United States Department of the Interior
Bureau of Land Management

BLM

Wind River /Big Horn Basin District - Lander Field Office - Wyoming

Environmental Assessment WY-050-EA12-33

North Lander Complex
Wild Horse Gather
(Conant Creek, Dishpan Butte, Rock Creek Mountain and Muskrat Basin HMAs)

U.S. Department of the Interior
Bureau of Land Management
Wind River – Big Horn Basin District
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Acronyms

AML	**Appropriate Management Level**
APHIS	**Animal and Plant Health Inspection Service**
BLM	**Bureau of Land Management**
CEQ	**Council on Environmental Quality**
CFR	**Code of Federal Regulations**
EA	**Environmental Assessment**
EIS	**Environmental Impact Statement**
FONSI	**Finding of No Significant Impact**
FWS	**Fish & Wildlife Service**
HMAP	**Herd Management Area Plan**
HMA	**Herd Management Area**
HSUS	**Humane Society of the United States**
IBLA	**Interior Board of Land Appeals**
LFO	**Lander Field Office**
LTH	**Long-Term Holding/Pasturing**
MVP	**Minimum Viable Population**
PZP-22	**Porcine Zona Pellucida - 22 month pellet**
RMP	**Resource Management Plan**
S&G	**Standards and Guidelines (for Rangeland Health)**
USGS	**United States Geological Survey**
WH&B	**Wild Horse and Burro**
WHBA	**Wild Horse and Burro Act, 1971**
WHHMA	**Wild Horse Herd Management Area**
WSA	**Wilderness Study Area**

1.3 Need for the Proposal

The purpose of the gather is to achieve and maintain the AML for wild horses in the North Lander Complex, implement fertility control treatments on mares gathered, collect information on herd characteristics, and determine herd health. By achieving and maintaining AML in the North Lander Complex, BLM will also meet its objectives within each of the HMAs. These objectives include:

- *Manage the North Lander Complex to achieve and maintain a thriving natural ecological balance, and multiple-use relationship.*
- *Manage the North Lander Complex population to preserve and enhance the historic, physical and biological characteristics of the herd.*
- *Manage sex ratios and age structures, which will allow for the continued physical, reproductive and genetic health of the North Lander Complex.*
- *Preserve and maintain a healthy and viable wild horse population that will survive and be successful within the North Lander Complex during poor years when elements of the habitat are limiting due to severe winter conditions, drought, or other uncontrollable and unforeseeable environmental influences to the herd.*
- *Manage the North Lander Complex wild horse herd as a self-sustaining population of healthy animals in balance with other uses and the productive capacity of their habitat.*
- *Conduct national research on the use of new fertility drugs and to work with other agencies to accomplish this objective.*

A variety of monitoring data has been collected since the AML was established, including vegetative trend, utilization and use pattern mapping, livestock actual use, professional observations and precipitation. In general, forage utilization levels vary from year to year based upon climatic conditions, vegetative production, and the number of horses, livestock and wildlife present in the complex. When the wild horse population is at the lower range of the AML, most of the HMAs receives slight to light use on upland areas (less than 40 percent utilization of current year's production). As the wild horse population approaches the upper range and exceeds the AML, the preferred horse use concentration areas begin to receive moderate to heavy use (41 percent to 80 percent utilization of current year's production), while other areas continue to receive slight to light use. This is primarily due to wild horse distribution and herd space requirements.

Forage and water availability have been significantly below normal this year. The area encompassing the North Lander Complex received below normal precipitation and is in a category D2 drought, which is "severe" (US Drought Monitor, August 28, 2012). Key cool season grasses such as Indian rice-grass, Needle-and-thread grass and Western wheatgrass grew very little this past growing season. Water conditions in the North Lander Complex are also very limited with reduced flows in all creeks and springs within the complex. Reservoir water is also in short supply, as the snow pack and thunderstorm events were lower than average this year. Water-hauling to four locations within the North Lander Complex began in late August, 2012.

As the wild horse population increases, and range forage conditions deteriorate, wild horses begin increasing their range in search of forage, water, and space. Historic livestock actual use levels have declined as permittees and BLM have tried to manage the rangelands within the HMAs to maintain an ecological balance between use by all animals and available forage. The Lander Field Office began conducting rangeland health assessments in the fall of 2011 within a large portion of the North Lander Complex. These assessments are expected to be completed by 2013.

1.4 Conformance with Existing Land Use Plans

The alternatives to be analyzed through this document are in conformance with the land use plan terms and conditions as required by (43 CFR 1610.5-3(a)). Any action in the Lander Field Office is subject to requirements established by the Lander Resource Management Plan (RMP), approved June 9, 1987. In the Lander RMP, the BLM designated the North Lander Complex as suitable for long term, sustained wild horse use. The proposed gather, removal, and fertility control treatment conforms to the land use decisions and resource management goals and objectives of the Lander RMP.

1.5 Relationship to Statutes, Regulations or Other Plans

Gathering excess wild horses is in compliance with Public Law 92-195 (Wild Free-Roaming Horses and Burros Act of 1971) ("WFRHBA") as amended by Public Law 94-579 (Federal Land Policy and Management Act of 1976), and Public Law 95-514 (Public Rangelands Improvement Act of 1978). Public law 92-195, as amended, requires the protection, management, and control of wild free-roaming horses and burros on public lands. The preparation and transport of wild horses will be conducted in conformance with all applicable state statutes.

The Alternatives conform with all applicable regulations at 43 Code of Federal Regulations (CFR) 4700 and applicable BLM policies. The following are excerpts from BLM regulations contained in 43 CFR relating to the protection, management, and control of wild horses under the administration of the BLM.

> 43 CFR 4700.0-2 One of the objectives of wild horse management is to manage wild horses "as an integral part of the natural system of the public lands under the principle of multiple use . . ."
>
> 43 CFR 4700.0-6(a-c) The BLM is required to manage wild horses "as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat" and "considered comparably with other resource values" while at the same time "maintaining free-roaming behavior."
>
> 43 CFR 4700.0-6 (e): "Healthy excess wild horses for which an adoption demand by qualified individuals exists shall be made available at adoption centers for private maintenance and care."
>
> 43 CFR 4710.3-1: HMAs "shall be established for the maintenance of wild horse and burro herds."
>
> 43 CFR 4710.4: "Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas. Management shall be at the

minimum level necessary to attain the objectives identified in approved land use plans and herd management area plans."

43 CFR 4720.1: "Upon examination of current information and a determination by the authorized officer that an excess of wild horses or burros exists, the authorized officer shall remove the excess animals immediately."

43 CFR Subpart 4180: BLM management actions should be designed to achieve or maintain healthy rangelands.

All federal actions must be reviewed to determine their probable effect on threatened and endangered plants and animals (the Endangered Species Act).

Federal actions must also be reviewed to determine their probable effect on cultural and historic properties. This process is termed section 106 consultation (Section 106 of the Historic Preservation Act).

Executive Order 13212 directs the BLM to consider the President's National Energy Policy and adverse impacts the alternatives may have on energy development.

The action would conform to the Lander Resource Area Wild Horse Herd Management Plan, Lander Herd Management Area Evaluation/Capture Plan and the associated Environmental Analyses (EAs) WY-036-EA3-010 and WY-036-EA3-013. Recommendations from these evaluations and documents were the basis for establishing the AML. These documents contain specific management prescriptions for the HMAs, as well as information on the existing environment and environmental impacts of the management actions. The decisions were affirmed by the Interior Board of Land Appeals in Animal Protection Institute of America et. al.(IBLA 93-308, 94-14). Changes to HMA boundaries or AMLs are beyond the scope of this analysis and will not be discussed further. The Alternatives are consistent with all other federal, state, and local plans. The gather will assist in maintaining the health of the public lands within the HMA, consistent with the "*Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the State of Wyoming,"* available at http://www.wy.blm.gov/range/sandgs.htm.

The carrying capacity for livestock and wild horses, and the terms and conditions for livestock grazing for the Big Pasture, Dishpan Butte, Conant Creek, Rim Pasture, Granite Mountain Open, and Muskrat Basin Allotments were established in conformance with the Lander RMP, BLM policy, and the Wyoming Standards and Guidelines.

AML is the numeric range of wild horses to be managed in the HMAs. The Lander Herd Management Area Evaluation/Capture Plan and the associated Environmental Analyses (EAs) WY-036-EA3-010 and WY-036-EA3-013 state that wild horses in the HMA Complex "will be managed in a range from 320 to 536 wild horses". Table 1 lists the AML for wild horses in the North Lander Complex by HMA and grazing allotment.

Table 1 AML by Allotment and Decision Record Date

Allotment	HMA Name	AML	Decision Record - Date
Big Pasture (#1703)	**Dishpan Butte**	50 - 100	February 25, 1993
Dishpan Butte (#1716)	**Dishpan Butte**		
Conant Creek (#1403)	**Conant Creek**	60 - 100	February 25, 1993

Rim Pasture (#1401)	**Rock Creek Mtn.**	50 - 86	February 25, 1993
Granite Mountain Open (#1636)	**Muskrat Basin**	160 - 250	February 25, 1993
Muskrat Basin (#1409)	**Muskrat Basin**	-----	February 25, 1993
Total		**320 - 536**	

Environmental analyses (EAs) conducted in the past have analyzed the impacts of various gather methods on wild horses, and other critical elements of the human environment, to achieve AML. These documents include:

1. The Great Divide Resource Area Wild Horse Herd Management Area Evaluation EA/ Capture Plan and the associated Environmental Analyses (EAs) WY-037-EA4-122 and WY037-EA4-121, May 1994.

2. Adobe Town – Salt Wells Creek Herd Management Complex – Management Action and Environmental Assessment EA No. WY040-07-EA-37 January 4, 2007.

3. Removing Excess and Stray Wild Horses From the Area North of Interstate 80 and West of US HWY 287 in the Rawlins Field Office, EA No. WY030-06-EA-165 August 8, 2006.

4. Removing Excess Wild Horses From the Adobe Town and Salt Wells Creek HMAs of the Rawlins and Rock Springs Field Offices EA No. WY030-05-EA-158 August 8, 2006.

5. Lander Resource Area Wild Horse Herd Management Plan, Lander Herd Management Area Evaluation/Capture Plan and the associated Environmental Analyses (EAs) WY-036 EA3-010 and WY-036-EA3-013, February 1993.

6. Wild Horse Gathering Inside and Outside of the Muskrat Basin, Rock Creek Mountain, Dishpan Butte and Conant Creek Wild Horse Herd Management Areas, EA No. WY- 050-EA1-039, May 2001.

7. Wild Horse Gathering Inside and Outside of the Crooks Mountain Wild Horse Herd Management Area, EA Number WY-050-EA2-032, April 2002.

8. Wild Horse Gathering Inside of the Green Mountain Wild Horse Herd Management Area EA Number WY-050-EA2-031, April 2002.

9. North Lander HMA Complex (Conant Creek, Rock Creek Mountain, Dishpan Butte and Muskrat Basin) Capture/Removal and Fertility Control Lander Field Office EA Number WY-050-EA4-061, 2004.

10. Antelope Hills/Cyclone Rim Horse Management Area Capture/Removal and Fertility Control Lander Field Office, EA Number WY-050-EA4-060, 2004.

11. Green Mountain Horse Management Area Capture/Removal and Fertility Control Lander Field Office, EA Number WY-050-EA5-133, 2005.

12. Crooks Mountain Horse Management Area Capture/Removal and Fertility Control Lander Field Office, EA Number WY-050-EA06-129, 2006.

13. Wild Horse Gathering for the North Lander Complex Wild Horse Herd Management Areas (Conant Creek, Dishpan Butte, Rock Creek Mountain and Muskrat Basin) Capture/Removal and Fertility Control, Lander Field Office, EA Number EA WY-050-EA08-95, 2008.

14. Wild Horse Gathering for the Red Desert Complex Wild Horse Herd Management Areas (Lost Creek, Stewart Creek, Green Mountain, Crooks Mountain, Antelope Hills), Environmental Assessment WY-030-2009-0258-EA, 2009.

15. Adobe Town – Salt Wells Creek Herd Management Area Complex Wild Horse Gather, Environmental Assessment WY-040-EA10-109, 2010.

16. Wild Horse Gathering for the Red Desert Complex Wild Horse Herd Management Areas (Lost Creek, Stewart Creek, Green Mountain, Crooks Mountain, Antelope Hills), Environmental Assessment Environmental Assessment WY-050-EA11-78.

These documents are available for public review from the office record. No other permits or authorizing actions are required prior to implementing one of the Alternatives.

2.1 Actions Common to Alternatives 1, 2 and 3

The following actions are common to Alternatives 1, 2 and 3:

Maintain an AML in the North Lander HMA Complex of 320 to 536 wild horses, as shown in Table 1.

Table 1. Management Range for Wild Horses

Name of HMA	Range of AML
Dishpan Butte	**50 – 100**
Conant Creek	**60 - 100**
Rock Creek Mtn.	**50 - 86**
Muskrat Basin	**160 - 250**
Totals	**320 - 536**

Wild horse movements among the four HMAs in the North Lander Complex are apparent through horse trails and seasonal variation in distribution. In isolation, the individual AMLs for wild horses in three of the herd areas (Dishpan Butte, Conant Creek, and Rock Creek Mountain) may not allow for genetically viable populations. However, these horses interact with each other between HMAs, which should ensure genetic viability. The total of the post gather populations in all four herd areas in the North Lander Complex will be within the AML.

- Gather operations would be conducted in accordance with the Standard BLM Operating Procedures for Wild Horse Removal (Appendix 1). The helicopter drive method would be used for this gather, and may include multiple gather sites. To the extent possible gather sites (traps) would be located in previously disturbed areas. Post-gather, every effort would be made to return released horses to the same herd management area from which they were gathered.

- An Animal and Plant Health Inspection Service (APHIS) veterinarian will be on-site to examine animals and make recommendations to BLM for care and treatment of wild horses. Euthanasia, if necessary for reasons related to health and handling, will be in accordance with Washington Office Instruction Memorandum (IM) 2009-041. The final decision for euthanasia is delegated to the Contacting Officer Technical Representative (COTR) on site, and it will be performed by the COTR or Contractor.

- Animals would be removed using a selective removal strategy (Gather Policy and Selective Removal Criteria for Wild Horses, Washington Office IM 2005-206). Selective removal criteria for this gather would include:

  a. Age Class Four Years and Younger: Wild horses four years of age and younger would be the highest priority for removal and placement into the national adoption program.

  b. Age Class Ten Years and Older: Wild horses ten years of age and older may be removed and placed into long-term pastures, if necessary to reach AML.

  Any animals that have a Henneke body condition score of 3 or less would be evaluatd to assess their prognosis for improvement. Any euthanasia would be in accordance with Washington Office Instruction Memorandum 2009-041. Older horses that, in the opinion

of the Authorized Officer, may survive if released but probably would not tolerate the stress of removal, preparation, and holding would be evaluated for return to the HMA or euthanasia as indicated.

c. Age Class Five to Nine Years: Wild horses aged five to nine years old would be removed last and only if the HMA cannot achieve AML without their removal.

The National Selective Removal Criteria would be followed to the extent possible. Exceptional animals that represent historic colors, size and/or confirmation may be chosen for release outside of the selective removal priorities. Weak, unhealthy and unthrifty animals would not be selected for release back onto the HMA.

To enhance the selection process, more animals than required by the Alternatives would initially be separated for release, and then a final sorting completed to select the exact animals for release, based on traits and ages of all of the animals initially selected. Additionally, in the event that the BLM Wild Horse and Burro Specialist confirms that a certain number of wild horses evade capture, the total number of animals released may be reduced by this number.

Data on the captured horses would be collected, including sex and age distribution, reproduction, survival, condition class information (using the Henneke rating system), color and size, along with the disposition of that animal (removed or released). . Hair samples would be collected in accordance with IM No. 2009-062 to assess the genetic diversity of the herd.

All wild horses outside of the HMA would be gathered and removed.

2.2 Alternatives

2.2.1 Alternative 1—Gather to Low Range AML (320 Horses) with Fertility Control (PZP-22)

Alternative 1 would continue implementation of a population management strategy for the North Lander Complex of HMAs in which wild horses would be managed in a range from 320 to 536 wild horses. Part of this alternative would involve capturing approximately 810 wild horses, returning about 226 animals to the HMAs, and removing approximately 580 horses. It is assumed that approximately 90 percent of the horses could be rounded up and that approximately 90 horses would remain on the range. The 230 horses returned and the 90 horses that remained would approximate the low range of the AML (320 horses). The BLM would assess sex, age, color, and herd health (pregnancy/physical condition). Individual animals would be sorted as to age, size, sex, temperament, and/or physical condition. Selected animals would then be returned to the range. Excess wild horses would be removed and sent to Bureau facilities for adoption or long term pasturing.

Under Alternative 1, approximately 113 breeding age mares selected for release back to the range would be treated with the porcine zona pellucida (PZP) vaccine PZP-22, which would inhibit their reproduction for two breeding seasons. The fertility control vaccine would be administered according to national protocols found in Appendix 3 of this document.

The gather would begin in October 2012 and take about 17 days to complete. Several factors such as animal health, body condition, weather or other considerations could result in adjustments in the

schedule. Gather operations would be conducted in accordance with the Standard Operating Procedures (SOPs) described in the National Wild Horse and Burro Gather Contract (Appendix 1).

The primary gather (capture) methods would be the helicopter drive trapping method with some limited helicopter assisted roping (from horseback) if needed to restrain individual horses. Trap sites and temporary holding facilities would be located in previously used sites or other disturbed areas whenever possible. New trap sites may be selected to avoid sensitive resources and would be surveyed for cultural, botanical, and wildlife resources prior to use. If sensitive resources are encountered, these locations would not be utilized unless appropriate mitigation actions are implemented to avoid impacts. Public access to the HMAs could be restricted during gather operations to ensure public and horse safety and minimize disruption to the gather process. Public viewing and access to the wild horse gather would be coordinated through the Public Affairs Officer assigned to the gather.

An Animal and Plant Health Inspection Service (APHIS) or other veterinarian would be on-site during the gather to examine animals and make recommendations to the BLM for care, treatment, and if necessary, euthanasia of captured wild horses. Decisions to humanely euthanize animals would be made (by the BLM COTR) in conformance with BLM policy (Washington Office Instruction Memorandum 2009-041). Refer to:

http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-041.html

2.2.2 Alternative 2-Gather to low Range AML (320 Horses) with Fertility Control, Gelding and Sex Ratio Adjustments

Similar to Alternative 1, this alternative would involve capturing approximately 810 wild horses, returning around 230 animals to the HMA, and removing the remainder of the horses. The mares that are returned would be treated with PZP-22, an adjustment of sex ratio of 60/40 in favor of studs would be accomplished, and 50 percent of studs returned to the range would be gelded. Of the 230 animals returned to the range, 92 would be fertility treated mares and 138 would be studs, of which 69 of the studs would be gelded. It is assumed that BLM would only be able to capture 90 percent of the herd, which would leave approximately 90 horses on the range, half (45) of which would be studs. The 230 horses returned to the range and the 90 horses left on the range would approximate the low end of the AML of 320 horses. The BLM would assess sex, age, color, and herd health (pregnancy/physical condition). Individual animals would be sorted as to age, size, sex, temperament, and/or physical condition. Selected animals would then be returned to the range, while excess wild horses would be sent to Bureau facilities for adoption or long term holding.

2.2.3 Alternative 3 (Proposed) - Gather to Low Range AML (320 Horses) with Fertility Control (SpayVac® and PZP-22)

Alternative 3 is similar to Alternative 1, but would be different in that the fertility treatment would involve using a new fertility control drug called "SpayVac® ". This alternative would involve the implementation of a research study in which the BLM, working with the United States Geological Survey (USGS) would evaluate the effectiveness of SpayVac®, see Appendix 3A for a complete description of the project study proposal and previous studies using SpayVac®. SpayVac® works similarly to PZP-22, but the fertility suppression effect may last longer.

SpayVac® is made up of three components: the antigen (PZP extracted and purified from pig ovaries), liposomes (cholesterol and lecithin), and an adjuvant, to stimulate the immune response. All the components have been previously approved in other vaccines.

SpayVac® uses the same proteins (antigens) and adjuvant (immune response stimulant), as conventional vaccines such as PZP-22. The difference between SpayVac® and PZP-22, however, is that the PZP proteins in SpayVac® are encapsulated in liposomes, which enhances the immune response Liposomes have been used for many years and are recognized as safe components of vaccines.

Approximately 60 breeding age mares would be treated with SpayVac® and released. Since this would be a research study project, another 30 breeding age mares would be identified, but not fertility treated to assess reproduction in the control group. As with Alternative 1, this alternative would involve capturing approximately 810 wild horses, returning around 230 animals to the HMA, and removing the remainder of the excess horses. The mares that are returned to the range would be treated with SpayVac® or PZP-22. Of the 230 animals returned, up to 60 mares would be fertility treated using SpayVac®. The SpayVac® treated mares and the control mares would be part of the field study conducted by USGS to determine the effect of SpayVac® on individual fertility and population growth rate. Remaining mares that had been previously treated with PZP-22 would be re-treated with PZP-22 and released. The sex ration adjustment under this alternative would be a 50/50 ratio of studs to mares.

The specific objectives and time table for the USGS research project using SpayVac® would run just over 5 years beginning with the 2012 fall gather of the North Lander Complex. The following sequence of events and their approximate time would be as follows:

1 August 2012 – 30 September 2012. Complete study proposal and obtain approval for the study from an Institutional Animal Care and Use Committee (IACUC) and the necessary State and Federal regulatory agencies. Obtain necessary import permit from USDA APHIS and procure SpayVac®® from the manufacturer.

1 October 2012 – 30 April 2013. At a time to be determined by weather and BLM's gather schedule (probably early November) , gather the herd, apply freeze marks, estimate the age of treated and control animals, record body condition, draw blood for pregnancy testing of study mares, and vaccinate mares in the treatment group. Control group mares will not receive an injection.

1 May 2013 – 30 September 2013. By direct observation, collect data on foaling from as many SpayVac®-treated and control mares as can be re-located. Mares will be pregnant at the time of vaccination, so the first data on drug efficacy will not be obtained until 2014. Data from 2013, however, will allow comparison of pre-treatment foaling rates among treated and control mares (no difference expected) and, by comparison with pregnancy data, estimation of fetal loss rates (again, no difference expected).

1 May 2014 – 30 September 2014. Collect data on foaling rates of treated and control mares in the first year of drug efficacy.

2015 – 2017. From May through September of each year, collect data on foaling of treated and control mares in the second, third, and fourth post-treatment years.

1 October 2017 – 30 April 2018. Complete data analysis and prepare manuscript(s) describing results.

The 230 horses returned to the range and the 90 horses left on the range would approximate the low end of the AML (320 horses). The BLM would assess sex, age, color, and herd health (pregnancy/physical condition). Individual animals would be sorted as to age, size, sex, temperament, and/or physical condition. Selected animals would then be returned to the range, while excess wild horses would be sent to Bureau facilities for adoption or long term holding.

2.2.4 Alternative 4—No Gather/Removal

Under the No Action Alternative, no gathering would take place. The herd would be allowed to increase until it reached levels where predation and environmental factors caused increased fetal, neonatal and adult population die-offs which would decrease the size and growth of the population. Considering the drought conditions experienced over the past 8 years in the North Lander Complex, it is anticipated that selection of this alternative could result in a rapid decline in the physical condition of the wild horses in the near future from increasing competition for available forage and water. This alternative would not be in conformance with the 1971 Act, the Lander RMP, or the consent decree with the State of Wyoming. It is also anticipated this alternative would ultimately result in a tremendous amount of starvation and animal suffering.

2.3 Alternatives Considered, but Eliminated From Further Analysis

The following alternatives were eliminated from further analysis because they would not accomplish the purpose and need for the action as defined by BLM's management objectives, they are not consistent with the RMP, regulation, and/or policy, or they would pose a health and safety issue for horses and personnel.

Use of Bait and/or Water Trapping

An alternative considered but eliminated from detailed analysis was use of bait and/or water trapping as the primary or sole gathering method. The use of bait and water trapping, though effective in specific areas and circumstances, would not be timely, cost-effective or practical as the primary gather method for this Complex. However, water or bait trapping may be used as a supplementary approach to achieve the desired goals of Alternatives 1, 2 or 3 if gather efficiencies are too low using a helicopter or a helicopter gather cannot be scheduled. This alternative was dismissed from detailed study as a primary or sole gather method for the following reasons: (1) the project area is too large to effectively use this gather method as the primary or sole method; (2) road access for vehicles to potential trapping locations necessary to get equipment in/out as well as safely transport gathered wild horses is limited; (3) wild horses in the North Lander Complex are extremely sensitive to human presence and associated materials that may be used, and may be very difficult to water trap effectively; and (4) the presence of scattered water sources on both private and public lands inside and outside the HMAs would make it almost impossible to restrict wild horse access to the extent necessary to effectively gather and remove all of the excess animals through only bait and/or water trapping to achieve management goals.

Gather Using Non-motorized Methods

Gather operations would be conducted using riders on horseback which would require numerous personnel. This alternative was dismissed from detailed study because the level of stress on wild horses would be substantially greater than helicopter gathering. When using riders, an individual group of horses is followed more closely and pushed constantly at a faster pace from initial contact to the trap. Otherwise, the animals evade capture. Gather time for each band of horses would be longer and overall human disturbance would be greater.

Predation by carnivores to control population

Predation from mountain lions may occur occasionally. According to the Wyoming Game and Fish Department there are mountain lions that frequent the area. Mountain lions have been hunted within the project area, with a total of 41 lions removed since 1987. This averages to 1.64 mountain lions per year. Even if lion hunting were to cease, this number of mountain lions may not impact the wild horse population enough to keep it within AML. Other prey such as elk, deer and pronghorn antelope live year round within the Complex and may also be a food source for mountain lions. Therefore, this alternative has been dismissed as a feasible way to maintain the population of wild horses.

Remove or Reduce Livestock within the HMA

This alternative would involve no removal of wild horses and instead address the effects of excess wild horse numbers through the removal or reduction of livestock within the HMA. This alternative was not brought forward for analysis because it would be inconsistent with the current land use plan and with BLM's multiple use mission. This gather document and subsequent Decision Record is not the appropriate mechanism for adjusting the authorized livestock use within the allotments associated with this HMA.

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

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

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

Fertility Treatment Using Dart Gun Application Method

Consideration was given to using a field darting delivery method for treating wild horse mares in the field, in lieu of gathering them. This method of delivery of the immunocontraceptive drug PZP-22 has been effective in other field offices. However, the land within the North Lander Complex and the temperament of the horses would not allow this type of delivery system to be used. The North Lander Complex is large in area, encompassing 375,000 acres. Water is common (in most years) throughout and the terrain and topography vary from large open flat expanses to tree lined rims and ridges. These natural features and lack of road access make finding and locating horses for this type of activity almost impossible. Furthermore, wild horses are not individually cataloged, making adequate and consistent fertility treatment difficult. Horses on the Complex are generally only approachable to within several hundred yards, not the 30–40 yards needed for darting. Weather would also hamper treatment efforts, as the ideal time to deliver the drug is from November to March, similar to when PZP-22 would be applied during the gather. During this time of the year, snow cover, including drifts, makes it virtually impossible to access the HMAs with a vehicle or by foot. Due to these circumstances, use of a dart gun to apply fertility treatments is impractical.

3.0 Description of the Affected Environment and Environmental Consequences

Introduction

This section of the EA briefly discusses the relevant components of the human and natural environment which would be either affected or potentially affected by the alternatives. Direct impacts are those that result from management actions while indirect impacts are those that exist once the management action has occurred. By contrast, cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Analysis related to maintaining the AML for the North Lander Complex of HMAs is tiered to the Lander RMP 1987.

The North Lander Complex of HMAs is located approximately ten to 40 miles east of Riverton, within Fremont County, Wyoming. The North Lander Complex is approximately 375,000 acres in size and is

made up of four HMAs. Elevations in the HMAs range from 5,300 in the Wind River Basin to 7,200 feet on top of Beaver Rim. Summers are hot, and winters can range from mild to bitterly cold. The area covered by this analysis is within the jurisdiction of the BLM Lander Field Office, Wyoming. It is bordered on the south by Highway 287, on the east by the Gas Hills and Split Rock grazing allotments, on the north by the Gas Hills Highway, Hwy 136, and on the west by the Wind River Indian Reservation. Appendix No. 2 portrays the analysis area. The majority of the private land holdings in the North Lander HMA Complex are scattered in holdings and mixed both in private and State of Wyoming lands. Annual precipitation ranges from five to 12 inches per year. About half of the precipitation falls during the growing season from April through June, with the remainder coming in the winter and during high intensity summer thunderstorms. Much of the precipitation from summer thunderstorms runs off in numerous drainages. Some of this water is captured in reservoirs or pits, and is the primary source of water for wild horses, livestock, and wildlife.

Because of the proposed location of the gathering facilities, the following elements are not present and will not be analyzed further: Environmental Justice, Floodplains, Waste (Hazardous or Solid), Prime or Unique Farmlands, Water Quality, and Wild and Scenic Rivers.

Resources Present or Potentially Affected

The resources that are present and may have potential to be affected by the Alternatives include: Wild Horses; Wildlife; Vegetation, Soils, and Watershed; Recreation; Wilderness; Livestock Grazing; Minerals and Heritage Resources.

3.1 Wild Horses

A. Wild Horses

1. North Lander Complex Description

The Lander Field Office area of jurisdiction is located in central Wyoming, covering Fremont County and portions of Sweetwater, Carbon, Hot Springs and Natrona Counties. The Conant Creek, Rock Creek Mountain, Muskrat Basin and Dishpan Butte HMAs are located in the Southeastern portion of Fremont County, north of Wyoming highway 789/287 and south of Wyoming highway 20/26 (See map in Appendix 2). The HMAs encompass about 375,000 acres of land. About 38,000 acres within the HMAs (about 10 percent) is privately or state owned. The Complex is characterized by rolling terrain with broken topography and steep escarpments along the Beaver Rim. Annual precipitation ranges from five to 14 inches per year, with an average of around eight inches per year. Approximately half of the precipitation falls during the growing season of April through June, with the remainder coming in high intensity summer thunderstorms or as early winter snows. This general discussion tiers to the affected environment that is discussed in the Lander Herd Management Area Evaluation /Capture plan and the associated Environmental Analyses (EAs) WY-036-EA3-010 and WY-036-EA3-013.

2. Gather History and Population Characteristics

Gathers were conducted in the North Lander Complex in 1983, 1985, 1986, 1988, 1993, 1995, 1997, 2001, 2004 and 2009. The 1983 through 1988 and 2001 gathers were a gate cut (all gathered horses removed), while the 1993, 1995, 1997, 2004 and 2009 gathers were age selective. The 1993 gather dictated that only horses five years old and younger could be removed. Removal criteria for the 1995, 1997, 2004 and 2009 gathers allowed the removal of all horses 10 years and

older, while all studs over five years of age were returned to the herd areas. These gathers were conducted on the entire complex of herd areas. Table 2 shows the number of wild horses that were gathered and the number removed during the gathers by year.

Table 2. Number of Wild Horses Gathered and Removed by HMA

Muskrat Basin:

Year	Number Gathered	Number Removed
1983	157	157
1985	285	285
1986	314	314
1988	159	159
1993	286	195
1995	257	206
1997	212	128
2001	152	152
2004	154	127
2009	470	385
Total	**2446**	**2108**

Dishpan Butte:

Year	Number Gathered	Number Removed
1985	145	145
1995	236	214
2001	57	57
2004	150	123*
2009	158	109
Total	**746**	**648**

Rock Creek Mountain:

Year	Number Gathered	Number Removed
1985	131	131
1986	58	58
1995	10	10
2001	47	47
2004	0	0
2009	76	27*
Total	**322**	**273**

Conant Creek:

Year	Number Gathered	Number Removed
1985	115	115
1986	21	21
1993	119	89
1995	10	10

2001	66	66
2004	113	95
2009	349	283
Total	**793**	**679**

Cumulative	**Number Gathered**	**Number Removed**
Total Wild Horses	4,307	3,708

**These 27 horses were released back into the Rock Creek Mountain HMA as it was determined that this is where these horses had originated from.*

As a result of the age selective removals in 1995, 1997, 2004 and 2009 the current wild horse population is anticipated to be made up primarily of younger horses.

Sex ratios, based upon gather data, was 47 percent females and 53 percent males in 2004. The sex ratio of the current population is expected to be approximately the same.

Table 3 shows the current inventory as of February 2012 pre-foaling population by HMA within the North Lander Complex. The population was last counted in July/August of 2011 using a helicopter direct count method with two observers. The count was conducted using a 1 ½ mile grid pattern across the HMAs.

Table 3. Inventory Population

HMA Name	Inventory Population 2012
Muskrat Basin	405
Conant Creek	123
Dishpan Butte	139
Rock Creek Mountain	83
TOTALS	750*

** Post foaling population in fall of 2012 will be approximately 900 horses*

Genetic Diversity and Viability

Blood samples were collected from horses removed during the 1993 and 2004 gathers to develop genetic baseline data (e.g. genetic diversity, historical origins of the herd, unique markers). The samples were analyzed by Dr. E. Gus Cothran, Equine Genetics Laboratory, Texas A&M University. His conclusions and recommendations regarding genetic diversity in the North Lander Complex of HMA's herd are summarized as follows:

> *"Genetic variability within the Conant Creek herd is high. The herd appears to be of mixed origins, mainly of North American Breeds. Basically, the same is true of the Muskrat Basin herd, although variability is lower. The Dishpan Butte herd has low genetic variability. It shows some association with Spanish horses, but most likely its origins are mixed and mainly from North American breeds."*

"The Conant Creek herd has high genetic variability so that no action need be taken at this time. However, the AML for this herd is fairly low so that future monitoring will be needed. The Muskrat Basin herd also has high variation and no action is required but the AML is low. The Dishpan Butte herd has low variation and should be monitored closely. It would be a good idea to bring some horses in from either of the other herds, as both have higher variability but are relatively closely related to this herd."

Based upon Dr. Cothran's recommendations and, to ensure that the genetic variation within the wild horse herd remains within acceptable levels, further genetic testing is planned in Dishpan Butte and Rock Creek Mountain for the proposed wild horse removal in the fall of 2012. Genetic tests would be based upon hair samples instead of blood samples in consideration of advances in technology.

At this time, there is little evidence to indicate that the North Lander Complex suffers from reduced genetic fitness. The immediate proximity of the different herds to each other allows for the constant exchange of genetic material as only fences separate the HMAs from each other. Although there are fences separating the HMAs, gates are often left open and horses will jump cattle guards and fences on occasion.

The following summarizes current knowledge of genetic diversity as it pertains to wild horses.

- Smaller, isolated populations (<200 total census size) are particularly vulnerable when the number of animals participating in breeding drops below a minimum needed level (Coates-Markle, 2000).
- It is possible that small populations will be unable to maintain adequate genetic diversity to protect animal health and fitness over the long term, unless there is a natural or management-induced influx of genetic information from neighboring herds. An exchange of only one to two breeding age animals per generation would maintain the genetic resources in small populations of about 100 animals, thus obviating the need for larger populations in all cases (Singer, 2000).
- There is little imminent risk of inbreeding since most wild horse herds sampled to date have large amounts of genetic heterozygosis, genetic resources are lost slowly over periods of many generations, wild horses are long-lived with long generation intervals. (Singer, 2000).
- Genetic effective population size (Ne) is a difficult number to calculate for wild horses, since the calculation is complicated by many factors inherent in wild horse herds. No single universally acceptable formula exists to deal with these complexities, and no standard goal for Ne or loss of genetic resources currently exists for wild horse herds. A goal of Ne=50 is currently being applied as an estimate for Ne in wild horse herds (Singer, 2000).
- Current efforts with wild horses suggest management should allow for a 90 percent probability of maintaining at least 90 percent of the existing population diversity over the next 200 years (Coates-Markle, 2000).

The following summarizes what is known about the North Lander HMA Complex as it pertains to genetic diversity:

- The estimated population for the North Lander Complex is approximately 900 head (post 2012 foaling).

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- Genetic effective population size (Ne) for North Lander Complex has not been established.

Current knowledge is limiting for application of these concepts to wild horse herds managed by the BLM. As more research is completed, and knowledge becomes available, it will be applied to the HMAs managed by the LFO.

Environmental Impacts on Wild Horses under Each Alternative

The following table provides a summary of the population modeling results for each alternative, as derived from the wild horse population model, WinEquus (Appendix 5). A total of 100 trials were run for 10 years, to assess the potential results of each possible management scenario. The results shown in Table 4, below represent the median trial for each alternative.

Table 4. Population Modeling Summary

Alternative	Population Size (0 to 20+ age horses)				Number of Horses Gathered, Removed, and Treated			Growth Rate
	Lowest Minimum	Minimum	Average	Maximum	Horses Gathered	Horses Removed	Horses Treated	
(1 & 3) Gather to 320 Horses with Fertility Control	229	337	456	588	1496	262	530	8.1%
(2) Gather to 320 Horses with Fertility Control, Skewing the Sex Ration and Gelding	186	292	432	584	1444	306	484	8.0%
(4) No Removal (No Action)	321	346	1093	2282	0	0	0	20.6%

Population modeling projects that the minimum, average, and maximum population size would be lowest under Alternative 1, 2 and 3. Population modeling for Alternative 3 (the proposed action) is the same as Alternative 1 because the SpayVac® vaccine being used in the field study has a similar formulation as the PZP-22 vaccine which was used in 2009. The difference, however, is that population modeling using SpayVac® is uncertain at this time due to a lack of use and study on this product. It is predicted that improved fertility control may be longer lasting or even permanent with this product. The lowest minimum population size under Alternative 2 would utilize fertility control and gelding, which would be within the parameters specified by Dr. Cothran for maintaining a genetically viable herd. The next lowest minimum population size would be under Alternative 1, which would involve gathering and applying fertility control with PZP-22 only, and would still be above the level which Dr. Cothran indicated is important to maintain genetic variation. The overall population growth rate would virtually be no different between Alternatives 1, 2 and likely 3, and would be substantially higher in Alternative 4. However, it is not known how long SpayVac® would last; this is the purpose of the research study. PZP-22 is known to wear off over a period of 2–3 years.

The population modeling indicated that at least a second removal would be required in the next seven years, beginning with the proposed removal in the fall of 2012, in order to maintain the population within the limits of the AML under Alternative 2. Under Alternative 1, a second removal would most likely be required in or around 2018. Under Alternative 3(the proposed action), a second removal may not be needed as soon as Alternatives 1 and 2, depending on the effectiveness of the SpayVac®® vaccine. The need to conduct a second removal will be determined after field monitoring data has been collected on the mares that were treated with SpayVac® .

Under Alternative 4, the wild horse population within the North Lander Complex of HMAs would grow to a level that would exceed the carrying capacity of the range. Over time, the condition of the range would degrade, and the condition of wild horses would also decline.

Impacts Common to Alternatives 1, 2 and 3

The Wild Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195 as amended) states that all management activities shall be at the minimum feasible level, which would require that removals and other management actions that directly impact the population, such as aerial inventory, occur as infrequently as possible (every 3 to 5 years). To the extent practical, these alternatives would allow maintenance of a self-sustaining population, as well as maintaining a thriving natural ecological balance.

Reducing the wild horse population in the North Lander Complex to 320 horses would meet the intent of the Wild Free Roaming Horse and Burro Act that all management actions shall be at the minimum feasible level. The following positive impacts for wild horses and their habitat would occur:

- A thriving natural ecological balance would be achieved and maintained by reducing the population to the lower limit of the management range.
- The wild horses remaining on the range would experience decreased stess and competitions for available resources.
- A viable population of wild horses would be ensured that would survive and be successful during poor years when elements of the habitat are limiting due to severe winter conditions, drought or other uncontrollable and unforeseeable environmental influences.
- Annual gathers would not be required which would allow for a greater level of herd stability and band integrity.
- Gathers would only occur when the population approaches or exceeds the upper limit of the management range, anticipated to be every four years.
- The wild horse population would be subjected to the stresses associated with gathering and handling as infrequently as possible.

If a management range is not maintained in the North Lander Complex, the intent of the Wild Free Roaming Horse and Burro Act (that all management actions shall be at the minimum feasible level) would not be met. The following negative impacts would occur:

- Annual gathers would be required to remove the annual increase in population each year, approximately 60 to 100 horses.
- A thriving natural ecological balance would not be maintained if yearly gathers to remove the annual increase does not take place. Resource degradation would begin occurring the year following the last gather and increase for each year that a gather is postponed.
- Annual gathers would have more severe impacts to herd stability and band integrity.
- The wild horse population would be subjected to the stress associated with gathering and handling annually.

To the extent practical, the lower limit of the management range should allow maintenance of a self-sustaining population, and the upper limit of the management range must be consistent with the objective of maintaining a thriving natural ecological balance. Population modeling (Appendix 5) conducted for Alternative 1 (Removal to the lower limit of the AML, with fertility control) indicates the lower level of the management range should allow for maintenance of a self-sustaining population. For Alternative 1and 3, the average population size in 10 years found that

the lowest number of 0–20+ year old horses ever obtained was 229 head, with a median trial population of 337 head. For Alternative 2, the lowest number of 0–20+ year old horses ever obtained was 186 head, with a median trial population of 292 head.

The 1993 Herd Management Area Evaluation, Environmental Assessment and Decision Record for the herd areas in the North Lander Complex established the level of horses that would result in maintaining a thriving natural ecological balance.
Maintenance of the AML in the herd areas within the North Lander Complex would meet the intent of the Wild Free Roaming Horse and Burro Act that all management actions shall be at the minimum feasible level. The following impacts for wild horses and their habitat would occur as a result of maintaining the population within the AML:

Selective Removal Criteria

Direct impacts associated with Alternatives 1, 2 and 3 would result, from selecting wild horses for release that possess the historic characteristics (color pattern, sex ratio) and age structure that are typical of the herd demographics of the North Lander Complex HMAs. The National Selective Removal Policy (described in Section 2.1) would be followed to the extent possible. Animals selected for release would be the most capable of surviving environmental extremes, thus ensuring a viable population is present in the HMA's. Utilizing the selective removal criteria would result in a positive impact for the long term health and stability of the population.

Removal of horses from the population is not expected to have a significant impact on herd population dynamics, age structure, or sex ratio, as long as the selection criteria for the removal maintain the social structure and breeding integrity of the herd. The selective removal strategy for the North Lander Complex HMAs would maintain the age structure (of critical breeding age animals), the sex ratio and the historic range of characteristics currently within the herd. This flexible procedure would allow for the correction of any existing discrepancies in herd dynamics, which could predispose a population to increased chances for catastrophic impacts.

Potential negative impacts to the long term health and stability of the population could occur from exercising poor selection criteria not based on herd demographics and age structure. These negative impacts would include modification of age or sex ratios to favor a particular class of animal. If the selective removal criteria support a higher number of studs over mares, it is expected to result in decreased band size, increased competition for mares, and an increase in the size and number of bachelor bands. If the selective removal criteria favor mares over studs, it would be expected to result in fewer and smaller bachelor bands, decreased competition for mares, and a likelihood of larger band sizes.

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

Gather Operations

These direct impacts include: handling stress associated with the gathering, processing, and transportation of animals from gather sites to temporary holding facilities, and from the temporary holding facilities to an adoption preparation facility. The intensity of these impacts varies by individual, and is indicated by behaviors ranging from nervous agitation to physical distress.

Mortality does occur during a gather; however, it is infrequent and typically is no more than one-half to one percent of the total animals gathered.

Impacts that may occur after the initial stress of herding and capture include: spontaneous abortion in mares, increased social displacement, and conflict with studs and mares. Spontaneous abortion following capture is rare, depending on the time of year gathered (typically early July). Traumatic injuries that may occur typically involve biting and/or kicking which results in bruises and minor swelling but normally do not break the skin. These impacts occur intermittently and the frequency of occurrence varies with individuals.

Population wide impacts may occur during or immediately following implementation of Alternatives 1, 2 or 3. They include displacement of bands during capture and the associated re-dispersal, temporary separation of members from individual bands of horses, re-establishment of bands following release, and removal of animals from the population. With the exception of the changes to herd demographics, 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 1 month of release except for a heightened shyness toward human contact. Observations of animals following release have shown that horses relocate themselves back to their home ranges within 12 to 24 hours of release.

All activities would be carried out in accordance with current BLM policy, with the intent of conducting as safe and humane a gather as possible. Recommended actions incorporate proven Standard Operating Procedures (Appendix 1) that have been developed over time. These SOPs represent the best methods for reducing impacts associated with gathering, handling, transporting and collecting herd data.

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

Animals would be transported from the trap to a designated BLM short-term field holding facility. Wild horses would then be aged, sexed and sorted to holding pens where they would be fed hay and fresh water. Mares that are returned to the range would be fertility treated at this temporary field facility. Mares and studs returning to the range would be held for a short period of time before being returned.

Horses slated for removal would then be transported to a larger receiving short-term holding facility in straight deck semi-trailers or goose-neck stock trailers. Trailers are inspected by the BLM prior to use to ensure wild horses can be safely transported and that the interior of the trailer is in a sanitary condition. Wild horses are segregated by age and sex and loaded into separate compartments. A small number of mares may be shipped with foals. Transportation of recently captured wild horses is limited to a maximum of eight hours. 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, recently captured wild horses are off-loaded by compartment and placed in holding pens where they are fed good quality hay and water. Most wild horses begin to eat and drink immediately and adjust rapidly to their new situation. At the short-term holding facility, a veterinarian examines each load of horses and provides recommendations to the BLM regarding care, treatment, and if necessary, euthanasia of the recently captured wild horses. Any animals affected by a chronic or incurable disease, injury, lameness or serious physical defect (such as severe tooth loss or wear, club feet, and other severe congenital

abnormalities) would be humanely euthanized using methods acceptable to the American Veterinary Medical Association (AVMA).

Wild horses in very thin condition or animals with injuries are sorted and placed in hospital pens, fed separately and/or treated for their injuries as indicated. 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 (with limitations). Preparation involves freeze-marking the animals with a unique identification number, drawing a blood sample to test for equine infectious anemia, vaccination against common diseases, castration, and de-worming. During the preparation process, potential impacts to wild horses are similar to those that can occur during handling and transportation. Serious injuries and deaths from injuries during the preparation process are rare, but can occur.

At short-term holding facilities, a minimum of 700 square feet is provided per animal. Mortality at short-term holding facilities averages approximately five percent 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 die during sorting, handling, or preparation.

Adoption or Sale with Limitations, and Long Term Pasturing

Adoption applicants are required to have at least a 400 square foot corral with panels that are at least 6 feet tall for horses over 18 months of age. Applicants are required to provide adequate shelter, feed, and water. The BLM retains title to the horse for 1 year and the horse and the facilities are inspected to assure the adopter is complying with the BLM's requirements. After one year, the adopter may take title to the horse, at which point the horse becomes the property of the adopter. Adoptions are conducted in accordance with 43 CFR 4750.

Potential buyers must fill out an application and be pre-approved before they may buy a wild horse. A sale-eligible wild horse is any animal that is more than 10 years old; or has been offered unsuccessfully for adoption three times. The application also specifies that all buyers are not to re-sell the animal to slaughter buyers or anyone who would sell the animal to a commercial processing plant. Sales of wild horses are conducted in accordance with Bureau policy. Animals 5 years of age and older are transported to long-term holding (LTH) grassland pastures. The BLM has maintained LTH pastures in the Midwest for over 20 years.

Potential impacts to wild horses from transport to adoption, sale or LTH are similar to those previously described. One difference is that when shipping wild horses for adoption, sale or LTH, animals may be transported for a maximum of 24 hours. Immediately prior to transportation, and after every 18-24 hours of transportation, animals are offloaded and provided a minimum of eight hours on-the-ground rest. During the rest period, each animal is provided access to unlimited amounts of clean water and 25 pounds of good quality hay per horse with adequate bunk space to allow all animals to eat at one time.

LTH pastures are designed to provide excess wild horses with humane, life-long care in a natural setting off the public rangelands. There wild horses are maintained in grassland pastures large

enough to allow free-roaming behavior and with the forage, water, and shelter necessary to sustain them in good condition. About 22,700 wild horses, that are in excess of the existing adoption or sale demand (because of age or other factors), are currently located on private land pastures in Iowa, Kansas, Oklahoma, and South Dakota. Located in mid or tall grass prairie regions of the United States, these LTH pastures are highly productive grasslands as compared to more arid western rangelands. These pastures comprise about 300,000 acres (an average of about eight to ten acres per animal). The majority of these animals are older in age.

Mares and castrated stallions (geldings) are segregated into separate pastures except one facility where geldings and mares coexist. Although the animals are placed in LTH, they remain available for adoption or sale to qualified individuals. No reproduction occurs in the long-term grassland pastures, but foals born to pregnant mares are gathered and weaned when they reach about eight to ten months of age and are then shipped to short-term facilities where they are made available for adoption. 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. A very small percentage of the animals may be humanely euthanized if they are in very thin condition and are not expected to improve to a body condition score of 3 or greater due to age or other factors. Natural mortality of wild horses in LTH pastures averages approximately eight percent per year, but can be higher or lower depending on the average age of the horses pastured there (GAO-09-77, Page 52). The savings to the American taxpayer which results from contracting for LTH pastures averages about $4.45 per horse per day as compared to maintaining the animals in short-term holding facilities.

Euthanasia and Sale without Limitation

While humane euthanasia and sale without limitation of healthy horses for which there is no adoption demand are authorized under the WFRHBA, Congress prohibited the use of appropriated funds between 1987 and 2004 and again in 2010 for this purpose. It is unknown if a similar limitation will be placed using fiscal year 2013 appropriated funds, but these management options are not being pursued by the BLM.

Data Collection

Direct impacts associated with data collection involve increased stress levels to the animals for the few minutes they are restrained in the portable chute for aging, sexing, determination of nursing status, hair collection for DNA testing and potentially treatment with a contraceptive. Once the animal is released from the chute, stress levels decrease rapidly. The collection of data is a positive impact to the long-term management of the population. This data would be used to develop population-specific objectives that would help to ensure the long-term viability of the population. This procedure is within the intent of the Act, as it relates to managing populations at the minimum feasible level.

Alternative 1: Gather to Low End of AML (320 Horses) with Fertility Control (PZP-22)

The impacts of Alternative 1 would result from capturing about 810 wild horses, releasing 230 horses back to the HMAs, and removing approximately 580 horses. Direct impacts associated with this alternative include potential changes to herd demographics, and stress associated with gathering. The effect on herd demographics was discussed in the Selective Removal Criteria section, and the stress associated with gathering was discussed under Gather Operations (refer to Section 3.1). Of the animals released back to the range, about 115 breeding age mares would be

treated with two-year immune-contraceptive (PZP-22) vaccine. Published research has shown effectiveness of 94 percent in year one, 82 percent in year two and 68 percent in year three.

Each mare to be released would receive a single-dose of the two-year PZP-22 contraceptive vaccine, as described in Appendix 3. When injected, PZP-22 (antigen) causes the mare's immune system to produce antibodies that bind to her eggs, effectively blocking sperm penetration and fertilization (ZooMontana, 2000). PZP-22 is relatively inexpensive, meets BLM requirements for safety to mares and the environment, and could be administered in the field. Also, among mares, PZP-22 contraception appears to be completely reversible, and to have no ill effects on ovarian function if the mare has not conceived for more than three consecutive years. PZP-22 would not affect normal development of the fetus, hormone health of the mare or behavioral responses to stallions, should the mare already be pregnant when vaccinated (Kirkpatrick, 1995). Turner (1997) also found that the vaccine has proven to have no apparent effect on pregnancies in progress, the health of offspring, or the behavior of treated mares. Inoculated mares would foal normally in 2013, and the contraceptive would limit foal production in 2014 and 2015. Near normal foaling rates would be expected to resume in 2016.

Mares receiving the vaccine would experience slightly increased stress levels from additional handling while being inoculated and freeze marked. There may be some swelling at the injection site following the administration of the fertility control vaccine, but this would be a temporary, short term impact. Injection site injury associated with fertility control treatments is rare in treated mares. The vaccine would be controlled, handled and administered by a trained BLM employee. Any direct impacts associated with fertility control are expected to be minor in nature and of short duration. The mares would quickly recover once released back to the HMA.

Alternative 2: Gather to Low End of AML (320 Horses), adjust the sex ration of 60/40 studs/mares, geld 50 percent of the studs being released and fertility treat 90 mares.

The direct impacts of this alternative would result from capturing approximately 810 wild horses, returning approximately 230 horses to the HMA's, and removing the remainder of the horses, along with an adjustment of the sex ratio to favor males over mares and gelding 50 percent of the released males. Therefore, approximately 69 stallions would be released along with 69 geldings for a total of 138 males. This would leave approximately 92 breeding age mares that would be treated with PZP-22 and released. The effect on herd demographics was discussed in the Selective Removal Criteria section, and the stress associated with gathering was discussed under Gather Operations (refer to Section 3.1).

Under this action, impacts would be the same as Alternative 1, plus the associated impacts of adjusting the sex ratio to favor studs over mares of 60/40 and to studs being gelded. Approximately 69 studs would be anesthetized and castrated. Prior to surgery, feed would be withheld for 24 hours. BLM requires that a general anesthetic is used for all surgical procedures. The specific castration technique used would be a standard surgical technique used in veterinary medicine that includes the surgical removal of both testicles, which technique (open/closed, emasculator/Henderson tool/ligation, scrotal incision/removal etc.) used would be at the discretion of the veterinarian performing the procedure. Upon completion of the castration procedure studs would need to be penned separately and monitored to assure no ill effects would compromise their health and well-being. Minor complications that could be expected (excessive swelling, excessive bleeding) should resolve themselves. Technicians/Specialists anticipate in 10 to 25 percent of cases, bleeding resolves within 24 hours, and swelling is apparent after 24 hours and lasts for 5 to 7 days. Other moderate complications that could be expected include swelling or excessive bleeding that does not resolve itself within 24 hours, and infection. These would be apparent between 1 and

7 days and may require treatment. It could be expected that these complications would occur in 0 to 5 percent of the cases. Serious complications that could be expected would be death and/or evisceration and should be apparent within 48 hours. These complications can be anticipated in zero to five percent of cases. Tetanus vaccination, anti-inflammatory pain medication and an antibiotic injection will be provided following surgery. These castration risks would be similar if horses were removed and castrated in a facility in preparation for adoption or long term pasturing.

The release of geldings likely would result in the formation of bachelor groups of geldings, or geldings within typical family bands, but the geldings would be non-reproducing. This procedure coupled with PZP-22 would reduce the wild horse population within the North Lander Complex and eventually reduce the number of animals removed at each gather.

Alternative 3 (Proposed Action): Gather to Low End of AML (320 Horses) with Fertility Control using SpayVac® and PZP-22

The direct impacts of Alternative 3 would include capturing approximately 810 wild horses, releasing 230 horses back to the HMAs, and removing the excess horses. Direct impacts associated with this alternative include potential changes to herd demographics, and stress associated with gathering. The effect on herd demographics was discussed in the Selective Removal Criteria section, and the stress associated with gathering was discussed under Gather Operations (refer to Section 3.1). Of the animals released back to the range, at least 60 breeding-age mares would be identified and treated with the immune-contraceptive vaccine SpayVac®. This vaccine has shown to be 83 percent effective during a 4-year trial on 12 mares. Another 30 control mares would be identified and not treated with any fertility drugs. This untreated control group is necessary for statistical assessment of the efficacy of SpayVac®. The remaining captured mares would be treated or re-treated with PZP-22 and released. Remaining mares to be released would receive a dose of the 2-year PZP-22 contraceptive vaccine, as described in Appendix 3.

A primary limitation of the immune-contraceptive agents currently available is that they have relatively short duration (1 or 2 years). However, the contraceptive SpayVac® has recently demonstrated the potential for long-lasting efficacy (at least 4 years) in captive wild horses (Killian et al., 2008). Maximizing the duration of contraceptive effectiveness is especially important in wild horses, which in most cases must be captured in order to successfully administer the vaccine. Although there is a lack of quantitative data available, vaccination with SpayVac® produces antibodies that may cause mares to become infertile. As a result, further testing of SpayVac® seems warranted.

In a companion study, USGS is currently evaluating the efficacy of SpayVac® in a pasture setting with captive wild horses. However, to the best of our knowledge the efficacy of SpayVac® has not been tested in free-ranging horses. Gray et al. (2010) reported on a trial using SpayVac® in free-ranging horses in Nevada, but later stated that the vaccine used was not actually SpayVac® because it was not prepared using the liposome technology developed by Immunovaccine Inc. (formerly ImmunoVaccine Technologies, Inc., Halifax, Nova Scotia, Canada) (Fraker and Brown 2011, Gray et al. 2011).

This study will generate new information on the contraceptive efficacy of SpayVac® in free-ranging wild horses. If SpayVac® proves to be an effective contraceptive over multiple years, it has the potential to reduce the number of horses that BLM must gather and remove to maintain healthy range conditions, reduce the number of excess animals that must be held in off-range pastures, and reduce total costs of the Wild Horse and Burro Program. For greater detail on SpayVac® and administration of the drug, please refer to Appendix 3 of this document.

Retreatment of mares with PZP-22 would have the same impacts to the animal as described in Alternative 1.

Alternative 4: No Action - No Removal of Wild Horses

Under this alternative, horses would not experience the stress associated with gathering, removal or adoption. The current population of wild horses would continue to increase, and exceed the carrying capacity of the range. According to population modeling, the population size could approach 3,500 horses within the next 10 years, which is well above the carrying capacity for wild horses in the North Lander Complex. Though it may require many years for the population to reach catastrophic levels, by exceeding the upper limit of the management range, this alternative poses the greatest risk to the long-term health and viability of the North Lander Complex wild horse population, wildlife populations, and the vegetation resources.

The population of wild horses would compete for the available water and forage resources. The areas closest to water would experience severe utilization and degradation of the rangeland resources. Over the course of time, the animals' condition would deteriorate as a result of declining forage availability and the increasing distance traveled between forage and water sources. The mares and foals would be affected most severely. The continued increase in population would eventually lead to catastrophic losses to the herd, which would be a function of the available forage and water and the degradation of the habitat. A point would be reached where the herd would exceed the ecological carrying capacity and both the habitat and the wild horse population would be critically unhealthy.

Ecological carrying capacity of a population refers to the level at which density-dependent population mechanisms would take effect within the herd. At this level, the herd would show obvious signs of ill fitness, including poor individual animal condition, low birth rates, and high mortality rates in all age classes due to disease and/or increased vulnerability to predation (Coates-Markle, 2000). In addition, irreparable damage would occur through overgrazing the habitat, which is not only depended upon by wild horses but by wildlife (including sensitive species) and permitted livestock. All multiple uses of the area would be impacted. Significant loss of wild horses in the North Lander Complex of HMAs due to starvation and disease would have obvious consequences to the long-term viability of the herd. Irreparable damage to the resources, which would include primarily vegetation and soil and watershed resources, would have obvious impacts to the future of the North Lander Complex and all other users of the resources that depend upon them for survival.

This alternative would not be acceptable to the BLM nor most members of the public. The BLM realizes that some members of the public advocate "letting nature take its course", however allowing horses to die of dehydration and starvation would be inhumane treatment and would clearly indicate that an overpopulation of wild horses existed in the HMA. The WFRHBA, as amended, mandates the Bureau to "*prevent the range from deterioration associated with overpopulation*", and "*remove excess horses in order to preserve and maintain a thriving natural ecological balance and multiple use relationships in that area*". Additionally, Federal Regulations at Title 43 CFR 4700.0-6 (a) state "*Wild horses shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat"*.

3.2 Soils, Vegetation, Riparian Areas and Watershed

Existing Situation

A wide range of soils occur within the North Lander Complex. Due to the arid climate, many soils in this area lack high vegetative cover which is necessary to continue the process of soil development.

The soils range from shallow (<20 inches) to very deep (>60 inches) and have an equally broad range of development from weak to well-developed diagnostic horizons. Rock outcrop formations dominate the area near Sweetwater Rocks and Badland formations are prevalent along Beaver Rim. Drainages and stream bottoms with accumulated silts and clays are found throughout the North Complex but make up a very small percentage of the overall area. In some locations, the level of soluble salts affects soil productivity.

Trailing and hoof action by wild horses has the potential of accelerating erosion following intense storms or snow melt. Loss of topsoil on these desert soils leads to an irreplaceable loss in soil productivity

Wetlands and Riparian Zones

Riparian vegetation is not extensive within the HMAs, however, it is a highly important resource for wildlife, wild horses, and livestock. Grazing management considerations often emphasize these areas as the most productive sites in the region. It is estimated that there are 2800 acres of riparian area and roughly 50 to 60 miles of stream side vegetation within the HMAs. There are also numerous springs and seeps found throughout the area. Severe resource degradation caused by livestock grazing and wild horses is currently occurring at some springs within the HMAs. There are also numerous reservoirs scattered throughout the HMAs.

Environmental Impacts on Wetlands and Riparian Zones under All Alternatives

Alternatives 1, 2 and 3

Direct impacts associated with the actions in alternatives 1, 2 and 3 would consist of disturbance to soil surfaces immediately in and around the trap site(s) and temporary holding facilities. Impacts would be created by vehicle traffic and hoof action as a result of concentrating horses, and vehicle use. Impact could be high in the immediate vicinity of the gather site(s) and holding facilities. These sites would be small (less than one half acre) in size. Any impacts would remain isolated in nature. Impacts from herding would be minimal due to the short-term duration. Most gather sites and holding facilities would enable easy access by vehicles and would be on or near existing roads or pullouts. These practices would minimize the long-term effects of impacts.

Implementation of the actions in alternatives 1, 2 and 3 would reduce the current wild horse population and prevent acceleration of soil erosion. Maintaining wild horse populations at the established AML would produce no adverse cumulative impacts to soils.

Alternative 4 - No direct impacts are expected under this alternative. However, in the absence of a wild horse gather, indirect impacts of soil loss from erosion would occur as a result of over-utilization of vegetation and heavy trailing. This loss would be most notable around water locations.

3.3 Endangered, Threatened, Proposed, Candidate and BLM Wyoming Sensitive Species

Existing Situation:

The following table shows the U.S. Fish and Wildlife Service (FWS) designated endangered and threatened species potentially occurring in the Lander Field Office.

Table 5. Threatened and Endangered Species near Lander Field Office

Listed Species	*Present or habitat in project*	*Affect?*	*May affect, not likely to adversely affect*	*May affect, likely to adversely affect*	*Rationale*
	Y/N/UNK	*NO/MAY*	*Y/N*	*Y/N*	
Lynx canadensis *Canada lynx (T)*	*N*				*No suitable forested habitat present.*
Mustela nigripes *Black-footed ferret (E)*	*Y*	*NO*			*Insufficient prey base within the project area (see discussion).*
Penstemon haydenii *Blowout Penstemon (E)*	*Y*	*NO*			*No structures will be built nor will horses be herded through sand dunes.*
Spiranthes diluvialis *Ute ladies= tresses (T)*	*Y*	*NO*			*No structures will be built nor will horses be herded through riparian meadows.*
Yermo xanthocephalus *Desert yellowhead (T)*	*Y*	*NO*			*No structures will be built nor will horses be herded through the desert yellowhead site.*
Critical Habitat *Yermo xanthocephalus*	*Y*	*NO*			*No structures will be built nor will horses be herded in critical habitat for desert yellowhead.*
Platte River water depletion species (T&E)	*Y*	*NO*			*No water depletions will occur.*
Listed, Non-essential, Experimental Population	*Present in project?*	*Affect?*	*Likely to jeopardize population*		*Rationale*
	Y/N/UNK	*NO/MAY*	*Y/N*		
Canis lupus irremotus *Gray wolf*	*UNK*	*NO*			*Not established populations in project area.*

Environmental Impacts

Alternatives 1, 2 and 3

Greater Sage-Grouse

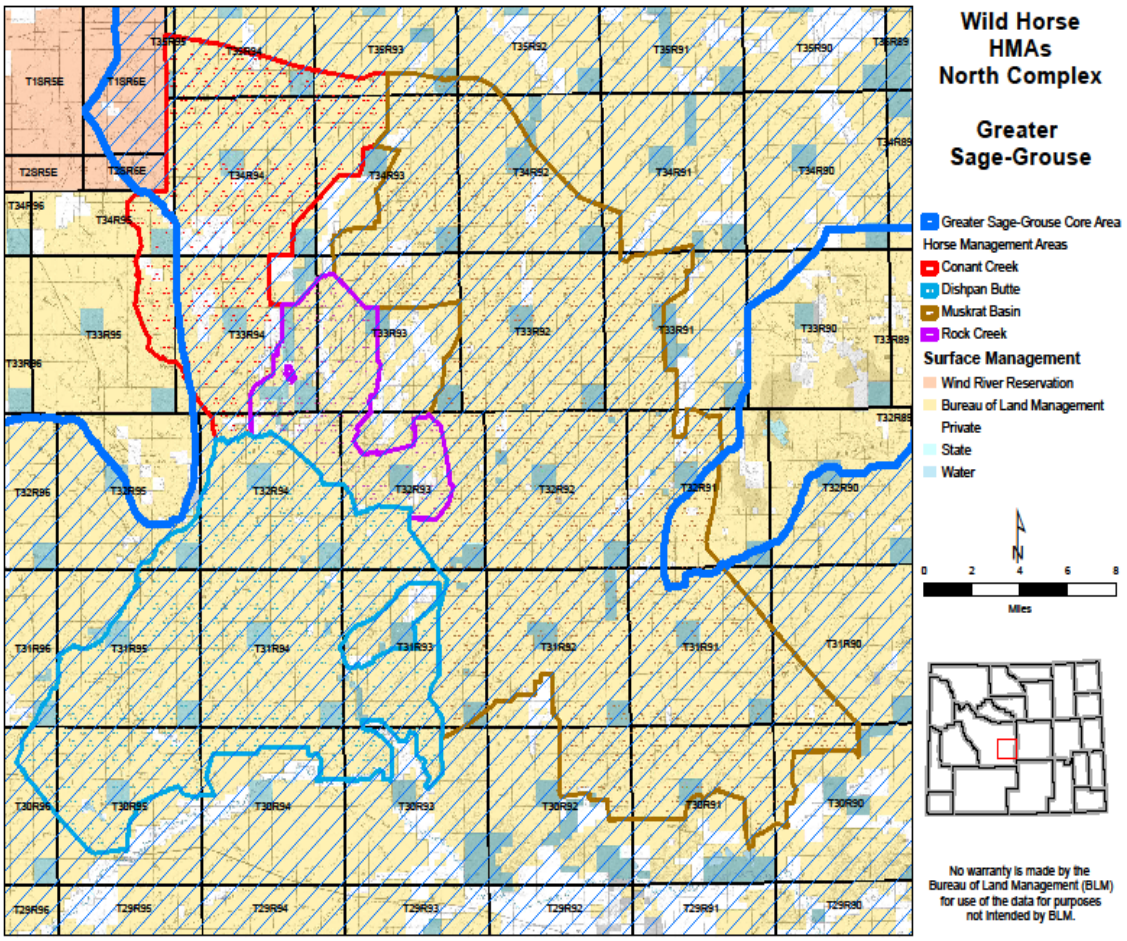
Greater Sage-Grouse populations have been declining across the western United States, prompting several petitions to list them as threatened under the ESA. In March 2010, the U.S. Fish and Wildlife Service (USFWS) determined that the Greater Sage-Grouse warranted listing as a threatened species under the Endangered Species Act (ESA), but precluded listing due to higher priority actions. Threats to Greater Sage-Grouse include degradation, loss, and fragmentation of habitat, predation, West Nile Virus, and human disturbance during sensitive periods (Lander Draft RMP, 2011).

Greater Sage-Grouse population levels throughout the planning area plummeted during the 1990's and then experienced resurgence in the 2000's. This resurgence is thought to be related to precipitation events that promoted grass growth, thus aiding survival of young. Populations in areas of extensive energy development have not seen the same degrees of growth as other parts of the planning area (Lander Draft RMP, 2011).

The project area is located entirely within Greater Sage-Grouse Core Population Area (Core Area) and restrictions on surface disturbance and disruptive activities during certain times of the year and have been in place since 2008. It is the policy of WY BLM (I.M. No. WY-2012-019) to manage Sage-Grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the Wyoming Game and Fish Department. This guidance is consistent with guidelines provided in the Wyoming Governor's Sage-Grouse Implementation Team's Core Population Area strategy and the Governor's Executive Order (Order 2011-5). The Lander Field Office (LFO) will consider and evaluate the following Sage-Grouse habitat conservation measures related to timing, distance, and density for all proposed projects within Core Areas (Lander Proposed RMP, 2012):

A) Within Core Areas, surface disturbing activity or surface occupancy is prohibited or restricted on or within a six tenths (0.6) mile radius of the perimeter of occupied Sage-Grouse leks.
B) Disruptive activity is restricted on or within six tenths (0.6) mile radius of the perimeter of occupied Sage-Grouse leks from 6 pm to 8 am from March 1st to May 15th.
C) Surface disturbing and/or disruptive activities are prohibited or restricted from March 15th to June 30th to protect Sage-Grouse nesting/early brood-rearing habitat inside Core Area.

No surface disturbance will occur within (0.6) mile radius of the perimeter of occupied Sage-Grouse leks. Similarly, no surface disturbance and/or disruptive activities will occur within nesting/early brood-rearing habitat inside Core Area prior to June 30th.



Black-Footed Ferret

The black-footed ferret is considered one of the rarest and most endangered mammals in North America and receives full protection under the Endangered Species Act (ESA) of 1973 (P.L. 93-205). The close association of black-footed ferrets and prairie dogs is well documented. The ferrets rely on prairie dogs for both food and shelter. The original range of the black-footed ferret corresponded closely with the prairie dog, extending over the Great Plains area from southern Canada to the west Texas plains, and from east of the 100th Meridian west to Utah and Arizona. Although prairie dogs may be found within the project area, the black-footed ferret requires large prairie dog colonies for survival. There are currently no colonies of sufficient size within the project area to support a ferret population. Consequently, there will be **no effect** to this species.

Blowout penstemon

The blowout penstemon is a member of the figwort family (Scrophulariaceae). The plant is a hairless perennial herb that grows one to two feet high. The blowout was listed as endangered under the Endangered Species Act on October 1, 1987. The blowout penstemon's habitat consists of sparsely vegetated, early successional, shifting sand dunes and blowout depressions created by wind. In Wyoming, it is often found on the lower half of steep, sandy slopes, deposited at the bases of sedimentary or granite mountains or ridges. Blowout penstemon is found most frequently in microsites that are zones of sand accumulation. The plant is a primary invader that does not persist when a blowout becomes completely vegetated. Wyoming populations occur at an elevation between 6660 and 7430 feet. Although there is some potential habitat for blowout penstemon in the North Lander HMA, no populations have been

found. Since no structures or activities associated with the proposed gather will occur in potential blowout penstemon habitat, there will be **no effect** to this species.

Ute ladies tresses

Due to its apparent global rarity and documented habitat loss, Ute ladies tresses was listed as threatened in 1992. In 1993, the first population of Ute ladies tresses was discovered in Wyoming. Over the next four years, three additional populations were found in Wyoming and new populations were discovered in Idaho, Montana, Nebraska and Washington. This plant is in the orchid family and is a perennial. Range wide, it grows primarily on moist, sub-irrigated or seasonally flooded soils in valley bottoms, gravel bars, old oxbows, or floodplains bordering springs, lakes, rivers, or perennial streams at elevations between 1800-6800 feet. No populations of Ute ladies tresses are known to occur in the Lander Field Office area. Since no structures or activities associated with the proposed gather will occur in Ute ladies' tresses habitat, there will be **no effect** to this species.

Desert yellowhead

Desert yellowhead is a plant which was proposed for listing as threatened in December 1998. A final rule listing the desert yellowhead as threatened was published in the Federal Register on March 14, 2002. A member of the Asteraceae (sunflower) family, it is the only species in the Yermo genus, meaning it seems to have no close relatives. Discovered in 1990, it inhabits about six acres in the Beaver Rim area. Searches have failed to yield more populations, making this the only known location of desert yellowhead in the world. Its population size seems fairly stable at 11,000-12,000 plants. In March 2004, 360 acres of critical habitat was designated for desert yellowhead. No structures or activities associated with the proposed gather will occur within the critical habitat for the desert yellowhead, hence there will be **no effect** to this species or its habitat.

Naturally occurring and functioning wetland habitat communities in the Platte River Basin are important to a number of the federally listed threatened, endangered and candidate species which are known to occur within this region. Likewise, many other fish and wildlife species also are dependent upon these same wetland habitat communities for some or all of their life cycles. Historical reductions in the number of and area of wetland habitat communities within and outside of the Platte River Basin have contributed to declines in the diversity and abundance of wetland dependent fish and wildlife species. The US Fish and Wildlife Service (FWS) has determined that significant water depletions from anywhere in the Platte River Basin have direct and indirect effects on, interior least tern, piping plover, pallid sturgeon, Eskimo curlew and western prairie fringed orchid in Nebraska. No water depletions are associated with the Alternatives; consequently there will be **no effect to** any federally-listed species downstream.
The BLM Wyoming Sensitive Species List for LFO shows the species that are likely to be present in the project area (see Appendix 4). No further discussion will occur for those species or their habitats not present in the project area.

Alternative 4 – Wild horse populations have few natural predators to limit their growth. If left unmanaged, their numbers will increase to the point of causing significant ecological damage in the project area. Although herbivory of listed plant species by animals such as wild horses is not usually considered a problem when sufficient forage is otherwise available, this could become an adverse impact if horse populations increase to the near carrying capacity of their environment. Likewise, population growths of prairie dogs may also be limited by forage competition with wild horses and preclude the possibility of providing sufficient prey base for black-footed ferrets.

Consultation will not be required for any of the designated T&E species. In addition, the proposed project will not cause water depletions to the Platte River and Colorado River systems.

3.4 Wildlife

Existing Situation

Wildlife is an integral part of the environment in the area. The LFO is home to several hundred species of wildlife, including big game, fur bearers, birds (both migratory and year-round resident), amphibians, reptiles, and small mammals. Some species are not affected by this action since they occupy habitats that the action would avoid, such as riparian areas or cliff/steep slopes. Species in these types of habitats will not be addressed further in this document. Some species that are of special interest that could potentially be impacted by Alternatives 1, 2 and 3 or the No Action Alternative include big game (pronghorn antelope, mule deer and elk), and various birds species (raptors, greater sage-grouse, and neotropical migrants).

Mule deer, pronghorn antelope and elk all have some degree of dietary overlap with wild horses (Stephenson 1982 and Meeker 1982), with competition greatest with elk. Wild horses also compete with these big game species for water resources and space. The complex consists of yearlong, winter-yearlong, and crucial winter range for both mule deer and pronghorn antelope. There is also some spring-summer-fall habitat for pronghorn in the HMAs. Elk habitat is officially classified by the Wyoming Game and Fish Department as "out", meaning "these areas, while a part of a herd unit, do not contain enough animals to be important habitat, or the habitats are of limited importance to the species." However, in recent years elk numbers in this area have been increasing and elk are now occupying the HMAs year round in numbers great enough to support harvest by hunting.

Neo-tropical birds include species such as ferruginous hawks, mountain plover, sage thrasher, northern shrike, etc. Some of these species are on the BLM Wyoming Sensitive Species List (See Appendix, 4). Habitat requirements vary by species. Neotropical birds migrate to warmer climates and are not present in this area in the winter.

There are primarily five priority vegetative habitat types within the HMAs that comprise the bulk of the wildlife use and needs. Upland sagebrush stands, upland grasslands, floodplain shrub stands, saline uplands and riparian areas. The preferred upland sagebrush stands are typically $\geq$10 percent canopy cover sagebrush with a healthy understory composition of herbaceous and forb species. These stands are particularly important to wintering big game and wintering and nesting sage grouse, as well as numerous other sagebrush obligate passerines like the sage thrasher, sage sparrow, and Brewer's sparrow. The upland grasslands typically comprise $\leq$10 percent sagebrush canopy cover with the predominant vegetation being grasses with some component of forbs. These sites can be important foraging areas for mule deer, pronghorn, and sage grouse, particularly in the spring and summer when diets shift from shrubs to grasses and forbs. Sage grouse depend on these more open grasslands during brood rearing when they are foraging on both forbs and insects. Like the sagebrush stands, a complex diversity of plant species in the grasslands is advantageous because it provides for an extended green-up period, and this equates to an increase in protein intake. The floodplain shrub stands provide mule deer both valuable cover and forage. Rabbitbrush, greasewood, sagebrush, as well as some cottonwood and willow are valuable forage species, particularly in the fall and winter. These shrub stands also provide much needed forbs in the spring and early summer.

Other vegetative communities provided within the HMA that are important to wildlife species are the saline upland sites, and riparian areas associated with reservoirs and seeps. The saline uplands provide nesting and foraging habitat for mountain plover. The saltbush component of these sites can be important forage for pronghorn and mule deer at times. Riparian areas and their

associated aquatic and wetland vegetation provide forage and cover to waterfowl and some passerines. These wet areas with succulent vegetation and abundant insects are also important foraging areas for sage grouse broods, particularly during late brood rearing when most other upland sites have dried up and vegetation has cured out.

All of the above habitat types can be vulnerable to improper grazing management, by both wild horses and livestock. If grazing is managed with the objectives of maintaining or improving species composition, structural diversity, and plant vigor, the valuable components of these vegetative habitats should remain sustainable for the wildlife species that depend upon them. Communities most valuable and most at risk in terms of importance to wildlife are the upland sagebrush stands and the floodplain shrub stands. Over-utilization of either the sagebrush canopy or the grass/forb understory would decrease both production and diversity of the entire community.

Environmental Impacts

Alternatives 1, 2 and 3 – Under these alternatives, the horses left on the range would have adequate forage, water, and space. Wildlife species would be able to live in a natural ecological balance within the HMA and adjacent to it. Improved quality and increased quantity of forage would help to obtain or maintain objective wildlife populations as defined by the Wyoming Game and Fish Department.

Wildlife populations in areas where excess wild horses are gathered could be disrupted for a short time during the gathering operations. Once gathering operations cease, these effects would stop. The short-term effects are a result of human presence and the noise of the helicopter which may cause wildlife to seek cover in areas away from gathering routes. However, large game species should return to the area within a few days. Capture activities would not cause abandonment of normal habitat areas. There would be no long-term adverse effect on wildlife.

BLM data and past experience show that removal of excess horses from areas of wild horse concentration would improve habitat conditions for wildlife. This effect would be most pronounced around water sources and would benefit both game and non-game wildlife. Maintaining wild horse populations at AML through the removal of excess wild horses enables wildlife populations to utilize the forage that would otherwise be used by the excess wild horses. No adverse cumulative impacts to wildlife are anticipated.

Alternative 4 – Unmanaged populations of wild horses might eventually stabilize at very high numbers near what is known as their food-limited ecological carrying capacity. At these levels, range conditions would deteriorate significantly. Due to the lack of large predators to limit population growth in the HMA, wild horse numbers would eventually exceed the carrying capacity of the HMA and adjacent areas. Competition for water sources and forage resources would increase between wildlife species, specifically pronghorn and mule deer. Inter specific competition over time could affect pronghorn and mule deer, especially in crucial winter ranges. Large game species may be displaced over time and population levels and overall health of the herds would diminish.

Under this alternative, sage grouse may be impacted from deteriorated range condition if vegetation required for nesting, specifically residual grasses within and adjacent to sagebrush pockets, becomes depleted. Under this alternative, raptors would not be impacted by wild horses and implementation of management practices. The impacts described above would be cumulative over time.

3.5 Heritage Resources

Existing Situation

Only a small fraction of the land surface within the North Lander HMA Complex has been inventoried for cultural resources. Prehistoric sites known to exist within the HMAs include open camps and lithic scatters. Many more of these are expected to be found as inventories continue to be done. Historic sites known to exist include trash dumps, trails, roads, and structures associated with early settlement and commerce, or with the local ranching industry. Many more historic sites are also expected to be found as inventories continue to be done. Cultural Resource Program support for the wild horse capture would consist of file search (Class I) and/or intensive field (Class III) inventories, and, if necessary, mitigation of impacts, at the locations of the horse trap prior to horse capture. Support includes consultation with the Wyoming State Historic Preservation Office according to the Wyoming State Protocol agreement of the BLM's National Cultural Resources Programmatic Agreement. Paleontological Resources would be treated the same as Cultural Resources.

Environmental Impacts

Alternatives 1, 2 and 3 – Direct or indirect impacts to cultural resources are not anticipated to occur from implementation of Alternative 1, 2 or 3. All gather sites and temporary holding facilities would be surveyed at the Class III level for cultural resources prior to construction. The LFO archeologist would review all proposed and previously used gather sites and temporary holding facility locations to determine if these have had a Class III cultural resources inventory, and/or if a new inventory is required. If cultural resources are encountered at proposed gather sites or temporary holding facilities, those locations would not be utilized unless they could be modified to avoid or mitigate adverse impacts to the cultural resource site(s).

Within the HMA, where Class III inventories have not been or would not be conducted, impacts to historic properties are limited to trampling. Naturally, fewer horses would result in lesser potential impacts to historic properties.

Alternative 4 – At the present time, a determination of no action would not adversely affect historic properties. However, a substantial increase in the number of horses over time may adversely affect historic properties by trampling.

3.6 *Livestock Grazing*

Existing Situation

The rangeland management program includes six grazing allotments within the HMAs currently under planned grazing systems with use periods of spring, summer, fall and winter (Appendix 6). Water for livestock and wild horses is mainly available from springs and reservoirs during late winter to early summer. Throughout the summer, spring flow and reservoir storage diminish. By the late part of the grazing season most water resources become dry, thus causing some excessive use in and around perennial riparian areas.

Alternative 1, 2 and 3
Livestock could be present in the HMAs during the gather. Added stress to livestock would occur when the helicopter is in the area. This would put an additional burden on the livestock

operator to ensure his cattle are out of the area, but impacts would be slight and only for a short time per trap site (up to five days).

Maintaining wild horse numbers within AMLs would result in slight to moderate wild horse forage utilization levels over a four year period. Overlap between wild horse and livestock use areas would be limited; therefore, areas where livestock graze could make progress toward meeting Standards for Rangeland Health.

Alternative 4
Under this Alternative wild horse numbers would increase. Competition between wild horses and livestock would occur. Wild horses would dominate watering locations and limit livestock's ability to access water as needed. Range conditions would deteriorate when compared to Alternatives 1,2 and 3 due to the increased use of forage by the additional numbers of wild horses.

3.7 Energy Development

Existing Situation

At the present time, several small oil and gas field exist within the Conant Creek and Dishpan Butte HMA's. The potential for further development or new technology to redevelop these fields is moderate to low. Mining exploration activities are dispersed throughout the HMA complex, and a small mine has been proposed in the Dishpan Butte HMA.

All Alternatives – are in compliance with Executive Order 13212, which directs the BLM to consider the President's National Energy Policy and adverse impacts the alternatives may have on energy development.

There is no impact to energy development anticipated under these alternatives: to the extent that wild horse populations consume forage, additional impacts by wild horses and other animals (livestock and wildlife) would tend to make reclamation more difficult. The impact to vegetation as well as soil and water discussed above would also impact reclamation. Thus, Alternative 1 & 3, in which the population would grow more slowly, would have less of an impact than Alternative 2, which would have less impact than Alternative 4.

3.8 Cumulative Impacts

Cumulative impacts are impacts on the environment that result from the incremental impact of the Alternatives when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively major or problematic actions taking place over a period of time.

The area affected by the Alternatives is the North Lander Complex. Please refer to the North Lander Complex map (Appendix 2), which displays the HMA boundaries. Past, proposed and reasonably foreseeable actions that may have similar effects on the North Lander Complex wild horse population would include past wild horse gathers and future wild horse gathers. Numerous gathers have been completed in the past, and future gathers would be scheduled according to a 3- to 4-year gather cycle. Over time, as wild horse population levels are maintained within an acceptable management range, a thriving natural ecological balance would be achieved and

maintained. Cumulative effects that may result would include continued improvement of the range condition and riparian-wetland condition. Cumulative beneficial effects from implementation of Alternative 1, 2 or 3 to wildlife, the wild horse population and domestic livestock would occur as forage availability and quality are maintained and improved. Water quality and riparian habitat would also continually improve.

Adverse cumulative impacts on natural resources would occur depending on which alternative is selected. Adverse cumulative impacts would include periodic over utilization of vegetative resources, which would result in decreased vegetative density, plant vigor, seed production, seedling establishment, and forage production. This may result in periodic decreases of the ecological status of plant communities.

Adverse cumulative impacts on natural resources for Alternative 4, No Action, would include continued over utilization of vegetative resources which would result in decreased vegetative density, plant vigor, seed production, seedling establishment, forage production, and a potential increase of non-native species to new areas in the HMA. Continued over use of the vegetative community would result in a loss of ecological status of the plant communities which may take decades to restore. Decreased vegetative density would result in an increase of bare ground, which may lead to increased erosion, increased negative impacts to stream banks and riparian habitat condition. With continued over use on upland sage-grouse habitat, a negative adverse cumulative impact to this species would occur. Wildlife, migratory birds, and wild horses would all be negatively affected by these adverse cumulative impacts to natural resources.

Based upon these considerations, the effects of other existing and reasonably foreseeable future activities including the Alternatives 1, 2 and 3 would not cause a major effect to the environment. Alternative 4, No Action, may cause a major impact to the environment.

There would be no known adverse cumulative impacts to any of the resources analyzed in this document as a result of Alternatives 1, 2 and 3. Adverse cumulative impacts to vegetation, soils and riparian habitat would occur as a result of selecting Alternative 4, No Action.

The HMAs contain a variety of resources and support a variety of uses. There are a number of other BLM conducted and authorized activities ongoing in and adjacent to the Complex. Any alternative course of wild horse management has the opportunity to affect and be affected by those activities. Most of those activities depend in one way or another on the maintenance of a healthy landscape. The cumulative impacts of Alternatives 1, 2 and 3 would be to maintain a thriving natural ecological balance and preserve the multiple use relationship among all resources within and surrounding the North Lander Complex. The cumulative impacts of Alternative 4 would be that a thriving natural ecological balance would not be maintained, and the multiple use relationship within the North Lander Complex would not be preserved. Cumulative impacts to the long-term viability of the horse herds would be monitored through genetic marker analysis in accordance with the Standard Operation Procedures (Appendix 1).

and burro interested party mailing lists, the Lander Field Office interested party mailing list, neighboring livestock permittees, and various state and federal agencies. The Scoping Statement was also posted on the BLM Wyoming web page. The BLM received approximately 4,000 comment letters or emails from individuals, organizations, and agencies following the issuance of the North Lander Complex Wild Horse Gather Scoping Letter. The majority of these comments were the result of a form-letter writing campaign. . All comments were reviewed, considered and resulted in approximately 18 specific and substantive comment themes. On July 6, 2012 the preliminary EA was issued for a 30 day review period. BLM received approximately 7,100 responses. All comment letters were reviewed, considered and resulted in approximately 23 unique substantive comments. Substantive comments were incorporated into the EA as appropriate. Comments that were not substantive are on file and can be reviewed at the Lander Field Office. Comments were received from the general public, organizations and agencies.

In accordance with 43 CFR 4740.1(b), a formal statewide hearing regarding the use of helicopters for the roundup of wild horses in Wyoming is held each year. The public is provided an opportunity to discuss concerns and questions with BLM staff. Extensive public scoping was conducted prior to and during the preparation of the Evaluation of Wild Horse Herd Areas, Lander Grazing Supplement (FEIS, September, 1986) and the Lander RMP (June, 1987). Several public meetings were held in the Lander area. Numerous comments were received regarding these HMAs, and were incorporated in the Evaluation, RMP and EIS.

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APPENDIX 1

Standard Operating Procedures for Wild Horse Gathers

Gathers would be conducted by utilizing contractors from the Wild Horse Gathers-Western States Contract, or BLM personnel. The following procedures for gathering and handling wild horses would apply whether a contractor or BLM personnel conduct a gather. For helicopter gathers conducted by BLM personnel, gather operations will be conducted in conformance with the *Wild Horse and Burro Program Aviation Management Handbook* (January 2009).

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

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

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

1. Helicopter Drive Trapping. This capture method involves utilizing a helicopter to herd wild horses into a temporary trap.
2. Helicopter Assisted Roping. This capture method involves utilizing a helicopter to herd wild horses or burros to ropers.
3. Bait Trapping. This capture method involves utilizing bait (e.g., water or feed) to lure wild horses into a temporary trap.

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

A. Capture Methods used in the Performance of Gather Contract Operations

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

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

2. The rate of movement and distance the animals travel shall not exceed limitations set by the COTR/PI who will consider terrain, physical barriers, weather, condition of the animals and other factors. Under normal circumstances this travel should not exceed 10 miles and may be much less dependent on existing conditions (i.e. ground conditions, animal health, extreme temperature (high and low), etc.).

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

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

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

    c. All runways shall be a minimum of 30 feet long and a minimum of six feet high for horses, and five feet high for burros, and shall be covered with plywood, burlap, plastic snow fence or like material a minimum of 1 foot to 5 feet above ground level for burros and 1 foot to 6 feet for horses. The location of the government furnished portable fly chute to restrain, age, or provide additional care for the animals shall be placed in the runway in a manner as instructed by or in concurrence with the COTR/PI.

    d. All crowding pens including the gates leading to the runways shall be covered with a material which prevents the animals from seeing out (plywood, burlap, plastic snow fence, etc.) and shall be covered a minimum of 1 foot to 5 feet above ground level for burros and 2 feet to 6 feet for horses

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

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

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

6. Alternate pens, within the holding facility shall be furnished by the Contractor to separate mares or jennies with small foals, sick and injured animals, strays or other animals the COTR determines need to be housed in a separate pen from the other animals. Animals shall be sorted as to age, number, size, temperament, sex, and condition when in the holding facility so as to minimize, to the extent possible, injury due to fighting and trampling. Under normal conditions, the government will require that animals be restrained for the purpose of determining an animal's age, sex, or other necessary

procedures. In these instances, a portable restraining chute may be necessary and will be provided by the government. Alternate pens shall be furnished by the Contractor to hold animals if the specific gathering requires that animals be released back into the capture area(s). In areas requiring one or more satellite traps, and where a centralized holding facility is utilized, the contractor may be required to provide additional holding pens to segregate animals transported from remote locations so they may be returned to their traditional ranges. Either segregation or temporary marking and later segregation will be at the discretion of the COTR.

7. The Contractor shall provide animals held in the traps and/or holding facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Animals held for 10 hours or more in the traps or holding facilities shall be provided good quality hay at the rate of not less than two pounds of hay per 100 pounds of estimated body weight per day. The contractor will supply certified weed free hay as required by Wyoming statute W.S. 11-5 –19.

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

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

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

11. Animals shall be transported to their final destination from temporary holding facilities as quickly as possible after capture unless prior approval is granted by the COTR for unusual circumstances. Animals to be released back into the HMA following gather operations may be held up to 21 days or as directed by the COTR. Animals shall not be held in traps and/or temporary holding facilities on days when there is no work being conducted except as specified by the COTR. The Contractor shall schedule shipments of animals to arrive at final destination between 7:00 a.m. and 4:00 p.m. No shipments shall be scheduled to arrive at final destination on Sunday and Federal holidays, unless prior approval has been obtained by the COTR. Animals shall not be allowed to remain standing on trucks while not in transport for a combined period of greater than three (3) hours in any 24 hour period. Animals that are to be released back into the capture area may need to be transported back to the original trap site. This determination will be at the discretion of the COTR/PI or Field Office horse specialist.

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

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

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

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

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

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

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

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

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

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

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

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

C. Use of Motorized Equipment

1. All motorized equipment employed in the transportation of captured animals shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of animals. The Contractor shall provide the COTR/PI, if requested, with a current safety inspection (less than one year old) for all motorized equipment and tractor-trailers used to transport animals to final destination.

2. All motorized equipment, tractor-trailers, and stock trailers shall be in good repair, of adequate rated capacity, and operated so as to ensure that captured animals are transported without undue risk or injury.

3. Only tractor-trailers or stock trailers with a covered top shall be allowed for transporting

animals from trap site(s) to temporary holding facilities, and from temporary holding facilities to final destination(s). Sides or stock racks of all trailers used for transporting animals shall be a minimum height of 6 feet 6 inches from the floor. Single deck tractor-trailers 40 feet or longer shall have at least two (2) partition gates providing at least three (3) compartments within the trailer to separate animals. Tractor-trailers less than 40 feet shall have at least one partition gate providing at least two (2) compartments within the trailer to separate the animals. Compartments in all tractor-trailers shall be of equal size plus or minus 10 percent. Each partition shall be a minimum of 6 feet high and shall have a minimum 5 foot wide swinging gate. The use of double deck tractor-trailers is unacceptable and shall not be allowed.

4. All tractor-trailers used to transport animals to final destination(s) shall be equipped with at least one (1) door at the rear end of the trailer which is capable of sliding either horizontally or vertically. The rear door(s) of tractor-trailers and stock trailers must be capable of opening the full width of the trailer. Panels facing the inside of all trailers must be free of sharp edges or holes that could cause injury to the animals. The material facing the inside of all trailers must be strong enough so that the animals cannot push their hooves through the side. Final approval of tractor-trailers and stock trailers used to transport animals shall be held by the COTR/PI.

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

6. Animals to be loaded and transported in any trailer shall be as directed by the COTR/PI and may include limitations on numbers according to age, size, sex, temperament and animal condition. The following minimum square feet per animal shall be allowed in all trailers:

   11 square feet per adult horse (1.4 linear foot in an 8 foot wide trailer);
   8 square feet per adult burro (1.0 linear foot in an 8 foot wide trailer);
   6 square feet per horse foal (.75 linear foot in an 8 foot wide trailer);
   4 square feet per burro foal (.50 linear feet in an 8 foot wide trailer).

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

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

D. Treatment of Injured or Sick; Disposition of Terminal Animals

The contractor would restrain sick or injured animals if treatment is necessary. A veterinarian may be called to make an assessment and recommendation. Destruction would be done by the most humane method available. Authority for humane destruction of wild horses is provided by the Wild Free-Roaming Horse and Burro Act of 1971,

Section 3(b)(2)(A), 43 CFR 4730.1, BLM Manual 4730 - Destruction of Wild Horses and Burros and Disposal of Remains, and is in accordance with BLM policy as expressed in Instructional Memorandum No. 98-141.

The Authorized Officer would determine if injured animals must be destroyed and provide for destruction of such animals. The contractor may be required to dispose of the carcasses as directed by the Authorized Officer.

The carcasses of the animals that die or must be destroyed as a result of any infectious, contagious, or parasitic disease would be disposed of by burial to a depth of at least 5 feet. If burial is not an option then carcasses may be taken to the nearest landfill or disposed of on the range where scavengers would benefit.

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

E. Safety and Communications

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

    a. The proper operation, service and maintenance of all contractor furnished property is the responsibility of the Contractor. The BLM reserves the right to remove from service any contractor personnel or contractor furnished equipment which, in the opinion of the contracting officer or COTR/PI, violates contract rules or are unsafe or otherwise unsatisfactory. In this event, the Contractor will be notified in writing to furnish replacement personnel or equipment within 48 hours of notification. All such replacements must be approved in advance of operation by the Contracting Officer or his/her representative.

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

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

2. Should the contractor choose to utilize a helicopter the following will apply:

    a. The Contractor must operate in compliance with Federal Aviation Regulations, Part 91. Pilots provided by the Contractor shall comply with the Contractor's Federal Aviation Certificates, applicable regulations of the State in which the gather is located.

    b. Fueling operations shall not take place within 1,000 feet of animals.

F. Site Clearances

No personnel working at gather sites may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage or otherwise alter or deface any archaeological resource located on public lands or Indian lands.

Prior to setting up a trap or temporary holding facility, BLM will conduct all necessary clearances (archaeological, T&E, etc). All proposed site(s) must be inspected by a government archaeologist. Once archaeological clearance has been obtained, the trap or temporary holding facility may be set up. Said clearance shall be arranged for by the COR, PI, or other BLM employees.

Gather sites and temporary holding facilities would not be constructed on wetlands or riparian zones.

G. Animal Characteristics and Behavior

Releases of wild horses would be near available water. If the area is new to them, a short-term adjustment period may be required while the wild horses become familiar with the new area.

H. Public Participation

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

I. Responsibility and Lines of Communication

Contracting Officer's Representative/Project Inspector
Scott Fluer – Lander Field Office

The Contracting Officer's Representatives (COTRs) and the project inspectors (PIs) have the direct responsibility to ensure the Contractor's compliance with the contract stipulations. The Lander and Rawlins Assistant Field Managers for Resources and Lander and Rawlins Field Managers will take an active role to ensure the appropriate lines of communication are established between the field, Field Office, State Office, National Program Office, and BLM Holding Facility offices. All employees involved in the gathering operations will keep the best interests of the animals at the forefront at all times.

All publicity, formal public contact and inquiries will be handled through the Assistant Field Managers for Renewable Resources and Field Office Public Affairs. These individuals will be the primary contact and will coordinate with the COTR/PI on any inquiries.

The COTR will coordinate with the contractor and the BLM Corrals to ensure animals are being transported from the capture site in a safe and humane manner and are arriving in good condition.

The contract specifications require humane treatment and care of the animals during removal operations. These specifications are designed to minimize the risk of injury and death during and after capture of the animals. The specifications will be vigorously enforced.

Should the Contractor show negligence and/or not perform according to contract stipulations, he will be issued written instructions, stop work orders, or defaulted.

J. Glossary

Appropriate Management Level- The number of wild horses and burros which can be sustained within a designated herd management area and which achieves and maintains a thriving natural ecological balance, keeping with the multiple use management concepts for the area.

Authorized Officer- An employee of the BLM to whom has been delegated the authority to perform the duties described in these Standard Operating Procedures. See BLM Manual 1203 for explanation of delegation of authority.

Animal Unit Month (AUM) - A standardized unit of measurement of the amount of forage necessary for the sustenance of one animal unit for 1 month; also, a unit of measurement that represents the privilege of grazing one animal unit for 1 month.

Animal Unit (AU)- A standardized unit of measurement for range livestock or wildlife. Generally, one mature (1,000-pound) cow or its equivalent, based on an average daily forage consumption of 26 pounds of dry matter per day.

Census The primary monitoring technique used to maintain a current inventory of wild horses and burros on given areas of the public lands. Census data are derived through direct visual counts of animals using a helicopter.

Contracting Officer (CO) - Is the individual responsible for an awarded contract who deals with claims, disputes, negotiations, modifications and payments. Appoints COTRs and PIs.

Contacting Officers Representative (COR)- Acts as the technical representative for the CO on a contract, ensures that all specifications and stipulations are met, reviews the contractor's progress, advises the CO on progress, problems, costs, etc., and is responsible for review, approval, and acceptance of services.

Evaluation- A determination based on studies and other data that are available as to if habitat and population objectives are or are not being met and where an overpopulation of wild horses and burros exists and whether actions should be taken to remove excess animals.

Excess Wild Horses or Burros- Wild, free-roaming horses or burros which have been removed from public lands or which must be removed to preserve and maintain a thriving ecological balance and multiple-use relationship within public lands.

Genetically Viable- The fitness of a population, as represented in its ability to maintain the long-term reproductive capacity for healthy, genetically diverse members.

Health Assessment- Evaluation process based on best available studies data to determine the current condition of resources in relation to potential or desired conditions.

Healthy Resources- Resources that meet potential or desired conditions or are improving toward meeting those potential or desired conditions.

Herd Area- The geographical area identified as having been used by wild horse and burro populations in 1971, at the time of passage of the Wild Free-roaming Horse and Burro Act.

Herd Management Area - The geographical area as identified through the land use planning process established for the long-term management of wild horse and burro populations. The boundaries of the herd management area may not be greater than the area identified as having been used by wild horse and burro populations in 1971, at the time of passage of the Wild Free-roaming Horse and Burro Act.

Invasive Weeds- Introduced or noxious vegetative species which negatively impact the ecological balance of a geographical area and limit the areas potential to be utilized by authorized uses.

Metapopulation (complex)- A population of wild horses and burros comprised of two or more smaller, interrelated populations that are linked by movement or distribution within a defined geographical area.

Monitoring- Inventory of habitat and population data for wild horses and burros and associated resources and other authorized rangeland uses. The purpose of such inventories is to be used during evaluations to make determinations as to if habitat and population objectives are or are not being met, where an overpopulation of wild horses and burros exists, and whether actions should be taken to remove excess animals.

Multiple Use Management- A combination of balanced and diverse resource use that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals watershed, domestic livestock, wild horses, wild burros, wildlife, and fish, along with natural, scenic, scientific, and historical values.

Project Inspector- Coordinates with the COTR assigned to a contract to support his/her responsibility for review, approval, and acceptance of services.

Research- Science based inquiry, investigation or experimentation aimed at increasing knowledge about wild horses and burros conducted by accredited universities or federal government research organizations with the active participation of BLM wild horse and burro professionals.

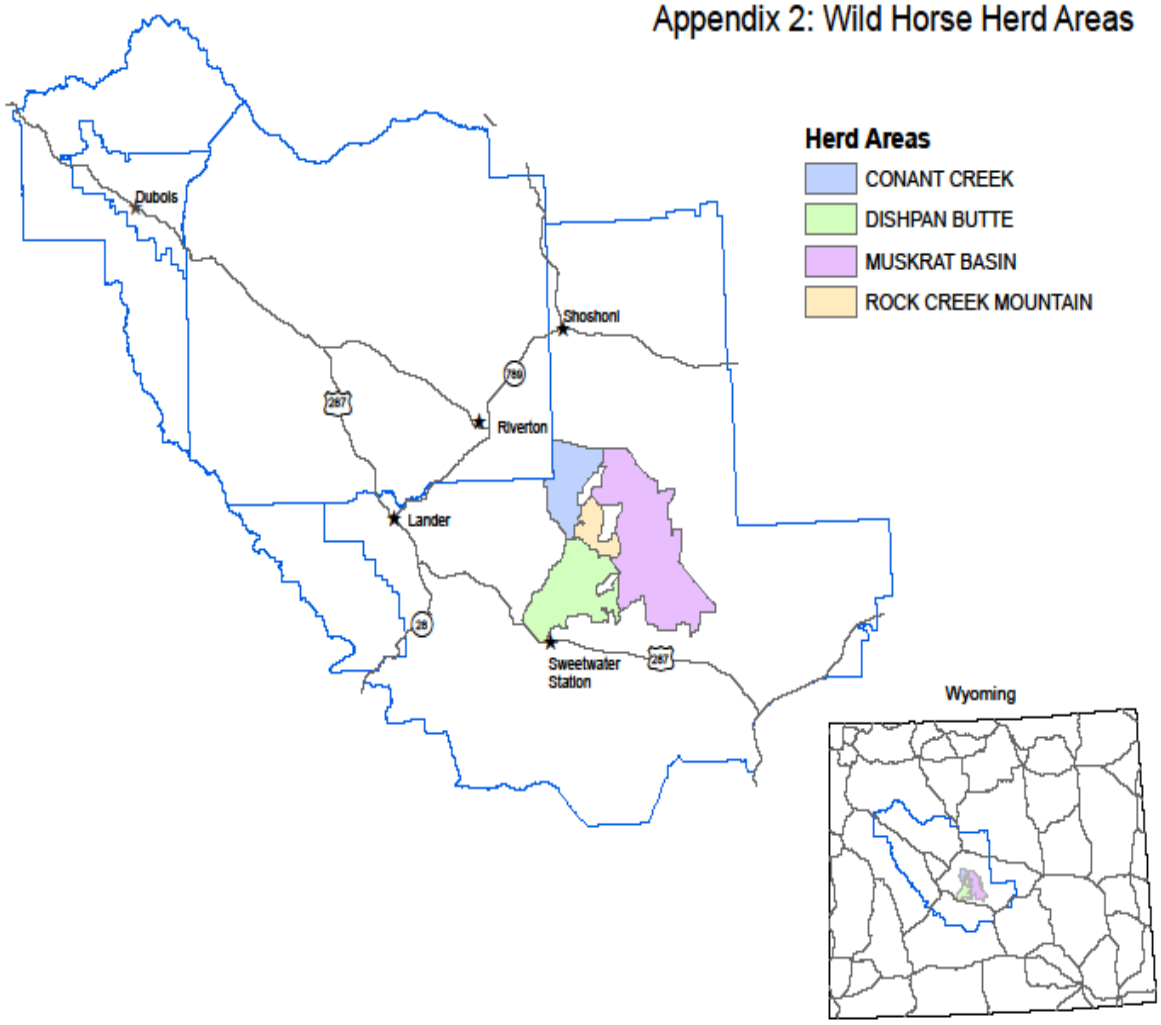
Science Based Decision Making- Issuance of decisions affecting wild horses and burros, associated resources and other authorized rangeland uses incorporating best available habitat and population data and in consultation with the public.

SpayVac® - SpayVac®® is made up of three components: the antigen (PZP extracted and purified from pigs ovaries), liposomes (cholesterol and lecithin), and an adjuvant, to stimulate the immune response.

Studies- Science based investigation of specific aspects of wild horse and burro habitat or populations in supplement to established monitoring. These investigations would not be established following rigid experimental protocols and could include drawing blood on animals to study genetics, disease and general health issues and population dynamics such as reproduction and mortality rates and general behavior.

Thriving Natural Ecological Balance - An ecological balance requires that wild horses and burros and other associated animals be in good health and reproducing at a rate that sustains the population, the key vegetative species are able to maintain their composition, production and reproduction, the soil resources are being protected, maintained or improved, and a sufficient amount of good quality water is available to the animals.

Appendix 2: Wild Horse Herd Areas



Appendix 3

Standard Operating Procedures for Fertility Control Treatment

PZP-22

The following management and monitoring requirements are part of Alternatives 1,2 and 3:

- The 22 month pelleted PZP vaccine would be administered by trained BLM personnel.
- The fertility control drug is administered with two separate injections: (1) a liquid dose of PZP-22 is administered using an 18 gauge needle primarily by hand injection; (2) the pellets are preloaded into a 14 gauge needle. These are loaded on the end of a trocar (dry syringe with a metal rod) which is loaded into the jab stick which then pushes the pellets into the breeding mares being returned to the range. The pellets and liquid are designed to release the PZP-22 over time similar to a time release cold capsule.
- Delivery of the vaccine would be as an intramuscular injection while the mares are restrained in a working chute. One half cubic centimeters (cc) of PZP-22 would be emulsified with 0.5 cc of adjuvant (a compound that stimulates antibody production) and loaded into a syringe. The pellets would be loaded into a trocar syringe and jab stick for the second injection. With each injection, the liquid and pellets would be propelled into the left hind quarters of the mare, in the gluteal region.
- All treated mares will be freeze-marked with two 3.5-inch letters on the left hip for treatment tracking purposes. The only exception to this requirement is that each treated mare can be clearly and specifically identified through photographs or markings. This step is to enable researchers to positively identify the animals during the research project as part of the data collection phase.
- At a minimum, estimation of population growth rates using helicopter or fixed wing surveys will be conducted the year preceding 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).
- 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 on mare to foal ratios can be collected, these data should also be shared with the NPO for possible analysis by the USGS.
- A PZP-22 Application Data sheet will be used by the field applicators to record all the pertinent data relating to identification of the mare (including a photograph if the mares are not freeze-marked) and date of treatment. Each applicator will submit a PZP-22 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.

A tracking system will be maintained by NPO detailing the quantity of PZP-22 issued, the quantity used, a disposition of any unused PZP-22, and the number of treated mares by HMA, field office, and state along with the freeze-mark applied by HMA.

Vaccination with SpayVac®

(SpayVac® is a Registered Trademark of Immunovaccine Inc., Halifax, Nova Scotia, Canada)

- SpayVac® will be prepared by Immunovaccine Inc., loaded into individual syringes, and delivered frozen to USGS. Personnel from USGS will transport the frozen vaccine to the gather site, where individual doses will be thawed approximately 30 minutes prior to use.

- SpayVac® will be formulated either as an aqueous emulsion with Modified Freund's Adjuvant (MFA; volume = 1.0 cc per dose) or mixed directly in MFA (volume = 0.5 cc per dose). The purpose of the adjuvant is to stimulate the immune response. The choice of formulation will be made based on results of a pasture trial currently being conducted in Oklahoma.

- The vaccine will be administered by intramuscular injection using an 18-gauge, 1.5-inch needle in the left gluteal region of a mare while she is restrained in a working chute. All inoculations will be delivered by a veterinarian or a trained BLM applicator. Mares in the control group will not receive a sham injection.

- Pending approval by the Wyoming Livestock Board, each treatment and control mare will also receive a unique 3-digit freeze-mark number on the left hip, each digit being 3.5 inches in height. All mares enrolled in the study will also be photographed at the time of treatment to ensure positive identification of individuals.

- Efficacy of the drug will be assessed by direct observation to compare foaling rates among treated and untreated (control) mares. Foals will be associated with individual mares based on nursing behavior and general proximity.

Appendix 3A

A. RESEARCH OBJECTIVES

BLM Wild Horse and Burro Program
Proposal for Collaborative Research Effort / Grant Application
DRAFT

Name and Address of Applicant or Applicant Organization:

James E. Roelle
U.S. Geological Survey, Fort Collins Science Center
2150 Centre Ave., Building C
Fort Collins, CO 80526

Title of Project:

A Field Trial to Assess the Efficacy of SpayVac® as a Contraceptive for Wild Horses

Abstract:

Given a general lack of natural predators and populations that often increase 15–20% annually, wild horse (*Equus caballus*) populations can quickly exceed the capacity of their ranges. To date, the Bureau of Land Management (BLM) has dealt with excess horses largely through a gather, removal, and adoption process. This approach is no longer tenable as the sole means of controlling population growth rates. As a result, BLM has recently become more interested in fertility control for wild horses. Currently available contraceptives, however, are of relatively short duration (1 or 2 years), and a longer lasting agent is desired because in most cases horses must be gathered to apply the contraceptive by hand injection. Recently, another form of contraceptive known as SpayVac® (Immunovaccine Inc., Halifax, Nova Scotia, Canada) has shown the potential for multi-year (at least 4) efficacy. We are currently conducting a pasture trial of SpayVac® on captive wild horses at a BLM facility in Pauls Valley, Oklahoma, and that study will provide a great deal of useful information. Ultimately, however, the efficacy of SpayVac® or any other contraceptive must be demonstrated on free-ranging animals. The goal of this study is thus to evaluate the effectiveness of SpayVac® over a 5-year period in preventing pregnancy and foaling in a free-ranging wild horse herd.

Name, official title, department, project responsibilities and time commitment (% of annual work effort) of all professional personnel engaged in project:

James E. Roelle, Biologist, U.S. Geological Survey. Responsible for administration and coordination of this and related studies on the effects of SpayVac® on wild horses; overall direction of project; data analysis; and preparation of interim and final reports. Time commitment is 3 months annually for the duration of the work proposed herein.

Albert J. Kane, Veterinary Epidemiologist and Senior Staff Veterinarian, Animal and Plant Health Inspection Service. Responsible for technical guidance in study design; assistance with data analysis and interpretation; oversight regarding animal care, health, and handling; and

review of interim and final reports. Time commitment is 1 month annually for the duration of the work proposed herein.

Stephen S. Germaine, Wildlife Ecologist, U.S. Geological Survey. Responsible for implementation of the study described herein; collection of all field samples and data; training of any additional staff required; assistance with data analysis; and preparation of interim and final reports. Time commitment is 3 months annually for the duration of the work proposed herein.

B. RESEARCH PROPOSAL

BLM Wild Horse and Burro Program
Proposal for Collaborative Research Effort / Grant Application

1. Goals / Objectives / Hypotheses:

Our overall goal is to evaluate the effectiveness of SpayVac®, a porcine zona pellucida (PZP) immunocontraceptive vaccine, in preventing pregnancy and foaling in a herd of free-ranging wild horses (*Equus caballus*). At a minimum we will test the following null hypotheses.

$H_0$1: Foaling rates do not differ between vaccinated and unvaccinated mares.

$H_0$2: Body condition at the time of vaccination does not affect drug efficacy.

$H_0$3: Vaccination with SpayVac® has no effect on the frequency of fetal loss during pregnancy.

The study will be conducted on the North Lander Complex managed by the Bureau of Land Management (BLM) in central Wyoming and consisting of the Dishpan Butte, Rock Creek Mountain, Conant Creek, and Muskrat Basin Herd Management Areas (HMAs). Preliminary investigation of these areas indicates that many of the horses are very reactive to human presence. If acclimation occurs over time such that observation of natural behaviors is possible, we may also be able to test the following null hypotheses.

$H_0$4: Vaccination with SpayVac® has no effect on the frequency of mare movement between harems.

$H_0$5: Frequency of occurrence of harem-social, harem-tending, herding, agonistic, and reproductive behaviors does not vary between vaccinated and unvaccinated mares.

3. Specific Aims:

1 August 2012 – 30 September 2012. Complete study proposal and obtain approval for the study from an Institutional Animal Care and Use Committee (IACUC). Obtain necessary import permit from USDA APHIS and procure SpayVac® from the manufacturer.

1 October 2012 – 30 April 2013. At a time to be determined by weather and BLM's gather schedule (probably late October), gather the herd, apply freeze marks, estimate the age of treated and control animals, record body condition, draw blood for pregnancy testing, and vaccinate mares in the treatment group. Control group mares will not receive a sham injection.

1 May 2013 – 30 September 2013. By direct observation, collect data on foaling for as many uniquely marked treated and control mares as can be re-located. Mares will be pregnant at the time of vaccination, so the first data on drug efficacy will not be obtained until 2014. Data from 2013, however, will allow comparison of pre-treatment foaling rates among treated and control mares (no difference expected) and, by comparison with pregnancy data, estimation of fetal loss rates (again, no difference expected).

1 May 2014 – 30 September 2014. Collect data on foaling rates of treated and control mares in the first year of drug efficacy.

2015 – 2017. From May through September of each year, collect data on foaling of treated and control mares in the second, third, and fourth post-treatment years.

1 October 2017 – 30 April 2018. Complete data analysis and prepare manuscript(s) describing results.

3. Background and Significance/Preliminary Studies: (Not to exceed 3 pages)

Background: As the primary agency responsible for management of wild horses on U.S. public lands, BLM has a need for a long-lasting contraceptive agent to help control population growth rates. Given a general lack of natural predators and populations that often increase 15–20% annually, wild horse (*Equus caballus*) populations can quickly exceed the capacity of their ranges. In the past, BLM has managed excess horses through a gather, removal, and adoption program, but adoption demand has decreased in recent years. Therefore, BLM has increased efforts to develop a contraceptive that will reduce population growth rates in wild horse herds. A main limitation of the agents currently available is that they are of relatively short duration (1 or 2 years; Turner et al. 2001, 2007). However, the contraceptive SpayVac® has recently demonstrated the potential for long-lasting efficacy (at least 4 years) in captive wild horses (Killian et.al. 2008). Maximizing the duration of contraceptive effectiveness is especially important in wild horses, which in most cases must be captured in order to successfully administer the vaccine. Further testing of SpayVac® thus seems warranted.

Gaps in current knowledge: In a companion study, we are currently evaluating the efficacy of SpayVac® in a pasture setting with captive wild horses. However, to the best of our knowledge the efficacy of SpayVac® has not been tested in free-ranging horses. Gray et al. (2010) reported on a trial using SpayVac® in free-ranging horses in Nevada, but later stated that the vaccine used was not actually SpayVac® because it was not prepared using the liposome technology developed by Immunovaccine Inc. (formerly ImmunoVaccine Technologies, Inc., Halifax, Nova Scotia, Canada) (Fraker and Brown 2011, Gray et al. 2011).

In addition, effects of SpayVac® on the behavior of wild horses have not been studied in any setting. Investigators studying behavior of horses treated with other forms of PZP have reported greater infidelity of mares to band stallions in both the non-breeding (Nuñez et al. 2009) and breeding (Madosky et al. 2010) seasons. Mares treated with PZP have also been reported to have more reproductive interactions with stallions in both the breeding (Ransom et al. 2010) and non-breeding (Nuñez et al. 2009) seasons, which is consistent with the hypothesis that PZP-treated mares continue to exhibit estrous cycles. Thus far, it does not appear that any of these effects have been deleterious to the individual mare or to the herd; however, in a highly social species such as the horse, we must be vigilant to potentially important changes in behavior.

Contribution to knowledge base: At a minimum, this study will generate new information on the contraceptive efficacy of SpayVac® in free-ranging wild horses. If SpayVac® proves to be an effective contraceptive over multiple years, it has the potential to reduce the number of horses that BLM must remove to maintain healthy range conditions, reduce the number of excess animals that must be held in off-range pastures, and reduce total costs of the Wild Horse and Burro Program. If the horses acclimate sufficiently to human presence, new information on the effects of SpayVac® on horse behavior will also be generated.

4. Experimental Approach: (Not to exceed 5 pages)

Study Area

The study will be conducted on the North Lander Complex, which includes the Dishpan Butte, Rock Creek Mountain, Conant Creek, and Muskrat Basin HMAs and is managed by the Lander Field Office of BLM. The complex encompasses about 152,000 ha of land, about 90% of which is public land administered by BLM. Vegetation of the complex is dominated by sage brush (*Artemisia* spp.) and grasses. Precipitation ranges from 13 to 30 cm per year, depending on elevation, which ranges from 1,600 to 2,200 m. Although each of the HMAs is fenced, there is no geographic separation and gates between them are often open, allowing movement of horses between areas. Appropriate Management Level (AML) for the complex is 320–526 horses, but the current population is estimated to be 750 plus the 2012 foal crop. In 2009, 82 mares on the complex were treated with a pellet (time-release) form of PZP and freeze-marked with the letters "HB" on the left hip. Although the drug used in this treatment should no longer be having a contraceptive effect, we will avoid enrolling any of these mares in our study.

Gather and Treatment

During the fall or winter of 2012–2013, the herd will be gathered by BLM in order to reduce the number of animals to near the low end of AML; we will treat mares with SpayVac® during the gather. In a separate study, we are currently testing two formulations of SpayVac® (oil-based and aqueous emulsion) in a pasture trial at the BLM facility in Pauls Valley, Oklahoma. To date, we have seen no reason to prefer one formulation over the other. Assuming that continues to be the case, we will test both formulations in the field trial described herein if sufficient mares are available.

Sample sizes will be determined by weighing three factors: power afforded in a statistical test, risk to the herd as determined by demographic and genetic modeling, and the number of mares available to be returned to the range, which in turn depends on the proportion of the herd that can be gathered. Power/sample size analyses for logistic regression indicate that 24 mares per sample group (study $n = 72$ for two vaccination groups plus a control group) will yield statistical power of 0.80 to detect a difference in foaling rate of 0.70:0.30 for control and treatment group mares. This approximates the minimum difference at which BLM would be interested in applying a particular contraceptive for management purposes. To allow for some natural attrition, we will attempt to include 30 mares in each treatment group, or a total of 90 mares for the study. Note, however, that this sample size will likely not allow us to distinguish differences in efficacy between the two SpayVac®-treated groups. In another part of our overall SpayVac® project, we are developing a demographic and genetic model that will allow us to estimate the proportion of mares in a herd that can be treated with a long-lasting or permanent fertility control agent without detriment to the herd. We will use that model to verify that treatment of 60 mares poses

minimal risk to the persistence of the herd. If the gather efficiency is so low that there are not 90 mares available to return to the range, we will select a single SpayVac® formulation (probably based on ease of handling) for testing and enroll as many mares as possible while still retaining a control group of adequate size.

Each mare enrolled in the study will be randomly assigned to a treatment group and, while restrained in a squeeze chute, will receive a unique 3-digit freeze mark on the left hip. A veterinarian or trained BLM applicator will then administer the vaccine by hand injection in the left gluteal region (controls will not receive a sham injection), estimate the age of the animal by tooth eruption and wear (Martin 2002), estimate body condition (Rudman and Keiper 1991), and draw 10 cc of blood in a red top vacutainer by jugular venipuncture for pregnancy testing. Following vaccination, all horses will be held overnight for observation. On the following day, they will be transported by trailer to the area where they were initially found.

Pregnancy Testing

Blood samples will be allowed to clot at room temperature for approximately 2 hours and then spun in a bench-top centrifuge for 15 minutes. Serum will be removed by pipette and approximately 2 mL will be placed in each of 2 cryovials and frozen. One set of samples will then be shipped to an accredited veterinary diagnostic laboratory (probably the Animal Health Diagnostic Center at Cornell University) for determination of pregnancy status as indicated by estrone sulfate and pregnant mare serum gonadotropin (PMSG) concentrations. Results from these tests and foaling records from the following year will allow us to assess the frequency of fetal loss ($H_0$3).

Foaling

We will determine presence or absence of a foal for each treatment or control mare that can be relocated in subsequent years by direct observation ($H_0$1). Foals will be paired with a dam based on nursing behavior and general proximity. To minimize detection bias, study observers will be blinded as to the status (treatment or control) of mares. To the extent possible, we will attempt to observe each mare at least once per week to minimize the chance of undetected neonatal loss. Such detection errors may still occur; however, they should be non-differential between treatment and control mares and therefore only bias results toward the null hypothesis if at all.

Behavior

If the horses acclimate sufficiently to human presence to allow observation of natural behaviors, field technicians will prepare weekly lists of which horses compose which harems. Madosky et al. (2010) noted that frequent observations are necessary to obtain a true picture of mare movement because some mares in their study changed bands multiple times in a week or even a day. Their study, however, occurred on an island of approximately 6.6 mi^2 where frequent observation of mares was possible (an average of every 1.2 days in 2007 and 1.6 days in 2008). It seems highly likely that mares in our study will be more dispersed, so we will attempt to ensure that each is seen at least once per week. These weekly “horse lists” will allow us to test $H_0$4. Body condition will also be recorded weekly.

In addition, given acclimation by the horses to human presence, we will attempt to collect behavioral data on all mares enrolled in the study using all-occurrence sampling (Altmann 1974).

We will divide the day into three intervals: 0800–1200 hours, 1200–1600 hours, and 1600–2000 hours. In each month that animals are accessible, we will attempt to observe each band for at least one 30-minute period in each of these intervals. During each observation period, we will record all occurrences of a subset of the behaviors described by Ransom and Cade (2009), to include herding, harem-tending, harem-social, reproductive, submissive, and aggressive behaviors ($H_0$5). In each instance, we will record the initiator and recipient of the behavior, and we will make all observations from distances that do not obviously elicit reactions from the subjects. Appropriate optics (binoculars, spotting scope) will be used as necessary.

5. Statistical Methods: (Not to exceed 1 page)

We will compare probability of foaling ($H_0$1) across treatments using mixed-effects logistic regression and including individual mare as a random effect on the intercept to account for repeated observations (multiple years) of individuals over time (Ransom et al. 2011). Mare age and body condition will be evaluated as covariates ($H_0$2). Probability of fetal loss ($H_0$3) and probability of mare movement between harems ($H_0$4) will be modeled similarly with the same covariates. In addition, presence of a dependent foal will be included as a covariate in the analysis of mare movement between harems. Mean frequency of occurrence of various behaviors ($H_0$5) and mean body condition (as a response variable; $H_0$2) will be compared across treatment groups using a general linear model approach similar to that of Ransom et al. (2010). Individual mare will again be included as a random effect, and covariates will include mare age and presence of a dependent foal.

6. Pitfalls and Limitations: (Not to exceed 1 page)

Successful completion of this study is critically dependent on being able to observe bands of horses from a distance (~0.25 miles or less) that allows individual mare freeze marks to be read and foals to be associated with individual mares based on behavior. We will attempt to ensure that this is the case by careful selection of observation points and thorough exploration of horse reaction to the presence of observers during a preliminary site visit. The observational and data-recording techniques included herein are nearly identical to those used during contraceptive studies at Little Book Cliffs Wild Horse Range, Pryor Mountain Wild Horse Range, and McCullough Peaks Herd Management Area (Ransom et al. 2010, 2011). Therefore, assuming that the horses acclimate somewhat to the presence of humans, we do not expect significant difficulties in applying these techniques in the current study. Although sample sizes will be sufficient to detect a treatment effect as compared to controls, they may not be large enough to detect differences between two SpayVac® treatments unless those differences are quite large (not expected).

7. References:

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APPENDIX 4

BLM WYOMING STATE DIRECTOR'S SENSITIVE SPECIES LIST (ANIMALS AND PLANTS) FOR LANDER FIELD OFFICE

Species Common Name	Scientific Name	Habitat	May be present in project (Y/N)	Rationale
MAMMALS				
Shrew, Dwarf	*Sorex nanus*	Mountain foothill shrub, grasslands.	Y	No habitat conversions are expected to occur.
Myotis, Long-eared	*Myotis evotis*	Conifer and deciduous forests, caves and mines	Y	No habitat conversions are expected to occur.
Bat, Spotted	*Euderma maculatum*	Cliffs over perennial water, basin-prairie shrub	Y	No habitat conversions are expected to occur.
Bat, Townsend's Big-eared	*Corynorhinus townsendii*	Forests, basin-prairie shrub, caves and mines	Y	No habitat conversions are expected to occur.
Prairie Dog, White-tailed	*Cynomys leucurus*	Basin-prairie shrub, grasslands	Y	No habitat conversions are expected to occur. Capture pens and herding will not take place in prairie dog towns.
Fox, Swift	*Vulpes velox*	Grasslands	Y	No habitat conversions are expected to occur.
Rabbit, Pygmy	*Brachylagus idahoensis*	Basin-prairie and riparian shrub	Y	No habitat conversions are expected to occur.
Bear, Grizzly	*Ursus arctos*	Forests with interspersed meadows and grasslands.	N	No known populations in project area.
BIRDS				
Eagle, Bald	*Haliaeetus leucocephalus*	Lakes, rivers and other large water bodies suitable for foraging with large trees for nesting and roosting.	N	No known populations in project area.
Ibis, White-faced	*Plegadis chihi*	Marshes, wet meadows	Y	Roundups will not occur during nesting season.
Plover, Mountain	*Charadrius montanus*	Shortgrass prairie/sparse vegetation	Y	Roundups will not occur during nesting season.
Swan, Trumpeter	*Cygnus buccinator*	Lakes, ponds, rivers	Y	Roundups will not occur during nesting season.
Goshawk, Northern	*Accipter gentilis*	Conifer and deciduous forests	Y	Roundups will not occur during nesting season.
Hawk, Ferruginous	*Buteo regalis*	Basin-prairie shrub, grassland, rock outcrops	Y	Inventory will be conducted prior to surface disturbing activity. Seasonal stipulation to protect nesting birds will be applied if necessary.
Falcon, Peregrine	*Falco peregrinus*	Tall cliffs	Y	Roundups will not occur during nesting season.
Sage-grouse, Greater	*Centrocercus urophasianus*	Basin-prairie shrub, mountain-foothill shrub	Y	Roundups will not occur during nesting season.
Curlew, Long-billed	*Numenius americanus*	Grasslands, plains, foothills, wet meadows	Y	Roundups will not occur during nesting season.
Cuckoo, Yellow-billed	*Coccyzus americanus*	Open woodlands, streamside willow and alder groves	Y	Roundups will not occur during nesting season.
Owl, Burrowing	*Athene cunicularia*	Grasslands, basin-prairie shrub	Y	No habitat conversions are expected to occur. Capture pens and herding will not take place in prairie dog towns.

Species Common Name	Scientific Name	Habitat	May be present in project (Y/N)	Rationale
Thrasher, Sage	*Oreoscoptes montanus*	Basin-prairie shrub, mountain-foothill shrub	Y	Roundups will not occur during nesting season.

Appendix 4 (Continued)

Shrike, Loggerhead	*Lanius ludovicianus*	Basin-prairie shrub, mountain-foothill shrub	Y	Roundups will not occur during nesting season.
Sparrow, Brewer's	*Spizella breweri*	Basin-prairie shrub	Y	Roundups will not occur during nesting season.
Sparrow, Sage	*Amphispiza billineata*	Basin-prairie shrub, mountain-foothill shrub	Y	Roundups will not occur during nesting season.
Sparrow, Baird's	*Ammodramus bairdii*	Grasslands, weedy fields	Y	Roundups will not occur during nesting season.
FISH				
Trout, Yellowstone Cutthroat	*Oncorhynchus clarki bouvieri*	Yellowstone drainage, small mountain streams and large rivers	N	No suitable habitat present.
REPTILES				
AMPHIBIANS				
Frog, Northern Leopard	*Rana pipiens*	Beaver ponds, permanent water in plains and foothills	Y	Capture pens will not be places in riparian areas.
Spadefoot, Great Basin	*Spea intermontana*	Spring seeps, permanent and temporary waters	Y	Capture pens will not be places in riparian areas.
Toad, Boreal (Northern Rocky Mountain population)	*Bufo boreas boreas*	Pond margins, wet meadows, riparian areas	Y	Capture pens will not be places in riparian areas.
Frog, Spotted	*Ranus pretiosa (lutieventris)*	Ponds, sloughs, small streams	Y	Capture pens will not be places in riparian areas.
PLANTS				
Meadow Pussytoes	*Antennaria arcuata*	Moist, hummocky meadows, seeps or springs surrounded by sage/grasslands 4,950-7,900'	Y	Capture pens will not be places in riparian areas.
Porter's Sagebrush	*Artemisia porteri*	Sparsely vegetated badlands of ashy or tufaceous mudstone & clay slopes 5,300-6,500'	Y	A survey for sensitive species will be conducted before locations for capture pens are approved.
Dubois Milkvetch	*Astragalus gilviflorus var. purpureus*	Barren shale, badlands, limestone, & redbed slopes & ridges 6,900-8,800'	N	No suitable habitat present.

Appendix 4 (continued)

Nelson's	*Astragalus*	Alkaline clay flats, shale	Y	A survey for sensitive species will be conducted before

Milkvetch	*nelsonianus* –*or-* *Astragalus pectinatus var. platyphyllus*	bluffs and gullies, pebbly slopes, and volcanic cinders in sparsely vegetated sagebrush, juniper, & cushion plant communities at 5200-7600’		locations for capture pens are approved.
Cedar Rim Thistle	*Cirsium aridum*	Barren, chalky hills, gravelly slopes, & fine textured, sandy-shaley draws 6,700-7,200'	Y	A survey for sensitive species will be conducted before locations for capture pens are approved.
Owl Creek Miner's Candle	*Cryptantha subcapitata*	Sandy-gravelly slopes & desert ridges on sandstones of the Winds River Formation 4,700-6,000'	N	No suitable habitat present.
Fremont Bladderpod	*Lesquerella fremontii*	Rocky limestone slopes & ridges 7,000-9,000'	Y	A survey for sensitive species will be conducted before locations for capture pens are approved.
Beaver Rim Phlox	*Phlox pungens*	Sparsely vegetated slopes on sandstone, siltstone, or limestone substrates 6,000-7,400'	Y	A survey for sensitive species will be conducted before locations for capture pens are approved.
Rocky Mountain Twinpod	*Physaria saximontana var. saximontana*	Sparsely vegetated rocky slopes of limestone, sandstone or clay 5,600-8,300'	Y	A survey for sensitive species will be conducted before locations for capture pens are approved.
Persistent Sepal Yellowcress	*Rorippa calycina*	Riverbanks & shorelines, usually on sandy soils near high-H^2O line	N	No suitable habitat present. Capture pens will not be places in riparian areas.
Shoshonea	*Shoshonea pulvinata*	Shallow, stony calcareous soils of exposed limestone outcrops, ridgetops, & talus slopes 5,900-9,200'	Y	A survey for sensitive species will be conducted before locations for capture pens are approved.
Barneby's Clover	*Trifolium barnebyi*	Ledges, crevices, & seams on reddish-cream Nugget Sandstone outcrops 5,600-6,700'	Y	A survey for sensitive species will be conducted before locations for capture pens are approved.

APPENDIX 5

WILD HORSE POPULATION MODELING

Population Model Overview

WinEquus is a program used to simulate the population dynamics and management of wild horses created by Stephen H. Jenkins of the Department of Biology, University of Nevada at Reno. For further information about this model, you may contact Stephen H. Jenkins at the Department of Biology/314, University of Nevada, Reno, NV 89557.

Detailed information is provided within the WinEquus program available at http://unr.edu/homepage/jenkins, and will provide background about the use of the model, the management options that may be used, and the types of output that may be generated.

The population model for wild horses was designed to help BLM evaluate various management strategies that might be considered for a particular area. The model uses data on average survival probabilities and foaling rates of horses to project population growth for up to 20 years. The model accounts for year-to-year variation in these demographic parameters by using a randomization process to select survival probabilities and foaling rates for each age class from a distribution of values based on these averages. This aspect of population dynamics is called environmental stochasticity, and reflects the fact that future environmental conditions that may affect wild horse population's demographics can't be established in advance. Therefore each trial with the model will give a different pattern of population growth. Some trials may include mostly "good" years, when the population grows rapidly; other trials may include a series of several "bad" years in succession. The stochastic approach to population modeling uses repeated trials to project a range of possible population trajectories over a period of years, which is more realistic than predicting a single specific trajectory.

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

To run the program, one must supply an initial age distribution (or have the program calculate one), annual survival probabilities for each age-sex class of horses, foaling rates for each age class of females, and the sex ratio at birth. Sample data are available for all of these parameters. Basic management options must also be specified.

Population Modeling – North Lander HMA Complex

To complete the population modeling for the North Lander HMA Complex, version 1.40 of the WinEquus program, created April 2, 2002, was utilized.

Objectives of Population Modeling

Review of the data output for each of the simulations provided many useful comparisons of the possible outcomes for each alternative. Some of the questions that need to be answered through the modeling include:

- Do any of the Alternatives "crash" the population?
- What effect does fertility control have on population growth rate?
- What effects do the different alternatives have on the average population size?
- What effects do the different alternatives have on the genetic health of the herd?

Population Data, Criteria, and Parameters utilized for Population Modeling

Initial age structure for the 2013 herd was developed from age structure data collected during the 2009 HMA complex gather. The following table shows the proposed age structure that was utilized in the population model for the Alternatives:

Initial Age Structure (2009 Gather)

Age Class	Females	Males
Foal	21	21
1	0	1
2	7	4
3	18	13
4	8	9
5	21	17
6	13	9
7	10	5
8	13	12
9	2	8
10-14	5	19
15-19	2	4
20+	0	3
Total	**120**	**125**

All simulations used the survival probabilities, foaling rates, and sex ratio at birth that was supplied with the WinEquus population model for the Garfield HMA.

Sex ratio at Birth:

49% Females
51% Males

The following percent effectiveness of fertility control was utilized in the population modeling for Alternative 1 and 2:

Year 1: 94%, Year 2: 82%, Year 3: 68%

The following table displays the contraception parameters utilized in the population model for the Alternatives 1 and 2:

Contraception Criteria
(Alternative 1, 2 and 3)

Age	Percentages for Fertility Treatment
Foal	0
1	100%
2	100%
3	100%
4	100%
5	100%
6	100%
7	100%
8	100%
9	100%
10-14	100%
15-19	100%
20+	100%

Population Modeling Criteria

The following summarizes the population modeling criteria utilized for Alternatives 1 and 2:

- Starting Year: 2010
- Initial gather year: 2013
- Gather interval: regular intervals of three years
- Gather for fertility treatment regardless of population size: Yes
- Continue to gather after reduction to treat females: Yes
- Sex ratio at birth: 51% males
- Percent of the population that can be gathered: 90%
- Minimum age for long term holding facility horses: Not Applicable
- Foals are included in the AML
- Simulations were run for 10 years with 100 trials each

The following table displays the population modeling parameters utilized in the model:

Population Modeling Parameters

Modeling Parameter	Alternatie 1 & 3– Removal and Fertility Control	Alternative 2 – Removal, Fertility Control and Castration of Stallions	Alternative 4 No Management
Management by removal and fertility control	Yes	Yes	No
Management by removal only	No	No	No
Threshold Population Size for Gathers	NA	NA	NA
Target Population Size Following Gathers	320	252	320
Gather for fertility control regardless of population size	No	No	No
Gathers continue after removals to treat additional females	Yes	Yes	No
Effectiveness of Fertility Control: year 1	94%	94%	NA
Effectiveness of Fertility Control: year 2	82%	82%	NA
Effectiveness of Fertility Control: year 3	68%	68%	NA

Results of WinEquus Population Modeling

Population modeling was completed for the alternatives. One hundred trials were run, simulating population growth and herd demographics to determine the projected herd structure for the next four years, or prior to the next gather. The computer program used simulates the population dynamics of wild horses. It was written by Dr. Stephen H. Jenkins, Department of Biology, University of Nevada, Reno, under a contract from the National Wild Horse and Burro Program of the Bureau of Land Management and is designed for use in comparing various management strategies for wild horses.

To date, one herd has been studied using the 2-year PZP-22 vaccine. The Clan Alpine study, in Nevada, was started in January 2000 with the treatment of 96 mares. The test resulted in fertility rates in treated mares of 6 percent year one and 18 percent year two.

Interpretation of the Model

The estimated population of 900 wild horses in the North Lander HMA Complex was based on a July 2011 inventory and an estimated 2012 foal crop of 20 percent, and was used in the population modeling. Year one (2010) is the baseline starting point for the model, and reflects wild horse numbers the year following the gather in 2009. In this population modeling, year one

would be 2010. Year two would be exactly one year in time from the original action, and so forth for years three, four, and five, etc. Consequently, at year eleven in the model, exactly ten years in time would have passed. In this model, year eleven is 2020. This is reflected in the Population Size Modeling Table by "Population sizes in ten years" and in the Growth Rate Modeling Table by "Average growth rate in 10 years". Growth rate is averaged over ten years in time, while the population is predicted out the same ten years to the end point of year eleven. The Full Modeling Summaries contain tables and graphs directly from the modeling program.

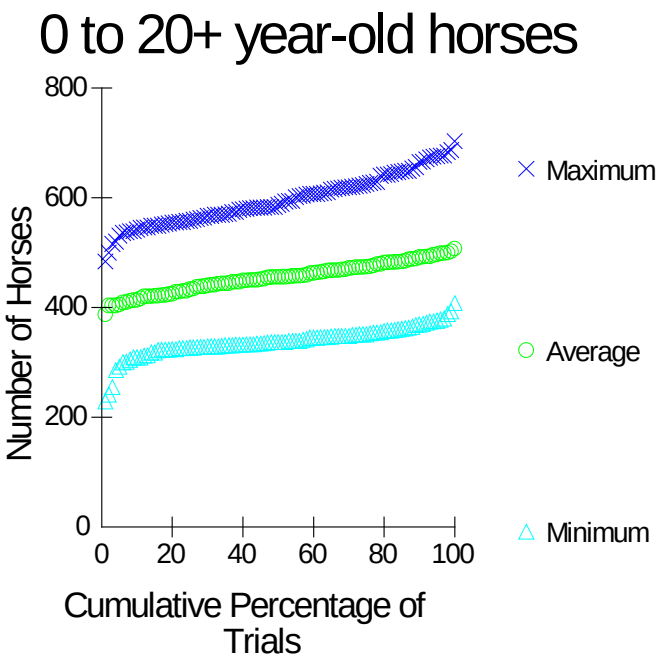
The initial herd size, sex ratio and age distribution for 2010 was structured by the WinEquus Population Model using data from the horses gathered and released during the 2009 gather. This initial population data was then entered into the model and the model was used to predict various outcomes of the four alternatives for comparison purposes. For Alternative 3, the fertility control drug VacSpayVac®, has no population control results currently available for use in this model. Therefore, Alternative 3 is assumed to be similar to Alternative 1, but potentially longer lasting than the current drug PZP-22 which is being used.

Results – Alternative 1 & 3 – Removal to 320 horses with Fertility Control

The parameters for the population modeling were:

1. gather every three years for fertility treatment regardless of population size
2. foals are included in AML
3. percent to gather 90
4. three years between gathers
5. number of trials 100
6. number of years 10
7. initial calendar year 2010
8. initial population size 320
9. population size after gather 320
10. implement selective removal criteria
11. fertility control Yes

Population Size and Modeling Graph and Table (Gather & Fertility Control)

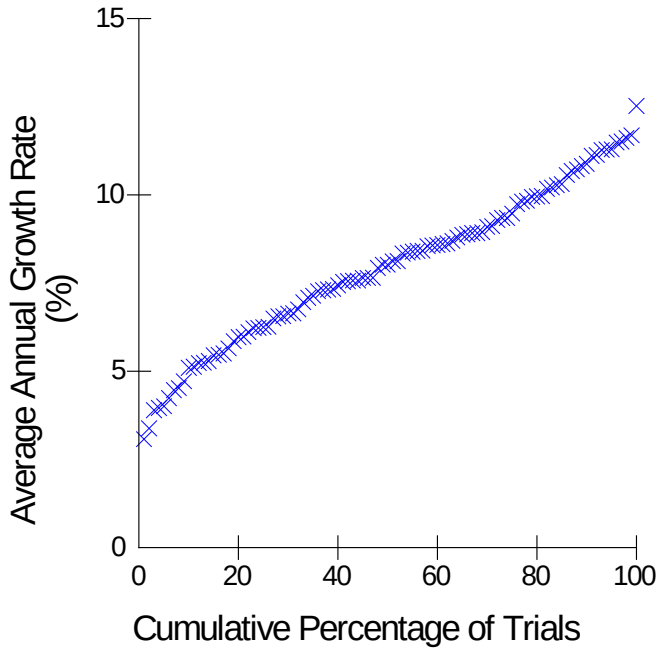


Population Sizes in 10 Years*

	Minimum	Average	Maximum
Lowest Trial	229	387	484
10th Percentile	309	415	544
25th Percentile	327	434	559
Median Trial	337	456	588
75th Percentile	352	475	626
90th Percentile	370	492	666
Highest Trial	408	507	703

* 0 to 20+ year-old horses

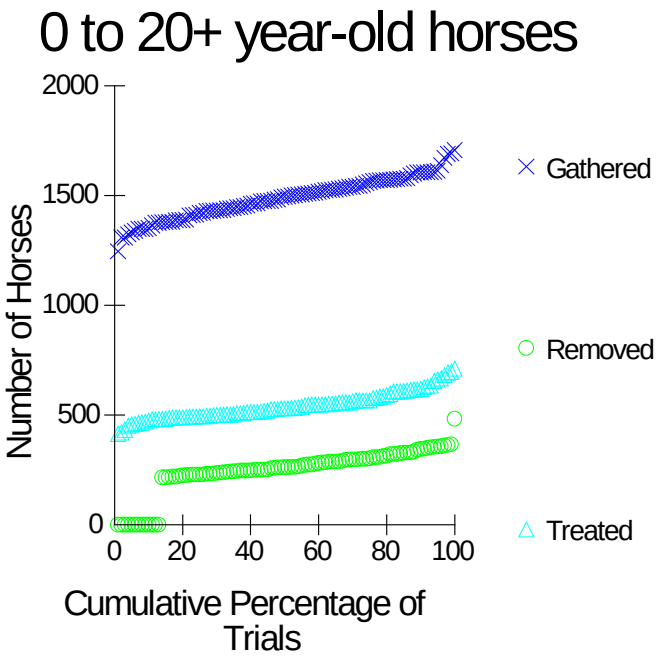
Growth Rate Modeling Graph and Table (Gather & Fertility Control)



Average Growth Rate in 10 Years

Lowest Trial	3.1
10th Percentile	5.1
25th Percentile	6.3
Median Trial	8.1
75th Percentile	9.6
90th Percentile	11.0
Highest Trial	12.5

Gathered, Removed & Treated Graph and Table (Gather & Fertility Control)



Totals in 11 Years*

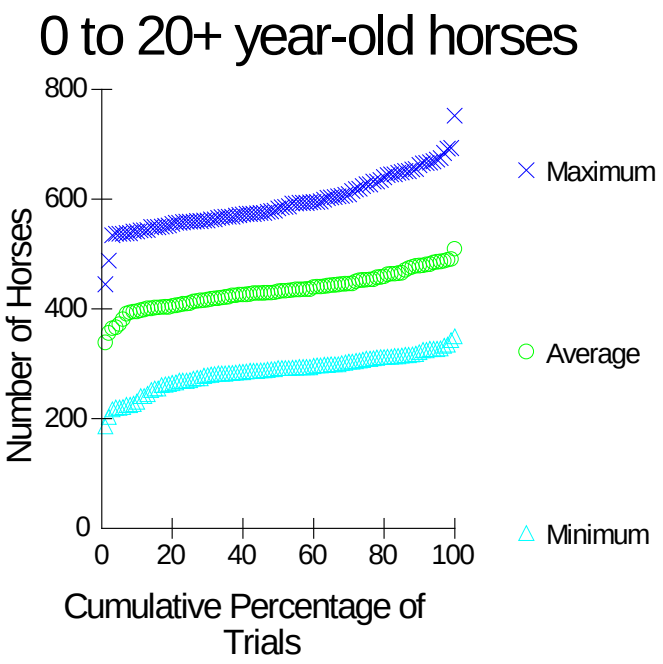
	Gathered	Removed	Treated
Lowest Trial	1246	0	414
10th Percentile	1358	0	478
25th Percentile	1422	229	494
Median Trial	1496	262	530
75th Percentile	1564	304	572
90th Percentile	1606	346	623
Highest Trial	1707	483	711

Results – Alternative 2 – Removal to 320 horses with Fertility Control & Castration

The parameters for the population modeling were:

1. gather every three years for fertility treatment regardless of population size
2. foals are included in AML
3. percent to gather 90
4. three years between gathers
5. number of trials 100
6. number of years 10
7. initial calendar year 2010
8. initial population size 320
9. population size after gather 252 (252 was used to express the actual breeding population, the total population would be 320 with 68 stallions being castrated & released as geldings)
10. implement selective removal criteria
11. fertility control Yes

Population Size and Modeling Graph and Table (Gather, Fertility Control & Castration)

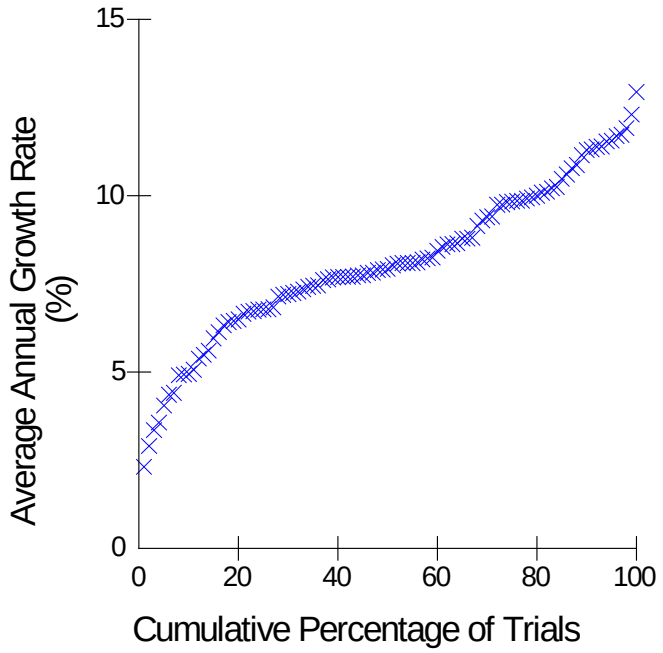


Population Sizes in 11 Years*

	Minimum	Average	Maximum
Lowest Trial	186	339	445
10th Percentile	236	396	542
25th Percentile	272	412	559
Median Trial	292	432	584
75th Percentile	309	453	627
90th Percentile	323	479	664
Highest Trial	350	509	752

* 0 to 20+ year-old horses

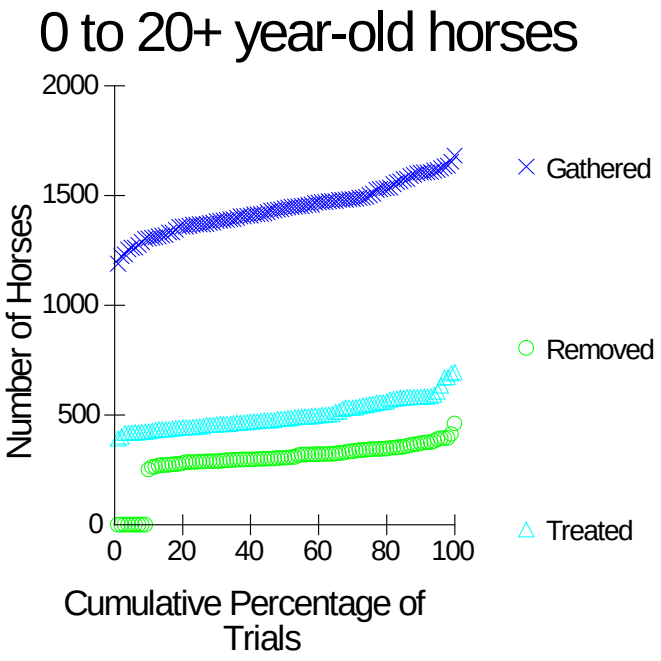
Growth Rate Modeling Graph and Table (Gather, Fertility Control & Castration)



Average Growth Rate in 10 Years

Lowest Trial	2.3
10th Percentile	5.0
25th Percentile	6.8
Median Trial	8.0
75th Percentile	9.8
90th Percentile	11.3
Highest Trial	12.9

Gathered, Removed & Treated Graph and Table (Gather, Fertility Control & Castration)

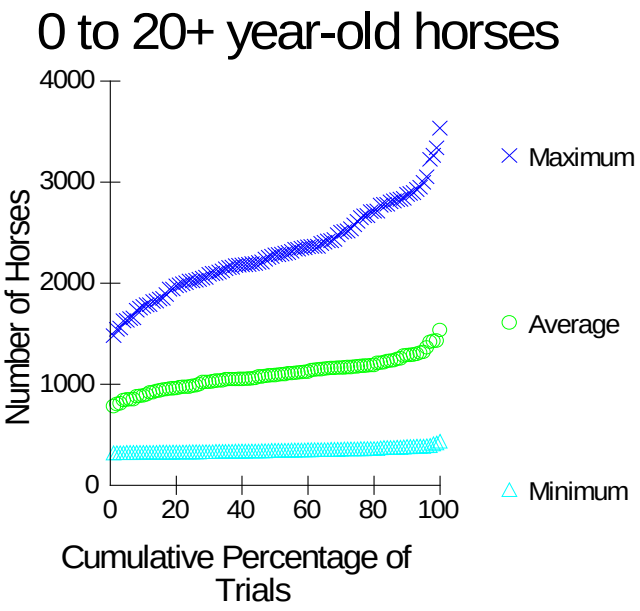


Totals in 11 Years*

	Gathered	Removed	Treated
Lowest Trial	1190	0	392
10th Percentile	1306	257	427
25th Percentile	1369	287	448
Median Trial	1444	306	484
75th Percentile	1506	344	550
90th Percentile	1604	372	584
Highest Trial	1682	461	695

* 0 to 20+ year-old horses

Results – Alternative 4 – No Management



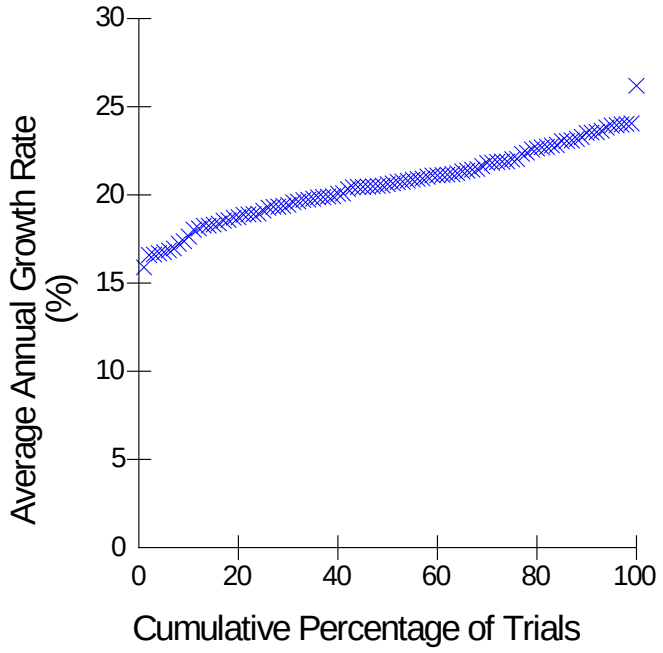
Populaion on Size and Modeling Graph and Table (Gather & Remove Only)

Population Sizes in 10 Years*

	Minimum	Average	Maximum
Lowest Trial	321	783	1482
10th Percentile	326	894	1778
25th Percentile	332	986	2026
Median Trial	346	1093	2282
75th Percentile	362	1178	2630
90th Percentile	383	1289	2884
Highest Trial	436	1537	3534

* 0 to 20+ year-old horses

Growth Rate Modeling Graph and Table (Gather & Remove Only)



Average Growth Rate in 10 Years

Lowest Trial	15.9
10th Percentile	17.8
25th Percentile	19.2
Median Trial	20.6
75th Percentile	22.0
90th Percentile	23.5
Highest Trial	26.2

This table compares the projected population growth for the alternatives at the end of the ten-year simulation. The population averages are from the median trial.

Modeling Statistic North Lander HMA Complex	**Alternatives 1 & 3**	**Alternative 2**	**Alternative 4**
Population in Year One	320	252	3 2 0
Median Growth Rate	**8.1%**	**8.0%**	**20.6%**
Average Population	456	432	1093
Lowest Average Population	387	339	783
Highest Average Population	507	509	1537
Lowest Number Removed	**0**	**0**	**0**
Median Number Removed	**262**	**306**	**0**
Highest Number Removed	**483**	**461**	**0**

APPENDIX 6

Summary of Permitted Livestock AUMS's by Allotment by HMA

HMA	Allotment Name	Permitted Cattle AUM	Permitted Sheep AUM
Conant Creek	Conant Creek	4906	3081
Dishpan Butte	Big Pasture	11909	
	Dishpan Butte	1983	
Muskrat Basin	Muskrat Open	6922	
	Granite Mt. Open	12,584	
Rock Creek Mountain	Rim Pasture	2671	1311
	Total Permitted AUM:	40975	4392

An AUM is defined by the Lander RMP as a standardized unit of measurement of the amount of forage necessary for the sustenance of one animal unit for 1 month. An animal unit month being defined as generally one mature (1,000-pound) cow or its equivalent, based on an average daily forage consumption of 26 pounds of dry matter per day.

Appendix 7

Summary and Response to Comments

Over 7,100 comment letters or emails were received from individuals, organizations, and agencies following the issuance of the preliminary North Lander Complex Wild Horse Gather EA (WY-050-EA12-33). All comment letters were reviewed and considered and resulted in 23 substantive comments. Comments that were not substantive are on file and can be reviewed at the Lander Field Office.

No.	Summarized Comment	BLM Response
1	Implement range improvements such as reseeding damaged forage, treating noxious and invasive weeds, improving water sources or adding water enhancements and allowing for interchange between wild horse bands by opening gates and making corridors available.	The North Lander Complex has a variety of water sources, including water wells that enhance water availability for wildlife and wild horses. Other range improvements such as seeding and noxious weed treatments are implemented on site-specific bases not only in this HMA, but other HMAs within the Lander Field Office. Pasture fences are primarily used to help manage cattle grazing, but after cattle have completed their use period, gates are generally left open to provide for wildlife and wild horse movement.
2	Include a full explanation of the allocation between wild horses and cattle populations, along with scientific data regarding range damage attributable to wild horses versus cattle.	This comment is outside the scope of this analysis. Forage allocation for livestock and wild horses within the planning area were determined through the development of the Lander Resource Management Plan Record of Decision (June, 1987) and the Lander Grazing Supplement, Final Environmental Impact Statement (September, 1986).
Population Controls		
3	Raise AML for wild horses and reduce AUMs for livestock and sheep. If the horses must be removed, then private livestock should be removed prior to the removal of the wild mustangs.	Livestock grazing allocation decisions are land-use management decisions that are evaluated in the RMP development process and are outside the scope of the alternative analysis. Livestock grazing can only be reduced if BLM follows regulations at 43 CFR 4100 and must be consistent with multiple use allocations set forth in the land-use plan.
4	Adaptive Management Strategy should be considered—flexibility within range planning.	Flexibility and grazing management is an ongoing process within the livestock grazing allotments that are part of the HMAs. All animals are considered during resource development and planning.

5	Due to the current drought situation in the HMA, gather horses to the low end of the AML to help protect the range and resources for cattle.	Comment Noted.
6	Continually depleting the population every few years through roundups and removals diminishes genetic viability while stimulating compensatory reproduction. This management technique contributes to higher growth rates as the horse herds endeavor to replenish their ranks in order to avoid extinction.	BLM is working to develop a method to decrease the need for frequent roundups and removals, thus, there is a need for a long-lasting contraceptive agent to help control population growth rates. In the past, BLM has managed excess horses through a gather, removal, and adoption program, but adoption demand has decreased in recent years. Therefore, BLM has increased efforts to use a contraceptive that will reduce population growth rates in wild horse herds. A main limitation of the agents currently available is that they are of relatively short duration (one or two years; Turner et al. 2001, 2007). However, the contraceptive SpayVac® has recently demonstrated the potential for long-lasting efficacy (at least four years) in captive wild horses (Killian et al. 2008). Maximizing the duration of contraceptive effectiveness is especially important in wild horses, which in most cases must be captured in order to successfully administer the vaccine. Further testing of SpayVac® thus seems warranted.
7	If helicopter operations are to continue, the COTR must specify limits on how far the wild horses are running as well as temperature minimums and maximums.	Gather operations, including the use of helicopters are conducted in accordance with the BLM's "Capture Methods used in the Performance of Gather Contracts Operations" which is part of this environmental assessment and can be found in Appendix 1.
8	The final EA should include specific and verified field monitoring data that explains how much movement actually goes on between the HMAs, in an effort to ensure genetic viability and diminish the chance for inbreeding between horse herds.	Genetic diversity and viability were discussed in Chapter 3 of the EA (p.20 - 21). Dr. E. Gus Cothran, Equine Genetics Laboratory, Texas A&M University in 2004 concluded that "Genetic variability within the Conant Creek herd is high. The herd appears to be of mixed origins, mainly of North American Breeds. Basically, the same is true of the Muskrat Basin herd, although variability is lower. The Dishpan Butte herd has low genetic variability. It shows some association with Spanish horses, but most likely its origins are mixed and

		mainly from North American breeds." Genetic testing is scheduled to take place in the fall of 2012
9	Senior horses (those past reproductive ages) should die a natural death on their home ranges, especially since holding capacity is a concern for BLM.	Comment noted.
Contraceptive Use		
10	More testing of the SpayVac® contraceptive should be done before it is used on wild horses. Once SpayVac® is thoroughly vetted and is proven not to cause permanent sterility or to cause behavioral abnormalities BLM should test the drug on a herd that hasn't been exposed to PZP. An EIS is called for as there is no research on the consequences of SpayVac®.	The testing of SpayVac® is already taking place in a controlled setting. Testing is being conducted in a pasture trial on captive wild horses at a BLM facility in Pauls Valley, Oklahoma. That study will provide a great deal of useful information. Ultimately, however, the efficacy of SpayVac® or any other contraceptive must be demonstrated on free-ranging animals. The goal of this study is thus to evaluate the effectiveness of SpayVac® over a 5-year period in preventing pregnancy and foaling in a free-ranging wild horse herd. The BLM has determined that an EIS is not necessary (see FONSI, for the North Lander complex Wild Horse Gather, 9/2012).
11	Due to the vastness of the 580-square-mile Complex, it would be difficult to adequately and accurately collect sufficient information regarding the behavioral changes resulting from the use of SpayVac® and the long-term tracking of mares to determine the rate which SpayVac® permanently sterilizes the majority of animals who are administered the infertility drug.	At the time of the gather various data will be recorded, including the age, body condition, and pregnancy rates of treated horses (60 mares injected with SpayVac®) and the control group (30 mares that will not be injected). From May to September 2013, data will be collected by direct observation from as many SpayVac® treated and control mares as can be relocated. Mares will be pregnant at the time of vaccination, so the first data on drug efficacy will not be obtained until 2014. Data from 2013 will allow comparison of pre-treatment foaling rates among treated and control mares, and, by comparison with pregnancy data, estimation of fetal loss rates. Further data will be collected from May-September for the second, third, and fourth post-treatment years recording foaling rates of treated and control mares, revealing drug efficacy. A complete data analysis and manuscript describing results will be available between October 2017 and April 2018.

		Preliminary investigation of these areas indicates that many of the horses are very reactive to human presence. If acclimation occurs over time such that observation of natural behaviors is possible, researchers may also be able to test the following null hypotheses: (1) vaccination with SpayVac® has no effect on the frequency of mare movement between harems and (2) frequency of occurrence of harem-social, harem-tending, herding, agonistic, and reproductive behaviors does not vary between vaccinated and unvaccinated mares.
12	Do not use SpayVac® on wild horses, as the National Academy of Sciences (NAS) committee received information from experts which revealed that SpayVac® appears to cause perpetual (possibly permanently) sterilization and serious health problems in horses.	SpayVac® uses the same proteins (antigens) and adjuvant (immune response stimulant), as conventional vaccines such as PZP-22. The difference between SpayVac® and PZP-22, however, is that PZP proteins in SpayVac® are encapsulated in liposomes, which facilitates the immune response. Liposomes have been used for many years and are recognized as safe components of therapeutics. There is no evidence, at this point that suggests SpayVac® causes permanent sterilization or serious health issues in horses.
13	Test SpayVac® on non-fertility treated mares already living in BLM holding facilities.	BLM is currently conducting a pasture trial of SpayVac® on captive wild horses at a BLM facility in Pauls Valley, Oklahoma, and that study will provide a great deal of useful information. Ultimately, however, the efficacy of SpayVac® or any other contraceptive must be demonstrated on free-ranging animals.
14	SpayVac® is a promising new alternative that should be tested.	Comment noted.
15	At the appropriate time of the year, use the one-year, reversible PZP drug which is to be administered via field dart and water and bait trap methodology. Water/bait trapping should be reintroduced as an alternative to reduce the stress put on the animals and alleviate costs to the American taxpayer. Because the complex is large, traps should be set up in logical places in each HMA. Field work could be condensed by recording the makeup of each band captured and darting the mares at the same time.	Fertility control using PZP-22 is addressed in section 2.2 of the EA. Water/bait trapping was dismissed from detailed study for the following reasons: (1) the project area is too large to use this gather method as the primary or sole method; (2) road access for vehicles to potential trapping locations necessary to get equipment in/out as well as safely transport gathered wild horses is limited; (3) wild horses in the North Lander Complex are extremely sensitive to human presence and associated materials that may be used are very difficult to water trap effectively; and (4) the presence of scattered water sources on both private and public lands inside and outside the HMAs would make it almost impossible to restrict wild horse access to the extent necessary to

		effectively gather and remove all excess animals through only bait and/or water trapping to achieve management goals.
16	All fillies one year and older should receive the native PZP to prevent two year-olds from foaling.	Comment noted. See Appendix 3 of the EA, Standard Operating Procedures for Fertility Control Treatment. For the purposes this analysis, breeding mares are those mares that are age of 2 or older.
17	Any PZP use must be accompanied by thorough tracking of mares on the drugs, the effectiveness of the drug, and any negative side effects.	As detailed in Appendix 3, all treated mares will be freeze-marked with two 3.5-inch letters on the left hip for treatment tracking purposes. The only exception to this requirement is when a mare can be clearly identified through photographs or markings. Estimation of population growth rates using helicopter or fixed wing surveys will be conducted the year preceding any subsequent gather to determine an estimate of population growth (i.e. # of foals to # of adults). Population growth rates of herds selected for intensive monitoring will be estimated every year post-treatment using helicopter or fixed wing surveys. If during routine HMA field monitoring (on-the-ground), data on mare to foal ratios can be collected, these data should also be shared for possible analysis by the USGS. A PZP-22 Application Data sheet will be used by the field applicators to record all the pertinent data relating to identification of the mare and date of treatment. A tracking system will be maintained, detailing the quantity of PZP-22 issued, the quantity used, a disposition of any unused PZP-22, and the number of treated mares by HMA, field office, and state along with the freeze-mark applied by HMA.
18	Geldings released back onto the range as well as those horses removed from the range permanently should not be included in the analysis of genetic viability as they are no longer contributing to the genetics of the herd. Any samples sent for genetic analysis containing samples of horses no longer on the range or geldings on the range should be flagged so that the researchers are aware of this. An EIS is required for any gelding of wild horse stallions and putting them back on the range. Gelding should be	Comment noted. The Lander Field Office has selected an alternative (Alternative 3), that does not incorporate the gelding method.

	removed from consideration in this and any future roundups.	
Other		
19	Discuss positive impacts of wild horses and provide opportunities for ecotourism. Implement a natural reserve and/or enhance wild horse ranges.	Comment noted. In the revised Lander RMP that will be released soon, a wild horse viewing loop has been identified to be established within one or several HMAs.
20	Reduce mountain lion hunting to give the chance for population expansion, allowing for natural predation as part of the management strategy.	Comment noted. Based on personal contact with local Wyoming Game and Fish Department, there are very few documented cases where wild horses are preyed-upon by mountain lions. The scale of wild horse removals needed within the AMLs compared to the potential predation by mountain lions would be insignificant to consider as a reasonable alternative to comply with the Wild Horse and Burro Act and established management objectives.
21	Do not lease land belonging to the HMAs for oil and gas use.	This comment is outside the scope of analysis.
22	The EA must include an economic analysis for each of the proposed alternatives.	A detailed economic analysis was not completed under this analysis because it was not identified as an issue during the scoping period.
23	Gathering activities should not occur during hunting season to minimize potential impacts to hunter success.	Comment noted. It is the BLM's goal to avoid any hunter conflicts when implementing gather activities. At this point, the BLM does not anticipate any conflicts since gather operations are not scheduled to start until November 4, 2012, which is outside the antelope and mule deer hunting seasons.