse populations within AML would be inconsistent with the WFRHBA (1971) which directs the Secretary to immediately remove excess wild horses. Livestock grazing is reduced or eliminated following the process outlined in the regulations found at 43 CFR Part 4100.

2.3.2 Complete Removal of Wild Horses from the HMA

Complete removal of wild horses within the HMA was eliminated from detailed analysis because it would not be in conformance with the SEORMP/ROD which specifically authorize AUMs and reestablished AML for wild horse use in Cold Springs HMA on pages 55-57. This LUP provides a management objective "To maintain/manage herds in HMAs at AMLs"; they do not include management direction to eliminate AML for wild horses. Elimination of wild horses and closure of HMAs can only be conducted during the land use planning process or within an RMP revision or amendment. The Proposed Action is not a land use plan allocation; therefore, elimination of wild horses is outside the scope of this EA for analysis.

2.3.3 Complete Removal of Wild Horses from the HMA Bait and Water Trapping Only

An alternative considered but eliminated from detailed analysis was the use of bait and/or water trapping as the primary or sole gathering method. The use of bait and water trapping, although 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 1-4 if gather efficiencies are too low using a helicopter or a helicopter gather cannot be scheduled. Water and bait trapping is an effective tool for specific management purposes such as removing groups of horses from an accessible concentration area. The use of only bait and water trapping was dismissed from detailed analysis as it was determined this method would not fully meet the purpose and need for action as there is a lack of adequate road access or ability for cross country motorized travel. This would make it technically infeasible to construct traps and safely transport captured wild horses from these areas of the HMA.

2.3.4 Gather by Horseback Only

Use of horseback drive-trapping to remove excess wild horses can be effective on a small scale (less than 50 horses); but due to the topography of the HMA, access restrictions (e.g. limited roads) and approachability of the horses, this technique would be ineffective and impractical. Horseback drive-trapping is also labor intensive as compared to helicopter drive trapping. Helicopter drive trapping would require approximately 2 days to gather this HMA vs. 1-2 months with 5 or more people during horseback drive-trapping. Horseback drive trapping can also be dangerous to the domestic horses and riders herding the wild horses. For these reasons, this alternative was eliminated from further consideration.

2.3.5 Intensive Fertility Control

This alternative would encompass a ten-year time frame with an initial helicopter gather to bring the horse numbers down to the low end of AML. This alternative is a fertility treatment program

consisting of administration of a liquid primer dose of PZP (or an approved and available fertility vaccine) administered to all released mares (age two and older) at the time of the initial gather and an annual booster vaccination of liquid PZP or an approved and available fertility vaccine applied through remote darting. The program would be designed to treat mares ages 2, 3, 4 and ages 11 through 20+. Following the initial primer dose and one year booster, all mares ages 5-10 would not be treated. The intent of such an alternative would be to reduce the population growth rate each year, thereby eliminating or reducing the need to remove horses through future bait or helicopter gathers.

Cold Springs horses are not easily approachable and there is a significant lack of screening vegetation to facilitate identification and darting. It was determined intensive fertility control alone would not fully meet the purpose and need of maintaining AML over the next ten years due to the previously mentioned factors, high elevation, and limited access within this HMA. When identifying the most promising fertility-control methods, the National Academy of Sciences (2013) concluded there are HMAs in which remote delivery (e.g., darting) is possible, but these seem to be exceptions. Given the current fertility-control options, remote delivery appears not to be a practical characteristic of an effective population management tool, but it could be useful in some scenarios (National Academy of Sciences, 2013). Access to animals for timely inoculation and other management constraints may affect the utility of PZP as a management tool for western feral horse populations (Ransom et al. 2011).

2.3.5 Wild Horse Numbers Controlled by Natural Means

This alternative was eliminated from further consideration because it is contrary to the WFRHBA which requires the BLM to prevent the range from deterioration associated with an overpopulation of wild horses. An alternative of using natural controls to achieve and maintain an established AML has not been shown to be feasible in the past or practical. Wild horses in the Cold Springs HMA are not substantially regulated by predators or other natural factors. In addition, wild horses are a long-lived species with documented foal survival rates exceeding 95%, and they do not self-regulate their population growth rate. This alternative would result in a steady increase in numbers which would continually exceed the carrying capacity of the range until severe and unusual conditions that occur periodically-- such as blizzards or extreme drought-- cause catastrophic mortality of wild horses.

3.0 Affected Environment and Environmental Consequences

3.1 General Description

This section of the EA describes the current state of the environment which includes the effects of past actions. The following environmental consequences discussions describe all expected effects including direct, indirect and cumulative on resources from enacting the alternatives.

3.2 Description of Affected Resources/Issues

The IDT reviewed the elements of the human environment, as required by law, regulation, Executive Order, and policy, to determine if they would be affected by any of the alternatives. An IDT also reviewed and identified issues and resources affected by the alternatives. The results are summarized in Table 1.

Table 1: Supplemental Authorities and Other Elements Potentially Affected by Action

Supplemental Authorities and Other Elements	Present	Affected	Rationale
ACECs	**NO**	**NO**	
Air Quality	**YES**	**NO**	The planning area is outside a non-attainment area. Implementation of the Proposed Action would result in small and temporary areas of disturbance.
American Indian Traditional Practices	**NO**	**NO**	No American Indian Traditional Practices areas are known to occur within the HMA.
Cultural Resources	**YES**	**NO**	To prevent any impacts to cultural resources, trap sites and temporary holding facilities would be located in previously disturbed areas. Cultural resource inventory and clearance would be required prior to using trap sites or holding facilities outside existing areas of disturbance.
Environmental Justice	**NO**	**NO**	
Fire Management	**NO**	**NO**	
Fish Habitat	**NO**	**NO**	
Floodplains	**NO**	**NO**	
Forest and Woodlands	**NO**	**NO**	
Grazing Management and Rangeland	**YES**	**YES**	Discussed below.
Hazardous or Solid Waste	**NO**	**NO**	
Lands and Realty	**NO**	**NO**	
Migratory Birds	**YES**	**YES**	Discussed below.
Minerals	**NO**	**NO**	
Noxious Weeds	**YES**	**YES**	Discussed below.
Paleontological Resources	**NO**	**NO**	
Prime or Unique Farmlands	**NO**	**NO**	
Recreation and Visual Resources	**NO**	**NO**	There would be no measurable effect to recreation or visual resources as the actions would be temporary in nature.
Riparian-Wetland Zones	**YES**	**YES**	Discussed below.
Social and Economic Values	**YES**	**NO**	There would not be measurable effect to social and economic values.
Soils and Biological Crusts	**YES**	**YES**	Discussed below.
Special Status Species and Habitat	**YES**	**YES**	Discussed below.
Threatened and Endangered Species	**NO**	**NO**	
Upland Vegetation	**YES**	**YES**	Discussed below.
Water Quality	**YES**	**NO**	Locate trap sites and temporary holding facilities away from any riparian areas to avoid impacts to water quality.
Wild and Scenic Rivers	**NO**	**NO**	

Supplemental Authorities and Other Elements	Present	Affected	Rationale
Wilderness and Wilderness Study Area	**NO**	**NO**	
Wilderness Characteristics	**YES**	**NO**	Wilderness Characteristic areas OR-034-047, 061, 067 and 068 are within the HMA. To prevent any impacts to wilderness characteristics, trap sites and temporary holding facilities would be located in previously disturbed areas. Use of trap sites or holding facilities outside existing areas of disturbance would not be located in areas with existing wilderness characteristics.
Wildlife and Locally Important Species	**YES**	**YES**	Discussed below.

3.2.1 Wild Horses

Affected Environment – Wild Horses

The topography of the Cold Springs HMA varies from flat to slightly rolling hills, and steep mountainous country. There are several high, steep ridges in the area with rims and rocky outcrops. Elevation varies from approximately 3,000 to 4,600 feet. Precipitation averages 10 inches at lower elevations to 12 inches at the highest elevations. Most of this precipitation comes during the winter and spring months in the form of snow, supplemented by localized thunderstorms during the summer months.

The area's designation as a HMA was maintained in the SEORMP/FEIS ROD (2002). AML was established as 75-150 wild horses in March 1983 in the Southern Malheur Management Framework Plan. Wild horses are allocated a maximum of 1,800 AUMs of forage in the Cold Springs HMA. Forage is allocated to ensure enough feed exists within the HMA to sustain AML of 150 horses throughout the year.

The most common management action that occurs within the project area for wild horses is horse gathers, which are to be done when monitoring data indicates that the maximum established AML number is exceeded. Depending on reproductive rates, results of rangeland monitoring data, funding, and management considerations, horses within the HMAs are typically gathered and removed on a four- to five-year cycle. Since 1976, there have been numerous census counts and gathers within the HMA. Table 2 shows the wild horse counts for each activity occurring since 1976.

Table 2: Cold Springs HMA - Census and Gather History since 1976

Year	Activity	Number of Horses
1976	Census	301
1977	Gather	355
1986	Census	351
1986	Gather	242
1987	Census	172
1987	Gather	125

Year	Activity	Number of Horses
2004	Census	245
2005	Gather	236
2010	Census	170
2010	Gather	105
2014	Census	213

The last removal of excess wild horses from the Cold Springs HMA was completed in July 2010 when 159 horses were gathered and 105 were removed. Following the gather, 27 mares and 40 stallions (a total of 67 animals) were released. The un-gathered population was estimated at 10 animals for a total estimated post-gather population of 77 animals (about 45 males and 30 females or a 60/40 % male/female sex ratio).

Horses came off the range in good health and quality, reflective of past management actions that returned the best animals to the range, thereby, improving and maintaining characteristics of good conformation, size, color, and temperament. A July 2014 helicopter inventory documented a total of 213 wild horses (189 adults and 24 foals), within the HMA. In summer 2015, use by wild horses exceeds the forage allocated to their use (1,800 AUMs at high AML) by approximately 244 AUMs. Herbaceous forage utilization monitoring documents heavy (61-80%) to severe (>81%) utilization levels in portions of the HMA experiencing concentrated wild horse use. Field observations in 2012, 2013, 2014, and 2015 document poor water availability across the HMA due to below average precipitation. Large concentrations of wild horses (75+) have been observed around these limited water sources, exacerbating overutilization and trailing within these areas.

Habitat for wild horses is composed of four essential components: forage, water, cover, and space. These components must be present within the HMA in sufficient amounts to sustain healthy wild horse populations and healthy rangelands over the long term (4700 WHB Handbook, Ch.3). Escalating problems are defined as conditions that deteriorate over time (4700 Handbook, 4.7.7). The key indicator of an escalating problem is a decline in the amount of forage or water available for wild horse use, which result in negative impacts to animal condition and rangeland health. Causal factors are normally drought or animal numbers in excess of AML (4700 WHB Handbook, 4.7.1).

Cold Springs HMA is located in one pasture of the North Star Mountain Allotment. Cattle are the livestock type authorized for this allotment. McInnis and Vavra (1978) found at least 88 percent of the mean annual diets of horses and cattle consisted of grasses; therefore, there is a direct competition for forage within these allotments. In McInnis and Vavra's (1978) work, horses and cattle showed predilection for many of the same forages, and dietary overlap was substantial (62 – 78%) every season. In addition, dietary overlap between horses and cattle grazing common sagebrush-grassland range in eastern Oregon average 67, 69, and 72 percent during spring, summer, and winter, respectively (Vavra and Sneva 1978). Dietary overlap is not sufficient evidence for exploitative competition (McInnis and Vavra 1987, Colwell and Futuyma 1971), and consequences of overlap partially depend upon availability of the resource. Site observations and utilization studies indicate wild horse utilization patterns are similar to

livestock; however, wild horses will typically use range farther from water than cattle. Miller (1983) found that wild horses generally stay within 4.8 km (2.98 miles) of a water source during the summer, while Pellegrini (1971) found wild horses will roam up to seven miles from water before returning. Green and Green (1977) found wild horses range from three to seven miles from a water source, but the distance is related to forage availability. When water and forage are available together, the range will be smaller, and when they are not available together wild horses concentrate in areas of ample forage and travel further distances to water (Green and Green 1977).

In the early 1970's, wild horses within the Cold Springs HMA were predominantly grays and draft type. Sorrel, buckskin, bay, brown, black, and red roans were also found, with most showing draft breed characteristics. Adult horses in the HMA weigh an average of 950 to 1250 pounds and stand between 14.2 and 16.0 hands, with some stallions being slightly larger.

Stallions from other herds with similar characteristics have been periodically introduced into this HMA to help ensure genetic diversity. This was especially important after a large dieoff that occurred in the winter of 1992-93 due to extremely deep snowpack and lack of access to winter feed.

Baseline genetic diversity samples were taken in 2005 and analysis was completed by E. Gus Cothran from Texas A&M University in 2008. Genetics analysis was completed by using blood samples collected from 41 horses during the 2005 gather. These samples indicate that genetic variability within the Cold Springs HMA is high and the herd appears to be of mixed origins from North American breeds. In comparison with other Oregon herds, the Cold Springs herd shows closest resemblance to the South Steens, Beattys Butte, and Paisley herds.

Table 3 is a summary of the two genetic reports within Cold Springs HMA. The observed heterozygosity (Ho) is a measure of how much diversity is found, on average, within individual animals in a wild horse herd and is insensitive to sample size, although the larger the sample, the more robust the estimate. Ho values below the mean for feral populations are an indication that the wild horse herd may have diversity issues. Herds with Ho values that are one standard deviation below the mean are considered at critical risk. The Fis is the estimated inbreeding level (ratio of 1-Ho/He). Fis levels greater than 0.25 are considered the critical level and suggestive of an inbreeding problem.

Table 3: Cold Springs HMA 2005 and 2010 Genetic Variability Measures Comparison.

Cold Springs HMA - Genetic Variability Measures		
	Ho	Fis
2005 (blood samples)	0.429	-0.079
2010 (hair samples)	0.806	-0.068
Critical level	<0.66 (hair) <0.310 (blood)	>0.25
Wild Horse Mean	0.716	-0.012
Domestic Horse Mean	0.71	0.012

Genetic similarity results suggest a herd with mixed ancestry is primarily North American breeds that include the Light Saddle and Racing breeds and Oriental and Arabian breeds (Cothran 2010). Cothran (2010) summarized that current variability levels are high enough that no action is needed at this point; although, with all herds with numbers less than several hundred, the herd should continue to be monitored. If interbreeding with neighboring herds in possible, this would allow for increased variation (Cothran 2010).

Environmental Consequences – Wild Horses

The cumulative effect analysis area (CEAA) for wild horses is the HMA boundary for all action alternatives (Alternatives 1 – 4) as they aim to maintain wild horse populations within AML which should provide adequate resources for the horses within the HMA. The No Action Alternative would have a CEAA for wild horses of an estimated ten miles outside the HMA boundary in all directions. This area was chosen because the AML is currently exceeded. No action to maintain populations within AML often causes horses to drift outside of an HMA as resources inside the HMA become limited.

Impacts Common to Action Alternatives (1-4)

Over the past 35 years, various impacts to wild horses as a result of gather activities have been observed. Under the actions proposing gathers, impacts to wild horses would be both direct and indirect, occurring to both individual horses and the population as a whole.

The BLM has been conducting wild horse gathers since the mid-1970s. During this time, methods and procedures have been identified and refined to minimize stress and impacts to wild horses during gather implementation. There is policy in place for gathers (both helicopter and bait/water) to enable efficient and successful gather operations while ensuring humane care and treatment of the animals gathered (IM 2015-151). This policy includes standard operating procedures such as time of year and temperature ranges for helicopter gathers to reduce physical stress while being herded toward a trap; maximum distances to herd horses based on climatic conditions, topography and condition of horses; and handling procedures once the animals are in the trap.

In Oregon wild horse or burro fatalities related to gather operations are less than 1% of the animals captured for both helicopter and bait/water trap gathers. Injuries generally occur once the animal is in the confined space of the trap. When capture and handling of wild animals are required to achieve management objectives, it is the responsibility of the management professionals to plan and execute operations that minimize the animal's risk of injury or death. However, when capturing any type of large, wild animal one must expect a certain percentage of injury or death. Multiple studies in the wildlife research and management field have worked to improve understanding of the margins of safe capture and handling and have documented their findings of capture related mortality. Delgiudice et al. 2005 reported 984 captures and recaptures of white-tailed deer (*Odocolleus virginianus*) under a wide range of winter weather conditions. Their results showed the incidence of capture accidents (e.g., trauma-induced paralysis, death) was 2.9 percent. Oregon Department of Fish and Wildlife (ODFW) Assistant District Wildlife Biologist, Autumn Larkins, stated the general consensus between biologists on capture-related mortality in wildlife is that "…anything up to 4% is the reality of the aerial capture process.

Once you get over 5% you need to reevaluate because something is not working, either the conditions are too poor, the methods are inappropriate, etc." (Larkins, pers. Comm.).

Individual, direct impacts to wild horses include the handling stress associated with the roundup, capture, sorting, handling, and transportation of the animals. The intensity of these impacts varies by individual, and is indicated by behaviors ranging from nervous agitation to physical distress. When being herded to trap site corrals by the helicopter, injuries sustained by wild horses may include bruises, scrapes, or cuts to feet, legs, face, or body from rocks, brush or tree limbs. Rarely, wild horses may encounter barbed wire fences and may receive wire cuts. These injuries are very rarely fatal and are treated on-site until a veterinarian can examine the animal and determine if additional treatment is indicated.

Other injuries may occur after a horse has been captured and is either within the trap site corral, the temporary holding corral, during transport between facilities, or during sorting and handling. Occasionally, horses may sustain a spinal injury or a fractured limb but based on prior gather statistics, serious injuries requiring humane euthanasia occur in less than 1 horse per every 100 captured.

To minimize the potential for injuries from fighting, the animals are transported from the trap site to the temporary (or short-term) holding facility where they are sorted as quickly and safely as possible, then moved into large holding pens where they are provided with hay and water.

Indirect individual impacts are those which occur to individual wild horses after the initial event. These may include miscarriages in mares, increased social displacement, and conflict in studs. These impacts, like direct individual impacts, are known to occur intermittently during wild horse gather operations. An example of an indirect individual impact would be the brief skirmishes between older studs which ends when one stud retreats. Injuries typically involve a bite or kick with bruises which do not break the skin. Like direct individual impacts, the frequency of these impacts varies with the population and the individual. Observations following capture indicate the rate of miscarriage varies, but can occur in about 1 to 5% of the captured mares, particularly if the mares are in very thin body condition or in poor health.

During a summer gather, foals are smaller than during gathers conducted during the winter months. Water requirements are greater than in the winter due to the heat. If forage or water is limiting, animals may be traveling long distances between water forage, and may become more easily dehydrated. To minimize the potential for distress during summer gathers, capture operations are often limited to the early morning hours when temperatures are cooler. The distance animals must travel to the trap is also shortened to minimize the potential for stress. The BLM and the gather contractor also make sure there is plenty of clean water for the animals to drink once they have been captured. A supply of electrolytes is also kept on hand to apply to the drinking water if necessary. Electrolytes help to replace the body fluids that may be lost during capture and handling.

A few foals may be orphaned during a gather. This can occur if the mare rejects the foal, the foal becomes separated from its mother and cannot be matched up following sorting, the mare dies or must be humanely euthanized during the gather, the foal is ill or weak and needs immediate care

that requires removal from the mother, or the mother does not produce enough milk to support the foal. On occasion, foals are gathered that were previously orphaned on the range (prior to the gather) because the mother rejected it or died. These foals are usually in poor, unthrifty condition. Every effort is made to provide appropriate care to orphan foals. Veterinarians may administer electrolyte solutions or orphan foals may be fed milk replacer as needed to support their nutritional needs. Orphan foals may be placed in a foster home in order to receive additional care. Despite these efforts, some orphan foals may die or be humanely euthanized as an act of mercy if the prognosis for survival is very poor.

Wild horses not captured may be temporarily disturbed and moved into another area during the gather operation. With the exception of changes to herd demographics from removals, direct population impacts have proven to be temporary in nature with most, if not all, impacts disappearing within hours to several days of release. No observable effects associated with these impacts would be expected within one month of release, except for a heightened awareness of human presence.

By maintaining wild horse population size within the AML, there would be a lower density of wild horses across the HMA, reducing competition for resources and allowing wild horses to utilize their preferred habitat. Maintaining population size within the established AML would be expected to improve forage quantity and quality and promote healthy, self-sustaining populations of wild horses in a thriving natural ecological balance and multiple use relationship on the public lands in the area. Deterioration of the range associated with wild horse overpopulation would be avoided. Managing wild horse populations in balance with the available habitat and other multiple uses would lessen the potential for individual animals or the herd to be affected by drought, and would avoid or minimize the need for emergency gathers, which would reduce stress to the animals and increase the success of these herds over the long-term.

Transport, Short Term Holding, and Adoption (or Sale) Preparation

Animals would be transported from the capture/temporary holding corrals to the designated BLM short-term holding corral facility(s) according to SOPs (Appendix A). During transport, potential impacts to individual 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 be seriously injured or die during transport.

Upon arrival at the short term holding facility, most wild horses begin to eat and drink immediately and adjust rapidly to their new situation. Recently captured wild horses, generally mares, in very thin condition may have difficulty transitioning to feed. Some of these animals are in such poor condition that it is unlikely they would have survived if left on the range. Similarly, some mares may lose their pregnancies. Every effort is taken to help the mare make a quiet, low stress transition to captivity and domestic feed to minimize the risk of miscarriage or death.

After recently captured wild horses have transitioned to their new environment, they are prepared for adoption or sale. During the preparation process, potential impacts to wild horses are similar to those that can occur during handling and transportation. Serious injuries and deaths from injuries during the preparation process are rare, 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% per year (GAO-09-77, page 51), and includes 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 are seriously injured or accidentally die during sorting, handling, or preparation.

From there, they would be made available for adoption or sale to qualified individuals or to long-term holding (grassland) pastures.

Adoption or Sale with Limitations, and Long Term Holding

Other indirect impacts include transportation to adoptions, sales, or long-term pastures (LTP). Adoptions are conducted in accordance with 43 CFR 5750. Sales of wild horses are conducted in accordance with Bureau policy. The BLM has maintained long-term pastures (LTP) in the Midwest for over 20 years. Potential impacts to wild horses from transport to adoption, sale or LTP are similar to those previously described.

LTPs are designed to provide excess wild horses with humane, life-long care in a natural setting off the public rangelands. Handling by humans is minimized to the extent possible although regular on-the-ground observation and weekly counts of the wild horses to ascertain their numbers, well-being, and safety are conducted.

Results of WinEquus Population Modeling

The WinEquus Wild Horse Population Model was designed for and used in this analysis for comparing fertility control and removal as management strategies. The fertility control portion of the model uses effectiveness results from applications of PZP in the field. Appendix E provides the comparison of alternatives resulting from the WinEquus Population Model. Population modeling using Version 3.2 of the WinEquus population model (Jenkins 2000) was completed to analyze possible differences that could occur to wild horse populations between alternatives. The purpose of the modeling was to analyze and compare effects of Action Alternatives on population size, average population growth rate, and average removal number. Table 4 summarizes the results. Alternative 1 – Proposed Action resulted in the smallest population growth rate and the least number of horses removed. Alternatives 2, 3, and 4 were calculated as the same management action as they have similar population management results and resulted in the least number of horses gathered as compared to the proposed action. In 11 years, the population size would be virtually the same under all action alternatives. The minimum number of years for analysis in the WinEquus program is 10 years. The 10 year analysis gives results on growth rate (in 10 years) and population (gather needs) on year 11. The 10 year analysis fits with the 10 year time frame of this EA.

Table 4: Average Population Size, Growth Rates and Next Projected Gather Year

Alternative	Avg. Pop. Size (11 Years)	Avg. Growth Rate Next 10 years (%)	Next Project Gather (Year)	Est'd No. to Remove (Next 11yrs.)
Alt. 1: Proposed Action	135	9.6	undetermined	229
Alt. 2: Proposed Action/No Fertility Control	133	13.4	undetermined	296
Alt. 3: Proposed Action with Gelding	135	9.6	undetermined	229
Alt. 4: Gate Cut Removal	132	20.4	undetermined	307
Alt. 5: No Action	680	20.4	NA	NA

This modeling was used to identify if any of the alternatives would eliminate the population or cause numbers or growth rates to reach a point where there was no new recruitment to the population. Modeling data indicate sustainable population levels and growth rates would be expected to be within reasonable levels and adverse effects to the population would be unlikely.

Alternative 1: Proposed Action – Remove Excess Wild Horses and Apply Available and Approved Fertility Treatment

Gathering every 4 to 5 years allows BLM to collect Deoxyribonucleic acid (DNA) samples, closely monitor the genetic variability of the herd, and make appropriate changes when testing deems necessary. A consistent gather cycle also enables the maintenance and improvement of desirable physical traits within the herd.

PZP acts as a vaccine against pregnancy by stimulating the production of zone pellucida antibodies in female mammals (Ransom et al. 2011, Liu et al. 1989, Sacco 1977). These antibodies provide a barrier that prevents sperm from binding to the surface of an ovum and results in limited penetration of the zona pellucida and subsequent limited pregnancy in horses (Ransom et al. 2011, Liu et al. 1989). Fertility control application should achieve a substantial treatment effect while maintaining some long-term population growth to mitigate the effects of environmental catastrophes (Ransom et al. 2013, BLM IM 2009-090). Cold Springs HMA was chosen for a fertility vaccination treatment area because the greatest beneficial impacts are expected to be seen where: (1) Annual herd growth rates are typically greater than 5 percent; (2) Post-gather herd size is estimated to be greater than 50 animals; and (3) Treatment of at least 50 percent of all breeding-age mares left on the range is possible. A maximum of 80 percent of all mares should be treated and is encouraged to maximize treatment effects (BLM IM 2009-090).

Contradictory evidence exists regarding the effect of PZP on the behavior of mares treated with PZP and the effect it has on the social structure of a herd. Determining effects is the question. When asked his opinion about behavioral changes associated with native PZP, the liquid formulation accompanied by a primer that is effective for 1 year, Dr. Jay Kirkpatrick states that after 24 years of experience in the field, using native PZP, researchers observing wild horse mares feel that fundamental wild horse social behavior is not changed by the vaccine

(Kirkpatrick et al. 2012). He explains that any behavioral changes that can be documented are the result of successful contraception, e.g. absence of foals, better body condition or increased longevity (Kirkpatrick et al. 2012).

As shown here and in the analysis for Alternative 2 below, there is still a great need for additional studies of the effects of immunocontraception on the behavior of wild horses.

Wild horse populations will produce roughly equal numbers of males and females over time (4700 WHB Handbook, 4.4.1). Re-establishing a 50/50, male to female, sex ratio is also expected to avoid consequences found to be caused by skewing the ratio in either direction. Sex ratio typically adjusted in such a way that 60 percent of the horses are male result in slightly reduced populations (Bartholow 2004), implying that ratios would need to be adjusted even further to account for a significant slowing of population growth. In the Pryor Mountain Wild Horse Range, Singer and Schoeneker (2000) found that increases in the number of males on this HMA lowered the breeding male age but did not alter the birth rate. In addition, bachelor males will likely continue to seek matings, thus increasing the overall level of male-male aggression (Rubenstein, 1986).

Reducing and then maintaining wild horse numbers within AML during the ten-year time frame of the proposed action using approved and available fertility control along with gathers when horses are found to be in excess of the high end of AML would reduce the risk of horses experiencing periods of diminished available forage and/or water (e.g. during drought). Having a plan in place would allow BLM staff to monitor and take appropriate action when needed before an emergency situation arises. Using adaptive management that involves incorporating the use of the most promising methods of fertility control (as long as it is approved for use and available) may allow BLM to extend the years between gather cycles while continuing to maintain numbers within AML and providing for a thriving natural ecological balance. Successful management of many species often relies on actions that involve intensive handling of individuals (Ashley and Holcombe 2001). Nevertheless, extending a gather cycle based upon a slowing of the population growth would extend the frequency of stressful events, such as gathers, put on horses.

The objectives set forth in the SEORMP ROD (2002) to maintain or improve riparian condition, upland health, forage and water resources, and wilderness characteristics would be most likely achieved under Alternative 1 (Proposed Action) because this alternative combines the best tools and actions to maintain wild horse populations within AML and therefore achieve a thriving natural ecological balance.

Alternative 2: Alternative A without Applying Available and Approved Fertility Treatment.

Effects to wild horses under this alternative would be the same as the proposed action with the exception of the use of fertility treatment. With no fertility treatment applied, wild horse numbers are expected to increase by approximately 20 percent annually, as they have in the past in Cold Springs HMA. Therefore, if the post gather population in the Cold Springs HMA is 75 horses (low AML), then within 4 years the herd size would be approximately 155 animals.

An alternative that omits fertility treatment as an action item takes into consideration the concerns regarding the ethics of potentially altering animal behavior and social structure through use of fertility control agents on free-roaming wild horses. Powell (1999) discusses how PZP-treated mares continually undergo nonconceptive cycles and thus demonstrate estrous behavior throughout the season, causing stallions to continue to tend and mate with mares until they cease to cycle in the fall. Ransom et al. (2011) hypothesized the repetitive estrous behavior in PZP treated mares may elicit excess reproductive behaviors prompting more frequent herding and harem-tending behaviors by stallions and elevate frequency of antagonism between stallions and females. Results from their four-year study show control and treated females, however, treated females received 54.5% more reproductive behaviors from stallions per hour than the control females. Nunez et al. (2010) concluded that PZP recipient mares exhibited a change in their reproductive schedule; recipient mares gave birth over a broader time period than did non-recipients. The study by Nunez et al. (2010) provides the first evidence that mares treated with PZP can extend ovulatory cycling beyond the normal breeding season. In addition, results of a study conducted by Madosky et al. (2010) on Shackleford Banks Island horses indicate that PZP used to control population numbers has a significant negative effect on harem stability.

As shown here and in the analysis for Alternative 1 above, there is still a great need for additional studies of the effects of immunocontraception on the behavior of wild horses. Nevertheless, under this alternative the population growth rate would remain at status quo yet the natural reproductive cycles and social behavior would remain without the interference from fertility control treatments.

The objectives set forth in the SEORMP ROD (2002) would become more difficult to achieve in a shorter time under this alternative as fertility treatment to slow population growth in wild horses would not be applied.

Alternative 3: Alternative 1 plus Geld Up to 15 Return Stallions.

BLM's 2010 Wild Horse and Burro Handbook (H-4700-1) suggests adjusting sex ratios by either releasing greater numbers of stallions post-gather or releasing geldings back to their home range. It suggests geldings would have less impact on the herd's social structure as compared to an increase in the proportion of stallions. "Based on anecdotal observations, geldings released back to their home range: (1) tend to remain near where they were released (with adequate forage and water), (2) form small bachelor groups rather than join with a reproducing band, (3) maintain better body condition than the herd average because they are sexually inactive, (4) live longer in comparison to sexually active horses, and (5) were easy to recapture (many have been recaptured and released several times)" (H-4700-1, 2010).

Nevertheless, there are several studies that contradict the efficacy of releasing sterilized stallions into a herd with the intent of slowing population growth. Garrott and Siniff (1992) compared the sterilization of only dominant harem stallions to sterilization of a proportion of all males regardless of their social rank with results indicating that a male-oriented contraceptive program will effectively suppress population growth only when a large proportion of all males are sterilized. The simulation results by Garrott and Siniff (1992) indicate that significant reproduction may occur even when 100% of the dominant harem stallions are sterilized, if other

males perform as little as 10% of the breeding. The long breeding season allows mares to cycle 6-10 times if not successfully bred and provides many opportunities for them to breed with males outside the harem. It would take weeks to months in the field (daily observances during the breeding season) to collect an accurate understanding of which stallions are dominant. BLM does not have the staff or funding to collect this extent of herd information. Eagle et al. (1993) studied the efficacy of sterilizing dominant males, by vasectomy, to reduce foaling rates of feral horses. Vasectomized males remained dominant, although the presence of foals in their bands suggested that subordinate stallions succeeded in inseminating some of the females. Although sterilization of dominant males may be an effective treatment to reduce foaling in a small sample of bands selected from a population, this treatment might not limit population growth (Eagle et al. 1993). In addition, this alternative returns up to 15 geldings to the range and keeps the mare (30) and stallion (30) sex ratio at approximately 50/50. This being said, the annual reproductive rate would virtually remain the same (approximately 20% annually) as previous years, but the beginning number of the reproductive population (30 mares) would be lower than normal as less mares would be released to the range (Refer to Table 5).

Table 5: Comparison of the reproductive population within Alternative A - Proposed Action and Alternative C – Alternative A plus Geld Up to 30 Return Stallions.

Alternative	Description	Make up of Horses Returned to HMA			Total Returned to HMA
		Mares	Stallions	Geldings	
Alternative 1 - Proposed Action	Return 50/50 ratio and apply immunocontraceptive to 28 mares.	37	38	NA	75
Alternative 3	Alternative A *plus* gelding of up to 30 return stallions.	30	30	15	75

An additional concern of a male oriented contraception program is that it may cause some undesirable changes in the seasonal reproductive patterns of wild horses. Horses have a 340-350 day gestation period and undergo a post-foaling heat approximately 5-15 days after parturition (Ginther 1979). These characteristics essentially lock mares into a relatively fixed yearly reproductive cycle, dictating that if a mare conceives during the post-foal heat she will produce consecutive foals at essentially the same time each year. Garrott and Siniff (1992) concluded a potential consequence of introducing substantial numbers of infertile males into the population is disrupted normal seasonal foaling. Shifting the foaling season toward the summer or autumn months would result in large numbers of relatively young foals entering the winter without adequate forage for themselves and the lactating dams, or adequate body reserves to endure long periods of nutritional stress. Garrott and Siniff (1992) predict the consequences of such conditions would undoubtedly be higher mortality of foals during the winter.

This alternative would have the same results as Alternative 1 (*Proposed Action*) as it relates to the objectives from the SEORMP ROD (2002).

Alternative 4: Gate Cut Removal

BLM Manual 4720.34 states budgetary limitations or other considerations may require consideration of "gate cut" removals (e.g. exceptions to the selective removal requirements) to achieve population objectives. This gather option is valid in situations where resources (e.g. water or forage) for horses are limited and threatening their wellbeing; however, does not address the long-term management of the herd. With a gate cut removal, horses not captured would likely be the more difficult horses to gather and manage, further perpetuating that trait. Gate cut removals eliminate the ability to remove wild horses based on animal health or desirable or historical characteristics, which often results in unintended impacts to the remaining herds. For example, horses of larger size, gentle disposition, or bright/light coloring are often easier to locate and capture. Therefore, they are typically the first to be removed and with the gate cut removal method, would not be returned to the HMA. This has the potential to permanently remove these genetic traits from the herd. Sex ratios and age distributions of the un-gathered population would be unknown because the gather would stop when approximately 75 horses remain in the HMA. These factors make estimating population growth and managing herd characteristics in the HMA difficult. Nevertheless, wild horses that are not gathered may be minimally impacted due to the helicopter activity but would otherwise be unaffected. Under this alternative, all impacts to horses would cease once gather operations were complete, as compared to Alternatives 1 through 3. Wild horses would not be held at the holding corrals for extended lengths of time while waiting to apply fertility control and horses would not be stressed by additional handling to apply fertility control. This Alternative would reduce the amount of stress some of the horses would receive during gathers; however, there would be less opportunity for quality control of the horse herd.

According to the results from WinEquus this alternative would have a similar wild horse population as the other action alternatives in 11 years. Wild horse populations would be the same as other action alternatives but the disposition and quality of the herd would be different as there would be no selection process for the horses remaining in the HMA. Horses with poor disposition or territorial and causing resources damage in sensitive areas may not be removed under this alternative. Nuisance horses would remain in their use areas making movement toward achieving objectives such as riparian and upland objectives from the SEORMP ROD (2002) more difficult to achieve

Alternative 5: No Action - Defer Gather and Removal

Based upon the normal 20% annual growth rate observed in this HMA, the No Action Alternative (no gather) would result in 256 adult horses in the HMA in 2016 and approximately 531 horses in the HMA by 2020. Results from WinEquus using the no action alternative indicates in 11 years there would be approximately a maximum of 1,461 horses in the HMA.

The Cold Springs HMA has minimal year-round water sources available. If horses are not gathered, water would be a limiting factor for all uses (horses, wildlife, and livestock) in the HMA. To maintain a thriving natural ecological balance "an adequate year round quantity of water must be present within the HMA to sustain wild horse and burro numbers within AML" (4700 Wild Free Roaming Wild Horse and Burro Management). The Merck Veterinary Manual (Kahn 2005) states that "[w]ater requirements depend largely on environment, amount of work

or physical activity being performed, nature of the feed and physiologic status of the horse." The manual suggests the minimum daily water requirement is 0.4 gallon per 100 pounds of weight, with the average daily intake being closer to 0.65 gallon per100 pounds. The manual also recognizes this would increase under specific conditions, such as sweat loss, increased activity, and lactation, with the increase being as much as 200%, up to 1.3 gallons per 100 pounds per day. Wild horses within the Cold Springs HMA range from 950 to 1,250 pounds. Assuming an average weight of 1,100 pounds, horses within Cold Springs HMA require a minimum daily water intake of 4.2 gallons, with an average daily intake of 6.8 gallons, but the requirement may be as high as 13.65 gallons. This calculates out to 315 gallons per day when the HMA is at the low end of the AML (75 animals) and using only the minimum amount of water, to almost 2,048 gallons per day when the HMA is at the high end of the AML (150) and requiring a water intake 200% above average. Over the course of a year, this translates to a range of 114,975 gallons of water (minimum) to 747,520 gallons of water (maximum). The maximum water requirements would be even higher for the HMA when horse numbers exceed the AML.

BLM has observed impacts from horses on riparian and upland use areas within the HMA with current horse numbers. Taking no action on reducing horse numbers or applying fertility control would only exacerbate the problem. Not only would horses have competition for forage and water with wildlife and livestock, but amongst themselves as well. Horses usually occupy home ranges (undefended, nonexclusive areas), however, when resources are limited, mutual avoidance occurs but can intensify into increased aggression for territory (defended, exclusive areas). In a wild horse behavior study in Grand Canyon, Berger (1977) summarized home ranges for all bands decreased in size in successive warm months, probably due to increased ambient temperature and drought, resulting in greater utilization of spring areas that led to increased interband confrontation and agonistic display. Miller and Denniston (1979) reported that even females participated along with male group mates when threatening another group of horses at water. Increased occurrences of aggressive activities, caused by a lack of necessary resources, and the consequent acute injuries or effects to the health and wellbeing of wild horses would not follow BLM's objective of managing for a thriving natural ecological balance within an HMA.

Non-achievement of the objectives in the 2002 SEORMP ROD, specifically the riparian, upland and forage and water resources objectives, would be realized more rapidly under the No Action Alternative as compared to the action Alternatives which aim to maintain wild horse populations within AML. If no action were taken to reduce the population size, initially there would be no effect to wild horses and forage/water availability. Livestock would be moved from the pasture if adequate forage/water was not available for wild horses present. However, as the population grew increased competition for forage, water and home ranges between wild horse bands would become apparent disrupting social behavior and increasing risk to herd health as forage quantity and quality becomes more limited.

3.2.2 Livestock Grazing Management

Affected Environment – Livestock Grazing Management

Cold Springs HMA is located entirely within the North Star Mountain Allotment. There are three grazing permits which authorize cattle use on the allotment. The operators are authorized to use 9030 Animal Unit Months (AUMs) of forage within the allotment each year between April 1 and October 31. An AUM is the amount of forage needed to sustain one cow, five sheep, or five goats for a month.

The allotment consists of various pastures grazed in a rest-rotation system per the ten-year permits which govern livestock management for the allotment. The Cold Springs HMA is located entirely within the Wildcat/Coldspring Pasture of the North Star Mountain Allotment. The pasture consists of 29,877 public land acres, representing 35% of the acreage within the entire allotment. Use for this pasture is either deferred until after the active growing season (May through June) or rested two of three years in the rotation. Permitted AUMs per pasture have not been identified; however, average actual use for the Wildcat/Cold Springs pasture between 2011-2015 has been 1616 AUMs.

The BLM allocated forage for livestock use in the allotment most recently in the 2002 record of decision for the Southeastern Oregon Resource Management Plan (SEORMP). The allocation was carried forward from the Southern Malheur Rangeland Program Summary (January 1984), and will be revisited during activity planning associated with evaluation and assessment within South Fork Malheur River/Stockades Geographic Management Area as described in the SEORMP.

Table 6 summarizes information about livestock grazing in North Star Mountain Allotment. Through previous decisions, the BLM has allocated available forage to livestock, wildlife and wild horses. The current level of permitted livestock grazing use is approximately 100 percent of that permitted in 1971 when the WFRHBA passed.

Table 6: Livestock Use Information in Allotment

Allotment	Total Allotment Acres	% of Allotment in HMA	Number of Permits	Number of Authorized Livestock	Authorized Season of Use	Authorized Livestock AUMs in Allotment	Average Actual Livestock Use (AUMs) (Past 5 years)
North Star Mountain	91,702 PD 6,283 Pvt 3,824 State	35%	3	1,311 Cattle	4/1 – 10/31	9,030	6488 average 5921 minimum 7119 maximum

During periods of livestock use, utilization collected for livestock use across the entire allotment has ranged from 10% (2014, Mosquito Creek Seeding) to 52% (2013, Mosquito Creek Seeding). Table 7 summarizes livestock grazing information specific to the Wildcat/Cold Springs pasture in which the HMA is located for the past five years and for the upcoming grazing season. Due to a large wildfire in 2014, the Wildcat/Coldsprings Pasture was rested in 2015 and will be rested again in 2016.

Table 7: Livestock Use Information in Herd Management Area

Year	Authorized Use Dates	Livestock Utilization %
2011	4/1 – 6/30	Not collected
2012	7/11 – 9/4	12
2013	rest	0
2014	4/1 – 6/30	33
2015	rest	0
2016	rest	NA

Through previous decisions, the BLM has allocated available forage to livestock, wildlife and wild horses. The current level of permitted livestock grazing use is approximately 100 percent of that permitted in 1971 when the WFRHBA passed.

Environmental Consequences – Livestock Grazing Management

Effects Common to All Alternatives

The current overpopulation of wild horses is continuing to contribute to areas of heavy vegetation utilization, trailing and trampling damage and is preventing the BLM from managing for rangeland health and a thriving natural ecological balance and multiple-use relationships on the public lands in the area.

Livestock grazing would be expected to continue to occur in a manner consistent with grazing permit terms and conditions. Utilization of the available vegetation (forage) would also be expected to continue at similar levels (up to 50%). In some years, this may result in livestock being removed from the area prior to utilizing all of their permitted AUMs.

Impacts Common to Action Alternatives (1-4)

Direct impacts to livestock and management practices from activity associated with gathering, including disturbance resulting from moving horses with a helicopter, would be minimal.

Removal of horses to the lower end of AML within the HMA would reduce competition between livestock and wild horses for the available forage and water resources. This benefit would decrease as wild horse numbers increased until the next gather. Indirect impacts would include an increase in the quality and quantity of the available forage in the short-term. Over the longer-term, improved vegetation resources would lead to a thriving natural ecological condition.

Impacts of Alternative 1 (Removal and Fertility Control) – This alternative would result in a slower increase in wild horse population than with removals only (Alternative 2). This would allow wild horse use to remain within their allocated AUMs for a longer period of time, increasing the availability of forage for livestock up to their full permitted use dependent on annual rangeland conditions. The ability to continue gathers, as needed, over the next 10 years

would decrease the risk of wild horse numbers interfering with the ability of livestock to utilize permitted AUMs while also maintaining an ecological balance by maintaining livestock and wild horse use at allocated levels.

Impacts of Alternative 2 (Removal Only) – Under this alternative, the effects would be the same as under Alternative A with the exception of the long-term benefits. Under this alternative, without the fertility treatment, wild horse numbers would increase at a quicker rate, resulting in the need for more gathers in the long term or increasing the likelihood that livestock use may have to be reduced prior to future gathers due to wild horse populations exceeding the high end of AML and the associated forage competition.

Impacts of Alternative 3 (Removal, Fertility Control, and Gelding) - Under this alternative, the effects would be the same as the proposed action. The only exception being that the beginning number of reproductive population would be less than the normal as fewer mares would be released to the range. The reproductive rate would virtually remain the same (approximately 20% annually) as previous years, but would take longer to populate to the high end of AML and show the subsequent resources effects.

Impacts of Alternative 4 (Gate Cut Removal) - Under this alternative, the effects would be similar as those under Alternative B. The exception would be that the 50/50 sex ratio would not be enforced. If more males were left than females, the reproduction rate would be slower than under alternative B, resulting in a longer period for livestock to fully utilize the permitted AUMs. If more females remained than males, the reproduction rate would be faster than under alternative B, the period livestock would be able to fully utilize permitted AUMs would be decreased.

Impacts of Alternative 5 (No Action)
Utilization of native perennial forage species by authorized livestock has been directly affected due to the current excess of wild horses above the AML. Wild horse numbers above the AML result in wild horses utilizing more AUMs than they were allocated in the 2002 SEORMP/ROD. In order to meet annual utilization targets and allow for management that would meet or make progress towards Rangeland Health Standards in the future, permitted livestock grazing would continue to be reduced below full permitted use, as wild horse numbers continue to exceed AML. Apparent heavy to severe utilization is occurring in areas used by livestock, wild horses, and wildlife, specifically around water sources, as indicated by field observations. These areas are currently receiving heavy use even when livestock are not present. The indirect effects of the No Action (Defer Gather and Removal) Alternative would be continued damage to the range as would be seen in S&Gs not being achieved in the future, continued competition between livestock, wild horses, and wildlife for the available forage and water, reduced quantity and quality of forage and water, and undue hardship on the livestock operators who would continue to be unable to fully use the forage they are authorized.

3.2.3 Upland Vegetation

Affected Environment – Upland Vegetation

Vegetation in the HMA primarily consists of Wyoming big sagebrush (*Artemisia tridentate ssp. wyomingensis*), rabbit brush (*Chrysothamnus viscidifloris*), low sagebrush (*Artemisia arbuscula*), stiff sagebrush (*Artemisia rigida*), bluebunch wheatgrass (*Pseudorogneria spictata*), Thurber's needlegrass (*Stipa thurberiana*), bottlebrush squirreltail (*Elymus elymoides*), Sandberg bluegrass (*Poa sandbergii*), and cheatgrass (*Bromus tectorum*). There are numerous perennial and annual forbs also present in the HMA.

Areas where wild horses and livestock congregate, as well as trailing routes, are heavily utilized with some areas having all vegetation removed. Annual grasses are an issue within the HMA but have not yet become the dominate understory species. There are approximately 15 acres of the invasive annual grass medusahead, and cheatgrass is scattered throughout the HMA. The 1987 and 1993 allotment evaluations both state that the vegetation is on a downward trend and in a mid-seral condition. The five year average livestock utilization is 15%, while utilization by wild horses is ~50% in their preferred areas. Desired perennials weakened by overgrazing allow cheatgrass to increase. Cheatgrass is becoming more predominant in the HMA, especially along horse trailing routes and waterholes. This can be observed in parts of the Wildcat-Coldsprings Pasture. As grazing pressure increases, so will cheatgrass. Medusahead isolates are increasing in the area and will continue to spread due to continued grazing pressure. Where present, it readily moves into cheatgrass stands and becomes the dominant grass. While livestock will commonly eat cheatgrass, medusahead is much less palatable and seldom foraged.

In 2014 the Saddle Draw fire burned 20% of the HMA. While the fire did not kill the native bunchgrasses, it did weaken the plants. Resting the grasses from grazing is needed to restore their health and vigor. Livestock were removed from the HMA for two growing seasons after the fire, but wild horses were not removed. The impacts of wild horse grazing post-fire have not been assessed, but it is anticipated there will be a decrease in perennial grass vigor.

The high wild horse utilization combined with immediate post-fire wild horse grazing may lead to conversion of native plant communities to invasive annual grass monocultures that serve little to no purpose on the landscape.

Environmental Consequences – Vegetation

Impacts Common to Action Alternatives (1-4)

Due to the hoof action and vehicle use around trap sites, upland vegetation is often trampled and/or uprooted. Because of these effects, trap sites would be located in areas previously used or those which have been disturbed in the past. The trap sites would be approximately 0.5 acres in size which would have a minimal effect on upland vegetation in the HMA. However, keeping gather sites in previously used areas or areas previously disturbed would minimize or reduce potential new effects to upland vegetation since vegetation will already have been impacted.

Reducing wild horse numbers to AML would reduce the potential for heavy, annual utilization levels in wild horse use areas. Reductions in horse numbers would result in decreased demand

for forage thus providing opportunity for some plants in use areas to have a full growing season of no use to restore vigor and complete a reproductive cycle. Removal of excess horses would allow native vegetation to improve in areas where they have received continuous moderate to heavy growing season use. Annual utilization of herbaceous plants during the growing season is widely known to reduce plant vigor, reproduction and productivity.

Impacts of Alternative 1 (Removal and Fertility Control)
Applying the fertility vaccine would slow down the reproductive rate reducing the grazing pressure over a longer period of time, disperse wild horse use areas and give native vegetation a greater stronghold. Healthy, diverse and productive plant communities promote improved resiliency, reducing the threat of noxious weed establishment and spread.

Impacts of Alternative 2 (Removal Only)
The environmental consequences on upland vegetation would be similar to Alternative 1 with the exception of slowing down the growth rate as a result of applying fertility treatment. Vegetation would be impacted by increased horse numbers sooner which would decrease vegetative recovery rates post gather.

Impacts of Alternative 3 (Removal, Fertility Control, and Gelding)
The environmental consequences on upland vegetation would be the same as Alternative 1.

Impacts of Alternative 4 (Gate Cut Removal)
The environmental consequences on upland vegetation would be the same as Alternative 2.

Impacts of Alternative 5 (No Action)
Under the No Action Alternative, wild horses in excess of the AML would not be removed. The increased number of horses on the range would increase the amount of utilization and decrease the amount of available forage. Rangeland Health Standards would not be achieved with the continued increase in the wild horse population. At approximately 256 adult horses in 2016 there would be twice that number in four years with a 20% annual growth rate. Consistent heavy (>61%) utilization in wild horse use areas could lead to Rangeland Health Standards not being achieved in the future. If native, perennial vegetation is degraded, the potential for the invasion of annual grasses would occur. Currently there are approximately 15 acres of medusahead known to exist in the Cold Springs HMA. Plant communities consisting of tall tussock perennial grasses are critical in preventing medusahead invasion and increasing tall tussock perennial grass density would reduce the susceptibility of a site to medusahead invasion (Davies, 2008).

No action to maintain the wild horse population within AML is expected to reduce the vigor and resiliency of perennial grasses in the HMA as utilization levels increase, therefore increasing the potential for annual grass invasion. Annual grass communities lack the plant community structure, root occupancy of the soil profile, ability to provide the amount and distribution of plant litter that native communities provide. Annual grass communities, as compared to the potential and capability of native perennial communities, lack the ability to protect the soil surface from raindrop impact; do not provide detention of overland flow; and do not provide maintenance of infiltration and permeability, and protect the soil surface form erosion (Rangeland Health Standards, 1997). Under this alternative increases in annual grasses would

occur and the condition of the range would deteriorate. The loss of native vegetation would lead to soil loss due to exposure to wind and water erosion and would expose previously uninfested areas to noxious and invasive weeds. Increases in erosion directly influence the potential to achieve Rangeland Health Standards 1 – Uplands and 3 – Ecological Processes.

3.2.4 Special Status Species and Habitat

Affected Environment

Columbia spotted frogs are found within the northeastern corner of the Cold Springs HMA and are BLM Sensitive species. Frogs have been identified on Skull Creek and Dry Creek, however, relatively little frog habitat occurs on public land, and there is currently no information on population size, population trends, or grazing impacts on this species within the HMA. Spotted frogs also occur in the Butte Creek and Dry Creek drainages downstream of the HMA, and incursions of wild horses into these areas reduces riparian vegetation crucial to the frogs for thermal cover and protection from predators.

The "Greater Sage-Grouse Conservation Assessment and Strategy for Oregon" (Hagen 2011), hereafter referred to as the Strategy, contains guidelines for wild horse management as it relates to sagebrush habitat management (Pg. 104), it states, "The management goals for wild horses are to manage them as components of the public lands in a manner that preserves and maintains a thriving natural ecological balance in a multiple use relationship. Wild horses are managed in twenty Herd Management Areas (HMAs) that involve 2.8 million acres of public land, primarily in Southeastern OR." The recommended conservation guidelines for wild horses from the strategy are:

1) The cumulative Appropriate Management Level (AML) for horse numbers should be kept within current AML (1,351 to 2,650) in herd management areas.
   a) Management agencies are strongly encouraged to prioritize funding for wild horse round-ups in sage-grouse areas that are over AML.
   b) Evaluate the AMLs for impacts on sagebrush habitat.
   c) Further measures may be warranted to conserve sage-grouse habitat even if horses are not at, above, or below appropriate AML for a herd management area.

In addition, the Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA) (September 2015) outlines the following objectives for wild horse and burro management:

1) *Manage wild horses and burros as components of BLM-administered lands in a manner that preserves and maintains a thriving natural ecological balance in a multiple use relationship.*
2) *Manage wild horse and burro population levels within established appropriate management levels (AML).*
3) *Complete assessments of Greater Sage-grouse habitat indicators for HMAs containing PHMA and GHMA.*

The Cold Springs HMA is located within a Priority Area for Conservation (PAC) and Fire and Invasive Assessment Tool (FIAT) Planning Area in the Northern Great Basin. The Crowley PAC is currently meeting habitat management thresholds identified in the ARMPA with 81% existing sage-grouse habitat. Below 65% would trigger adaptive management. Population management thresholds within the PAC have been crossed, indicating that management changes are needed (ARMPA, 2015).

Greater Sage-Grouse (GRSG) use the HMA yearlong and have 4 leks within the HMA, 1 of which is classified as occupied pending and the other 3 are unoccupied pending. An "Unoccupied-pending" as defined by ODFW is a lek not counted regularly in a 7 year period, but birds were NOT present at last visit. All 29,877 BLM managed acres in the Cold Springs HMA is designated Preliminary Priority Habitat. More than 80% of nests are located within four miles of a lek (Hagen 2011). All but 450 acres or 98.5% of the HMA is within four miles of a lek site. Since most sage-grouse hens nest during late March to early April, new growth of perennial grasses is minimal and previous years' (residual) grass growth provides cover for nesting. Grass height is a strong predictor of GRSG nest survival, and increasing hiding cover can increase nest success (Taylor et al. 2012; Doherty et al. 2011). DeLong et al. (1995) found lower predation rates on artificial nests at Hart Mountain, Oregon, were associated with tall grass cover and medium-height shrub cover. Similarly, a study at Hart Mountain and Jackass Creek showed that nests not subject to predation were in areas of greater cover of residual grass, with medium-height shrubs, than were nests subject to predation (Gregg et al. 1994). Grazing reduces grass height and can reduce GRSG nesting success (Beck and Mitchell 2000; Doherty et al. 2014).

Brood rearing also occurs within the HMA, but with few meadow areas in the HMA, sage-grouse hens would be expected to move to higher elevations. During the summer months, sage-grouse seek water, usually associated with wet meadows and succulent vegetation (Call and Maser 1985). Sage-grouse winter in lower elevations of the HMA, depending on snow depth during the winter. Sage-grouse rely heavily on sagebrush leaves for food during the winter, and as such choose areas where there is sagebrush above the snow or on windswept areas.

Environmental Consequences – Special Status Species and Habitat

Effects Common to All Alternatives

Under all alternatives wild horses would continue to graze within the Cold Springs HMA. The sagebrush plant communities within the HMA that support sage-grouse are very complex and successionally dynamic, making it difficult to form large-scale conclusions about the impacts of grazing on sage-grouse populations (Crawford et al. 2004). Grazing effects are not distributed evenly because historic practices, management plans and agreements, and animal behavior all lead to differential use of the range (Manier et al. 2013). However, research suggests it is possible for grazing to be managed in a way that promotes forage quality for sage-grouse since grazing may result in increased forb presence (Vavra 2005).

Impacts Common to Action Alternatives (1-4)

In these alternatives sage-grouse would have the same resources available as are currently present within the HMA. Horse numbers would be reduced to AML reducing the occurrence of large areas of uniform utilization at heavy intensities on a year round basis. Utilization is not

expected to exceed 50%. Anderson and McCuistion (2008) found grazing management (including horses), when upland birds are present, should be flexible, but limited to a light to moderate use (30%-50% utilization). They concluded light to moderate use can increase forb quality and quantity since it can delay the maturation of forbs, extending availability throughout the growing season. Adams et al. (2004) suggests that light to moderate grazing encourages the height and cover of sagebrush and other native species during nesting seasons, and light grazing is used to create patches in the vegetation, increasing the herbage of species preferred by sage-grouse, especially during nest and brood rearing. Moderate levels of livestock use are generally considered compatible with maintaining perennial bunchgrass, with the level of sustainable use depending on a number of environmental factors (Hagen 2011).

Under these alternatives, herbaceous cover, as well as riparian vegetation, is expected to increase which will benefit the sage grouse and Columbia spotted frogs by providing improved thermal cover and protection from predators. This would improve survivability and may increase population over time resulting in numbers at or above management objectives. Areas within the HMA near water sources would continue to be affected by concentrated grazing uses. Portions of the HMA away from existing waterholes and springs would have non-grazed areas, which would be expected to provide more suitable nesting sites for sage-grouse due to more residual grass cover. This would be expected to be highest in areas outside of the current use area during drought years and lowest in these areas during wet years since in those years it would be expected that all water sources would have water and attract livestock and wild horses while dispersing their use. Residual grass cover provides horizontal screening at nest sites, in addition to screening from shrubs, which is believed to reduce predation. Maintaining wild horse numbers with AML would aid BLM land managers in their ability to provide quality sage-grouse habitat in the quantities needed for their survival and the growth of populations. This alternative would maintain achievement of Rangeland Health Standard 5 with the goal of providing habitats that support healthy, productive and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate and landform. This alternative would not contribute to the decline of sagebrush habitat for sage-grouse or the reduction of sage-grouse populations.

Impacts of Alternative 5 (No Action)

Under this alternative horse numbers would continue to increase; resulting in greater use of the area and reduce residual grasses that provide horizontal cover for sage-grouse nests. Riparian vegetation browsing and trampling of springs, primarily due to wild horse use, would further degrade habitat conditions for wildlife, including Columbia spotted frogs. Utilization studies in the HMA are currently showing only localized moderate to heavy (41-60% to 61-80%) use areas around water sources and wild horse home ranges. This alternative would likely expand those moderate to heavy use areas with an indefinite increase in wild horse numbers. Findings from France et. al. (2008) suggests cattle initially concentrate grazing on plants between shrubs, and begin foraging on perennial grasses beneath shrubs as interspace plants are depleted. It can be assumed wild horse use would mimic cattle use of perennial grasses as the more easily accessible plants would be grazed first. France et. al. (2008) found cattle use of understory perennial grass was minimal until standing crop utilization reached about 40%; although this utilization level would likely vary depending on sagebrush density, sagebrush arrangement (e.g., patchy vs. uniform distribution), bunchgrass structure, and accompanying forage production levels. As

utilization levels increase across the HMA with increased wild horse numbers it is expected that horizontal screening cover of sage-grouse nests would decline. An increase in wild horse numbers would also decrease the likelihood that individual perennial plants could receive a full growing season of rest from wild horse use. When perennial plants lack adequate growing season rest periods where they are able to complete a full reproductive cycle the plant community composition, age class distribution, and productivity of healthy habitats is negatively affected thus influencing the ability to achieve Rangeland Health Standard 5 for native, T&E and Locally Important Species. Increases in wild horse numbers beyond AML could also lead to direct competition between horses and sage-grouse for food sources during critical stages of the sage-grouse life cycle (nesting and brood rearing), with less available resources for sage-grouse due to over utilization of the area by horses. This alternative could, and is expected to, result in lower habitat quality for sage-grouse and contribute to the further reduction of sage-grouse habitat and population numbers. Habitat management thresholds identified in the ARMPA would move toward or meet triggers over time and population thresholds would move from soft to hard triggers requiring more restrictive action.

3.2.5 Migratory Birds

Affected Environment – Migratory Birds

The sagebrush steppe present within the HMA supports several species of sagebrush obligate and facultative migratory birds, including sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza belli*), Brewer's sparrow (*Spizella breweri*), and loggerhead shrike (*Lanius ludovicianus*). Other species commonly occurring in sagebrush habitat in the area include mountain bluebird (*Sialia currucoides*), vesper sparrow (*Pooecetes gramineus*), horned lark (*Eremophila alpestris*) and western meadowlark (Sturnella neglecta). Bird species associated with western juniper include gray flycatcher (*Empidonax wrightii*), dusky flycatcher (*Empidonax oberholseri*), northern flicker (*Colaptes auratus*), and American robin (*Turdus migratorius*). Raptors found in or near the project area include golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius*), prairie falcon (*Falco mexicanus*), long-eared owl (*Asio otus*) and short-eared owl (*Asio flammeus*). Species listed by the US Fish and Wildlife Service as Birds of Conservation Concern that occur in the HMA are golden eagle, ferruginous hawk, loggerhead shrike, sage thrasher, Brewer's sparrow, and sage sparrow (USFWS 2008).

Fires have burned approximately 31% of the HMA and is the dominant factor influencing the affected environment for migratory birds, but other actions have helped shape the existing conditions. Other past and present actions affecting the area include road and fence construction, water developments, livestock and wild horse grazing, and recreation. These actions and events can have mixed effects on migratory birds and their habitat depending on the species. Livestock and wild horse grazing is the most widespread and long-term actions occurring within the affected environment; and is managed and monitored to facilitate sustainable multiple use, including maintenance of migratory bird habitat.

Environmental Consequences – Migratory Birds

Impacts Common to Action Alternatives (1-4)
Under these alternatives, herbaceous cover is expected to increase which will benefit migratory birds by providing improved nesting and hiding cover, protection from predators, and forage. Maintaining wild horse numbers with AML would aid BLM land managers in their ability to provide quality migratory bird habitat in the quantities needed for their survival and the growth of populations. This alternative would maintain achievement of Rangeland Health Standard 5 with the goal of providing habitats that support healthy, productive and diverse populations and communities of native plants and animals. This alternative would not contribute to the decline of sagebrush habitat for sagebrush obligate species.

Some migratory birds could be temporarily disturbed or displaced by the helicopter or by placement of traps, however the general helicopter gather period would be outside the breeding and nesting period. Impacts would be short term (<2 weeks) and many species of migratory birds would return to regular use of the areas after the disturbance has passed. Reduction of wild horse numbers to AML would reduce utilization of forage and water resources by horses, reducing competition for these resources and allowing for improvement of habitat conditions for migratory bird species.

Impacts of Alternative 5 (No Action)
Under this alternative horse numbers would continue to increase; resulting in greater use of the area and reduced residual grasses that provide food, hiding cover and nesting habitat for migratory birds. An increase in wild horse numbers would also decrease the likelihood that individual perennial plants could receive a full growing season of rest from wild horse use. When perennial plants lack adequate growing season rest periods where they are able to complete a full reproductive cycle, the plant community composition, age class distribution, and productivity of healthy habitats is negatively affected thus influencing the ability to achieve Rangeland Health Standard 5 for native, T&E and Locally Important Species. Increases in wild horse numbers beyond AML could also lead to direct competition between horses and migratory birds for food sources during critical stages of their life cycle (nesting and brood rearing), with less available resources due to over utilization of the area by horses. This alternative could, and is expected to, result in lower habitat quality for migratory birds and contribute to the further reduction of migratory bird habitat.

3.2.6 Wildlife and Locally Important Species

Affected Environment – Wildlife and Locally Important Species
A variety of wildlife, other than migratory birds and SSS, include small mammals (black-tailed jackrabbit, cottontails, ground squirrels, pocket gophers, deer mouse, bobcat, yellow-bellied marmot, wood rats, voles, chipmunks, bats) cougar, coyote, amphibans, and reptiles common to southeast Oregon can be found throughout the area. Pronghorn antelope (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), and elk (*Cervus canadensis*) use the HMA to varying extents. Pronghorn and mule deer are present year-long while elk generally migrate into the herd area during the winter. Chukar partridge (*Alectoris chukar*) are also found in the area.

Forage allocation for wildlife in North Star Mtn Allotment is 450 AUMs for deer, 125 AUMs for antelope, and 25 AUMs for elk (SEORMP Appendix E, 2002).

Wild horses present throughout the HMA may exclude other wildlife use from water sources, especially in late summer when water sources are limited. Miller (1983) found that when antelope could get to water while being no closer than 3 meters from a wild horse or cow, they were able to water; otherwise, they would only circle the waterhole, leave, and return later to try again.

Mule deer use bitterbrush as a fall and winter browse. Historically there were several areas throughout the HMA with extensive stands of bitterbrush, however these areas have been greatly reduced due to wildfire and wild horse grazing. The increase in wildfires in the Great Basin has resulted in loss of important big game winter ranges in the Great Basin (Pellant 1990; Updike et al. 1990), habitat supporting North America's densest concentration of nesting raptors (Kochert and Pellant 1986), and nongame bird occurrence (Dobler 1994). In addition, plant diversity is reduced at both the local and landscape levels with frequent wildfires (Whisenant 1990). Not only is cheatgrass a permanent component of many Intermountain ecosystems, including within Cold Springs HMA, it is the focal point for the disruption of many ecosystem processes and functions. Wildfire cycles are shorter and severity and extent of fire impacts are greater with cheatgrass in the ecosystem. Wildlife species are affected both directly by alteration of habitat due to cheatgrass invasion and indirectly by the loss of habitat due to increased wildfires. Also, the diversity and cover of microbiotic crusts are diminished with cheatgrass in the ecosystem allowing additional entry of cheatgrass and other weeds. The rangeland health of cheatgrass infested communities is either at risk or already in the unhealthy category with even more undesirable weeds invading some cheatgrass communities (Pellant 1996).

Environmental Consequences – Wildlife and Locally Important Species

Impacts Common to Action Alternatives (1-4)
Some wildlife could be temporarily disturbed or displaced by the helicopter or by placement of traps. Impacts would be short term (<2 weeks) and many species of wildlife would return to regular use of the areas after the disturbance has passed. Reduction of wild horse numbers to AML would reduce utilization of forage and water resources by horses, reducing competition for these resources and allowing for improvement of habitat conditions for wildlife species.

Impacts of Alternative 5 (No Action)
Over time the wild horse population would continue to increase, using more resources and leaving fewer forage species for wildlife to graze upon. Of the three most common big game species in the HMA; elk, then pronghorn would be effected before forage competition between deer and wild horses was evident as Hubbard and Hansen (1976) found wild horse foods were 40% identical to elk in the Red Desert of Wyoming; on an annual basis, dietary overlap between feral horses and pronghorn averaged 16% and ranged from 7 to 26% (McInnis and Vavra 1987); and a study by Hansen et al. (1977) found that mule deer food habits appear to be complementary rather than conflicting with diets of wild horses. The no action alternative and the subsequent increase in wild horse numbers would also cause increased competition, between horses and some wildlife, for water. As wild horse numbers increase they may exclude wildlife

from using water sources, especially in late summer when water sources are limited and horse concentrations are high around the remaining water sources. Miller (1983) found pronghorn often came to a water hole, walked around the concentration of horses and left, only to return shortly and repeat the behavior. When there was enough room at a waterhole for pronghorn to drink without getting closer than 3 meters to a horse or cow, they drank freely. Miller (1983) also found that the presence of horses at waterholes did not prevent either sage grouse or coyotes from drinking. As horse numbers increase, wildlife numbers in the HMA could decrease due to lack of forage base support and accessible water sources.

3.2.7 Noxious Weeds

Affected Environment – Noxious Weeds

Noxious weeds are known to exist within the HMA. A complete survey of the area has not been conducted. Table 8 shows approximate acres and locations.

Table 8: Cold Springs HMA Weed Sites

Weed Species	Approx. Acres	Invasion sites
Russian knapweed	1.0	Crowley Road
Diffuse knapweed	0.25	Road Canyon
Whitetop	2.0	Roads, trails, disturbed areas
Perennial pepperweed	0.1	Springs, seeps, moist areas
Scotch thistle	2.0	Roads, trails, disturbed areas
Canada thistle	0.1	Springs, seeps, moist areas
Bull thistle	0.1	Springs, seeps, moist areas

Known sites of Russian knapweed, whitetop, pepperweed and Scotch thistle are subject to on-going treatments. One diffuse knapweed site in the Road Canyon area adjacent to the HMA, and associated outliers, has been treated and continue to be monitored for flare-ups.

Environmental Consequences – Noxious Weeds

Affects Common to All Alternatives

Areas of high horse concentration lead to heavy grazing. This disturbance opens up more niches for noxious weed establishment and spread. By maintaining horse numbers at or below AML, the opportunities for noxious weed spread would be reduced. Limiting vehicle travel to existing roads and ways and timing gather events to avoid times of high spread potential (seed shatter, muddy conditions, etc.), as much as possible, combined with aggressive weed treatment during the year pre-gather and avoiding noxious weed infested areas when selecting trap sites, would limit the potential of noxious weed spread during gathering operations. Gather sites would be noted, monitored by the range staff, and should weeds become evident, those details would be reported to district weed personnel for treatment and monitoring. Gather related monitoring and treatment of noxious weeds are described in the Project Design Features section 2.1.1.

Impacts Common to Action Alternatives (1-4)
By reducing horse populations and managing within AML, vegetation in areas of horse usage within the HMA would be less heavily grazed, allowing the desirable vegetation to be more vigorous and competitive and provide less opportunity for new weed infestations. The fertility treatment may lengthen the time before horse numbers return to high AML which would allow the vegetation a longer time period in which to recover.

Improving desirable riparian vegetation, along with aggressive weed treatments, would reduce the dominance of this noxious weed and allow the riparian areas to recover and function properly. Aggressive weed treatments along roads and other disturbed areas reduce opportunities for spread from all vectors, including increased recreation activities.

If the gather activities follow the listed Standard Operating Procedures (SOPs) and Project Design Elements, including thoughtful selection of ***timing*** of gathers which minimize likelihood of weed spread, then the gather activities themselves would not increase the opportunities for increased noxious weed introduction and spread. Trap sites would be disturbed and would need to be monitored at least 2 years post-gather. Any weeds found need to be treated in a timely manner using the most appropriate methods.

Impacts of Alternative 5 (No Action)
The continuing increase in horse numbers above the AML would lead to areas of higher horse concentrations causing more impacts to the vegetation due to overgrazing. This opens up more niches for noxious weeds to establish and spread. Areas of horse concentration and consequent heavy use typically are highest near riparian areas, springs and reservoirs. This would exacerbate the recovery of the riparian areas and lead to increases in Canada thistle and other riparian weeds such as perennial pepperweed and whitetop. Heavier use around already disturbed areas such as water holes and congregation areas would lead to increased disturbance and consequent increases in noxious weed establishment.

3.2.8 Hydrology and Riparian-Wetland Areas

Affected Environment – Hydrology and Riparian-Wetland Areas
Cold Springs HMA lies within the Lower Owyhee Subbasin (HUC #17050110). Two main drainages exist within the HMA, Wildcat Creek (5.2 miles) and Cold Spring Creek (3.5 miles). These creeks lie in the northern and central portion of the HMA and are mostly intermittent flow with small segments of perennial water that persist throughout the year. These drainages are tributaries to Dry Creek, a tributary to the Owyhee River. Riparian vegetation is sparse along the drainages and isolated to those areas of perennial surface water. Where riparian vegetation does exist it is primarily herbaceous (sedge and rush species) and a few isolated willows. Small aspen groves persist where snow drifts accumulate. The HMA has multiple springs and seeps and several reservoirs scattered throughout that are reliable yearlong water sources. Inventory and assessments have not fully been completed on these riparian areas, but field observations indicate there is significant horse use on all riparian areas in the HMA.

Environmental Consequences – Hydrology and Riparian-Wetland Areas

Impacts Common to Action Alternatives (1-4)
The action alternatives would limit the intensity of use at water sources and surrounding uplands. Regulating the number of wild horses in the HMA would decrease frequency, duration and intensity of use, reducing degradation to water sources and riparian areas in the HMA

Trap sites would not be located adjacent to any surface water sources or riparian areas; therefore, there would be no anticipated direct impact due to the gather.

Impacts of Alternative 5 (No Action)
Increasing numbers of wild horses in the HMA would result in greater use and degradation of riparian areas. This would result in an unacceptable decline in water quality through increased sedimentation and water temperatures. Riparian area vegetation would be degraded as additional horse use would decrease vegetation recruitment, reproduction, and survivability. In addition, riparian vegetation community types and distribution would be changed, root density lessened, and canopy cover reduced. This would lead to reduced stream channel and spring/seep dynamics and further deterioration of these systems.

3.2.9 Upland Soils and Biological Crusts

***Affected Environment* – Upland Soils and Biological Crusts**
The soils found in the Cold Springs HMA were surveyed and described in Oregon's Long Range Requirements for Water 1969, Appendix I-11, Owyhee Drainage Basin. There are four general soil classification units within the HMA. Unit 56 (28%-9046 acres), Unit 76 (65%-21,181 acres), Unit 77 (3%-1000 acres) and Unit 84 (3%-1000 acres). Microbiotic crusts have not been inventoried, but are known to exist in the HMA.

Unit 56 soils are shallow, well drained soils with clayey subsoils and cemented pans. They occur on very extensive, gently sloping to moderately steep old fans on high terrace remnants. Native vegetation consists mostly of big sagebrush, low sagebrush, rabbitbrush, budsage, Atriplex spp., needlegrass, and squirreltail grass. These soils occur on 3-12% slopes.

Unit 76 soils are shallow, clayey, very stony, well drained soils over basalt, rhyolite, or welded tuff. These soils occur on gently undulating to rolling lava plateaus and some very steep faulted and dissected terrain. Native vegetation consists mostly of big sagebrush, low sagebrush, bluebunch wheatgrass, and Sandberg bluegrass. This soil makes up approximately 70% of the HMA. These soils occur on 20 – 60% slopes.

Unit 84 soils make up the steep canyon area on the southwestern part of the HMA where a large portion of the water sources for the HMA are found. These soils are very shallow, very stony, rocky, well drained soils over basalt, rhyolite, or welded tuff. They occur on gently undulating to rolling plateaus and very steep canyon lands and escarpments. Native vegetation consists mostly of low sagebrush, Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass, and juniper.

Biological Soil Crusts (BSCs) have not been inventoried, but are known to exist in the HMA. BSCs contribute important functions in an ecosystem included but not limited to increasing the residence time of moisture and reducing erosional processes. Factors influencing distribution of

BSCs (TR-1730-2) include, but are not limited to: elevation, soils and topography, percent rock cover, timing of precipitation, and disturbance.

Possible disturbances that have occurred within the HMA include, but are not limited to: effects from livestock grazing, vehicles, wild horses and recreation.

Environmental Consequences – Upland Soils and Biological Crusts

Impacts Common to Action Alternatives (1-4)
Wild horses, much like livestock, tend to congregate around areas where resources are plentiful, such as water sources. When horse numbers increase, the impacts to soils and biological soil crusts (e.g. soil compaction) increase. Soil loss and compaction would be expected to decrease in those areas near water sources where horses are forced to concentrate. Lower populations of horses would result in less hoof traffic, thereby decreasing negative impacts to soil and micro biotic crusts.

Soil would be displaced and/or disturbed on two acres at each site in the construction of the trap, use of the access routes, and in the round-up and loading of the wild horses. The area of severe surface disturbance is normally less than 2,000 square feet. Minimal surface wind and water erosion is expected on these areas during the vegetative rehabilitation period (approximately 1 to 3 years).

Impacts of Alternative 5 (No Action)
Under the No Action Alternative, wild horse numbers would increase at a rate of approximately 20% per year with no gathering to the lowest AML. Increases in horse numbers would lead to excessive overgrazing which would expose soils to wind and water erosion and remove biological soil crusts from the HMA. Larger areas around water resources would become compacted as animal numbers increase. Increased loss of biological soil crusts across the HMA would occur as wild horses utilize more of the area looking for resources as they become scarce.

4.0 CUMULATIVE EFFECTS

The NEPA regulations define cumulative impacts as impacts on the environment that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such 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 impacts study area (CSA) for the purposes of evaluating cumulative impacts is the Cold Springs HMA.

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

4.1 Past Actions

In 1971 Congress passed the Wild Free-Roaming Horses and Burros Act which placed wild and free-roaming horses and burros, that were not claimed for individual ownership, under the protection of the Secretaries of Interior and Agriculture. In 1976 the Federal Land Policy and Management Act (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 (PRIA) was passed which amended the WFRHBA to provide additional directives for BLM's management of wild free-roaming horses on public lands.

Past actions include establishment of wild horse HMAs and establishment of AML for wild horses, wild horse gathers, vegetation treatment, livestock grazing, wildfires, and recreational activities throughout the area. Some of these activities have increased infestations of invasive plants, noxious weeds, and pests and their associated treatments.

In August 2002 the SEORMP was signed. Currently, management of HMAs and wild horse population is guided by the 2002 SEORMP. The AML range for the Vale District is 714-1392 wild horses. The Land Use Plan analyzed impacts of management's direction for grazing and wild horses, as updated through Bureau policies, Rangeland Program direction, and Wild Horse Program direction. It also reaffirmed boundaries and AMLS for the Vale District's HMAs to ensure sufficient habitat for wild horses and achieve a thriving natural ecological balance and rangeland health..

Adjustments in livestock season of use, livestock numbers, and grazing systems were made through the allotment evaluation/multiple use decision process. In addition, temporary closures to livestock grazing in areas burned by wildfires, or due to extreme drought conditions, were implemented to improve range condition.

The Southeast Oregon Resource Advisory Council (SEORAC) developed standards and guidelines for rangeland health that have been the basis for assessing rangeland health in relation to management of wild horse and livestock grazing within the Vale District. Adjustments in numbers, season of use, grazing season, and allowable use have been based on the evaluation of progress made toward reaching the standards.

4.2 Present Actions

Program goals have expanded beyond establishing a "thriving natural ecological balance" by setting AML for individual herds to now include achieving and maintaining healthy and stable populations and controlling population growth rates.

Though authorized by the WFRHBA, current appropriations and policy prohibit the destruction of healthy animals that are removed or deemed to be excess. Only sick, lame, or dangerous animals can be euthanized, and destruction is no longer used as a population control method. A recent amendment to the WFRHBA allows the sale of excess wild horses that are over 10 years in age or have been offered unsuccessfully for adoption three times. BLM is adding additional long-term grassland pastures in the Midwest and West to care for excess wild horses for which

there is no adoption or sale demand. Most animals not immediately adopted or sold have been transported to long-term grassland pastures in the Midwest. Approximately 47,628 excess wild horses are being maintained within BLM's off-range corrals (USDI-BLM-WHB Program 2016).

The actions which have influenced today's wild horse population are primarily wild horse gathers, which have resulted in the capture and removal of some 1,063 wild horses (see Table 2).

Within the proposed gather area cattle grazing occurs on a yearly basis. Wildlife use by large ungulates such as elk, deer, and antelope is also currently common in the project area. The focus of wild horse management has also expanded to place more emphasis on achieving rangeland health as measured against the SEORAC Standards. Adjustments to numbers, season of use, grazing season, and allowable use are based on evaluating achievement of or making progress toward achieving the standards.

Both the "Greater Sage-Grouse Conservation Assessment and Strategy for Oregon" (Hagen 2011) and the Oregon Greater Sage-Grouse ARMPA (2015) contains guidelines for wild horse management as it relates to maintaining or enhancing Greater Sage-Grouse habitat. The plans emphasize appropriate wild horse management throughout the Vale District.

4.3 Reasonably Foreseeable Future Actions

Future wild horse management in the Vale District would focus on an integrated ecosystem approach with the basic unit of analysis being the watershed. This process will 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 and USFS achieve AML on a national basis, gathers should become more predictable due to facility space. Population growth suppression (PGS) 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 and help resolve issues leading to the over population of wild horses in the proposed gather area.

The proposed gather area 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 the Proposed Action include: future wild horse gathers, continuing livestock grazing in the allotments within the area, mineral exploration, 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. The significance of cumulative effects based on past, present, proposed, and reasonably foreseeable future actions are determined based on context and intensity.

Both the "Greater Sage-Grouse Conservation Assessment and Strategy for Oregon" (Hagen 2011) and the Oregon Greater Sage-Grouse ARMPA (2015) will continue to guide wild horse management as it relates to maintaining or enhancing Greater Sage-Grouse habitat. The plans emphasize appropriate wild horse management throughout the Vale District in the future.

4.4 Summary of Past, Present, and Reasonably Foreseeable Future Actions

Impacts Common to Action Alternatives (1-4)
The cumulative effects associated with the capture and removal of excess wild horses includes gather-related mortality of less than 1% of the captured animals, about 5% per year associated with transportation, short term holding, adoption or sale with limitations and about 8% per year associated with long-term holding. This compares with natural mortality on the range ranging from about 5-8% per year for foals (animals under age 1), about 5% per year for horses ages 1-15, and 5-100% for animals age 16 and older (Stephen Jenkins, 1996, Garrott and Taylor, 1990). In situations where forage and/or water are limited, mortality rates increase, with the greatest impact to young foals, nursing mares and older horses.

The other cumulative effects which would be expected when incrementally adding either of the Action Alternatives to the CSA would include continued improvement of upland vegetation conditions, which would in turn benefit permitted livestock, native wildlife, and wild horse population as forage (habitat) quality and quantity is improved over the current level. Benefits from a reduced wild horse population would include fewer animals competing for limited forage and water resources. Cumulatively, there should be more stable wild horse populations, healthier rangelands, healthier wild horses, and fewer multiple use conflicts in the area over the short and long-term. Over the next 15-20 years, continuing to manage wild horses within the established AML range would achieve a thriving natural ecological balance and multiple use relationship on public lands in the area.

Impacts of Alternative 1 (Proposed Action)
Application of fertility control and adjustment in sex ratios to favor males should slow population growth and result in fewer gathers and less frequent disturbance to individual wild horses and the herd's social structure. However, return of wild horses back into the HMA could lead to decreased ability to effectively gather horses in the future as released horses learn to evade the helicopter.

Impacts of Alternative 3 (Removal and Fertility Control)
Application of fertility control should slow population growth and result in fewer gathers and less frequent disturbance to individual wild horses and the herd's social structure. However, return of wild horses back into the HMA could lead to decreased ability to effectively gather horses in the future as released horses learn to evade the helicopter.

Impacts of Alternative 4 (Removal and Sex Ratio Adjustment)
Adjusting the sex ratio of the herd should slightly slow population growth and result in fewer gathers and less frequent disturbance to individual wild horses and the herd's social structure. However, return of wild horses back into the HMA could lead to decreased ability to effectively gather horses in the future as released horses learn to evade the helicopter.

Impacts of Alternative 5 (No Action)
Under the No Action Alternative, the wild horse population could exceed the low end of AML by approximately four or five times in four years. Movement outside the HMA would be expected as greater numbers of horses search for food and water for survival, thus impacting larger areas of public lands. Heavy to excessive utilization of the available forage would be expected and the water available for use could become increasingly limited. Eventually, ecological plant communities would be damaged to the extent that they are no longer sustainable and the wild horse population would be expected to crash.

Emergency removals could be expected under this alternative in order to prevent individual animals from suffering or death as a result of insufficient forage and water. During emergency conditions, competition for the available forage and water increases. This competition generally impacts the oldest and youngest horses as well as lactating mares first. These groups would experience substantial weight loss and diminished health, which could lead to their prolonged suffering and eventual death. If emergency actions are not taken, the overall population could be affected by severely skewed sex ratios towards stallions as they are generally the strongest and healthiest portion of the population. An altered age structure would also be expected.

Cumulative impacts would result in foregoing the opportunity to improve rangeland health and to properly manage wild horses in balance with the available forage and water and other multiple uses. Attainment of site-specific vegetation management objectives and Standards for Rangeland Health would not be achieved. AML would not be achieved and the opportunity to collect the scientific data necessary to re-evaluate AML levels, in relationship to rangeland health standards, would be foregone.

5.0 CONSULATION AND COORDINATION

A scoping letter was mailed to 68 interested parties on May 11, 2016, to notify them of BLM's intent to manage wild horses within AML, specifically the need to address the excess horses above AML. In addition, this EA was mailed to the same individuals allowing a 30-day comment period.

5.1 Agencies and Individuals Consulted

Oregon Department of Fish and Wildlife, Ontario, Oregon
Grazing Permittees

5.2 Interdisciplinary Team

Shaney Rockefeller, Wild Horse and Burro Specialist (Lead Preparer - Wild Horses)
Rebecca Evans, Range Management Specialist (Livestock Grazing Management)
Susan Fritts, Botanist (Upland Vegetation)
Megan McGuire, Wildlife Biologist (SSS-Animals, Migratory Birds, Wildlife)
Lynne Silva, District Weed Specialist (Noxious Weeds)
Todd Allai, Natural Resource Specialist (Riparian, Water Quality, Soils, BSCs)
Brent Grasty, District Planning and Environmental Coordinator
Kari Points, Outdoor Recreation Planner (Wilderness, WSR, WSAs, Recreation)
Cheryl Bradford, Archaeologist (Cultural Heritage)
Marissa Russell, GIS Specialist
Pat Ryan, Malheur Resource Area Manager

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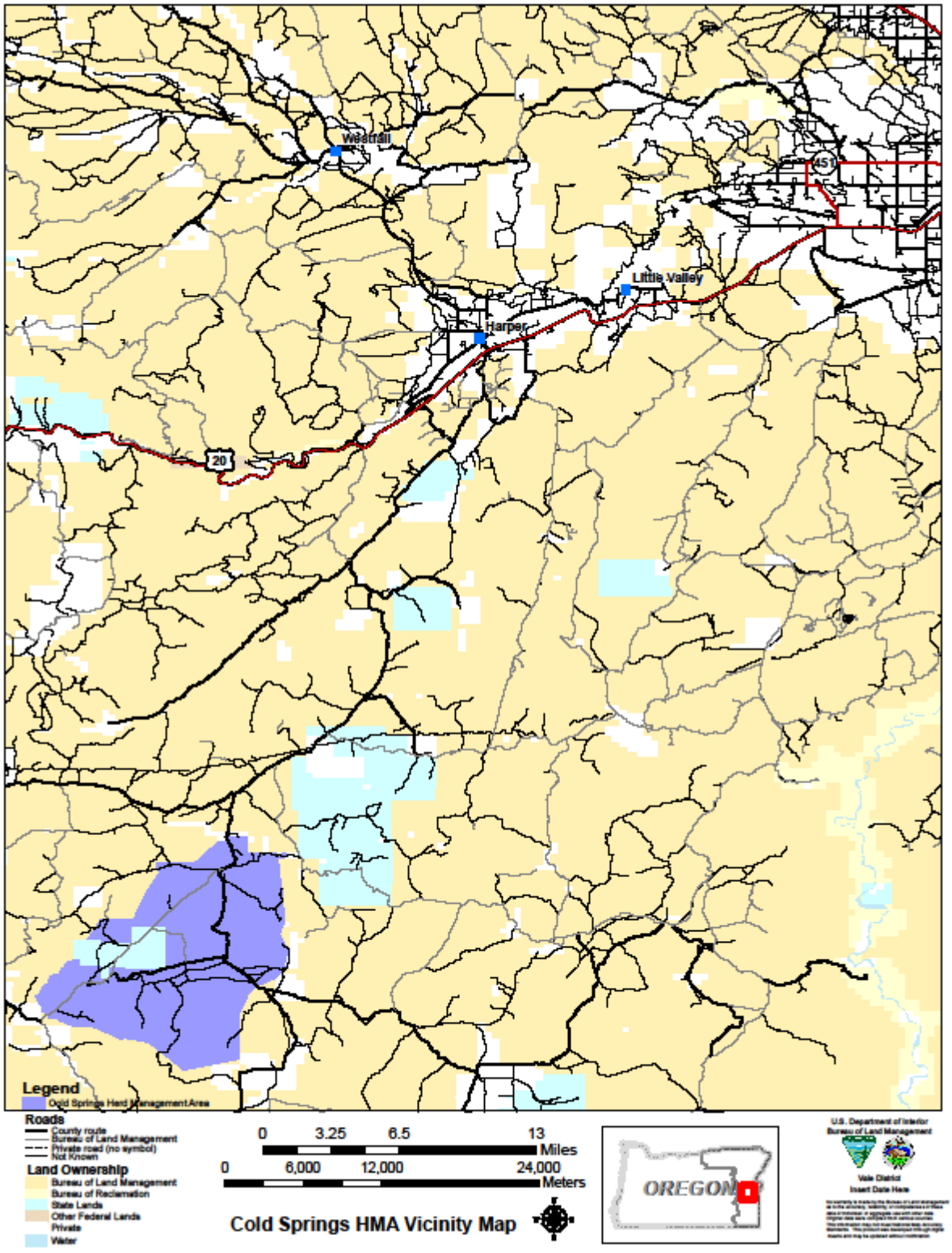
7.0 APPENDICES

Appendix A – Vicinity Map



Appendix B - Issues Considered But Not Analyzed in Detail

The following issues were raised by the public or Bureau of Land Management (BLM) during scoping and internal reviews for the project. These issues have been considered but eliminated from detailed analysis because they are outside the scope of this analysis or do not relate to how the proposed action or alternatives respond to the purpose and need:

- ***Can livestock AUMs be reduced to raise wild horse AUMs or enlarge HMAs?***
  Response: This is outside the scope of this document as Appropriate Management Level (AML) for wild horses, the HMA boundaries, and the livestock forage allocations are identified in the SEORMP ROD (2002, pp. 55-57).

- ***Analyze the need for each fence within the HMA.***
  Response: This it outside the scope of this document as it does not fit the purpose and need.

- ***We request information on all of the horses previously captured in this HMA so the impacts of the roundup on horses can be adequately assessed.***
  Response: This information is available at the Vale District Office through the Freedom of Information Act (FOIA). The FOIA gives you the right to request access to any agency record. This does not mean, however, that an agency will disclose every record requested. There are statutory exemptions that authorize the withholding of information of an appropriately sensitive nature.

- ***Can BLM analyze and develop projects to prevent horses from leaving the HMA?***
  Response: This it outside the scope of this document as it does not fit the purpose and need.

- ***Can the EA disclose water usage of each oil and gas rig, wind turbine and geothermal plant; the number of acres designated for buildings/equipment associated with them; and their effects on sage-grouse, wildlife and wild horses?***
  Response: This issue is outside the scope of the analysis as there are no oil/gas rigs, wind turbines, or geothermal plants within the vicinity of the HMA.

- ***Can cattle guards be retrofitted to allow horses to cross them safely?***
  Response: This it outside the scope of this document as it does not fit the purpose and need. Installation of horse safe cattleguards is a standard practice on the Vale District in identified crossings of concern.

- ***Are SOPs available to maintain the integrity of social bands during all aspects of the gather operation?***
  Response: No. BLM aims to keep mares and their dependent foals together during gathers and at traps and holding facilities, but not social bands. Once horses are brought to a trap during a gather, it is safer for BLM personnel and for the wild horses if adult stallions are separated from the mares and foals as they would continue to fight to protect their harem.

- ***Can BLM analyze and decrease the hunting of predators in the Cold Springs HMA so they can be used as a natural method of population control?***
  Response: Predator control is outside the purview of the Vale District BLM. It is managed by Oregon Department of Fish and Wildlife, therefore, will not be analyzed in this document.

- ***Could the horse population be managed within AML by catching, treating with available and approved fertility control vaccines, and releasing all mares over one year of age without having to remove horses from the HMA?***
  Response: Following the gather there was a total of 75 horses remaining in the HMA, with a total of 30 mares. Based upon the simultaneous double count census of the HMA that occurred in July 2014, the wild horse population was already 63 horses over the high end of AML (150 horses). Vale District BLM determined that a catch, treat, and release approach to managing wild horse population in Cold Springs HMA would also be ineffective.

Appendix C - COMPREHENSIVE ANIMAL WELFARE PROGRAM FOR WILD HORSE AND BURRO GATHERS

Developed by The Bureau of Land Management Wild Horse and Burro Program in collaboration with Carolyn L. Stull, PhD, Kathryn E. Holcomb, PhD, University of California, Davis School of Veterinary Medicine

CONTENTS

STANDARDS

Standard Definitions

Major Standard: Impacts the health or welfare of WH&Bs. Relates to an alterable equipment or facility standard or procedure. Appropriate wording is "must," "unacceptable," "prohibited."
Minor Standard: unlikely to affect WH&Bs health or welfare or involves an uncontrollable situation. Appropriate wording is "should."
Lead COR = Lead Contracting Officer's Representative
COR = Contracting Officer's Representative
PI = Project Inspector
WH&Bs = Wild horses and burros

I. FACILITY DESIGN

A. Trap Site and Temporary Holding Facility

1. The trap site and temporary holding facility must be constructed of stout materials and must be maintained in proper working condition, including gates that swing freely and latch or tie easily. (**major**)
2. The trap site should be moved close to WH&B locations whenever possible to minimize the distance the animals need to travel.(minor)
3. If jute is hung on the fence posts of an existing wire fence in the trap wing, the wire should be either be rolled up or let down for the entire length of the jute in such a way that minimizes the possibility of entanglement by WH&Bs unless otherwise approved by the Lead COR/COR/PI. (minor)
4. Fence panels in pens and alleys must be not less than 6 feet high for horses, 5 feet high for burros, and the bottom rail must not be more than 12 inches from ground level. (**major**)
5. The temporary holding facility must have a sufficient number of pens available to sort WH&Bs according to gender, age, number, temperament, or physical condition. (**major**)
    a. All pens must be assembled with capability for expansion. (**major**)
    b. Alternate pens must be made available for the following: (**major**)
        1) WH&Bs that are weak or debilitated
        2) Mares/jennies with dependent foals
    c. WH&Bs in pens at the temporary holding facility should be maintained at a proper stocking density such that when at rest all WH&Bs occupy no more than half the pen area. (minor)
6. An appropriate chute designed for restraining WH&Bs must be available for necessary procedures at the temporary holding facility. This does not apply to bait trapping operations unless directed by the Lead COR/COR/PI. (**major**)
7. There must be no holes, gaps or openings, protruding surfaces, or sharp edges present in fence panels or other structures that may cause escape or possible injury. (**major**)
8. Padding must be installed on the overhead bars of all gates and chutes used in single file alleys. (**major**)
9. Hinged, self-latching gates must be used in all pens and alleys except for entry gates into the trap, which may be secured with tie ropes. (**major**)
10. Finger gates (one-way funnel gates) used in bait trapping must be constructed of materials approved by the Lead COR/COR/PI. Finger gates must not be

constructed of materials that have sharp ends that may cause injuries to WH&Bs, such as "T" posts, sharpened willows, etc. (**major**)

11. Water must be provided at a minimum rate of ten gallons per 1000 pound animal per day, adjusted accordingly for larger or smaller horses, burros and foals, and environmental conditions, with each trough placed in a separate location of the pen (i.e. troughs at opposite ends of the pen). Water must be refilled at least every morning and evening. (**major**)
12. The design of pens at the trap site and temporary holding facility should be constructed with rounded corners. (minor)
13. All gates and panels in the animal holding and handling pens and alleys of the trap site must be covered with materials such as plywood, snow fence, tarps, burlap, etc. approximately 48" in height to provide a visual barrier for the animals. All materials must be secured in place.(**major**)

    These guidelines apply:

    a. For exterior fences, material covering panels and gates must extend from the top of the panel or gate toward the ground.(**major**)
    b. For alleys and small internal handling pens, material covering panels and gates should extend from no more than 12 inches below the top of the panel or gate toward the ground to facilitate visibility of animals and the use of flags and paddles during sorting. (minor)
    c. The initial capture pen may be left uncovered as necessary to encourage animals to enter the first pen of the trap. (minor)

14. Non-essential personnel and equipment must be located to minimize disturbance of WH&Bs. (**major**)
15. Trash, debris, and reflective or noisy objects should be eliminated from the trap site and temporary holding facility. (minor)

B. Loading and Unloading Areas

1. Facilities in areas for loading and unloading WH&Bs at the trap site or temporary holding facility must be maintained in a safe and proper working condition, including gates that swing freely and latch or tie easily. (**major**)
2. The side panels of the loading chute must be a minimum of 6 feet high and fully covered with materials such as plywood or metal without holes that may cause injury. (**major**)
3. There must be no holes, gaps or openings, protruding surfaces, or sharp edges present in fence panels or other structures that may cause escape or possible injury. (**major**)
4. All gates and doors must open and close easily and latch securely. (**major**)
5. Loading and unloading ramps must have a non-slip surface and be maintained in a safe and proper working condition to prevent slips and falls. Examples of non-slip flooring would include, but not be limited to, rubber mats, sand, shavings, and steel reinforcement rods built into ramp. There must be no holes in the flooring or items that can cause an animal to trip. (**major**)
6. Trailers must be properly aligned with loading and unloading chutes and panels such that no gaps exist between the chute/panel and floor or sides of the trailer creating a situation where a WH&B could injure itself. (**major**)
7. Stock trailers should be positioned for loading or unloading such that there is no more than 12" clearance between the ground and floor of the trailer for burros and 18" for horses. (minor)

II. CAPTURE TECHNIQUE

A. Capture Techniques

1. WH&Bs gathered on a routine basis for removal or return to range must be captured by the following approved procedures under direction of the Lead COR/COR/PI. (**major**)
   a. Helicopter

   b. Bait trapping

2. WH&Bs must not be captured by snares or net gunning. (**major**)
3. Chemical immobilization must only be used for capture under exceptional circumstances and under the direct supervision of an on-site veterinarian experienced with the technique. (**major**)

B. Helicopter Drive Trapping

1. The helicopter must be operated using pressure and release methods to herd the animals in a desired direction and should not repeatedly evoke erratic behavior in the WH&Bs causing injury or exhaustion. Animals must not be pursued to a point of exhaustion; the on-site veterinarian must examine WH&Bs for signs of exhaustion. (**major**)
2. The rate of movement and distance the animals travel must not exceed limitations set by the Lead COR/COR/PI who will consider terrain, physical barriers, access limitations, weather, condition of the animals, urgency of the operation (animals facing drought, starvation, fire, etc.) and other factors. (**major**)
   a. WH&Bs that are weak or debilitated must be identified by BLM staff or the contractors. Appropriate gather and handling methods should be used according to the direction of the Lead COR/COR/PI. (**major**)
   b. The appropriate herding distance and rate of movement must be determined on a case-by-case basis considering the weakest or smallest animal in the group (e.g., foals, pregnant mares, or horses that are weakened by body condition, age, or poor health) and the range and environmental conditions present. (**major**)
   c. Rate of movement and distance travelled must not result in exhaustion at the trap site, with the exception of animals requiring capture that have an existing severely compromised condition prior to gather. Where compromised animals cannot be left on the range or where doing so would only serve to prolong their suffering, euthanasia will be performed in accordance with BLM policy. (**major**)
3. WH&Bs must not be pursued repeatedly by the helicopter such that the rate of movement and distance travelled exceeds the limitation set by the Lead COR/COR/PI. Abandoning the pursuit or alternative capture methods may be considered by the Lead COR/COR/PI in these cases. (**major**)
4. When WH&Bs are herded through a fence line en route to the trap, the Lead COR/COR/PI must be notified by the contractor. The Lead COR/COR/PI must determine the appropriate width of the opening that the fence is let down to allow for safe passage through the opening. The Lead COR/COR/PI must decide if existing fence lines require marking to increase visibility to WH&Bs. (**major**)

5. The helicopter must not come into physical contact with any WH&B. The physical contact of any WH&B by helicopter must be documented by Lead COR/COR/PI along with the circumstances. (**major**)
6. WH&Bs may escape or evade the gather site while being moved by the helicopter. If there are mare/dependent foal pairs in a group being brought to a trap and half of an identified pair is thought to have evaded capture, multiple attempts by helicopter may be used to bring the missing half of the pair to the trap or to facilitate capture by roping. In these instances, animal condition and fatigue must be evaluated by the Lead COR/COR/PI or on-site veterinarian on a case-by-case basis to determine the number of attempts that can be made to capture an animal.(**major**)
7. Horse captures must not be conducted when ambient temperature at the trap site is below 10ºF or above 95ºF without approval of the Lead COR/COR/PI. Burro captures must not be conducted when ambient temperature is below 10ºF or above 100ºF without approval of the Lead COR/COR/PI. The Lead COR/COR/PI will not approve captures when the ambient temperature exceeds 105 ºF. (**major**)

C. Roping

1. The roping of any WH&B must be approved prior to the procedure by the Lead COR/COR/PI. (**major**).
2. The roping of any WH&B must be documented by the Lead COR/COR/PI along with the circumstances. WH&Bs may be roped under circumstances which include but are not limited to the following: reunite a mare or jenny and her dependent foal; capture nuisance, injured or sick WH&Bs or those that require euthanasia; environmental reasons such as deep snow or traps that cannot be set up due to location or environmentally sensitive designation; and public and animal safety or legal mandates for removal. (**major**)
3. Ropers should dally the rope to their saddle horn such that animals can be brought to a stop as slowly as possible and must not tie the rope hard and fast to the saddle so as to intentionally jerk animals off their feet. (**major**)
4. WH&Bs that are roped and tied down in recumbency must be continuously observed and monitored by an attendant at a maximum of 100 feet from the animal. (**major**)
5. WH&Bs that are roped and tied down in recumbency must be untied within 30 minutes. (**major**)
6. If the animal is tied down within the wings of the trap, helicopter drive trapping within the wings will cease until the tied-down animal is removed. (**major**)
7. Sleds, slide boards, or slip sheets must be placed underneath the animal's body to move and/or load recumbent WH&Bs. (**major**)
8. Halters and ropes tied to a WH&B may be used to roll, turn, position or load a recumbent animal, but a WH&B must not be dragged across the ground by a halter or rope attached to its body while in a recumbent position. (**major**)
9. Animals captured by roping must be evaluated by the on-site/on-call veterinarian within four hours after capture, marked for identification at the trap site, and be re-evaluated periodically as deemed necessary by the on-site/on-call veterinarian. (**major**)

D. Bait Trapping

1. WH&Bs may be lured into a temporary trap using bait (feed, mineral supplement, water) or sexual attractants (mares/jennies in heat) with the following requirements:
   a. The period of time water sources other than in the trap site are inaccessible must not adversely affect the wellbeing of WH&Bs, wildlife or livestock, as determined by the Lead COR/COR/PI. (**major**)
   b. Unattended traps must not be left unobserved for more than 12 hours. (**major**)
   c. Mares/jennies and their dependent foals must not be separated unless for safe transport. (**major**)
   d. WH&Bs held for more than 12 hours must be provided with accessible clean water at a minimum rate of ten gallons per 1000 pound animal per day, adjusted accordingly for larger or smaller horses, burros and foals and environmental conditions. (**major**)
   e. WH&Bs held for more than 12 hours must be provided good quality hay at a minimum rate of 20 pounds per 1000 pound adult animal per day, adjusted accordingly for larger or smaller horses, burros and foals. (**major**)
      1) Hay must not contain poisonous weeds, debris, or toxic substances. (**major**)
      2) Hay placement must allow all WH&Bs to eat simultaneously. (**major**)

III. WILD HORSE AND BURRO CARE

A. Veterinarian

1. On-site veterinary support must be provided for all helicopter gathers and on-site or on-call support must be provided for bait trapping. (**major**)
2. Veterinary support must be under the direction of the Lead COR/COR/PI. The on-site/on-call veterinarian will provide consultation on matters related to WH&B health, handling, welfare, and euthanasia at the request of the Lead COR/COR/PI. All decisions regarding medical treatment or euthanasia will be made by the on-site Lead COR/COR/PI. (**major**)

B. Care

1. Feeding and Watering
   a. Adult WH&Bs held in traps or temporary holding pens for longer than 12 hours must be fed every morning and evening with water available at all times other than when animals are being sorted or worked. (**major)**
   b. Water must be provided at a minimum rate of ten gallons per 1000 pound animal per day, adjusted accordingly for larger or smaller horses, burros and foals, and environmental conditions, with each trough placed in a separate location of the pen (i.e. troughs at opposite ends of the pen). . (**major**)
   c. Good quality hay must be fed at a minimum rate of 20 pounds per 1000 pound adult animal per day, adjusted accordingly for larger or smaller horses, burros and foals. (**major**)
      i. Hay must not contain poisonous weeds or toxic substances. (**majo**r)
      ii. Hay placement must allow all WH&Bs to eat simultaneously. (**major**)
   d. When water or feed deprivation conditions exist on the range prior to the gather, the Lead COR/COR/PI should adjust the watering and feeding

arrangements in consultation with the onsite veterinarian as necessary to provide for the needs of the animals. (minor)

2. Dust abatement
   a. Dust abatement by spraying the ground with water must be employed when necessary at the trap site and temporary holding facility. (**major**)
3. Trap Site
   a. Dependent foals or weak/debilitated animals must be separated from other WH&Bs at the trap site to avoid injuries during transportation to the temporary holding facility. Separation of dependent foals from mares must not exceed four hours unless the Lead COR/COR/PI authorizes a longer time or a decision is made to wean the foals. (major)
4. Temporary Holding Facility
   a. All WH&Bs in confinement must be observed at least once daily to identify sick or injured WH&Bs and ensure adequate food and water. (major)
   b. Foals must be reunited with their mares/jennies at the temporary holding facility within four hours of capture unless the Lead COR/COR/PI authorizes a longer time or foals are old enough to be weaned during the gather. (major)
   c. Non-ambulatory WH&Bs must be located in a pen separate from the general population and must be examined by the BLM horse specialist and/or on-call or on-site veterinarian as soon as possible, no more than four hours after recumbency is observed. Unless otherwise directed by a veterinarian, hay and water must be accessible to an animal within six hours after recumbency.(major)
   d. Alternate pens must be made available for the following: (major)
      1) WH&Bs that are weak or debilitated
      2) Mares/jennies with dependent foals
   e. Aggressive WH&Bs causing serious injury to other animals should be identified and relocated into alternate pens when possible. (minor)
   f. WH&Bs in pens at the temporary holding facility should be maintained at a proper stocking density such that when at rest all WH&Bs occupy no more than half the pen area. (minor)

C. Biosecurity

1. Health records for all saddle and pilot horses used on WH&B gathers must be provided to the Lead COR/COR/PI prior to joining a gather, including: (**major**)
   a. Certificate of Veterinary Inspection (Health Certificate, within 30 days).
   b. Proof of:
      1) A negative test for equine infectious anemia (Coggins or EIA ELISA test) within 12 months.
      2) Vaccination for tetanus, eastern and western equine encephalomyelitis, West Nile virus, equine herpes virus, influenza, *Streptococcus equi*, and rabies within 12 months.
2. Saddle horses, pilot horses and mares used for bait trapping lures must not be removed from the gather operation (such as for an equestrian event) and allowed to return unless they have been observed to be free from signs of infectious disease for a period of at least three weeks and a new Certificate of Veterinary Examination is obtained after three weeks and prior to returning to the gather. (**major**)

3. WH&Bs, saddle horses, and pilot horses showing signs of infectious disease must be examined by the on-site/on-call veterinarian. (**major**)
   a. Any saddle or pilot horses showing signs of infectious disease (fever, nasal discharge, or illness) must be removed from service and isolated from other animals on the gather until such time as the horse is free from signs of infectious disease and approved by the on-site/on-call veterinarian to return to the gather. (**major**)
   b. Groups of WH&Bs showing signs of infectious disease should not be mixed with groups of healthy WH&Bs at the temporary holding facility, or during transport. (minor)
4. Horses not involved with gather operations should remain at least 300 yards from WH&Bs, saddle horses, and pilot horses being actively used on a gather. (minor)

IV. HANDLING

A. Willful Acts of Abuse

1. Hitting, kicking, striking, or beating any WH&B in an abusive manner is prohibited. (**major**)
2. Dragging a recumbent WH&B without a sled, slide board or slip sheet is prohibited. Ropes used for moving the recumbent animal must be attached to the sled, slide board or slip sheet unless being loaded as specified in Section II. C. 8. (**major**)
3. There should be no deliberate driving of WH&Bs into other animals, closed gates, panels, or other equipment. (minor)
4. There should be no deliberate slamming of gates and doors on WH&Bs. (minor)
5. There should be no excessive noise (e.g., constant yelling) or sudden activity causing WH&Bs to become unnecessarily flighty, disturbed or agitated. (minor)

B. General Handling

1. All sorting, loading or unloading of WH&Bs during gathers must be performed during daylight hours except when unforeseen circumstances develop and the Lead COR/CO/PI approves the use of supplemental light. (**major**)
2. WH&Bs should be handled to enter runways or chutes in a forward direction. (minor)
3. WH&Bs should not remain in single-file alleyways, runways, or chutes longer than 30 minutes. (minor)
4. Equipment except for helicopters should be operated and located in a manner to minimize flighty behavior . (minor)

C. Handling Aids

1. Handling aids such as flags and shaker paddles must be the primary tools for driving and moving WH&Bs during handling and transport procedures. Contact of the flag or paddle end of primary handling aids with a WH&B is allowed. Ropes looped around the hindquarters may be used from horseback or on foot to assist in moving an animal forward or during loading. (**major**)

2. Electric prods must not be used routinely as a driving aid or handling tool. Electric prods may be used in limited circumstances only if the following guidelines are followed:
   a. Electric prods must only be a commercially available make and model that uses DC battery power and batteries should be fully charged at all times. (major)
   b. The electric prod device must never be disguised or concealed. (major)
   c. Electric prods must only be used after three attempts using other handling aids (flag, shaker paddle, voice or body position) have been tried unsuccessfully to move the WH&Bs. (major)
   d. Electric prods must only be picked up when intended to deliver a stimulus; these devices must not be constantly carried by the handlers. (major)
   e. Space in front of an animal must be available to move the WH&B forward prior to application of the electric prod. (major)
   f. Electric prods must never be applied to the face, genitals, anus, or underside of the tail of a WH&B. (major)
   g. Electric prods must not be applied to any one WH&B more than three times during a procedure (e.g., sorting, loading) except in extreme cases with approval of the Lead COR/COR/PI. Each exception must be approved at the time by the Lead COR/COR/PI. (major)
   h. Any electric prod use that may be necessary must be documented daily by the Lead COR/COR/PI including time of day, circumstances, handler, location (trap site or temporary holding facility), and any injuries (to WH&B or human). (major)

V. TRANSPORTATION

A. General

1. All sorting, loading, or unloading of WH&Bs during gathers must be performed during daylight hours except when unforeseen circumstances develop and the Lead COR/CO/PI approves the use of supplemental light. (major)
2. WH&Bs identified for removal should be shipped from the temporary holding facility to a BLM facility within 48 hours. (minor)
   a. Shipping delays for animals that are being held for release to range or potential on-site adoption must be approved by the Lead COR/COR/PI. (major)
3. Shipping should occur in the following order of priority; 1) debilitated animals, 2) pairs, 3) weanlings, 4) dry mares and 5) studs. (minor)
4. Planned
5. transport time to the BLM preparation facility from the trap site or temporary holding facility must not exceed 10 hours. (major)
6. WH&Bs should not wait in stock trailers and/or semi-trailers at a standstill for more than a combined period of three hours during the entire journey. (minor)

B. Vehicles

1. Straight-deck trailers and stock trailers must be used for transporting WH&Bs. (major)
   a. Two-tiered or double deck trailers are prohibited. (major)

b. Transport vehicles for WH&Bs must have a covered roof or overhead bars containing them such that WH&Bs cannot escape. (major)

2. WH&Bs must have adequate headroom during loading and unloading and must be able to maintain a normal posture with all four feet on the floor during transport without contacting the roof or overhead bars. (major)
3. The width and height of all gates and doors must allow WH&Bs to move through freely. (major)
4. All gates and doors must open and close easily and be able to be secured in a closed position. (major)
5. The rear door(s) of the trailers must be capable of opening the full width of the trailer. (major)
6. Loading and unloading ramps must have a non-slip surface and be maintained in proper working condition to prevent slips and falls. (major)
7. Transport vehicles more than 18 feet and less than 40 feet in length must have a minimum of one partition gate providing two compartments; transport vehicles 40 feet or longer must have at least two partition gates to provide a minimum of three compartments. (major)
8. All partitions and panels inside of trailers must be free of sharp edges or holes that could cause injury to WH&Bs. (major)
9. The inner lining of all trailers must be strong enough to withstand failure by kicking that would lead to injuries. (major)
10. Partition gates in transport vehicles should be used to distribute the load into compartments during travel. (minor)
11. Surfaces and floors of trailers must be cleaned of dirt, manure and other organic matter prior to the beginning of a gather. (major)

C. Care of WH&Bs during Transport Procedures

1. WH&Bs that are loaded and transported from the temporary holding facility to the BLM preparation facility must be fit to endure travel. (major)
   a. WH&Bs that are non-ambulatory, blind in both eyes, or severely injured must not be loaded and shipped unless it is to receive immediate veterinary care or euthanasia. (major)
   b. WH&Bs that are weak or debilitated must not be transported without approval of the Lead COR/COR/PI in consultation with the on-site veterinarian. Appropriate actions for their care during transport must be taken according to direction of the Lead COR/COR/PI. (major)
2. WH&Bs should be sorted prior to transport to ensure compatibility and minimize aggressive behavior that may cause injury. (minor)
3. Trailers must be loaded using the minimum space allowance in all compartments as follows: (major)
   a. 12 square feet per adult horse.
   b. 6.0 square feet per dependent horse foal.
   c. 8.0 square feet per adult burro.
   d. 4.0 square feet per dependent burro foal.
4. The Lead COR/COR/PI in consultation with the receiving Facility Manager must document any WH&B that is recumbent or dead upon arrival at the destination. (**major**)

a. Non-ambulatory or recumbent WH&Bs must be evaluated on the trailer and either euthanized or removed from the trailers using a sled, slide board or slip sheet. (**major**)

5. Saddle horses must not be transported in the same compartment with WH&Bs. (**major**)

VI. EUTHANASIA OR DEATH

A. Euthanasia Procedure during Gather Operations

1. An authorized, properly trained, and experienced person as well as a firearm appropriate for the circumstances must be available at all times during gather operations. When the travel time between the trap site and temporary holding facility exceeds one hour or if radio or cellular communication is not reliable, provisions for euthanasia must be in place at both the trap site and temporary holding facility during the gather operation. (**major**)
2. Euthanasia must be performed according to American Veterinary Medical Association euthanasia guidelines (2013) using methods of gunshot or injection of an approved euthanasia agent. (**major**)
3. The decision to euthanize and method of euthanasia must be directed by the Authorized Officer or their Authorized Representative(s) that include but are not limited to the Lead COR/COR/PI who must be on site and may consult with the on-site/on-call veterinarian. (**major**)
4. Photos needed to document an animal's condition should be taken prior to the animal being euthanized. No photos of animals that have been euthanized should be taken. An exception is when a veterinarian or the Lead COR/COR/PI may want to document certain findings discovered during a postmortem examination or necropsy. (minor)
5. Any WH&B that dies or is euthanized must be documented by the Lead COR/COR/PI including time of day, circumstances, euthanasia method, location, a description of the age, gender, and color of the animal and the reason the animal was euthanized. (**major**)
6. The on-site/on-call veterinarian should review the history and conduct a postmortem physical examination of any WH&B that dies or is euthanized during the gather operation. A necropsy should be performed whenever feasible if the cause of death is unknown. (minor)

B. Carcass Disposal

1. The Lead COR/COR/PI must ensure that appropriate equipment is available for the timely disposal of carcasses when necessary on the range, at the trap site, and temporary holding facility. (**major**)
2. Disposal of carcasses must be in accordance with state and local laws. (**major**)
3. WH&Bs euthanized with a barbiturate euthanasia agent must be buried or otherwise disposed of properly. (**major**)
4. Carcasses left on the range should not be placed in washes or riparian areas where future runoff may carry debris into ponds or waterways. Trenches or holes for buried animals should be dug so the bottom of the hole is at least 6 feet above the water table and 4-6 feet of level earth covers the top of the carcass with additional dirt mounded on top where possible. (minor)

CAWP
REQUIRED DOCUMENTATION AND RESPONSIBILITIES OF LEAD COR/COR/PI

Required Documentation Section	**Documentation**
II.B.5	Helicopter contact with any WH&B.
II.C.2	Roping of any WH&B.
III.B.3.a and III.B.4.b	Reason for allowing longer than four hours to
III.C.1	reunite foals with mares/jennies. Does not apply if foals are being weaned. Health status of all saddle and pilot horses.
IV.C.2.h	All uses of electric prod.
V.C.4	Any WH&B that is recumbent or dead upon arrival at destination following transport.
VI.A.5	Any WH&B that dies or is euthanized during gather operation.

Responsibilities Section	**Responsibility**
I.A.10	Approve materials used in construction of finger gates in bait trapping
II.A.1	Direct gather procedures using approved gather technique.
II.B. 2	Determine rate of movement and distance limitations for WH&B helicopter gather.
II.B.2.a	Direct appropriate gather/handling methods for weak or debilitated WH&B.
II.B.3	Determine whether to abandon pursuit or use other capture method in order to avoid repeated pursuit of WH&B.
II.B.4	Determine width and need for visibility marking when using opening in fence en route to trap.
II.B.6	Determine number of attempts that can be made to capture the missing half of a mare/foal pair that has become separated.
II.B.7	Determine whether to proceed with gather when ambient temperature is outside the range of 10°F to 95°F for horses or 10°F to 100°F for burros.
II.C.1	Approve roping of any WH&B.
II.D.1.a	Determine period of time that water outside a bait trap is inaccessible such that wellbeing of WH&Bs, wildlife, or livestock is not adversely affected.
III.A.2	Direct and consult with on-site/on-call veterinarian on any matters related to WH&B health, handling, welfare and euthanasia.

III.B.1.e	Adjust feed/water as necessary, in consultation with onsite/on call veterinarian, to provide for needs of animals when water or feed deprivation conditions exist on range.
III.B.4.c	Determine provision of water and hay to non-ambulatory animals.
IV.C.2.g	Approve use of electric prod more than three times, for exceptional cases only.
V.A.1	Approve sorting, loading, or unloading at night with use of supplemental light.
V.A.2.a	Approve shipping delays of greater than 48 hours from temporary holding facility to BLM facility.
V.C.1.b	Approve of transport and care during transport for weak or debilitated WH&B.
VI.A.3	Direct decision regarding euthanasia and method of euthanasia for any WH&B; may consult with on-site/on-call veterinarian.
VI.B.1	Ensure that appropriate equipment is available for carcass disposal.

Appendix D - Standard Operating Procedures for Population-level Fertility Control Treatments

One-year liquid vaccine: The following implementation and monitoring requirements are part of the Proposed Action:

1. PZP vaccine would be administered through darting by trained BLM personnel or collaborating research partners only. For any darting operation, the designated personnel must have successfully completed a Nationally recognized wildlife darting course and who have documented and successful experience darting wildlife under field conditions.

2. 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).

3. The liquid dose of PZP vaccine is administered using 1.0 cc Pneu-Darts with 1.5" barbless needles fired from either Dan Inject® or Pneu-Dart® capture gun.

4. Only designated darters would mix the vaccine/adjuvant and prepare the emulsion. Vaccine-adjuvant emulsion would be loaded into darts at the darting site and delivered by means of a capture gun.

5. Delivery of the vaccine would be by intramuscular injection into the left or right hip/gluteal muscles while the mare is standing still.

6. Safety for both humans and the horse is the foremost consideration in deciding to dart a mare. The Dan Inject® gun would not be used at ranges in excess of 30 m while the Pneu-Dart® capture gun would not be used over 50 m, and no attempt would be taken when other persons are within a 30-m radius of the target animal.

7. No attempts would be taken in high wind or when the horse is standing at an angle where the dart could miss the hip/gluteal region and hit the rib cage. The ideal is when the dart would strike the skin of the horse at a perfect 90° angle.

8. If a loaded dart is not used within two hours of the time of loading, the contents would be transferred to a new dart before attempting another horse. If the dart is not used before the end of the day, it would be stored under refrigeration and the contents transferred to another dart the next day. Refrigerated darts would not be used in the field.

9. No more than two people should be present at the time of a darting. The second person is responsible for locating fired darts. The second person should also be responsible for identifying the horse and keeping onlookers at a safe distance.

10. To the extent possible, all darting would be carried out in a discrete manner. However, if darting is to be done within view of non-participants or members of the public, an explanation of the nature of the project would be carried out either immediately before or after the darting.

11. Attempts will be made to recover all darts. To the extent possible, all darts which are discharged and drop from the horse at the darting site would be recovered before another darting occurs. In exceptional situations, the site of a lost dart may be noted and marked, and recovery efforts made at a later time. All discharged darts would be examined after recovery in order to determine if the charge fired and the plunger fully expelled the vaccine.

12. All mares targeted for treatment will be clearly identifiable through photographs to enable researchers and HMA managers to positively identify the animals during the research project and at the time of removal during subsequent gathers.

13. Personnel conducting darting operations should be equipped with a two-way radio or cell phone to provide a communications link with the Project Veterinarian for advice and/or assistance. In the event of a veterinary emergency, darting personnel would immediately contact the Project Veterinarian, providing all available information concerning the nature and location of the incident.

14. In the event that a dart strikes a bone or imbeds in soft tissue and does not dislodge, the darter would follow the affected horse until the dart falls out or the horse can no longer be found. The darter would be responsible for daily observation of the horse until the situation is resolved.

22-month time-release pelleted vaccine: The following implementation and monitoring requirements are part of the Proposed Action:

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 jabstick 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. Delivery of the vaccine would be by intramuscular injection into the gluteal muscles while the mare is restrained in a working chute. The primer would consist of 0.5 cc of liquid PZP emulsified with 0.5 cc of Freunds Modified Adjuvant (FMA). The pellets would be loaded into the jabstick for the second injection. 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).

4. 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.

5. All treated mares will 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 will 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 will 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 will 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 will submit a PZP Application Report and accompanying narrative and data sheets will be forwarded to the NPO (Reno, Nevada). A copy of the form and data sheets and any photos taken will be maintained at the field office.

4. A tracking system will 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 E - WinEquus Population Modeling

These population models were run based on the July 2014 simultaneous double count aerial inventory of 206 wild horses plus a 20% population growth rate to account for the 2015 foal crop. Therefore, at the time these models were run there were an estimated 247 horses in Cold Springs HMA.

No Action – Alternative 5

Average Growth Rate in 10 Years	
Lowest Trial	14.5
10th Percentile	17.2
25th Percentile	18.4
Median Trial	**20.4**
75th Percentile	21.5
90th Percentile	22.6
Highest Trial	24.7

Population Sizes in 11 Years*

	Minimum	Average	Maximum
Lowest Trial	206	482	967
10th Percentile	210	569	1096
25th Percentile	215	616	1232
Median Trial	225	**680**	1461
75th Percentile	234	733	1587
90th Percentile	252	793	1770
Highest Trial	287	965	2077

* 0 to 20+ year-old horses

Proposed Action – Alternative 1 (and closest estimate for Alternative 3)

Average Growth Rate in 10 Years	
Lowest Trial	3.1
10th Percentile	6.4
25th Percentile	7.6
Median Trial	**9.6**
75th Percentile	11.3
90th Percentile	12.5
Highest Trial	13.6

Population Sizes in 11 Years*

	Minimum	Average	Maximum
Lowest Trial	58	108	206
10th Percentile	78	122	210
25th Percentile	85	126	215
Median Trial	92	**135**	226
75th Percentile	100	145	238
90th Percentile	107	154	252
Highest Trial	126	179	338

* 0 to 20+ year-old horses

Totals in 11 Years*

	Gathered	Removed	Treated
Lowest Trial	334	118	28
10th Percentile	377	198	38
25th Percentile	398	213	43
Median Trial	**424**	**229**	**48**
75th Percentile	454	250	53
90th Percentile	488	267	58
Highest Trial	548	299	70

* 0 to 20+ year-old horses

Gate Cut – Alternative 4

Average Growth Rate in 10 Years	
Lowest Trial	13.7
10th Percentile	16.1
25th Percentile	18.1
Median Trial	**20.4**
75th Percentile	21.9
90th Percentile	23.3
Highest Trial	25.6

Population Sizes in 11 Years*			
	Minimum	Average	Maximum
Lowest Trial	57	117	207
10th Percentile	74	124	210
25th Percentile	79	128	214
Median Trial	84	**132**	225
75th Percentile	88	135	236
90th Percentile	91	138	250
Highest Trial	98	149	286

* 0 to 20+ year-old horses

Totals in 11 Years*		
	Gathered	Removed
Lowest Trial	212	202
10th Percentile	284	272
25th Percentile	304	291
Median Trial	**321**	**307**
75th Percentile	337	326
90th Percentile	358	340
Highest Trial	417	405

* 0 to 20+ year-old horses

Gather Only – Alternative 2

Average Growth Rate in 10 Years	
Lowest Trial	5.2
10th Percentile	10.0
25th Percentile	12.0
Median Trial	**13.4**
75th Percentile	15.5
90th Percentile	16.8
Highest Trial	21.7

Population Sizes in 11 Years*			
	Minimum	Average	Maximum
Lowest Trial	49	112	206
10th Percentile	74	122	210
25th Percentile	80	127	215
Median Trial	87	**133**	223
75th Percentile	92	138	240
90th Percentile	94	147	255
Highest Trial	101	184	368

* 0 to 20+ year-old horses

Totals in 11 Years*		
	Gathered	Removed
Lowest Trial	270	196
10th Percentile	296	209
25th Percentile	310	224
Median Trial	**406**	**296**
75th Percentile	442	318
90th Percentile	481	342
Highest Trial	663	472

* 0 to 20+ year-old horses