

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
BILLINGS FIELD OFFICE

**ENVIRONMENTAL ASSESSMENT AND GATHER PLAN**

**PRYOR MOUNTAIN WILD HORSE RANGE**

**FY2001 WILD HORSE POPULATION GATHER & SELECTIVE REMOVAL**

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## **I. INTRODUCTION**

With passage of the Wild Horse and Burro Act of 1971, Congress found that: “Wild horses are living symbols of the pioneer spirit of the West”. In addition, the Secretary of the Interior was ordered to “manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands”. From the passage of the Act through present day the Bureau of Land Management (BLM), Billings Field Office (BiFO), has endeavored to meet the requirements of the Act. The procedures and policies implemented to accomplish this mandate have been constantly evolving over the years.

Throughout this period, BLM experience has grown, and the knowledge of the effects of current and past management on wild horses and burros has increased. At the same time, nationwide awareness and attention has grown. As these factors have come together, the emphasis of the wild horse and burro program has shifted. Program goals have expanded beyond simply establishing “thriving natural ecological balance” (setting appropriate management levels) for individual herds, to include achieving and maintaining genetically-viable and self-sustaining populations.

This document has been prepared to outline current information defining the Pryor Mountain wild horse herd, present the justification, methods and procedures to be used in gathering wild horses, and to assess the environmental impacts of removing excess wild horses from the Pryor Mountain Wild Horse Range (PMWHR). The Proposed Action section and Standard Operating Procedures for Removal and Safety (Attachments 1A and 1B) of this environmental assessment serve as the 2001 Operational Gather Plan and address the herd Appropriate Management Level (AML), management goals for establishing AML, as well as technical and logistical aspects of the proposed action.

The proposed action would reduce the horse population to a number within the Appropriate Management Level (AML), initially determined by the Herd Management Area Plan (June 1984), and subsequently revised by the Revision of the Herd Management Plan (July 1992). Recommendations for reducing the population size with subsequent impacts on herd composition will consider research results, within the last decade, pertaining to genetic viability of the Pryor herd and multi-species forage utilization on the horse range, as well as long term trends (~25 years) for Pryor wild horse population health and overall range condition.

Removal decisions will be selective, with priority given to maintaining a genetically viable herd while preserving the population social structure including healthy and reproductively successful individuals. The impact of the recommended removal on population demographics including age structure and sex ratio are also evaluated. The numbers, age, and sex of animals proposed for the upcoming removal are supported by recent research on genetic viability of the herd and predicted impacts on the range as shown by ecosystem models. Herd data was also applied to the Wild Horse Population Model Version 3.2 developed by Dr. Steve Jenkins, Associate Professor, University of Nevada Reno. Details on all completed research efforts have been made available to the public on an on-going basis and parameters and output for specific population modeling

runs are on file at the Billings Field Office (BiFO).

**Public comments to the EA/gather plan, must be submitted in writing and received by the Billings Field Office within a 30-day comment period determined by date of mailing of the document. A public hearing, regarding the use of helicopters in this proposed action, will be held on Thursday, August 16th, 2001 (7 pm) at the Bighorn Canyon National Recreation Area Visitor Center, in Lovell, Wyoming.** The proposed removal operation is scheduled to begin no earlier than September 10, 2001. Culmination of the gather effort, with an organized oral competitive-bid adoption, is tentatively scheduled for Saturday, September 29, 2001 at the BLM Britton Springs Administrative Site, near Lovell, Wyoming.

## **II. GENERAL AREA , POPULATION DESCRIPTION and BACKGROUND DATA**

**A. LOCATION:** The Pryor Mountain Wild Horse Range (PMWHR) is located in the southeastern portion of Carbon County, Montana and extends into the northern portion of Big Horn County, Wyoming (Appendices 1, 2). The range is approximately 13 miles north of Lovell, Wyoming. The PMWHR was created in 1968 by order of the Secretary of the Interior, Stewart L. Udall. This designation was the first of its kind in the United States, and directs that management of the wild horses be within a balanced program which considers all public values without impairment to the productivity of the land. Henceforth this area has been administered for the protection and management of wild horses, wildlife, watershed, archeological, recreational, and scenic values. The order also states that the BLM will manage the range in a manner compatible with the Bighorn Canyon National Recreational area, which is adjacent to East Pryor Mountain.

Since designation, much of the Pryor range has been included within wilderness study area status and was recommended for wilderness designation in 1991. There are three BLM wilderness study areas within the PMWHR, containing approximately 23,000 acres, in addition to Lost Water Canyon (USFS) and Bighorn Canyon (NPS). As such, wilderness values must also be considered, and not impaired, before Congress makes a decision on final status. Much of the area was recently (1998) recommended for ACEC (Area of Critical Environmental Concern) status as well. The East Pryor Mountains, including the PMWHR, were designated in a Decision Record in March 1999. Goals are to conserve the area for wild horse and paleontological values, provide recreational use and enhance fish and wildlife habitat.

Elevations within the range vary from 3,640 feet (1300 m) to 8,000 feet (2,600 m) at the northeast corner. The topography is highly variable being characterized by deep, steep-walled canyons, isolated grassy plateaus and foothill slopes. The climate is typical cold desert and can be highly variable. Rainfall varies, on an elevational gradient, from 5 to 20 inches (12-50 cm) annually. Based on range topography and vegetation, revised estimates of the ecological site inventory in 1992 (Revision of the Pryor Mountain Herd Management Area Plan) indicate that almost 25% of the range is rock outcrop or dense trees and produces little or no forage. Almost 38% of the range is considered to be in poor condition (based on historical use and other impacts), while the balance of the range is considered in fair to good condition. Soils which characterize the range are shallow to moderately deep, loamy, calcareous, moderately alkaline,

and a mixture of limestone, sandstone and shale. Due to the young, fragile nature of the soils throughout the horse range, erosion occurs quite easily. Environmental influences, both man-made and natural, have therefore contributed to much erosion and soil loss on the range. This, along with the high lime content, limits the productivity of the soils.

Vegetation is very diverse in both density and composition. It tends to occur in belts, including subalpine meadows (higher elevations), conifer grassland/shrub, mountain shrub, and red desert/saltbrush in the very lowest elevations. The upper elevations support a wide variety of plant species, including alpine fir, and perennial forbs, sedges and grasses. In areas where the vegetative cover is quite dense, the watershed condition ranges from fair to good. The mid-elevations are characterized by stands of Douglas Fir and are interspersed with limber pine. There are occasional fingers of open meadows supporting grasses, forbs and sagebrush. The next belt of mountain shrubs includes primarily juniper, mountain mahogany and big sagebrush. On the lower portions of red desert and salt-shrub, vegetation is generally sparse and scattered with significant amounts of bare soil. In these areas the watershed conditions remain poor to fair. The west side of the range, along Crooked Creek, has distinctly different vegetation including broadleaf shrubs, due to the permanent supply of water.

Several rare and sensitive plants occur in the arid and semi-arid plant communities of the Pryor Mountains. Among these is a short-lived perennial in the Mustard family, Lesquerella lesicii (Pryor Mountain bladderpod), which is not known to occur anywhere else in the world (listed as critically imperiled globally). It exists within 3 areas of the PMWHR, primarily in sparsely vegetated soil of grasslands, mountain mahogany and juniper woodlands. The largest population occurs on Sykes Ridge, in an area which the horses are known to use as habitat. At this time, all 3 populations appear to be thriving but there is concern regarding the potential impact of ungulate trampling and grazing on this species. In addition, it grows with a number of other Madison limestone endemics including Shoshonea pulvinata (shoshonea), which is listed as globally imperiled because of rarity, and is federally listed as a Category 2 species.

Rangeland encompassing about 38,000 acres including BLM, National Park Service (Bighorn Canyon/Dryhead), Custer National Forest (lower Lost Water Canyon), and private lands (Krueger) are currently available to the horses. Natural topographical barriers (westside - Crooked Creek; eastside - Bighorn Canyon), as well as man-made barrier fences to the north and south, restrict the majority of horses to available range. Otherwise the Pryor herd freely roams throughout the range, largely unrestricted by internal fences. Water exists as 2 perennial springs (Layout and Crooked Creek) and 2 permanent springs (Cottonwood and Sykes) in the lower elevations and several man-made reservoirs in the upper elevations. Two water catchments, built about 20 years ago in the middle elevations, are currently inoperable. Seasonal drifting of horses onto unauthorized lands within the Custer National Forest, to the north of the horse range, has been occurring for at least the last 12 years. This activity is considered primarily transitory and may occur from mid July through September.

The wild horses are strongly migratory and winter in the lower and mid-elevations where typical snow-depths range from 0-25 cm. The mid-elevation ridges and plateaus are nearly always snow-free (<10 cm of snow) because of wind and exposure to winter sunshine. The horses typically do

not spend the winter in the subalpine meadows where snow-depths may exceed 1 m for several months. Horse distribution, however, tends to be relatively unrestricted during the winter when they may ingest snow for fluid intake. During other times of the year, especially mid to late summer, horse distribution seems to be restricted to facilitate easy access of nearby water reservoirs. The attached maps (Appendices 1 and 2), show the location of the range, its boundaries and three geographical areas: Burnt Timber Ridge (14,050 acres); Sykes Ridge (14,200 acres); and the Dryhead (8400 acres); which serve as home range areas for three separate, but not genetically distinct, subpopulations of the wild horse herd.

This PMWHR also supports a variety of large and small wildlife species throughout the year. The primary game species are mule deer, bighorn sheep and black bear. On-going research is making an effort to identify management actions which will support a viable bighorn sheep population within the PMWHR. Introductions were initiated 30 years ago but the population continues to experience instability in its size (range 100-200 animals). Mule deer herds tend to use the lower elevations during the winter and primarily move north of the PMWHR during the summer period. Although grazing allotments do not exist within the boundaries of the PMWHR, trespass cattle have had a limited but recurring impact on vegetation within some of the lower elevation range. This has primarily been the result of drifting cattle during authorized (BLM and NPS) trailing activities. To the extent possible, the agencies have worked with local ranchers to curtail this drifting activity.

Recreation activities within the horse range are varied and include hiking, backpacking, photography (video and still), hunting, fishing, camping, spelunking, sightseeing, and scenic viewing of wild horses, wildlife and many other aspects of this unique area. Big game hunting (primarily mule deer, mountain lion, bear and bighorn sheep) occurs throughout the Fall, Winter and Spring of each year and often covers all elevations of the range. Visitor impact days of recreation and sightseeing has been increasing dramatically, primarily due to the attention brought to the range by professional film companies and photographers and special interest groups as well as various socio-economic issues. Commercial activity has been active and primarily in the form of documentary and videotography permits. Outfitter permits have been issued for the PMWHR in the past, however this type of activity is currently on hold pending the outcome of the Herd Plan Revision.

## **B. APPROPRIATE MANAGEMENT LEVELS:**

**Current Resource Area (Field Office) and Herd Management Plans:** The Bureau of Land Management has defined Appropriate Management Level (AML) as the median number of adult wild horses (12 months and older), determined through BLM's planning process, to be consistent with the objective of achieving and maintaining a thriving natural ecological balance and multiple-use relationship in a particular herd management area. The Pryor Mountain Herd Management Plan (HMP) (June 15, 1984), and the Billings Resource Area Management Plan (Sept. 28, 1984) established the initial stocking rate for the range at 121 total head of wild horses. Long term data (Figure 1) indicate that BLM management efforts have resulted in a total pre-removal population size (including foals) fluctuating between 136-200 wild horses annually,

with post-removal numbers ranging between 115-155 horses. The average post-removal population size since 1971 has been  $142 \pm 24$  horses, or  $144 \pm 21$  since 1984 (Appendix 3). **Most evidence indicates that this average population size (~140) has resulted in both a healthy, genetically sound and productive herd of wild horses, as well as a thriving and prolonged ecological balance on the range (details below).**

The 1992 Revision of the Herd Management Area Plan (MT- 025-2-18/1992 ) recommended reducing the stocking rate to  $95 \pm 10\%$  horses annually, based on recalculated grazing capacity acreage (involving the loss of the Sorenson Extension-NPS lands) for the horse range. It was not stated whether this number was to include or exclude foals of the current year. The reduction in AML was justified by projections that, on the average, over 25% of the total range area produces no usable forage; 66% of the producing range is in poor condition; while 33% of the range is in fair to good condition and produces over 65% of the forage available to grazing populations. Migratory and actual use patterns of grazing populations were not evaluated in this document. This document is on file at BiFO.

Subsequent communications from the Area Manager to the District Manager in May 1994 (letter on file at BiFO), further clarified the revised AML. It was recommended that the herd be maintained at a minimum of 100 adult horses (12 months and older), plus foals of the current year (annual average of  $28 \pm 6$  foals since 1984), for a total post-removal population size of approximately 130-140 horses. The 1992 revised AML of 95 adult horses would then be considered a base herd number reflective of significant decreases in available acreage, fire or severe drought conditions.

**Status of planned Amendment to the Billings Resource Area Management Plan and Revision of the Pryor Mountain Herd Management Plan:** The Billings Field Office is continuing efforts on the Revision of the Pryor Mountain Herd Management Plan. The revision will incorporate eight years of ecological research studies on wild horse population genetics and ecosystem modeling. These studies were generated through co-operative efforts with 6 state and federal agencies and 3 universities, and results of this research were released to the public in February 2000. The public was provided with an brief update on plan revision progress via a press release in January 2001.

Based on previously-stated public concern and input, the revision is considering a minimum of 10 issues pertaining to determination of AML and management of the wild horse herd in balance with the Pryor ecosystem. Public scoping meetings were held late March 2000, and public comments were received through April 2000. Inter-agency meetings, regarding the plan revision, were held in late April 2000 and invited comments were received by late Fall 2000. Extensive submitted comments, regarding the revision, have been reviewed and summarized and have been made available to the public, upon request, since April 2001.

As a result of concerns raised by the public during the scoping process, BLM initiated field studies in 2000 to better evaluate: 1) the impacts of visitor activity within the horse range; 2) the potential impacts of predation on the wild horse herd; 3) to create baseline social behavior data for wild mares and 4) to determine areas having sizable fuels loads for possible prescribed burns

in an effort to develop additional wildlife habitat within the horse range. Results of these studies will likely impact AML for the horse herd, recommended long-term population control techniques, as well as other management actions, and research efforts are continuing through field season 2001. Final reports for the preliminary studies have been made available to the public, upon request, since April 2000.

In addition, the last five years of herd census and demographic information have been analyzed and compared to horse distribution and range utilization studies taken over the same time period. More recent data are being compared to existing historical data on herd size and long-term range condition and trend. Existing data are also being compared to predicted future impacts generated by herd genetic and ecosystem research models, in order to further evaluate AML for the herd. These efforts, coupled with other on-going studies by other agencies (BRD-USGS research on Bighorn Sheep viability and FS management decisions regarding repairing the PMWHR northern boundary fenceline) will eventually impact BLM decisions regarding possible range expansion, artificial water sources, prescribed burns, road closures, and use of firearms on the horse range. All of this work is currently on-going and will continue to require significant interagency input and discussion. Release of a Draft Plan, evaluating alternative management actions, for public review and input, is thus not expected prior to Fall 2002.

**C. POPULATION CENSUS:** The Pryor Mountain wild horse population comprises a harem band social structure with associated bachelor groups. Individual horses can be recognized by coat color and scars, facial and leg markings, and group association and are tracked annually using a CD-ROM wild horse management database (WHIMS) developed by BRD-USGS researchers. Within the last decade, population census and monitoring has comprised a combination of aerial census (a maximum of twice annually) and year-round ground surveys by BLM employees, student interns, and public volunteers.

Since the early 1990's, efforts from the local Pryor Mountain Mustang Association have contributed greatly to accuracy in ground surveys of individuals within the population. In addition, extensive research surveys (Singer - BRD-USGS) have been conducted every year since 1995, and this information, coupled with intensified BLM efforts, has resulted in the development and maintenance of a very comprehensive database for the Pryor Mountain population (Appendix 4). The composition of harems and dominant stallions is fluid in nature, and therefore this information is tracked on an on-going basis.

Current estimates place the population at 188 subadults and adults, with 25-30 surviving foals expected for 2001 (Appendix 3, 4 - as of June 15, 2001). Summer foal mortality has been as high as 30% of all foals born, and this will be monitored closely this season. BLM is currently speculating on the existence of only 4 horses which have been missing for some time and are presumed dead. The total herd size at the time of the proposed gather, then, will exceed 200 horses, and will place the population a minimum of 60 horses in excess of the current AML for the range. Existing management plans, BLM monitoring (utilization) and range trend data, results of recent genetic research and the spatial ecosystem model all support a population gather and removal if the herd should exceed 200 horses in size. Details of the authority and

justification for the removal are provided in the Purpose and Need for Action section of this document.

**D. COLONIAL SPANISH PHENOTYPE:** The Pryor Mountain wild horse has been identified as a rare wild strain of the Spanish Colonial Horse or Spanish Mustang (Sponenberg - College of Vet. Medicine, Virginia). The herd exists along a major historical Crow and Shoshone migration route, and probably has an origin in tribal horses. The rationale for conserving the Spanish Colonial Horse is that it is unique among horse breeds as an old and consistent genetic package that is not similar to other more widely available breeds. Since the colonial type is no longer present in Spain, the Pryor Mountain horses are a critical component of a remnant gene pool, representing an isolated strain which is still subjected to the pressures of existence in the wild. The identified phenotype is generally small (~14 hands high and 700-800 pounds), showing a straight to concave forehead, a convex nose which tapers to a narrow muzzle in a frontal view, a narrow but deep chest, a long and angulated shoulder, and a sloping croup with relatively low set tail. Short, strong backs may possess either five or six lumbar vertebrae. Some horses will have a tendency towards “gaitedness” in their pattern of footfall.

According to Sponenberg (as well as other proponents of Spanish horses), the majority of the Pryor Mountain population uniformly demonstrate Spanish Colonial Horse phenotypic features. Relevant documents are on file at BiFO. Only a very small percentage of older horses, remaining on the range, appear to show what is considered to be “atypical” Spanish-type conformation. Thus removals based on conformational phenotype, should be of limited priority in comparison to other aspects of individual reproductive fitness and social status within the population.

**E. POPULATION COLOR BALANCE:** Colors of the Colonial Spanish Horse vary widely and include a full range of solid colors including black, bay, brown, chestnut, sorrel, grullo, zebra and red dun, buckskin, palomino and cream. In many horses, these base colors will combine with white hairs to produce a “roaning” pattern or a paint sabino pattern. This range of colors is present within the Pryor Mountain herd and is consistent with a Spanish origin (figure 2). According to recent data (figure 3), some color types are recognized as being less common within the herd and conservationists recommend selectively saving these colors to protect the variant from becoming extinct. These rarer types include nonlinebacked duns, palominos and the sabino color patterns.

If we examine long term trends of color balance within the Pryor population (Figure 2), we see that selective management has already resulted in an increased expression of some color patterns considered representative of the Spanish-type horse. Currently no negative impact to population survival can be linked to the expression of any particular color pattern within this population, and as such, it is proposed that the existing color balance should be preserved with particular attention given to identified rarer colors. These conditions may change if the presence and impact of natural predators, primarily mountain lions, increases on the range. Furthermore, the recommendation to retain rarer colors should be secondary to aspects of herd social structure and individual reproductive fitness.

**F. POPULATION DEMOGRAPHICS:** Unless otherwise indicated, the data discussed below has been compiled via long-term BLM monitoring efforts on the PMWHR, were analyzed by BLM employees and are on file at BiFO. Historically, and especially within the last decade, these efforts have been enhanced with monitoring efforts by the Pryor Mountain Mustang Association and research teams from the Biological Resources Division of USGS.

*a. Social Structure:* According to the most recent research efforts (Singer, BRD-USGS), the number of harems within the PMWHR has increased from 18 to 31 since 1992. This increase has been correlated with a decreasing number of average mares per harem and an overall increase in the number of male horses on the range (see sex ratio information below). In addition, the population is characterized by having one the highest rates of interchange of mares between harem stallions (45-49% of mares have interchanged between harems annually for the last 5 years) recorded for wild horse populations (Figure 4). It is not uncommon for foals to be abandoned or injured and subsequently die because of this activity (Figure 26). Recently this has resulted in a fairly unstable social structure and one where the stallions seem to be the dominant decision-makers on the range.

The expression of lead mare-social facilitator type personalities is currently limited within this herd, as very few stallions seem to develop associations with specific mares for multi-year periods. Assuming that the majority of reproductively successful stallions are the dominant harem stallions (Figure 5), removals should have limited impact on these individuals in an effort to preserve both the social and genetic integrity of the herd (Appendix 5). On-going research by BRD-USGS will confirm foal parentage and participating males within the last decade. Genetic implications for this recommended removal strategy are discussed in the Genetic Viability section of this document.

*b. Foaling Rates:* BLM data and on-going research efforts have characterized the population as averaging a moderate foaling rate of 63% (Figure 6), with almost 80% of mares three years of age and older conceiving during the breeding season. Long-term trends in the number of foals born (Figure 1) indicate an annual average of  $26 \pm 7$  foals, primarily born during the months April-June. The actual foaling rate may be somewhat higher than this figure, as the incidence of early post-natal deaths may be higher than previously recorded. Mares aged 4-11 years appear to contribute the most to foal production (Figure 7). In general, there appears to be only limited foaling by two-year old mares (3 -9%), while many wild horse populations, which are subjected to regular herd (including foal) reductions, have responded with foaling rates in the order of 17-41%. This might suggest that the Pryor population is currently not perceiving pressure to maximize reproductive efforts by including yearlings within the breeding ranks.

Previously, overall foal survival has been about 90% with the annual rate of population increase averaging 17-18%. During the last period (1996-2000), foal survival has been impacted (Figure 8) as much as 30% by mountain lion and black bear predation as well as mare interchange related injuries (data on file at BiFO). In addition, average foaling rates have dropped to 53% and annual rates of population increase have also dropped to less than 10%. It is interesting to note the increased foaling rate of 3 year old mares, in 2000, perhaps in response to dramatically lowered foal survival rates in 1999 (Figure 9). Some of these 3 year old mares (and their foals)

died and several mares remain in poor physical condition due of the energy demands of gestation and lactation at a young age (Figure 10 a, b, c). In any case, current estimates of herd foaling success are still indicative of a healthy and productive wild horse population. The recent trend of decreasing foal survival will continue to be monitored closely by the BLM.

*c. Sex Ratio:* Long-term trends in the population and foal crop sex ratio (Figure 11) are both perplexing and controversial. Early reports suggest a possible abundance of males on the Pryors, yet the majority of years under which this population has been managed (1974-1993), show a predominance of females in both the foal crop and population as a whole. A report by Lynne Taylor (PMWHR Herd Manager 1971-1990), states explicitly that more females were retained on the range during this period in an effort to retain desirable colors, as well as encourage the development of larger sized harems which would facilitate management efforts such as removals.

Most wild horse population sex ratios will favor females (~60%) over males (~40%), while almost the reverse seems to be indicative of the last several years on the Pryors. This current trend, towards the predominance of males, is poorly understood. The abundance of young bachelors coming of age, however, probably contributes to the current instability and degree of mare interchange within the social structure. This trend should increase male participation in breeding efforts and enhance the genetic viability of the herd (to be discussed in the Genetic Viability section of this document). In light of the uncertainty regarding mechanisms and reasons for the shifting sex ratio, it is recommended that the existing population sex ratio be impacted by gather activities as little as possible. This approach would support natural changes and/or cycles which are occurring within the population.

*d. Age Structure:* A typical age structure for a wild ungulate herd should be pyramidal in shape with the majority of animals in the youngest age categories. This has historically been, and currently is, the structure for the PMWHR herd (Figure 12). There is a slight tendency towards bimodality (some age groups under-represented) and it is possible that age selective management has contributed to this condition. Bimodality could present a problem if severe climate, or other extreme environmental factors, were to have a negative influence on foal production (or survival) during years when smaller numbers of horses comprise the reproductively-active age classes. Also note that females tend to be slightly predominant in the younger age classes, while males tend to be predominant in the older age classes. This is probably a function of age-related natural mortality patterns and will be discussed in the next section. Clearly, the maximum age of horses on the range is fairly restricted, with horses older than 15 years almost non-existent. It is possible that both selective management and environmental conditions, such as severe winters, have contributed to limited older horses in the population.

*e. Patterns of Natural Mortality:* Data from earlier research studies (Figure 13) have been used to define patterns of natural mortality (due to predators, disease, environmental exposure) within the Pryor Mountain wild horse herd. Mortality data from an extreme winterkill (1978) were excluded from this "average year" analysis (see Population Viability section of this document). These data have been compared to known deaths and carcass retrieval information from more recent studies (Figure 14), as well as age-class related survival estimated from tracking known

individuals on the range (Figure 15). It is evident that a typical pattern shows relatively limited mortality across most age classes, with more deaths occurring by foals and yearlings as well as animals over 15 years of age. It could also be argued that some gender-specific impacts are more evident in young males, perhaps related to social aggression, and older females, perhaps related to energy investment in years of foal production.

Given the current age structure of the herd, and this pattern of natural mortality, it is recommended that selective removals are limited across most reproductively-active age classes, with selective emphasis on the youngest (1 - 4 year olds) and most plentiful horses within the population (Figure 16a). This pattern of removal is also recommended by Cothran (Veterinary Science, Univ. of Kentucky) and supported by Singer (BRD-USGS) and Gross (NREL-CSU), in light of preserving both the genetic diversity and viability within the PMWHR population (see Genetic Viability section of this document). This recommendation is also consistent with current BLM selective removal policy and the National Wild Horse and Burro Strategy which prioritizes the removal of individual animals of age class 5 years and younger. This strategy is based on the perceived impacts of removals on the genetic health of herds, as well as enhancing placement of excess animals in approved adopter homes following removal from the range.

**G. GENETIC ANCESTRY:** Wild horse herds usually start from a limited number of founder animals, which can have a profound effect on the subsequent makeup of the herd. As mentioned earlier, the Pryor herd exists along a major historical Crow and Shoshone migration route, and probably has an origin in tribal horses. Smaller herds (<200 animals in size) which have experienced any degree of isolation (such as the PMWHR), tend to lose alleles (genetic information) through genetic drift which is simply the active loss of genetic material which results from the random mating of two individuals. This loss of material has an impact on the final genetic composition of the herd. Although no alleles were found in Pryor horses which have not been observed in domestic horses, this herd does possess some very characteristic Spanish bloodtype markers, which are relatively high in frequency within the population. Several variants (including Pi-W and Qac) are accredited with establishing the uniqueness of the Spanish origin. Also, of noted importance, is the lack of clearly nonSpanish markers within the herd. It is presumed, however, that the large number of rare alleles is at least partially due to past introductions of horses from other breeds, herds or geographic regions.

Researchers studying the genetics of the Pryor Mountain horses (Sponenberg, Va and Cothran, UofK), recommend preserving the remaining genetic uniqueness of the herd and removing any known introduced horses. Apparently, introductions of non-Pryor horses are unnecessary, due to the present genetic soundness of the population (see Genetic Viability section of this document) and the potential deleterious effect of diluting existing genes within the herd. Currently, no introduced mares or stallions remain on the range and all related progeny were removed in scheduled gather operations during the late 80's and early 90's.

**H. REPRODUCTIVE FITNESS:** One of the most critical components defining population survivability is the success of individual animals to produce foals which will in turn produce viable offspring. Due to the on-going efforts of monitoring and research studies, there is

evidence that some dominant stallions may have more notable reproductive success and, over time, significantly impact the population gene pool. Current evidence indicates that limits to this success may be linked to the age structure and sex ratio of the population, and ultimately depend how long this stallion can defend mares from rival stallions and bachelors.

Researchers recommend that a long term strategy for genetic management is for no individual horse to be over-represented in the replacement generation of offspring. The genetically ideal situation is for each stallion to provide one colt replacement, and each mare to provide one filly replacement within the next generation (10 year span). Over-successful reproduction could otherwise lead to unacceptable levels of inbreeding in this relatively small population. Current research efforts (Cothran, UofK), however, indicate that estimates of inbreeding for the Pryor herd are near-negligible.

Based on visual evidence of mare-stallion association ~340 days prior to foaling, BLM has estimated the average stallion contribution to the foal crop for the last several years (Figure 17). Cothran (UofK) has already demonstrated that simply monitoring the Pryor population for breeding interactions can result in a 43% error rate in presumed parentage. More accurate information is best acquired through blood or tissue sampling and DNA-marker analysis of young animals and parents on a periodic basis. As several important stallions were neither gathered nor sampled in the last gather (1997), BLM recommends blood sampling all captured animals during the 2001 gather for which genetic information does not exist. This effort will support on-going research to further evaluate lifetime reproductive contribution of males and females and the effective genetic size of the population (Singer, BRD-USGS).

Rather than removing reproductively over-successful horses, researchers (Sponenberg, Va) feel it may be more realistic, from a management perspective, to remove higher levels of progeny from these stallions and/or mares. In fact, this type of selective removal may have taken place to some extent over the last twenty-five years of management on the range. The last several years of social instability and mare interchange have apparently maintained individual stallion contribution at a relatively uniform level (Figure 18). It does appear, however, that one or two stallions may be becoming over-represented in the herd gene pool and consideration should be given to selective removal of some of their progeny. These selections would occur at the time of the gather, based on the social structure of the herd at that time, as well as which horses are captured during the gather effort.

**I. GENETIC VIABILITY:** According to recent studies by Cothran (UofK), current levels of genetic variation within the Pryor Mountain herd appear to have limited vulnerability to inbreeding depression. In fact, genetic variation is relatively high for a wild horse population and well above the mean for domestic breeds. The impact of inbreeding is apparently much less than would be expected in a horse population of its current size. Since inevitable loss of genetic variation could reduce long term adaptability and survivability of the herd, it is important to continue to regularly monitor this factor.

Of additional concern, is that the current level of genetic variation is based on high allelic

diversity within the herd. Over 50% of this material is considered rare and present at low frequency levels (Figure 19). These alleles are therefore at a relatively high risk of being lost, especially at low population sizes. Due to the relatively long generation time of horses (10 year span) and the long reproductive life span of individual horses, however, maintenance of genetic variability within the population is not yet at a critical level. In addition, management can elect different strategies to promote genetic conservation within the herd.

One aspect of the PMWHR herd that is favorable for the maintenance of genetic variation is the division of the herd into geographic areas. Typically this subdivision will allow for preservation of genetic diversity within sub-herds despite inbreeding. When the sub-herds interbreed, as is the case on the Pryors, the diversity that was lost due to genetic drift or inbreeding, is restored to some extent. Thus it is believed that the division of the herd into these three areas may have contributed to the current high levels of genetic variation in the population. Limited natural mixing of horses between the areas (1-5 horses per 10 year period), therefore, promotes overall genetic health of the herd. As a result, Cothran (UofK) recommends that removals of horses from the range should not concentrate on one geographic area over another.

Simply increasing herd size, is not always an effective method of conserving genetic health within a population. If a conservation goal is set at maintaining 90% of existing diversity over the next 200 year period, then Gross (NREL-CSU) has demonstrated that the herd size would need to be increased to levels far beyond that which the Pryor range could sustain (Figure 20). However, alternatives do exist in that any management action which serves to increase overall male participation in breeding, will have a positive impact on the effective genetic herd size (see Gross, NREL-CSU and BLM Wild Horse and Burro PVA Forum Recommendations). Thus removals which increase the proportion of breeding-aged animals within the herd or increase the sex ratio slightly in favor of males (and tend to support a social structure of many, smaller harems over that of fewer, larger harems), will also result in more males producing progeny. Furthermore, management actions which delay the age to first reproduction for mares (by removing or contracepting only young mares) will reduce the number of lifetime matings, and thus, reduce the total loss of genetic variation (due to genetic drift) over the lifetime of the individual. This will serve to conserve genetic variation within the herd over time.

Genetic effective population size ( $N_e$ ) is the total number of mares and stallions within the herd that actually contribute genetically, through successful breeding, to the next generation of horses. This value permits an estimate of the loss in genetic variation, within the herd, due to genetic drift. Genetic studies (Singer, BRD-USGS and Cothran, UofK), within the last decade, hoped to establish an effective population size ( $N_e$ ) necessary to preserve the genetic viability of the Pryor herd. Their research presented a range of values, with the most recent period (1995-1997) resulting in an approximate value of  $N_e = 50$ . Researchers consider this to be a maximum estimate as they assumed that no removals were occurring from the range and that no mating was occurring between related individuals. As such,  $N_e$  for the Pryor herd, under the existing population age structure, sex ratio and social structure is about 1/3 of the average total population size (~145 horses).  $N_e = 50$  also represents the known minimum standard for genetic conservation when breeding domestic horses, and may not be sufficient, over the long-term, to mitigate catastrophic environmental events which wild populations are exposed to in their natural

habitat.

**J. POPULATION VIABILITY:** Small populations are subjected to catastrophic events, beyond the effects of genetic drift, which could seriously jeopardize population survival. Typically, the effective population size necessary to overcome these events may exceed the necessary effective genetic population size. An example of this is the extreme climatic conditions and PMWHR winterkill of 1977-78. In this instance, it was important that population size was sufficient to enable population recovery within a few years. Examination of the long term data for population numbers (Figure 1, Appendix 3), indicates that the 1977 post-removal total population size of 145 horses allowed for a ~50% population loss plus a steady to complete recovery of population size by 1981. Lynne Taylor (PMWHR Herd Manager 1971-1990) reported that the death loss was most significant in the 1977 foals and their dams, as well as horses in the older age classes. This information provides evidence that historically the PMWHR herd has been managed at levels which ensured population viability in the face of climatic extremes.

In addition to environmental extremes, wild populations may be exposed to diseases of domestic species which then may cause significant mortality within the herd. Wild populations which are geographically situated near large herds of domestic horses (such as the Pryors) may be especially prone to this problem. In Fall 2000, a yearling filly within the Pryor Mountain Dryhead sub-herd died due to a massive Streptococcus equi infection (documents on file at BiFO), although no other young animals on the range showed symptoms of this problem. This is the bacteria which normally causes strangles in domestic horses and within this particular filly it had progressed to the “bastard” strangles level with significant internal infection.

In 2001, the BLM Wild Horse and Burro Program has begun a major campaign, in association with researchers at Colorado State University, to evaluate risks associated with infectious upper respiratory diseases (IURDs), including strangles, in selected herd management areas. The Pryors has been selected as a viable site due to its proximity to domestic horses, known cases of strangles in the field, and the fact that management has already recommended subjecting captured animals to blood-drawing for genetic purposes (see Genetic Viability section of this document). It would be a wise management decision to evaluate the presence or risk of strangles in the Pryor Mountain wild horse population, prior to potential development of an emergency epidemic.

**III. PURPOSE AND NEED FOR ACTION:** Following a thorough review of existing BLM herd and range monitoring data, results of recent research studies on genetic viability and ecosystem modeling and recognizing that wild horses are to be managed in a thriving, natural ecological balance with other multiple uses and resources, the Billings Field Office manager has determined a need for a population gather and removal of excess horses within the Pryor Mountain Wild Horse Range. The purpose of the action is to achieve and maintain the determined AML, collect additional information on herd characteristics, further determine issues of herd genetics and health on a individual horse basis, maintain sustainable rangelands, and

maintain a healthy and genetically viable Pryor Mountain wild horse population.

In keeping with the BLM National Wild Horse and Burro Strategy developed in 2000-2001, population size is to be determined annually on March 01, and therefore, usually will not include the current year foal crop. AML is now defined as the maximum, rather than median, number of wild horses that a range area can support before long-term impacts become deleterious to the herd and other multiple uses of the range. It is the point at which mitigation of negative impacts requires a gather and removal of excess horses to reduce herd size to the lower end of a range in AML. This lower range can be determined by the minimum number needed to assure that a genetically viable herd of horses is maintained over the long term.

**The Proposed Action section and Standard Operating Procedures for Removal and Safety (Attachments 1A and 1B) of this environmental assessment serve as the FY2001 Operational Gather Plan and address the acceptable range in the Pryor Mountain herd appropriate management level (AML), as well as the technical and logistical aspects of the proposed removal.**

The objectives of the proposed action are to: 1) reduce population size to level which will permit both a healthy and genetically-viable herd as well as a thriving natural ecological balance to be maintained on the range; 2) reduce annual rates of population increase to a level which will allow for a limited cycle of intrusive gather activity and impact on the herd to maintain AML (preferably no more than an every 3-4 year gather cycle); 3) conduct a safe and successful gather and removal effort having minimal impact on the existing herd age structure, sex ratio and phenotypic composition and maintain the breeding integrity of the herd social structure.

**A. AUTHORITY:** The Wild Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195) as amended, Section 3(b)(1), states that the Secretaries of the Interior and Agriculture shall “determine appropriate management levels of wild free-roaming horses and burros on areas of public lands; and determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (such as sterilization or natural controls on population levels).” Section 3(b)(2) states, “that if an overpopulation exists on a given area of the public lands and that action is necessary to remove excess animals, he shall immediately remove excess animals from the range so as to achieve appropriate management levels. Such action shall be taken, until all excess animals have been removed so as to restore a thriving natural ecological balance to the range, and protect the range from the deterioration associated with overpopulation.” The authority may also be found at Title 43 of the Code of Federal Regulations (CFR-4700, Protection, Management and Control of Wild and Free-Roaming Horses and Burros).

With implementation of this plan, wild horses will be removed from inside the Herd Management Area in accord with 43 CFR 4700.0-2 which states, in part, that [...wild horses will be managed] "as an integral part of the natural system of the public lands under the principle of multiple use...", with 43 CFR 4700.0-6 which identifies that [...wild horses]" shall be managed as self-sustaining animals in balance with other uses and the productive capacity of their habitat.",

and with Public Law (PL) 92-195 Sec 3 (b) (2) which identifies the need to maintain appropriate management levels of wild horses within their herd management area (HMA).

Wild horses that have drifted outside designated boundaries (Figure 21), and land made available through interagency agreements or established grazing leases, of the Pryor Mountain Wild Horse Range, will be removed in accordance with 43 CFR-4710.4 which states that "Management of [wild horses] shall be undertaken with the objective of limiting the animals' distribution to herd areas", which is the "geographic area identified as having been used by a herd as its habitat in 1971" (43 CFR 4700.0-5), and with PL 92-195, which limits wild horse management to areas inhabited by wild horses at the time of passage of the Act (December 1971). At this time, the only Forest Service management area designated to provide habitat for a healthy, viable wild horse population is management area Q (Custer National Forest and Grasslands Land and Resource Management Plan, pp. 89 and 90). As such, horses that have drifted beyond the northern boundary (buck and pole) fence of the PMWHR onto Custer National Forest Lands, which are unauthorized for that use, will be gathered and considered for removal under the guidance of the selective removal plan. Horses not deemed excess will then be returned to areas within the designated boundaries of the horse range.

**B. CONFORMANCE with EXISTING LAND USE PLANS:** The Billings Resource Management Plan Final EIS (Sept. 1984), Record of Decision, has been reviewed and the proposed action is in conformance with this Plan by supporting objectives of managing a balance between a healthy and viable population of wild horses and improvements in range condition, wildlife habitat, and watershed condition. The East Pryor Mountains, including the PMWHR, were designated as an ACEC in a Decision Record and Approved Amendment of the Resource Management Plan in March 1999. Goals are to conserve the area for wild horse and paleontological values, provide recreational use and enhance fish and wildlife habitat. The proposed action is in conformance with these goals.

Under the Federal Policy and Management Act of 1976 (FLPMA), wilderness preservation is part of BLM's multiple use mandate. The Burnt Timber Canyon, Pryor Mountain and Big Horn Tack-On wilderness study areas were recommended for wilderness designation in the Montana Statewide Wilderness Study Report, Volume II (BLM, 1991). The Pryor Mountain Wild Horse Range encompasses the majority of the three wilderness study areas in parts of both Montana and Wyoming.

As such, these areas must be managed to preserve wilderness values until such time that Congress makes a decision on wilderness designation. The proposed action is in conformance with these goals.

The Pryor Mountain Wild Horse Range Herd Management Plan (BLM-MT-PT-84-019-4321/June 1984), provides the authority to manage the horse herd at an established Appropriate Management Level (AML) and make selective removals on the basis of type conformation, color, age, sex, location and free-roaming behavior. The plan directs that management of wild horses be within a balanced program that considers all public values without impairment to the productivity to the land. The Revision of the Herd Management Plan (MT-025-2-18/July 1992)

and the accompanying Environmental Assessment (FONSI - MT-025-2-18) and Decision Record (EA-MT-025-2-18), specifically provide for a revision of the established AML, allowing the authorized officer the discretion to determine the exact number of horses (within a previously approved range), based on forage and range conditions, animal health and the size of the foal crop. These latter documents also allow for the opportunity to use helicopters to move and capture wild horses except during the foaling period. In fact, in 1997, the Pryor Mountain horses were gathered exclusively with the use of a helicopter. This was deemed an extremely successful event as the operation was completed within 4 days with no injury to horses, employees, or members of the public. Previous gather efforts had almost exclusively used wranglers on horseback as the topography was considered too severe to facilitate the use of a helicopter.

In March 2000, the Forest Service (FS) went out to the public with a scoping letter regarding their concerns that the existing buck and pole fence is not keeping wild horses out of Lost Water Canyon. Wild horse family groups are crossing into the Lost Water Canyon Research Natural Area (established 7/20/94, Forest Plan, pp. 77-79; Forest Plan Amendment #28; 3,645 acres) and lands in the Lost Water Canyon area recommended for wilderness classification, management area H (Forest Plan pp. 67 and 68; Record of Decision pp. 20 and 21). The FS wishes to establish a more effective barrier and the BLM asked the FS if they would consider authorizing them to construct an improved fence. The FS and BLM continue to evaluate this situation including efforts to determine appropriate agency responsibilities in the matter. At this time, however, FS lands beyond the Buck and Pole fence are not legally authorized for use by the horses and will not be considered in efforts to evaluate carrying capacity for the PMWHR.

**C. JUSTIFICATION FOR REMOVAL EFFORTS:** The long term management goal on the Pryor Mountain Wild Horse Range involves maintaining a balance within the entire ecosystem, of which the wild horses are only a component. The Herd Management Plan (BLM-MT-PT-84-019-4321/June 1984) clearly states that the range should be administered for the protection and management of wild horses, wildlife, watershed, archeological, recreational, and scenic values. In addition, the East Pryor Mountains, including the PMWHR, were designated as an ACEC in March 1999. Goals are to conserve the area for wild horse and paleontological values, provide recreational use and enhance fish and wildlife habitat. As such, all values that contribute to this ACEC designation must be protected from degradation. The Burnt Timber Canyon, Pryor Mountain and Big Horn Tack-On wilderness study areas have been recommended for wilderness designation and these areas must be managed to preserve wilderness values until such time that Congress makes a decision on designation. This implies that management decisions should be conservative and not necessarily promote maximum production of any given entity on the range. A "thriving natural ecological balance" should promote viable populations of multiple floral and faunal species and mutual co-existence. Potentially detrimental conditions, affecting this balance, should be evaluated and corrected prior to evidence of deteriorating range condition and trend.

Within the PMWHR there is a fixed land mass offering a range of precipitation levels and vegetation zones. As such, habitat types are diverse and can vary extensively in productivity, even on an annual cycle. Recent research (Dettling, Colorado State University) indicates that

climatic variation is extensive, and probably contributes to greater fluctuations in annual productivity than any other variable. Long term trend studies (data on file at BiFO) also indicate that within the last 25 years, since designation of the horse range, general vegetative condition on the range has shown steady, but limited, improvement. This improvement has occurred under conditions of an average of ~140 horses present on the range. Improvements, however, have been localized in nature indicating increases in vegetative density and/or cover are probably the result of reduced local grazing pressure of some type. More recent impact studies (Dettling, CSU and Appendix 6) confirm this localized and highly variable distribution of use patterns on the range, and also provide evidence of negative vegetative changes in areas subjected to regular grazing activity. These studies were not designed to detect the responsible grazing species, but do indicate the existence of critically-impacted areas (level of annual use > 80%) on a seasonal basis.

Competitive interaction studies, recently completed between grazing ungulates on the range (Kissell - Montana State University) are controversial, but indicate that at least within the last few years, three species of ungulates (bighorn sheep, mule deer and wild horses), have co-existed in populations of varying density with minimal negative impact on one another. As populations change in size due to reproductive success, disease and/or other natural regulatory mechanisms, this tenuous balance could easily shift. It is important to maintain this balance by ensuring that population control mechanisms are effective. This same research (Kissell - MSU) indicates that the current population size for both deer and sheep is decreasing slightly due to some form of natural control. In fact, concerns over the viability of the bighorn sheep population continues and on-going research is being done by Singer (BRD-USGS). The absence of significant impacts from a natural top level predator for the horse population (coupled with healthy foaling rates), however, generally results in intervention by human managers. The most appropriate intervention should be minimally-intrusive in nature, focus on the long-term, and mimic natural patterns of population regulatory mechanisms.

Currently, numbers of horses on the Pryors have exceeded 200 (188 plus surviving 2001 foal crop), which is considered to have exceeded the long-term carrying capacity of the range. All available evidence (research studies, ecosystem modeling and long-term BLM monitoring data), indicate that overall range conditions may suffer markedly under the duress of prolonged high numbers of both horses and other grazing species impacting the range. Therefore the prudent decision would be to sustain the current level of all-around health on the range, remove horses to a level which will maintain the herd at a historically viable size averaging ~140 (see above sections), and resist the temptation to push the range to its maximum limits. Impacts from livestock in the Pryors, during the turn-of-the-century, have demonstrated that recovery from intense grazing pressure, within these semi-desert and subalpine environments, is generally slow and incomplete.

**D. UTILIZATION AND ACTUAL USE STUDIES:** BLM utilization studies do show that there are seasonal differences in intensity of grazing impacts on the range (Appendix 6). The average grazing impact on the range appears light to moderate over the last six years and is reflective of an average impact of ~165 horses (all ages) on the range, as well as impacts from

other grazing species. The primary function of utilization data is to promote and protect the health of the land by limiting grazing impacts to acceptable levels based on plant physiological responses to grazing. Traditionally the data represents what is being removed (offtake) from the plant community by grazing animals, and is meant to be interpreted at the landscape level. Studies are performed using the Key Forage Plant method (grass species only), which focus on the most vulnerable forage species at each site (data on file at BiFO). Also, it is often difficult to directly correlate utilization (grazing impact) with actual animal density in a free-ranging population, as repeated impacts may be quite localized and result from continuous use by a single family group of horses as opposed to limited use by larger numbers of horses. The challenge for management then, is to analyze and interpret this data at the landscape level.

Utilization studies are performed on the PMWHR in areas that are identified as known use areas by the horse herd (Figure 22 a, b). These use areas change seasonally, and often annually and the horses are not static in the use of the range. In order to stay current with horse use patterns the BLM monitors daily activity patterns May through October, and performs aerial surveys in the late Fall and late Spring of each year. These patterns are tracked on the basis of individual harems and subpopulations. As a result BLM has been able to identify seasonally changing patterns of use and identify areas to monitor utilization impacts biannually.

Aerial surveys demonstrate that during the late Fall through late Spring, horse distribution is relatively uniform across the landscape, but mostly concentrated in the lower and mid-elevations of the range (Figure 23 a, b). Several permanent springs do exist in the lower elevations but would require some travel to access the water at this time of year. Monthly actual use studies (data on file at BiFO, Attachment 3) clearly show the seasonal migration to the upper elevation subalpine meadows by both the Burnt Timber and Sykes Ridge subpopulations. Several man-made reservoirs exist at these elevations, providing relatively easy access to water. As vegetative conditions mature on the upper meadows, several harems from primarily the Burnt Timber subpopulation, move north onto unauthorized lands within the Custer Forest. Residency time, in this area, is restricted to the months of July through September and is highly variable depending on weather, impacts from predators and possibly visitors to the area. In the last 3 years two harems have become permanent residents in this area, but social disruption of those family groups, early in 2001, may change this pattern.

Use patterns in the Dryhead area of the horse range continue to change. Historically these lands were available for winter use, then used year-round by the majority of the harems. BLM now sees a pattern where horse presence is most notable during the late Spring and early summer, after which many (all but 3) of the harems predominantly leave the area. Aerial surveys have shown that many of the Dryhead harems, as well as bachelor stallions, can be found on the lower and middle elevations of Sykes Ridge most of the Fall, Winter and Spring. Reasons for this shift in use may be a behavioral adaptation in an effort to seek out preferred grass forage and/or younger females for breeding purposes. Both commodities are currently limited within the Dryhead area itself. The family groups which have permanent residence in this area can be found primarily in the southern end of the range by Horseshoe Bend and in the northern end of the range by Mustang Flats and Layout Creek. These were the only areas monitored for grazing impact in 2000.

Researchers (Tom Hobbs, Colorado State University) have recommended that carrying capacity estimates for the Pryor range be approached from a risk management standpoint with an identified proper use level applied at the landscape level. For example, no more than 10% of identified critically-used areas should show more than 80% vegetative offtake during the course of a year, and, at the landscape level, overall use should not exceed 50% (primarily light to moderate). BLM data (Figures 24a, b; Appendix 6) clearly show that winter use currently results in 8% of identified areas, and summer use results in 2% of identified areas, being subjected to more than 80% offtake. In general, summer use throughout the range is light, while winter impacts are more localized and notably heavier. These data represent known critically-used areas by the horses, and in particular suggest caution about placing additional grazing burdens on the range. In addition, over the last 5 years, grazing impacts have been detected by trespass cattle on at least 50 % of the transect sites on lower Sykes. Although BLM has been taking steps to remedy this particular situation, it is possible that other areas are being impacted by other grazing species which have not been identified by the BLM. Although average impacts on unauthorized Forest Service lands have not been consistently monitored (by BLM), actual use patterns indicate that animal presence is not necessarily correlated with grazing impact. Grazing relief provided by the use of these lands, however, has obviously resulted in some reduced impacts on the subalpine meadows within designated range. This may change, however, as within the last 2 years BLM has recorded reduced activity of horses on Forest Service lands, most likely as a result of predator impacts on the foal crop.

Other studies (Coughenour, 1991; McKinney, 1997; Burkhardt, 1997) have cautioned that determining the health of an ecosystem should not be approached from a single year perspective - only long-term monitoring (or modeling) over a landscape-wide approach can reveal the most likely scenario. Spatial Ecosystem Models (Coughenour, Colorado State University) have been developed (Appendix 7) to help BLM managers attain long-term predictive management tools. Models represent an alternative strategy to traditional approaches for evaluating carrying capacity based solely on forage supply or animal population dynamics. The analysis, however, does not predict an optimal number of horses which will serve to provide for optimal Pryor ecosystem performance. These studies do help to define acceptable ranges in herd size and expected impacts on the range (data on file at BiFO). For example, a horse population even as small as 50 animals would have a noticeable impact on the range. More importantly, a herd size exceeding 200 horses is clearly beyond the long-term carrying capacity of the range. Therefore, grazing impacts to the range can be considered to fall within an acceptable zone (under “average” conditions) as long as horse numbers range below a herd size totaling 200. As the herd increases beyond this number, the range would experience a dramatic increase in critically-used areas (>50% of known areas) receiving unacceptable levels of offtake (80% or more).

**IV. ALTERNATIVES INCLUDING THE PROPOSED ACTION:** The proposed action and alternatives represent a reasonable range of alternatives based on the issues and goals identified through public scoping efforts and results of multi-agency, multi-institutional research efforts on genetic viability and ecosystem modeling on the PMWHR.

**A. PROPOSED ACTION: Selective Removal Strategy, Blood-Draws for Genetic and Health Studies and Humane-use of Fertility Control on Yearlings and Two-year Old Mares Only.**

**1) Selective Removal Strategy:** The PMWHR herd totals approximately 188 animals, 1 year of age and over, with currently 26 live foals born as of June 15, 2001 (Appendix 5). BLM is currently speculating on the existence of only 4 horses which have been missing for some time and are presumed dead (Appendix 4). The revised appropriate management level (AML), established in 1992, is  $95 \pm 10\%$  animals and was determined not to include foals. Given the current condition of the range, recent results of herd and range monitoring data and research studies on genetic viability and ecosystem modeling, management has the legal basis and biological justification to manage the population towards the lower limit of AML at 140 total horses. These same data indicate that a population gather and removal of excess horses is warranted when the herd size exceeds 200 total animals. Current numbers then, at the time of the gather, will place the population a minimum of 60 horses in excess of AML.

The best available data on horse and range ecology, and population dynamics (discussed above) have led BLM management to determine that the appropriate philosophy for the Pryor herd involves retention of the natural social integrity of the population, allowing the majority of breeding decisions to be driven by the horses themselves. This means that priority has been given to retaining dominant harem stallions, and reproductively successful mares (and corresponding 2001 foals) within most established family groups (Appendix 4, 5). This approach also recognizes the importance of maintaining reproductively fit horses to assist with long-term perpetuation of the herd. This strategy also has genetic implications as the older animals tend to possess a greater diversity of genetic material and the current number of subpopulations and harems on the range may promote important genetic exchange.

Within the herd, there are three geographic subpopulations which consist of approximately 59/60/95 total horses in the Dryhead, Sykes Ridge, and Burnt Timber areas respectively (Appendix 4, 5). In order to facilitate the selective removal process, it is recommended that the gather effort focus on all three subpopulations, with a proportionately equal number of horses gathered from each area. Due to the selective nature of the action, approximately 125-150 horses will need to be captured in order for a minimum of 58 horses, aged 1 to 5 years, to be made available for removal (Appendix 5, Figure 16a). Additional animals (within the limits of the selective strategy) may be removed depending on 1) the number of surviving or poor condition foals by the time of the gather, 2) the individual condition of some younger mares which are currently in poor condition, and 3) some younger stallions who are coming of age but are within over-represented genetic lines in the herd. As a result, a potential range of 58 - 70 total animals may be removed by gather efforts scheduled for September 2001. Remaining captured animals will be re-released onto the range, resulting in a population balance of 140-150 horses. This strategy will result in a post-gather genetic effective population size ( $N_e$ ) of at least 50, the minimum requirement to maintain long-term genetic health in the herd (see previous section on Genetic Viability).

Appendix 4 (note corresponding keys) outlines selected individuals who fall within the selective removal program and are considered to be eligible for removal from the range. Actual removal, for most horses however, will depend on a given animal's susceptibility to the gather effort. Within the herd, a few individuals (Appendix 4) have been identified which either offer extremely rare genetic qualities (color alleles) or unique phenotypic traits, based on evaluations by researchers (Sponenberg, Va and Cothran, UofK). For these reasons, it is recommended that these animals not be removed from the range. Responsible management should recognize and retain rarer genetic qualities, otherwise, color and conformation (phenotype) are not criteria used in developing the selective removal program for this population. If susceptible to gather efforts, any additional animals located and listed as "uncertain status" (Appendix 4) will also be removed. This is consistent with managements' philosophy of preserving critical components of the social structure of the herd. Since the population structure is very fluid within the Pryors, proposed actions may need to be re-evaluated and adjusted just prior to the beginning of the gather.

**2) Blood-Draws for Genetic and Health Studies:** Blood samples will be drawn from all horses which are captured during the gather effort. These samples will be used to supplement genetic data (from both blood and hair samples) which has been gathered periodically during the last decade, in an effort to further evaluate male and female contribution to the gene pool and estimates of genetic viability and genetic effective population size for the Pryor herd. These same blood samples will then be tested and banked at Colorado State University in efforts to evaluate the risks of infectious upper respiratory diseases (IURDs), including strangles and other health issues, in the Pryor herd. At the same time detailed records will be taken regarding indices of overall herd health. The benefits of this health study to the long-term well-being of the Pryor herd were discussed in the Population Viability section of this document.

**3) Humane-use of Fertility Control on Yearling and Two-year Old Mares:** In the last 5 years (1996-2000), BLM monitoring has shown that 5 two-year old mares and 20 three-year old mares have produced foals (Figure 9). The contribution to annual foal production is usually small for these age classes with an average of 1 foal per year from two-year olds and 3-4 foals per year from the three-year old mares. The largest annual contribution from three-year old mares was in 2000 presumably in response to significantly increased foal mortality the year before. In several cases, the energetic demands of gestation and/or lactation have had deleterious impacts on these mares. Several mares (66% of the 2 year olds; 25% of the 3 year-olds; and 25% of the 4-year olds) lost their foals, 2 mares and their foals both died and 2 mares suffered serious injuries presumably during a prolonged or difficult labor. All surviving mares (100 %) were in poor condition (1-2 condition factor, out of a possible 5) post-foaling (Figure 10a, b, c) and are not recovering well (data on file at BiFO).

Thus, purely from the standpoint of humane management and compassionate use of the vaccine, BLM is recommending that all yearling and two-year old mares, remaining after the gather (~11 mares), receive a single-dose (primer) of PZP contraceptive vaccine. When injected, PZP (antigen) causes the mare's immune system to produce antibodies and these antibodies bind to the mare's own eggs and effectively block sperm binding and fertilization (ZooMontana, 2000). PZP is relatively inexpensive, meets BLM requirements for safety to mares and environment

(Attachments 2 and 5), can easily be administered in the field, and requires a single annual booster dose to confer infertility for a single breeding season. 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.

This one-shot application, applied at the capture site, will not be sufficient to prevent these young mares from conceiving but will act to enhance the immune system response to subsequent applications of the vaccine. If these mares are already pregnant, research ( Kirkpatrick,1995) has shown that the vaccine will not affect normal development of the fetus, hormone health of the mare or behavioral responses to stallions. Recent behavioral studies with the Assateague Island and Shackleford Banks populations (Powell, 1999; Rogers, 2001), have shown that contracepted and uncontracepted mares had virtually identical activity budgets, associated in a similar manner with the harem stallion and showed no increase in harem exchange behavior or change in their social status during the length of the study. Current data for the PMWHR, (Figure 25) shows that a high rate of interchange activity between harems appears to be the "norm" for yearling and especially two-year old mares. The Shackleford study, however, did raise concerns that young primed (one shot only) mares showed a decrease in the overall length of time they spent grazing as a result of increased herding behavior by the stallions. Currently, the reasons for this behavior are unidentified and research continues in this area. Any behavioral changes within the Pryor horses following application of the primer shot, would be carefully monitored and documented by the BLM.

The decision to apply a booster vaccine to these same mares, in order to prevent conception during the 2002 breeding season, will be made during late Fall 2001-early Winter 2002. At that time the BLM will have evaluated foal survival for 2001, have up-to-date data on the number of potentially pregnant mares and individual mare condition going into Winter 2001-2002. Any booster shots applied will be remotely-delivered in the field during March 2002 and will not require capturing and confining the small number of mares. The intent of this booster would be for a one-time application, allowing one year of infertility, in order to give the mare an opportunity to fully mature before shunting limited resources to a developing foal. There are also known genetic advantages to this approach of contracepting younger mares, which have been well researched for the Pryor herd, and were discussed in the Genetic Viability section of this document. All mares subjected to fertility control would be monitored for aspects of social behavior and compared to existing baseline (control) data on Pryor mare behavior during on-going field studies. Furthermore, the BLM will prepare a separate Environmental Assessment and Action Plan for public review and comments (allowing a 30-day comment period) prior to proceeding with this booster effort.

**4) Capture Operations:** All capture and handling activities will be conducted in accordance with the Standard Operating Procedures for Removal and Safety section of this EA and Gather Plan (Attachments 1A and 1B). Selection of capture techniques will primarily involve the use of a helicopter and will take into consideration herd health and distribution, season of year, local weather and environmental considerations. All animals will be gathered and held at the Britton Springs Administrative Site and corral facility at the base of the PMWHR, until the scheduled adoption September 29, 2001.

**B. ALTERNATIVE ACTION: Selective Removal Strategy and Blood-Draws for Genetic and Health Studies Only.**

**1) Selective Removal Strategy:** Identical to the Proposed Action.

**2) Blood-Draws for Genetic and Health Studies:** Identical to the Proposed Action.

**3) Humane-use of Fertility Control on Yearlings and Two-year Old Mares:** Under this alternative, the use of a PZP immunocontraceptive (fertility control) primer shot would NOT be given to any yearling or two-year old mares. As such, a follow-up booster, which would convey infertility, would not be applied either. These mares would then be allowed to conceive under natural conditions and be potentially subjected to the physiological constraints of foal production at an early age. A maximum of 11 mares would be affected with an average potential for 5-6 additional foals in 2003 (based on a 53% herd foaling rate).

**4) Capture Operations:** Identical to the Proposed Action.

**C. ALTERNATIVE ACTION: Fertility Control on All Age Classes of Mares as a Complete Means of Population Control.**

**1) Selective Removal Strategy:** Under this alternative, no removals of any age horses would take place from the PMWHR.

**2) Blood-Draws for Genetic and Health Studies:** Identical to the Proposed Action

**3) Fertility Control on All Age Classes of Mares:** Under this alternative, at least 80% of all breeding-aged mares currently on the range would need to be gathered and brought into the Britton Springs corral facility. Research studies on east-coast barrier island populations being managed by fertility control, and application of the Wild Horse Population Model Version 3.2 developed by Dr. Steve Jenkins to the Pryor data (data on file at BiFO), clearly indicate that during the first 3 years of management at least 80% of all breeding aged mares must receive the vaccine and subsequent boosters for each year of expected infertility. This level of infertility is necessary to reduce population growth rates to only a stabilizing level. This action will not allow for reductions in herd size, but will, at best, maintain the population at the size it was (188 horses plus the 2001 foal crop) when fertility control was first applied.

**4) Capture Operations:** Identical to the Proposed Action.

This alternative was considered but eliminated from further analysis due to unacceptable impacts on the population, at this time, and the inability of this alternative to reduce the herd to within the acceptable range of AML, within a timely manner. Failure to reduce the herd to within acceptable limits of AML would result in irreparable harm to the range. In addition, all breeding-aged mares would either need to be gathered and brought into Britton Springs each March for

booster shots or the vaccine would need to be remotely-delivered in the field. Gather activities at this time of year might have a negative impact on mares heavy with foal. Furthermore, remote access to this number of mares in the field may be compromised by weather and snowfall conditions during this time period. Due to limitations in field assistance during the winter, concerns over impacts of the PZP vaccine on the social behavior of the mares could not be fully evaluated for all age classes which were contracepted. Most importantly, impacts of predation on the foal crop may continue to increase and the combination of high-levels of contraception as well as natural foal deaths may result in the loss of whole age classes of horses. Further analysis of normal behavior in Pryor mares and the increasing impacts of predation and other natural mortality is needed prior to further consideration of this alternative.

#### **D. ALTERNATIVE ACTION: No Action Alternative.**

**1) Selective Removal Strategy:** Under this alternative, no removals of any age horses would take place from the PMWHR.

**2) Blood-Draws for Genetic and Health Studies:** Under this alternative, no horses would be subjected to blood-draws for any purpose.

**3) Fertility Control on All Age Classes of Mares:** Under this alternative, no mares would be subjected to fertility control for either humane or population-control reasons.

**4) Capture Operations:** Under this alternative, no horses would be subjected to capture and removal operations.

This alternative was considered but eliminated from further analysis due to unacceptable long-term impacts on the population and range, and the inability of this alternative to reduce the herd to within the acceptable range of AML. This alternative would allow natural controls to regulate the size of the Pryor herd. There would be no active management to control the size of this population. Under this alternative, the wild horses would be allowed to regulate their numbers naturally through predation, disease, and forage, water and space availability. Gather operations may only occur through court orders.

This alternative was eliminated from further consideration due to several factors. The Pryor horses are a long-lived species (average 15-20 years) with documented survival rates exceeding 90% for most age-classes. The herd is currently not substantially regulated by predators. Documented impacts are only on the foal crop and remain at 30% of the age class or less. Research with other wild horse herds, which are known to be regulated by predation (Turner, 1992), indicate that at least 70% of the foal crop must succumb to natural predation in order for stabilization of herd size to occur. Significantly greater predation impacts, or a combination of disease and starvation as well as predation, would be needed to reduce herd size. Therefore this alternative would result in a steady increase in the Pryor herd which would quickly exceed the carrying capacity of the range. Ecosystem studies (Coughenour, CSU) have shown that the Pryor

herd would potentially increase to 300-450 horses before density-dependent regulatory mechanisms would take effect. By this time, the herd would be experiencing high levels of natural mortality and reduced fitness coupled with irreparable damage to the range. At this number of horses, grass offtake would exceed 90% in many areas of the range and, consequently, negative impacts to all grazing species on the range would be detected. This is not a BLM management objective (see PVA Forum recommendations) as the Wild Horse and Burro Act of 1971 mandates the Bureau to “prevent the range from deterioration associated with overpopulation”, and “preserve and maintain a thriving natural ecological balance and multiple use relationships in that area”.

**V. AFFECTED ENVIRONMENT, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:**

**A. AFFECTED ENVIRONMENT:** The purpose of this section is to provide the reader and decision-makers with a listing of the resource values which are known to occur within the Pryor Mountain Wild Horse Range. A general description and discussion of these resource values can be found in the General Area, Population Description and Background Data section of this document.

Table 1. Summary of Critical Elements & Other Resources of Concern within The Human Environment.

Element	Present	Not Present	Element	Present	Not Present
<b>Sensitive, Threatened or Endangered Plant Species</b>	X		Range and Watershed Condition	X	
Cultural and Paleontological Resources	X		Native American Religious Concerns	X	
<b>Wilderness Study Area</b>	X		Sensitive, Threatened or Endangered Wildlife Species	X	
Water Quality (surface or ground water)	X		Fisheries Habitat	X	
<b>Visual Resources Recreation, and Hunting</b>	X		<b>Areas of Critical Environmental Concern (ACECs)</b>	X	
Climate and Air Quality	X		Wetlands and Riparian Areas	X	

Hazardous Waste	X		<b>Livestock Grazing and Trailing</b>	X	
<b>Pryor Mountain Wild Horses</b>	X		<b>Vegetation</b>	X	
<b>Soils</b>	X		<b>Terrestrial Wildlife</b>	X	
Social Economic Concerns	X		Forestry/Timber	X	

The following resources of concern, although present, were determined not to be affected or impacted by the Proposed Action and will not be discussed further in this EA: Climate and Air Quality; Cultural and Paleontological Resources; Threatened, Endangered, Candidate, or Sensitive Wildlife Species; Range and Watershed Condition; Water Quality (Surface or Ground Water); Native American Concerns; Hazardous Waste; Social Economic Concerns; Forestry/Timber; Fisheries Habitat; Wetlands and Riparian Areas. The remaining resources (**in bold**) will be evaluated for potential impacts and mitigation measures.

**B. ENVIRONMENTAL IMPACTS and MITIGATION MEASURES:** Resources impacted by the **A. Proposed Action** (Selective Removal Strategy, Blood-Draws for Genetic and Health Studies and Humane-use of Fertility Control on Yearlings and Two-year Old Mares Only) and the

**B. Alternative Action** (Selective Removal Strategy and Blood-Draws for Genetic and Health Studies Only) will be evaluated for direct, indirect and cumulative consequences. Mitigation measures will be provided as needed. No irretrievable or irreversible impacts to any resource value are anticipated (with the exception of individual wild horses identified as excess) with implementation of the Proposed or Alternative Action.

**1) Impacts and Measures Common to Actions A and B for the Pryor Wild Horse Herd:** All phases of the gather, capture, and preparation operation would be largely similar for both alternatives. The Proposed Action differs from the Alternative Action in that it recommends the application of PZP immunocontraceptive vaccine (as a primer only) to approximately eleven 1 and 2 year-old mares which would remain on the range following the gather and removal effort. All activity would be carried out according to current BLM policy with the intent of conducting as safe and humane an operation as possible. Recommended actions incorporate proven Standard Operating Procedures (SOPs) which have been developed over time. Theses SOPs (Attachments 1A and 1B) represent the “best methods” for reducing impacts associated with gathering, handling, transporting and collecting herd data. If conditions warrant, and animal health or welfare is in jeopardy at any time, gather operations would be delayed or halted.

Impacts to wild horses take the form of direct and indirect impacts and may occur on either the individual or the population as a whole. Direct individual impacts are those impacts which occur to individual horses and are immediately associated with implementation of the Proposed or Alternative Action. These impacts include: handling stress associated with the gather, capture, sorting, animal handling and preparation, and transportation of the animals. There would be an additional impact to animals at the isolated injection site following the administration of the fertility control vaccine. The intensity of these impacts vary by individual, and are indicated by behaviors ranging from nervous agitation to physical distress. Mortality of individuals from this impact is infrequent but does occur in one half to one percent of horses gathered in a given removal operation. Injection site injury associated with fertility control treatments is extremely rare in treated mares, and may be related to experience of the administrator. In the Proposed Action, the primer shot would be controlled, handled and administered by one of the lead researchers (Dr. Jay Kirkpatrick) who originally developed the vaccine and perfected the technique for delivery.

Protocols have been developed (see Attachments 1A and 1B) which would minimize impacts associated with handling stress, blood-drawing for genetic and health studies and the use of fertility control drugs. There are no indications that these direct impacts persist beyond a short time following the stress event. They would be expected to completely dissipate following release. Stress levels, and the potential for injury, are however, expected to be highest immediately following capture, and when animals are moved through the chutes in preparation for adoption. Mitigation measures would include well-constructed corrals at the corral facility, well-maintained equipment, and additional pens for animals determined best kept separate from other animals, in an effort to decrease stress and the potential for injury and illness. If necessary, the holding facility would be watered down regularly, to keep down the dust. Safety and performance records, and years of experience in gathering wild horses would be weighed carefully during selection of the national gather contractor. Experienced BLM personnel would be on-site, during all phases of the operation. A contract veterinarian or APHIS veterinarian technician would either be on-site, or on-call, at all times during the operation. Observers would be asked to remain some distance from the animals during all phases of the gather and preparation of the animals, in order to decrease additional stress due to surrounding levels of commotion and activity.

Indirect individual impacts are those impacts which occur to individual horses after the initial stress event, and may include spontaneous abortions in mares and increased social displacement and conflict in stallions. These impacts, like direct individual impacts, are known to occur intermittently during wild horse gather operations. An example of an indirect individual impact would be the brief skirmish which occurs with most older stallions following sorting and release into containment pens which generally lasts less than two minutes. With the Pryor gather, every effort is made to contain animals in pens as family groups to minimize the level of social disruption. Certain circumstances, during the gather, may prevent this from happening. One example of this would be too many family groups in the corrals at one time for the number of pens available. This situation is possible if, during the gather, the majority of family groups are on the subalpine meadows and must be brought down the mountain in concentrated numbers (see

Attachment 3). In this case, the groups would be resorted by gender and age and confined in pens at Britton Springs facility in this manner.

Regardless of the sorting and handling process, traumatic injuries are usually rare, however, they do occur. These injuries typically involve a bite and/or kicking with bruises which don't break the skin. Like direct individual impacts, the frequency of occurrence of these impacts among a population varies with the individual. Spontaneous abortion events among mares following captures is very rare. During the 1997 gather, which involved the exclusive use of helicopters for the first time, one yearling mare aborted a 2 month old fetus (see Attachment 4). Recovery of the mare after this event was quick and complete.

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

The effect of band displacement on a population as a result of gather operations has been observed in several HMA's following releases and in the Pryors following the 1997 gather (see Attachment 4). Observations have been made of individual and harem band response following releases from the central holding facility at Britton Springs where all captured animals were held. Most horses relocated themselves from the release site back to their home ranges within 2 to 4 hours or less. In 1997, the majority of horses were released as family bands from the corrals and had no problem re-orientating themselves on the range.

If it would be necessary to group animals by gender and age within the corrals, experience has shown that redistribution occurs following a brief "reorientation swing". Due to the position of Britton Springs at the base of the Pryor range, it is expected that even groups of same sex horses would quickly sort themselves out and return to their preferred geographic ridge or area. Specialists have observed specific horse behavior, following releases, as it relates to bands which are separated at capture. While the affinity of individual animals to their band is expected to vary, it is common that mares or stallions break away from the group they were released with (unexpected behavior for a social animal exercising the flight response) and head toward a particular animal or group of animals. Following this activity, individual groups are usually observed later together in the site of their original home range.

The effect of removal of horses from the Pryor herd is not expected to have significant impact on population dynamics or structure, as long as the selection criteria for the removal maintains the social structure and breeding integrity of the herd (Appendix 5 and discussed at length in the Proposed Action section). All research evidence indicates that this would result in positive

genetic benefits to the herd (see section on Genetic Viability). The recommended selective removal strategy for the Pryors would maintain the age structure (of the critical breeding-age animals), the sex ratio and the color diversity currently within the herd (Figures 16a and b, Appendix 5). A similar selective removal in 1997 focused primarily on younger animals (1-4 years old) who had not, as yet, entered the breeding ranks of the herd (Attachment 4). This pattern of removal mimics potential patterns of natural mortality and recognizes that younger animals would generally adapt easier to domestication and thus encourage longer adopter retention after adoption. In wildland species, a more uniform age structure is also known to provide the population more resilience in the face of environmental extremes or catastrophes. As such, removed animals were taken from the most abundant age classes, ensuring sufficient animals were left to carry on the age class (e.g. no more than 50% of the age class was targeted for removal). No long-term negative impacts were detected on the herd, as the direct or indirect result of this gather.

In addition to the removal impacts, the Proposed Action would result in an opportunity to allow increased fitness and condition on 11 younger mares prior to foaling (Appendix 5). It is possible a secondary impact would be the reduction of the 2003 foal crop by a possible 5-6 foals. This estimate is based on the current herd foaling rate of 53%. This impact would result only if the primer shot given during the 2001 gather is followed by a booster applied in March 2002. As already indicated, the BLM would prepare an EA and Action Plan (late Fall) allowing for public review, if a recommendation is made to follow through with the booster shot. Other potential behavioral impacts of the primer shot were discussed under the specifics of the Proposed Action. Effects resulting from successive removals causing shifts in sex ratios away from normal ranges are not expected to occur in the future with the Pryor herd, although some evidence of gender selection was evident in historical removals (Figure 11). Currently there is no evidence that these selection impacts had any negative long-term impacts on herd health or viability. Effects resulting from successive removals causing shifts in age structure may have caused some bimodality in the herd. This does not represent a problem unless the numbers of animals in these age classes are limited and mortality (or removal) may result in missing age classes in the herd over time. Missing age classes could potentially affect long-term population viability. The Proposed Action would mitigate the potential adverse impacts on the Pryor wild horse herd by establishing a procedure for determining what selective removal criteria are warranted for the herd. These recommendations are discussed in detail under the Proposed Action, and establish a standard for selection which should minimize the possibility for developing negative age or sex based selection effects on the population in the future.

Population wide indirect impacts would not appear immediately as a tangible effect and are more difficult to quantify. Population wide indirect impacts are associated primarily with use of fertility control drugs and reductions in short term fecundity of potentially a large number of herd mares. Other impacts include increasing herd health as AMLs are achieved, and potential genetic issues regarding some control over mare contribution to the gene pool, especially in small populations. Again, with implementation of the Proposed Action, these impacts would be expected to be mitigated by an overall lessening of the need to impose fertility control treatments on a high proportion of the female component of the herd, and allowing most mares the opportunity to produce at least one foal.

Maintaining the PMWHR population within an acceptable range of AML (lower limit determined by minimum effective genetic herd size and upper limit determined by the point at which grazing impacts surpass an acceptable use level based on a risk management approach) would result in no cumulative impacts to the long-term viability of the managed herd and would aid in the attainment of a thriving ecological balance on the range.

**2) Impacts and Measures Common to Actions A and B for Wilderness Study Areas:** Three BLM wilderness study areas, containing approximately 23,000 acres, exist within the boundaries of the Pryor Mountain Wild Horse Range including Pryor Mountain, Burnt Timber Canyon and Bighorn Tack-On. In addition, sections of Lost Water Canyon (USFS) and Bighorn Canyon (NPS) are contained within horse range boundaries. Certain activities are restricted within these wilderness study areas including off-road vehicle use. Maps and information would be provided to the gather contractor which clearly indicate wilderness boundaries and operative restrictions. Most gather activity would happen through the use of a helicopter and therefore predicted impacts to WSA values are considered very temporary and meet non-impairment criteria. The permanent corral facility at Britton Springs would likely be the only trap and holding facility which would be needed for the gather. Any temporary traps that are likely to be needed would be constructed along designated roads which are excluded from WSA status. Any impacts would be considered as only a temporary disturbance and, as such, no irretrievable or irreversible impacts to any WSA value are anticipated with implementation of the Proposed or Alternative Action.

Maintaining the PMWHR population within an acceptable range of AML (lower limit determined by minimum effective genetic herd size and upper limit determined by the point at which grazing impacts surpass an acceptable use level based on a risk management approach) would result in no cumulative impacts to identified wilderness values and the attainment of a thriving ecological balance on the range would likely aid in maintaining these values over the long-term.

**3) Impacts and Measures Common to Actions A and B for Visual Resources, Recreation and Hunting:** In an effort to ensure the safety and welfare of all participants and observers for either the Proposed or Alternative Action, management intends to apply a full, but rotating closure affecting two designated areas of the range. As such, for a 1-2 day period in which the helicopter is working either Sykes Ridge or Burnt Timber Ridge, these areas, including road access, would be individually closed. Only one area would be affected at a time. Gather efforts along the Bighorn Canyon National Recreation Area "Dryhead" would be co-ordinated through the National Park Service. This area would not be closed but some traffic control would be in effect during actual days of helicopter activity. It would also be necessary to co-ordinate with "livestock trailing" ranchers who may be using the Dryhead area during this same time period. Mitigation measures would include early and repeated notification to the public regarding proposed closures and timing, as well as close inter-agency co-ordination during the gather period.

Efforts would also be made to avoid time periods, such as weekends, of heavier anticipated public use of the range. However, the helicopter contractors are available to work on weekends,

and this may be necessary as dictated by temporary weather shut-down or other unforeseen circumstances. Scheduling of the gather in early September should mitigate, if not eliminate, most conflicts with mule deer, black bear and bighorn sheep hunters on the PMWHR. Efforts would be made to contact hunters who might be using the area, to inform them of the planned gather and schedule for closures well in advance the event. It should be stressed, however, that area and road closures would be of limited duration and only on days the helicopter is actually working a particular ridge.

Also, in an effort to facilitate anticipated media and public interest and attention towards the gather, management would establish specific viewing areas to the northeast of the Britton Springs Administrative Site. These sites would provide excellent viewing of helicopter gather activities as the horses are guided down either ridge. In addition, public affairs staff would be on hand at these sites to comment on the gather activity and current events. At the conclusion of each days activities, the Wild Horse and Burro Specialist would be available to comment and answer questions pertaining to specifics of the gather activity and selected removal program.

#### **4) Impacts and Measures Common to Actions A and B for Sensitive Plant and T&E Species:**

Several rare and sensitive plants occur in the arid and semi-arid plant communities of the Pryor Mountains. Among these is Lesquerella lesicii (Pryor Mountain bladderpod), which exists within 3 areas of the PMWHR, including Mystery Cave, Big Coulee and Sykes Ridge. The largest population occurs on Sykes Ridge, in an area which the horses are known to use as habitat. At this time, all 3 populations appear to be thriving but there is concern regarding the potential impact of ungulate trampling and grazing on this species (Lesica, on file at BiFO). In addition, it grows with a number of other rare and sensitive endemics including Shoshonea pulvinata (shoshonea).

Based on the expected distribution of the Pryor horses in September (Attachment 3), at the time of the gather, it is not anticipated that horses would be brought down off the mountain using either the Sykes Ridge or Big Coulee areas. It is highly expected that the horses which are within the subalpine meadows would travel down Burnt Timber Ridge, as it is the shortest and most direct route. If this is the case, then potential trampling effects by the horses upon these plants would be mitigated by this behavior.

As such, no irretrievable or irreversible impacts to any sensitive plant species are anticipated with implementation of the Proposed or Alternative Action.

Maintaining the PMWHR population within an acceptable range of AML (lower limit determined by minimum effective genetic herd size and upper limit determined by the point at which grazing impacts surpass an acceptable use level based on a risk management approach) would help limit cumulative impacts to identified sensitive plant species within the horse range. Presently, there is concern regarding the potential affects of ungulate trampling and grazing on these species, and mitigation measures would include initiating necessary research to evaluate these possible impacts.

**5) Impacts and Measures Common to Actions A and B for ACECs:** The East Pryor Mountains (including the PMWHR) were designated ACEC in March 1999. The area is to be managed per VRM Class II objectives. Most gather activity would happen through the use of a

helicopter and therefore predicted impacts to ACEC values are considered very temporary and minimal. The permanent corral facility at Britton Springs would likely be the only trap and holding facility which would be needed for the gather. Any temporary traps that are likely to be needed would be constructed along designated roads which is acceptable under ACEC status. Any impacts would be considered as only a temporary disturbance and, as such, no irretrievable or irreversible impacts to any ACEC values are anticipated with implementation of the Proposed or Alternative Action.

Maintaining the PMWHR population within an acceptable range of AML (lower limit determined by minimum effective genetic herd size and upper limit determined by the point at which grazing impacts surpass an acceptable use level based on a risk management approach) would result in no cumulative impacts to identified ACEC values and the attainment of a thriving ecological balance on the range would likely aid in maintaining these values over the long-term.

**6) Impacts and Measures Common to Actions A and B for Livestock Grazing and Trailing:** Movement of cattle through the Dryhead (NPS) portion of the horse range occurs during the Fall period under agency authorized trailing activities. Co-ordination with the Park Service and local ranchers would be necessary to mitigate potential impacts of helicopter gathering on this trailing activity. In addition one family group of horses (3 animals) has, for the past two years, used portions of Commissary Ridge within the Custer National Forest unauthorized lands on a year-round basis. Part of the removal effort would involve bringing these animals back onto designated or authorized range. This would require co-ordination with the Forest Service as well as the permittees who may have cattle in the Commissary Allotment at the time of the gather. Removing these horses from unauthorized lands would reduce conflict for the permittee as well as the Forest Service, and also provide the BLM with an improved opportunity to provide protection to this band of horses as required by law.

**7) Impacts and Measures Common to Actions A and B for Vegetation:** Implementation of the Proposed or Alternative Action would reduce the wild horse population to AML within the PMWHR. This action would be expected to promote a thriving, natural ecological balance. Maintaining the wild horse population within the appropriate management range would also allow for increases in vegetation density, vigor, reproduction, productivity, and would thus result in increased forage availability.

Adverse impacts to vegetation with implementation of the Proposed and Alternative Action would include slight surface disturbance and trampling of native vegetation, to some extent, during the gathering process of the capture. Mitigation measures would include permitting the horses to select their own route down the mountain as, in most cases, they would use pre-existing trails and roads. Immediately in and around temporary trap sites and holding facilities, there would be some level of disturbance of native vegetation. Impacts created by vehicle traffic, and hoof action of penned horses, can be locally severe in the immediate vicinity of any corrals and holding facilities. Generally, these activity sites would be small (less than one half acre) in size and these impacts would remain site specific and isolated in nature. These impacts are unlikely to happen, however, as it is anticipated that the Britton Springs corral facility would serve as the primary (and perhaps only) trap and holding facility needed for the gather. The area surrounding

this facility is under administrative withdrawal. In addition, most temporary trap sites or holding facilities are selected to enable easy access by transportation vehicles and logistical support equipment and would therefore generally be adjacent to or on roads, pullouts, water haul sites, or other flat spots which possess an increased likelihood of having been previously disturbed, thereby minimizing the cumulative effects of these impacts.

**8) Impacts and Measures Common to Actions A and B for Terrestrial Wildlife:** Under the Proposed and Alternative Actions, the potential exists for a temporary loss of a small amount of habitat and temporary displacement of wildlife from disturbance associated with the gather activity. The contractor would be guided to be wary of placing undue helicopter pressure on other ungulates on the range. Direct mortality of less mobile species, such as reptiles and small mammals, is likely to occur as bands of horses are herded down the mountain. All of these impacts would be temporary and none would be considered significant. No impact to avian species would be expected because all nesting and fledgling of young would be completed by the time of the gather, and the major use by nongame birds appears to occur during the spring and summer months.

Competitive interaction studies were recently completed between grazing ungulates on the range and indicate that at least within the last few years, three species of ungulates (bighorn sheep, mule deer and wild horses), have co-existed in populations of varying density with minimal negative impact on one another. As populations change in size due to reproductive success, disease and/or other natural regulatory mechanisms, this tenuous balance could easily shift. It is important to maintain this balance by ensuring that population control mechanisms are effective. The mule deer and bighorn sheep populations seem to be subjected to natural controls while the horse herd must rely on artificial intervention to maintain a balance between population size and habitat capacity. As such, maintaining the PMWHR population within an acceptable range of AML (lower limit determined by minimum effective genetic herd size and upper limit determined by the point at which grazing impacts surpass an acceptable use level based on a risk management approach) would result in no cumulative impacts to other wildlife species, yet the attainment of a thriving ecological balance on the range would likely promote viable populations of these other species as well.

**9) Impacts and Measures Common to Actions A and B for Soils:** The gather of horses, under both the Proposed and Alternative Action, would occur along existing horse trails or designated roads and conclude in the Britton Springs corral facility. During the gather some additional disturbance to soils and vegetation adjacent to the trails would occur. Aggregate structure can be destroyed, deep hoof prints could modify and influence surface drainage, additional compaction of the soil and trampling of vegetation can result. The degree of these impacts would be dependent on soil moisture conditions, the concentration of horses and the overall amount of time horses are present.

The most severe impacts to the soil resource would be expected near and in temporary traps and holding corrals, if they should be constructed. Dry soil conditions at the time of the gather would decrease the potential for compaction and deep hoof prints, but soil particles would be more susceptible to wind erosion due to reduced aggregate stability. These impacts to the soil resource

would be localized and generally short-term, unless severe adverse climatic conditions followed shortly after the gather. The latter would further displace or remove soil materials by wind or water erosion. Any temporary trap areas should be monitored the following growing season to insure that the native perennial plant community would be capable of maintaining adequate soil cover to prevent wind or water erosion. Revegetation of these areas would be needed if the native plant community is not capable of protecting the soil resource.

**VI. CONSULTATION AND COORDINATION:** Through the process of public scoping for the Pryor Mountain Wild Horse Range Herd Plan Revision, which included two public meetings as well as the submission and summary of significant written comments, BLM reviewed received input regarding ALM for the Pryor herd as well as population control techniques. Several mailings went out to the public during this period in order to seek additional input on several other issues being considered in the plan revision. All of this input was considered in the development of this EA and Gather Plan as well. In addition, results of eight years of ecological research studies on Pryor wild horse population genetics and ecosystem modeling were given detailed consideration. It is significant that these studies involved co-operative efforts with 6 state and federal agencies and 3 universities. Results of all of these research efforts have been extensively shared with a Pryor Mountain distribution list totaling over 400 individuals and groups. A public hearing, regarding the use of helicopters in this proposed action, will be held on Thursday, August 16th, 2001 (7 pm) at the Bighorn Canyon National Recreation Area Visitor Center, in Lovell, Wyoming. During these meetings, the public will be given the opportunity to present new information and to voice any concerns regarding the use of these methods to capture wild horses.

**A. List Of Preparers:**

Linda Coates-Markle, Wild Horse and Burro Specialist, Montana/Dakotas

**B. Individuals, Groups and Agencies Consulted:** This EA and Gather Plan have been distributed to members of the general public, special interest groups, intra- and interagency personnel, and researchers at several different institutions (see Attachment 6) for review and comment. A press release was issued in the local and state media informing the public that the EA and Gather Plan had been prepared and is available for review. Copies of the EA are available at the Billings Field Office.

**VII. FONSI:** The environment assessment, analyzing the environmental effects of the proposed action, has been reviewed. With the implementation of the attached mitigation measures, there is a finding of no significant impact on the human environment and an Environmental Impact Statement (EIS) is not required. Implementation of the Proposed Action will not result in unnecessary or undue degradation of the Public Lands. In addition, the Proposed Action is in conformance with the appropriate and approved land use and herd management plans.

**SIGNATURE OF PREPARER:** \_\_\_\_\_

**Date Signed:** \_\_\_\_\_

**SIGNATURE OF ENVIRONMENTAL REVIEWER:** \_\_\_\_\_

**Date Signed:** \_\_\_\_\_

**SIGNATURE OF AUTHORIZED OFFICIAL:** \_\_\_\_\_

**Date Signed:** \_\_\_\_\_

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