Wild Horse Gathering for the
Fifteenmile Wild Horse Herd Management Area
Worland Field Office

Environmental Assessment
WY-010-EA04-83

1.0 Introduction

1.1 Background Information

The purpose of this environmental assessment (EA) is to analyze the impacts associated with the Bureau of Land Management's (BLMs) proposal to remove excess wild horses from the Fifteenmile Wild Horse Herd Management Area (HMA) in the summer or fall of 2004 to restore the range to a thriving natural ecological balance and prevent deterioration of the range. The EA will also address whether or not a fertility control treatment should be applied to mares released back to the range following the gather.

The Fifteenmile HMA is located approximately 35 miles north-west of Worland, within Washakie, Big Horn, and Park Counties, Wyoming. The HMA is approximately 83,130 acres in size. Approximately 7,000 acres within the HMA, or about 8% of the total, is privately owned. Refer to attached map.

The AML for wild horses within the Fifteenmile HMA was established in 1985 at 70 to 160 mature horses (Fifteenmile Wild Horse Herd Management Plan, EA No. WY-011-EA5-50). The AML was established based on in-depth analysis and monitoring data including precipitation data, livestock grazing preference and actual use, wild horse herd inventory and actual use, forage utilization, vegetation condition and trend. The AML was further evaluated and affirmed in 1990 with the Evaluation and Update to the Fifteenmile Wild Horse Herd Management Area Plan/Capture Plan (EA No. WY-016-EA0-008), and in 2000, Wild Horse Gathering for the Fifteenmile Wild Horse Herd Management Area (EA No. WY-010-EA0-083). As discussed in these documents, the AML is the optimum number of horses which can graze without damage to the range.

The Fifteenmile HMA was last gathered in 2000 to remove excess wild horses. Following that gather, approximately 136 horses remained on the range. The sex ratio was estimated to be 46% female and 54% male. Aerial census in the fall of 2002 revealed a total of 172 horses. An aerial census was also conducted in the winter of 2003, prior to foaling, and a total of 186 horses were observed. Based on these observations, the average annual population increase for the Fifteenmile HMA since the last removal is approximately 12%. It is estimated that the 2004 post foaling population of the Fifteenmile HMA will be approximately 210 total wild horses. This population level is above the upper range of the established AML. Monitoring data collected since the AML was established indicates that the current AML of 70 to 160 mature wild horses is appropriate and that excess animals are present and require removal.

1.2 Need for the Proposal

The need for management of wild, free roaming horses is to maintain a thriving natural ecological balance and to preserve the multiple use relationship that exists in the areas affected by wild

horses. Management is needed to maintain the health of the public rangelands that wild horses and other animals depend on.

A variety of monitoring data has been collected since the AML was established, including vegetative trend, utilization and use pattern mapping, watershed health evaluations, and precipitation. In general, forage utilization levels vary from year to year based upon vegetative production, and the number of horses present in the HMA. When the wild horse population is at the lower range of the AML, most of the HMA receives slight to light use (less than 40% utilization of current year's production). As the wild horse population approaches the upper range of the AML, the preferred horse use areas receive moderate to heavy use (41% to 80% utilization of current years production), while other areas still receive slight to light use. This is due to poor wild horse distribution, primarily from lack of reliable water. Use pattern mapping each fall has indicated increasingly large areas of heavy use each year with increasing wild horse numbers, since the last wild horse removal in the fall of 2000. This forage utilization is attributed solely to wild horses, with minor wildlife use, since domestic livestock grazing within the HMA has been in voluntary non-use for several years.

In addition, the Bighorn Basin has been subjected to severe drought conditions since 2000, with no relief anticipated in the near future. According to BLM precipitation monitoring data, the Fifteenmile HMA received approximately 65% of normal precipitation from 2000 to 2003. Current year's precipitation, from October, 2003 through June, 2004, indicates that the HMA has received 52% of normal precipitation (BLM Dead Indian Rain Gauge). Forage production in the HMA since 2000 has been very low, with minimal production in 2004. Forage availability for wild horses since the drought began has declined each year, as well as the health and vigor of the key forage plant species. Residual forage levels in most of the HMA are extremely low, impacting not only wild horses, but degrading wildlife habitat and watershed conditions. Current forage levels in the Fifteenmile HMA would not be adequate to sustain the existing wild horse population until the next growing season without a serious decline in the physical condition of the animals.

Water availability in the HMA is also severely limited. Water for wild horses comes exclusively from reservoirs that collect runoff. Under normal conditions, there are eight to ten reservoirs that provide water for wild horse use. As of mid-July, 2004, only four reservoirs in the HMA are providing water for wild horses, and two of these are expected to be dry within one to two weeks. As water levels decline, horses are forced to range further in search of water and forage, causing additional stress on the animals. Available water levels are currently not adequate to sustain the wild horse population through the remainder of the summer. The wild horses in the Fifteenmile HMA are still determined to be in good physical condition, but that situation could change rapidly as water and forage availability continues to deteriorate. There is a distinct possibility that hauling water to the HMA to sustain the wild horse herd may be necessary before the end of summer.

Vegetation and population monitoring in relation to use by wild horses in the HMA has determined that current wild horse population levels are at risk of exceeding the range's capacity to sustain wild horse use over the long term. This situation is compounded by the current drought conditions. Resource damage is occurring in parts of the HMA, and is likely to continue to occur without immediate action to reduce wild horse numbers. Continued resource damage would significantly reduce the sustained yield of the rangeland, thereby affecting the capability of the public lands within the HMA to sustain a viable wild horse population in the future.

The proposed capture and removal is needed to remove the excess animals in order to achieve a thriving natural ecological balance between wild horse populations, wildlife, livestock and

vegetation, and to protect the range from the deterioration associated with overpopulation of wild horses as authorized under Section 3(b) (2) of the 1971 Free-Roaming Wild Horses and Burros Act (1971 Act) and section 302(b) of the Federal Land Policy and Management Act of 1976. It is imperative that excess wild horses be removed as soon as possible, to insure that adequate forage and water is available to sustain the remaining wild horses within the HMA.

1.3 Conformance with Existing Land Use Plans (LUPs)

The Proposed Action is subject to the Record of Decision and Approved Resource Management Plan (RMP) for the Grass Creek Planning Area, approved in September, 1998, which established the following objective for wild horse management in the WFO jurisdiction:

> "In the Fifteenmile Wild Horse Herd Management Area (herd area), maintain free-roaming wild horses in a thriving ecological balance." [Page 21]

The RMP specified the following management actions necessary to achieve the above objective:

> "The herd area will be managed for an initial herd size of at least 70 and no greater than 160 mature animals. To the extent possible, horses will be managed at the lower end of this range during periods of drought." [Page 21]
>
> "The Fifteenmile Wild Horse Herd Gathering Plan will be kept up-to-date and implemented for roundups. Emphasis will be placed on gathering horses that wander outside the herd area or onto privately-owned lands." [Page 21]
>
> "Wild horses will be allocated 2,300 animal unit months (AUMs) of forage annually." [Page 22]

The Proposed Action has been determined to be in conformance with this plan as required by regulation (43 CFR 1610.5-3(a)). The Fifteenmile HMA has been designated as suitable for long term sustained wild horse use in the Grass Creek RMP, and the proposed capture and removal conforms to the land use decisions and resource management goals and objectives of the land use plan.

1.4 Conformance with Rangeland Health Standards and Guidelines

The Fifteenmile HMA has been assessed for Conformance with the Wyoming Standards for Healthy Rangelands, and the HMA has been determined to be in Conformance with the Standards. Table 1, below, summarizes this assessment, or refer to Appendix A, Wyoming Rangeland Standards Conformance Review Summary.

Table 1 – Wyoming Rangelands Standards Conformance Review

Rangeland Health Standard	Meets Standard	Does Not Meet Standard	Not Applicable	Unknown
Soils	XX			
Riparian/Wetland			XX	
Upland Vegetation	XX			
Biodiversity	XX			
Water Quality				XX
Air Quality	XX			

1.5 Relationship to Statutes, Regulations or Other Plans

Gathering excess wild horses is in compliance with Public Law 92-195 (Wild Free-Roaming Horse and Burro Act of 1971) 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 Proposed Action is in conformance with all applicable regulations at 43 Code of Federal Regulations (CFR) 4700 and policies. The following are excerpts from 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 regarding 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) Requires that BLM manage wild horses "…as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat … considered comparably with other resource values …" while at the same time "…maintaining free-roaming behavior."
>
> 43 CFR 4710.3-1 "HMA's shall be established [through the land use planning process] for 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."
>
> 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."

Under 43 CFR 4180 it is required that all BLM management actions 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 Proposed Action is also in conformance with the Fifteenmile Wild Horse Herd Management Area Plan, EA No. WY-011-EA5-50 (1985), which established the original AML for the HMA of 70 to 160 mature wild horses, and the Evaluation and Update to the Fifteenmile Wild Horse Herd Management Area Plan/Capture Plan, EA No. WY-016-EA0-008 (1990). These documents were affirmed by the Interior Board of Land Appeals in *Animal Protection Institute of America et al.* (IBLA 90-412). This document also references the environmental

assessment, Wild Horse Gathering for the Fifteenmile Wild Horse Herd Management Area, EA No. WY-010-EA0-083, and Decision Record and Finding of No Significant Impact (2000).

No other permits or authorizing actions are required prior to implementing the Proposed Action.

2.0 Alternatives

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

- Alternative 1 (Proposed Action) – Gather to Low Range AML (70 Mature Horses)
- Alternative 2 – Gather to Low Range AML (70 Mature Horses) with Fertility Control
- Alternative 3 (No Action) – No Gather/Removal

Alternatives 1 and 2 were developed based on the need to remove excess animals in order to manage the range in a thriving natural ecological balance and multiple-use relationship and to prevent range deterioration. The removal of wild horses under these alternatives would ensure that the wild horses remaining within the HMA have adequate forage and water to survive and maintain satisfactory physical condition. Removal of excess wild horses would also help to sustain the long-term productivity of the rangeland resources on the public lands that wild horses depend on. Application of fertility control is also analyzed to determine whether or not its use would be cost effective and result in reducing reproduction rates in mares released back to the range and in reducing gather frequency and decreasing disturbance to herd social structure. Although Alternative 3 (No Action) does not comply with the 1971 Act, as amended, nor meet the purpose and need for this action, it is included as a basis for comparison with the two action alternatives.

2.1 Actions Common to Alternatives 1 and 2

The following actions are common to Alternatives 1 and 2:

- Gather operations would be conducted in accordance with the Standard BLM Operating Procedures for Wild Horse Removal (Appendix B) The helicopter drive method would be used for this gather, and would 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 animals to the same general area from which they were gathered.

- An Animal and Plant Inspection Service (APHIS) veterinarian may be on-site, as needed, to examine animals and make recommendations to BLM for care and treatment of wild horses. A veterinarian would be consulted prior to euthanasia in accordance with Washington Office Instruction Memorandum (IM) 2001-165.

- Animals would be removed using a selective removal strategy (Gather Policy and Selective Removal Criteria for Wild Horses, Washington Office IM 2002-095). Selective removal criteria for this gather would include:

  a. Age Class Four Years and Younger: Wild horses four years of age and younger may be removed and placed 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 holding.

Any animals within this age class that are in the Henneke category of 2 or less and have no chance of timely improvement would be evaluated for euthanasia. Any euthanasia would be in accordance with Washington Office Instruction Memorandum 2001-165. 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.

c. Age Class Five to Nine Years: Wild horses aged five to nine years old should 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 Proposed Action or 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 for release. Additionally, in the case that a certain number of wild horses evade gather, and have been confirmed by the BLM WH&B Specialist, the total number of animals released may be reduced by this number.

- Blood samples would be acquired to determine whether or not BLMs management is maintaining acceptable genetic diversity (avoiding inbreeding depression). The blood samples would be collected from horses returned to the HMA, if possible. Other data including sex and age distribution, reproduction, survival, condition class information (using the Henneke rating system), color , size and other information may also be recorded, along with the disposition of that animal (removed or released).

- A primary focus would be placed on gathering horses that are located on grazing allotments outside of the HMA. All areas outside of the HMA would be considered total removal areas.

2.2 Proposed Action and Alternatives

2.2.1 – Alternative 1 (Proposed Action) – Gather to Low Range AML (70 Mature Horses)

Under this alternative, BLM would continue to implement a population management strategy for the Fifteenmile HMA in which wild horses would be managed in a range from 70 to 160 mature horses.

This alternative would involve capturing about 210 wild horses, returning about 70 mature animals to the HMA, and removing the remainder of the horses. BLM would also assess sex, age and color, herd health (pregnancy/parasite loading/physical condition, etc.) and collect blood samples for genetic analysis. 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.

2.2.2 – Alternative 2 – Gather to Low Range AML (70 Mature Horses) with Fertility Control

Alternative 2 would continue implementation of a population management strategy for the Fifteenmile HMA in which wild horses would be managed in a range from 70 to 160 mature wild horses. Part of the Alternative would involve capturing about 210 wild horses, returning about 70 mature animals to the HMA, and removing the remainder of the horses. The Bureau would also assess sex, age and color, herd health (pregnancy/parasite loading/physical condition, etc.). Blood samples would be collected for genetic analysis and 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 sent to Bureau facilities for adoption or long term holding.

Also under Alternative 2, immunocontraceptive research would be conducted, with the results monitored as appropriate. Breeding age mares selected for release back to the range would be treated with Porcine zona pellucidae (PZP) vaccine which would inhibit reproduction of the treated mares for two breeding seasons.

The following management and monitoring requirements are part of Alternative 2:

- PZP vaccine would be administered by trained BLM personnel.
- A liquid dose of PZP would be administered concurrently with a time released portion of the drug (pelleted formulation) to breeding mares returned to the range (the pellets are injected with the liquid and are designed to release PZP at several points in time much the way time-release cold pills work).
- Delivery of the vaccine would be as an intramuscular injection by jab stick syringe or dart with a 12 gauge needle or 1.5" barbless needle, respectively while mares are restrained in the working chute; 0.5 cubic centimeters (cc) of the PZP vaccine would be emulsified with 0.5 cc of adjuvant (a compound that stimulates antibody production) and loaded into the delivery system. The pellets would be placed in the barrel of the syringe or dart needle and would be injected with the liquid. Upon impact, the liquid in the chamber would be propelled into the muscle along the pellets[1].
- All treated mares would be freeze-marked on the hip to enable researchers to positively identify the animals during the research project as part of the data collection phase.
- At a minimum, monitoring of reproductive rates using helicopter flyovers would be conducted in years 2 through 4 by locating treated mares and checking for presence/absence of foals. The flight scheduled for year 4 would also assist in determining the percentage of mares that have returned to fertility. In addition, field monitoring would be routinely conducted as part of other regular ground-based monitoring activities.
- A field data sheet would be forwarded to the field from BLMs National Program Office (NPO) prior to treatment. This form would be used to record all pertinent data relating to identification of the mare (including a photograph when possible), date of treatment, type of treatment (1 or 2 year vaccine, adjuvant used) and HMA, etc. The form and any photos would be maintained at the field office and a copy of the completed form would be sent to the authorized officer at NPO (Reno, Nevada).

[1] This delivery method has been used previously to deliver immunocontraceptive vaccine with acceptable results. Administration of this two year vaccine to mares would be expected to be 94% effective the first year, 82% effective the second year, and 68% effective the third year. To date, one herd area has been studied using the 2-year PZP vaccine. The Clan Alpine study in Nevada was started in January 2000 with the treatment of 96 mares. The test resulted in fertility rates in treated mares of 6% in year one, 18% in year two and 32% in year three. Average fertility rates in untreated mares range between 50-60% in most populations. The Clan Alpine fertility rate in untreated mares, obtained from direct observation in September of each year, average 51% over the course of the study.

- A tracking system would be maintained by NPO detailing the quantity of PZP issued, the quantity used, disposition of any unused PZP, the number of treated mares by HMA, field office, and state along with the freeze-mark applied by HMA.
- The field office would assure that treated mares did not enter the adoption market for three years following treatment. In the rare instance, due to unforeseen circumstances, treated mares were removed from the HMA before three years has lapsed, they would be maintained in either a BLM facility or a BLM-contracted long term holding facility until expiration of the three year holding period. In the event it would be necessary to remove treated mares, their removal and disposition would be coordinated through NPO. After expiration of the three year holding period, the animals may be placed in the adoption system.

2.2.3 – Alternative 3 (No Action) – 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, coupled with density-dependant adjustments in reproductive rates stabilized the populations. Considering the limited forage and water availability due to the continuing drought conditions in the Fifteenmile HMA, 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, or the Grass Creek RMP.

2.3 Alternatives Considered But Eliminated From Further Analysis

One alternative considered was using fertility control measures only to regulate wild horse populations. Periodic capture operations would be required to administer PZP vaccine to mares, or suitable remote delivery methods would need to be developed. This alternative was eliminated from further analysis since the vaccine has not been formally approved by the Food and Drug Administration for management-based applications. Even with formal approval, an effective remote delivery methodology (aerial or water based) has not been developed for current formulations. Additionally, the current data suggest that repeated long-term applications of the vaccine may affect fecundity. Also, this alternative would not reduce wild horse numbers to a level that current rangeland conditions within the HMA can support.

3.0 Environmental Impacts

This chapter will assess the environmental impacts (either positive or negative) on the components of the human environment either affected or potentially affected by the Proposed Action and Alternatives. Direct impacts are those that result from the actual gather and removal of wild horses in the Fifteenmile HMA. Indirect impacts are those impacts that exist once the excess animals are removed. 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 actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The numbers, age, and sex of animals proposed for removal are derived from WinEquus (Wild Horse Population Model) Version 1.40 developed by Dr. Stephen H. Jenkins, Associate Professor, Department of Biology, University of Nevada, Reno. See the attached Appendix C – Population Modeling, which establishes the parameters used for the HMAs population modeling runs.

Critical elements of the human environment (USDI-BLM 1988) and their potential to be affected by the Proposed Action and Alternatives must be considered. These critical elements are listed below in Table 2. The elements that are determined to be not affected will not be analyzed or discussed further in this document.

Table 2 – Critical Elements Checklist

Critical Element	Present	Affected
Air Quality	Yes	No
Areas of Environmental Concern (ACECs)	No	No
Cultural Resources	Yes	Yes
Environmental Justice	No	No
Floodplains	No	No
Invasive, Non-native Species	No	No
Migratory Birds	Yes	No
Native American Religious Concerns	No	No
Prime or Unique Farmlands	No	No
Special Status Species	Yes	No
Waste, Hazardous or Solid	No	No
Water Quality (Surface and Ground)	Yes	No
Wetlands and Riparian Zones	No	No
Wild and Scenic Rivers	No	No
Wilderness	Yes	Yes

3.1 Wild Horses

Existing Situation

HMA Description

As discussed in the Background Information (EA-Page One), the Fifteenmile HMA is located approximately 35 miles north-west of Worland, within portions of Washakie, Big Horn, and Park Counties, Wyoming. The HMA is approximately 83,130 acres in size. Approximately 7,000 acres within the HMA, or about 8% of the total, is privately owned. Elevation ranges from 4,600 feet along Fifteenmile Creek, to 6,100 feet on Tatman Mountain. Summers are extremely hot, and winters can range from mild to bitterly cold.

Annual precipitation ranges from 4 to 12 inches per year, with an average of 6.7 inches per year. Overall precipitation from 2000 through 2003 was approximately 65% of normal. About half of the precipitation falls during the growing season from April through June, with the remainder coming in 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. Due to the highly erosive nature of the soils, these reservoirs and pits quickly fill with sediment, thereby reducing their capacity to hold water. Evaporation rates are also very high due to the hot, dry weather experienced during the summer months. In some parts of the HMA that receive very little wild horse use, vegetative cover and litter have increased to the point that storm runoff is insufficient to fill some reservoirs and pits. Because of these factors, water availability is a major concern in the HMA.

The Fifteenmile HMA was established in 1985. The established AML is 70 to 160 mature horses. At the time that the AML was established, mature horses were considered to be horses 2 years of

age and older. The Grass Creek RMP allocated a total of 2,300 AUMs of forage for wild horses, which is the amount of forage required to sustain 160 mature wild horses, along with immature animals, when the population is at the upper range the AML.

Some of the horses frequently travel outside of the HMA onto adjacent grazing allotments. The following grazing allotments are regularly used by wild horses:

New Burlington Allotment No. 00509
Fernandez Blu-Jay Allotment No. 00510
South Tatman Allotment No. 00612
Timber Creek Allotment No. 00626
Tatman Mountain Common Allotment No. 00639
Snyder Allotment No. 00640
West Five Mile Allotment No. 00651
North Tatman Allotment No. 00674

A small band of horses, approximately 10 to 20 head, is located in the Fivemile area about 15 miles east of the HMA. There is no known interaction between these horses and the horses in the Fifteenmile HMA. Several attempts have been made to remove these horses over the past 20 years, but due largely to the remoteness of the area and rugged topography, a few horses have always evaded capture.

Four years of consecutive drought has limited water available to wild horses, and severely limited forage production in the HMA (refer to Section 1.2). This has resulted in heavy use of forage near available water sources, and in preferred wild horse use areas.

Gather History and Population Characteristics

Recent gathers in the Fifteenmile HMA were conducted in 1984, 1991, 1994 and 2000. In 1984 and 1991 the gather was a gate cut (nearly all gathered horses removed), while the 1994 and 2000 gathers were age selective. During the 1994 gather, many of the young adoptable horses were removed, with predominately older horses returned to the HMA. During the 2000 gather, many of the older horses were removed, returning the herd to a more typical age structure. Table 3 shows the number of wild horses that were gathered and the number removed during the recent gathers.

Table 3 – Number of Wild Horses Gathered, Removed, and Remaining

Year	Number Gathered	Number Removed	Estimated Number Remaining
1984	360	360	69
1991	151	129	116
1994	185	141	97
2000	233	161	136

Following the 1994 gather, the sex ratio of the herd was estimated to be 30% female and 70% male, due to the large percentage of older stud horses which were returned to the HMA. Following the 2000 gather, when many of these older horses were removed, the sex ratio was estimated to be 46% female and 54% male.

Data from the 2000 gather was used to determine animal colors and the approximate frequency of the color within the herd. The frequencies of colors found during the 2000 gather were: bay (49%), gray (18%), sorrel (12%), pinto (9%), roan (6%), brown (4%), and black (2%).

The current wild horse population, prior to the 2004 foaling period, is estimated to be 186 horses, based upon the latest census in the winter of 2003. The horse population following the 2004 foaling period is projected to be approximately 210 horses.

No predation of wild horses has been documented in the HMA, and it is considered to have little or no effect on the wild horse population.

Genetic Diversity and Viability

Blood samples were collected from horses removed during the 1991 and 2000 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, Department of Veterinary Science, University of Kentucky. His conclusions and recommendations regarding genetic diversity in the Fifteenmile herd are summarized as follows:

> "Genetic variability of the Fifteenmile herd is very high, among the highest levels seen in horse populations. The high variation is probably due to a mixed origin of the herd and possibly continued gene flow. The genetic similarity and RML cluster analysis support the mixed nature of this herd." (Cothran, 2001)
>
> "No action is needed at this time. As long as the population size is kept at around 100 individuals, genetic variation should not decay to detrimental levels for several generations. Caution is advised to avoid population sizes of 50 or fewer horses. Much of the genetic diversity of this herd is in rare variants that could be lost quickly of population size is maintained at extremely low levels." (Cothran, 2001)

Environmental Impacts

The following table provides a summary of the population modeling results for each alternative, as derived from the wild horse population model, WinEquus (Appendix C). A total of 50 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) Gather to 70 Mature Horses (Proposed Action)	70	94	155	242	349	234	0	16.7%
(2) Gather to 70 Mature Horses with Fertility Control	54	94	154	244	372	236	43	13.8%
(3) No Removal (No Action)	187	204	444	788	0	0	0	14.1%

Population modeling projects that the minimum, average, and maximum population size would be lowest under Alternative 1 and 2. The lowest minimum population size under Alternative 1 would be within the parameters specified by Dr. Cothran for maintaining a genetically viable herd. The lowest minimum population size under Alternative 2, which would utilize fertility control treatments, would come dangerously close to approaching the level at which Dr. Cothran indicated that acceptable genetic variation could be lost. The overall population growth rate would be somewhat lower under Alternative 2 than under Alternative 1.

The population modeling also indicated that two removals would be required in the next 10 years to maintain the population within the limits of the AML. Under Alternatives 1, a second removal would most likely be required in 2009, while under Alternative 2, utilizing fertility control treatments, the second removal would not be necessary until 2010 or 2011. However, the total number of horses gathered and removed over the 10 year trial period would be similar for Alternatives 1 and 2.

Under Alternative 3, the No Action alternative, the wild horse population within the Fifteenmile HMA would grow to a level that would quickly exceed the carrying capacity of the range.

Impacts Common to Alternatives 1 and 2

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. The minimum feasible level of management would require that removals and other management actions that directly impact the population, such as helicopter census, occur as infrequently as possible (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 Fifteenmile HMA to 70 mature 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.
- With limited forage and water availability due to the ongoing drought, the wild horses remaining on the range would experience decreased competition and stress for available resources.
- Ensure a viable population of wild horses 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 to the herd.
- 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 5 to 7 years.
- The wild horse population would be subjected to the stresses associated with gathering and handling as infrequently as possible.

Selective Removal Criteria

Direct impacts associated with Alternatives 1 and 2 would consist of 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 Fifteenmile HMA. 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. Utilizing the selective removal criteria would result in a positive impact for the long term health and stability of the population.

The effect of removal of horses from the population is not expected to have significant impact on herd population dynamics, age structure or sex ratio, as long as the selection criteria for the removal maintains the social structure and breeding integrity of the herd. The selective removal strategy for the Fifteenmile HMA 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. Effects resulting from successive removals causing shifts in sex ratios away from normal ranges are fairly self evident. If the selective removal criteria favor studs over mares, it would be 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.

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

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

Population wide impacts may occur during or immediately following the implementation of Alternatives 1 or 2. They include the 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 the removal of animals from the population. With the exception of the changes to herd demographics, direct wide population impacts have proven to be temporary in nature with most if not all impacts disappearing within hours to several days of release. No observable effects associated with these impacts would be expected within one month of release except for a heightened shyness toward human contact. Observations of animals following release have shown 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 Operation Procedures (Appendix B) which have been developed over time. These SOPs represent the best methods for reducing impacts associated with gathering, handling, transporting and collecting herd data.

Data Collection

Direct impacts associated with data collection involve increased stress levels to the animals as they are restrained in the portable aging chute. Those animals selected for blood sampling may become very agitated as the samples are drawn. 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: Proposed Action - Gather to Low Range AML (70 Mature Horses)

The direct impacts of the Proposed Action would include capturing approximately 210 wild horses, returning approximately 70 mature horses to the HMA, and removing the remainder of the horses. Direct impacts associated with the Proposed Action also 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).

Implementation of the Proposed Action would prevent the population from increasing beyond the upper limit of the management range until the fifth year, 2009. Gathering to the lower limit of the management range (70 mature horses) would allow the wild horse population to increase over time to the upper limit of the management range (160 mature horses). When this level is exceeded, another gather would be scheduled. Because the HMA would be gathered again when the upper limit of the management range is exceeded, resource degradation associated with wild horses would be minimized. Under the Proposed Action, horses left on the range would have adequate forage, water and space. A thriving natural ecological balance would exist within the HMA and adjacent to it. Reducing the population to 70 mature horses would benefit the remaining horses by improving the quality and quantity of forage. This would ensure a vigorous and viable breeding population, reduce stress on vegetative communities and wildlife, and be in compliance with the Wild Free Roaming Horse and Burro Act, and the Grass Creek Resource Management Plan. Reducing the wild horse population to 70 mature horses would also maintain the wild horse population at a level that Dr. Cothran indicated would preserve the genetic diversity of the Fifteenmile wild horse herd.

Alternative 2: Gather to Low Range AML (70 Mature Horses) with Fertility Control

The direct impacts of Alternative 2 would include capturing about 210 wild horses, releasing 70 mature horses back to the HMA, and removing the remainder of the 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 20 breeding age mares would be treated with two-year immunocontraceptive (PZP) vaccine. This vaccine has shown effectiveness of 94% in year one, 82% in year two and 68% in year 3.

Each mare to be released would receive a single-dose of the two-year PZP contraceptive vaccine, as described in Section II. When injected, PZP (antigen) causes the mare's immune system to produce antibodies that bind to her eggs, effectively blocking sperm penetration and fertilization (ZooMontana, 2000). PZP is relatively inexpensive, meets BLM requirements for safety to mares and the environment, and could be administered in the field. Also, among mares, PZP contraception appears to be completely reversible, and to have no ill effects on ovarian function if the mare is not contracepted for more than 3 consecutive years. PZP 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 affects on pregnancies in progress, the health of offspring, or the behavior of treated mares. Inoculated mares would foal normally in 2005, and the contraceptive would limit foal production in 2006 and 2007. Near normal foaling rates would be expected to resume in 2008.

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 extremely rare in treated mares, and may be related to experience of the person administering the vaccine. Injection of the vaccine would be controlled, handled and administered by a trained BLM employee, researcher or veterinarian. 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.

The implementation of fertility control applications appears to be most beneficial in herds with a higher growth rate. Since the last removal in 2000, the Fifteenmile herd has only increased approximately 12% per year. Population modeling has shown that with this lower than normal growth rate, the benefits of fertility control are not as apparent. Over the next 10 year period, the number of horses gathered under this alternative would be nearly identical to the Proposed Action, and the number of horses removed would be only slightly lower. Also, this alternative would provide the greatest potential for the minimum population size to approach the level at which Dr. Cothran indicated that acceptable genetic variation could be lost.

Other environmental consequences related to reducing the number of horses in the Fifteenmile HMA would be nearly identical to the Proposed Action.

Alternative 3: 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 would approach 800 horses within the next 10 years, which is well above the carrying capacity of the Fifteenmile HMA. 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 Fifteenmile HMA wild horse population, wildlife populations, and the vegetative resource.

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 range resource. Over the course of time, the animals would deteriorate in condition 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 reaches the ecological carrying capacity and both the habitat and the wild horse population would be critically unhealthy.

Ecological carrying capacity of a population is a scientific term, which refers to the level at which density-dependant population regulatory 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 to the habitat through overgrazing, which is not only depended upon by wild horses but by wildlife (which include sensitive species), and permitted livestock. All multiple uses of the area would be impacted. Significant loss of wild horses in the Fifteenmile HMA due to starvation and disease would have obvious consequences to the long-term viability of the herd. Irreparable damage to the resources, which would include primarily vegetative, soil and watershed resources, would have obvious impacts to the future of the Fifteenmile HMA and all other uses of the resources, which 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 Wild Free-Roaming Horse and Burro Act of 1971, 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, Promulgated Federal Regulations at Title 43 CFR 4700.0-6 (a) state "*Wild horses shall be managed as self- sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat"*.

3.2 Vegetation, Soils and Watershed

Existing Situation

The majority of soils in the HMA are desert soils developed under low precipitation with minimal topsoil development--Aridisols and Entisols. The soils are mostly fine textured with areas of sand dunes, badlands, and saline areas with severe erosion potentials when disturbed. Loss of topsoil from these desert soils lead to an irreplaceable loss in soil productivity, and thus ability to regain natural plant communities if lost.

Vegetation in the HMA varies from desert shrub to sagebrush/grass. Major plant species in the desert shrub type consist of Gardner's saltbush *(Atriplex gardnerii)*, greasewood *(Sarcobatus vermiculatis)*, Indian ricegrass *(Oryzopsis hymenoides)*, Sandberg bluegrass *(Poa sandbergii)*, bottlebrush squirreltail *(Sitanion hystrix)*, saltgrass *(Distichlis spp.)*, and pricklypear cactus *(Opuntia spp.)*. Wyoming big sagebrush *(Artemisia tridentata)*, bluebunch wheatgrass *(Agropyron spicatum)*, western wheatgrass *(Agropyron smithii)*, needle-and-thread *(Stipa comata)*, prairie junegrass *(Koeleria nitada)*, and blue grama *(Bouteloua gracillis)* are the primary components of the sagebrush/grass type. There are no known threatened and endangered or sensitive plants located within the Fifteenmile HMA.

Fifteenmile Creek is a cottonwood-lined ephemeral stream that originates above the HMA, and flows through the center of the HMA before draining into the Bighorn River at Worland. Fifteenmile Creek is a WYDEQ Class 3B water. Class 3 waters are waters, other than those

designated as Class 1, that are intermittent, ephemeral or isolated waters and because of natural habitat conditions, do not support nor have the potential to support fish populations or spawning. Uses designated on Class 3 waters include aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value. Class 3B waters are tributary waters including adjacent wetlands that are not known to support fish populations or drinking water supplies and where those uses are not attainable. Class 3B waters are intermittent and ephemeral streams with sufficient hydrology to normally support and sustain communities of aquatic life including invertebrates, amphibians, or other flora and fauna which inhabit waters of the state at some stage of their life cycles. In general, 3B waters are characterized by infrequent linear wetland occurrences or impoundments within or adjacent to the stream channel over its entire length. Siltation from Fifteenmile Creek into the Bighorn River has been a primary focus of concern in recent years. There are also numerous smaller drainages and reservoirs scattered throughout the HMA.

Environmental Impacts

Alternatives 1 and 2 - The removal of excess wild horses from the herd area would avoid potential over-utilization of forage and reduction in vegetative ground cover. Vegetation composition, cover, and vigor would improve or be maintained, especially near water sources. Potential for competition for forage and water between wild horses, wildlife and livestock, and surface disturbing activity in around water sources would be reduced. Quantity of forage would be increased. The increased vegetative cover would protect soils and reduce erosion of the surface soil layer.

Physical surface disturbance would occur at the trap sites due to the erection of the traps, trampling by horses, and vehicle traffic. When the horses are herded some vegetation would be disturbed. Extreme surface disturbance occurs within the paddocks of the trap due to the milling about by the horses; however, the total impacted area would be less than one-quarter acre per trap site. The vegetation in these areas should recover quickly. Vehicles would damage vegetation, but staying on existing roads and trails minimizes the impact.

Maintaining wild horse populations at the established AML would produce no adverse cumulative impacts to vegetation, soils and watersheds.

Alternative 3 - Increased use over the entire HMA would adversely impact soils and vegetation health, especially around the water locations. As native plant health deteriorates and plants are lost, soil erosion would increase. The shallow desert topsoil can not tolerate much loss without losing productivity and thus the ability to be revegetated with native plants. Invasive non-native plant species would increase and invade new areas following increased soil disturbance and reduced native plant vigor and abundance. This would lead to both a shift in plant composition towards weedy species and an irreplaceable topsoil and productivity loss from erosion. These impacts would be cumulative over time. There would also be increased impacts to areas outside the HMA as horses move out in search of better forage.

3.3 Wildlife

Existing Situation

The HMA provides valuable habitat for a variety of wildlife species, including crucial winter and winter/yearlong habitat for mule deer and pronghorn. The area also provides winter, breeding, and brood rearing habitat for sage grouse. Numerous other raptors, small mammals, passerines, and predators inhabit the area as well.

There are primarily 3 priority vegetative habitat types within the HMA that comprise the bulk of the wildlife use and needs. Upland sagebrush stands, upland grasslands, and floodplain shrub stands. The preferred upland sagebrush stands are typically ≥10% 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 ≤10% 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. These areas also contain most of the white-tailed prairie dog colonies within the HMA. The prairie dog colonies themselves provide habitat for other sensitive species like the burrowing owl and ferruginous hawk, as well as the mountain plover. Like the sagebrush stands, a complex diversity of 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. The cover provided in these bottoms is particularly critical during breeding season when mule deer are most vulnerable. The variety of structure provided in the cottonwood and willow components of these bottoms is also valuable foraging and nesting habitat for numerous passerines, woodpeckers, and some raptor species.

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. In addition, habitat enhancement projects would be considered in situations where vegetative communities are not meeting objectives for species composition, structural diversity, and vigor.

Environmental Impacts

Alternatives 1 and 2 – 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 3 – 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.

3.4 Domestic Livestock

Existing Situation

There are 5 unfenced grazing allotments located within the HMA. These grazing allotments are:

LU Allotment No. 00604 (part)
Badger Gulch Allotment No. 00652
Allen Basin Allotment No. 00669
Pitchfork Allotment No. 00676
Hunt Oil 15 Mile Allotment No. 00862

The total permitted livestock grazing on these allotments is 7,925 AUMs. This use is permitted as winter sheep use, from November through March. The majority of this livestock use has been in voluntary non-use for several years, but could be activated at any time by the permittees.

In contrast to the amount of authorized livestock use, the overall recommended stocking level for both livestock and wild horses in the HMA is about 5,670 AUMs, based on rangeland vegetation inventory data. The Grass Creek RMP specified that annual forage use by domestic livestock would not be allowed to exceed 3,370 AUMs.

Environmental Impacts

Alternatives 1 and 2 – While at present there is no direct competition between wild horses and domestic livestock within the HMA, due the amount of non-use taken by the livestock permittees, there is competition for forage and water between livestock and wild horses which are on grazing

allotments outside of the HMA. Also, the livestock permits within the HMA could be activated by the permittees at any time. In general, increased wild horse numbers would result in increased competition between horses and livestock.

Under these alternatives, there would be no long-term effect on domestic livestock. Maintaining the wild horse population at the AML would ensure that the quality and quantity of forage for domestic livestock, both in and near the HMA, would be adequate. Temporary stress which could occur in conjunction with gathering operations would be minimized or avoided by careful attention to timing and location of activities and close communication with the owners of the domestic livestock.

There would be no adverse cumulative impacts to domestic livestock as a result of implementing Alternatives 1 or 2.

Alternative 3 – Under this alternative, increasing horse populations would first displace livestock in the HMA, and then over time in adjacent areas surrounding the HMA. Displacement would be slow and indirect. As competition for forage and water increased, it would become less economically favorable to utilize the areas with domestic livestock. Authorized livestock grazing would be reduced or eliminated. This would have a negative economic impact on livestock producers. Range conditions in and around the HMA would deteriorate significantly. These impacts would be cumulative over time.

3.5 Wilderness

Existing Situation

All or part of 3 Wilderness Study Areas (WSA's) are located within or near the HMA. The Bobcat Draw WSA, covering 18,540 acres, is located almost entirely within the south-east part of the HMA. A small portion of the Sheep Mountain WSA is located in the north-east part of the HMA. The wild horses in the Fivemile area, approximately 15 miles east of the HMA, are generally found within or near the Red Butte WSA.

Until these areas are designated wilderness or released from further consideration by Congress, they are managed under the Interim Management Policy (IMP) for lands under wilderness review. Under the IMP, WSA's are managed so as not to impair the suitability of such areas for Congressional preservation as wilderness. At present, all activities permitted in WSA's must be temporary uses that create no surface disturbance, nor involve permanent placement of structures.

Environmental Impacts

Alternatives 1 and 2 – These alternatives meet the nonimpairment criteria as it is temporary, it would cause no surface disturbance, and no reclamation is needed. The use of a helicopter to gather wild horses is specifically allowed in handbook H-8550-1, Interim Management Policy and Guidelines for Lands Under Wilderness Review (page 43). There would be a short-term impact on solitude for any visitors who are present in the WSA's while the helicopter is being used. The time frame involved is very limited. Removal of excess wild horses would help to protect the vegetative cover within the WSA's, and would be beneficial for the wild horses which remain in the area. No wild horse trap site locations are planned within WSA boundaries.

There would be no adverse cumulative impacts to wilderness as a result of implementing Alternatives 1 or 2.

Alternative 3 – Impacts of an increased wild horse herd size would probably decrease the naturalness of the WSA's and therefore impair their suitability for designation as wilderness. The

previously described impacts to soils, vegetation, wildlife, wildlife habitat and watershed function would have a detrimental effect on the WSA's ecosystem. Impacts on the naturalness of the WSA's could come in many forms, primarily in the form of excessive erosion due to increased horse traffic and reduced soil stabilizing vegetative cover, and a change in the number of members of other species displaced by the increased competition for resources. Also, the deteriorated habitat would negatively impact opportunities for primitive and unconfined recreation.

3.6 Recreation

Existing Situation

Some members of the public enjoy seeing wild horses roaming free in the Fifteenmile area. Both residents and non-residents occasionally make special trips to the area to view wild horses in their natural environment. Visitor use has not been documented due to its random nature.

Other recreation in the HMA is quite dispersed with the greatest amount occurring during the hunting seasons for the various game animals and birds. Some other recreational uses of the area include mountain biking, horseback riding, ATV use, sightseeing, and photography.

Environmental Impacts

Alternatives 1 and 2 – Maintaining wild horse populations at the established AML guarantees the opportunity for the public to view wild horses in a wild and free-roaming state. Although there would be fewer horses to view, the remaining horses would be in better condition than under the No Action alternative. Additional recreational opportunities would be provided by wild horse adoption and adoption events. Since wildlife and wildlife habitat benefit from the removal of excess horses, there is a beneficial effect for recreationalists who view game and non-game species and those who hunt. Public access to the trap site locations may be temporarily limited, if necessary, so as not to disrupt the gather operations. There would be no adverse cumulative impacts to recreation as a result of implementing Alternatives 1 or 2..

Alternative 3 – Short-term impacts to recreationists observing wild horses on the range would be positive, as there would be more horses over a larger area. Over time, however, the condition of the wild horses would decline, as would the habitat (an adverse cumulative impact). Increases in wild horse numbers would likely mean a decline in the opportunity to enjoy wildlife-related consumptive and non-consumptive recreation. There would be no opportunity to adopt a wild horse from the area.

3.7 Heritage Resources

Existing Situation

Only a small fraction of the land surface within the HMA has been inventoried for heritage resources. As a result, archaeologists have recorded only twenty-nine archaeological properties. Prehistoric site types known to exist within the HMA include open camps, lithic scatters, and rock art. Historic site types include trash dumps, trails, roads, and structures associated with the local farming and ranching industries.

Environmental Impacts

Alternatives 1 and 2 – Following the requirements of the Wyoming State Protocol, impacts to historic properties, as defined by 36 CFR 800.2(e), are not anticipated because if historic properties are identified through Class III inventory the Protocol requires mitigation of adverse effects. 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 3 – 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.

3.8 Energy Development

Existing Situation

At the present time, energy development within the HMA is limited to the staking of two exploratory natural gas wells just inside the north boundary of the HMA. Road construction to provide access to these locations is scheduled to begin in the summer of 2004. The majority of the proposed road construction is located outside of the HMA. Drilling operations at the well sites are anticipated to begin in September, 2004.

Environmental Impacts

Alternatives 1 and 2 – The primary wild horse trap site location is located approximately 7 miles from the proposed drilling locations. Any wild horses located within the vicinity of the road construction or drilling operations would be herded out of these areas by helicopter. Road construction activities may need to pause briefly to allow horses to be herded from the area. This impact would be very short-term in nature, not expected to exceed a few minutes. If the road construction is completed at the time of the gather, it could provide increased public access to the HMA. Access for the general public may be temporarily limited, if necessary, so as not to disrupt the gather operations.

Alternatives 1 and 2 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. No adverse impacts to energy development are anticipated under Alternatives 1 and 2.

Alternative 3 – No adverse impacts to energy development are anticipated under the No Action Alternative. Selection of Alternative 3 would also be in compliance with Executive Order 13212.

3.9 Cumulative Impacts

The HMA contains a variety of resources and supports a variety of uses. There are a number of other BLM conducted and authorized activities ongoing in and adjacent to the HMA. 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 and 2 would be to maintain a thriving natural ecological balance and preserve the multiple use relationship among all resources within and surrounding the Fifteenmile HMA. The cumulative impacts of Alternative 3 would be that a thriving natural ecological balance would not be maintained, and the multiple use relationship within the Fifteenmile HMA would not be preserved. Cumulative impacts to the long-term viability of the horse herd would be monitored through genetic marker analysis in accordance with the Standard Operation Procedures (Appendix B).

4.0 Consultation and Coordination

The Bureau of Land Management is responsible for obtaining public input on proposed actions within the wild horse program. Public input has been solicited for several actions proposed since the establishment of the Fifteenmile HMA.

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 Grass Creek RMP, which established the current decisions regarding the management of the Fifteenmile WHA. Several public meetings were held throughout the Bighorn Basin. Numerous comments were received regarding the Fifteenmile HMA, and were incorporated in the RMP to the extent possible.

5.0 List of Preparers

Following is a list of preparers and reviewers for this Environmental Assessment:

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6.0 References Cited

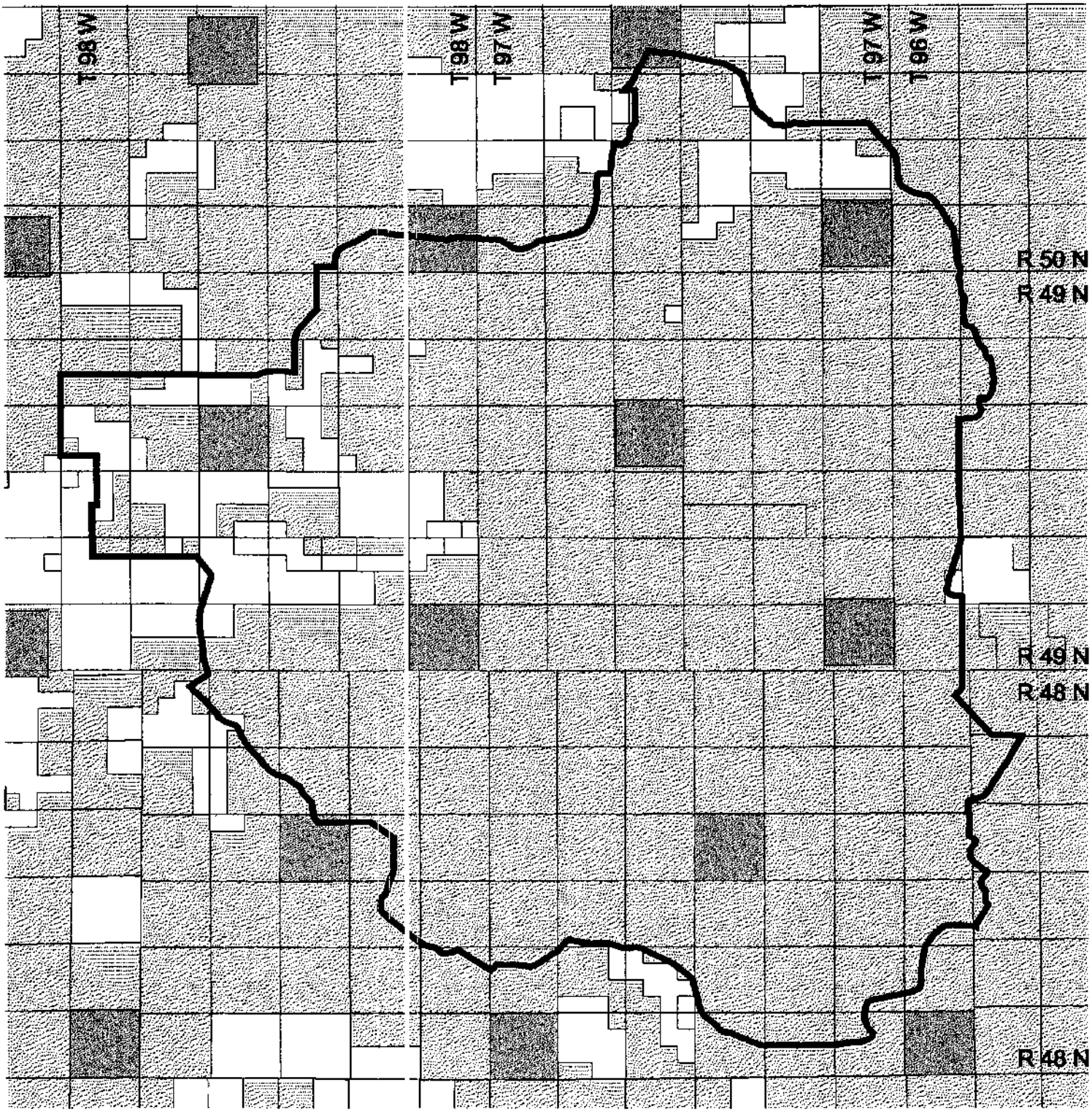
Coates-Markle, L (2000) Summary Recommendations, BLM Wild Horse and Burro Population Viability Forum April 1999, Ft. Collins, CO. Resource Notes 35: 4 pp.

Cothran, E. Gus (2001) Genetic Analysis of the Fifteenmile, WY Feral Horse Herd. Department of Veterinary Science, University of Kentucky. Report to BLM.

Kirkpatrick, J.F., R. Naugle, I.K.M. Lui, J. W. Turner Jr., M. Bernoco (1995) Effects of Seven Consecutive years of PZP Contraception on Ovarian Function in Feral Mares, Biology of Reproduction Monograph Series 1: Equine Reproduction VI: 411-418.

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

ZooMontana (2000) Wildlife Fertility Control: Fact and Fancy. ZooMontana Science and Conservation Biology Program, Billings, MT.



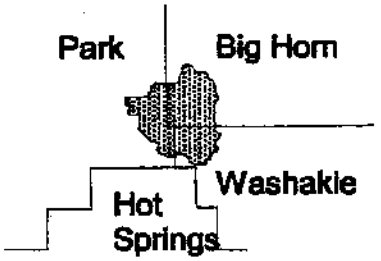
Fifteenmile Wild Horse Herd Management Area

2 0 2 Miles

N

Surface ownership:

- Federal
- Private
- State



APPENDIX A
WYOMING RANGELAND STANDARDS
CONFORMANCE REVIEW SUMMARY

ALLOTMENT: Fifteenmile Wild Horse Herd Management Area (Dickie #00604, Badger Gulch #00652, Allen Basin #00669, Pitchfork #00676, Hunt Oil 15-Mile #00682)

FIELD OFFICE: Worland FO

PERMITTEES/LESSEES: LU Sheep Co., YU Land & Cattle, ZE Ranch, Webster Ranch, Hunt Oil Co.

ACTIVITY PLAN: Fifteenmile Wild Horse Herd Management Area Plan

PART 1 - CONFORMANCE REVIEW

STANDARD #1: *Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.*

Resource conditions in the allotment meet the standard? Yes

Rationale: Rangeland health evaluations were conducted at the 5 primary upland key areas in the HMA. Soil/site stability, integrity of the biotic community, and hydrologic function was determined to be stable, intact, and functioning, relative to the site potential, at each key area.

STANDARD #2: *Riparian and wetland vegetation has structural, age, and species diversity characteristic of the stage of channel succession and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for ground water recharge.*

Resource conditions in the allotment meet the standard? N/A

Rationale: The only designated stream segments in the HMA are Fifteenmile Creek, and several major tributaries. These are desert ephemeral drainages which run water in direct response to storm events. Extensive riparian function studies have been conducted on Fifteenmile Creek and it's major tributaries. It has been determined that the entire system is incapable of dissipating the energy from the intense flow events that it receives. A detailed analysis of the Fifteenmile Creek Watershed can be found in the North Gooseberry #00508 Allotment Management Plan-Environmental Assessment, EA No. WY-018-EA6-184, located in the North Gooseberry Allotment #00508 AMP file. Current management of the HMA does not appear to be contributing to a decline in riparian function.

STANDARD #3: *Upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.*

Resource conditions in the allotment meet the standard? Yes

Rationale: Vegetative trend data has been collected at the 5 primary upland key areas in the HMA using the Wyoming Permanent 10-Plot Trend Transect method since 1983. The data indicates that range condition

currently varies from 46% to 73% of potential, with a static to upward trend at each key area. Total ground cover ranges from 53% to 90%.

STANDARD #4: *Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.*

Resource conditions in the allotment meet the standard? Yes

Rationale: The HMA provides crucial winter and winter/year-long habitat for mule deer and antelope. The area also provides winter, breeding and brood rearing habitat for sagegrouse. Numerous other raptors, small mammals, passerines, and predators inhabit the area as well. Due to recent light to moderate use levels by wild horses only, in general, the condition of the vegetative communities within the HMA are as good as can be expected given the potential of the area. Plant communities offer both vegetative and structural diversity as well as adequate vigor, residue and litter important to soil stability and water retention.

STANDARD #5: *Water quality meets State standards.*

Resource conditions in the allotment meet the standard? Unknown

Rationale: There are no available data at this time to indicate that this standard is not being met. The HMA drains to Fifteenmile Creek via ephemeral channels. Fifteenmile Creek is a WYDEQ Class 3B water. Class 3 waters are waters, other than those designated as Class 1, that are intermittent, ephemeral or isolated waters and because of natural habitat conditions, do not support nor have the potential to support fish populations or spawning. Uses designated on Class 3 waters include aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value. Class 3B waters are tributary waters including adjacent wetlands that are not known to support fish populations or drinking water supplies and where those uses are not attainable. Class 3B waters are intermittent and ephemeral streams with sufficient hydrology to normally support and sustain communities of aquatic life including invertebrates, amphibians, or other flora and fauna which inhabit waters of the state at some stage of their life cycles. In general, 3B waters are characterized by infrequent linear wetland occurrences or impoundments within or adjacent to the stream channel over its entire length. Fifteenmile Creek is not listed on DEQ’s 2000 303(d) list of water quality impaired water bodies. It does not appear that current management in the HMA is contributing to a decline in water quality beyond what is naturally occurring.

STANDARD #6: *Air quality meets State standards.*

Resource conditions in the allotment meet the standard? Yes

Rationale: According to the Wyoming Department of Environmental Quality, there are no non-attainment areas in the Big Horn Basin.

PART 2 - FACTORS RELATED TO NON-CONFORMANCE WITH STANDARDS:
The entire Fifteenmile Creek riparian system is in a non-functional state. This is largely due to historic management of the area, and the natural features of the area. It is believed that improving the upland vegetation is the best management tool available to facilitate improvement in the overall

watershed. The current management of the Fifteenmile HMA is helping to achieve this goal.

PART 3 - SELECTED GUIDELINES TO IMPLEMENT CHANGE IN GRAZING MANAGEMENT:
No change in grazing management is needed.

PART 4 - IDENTIFICATION OF SPECIFIC ACTIONS INCLUDING PERMIT/LEASE TERMS AND CONDITIONS:
Continue existing management under the Fifteenmile Wild Horse Herd Management Area Plan.

APPENDIX B

STANDARD BLM OPERATING PROCEDURES
For
WILD HORSE REMOVAL

A. Methods for Humane Capture Of Wild Horses or Burros

Helicopter Removals with or without a Contract

The Helicopter Drive Trapping method employed for this capture operation would require that horses be herded to a trap constructed of portable panels. Gathering would be conducted by using agency personnel or contractors experienced in the humane capture and handling of wild horses. The same rules apply whether a contractor or BLM personnel are used. The following stipulations and procedures would be followed during the contract period to ensure the welfare, safety and humane treatment of the wild horses in accordance with the provisions of 43 CFR 4700.

Additional personnel may be requested through the Wild Horse National Program Office (NPO) in Reno, Nevada to assist with field operations and on-the-ground technical assistance. Personnel to be provided would have extensive experience as project CORs, overseeing helicopter gather operations within the BLM Wild Horse and Burro Program.

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

a. Helicopter Drive Trapping

This capture method would involve driving horses into a pre-constructed trap using a helicopter. The trap is constructed of portable steel panels consisting of round pipe. Wings are constructed off the ends of the panel trap to aid in funneling horses into the trap. The wings are constructed of natural jute, (or similar netting which will not injure a horse), which is hung on either trees or long steel posts. This sort of wing forms a very effective visual barrier to the horses that they typically will not run through. When the trap is ready for use, a helicopter would start moving one band of horses at a time toward the trap and into the wings.

In rough terrain, it may be necessary to use wranglers in support of the helicopter to move the horses. The helicopter would act more as a spotter for the ground crew in this situation.

The distance that animals must travel shall not exceed limitations set by the COR, who will consider terrain, physical barriers, weather, condition of the animals, as well as other factors. It is understood that the proposed action may cause some stress to the animals, however, the health and well-being of the gathered and captured horses is paramount during this scheduled operation. The responsibilities for overseeing this operation lie with the designated COR and PI, as well as the Field Office Manager.

Several methods may be used to monitor the removal operations, including air to ground communications, observers on horseback or in vehicles, and/or placing stationary observers in strategic locations. Among other aspects, capture operations shall be monitored to ensure foals are not orphaned and left on the range. It would be standard practice to check for wet mares without foals or foals coming into the trap without a mare.

At least one saddle horse should be immediately available at the trap site to perform roping if necessary. Roping may be done as determined by the Contracting Officer's Representative (COR) or Project Inspector (PI). Under no circumstances, unless an absolute emergency, shall animals be tied down.

The contractor/BLM shall attempt to keep bands intact except where animal health and safety become considerations, which would prevent such procedures. The contractor/BLM shall ensure that foals are not left behind.

Domestic saddle horses may also be used to assist the helicopter pilot (on the ground) during the gather operation, by having the domestic horse act as a pilot (or "Judas") horse on the ground, leading the wild horses into the trap site. Individual ground hazers and individuals on horseback may be used to assist in the gather.

b. Helicopter Assisted Roping

Some capture attempts may be accomplished by utilizing a helicopter to drive animals to ropers. This would only happen if helicopter drive-trapping methods are proving unsuccessful and only under the express permission of the Field Manager.

Only under circumstances of extreme emergency, involving issues of horse safety and as determined by the COR/PI, shall horses be tied down.

Animals to remain on the range would be identified during the roping process and released immediately unless additional information is necessary on the individual. Only animals designated for removal from the range would be transported to the Herd Area sorting/holding facility.

Roping shall be performed in such a manner that bands will remain together. Foals shall not be left behind.

2. Other Non-Helicopter Capture Methods

a. Water Trapping

Although unlikely, water trapping may be used as an additional or alternative method of capture. This would only happen if helicopter drive-trapping methods are proving unsuccessful and only under the express permission of the Field Manager. This method would involve setting up a trap around a well-used water source and employing a self-closing gate with a triggering device or finger gates. Finger gates can be used only with the prior approval and under the supervision of the COR/PI. It may be necessary to exclude access to other neighboring water sources to encourage use by the target population at the trap site. Water traps equipped with trip wires would be checked at least every 8 hours for trapped animals.

Animals to remain on the range would be identified at the trap site and released immediately unless additional information is necessary on the individual. Only animals designated for removal from the range would be transported to the Herd Area sorting/holding facility.

Animals shall be transported to Herd Area sorting/holding facility from temporary traps within a maximum of 8 hours after capture unless prior approval is granted by the COR/PI for unusual circumstances.

All exclosures constructed for the purpose of the gather would be flagged and highly visible to the horses, wildlife, and the public. The wires, twine, and flagging would be promptly removed following completion of the trapping.

All water traps and exclosures would be constructed (whenever possible) to accommodate wildlife access points. These points would be where wildlife could get to water by going underneath the panels, such as along trails, washes or low spots.

Placement of portable corral panels would be permitted during foaling season to allow wild horses to become accustomed to them.

b. Bait Trapping

Although unlikely, bait trapping using hay or other enticements may be used as an additional or alternative method of capture. This would only happen if helicopter drive-trapping methods are proving unsuccessful and only under the express permission of the Field Manager. This method would involve setting up a panel trap in an area accessible to the horses and feeding of enticements in the trap over a period of time to habituate the target animal to the bait. Once virtually all horses in an area were coming in to the bait, they would be trapped. Animals to remain on the range would be identified at the trap site

and released immediately unless additional information is necessary on the individual. Only animals designated for removal from the range would be transported to the Herd Area sorting/holding facility. The principal limitation of this method is that forage must be limited or the bait must be more desirable than the surrounding forage.

3. Stipulations for Capture Efforts and Traps/Holding Facilities

All capture attempts shall be accomplished utilizing either helicopter-drive trapping, helicopter-roping, or bait trapping techniques and shall incorporate the following:

The Herd Area holding/sorting facility would act as the final destination for this gather effort. This holding/sorting facility is constructed of steel portable panels and would be covered with burlap (jute) and/or snow fence to enhance the visual barrier to horses. At this facility, there would be a separate holding facility for domestic horses, if needed, to alleviate the need for communal housing of wild and domestic horses.

The helicopter shall be used in such a manner that family bands would remain together. Foals shall not be left behind. The rate of movement and distance the animals travel shall not exceed limitations set by the COR/PI who will consider terrain, physical barriers, weather, condition of the animals and other factors. Given the ruggedness of the terrain in the Fifteenmile HMA, it is recommended that the horses be given every opportunity to choose both rate and path of movement, in response to helicopter pressure.

Capture traps would be constructed in a fashion to minimize the potential for injury to wild horses or burros and BLM personnel. Gates would be wired open at all unmanned trap sites, and would be left closed only when needed to hold horses inside. Trapped horses would not be held inside the traps for a period exceeding 8 hours, unless provided with feed (weed free hay) and water.

Animals to be released back into the HMA following gather operations must be so released as soon as feasible without interference to on-going gather efforts. In rare situations, animals may be held up to a maximum of 21 days or as directed by the COR/PI. Animals shall not be held in temporary traps and/or satellite holding facilities on days when there is no work being conducted except as specified by the COR/PI.

The Wyoming Game and Fish Department would be notified as soon as possible if any wildlife became injured during capture operations. Wildlife caught inside traps would be released immediately.

4. Contract Helicopter, Pilot and Communications

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.

When refueling, the helicopter shall remain a distance of at least 1,000 feet or more from animals, vehicles (other than fuel truck), and personnel not involved in refueling.

The COR/PI shall have the means to communicate with the contractor's pilot at all times. If communications cannot be established, the Government will take steps as necessary to protect the welfare of the animals. The frequencies used for this contract will be assigned by the COR/PI when the radio is used. The contractor shall obtain the necessary FCC licenses for the radio system.

The proper operation, service, and maintenance of all contractor furnished helicopters are the responsibility of the contractor. The BLM reserves the right to remove from service pilots and helicopters that, in the opinion of the Contracting Officer or COR/PI, violate contract and FAA rules, are unsafe or otherwise unsatisfactory. In this event, the contractor will be notified in writing to furnish replacement pilots or helicopters within 48 hours of notification. The Contracting Officer or his/her representative must approve all such replacements in advance of operation.

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

An Aircraft Safety Plan and flight hazard analysis will be appropriately approved and filed and copies distributed to the necessary individuals prior to commencing the removal operation. Daily flight plans will also be filed. If a BLM contract helicopter is used, all BLM, Aircraft Safety and Operations standards will be adhered to.

There will be daily briefings with the helicopter pilot, Authorized Officer and all personnel involved in the day's operation. The purpose of this meeting is to discuss in detail all information gathered during the familiarization flight such as hazards, location of horses, potential problems, etc. Discuss any safety hazards anticipated for the coming day's operation or any safety problems observed by the Authorized Officer or anyone else, outline the plan of action, delineate course of actions, specifically position the hazers and their responsibilities, logistics, and timing. After each flight, removal personnel will discuss any problems and suggest solutions. This may be accomplished over the radio or on the ground as the need dictates.

A flight operations plan will be filed with the Cody Interagency Dispatch Center. This plan will describe the area to be flown and the expected time frames of flight operations. A weather forecast will be acquired from the dispatcher. There will be no flights on days of high or gusty, erratic winds or days with poor visibility.

Two-way radio communication between the helicopter and the ground crew will be maintained at all times during the operation.

An operation or contractor's log will be maintained for all phases of the operation. The log will be as detailed as possible and will include names, dates, places and other pertinent information, as well as, observations of personnel involved.

5. Animal Handling and Care

Prior to any gathering operations, the COR/PI will provide for a pre-capture evaluation of existing conditions in the gather areas. The evaluation will include animal condition, prevailing temperatures, drought conditions, soil conditions, road conditions, and a topographic map with 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 capture efforts necessitate the services of a veterinarian, one would be obtained before capture would proceed.

The contractor will be apprised of the all conditions and will be given instructions regarding the capture and handling of animals to ensure their health and welfare is protected.

The Authorized Officer and pilot may take a familiarization flight identifying all natural hazards (rims, canyons, winds) and man-made hazards in the area so that helicopter flight crew, ground personnel, and wild horse safety will be maximized. Aerial hazards will be recorded on the project map.

No fence modifications will be made without authorization from the Authorized Officer. The contractor/BLM shall be responsible for restoration of any fence modification that has been made.

Wings shall not be constructed out of materials injurious to animals and must be approved by the Authorized Officer.

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

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

Branded or privately owned animals captured during gather operations will be handled in accordance with state estray laws and existing BLM policy. Collection of gather fees and any appropriate trespass charges will be done at the time of change of possession. If animals are not redeemed by payment of trespass and capture fees by their owners, they will be sold at public auction.

Capture methods will be identified prior to issuance of delivery orders. Regardless of which

methods are selected, all capture activities shall incorporate the following:

a. Trap Site Selection

The Authorized Officer will make a careful determination of a boundary line to serve as an outer limit within which horses will be herded to a selected trap site. The Authorized Officer will insure that the pilot is fully aware of all natural and man made barriers which might restrict free movement of horses. Topography, distance, and current condition of the horses are factors that will be considered to set limits to minimize stress on horses.

Gather operations will be monitored and restricted (if necessary) to assure the body condition of the horses is compatible with the distances and the terrain over which they must travel. Pregnant mares, mares with small colts, and other horses would be allowed to drop out of bands which are being gathered if necessary to protect the safety and health of the animals.

All additional, trap and holding facility 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 BLM land must have prior written approval of the agency and/or landowner.

Each general trap site will be selected by the COR/PI after determining the habits of the animals and observing the topography of the area. The Contractor, with the BLM's approval, within this general pre-selected area, may recommend site-specific locations. Trap sites will be located to cause as little damage to the natural resources of the area as possible. Sites will be located on or near existing roads, and will receive cultural, and/or threatened/endangered plant and animal clearances prior to construction.

Trap sites will be located to cause as little injury and stress to the animals as possible. Additional trap sites may be required, as determined by the Authorized Officer, to relieve stress to the animals caused by specific conditions at the time of the gather (i.e. dust, rocky terrain, temperatures, etc.).

b. Trap/Facility Requirements

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:

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 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.

Temporary wings shall not be constructed out of barbed wire or other materials injurious to animals and must be approved by the COR/PI. Wings may be constructed along existing fence lines, at the discretion of the COR/PI, only if the barbed wire or other wire fencing material is removed from the fence posts and laid on the ground for the length of the wing, or if portable panels are placed along the inside of the fence to protect the animals from injury from fence wire. In this case, the panels must then be covered with either jute or plastic snow fence to facilitate viewing and further reduce possible horse injury.

All loading chute sides shall be fully covered with plywood (without holes) or like material. The loading chute shall also be a minimum of 6 feet high.

All runways shall be of sufficient length and height to ensure animal and wrangler safety. Runways may be covered with plywood, burlap, plastic snow fence or like material a minimum of 1 foot to 6 feet above ground level for horses.

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

If a government furnished portable chute is used to restrain, age, or to provide additional care for animals, it shall be placed in the runway in a manner as instructed by or in concurrence with the Authorized Officer.

All crowding pens including the gates leading to the runways may, if necessary to prevent injuries from escape attempts, be covered with a material which prevents the animals from seeing out (plywood, burlap, snow fence etc.) and should be covered a minimum of 2 feet to 6 feet above ground level for horses.

When holding facilities are used, and alternate pens are necessary to separate mares with small foals, animals which will be released, sick and injured animals, and estrays from the other animals or to facilitate sorting as to age, number, size, temperament, sex, and condition. Animals shall be gathered and sorted preferably by family band or, if this is not possible, by age number, size, temperament, sex, and condition. This is to minimize, to the extent possible, intrusive activity and injury due to fighting and trampling when in the holding facility.

In some cases, the Government will require that animals be restrained for determining an animal's age or for other purposes. In these instances, the Government will provide a portable restraining chute. Either segregation or temporary marking and later segregation will be at the discretion of the COR.

The Contractor may be required to assist BLM personnel in the special handling of some animals before their release or transport. Such special handling may include, but is not limited to, de-worming, inoculations, blood-draws, and freeze branding.

If animals are held in the traps and/or holding facilities, a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day would be supplied. Animals held for 8 hours or more in the traps or holding facilities shall be provided good quality hay (preferable grass/alfalfa mix) at the rate of not less than two pounds of hay per 100 pounds of estimated body weight per day. This hay must be certified as weed-free. Due to unnecessarily high protein content, straight alfalfa hay is not acceptable.

Separate water troughs shall be provided at each pen where animals are being held. Water troughs shall be constructed of such material as to avoid injury to animals.

When dust conditions occur within or adjacent to the trap or holding facility, the contractor/BLM shall be required to wet down the ground with water to alleviate the problem. When excessively muddy conditions occur within or adjacent to the trap or holding facility, the contractor shall be required to scatter wood shavings or straw to improve footing for reasons of safety. Operations will not take place when conditions are so wet that excessive and irreparable resource damage will occur.

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

The contractor/BLM shall restrain sick or injured animals if treatment is necessary. An APHIS or contract veterinarian may be called to make a diagnosis and final determination. Euthanasia shall be done by the most humane method available. Authority for humane destruction of wild horses (or burros) is provided by the Wild Free-Roaming Horse and Burro Act of 1971, Section 3(b)(2)(A), 43 CFR 4730.1, BLM Manual 4730 - Destruction of Wild Horses and Burros and Disposal of Remains, and is in accordance with BLM policy as expressed in appropriate Instructional Memorandum.

Any captured horses that are found to have the following conditions may be humanely destroyed:

a. The animal shows a hopeless prognosis for life;
b. Suffers from a chronic or incurable disease or serious congenital defect;
c. Requires continuous treatment for relief of acute pain and suffering;
d. Incapable of maintaining a body condition rating above two, in a normal rangeland environment;
e. The animal is a danger to itself or others.

The Authorized Officer will determine if injured animals must be euthanized and provide for the euthanasia of such animals. The contractor/BLM may be required to dispose of the carcasses as directed by the Authorized Officer. State sanitation laws provide for the disposition of animal carcasses at the local landfill, but it is ecologically more appropriate for the carcasses to be subjected to natural decomposition on the range.

The carcasses of the animals that die or must be destroyed because of any infectious, contagious, or parasitic disease will be disposed of by burial to a depth of at least 3 feet.

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

7. Motorized Equipment

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 Authorized Officer with a current safety inspection (less than one year old) of all tractor/stock trailers used to transport animals to final destination.

Vehicles 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.

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

All vehicles used to transport animals to the final destination(s) shall be equipped with at least one (1) door at the rear end of the vehicle, which is capable of sliding either horizontally of vertically. The rear door must be capable of opening the full width of the trailer. All panels facing the inside of all trailers must be free of sharp edges or holes that could cause injury to the animals. The material facing the inside of the trailer must be strong enough, so that the animals cannot push their hooves through the sides. Final approval of vehicles to transport animals shall be held by the Authorized Officer.

Floors of vehicles, trailers, and the loading chute shall be covered and maintained with materials sufficient to prevent the animals from slipping.

Animals to be loaded and transported in any vehicle or trailer shall be as directed by the

Authorized Officer and may include limitations on numbers according to age, size, sex, temperament, and animal condition. The minimum square footage per animal is as follows:

11 square feet/adult horse (1.4 linear feet in an 8 foot wide trailer)
6 square feet/horse foal (0.75 linear feet in an 8 foot trailer)

The Authorized Officer shall consider the condition of the animals, weather conditions, type of vehicles, distance to be transported, or other factors when planning for the movement of captured animals. The Authorized Officer shall provide for any brand and/or inspection services required for the captured animals.

Communication lines will be established with personnel involved in off-loading the animals to receive feedback on how the animals arrive (condition/injury etc.). Should problems arise, gathering methods, shipping methods and/or separation of the animals will be changed in an attempt to alleviate the problems.

If the Authorized Officer determines that dust conditions are such that animals could be endangered during transportation, the contractor/BLM will be instructed to adjust speed and/or use alternate routes.

Periodic checks by the Authorized Officer will be made as animals are transported along dirt roads. If speed restrictions are in effect the Authorized Officer will at times follow and/or time trips to ensure compliance.

8. Special Stipulations.

Private landowners or the proper administering agency(s) would be contacted and authorization obtained prior to setting up traps on any lands, which are not administered by BLM. Wherever possible, traps would be constructed in such a manner as to not block vehicular access on existing roads.

If possible, traps would be constructed so that no riparian vegetation is contained within them. Impacts to riparian vegetation and/or running water is located within a trap (and available to horses) would be mitigated by removing horses from the trap immediately upon capture. No vehicles would be operated on riparian vegetation or on saturated soils associated with riparian/wetland areas.

Gathering would be conducted when soils are dry or frozen and conditions are optimal for safety and protection of the horses and wranglers.

The helicopter would avoid eagles and other raptors, and would not be flown repeatedly over any identified active raptors nests. No unnecessary flying would occur over big game on their winter ranges or active fawning/calving grounds during the period of use.

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

9. Herd Health and Viability Data Collection

The following information will be collected form each animal captured: age, sex, color, overall health, pregnancy, or nursing status.

In addition, blood or hair samples may be collected from individuals within the herd. Certain other activities including immunocontraceptive research, and freeze marking may be conducted.

a. Population Management Plan/Selective Addition or Removal

Blood samples may be taken for the purposes of furthering genetic ancestry and diversity studies.

On occasion, it may be necessary to enhance and maintain genetic diversity of the herd. In this situation, a few animals with compatible characteristics may be introduced from other neighboring HMAs. Introduced animals will be taken from areas with similar habitat and climate.

b. Immunocontraceptive Research

When the immunocontraceptive vaccine is used, trained individuals would conduct delivery of the vaccine, using approved delivery methods. The vaccine would be administered to the large muscle on the hip.

10. Public Participation

Prior to conducting a gather, a communications plan or similar document summarizing the procedures to follow when media or interested public request information or viewing opportunities during the gather should be prepared. No public viewing during the gathering activities at the trap sites will be allowed. All Agency personnel or other individuals must have prior approval from the BLM WH&B Specialist before being allowed to photograph, take video footage, etc. at trap sites.

The public must adhere to guidance from the agency representative and viewing must be prearranged.

11. Safety

Safety of BLM employees, contractors, members of the public, and the wild horses will be given primary consideration. The following safety measures will be used by the Authorized Officer and all others involved in the operation as the basis for evaluating safety performance and for safety discussions during the daily briefings:

A briefing between all parties involved in the gather will be conducted each morning.

All BLM personnel, contractors, and volunteers will wear protective clothing suitable for work of this nature. BLM will alert observers of the requirement to dress properly. BLM will assure that members of the public are in safe observation areas.

The handling of hazardous, or potentially hazardous materials, such as liquid nitrogen and vaccination needles will be accomplished in a safe and conscientious manner by BLM personnel and/or the contract veterinarian.

12. Responsibility and Lines of Communication

The Contracting Officer's Representative and Project Inspector from have the direct responsibility to ensure the contractor's compliance with the contract stipulations.

The Worland Field Manager and the Assistant Field Manager will take an active role to ensure the appropriate lines of communication are established between the field, Field Office, State Office and the HMA holding/sorting facility.

All employees involved in the gathering operations will keep the best interests of the animals at the forefront at all times.

13. Glossary

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

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 CORs 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. 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.

Genetically Viable - Fitness of a population as represented by its ability to maintain the long-term reproductive capacity of 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 and 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 uses 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 COR 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.

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 C - Population Modeling

Population Model Overview

WinEquus is a program 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.

The following data was summarized from the information provided within the WinEquus program, 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 wild horse and burro specialists 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.

Descriptions/Definitions of terms used in the Population Model

Population Data: Age-Sex Distribution

An important point about the initial age-sex distribution is that it is NOT necessarily the starting population for each of the trials in a simulation. This is because the program assumes that the initial age-sex distribution

supplied on this form or calculated from a population size that the user enters is not an exact and complete count of the population. For example, if the user enters an initial population size of 100 based on an aerial survey, this is really an estimate of the population, not a census. Furthermore, it is likely to be an underestimate, because some horses will be missed in the survey. Therefore, the program uses an average sighting probability of approximately 90% (Garrott et al. 1991) to "scale-up" the initial population estimate to a starting population size for use in each trial. This is done by a random process, so the starting population sizes are different for all trials. An option does exist to consider the initial population size to be exact and bypass this scaling-up process.

Population Data: Survival Probabilities

A fundamental requirement for a population model such as this is data on annual survival probabilities of each age class. The program contains files of existing sets of survival, or it is possible to enter a new set of data in the table.

In most cases, Wild Horse and Burro Specialists don't have information on survival probabilities for their populations, so the sample data files provided with WinEquus are used and assume that average survival probabilities in the populations are similar. These data are more difficult to get than is often assumed, because they require keeping track of known individuals over time. A "snapshot" of a population, providing information on the age distribution at a single gather, can NOT be used to estimate survival probabilities without assuming a particular growth rate for the population (Jenkins1989). More data from long-term studies of marked horses are needed to develop estimates of survival in various habitats.

Population Data: Foaling Rates

Foaling rates are the proportions of females in each age class that produce a foal at that age. Files are available within the program that contains existing sets of foaling rates, or the user may enter a new set of data in the table. The user may also enter the sex ratio at birth, another necessary parameter for population simulation.

Environmental Stochasticity

For any natural population, mortality and reproduction vary from year to year due to unpredictable variation in weather and other environmental factors. This model mimics such environmental stochasticity by using a random process to increase or decrease survival probabilities and foaling rates from average values for each year of a simulation trial. Each trial uses a different sequence of random values, to give different results for population growth. Looking at the range of final population sizes in many such trials will give the user an indication of the range of possible outcomes of population growth in an uncertain environment.

How variable are annual survival probabilities and foaling rates for wild horses? The longest study reporting such data was done at Pryor Mountain, Montana by Garrott and Taylor (1990). Based on 11 years of data at this site, survival probability of foals and adults combined was greater than 98% in 6 years, between 90 and 98% in 3 years, 87% in 1 year, and only 49% in 1 year of severe winter weather. These values clearly aren't

normally distributed, but can be approximated by a logistic distribution. This pattern of low mortality in most years but markedly higher mortality in occasional years of bad weather was also reported by Berger (1986) for a site in northwestern Nevada. Therefore, environmental stochasticity in this model is simulated by drawing random values from logistic distributions. If desired, different values can be entered to change the scaling factors for environmental stochasticity.

Because year-to-year variation in weather is likely to affect foals and adults similarly, this model makes foal and adult survival perfectly correlated. This means that when survival probability of foals is high, so is survival probability of adults, and vice versa. By contrast, the correlation between survival probabilities and foaling rates can be adjusted to any value between -1 and +1. The default correlation is 0 based on the Pryor Mountain data and the assumption that most mortality occurs in winter and winter weather is not highly correlated with foaling-season weather.

The model includes another form of random variation, called demographic stochasticity. This means that mortality and reproduction are random processes even in a constant environment; i.e., a foaling rate of 40% means that each female has a 40% chance of having a foal. Because of demographic stochasticity, even if scaling factors for both survival probabilities and foaling rates were set equal to 0, different runs of the simulation would produce different results. However, variation in population growth due to demographic stochasticity will be small except at low population sizes.

Gathering Schedule

There are three choices for the gather schedule: gather at a regular interval, gather at a minimum interval (the default), or gather in specific years. Gathering at a minimum interval means that gathers will be conducted no more frequently than a prescribed interval (e.g., 3 years), but will not be conducted if the time interval has passed unless the population is above a threshold size that triggers a gather.

Gather interval

This is the number of years between gathers.

Gather for fertility treatment regardless of population size?

If this option is selected (the default), then gathers occur according to the gathering schedule specified regardless of whether or not the population exceeds a threshold population size. One effect of this is that a minimum-interval schedule really functions as a regular interval.

Continue gather after reduction to treat females?

Continuing a gather after a reduction to treat females (with fertility control management options) means that, if a gather for a removal has been triggered because the population has exceeded a threshold population size, then horses will continue to be processed even after enough have been removed to reduce the population to the target population size. As additional horses are processed, females, to be released back, will be treated

with an immunocontraceptive according to the information specified in the Contraceptive Parameters form.

Threshold for gather

The threshold population size for triggering a gather is the actual population size in a particular year estimated by the program. This is NOT the same as the number of horses counted in an aerial census, but closer to an estimate of population size taking into account the fact that an aerial census typically underestimates population size.

Target population size

This is the goal for the population size following a gather and removal. Horses will be removed until this target is reached, although it may not be possible to achieve this goal, depending on the removal parameters (percentages of each age-sex class to be removed) and gathering efficiency.

Are foals included in AML?

In most districts, foals are counted as part of the appropriate management level (AML).

Gathering efficiency

Typically, some horses will successfully resist being gathered, either by hiding in habitats where they can't be seen or moved by a helicopter, or following escape routes that make it dangerous or uneconomical for them to be herded from the air. These horses aren't available for removals or fertility treatment. The default gathering efficiency is 80%, meaning that the program assumes that 20% of the population will successfully resist being gathered. This value may be changed.

Note that the program assumes that horses of all age-sex classes are equally likely to be able to be gathered. This is an unrealistic assumption because bachelor males, for example, may be more likely to successfully avoid being gathered than females or foals or band stallions.

Sanctuary-bound horses

Age-selective removals typically target younger age classes such as 0 to 5-year-olds or 0 to 9-year-olds because these horses are more easily adopted. However, it may not be possible to reduce the population to a target size by restricting removals to these younger age classes, especially if age-selective removals have been conducted in the past. In this case, an option is available to remove older animals as well, who may be destined for permanent residence in a long term holding facility rather than for adoption. The minimum age of these long term holding facility horses is specified for this element. When older age classes as well as younger age classes are identified for removal on the Removal Parameters form, horses of these older age classes are selected along with younger age class horses as the population is reduced to the target value. If a

minimum age for long term holding facility horses is specified, then older animals are only removed if the population can't be reduced to the target population size by removing the younger ones.

Percent Effectiveness of fertility control

These percentages represent the percentage of treated females that are in fact sterile for one year, two years, etc. (i.e., the efficacy or effectiveness of fertility treatment). The default values are 90% efficacy for one year. However, the user may specify the effectiveness year by year, for up to five years.

Removal Parameters

This allows the user to determine the percentages of horses in each sex and age class to be removed during a gather. The program uses these percentages to determine the probabilities of removing each horse that is processed during a gather. If the percentage for an age-sex class is 100%, then all horses of that age-sex class that are processed will be removed until the target population size is reached. If the percentage for an age-sex class is 0%, then all horses of that age-sex class will be released. If the percentage for an age-sex class is greater than 0% but less than 100%, then the proportion of horses of that age-sex class removed will be approximately equal to the specified percentage.

Contraception Parameters

This allows the user to specify the percentage of released females of each age class that will be treated with an immunocontraceptive. The default values are 100% of each age class, but any or all of these may be changed.

Most Typical Trial

This is the trial that is most similar to each of the other trials in a simulation

Population Size Table

The default is both sexes and all age classes, but summary results may also be chosen for a subset of the population. The table identifies some key numbers such as the lowest minimum in all trials, the median minimum, and the highest minimum. Thinking about the distribution of minima for example, half of the trials have a minimum less than the median of the minima and half have a minimum greater than the median of the minima. If the user was concerned about applying a management strategy that kept the population above some level, because the population might be at risk of losing genetic diversity if it were below this level, then one might look at the 10th percentile of the minima, and argue that there was only a 10% probability that the population would fall below this size in x years, given the assumptions about population data, environmental stochasticity, and management that were used in the simulation.

Gather Table

The default is both sexes and all age classes, but summary results may be for a subset of the population. The table shows key values from the distribution of the minimum total number of horses gathered, removed, and (if one elected to display data for both sexes or just for females) treated with a contraceptive across all trials. This output is probably the most important representation of the results of the program in terms of assessing the effects of your management strategy because it shows not only expected average results but also extreme results that might be possible. For example, only 10% of the trials would have entailed gathering fewer animals than shown in the row of the table labeled "10th percentile", while 10% of the trials would have entailed gathering more than shown in the row labeled "90th percentile". In other words, 80% of the time one could expect to gather a number of horses between these 2 values, given the assumptions about survival probabilities, foaling rates, initial age-sex distribution, and management options made for a particular simulation

Growth Rate

This table shows the distribution of the average population growth rate. The direct effects of removals are not counted in computing average annual growth rates, although a selective removal may change the average foaling rate or survival rate of individuals in the population (e.g., because the age structure of the population includes a higher percentage of older animals), which may indirectly affect the population growth rate. Fertility control clearly should be reflected in a reduction of population growth rate.

Population Modeling – Fifteenmile HMA

To complete the population modeling for the Fifteenmile HMA, version 1.40 of the WinEquus program 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 current herd was developed from age structure data collected during the 2000 Fifteenmile HMA wild horse gather. Following the 2000 gather, approximately 64 horses remained in the HMA that were not captured. A total of 72 captured horses were released back into the HMA. The age and sex of the released horses was known. The age and sex of the horses not captured was estimated based on the population structure of all horses captured during the removal effort.

The wild horse population model was used to scale the population upward to 186 horses, which is the number of horses observed during the latest inventory in the winter of 2003. The following table displays the estimated age structure for the Fifteenmile wild horse herd in 2003:

Fifteenmile Age Structure

Age Class	Estimated 2003		
	Female	Male	Total
Foals	18	17	35
1	7	6	13
2	14	10	24
3	5	12	17
4	11	10	21
5	5	1	6
6	4	2	6
7	3	7	10
8	6	5	11
9	4	7	11
10-14	7	17	24
15-19	1	6	7
20+	0	1	1
Total	85	101	186

The estimated 2003 population was used in the population modeling simulations. All simulations used the survival probabilities, foaling rates, and sex ratio at birth supplied with the WinEquus population model for the Garfield Range HMA (granites_berger.sin & granites_berger.fin). This data was extracted from, "Wild Horses of the Great Basin", by J. Berger (1986, University of Chicago Press, Chicago, IL, xxi + 326 pp.). It is based on Joel Berger's 6 year study in the Granite Range HMA in northwestern Nevada.

Survival probabilities and foaling rates utilized in the population model for three alternatives analyzed, including the Proposed Action and No Action Alternatives, and are displayed in the following table:

Survival Probabilities and Foaling Rates

Age Class	Survival Probabilities		Foaling Rates
	Females	Males	
Foals	.917	.917	0
1	.969	.969	0
2	.951	.951	.35
3	.951	.951	.40
4	.951	.951	.65
5	.951	.951	.75
6	.951	.951	.85
7	.951	.951	.90
8	.951	.951	.90
9	.951	.951	.90
10-14	.951	.951	.85
15-19	.951	.951	.70
20+	.951	.951	.70

The following is the sex ratio at birth utilized in the population modeling for Alternatives 1-3:

Sex ratio at Birth:

57% Males
43% Females

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

Removal Criteria
(Alternatives 1 and 2)

Age	Percentages for Removals	
	Females	Males
Foal	90%	90%
1	90%	90%
2	90%	90%
3	90%	90%
4	90%	90%
5	10%	10%
6	10%	10%
7	10%	10%
8	10%	10%
9	10%	10%
10-14	90%	90%
15-19	90%	90%
20+	90%	90%

To date, one herd area has been studied using the 2-year PZP vaccine. The Clan Alpine study, in Nevada, was started in January 2000 with the treatment of 96 mares. The test resulted in fertility rates in treated mares of 6% year one, 18% year two and 32% year three. This data must be compared to normal fertility rates in untreated mares of 50/60% in most populations. The Clan Alpine fertility rate in untreated mares collected in September of each year by direct observation averaged 51% over the course of the study.

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

Year 1: 94%

Year 2: 82%

Year 3: 68%

The following table displays the contraception parameters utilized in the population model for Alternative 2:

Contraception Criteria
(Alternative 2)

Age	Percentages for Fertility Treatment
Foal	100%
1	100%
2	100%
3	100%
4	100%
5	75%
6	75%
7	75%
8	75%
9	75%
10-14	100%
15-19	100%
20+	100%

Population Modeling Criteria

The following summarizes the population modeling criteria that are common to the Alternatives:

- Starting Year: 2003
- Initial gather year: 2004
- Gather interval: minimum interval of three years
- Gather for fertility treatment regardless of population size: No
- Continue to gather after reduction to treat females: Yes
- Sex ratio at birth: 43% female, 57% male
- Percent of the population that can be gathered: 90%
- Minimum age for long term holding facility horses: 10 years old
- Foals are NOT included in the AML
- Simulations were run for ten years with 50 trials each

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

Population Modeling Parameters

Modeling Parameter	Alternative 1 – Proposed Action Remove to 70 Mature Horses	Alternative 2 - Remove to 70 Mature Horses with Fertility Control	Alternative 3 - No Action No Removal & No Fertility Control
Management by removal only	Yes	No	N/A
Management by removal with fertility control	No	Yes	N/A
Threshold population size for gathers	160	160	N/A
Target population size following gathers	70	70	N/A
Foals included in AML	No	No	N/A
Gather for fertility control regardless of population size	No	No	N/A
Gathers continue after removals to treat additional females	No	Yes	N/A
Effectiveness of Fertility Control: year 1	N/A	92%	N/A
Effectiveness of Fertility Control: year 2	N/A	84%	N/A
Effectiveness of Fertility Control: year 3	N/A	68%	N/A

Population Modeling Results - Fifteenmile HMA

Population Modeling Results

Population size in ten years

Out of 50 trials in each simulation, the model tabulated minimum, average, and maximum population sizes. The model was run from 2004 to 2013 to determine what the potential effects would be on population size for the Proposed Action and Alternatives. These numbers are useful to make relative comparisons of the different alternatives, and potential outcomes under different management options. The data displayed within the tables is broken down into different levels. The lowest trial, highest trial, and several in between are displayed for each simulation completed. According to the creator of the modeling program, this output is probably the most important representation of the results of the program in terms of assessing the effects of proposed management, because it shows not only expected average results but also extreme results that might be possible.

Population Sizes in 11 years - Minimum

Alternative	Proposed Action	2	3
Lowest Trial	70	54	187
10th Percentile	79	85	190
25th Percentile	84	89	195
Median Trial	**94**	**94**	**204**
75th Percentile	100	101	218
90th Percentile	106	106	230
Highest Trial	114	136	248

This table shows that in eleven years and 50 trials for each alternative, the lowest number of 0-20+ year old horses ever obtained was 54 under Alternative 2. Half of the trials were greater than the median and half were less than the median. Additional interpretation may be made by comparing the various percentile points. For example, for the Proposed Action (selective removal to 70 mature horses), only 10% of the trials resulted in fewer than 79 wild horses as the minimum population, and 10% of the trials resulted in a minimum population larger than 106 wild horses. In other words, 80% of the time, one could expect a minimum population between these two values for the Proposed Action, given the assumptions about survival probabilities, foaling rates, initial age-sex distribution, and management options made for this simulation.

The Proposed Action (selective removal to 70 mature horses) and Alternative 2 (selective removal to 70 mature horses with fertility control) reflect the lowest minimum population size of all the alternatives. Alternative 3 (No Action) reflects the highest minimum population level of all of the trials.

None of the results obtained for any of the alternatives indicate that a crash of the population is likely to occur if the alternative were implemented. The level to which the population is gathered appears to be more of an influence to the population size than fertility control. The lowest population size ever obtained (54 head) is less than the lower level of the current management range of 70 mature wild horses. However, for 90% of the time the simulation indicates that the population would be 85 head or more, which is slightly higher than the lower level of the management range. However, the simulation results for Alternative 2

indicate that the lowest minimum population falls very near the level that genetic testing has indicated that genetic viability in the herd could be lost (< 50 animals).

Population Sizes in 11 years - Average

Alternative	Proposed Action	2	3
Lowest Trial	122	142	338
10th Percentile	142	144	374
25th Percentile	149	147	400
Median Trial	**155**	**154**	**444**
75th Percentile	161	159	516
90th Percentile	169	168	559
Highest Trial	186	181	645

This table displays the average population sizes obtained for the 50 trials ran for each alternative. The average population size across eleven years ranged from a low of 154 wild horses under Alternative 2, to a high of 444 wild horses under Alternative 3. The average population sizes indicated for the Proposed Action and Alternative 2 are nearly identical. This tends to indicate that when the population is gathered to the same number of horses, fertility control would have very little affect on the average population size.

Population Sizes in 11 years - Maximum

Alternative	Proposed Action	2	3
Lowest Trial	205	198	490
10th Percentile	221	220	621
25th Percentile	229	231	679
Median Trial	**242**	**244**	**788**
75th Percentile	254	255	1007
90th Percentile	270	286	1108
Highest Trial	324	350	1393

This table displays the largest populations that could be expected out of 50 trials for each alternative. The figures for the Lowest Trial represent what the population is likely to be in 2014. All figures are very similar under the Proposed Action and Alternative 2 because the same starting population, gather efficiency, etc., is assumed. The numbers vary due to randomness and assumptions inherent to the modeling program.

Average Growth Rates in ten years

Average growth rates were obtained by running the model for 50 trials from 2004 to 2014 for the Proposed Action and each alternative. The following table displays the results obtained from the model:

Average Growth Rate in 10 Years

Alternative	Proposed Action	2	3
Lowest Trial	7.2%	7.2%	9.0%
10th Percentile	12.2%	10.1%	11.5%
25th Percentile	14.3%	12.0%	12.8%
Median Trial	**16.7%**	**13.8%**	**14.1%**
75th Percentile	18.4%	15.7%	17.2%
90th Percentile	20.3%	16.7%	18.3%
Highest Trial	23.5%	21.8%	20.5%

As expected, Alternative 2, which implements fertility control, reflects the lowest overall median growth rate. For the median trial, Alternative 2 indicates a growth rate that is 2.9% lower than the Proposed Action and only 0.3% lower than the No Action Alternative. The lowest trial growth rates do not appear to be a direct result of the management options, but appear to reflect the random nature of the model and the ability to show extremes in possible outcomes. The range of growth rates is a reasonable representation of what could be expected to occur in a wild horse population.

Totals in eleven years – Gathered, Removed and Treated

The same type of tabular data was obtained from the population model (50 trials) for the numbers of wild horses gathered, removed, and treated under each alternative, over a ten year period. Under each alternative involving removals of wild horses (Alternatives 1 and 2), the population model indicates that two gathers would be necessary over the next ten year period, beginning with the proposed gather in 2004. For the Proposed Action, a second gather would be required in 2009, while under Alternative 2 a second gather would not be required until 2010 or 2011. This is due to the fact that Alternative 2, which implements fertility control, indicates a slightly lower growth rate than the Proposed Action. Under Alternative 3, no wild horses would be gathered or removed from the HMA.

Totals in 11 Years -- Gathered

Alternative	Proposed Action	2	3
Lowest Trial	175	157	0
10th Percentile	322	302	0
25th Percentile	336	358	0
Median Trial	**349**	**372**	**0**
75th Percentile	372	383	0
90th Percentile	434	415	0
Highest Trial	572	458	0

Totals in 11 Years -- Removed

Alternative	Proposed Action	2	3
Lowest Trial	110	100	0
10th Percentile	207	190	0
25th Percentile	217	221	0
Median Trial	**234**	**236**	**0**
75th Percentile	253	249	0
90th Percentile	294	272	0
Highest Trial	388	283	0

Totals in 11 Years – Treated

Alternative	Proposed Action	2	3
Lowest Trial	0	23	0
10th Percentile	0	35	0
25th Percentile	0	39	0
Median Trial	**0**	**43**	**0**
75th Percentile	0	46	0
90th Percentile	0	49	0
Highest Trial	0	59	0

The number of horses gathered does not differ greatly between the Proposed Action and Alternative 2, because gather criteria is the same for all alternatives. The number of horses removed over the ten year period also does not differ greatly between these alternatives. Again, under Alternative 3, no wild horses would be gathered, removed, or treated.

Population Modeling Summary – Fifteenmile HMA

Population Modeling Summary

To summarize the results obtained by simulating the range of alternatives for the proposed Fifteenmile HMA wild horse gather, the original questions can be addressed.

- Do any of the Alternatives "crash" the population?

None of the alternatives indicate that a "crash" is likely to occur to the population. Minimum population levels and growth rates are all within reasonable levels, and adverse impacts to the population are not likely. The only potential concern is the lowest minimum population size indicated under Alternative 2. A minimum population size of 54 horses would fall very near the level that genetic testing has indicated that genetic viability in the herd could be lost (< 50 animals).

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

Alternative 2 also reflects the lowest overall median growth rate, although by a small margin. For the median trial, Alternative 2 indicates a growth rate that is 2.9% lower than the Proposed Action. The target size to which the population is gathered to (70 mature horses) appears to have minimal impacts to growth rates, as demonstrated by the growth rates being quite similar for Alternative 3.

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

The level to which the population is gathered appears to be more of an influence to average population size than fertility control. Both the Proposed Action and Alternative 2, which gather to 70 mature horses, indicate the lowest average population size. The use of fertility control in Alternative 2 did not result in a significantly lower average population size than the Proposed Action, which did not utilize fertility control. As expected, the No Action Alternative results in the highest minimum population.

- What effects do the different alternatives have on the genetic health of the herd?

The minimum population levels and growth rates are all within reasonable levels for the Proposed Action, therefore adverse impacts to the population are not likely under this alternative. Under Alternative 2, the minimum population level falls very close to the level at which Dr. Cothran indicated that genetic diversity could be lost. The drop in population numbers could have a detrimental/adverse impact to the genetic viability of the herd under Alternative 2.