## APPENDIX A

# LITTLE BOOK CLIFFS WILD HORSE RANGE POPULATION MANAGEMENT PLAN

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# LITTLE BOOK CLIFFS WILD HORSE RANGE POPULATION MANAGEMENT PLAN

The purpose of a population management plan is to provide guidance for the management of wild horses within Herd Management Areas. As a basis for determining the appropriate management actions in the future, a review of historical events, background information, past management, local population data and studies, current research and as well as current policy is necessary. Following is a discussion of each of these elements followed by management actions for the Little Book Cliffs wild horse herd identified to meet management objectives in the Herd Management Plan and provisions of the Wild Free-Roaming Horse and Burro Act.

## HISTORY AND BACKGROUND

The Little Book Cliffs Wild Horse Range was established through a General Management agreement in 1974 and officially dedicated as a wild horse range on November 7, 1980. Wild horses had inhabited the area many years prior to 1974, dating back to the first part of the 20th century. Throughout the first half of this century horses were introduced and removed by local ranchers. In 1971, the Wild Free-Roaming Horse and Burro Act was enacted to protect, manage and control wild horses and burros on BLM land. The population count for the Little Book Cliffs Horse Area at this time was 42 head. Once protected the population expanded annually. The annual increase in population size ranges from 15 to 25 %.

The Little Book Cliffs Wild Horse Management Plan (WHMP) was implemented in 1979 and updated in 1984, 1990 and 1992. Specific population objectives were:

- Provide for the protection of wild horses from capture, branding, harassment and death.
- Maintain a healthy, viable breeding population of 65 to 125 wild horses, with an Appropriate Management Level (AML) of 80 head.

This Population Management Plan (PMP) is an amendment to the WHMP. It will provide guidance for the management of the Little Book Cliffs Wild Horse Range and the horses on the range, and establish the appropriate management level (AML) for the horse population.

Several gathers have occurred since 1979 to meet the population objectives stated above. Gathers have occurred in 1975, 1977(40), 1983(45), 1988(44), 1989(40), 1992(39), 1996 (53), 1997(10), and 1999(56). Numbers in parentheses represent the number of horses removed from the range. The gathers in 1975 and 1997 were to gather horses outside the area. In 1975 the horses were gathered from the adjoining livestock allotment, particularly the Red Rock, Round Mountain and Bronco Flats area, and moved into the Horse Area. Gathers in 1989 and 1977 were unscheduled but necessary due to drought conditions.

The WHMP called for periodic introduction of wild horses from other BLM horse herds into the area to avoid the undesirable effects of inbreeding, to maintain vigor as well as good conformation and to keep a diversity of color in the herd. The history of released animals is as follows:

| Year | Number Released | Sex of Horses | Color of Horses | Previous Location | Location Released |
|---|---|---|---|---|---|
| 1983 | 6 | 4 studs, 1 mare, 1 filly | Gray Pinto, Buckskin, Palomino, Sorrel (2) | Colorado- Piceance Herd | Indian Park |
| 1985 | 2 | studs | Buckskin. Red roan | Wyoming | North Soda |
| 1986 | 2 | studs | Palomino, Brown Paint | Wyoming | Coal Canyon |
| 1987 | 4 | 3 studs, 1 mare | Gray, Pinto, Red roan, Blue roan | Wyoming | Indian Park |
| 1993 | 2 | mares | Buckskin, Dun | Nevada | Coal Canyon |
| 1994 | 3 | 2 mares, 1 colt | Paint, Bay Paint | Utah-Vernal | Low Gap North Soda |
| 1998 | 1 | stud | Gray | Colorado- Spring Creek | Indian Park |

Past introductions have been very successful. Observations have shown that young studs released take several years before they obtain a mare or harem. Whereas mares generally are picked up by a stud soon after release, but will wander from stud to stud before sticking with a particular stallion.

Genetic Studies

Genetic variation and diversity is a concern in the Little Book Cliffs herd due to the relatively small population size. In 1993 a report was written by E. Gus Cothran, PhD. from the University of Kentucky summarizing an analysis of genetic data from the Little Book Cliffs horses including recommendations for management. Results were obtained from the analysis of blood samples taken from adopted horses gathered from the area and animals rounded up in 1992.

In terms of genetic similarity Dr. Cothran states that the genetic origin of the herd is not clear, however data suggests a fairly strong Spanish component including the Morgan Horse and the American Saddlebred . He also states, genetically the herd does not fit in well with any grouping of domestic breeds and is placed in a position between the saddle horses and the cold blood breeds. Genetic tests revealed that the Little Book Cliffs herd is most similar to the Spring Creek Basin and Piceance herds.

The level of genetic variation in the Little Book Cliffs herd is low, but not immediately threatening. Mr. Cothran concluded that overall genetic variability is low but when compared to other feral horses is higher. He states that inbreeding is not yet a problem, however if population size is kept at a low level and there is no introduction of outside animals, inbreeding is inevitable.

Management actions suggested by Dr. Cothran based on his analysis were:

-Keep the population near the carrying capacity of the range to build up the genetic reserve of the herd.
-On an irregular basis introduce one or two horses to the herd to increase genetic variability reducing the risk of inbreeding. Females are preferred as introductions as they are less likely to cause drastic changes in the makeup of the population with unpredictable results. Select horses from within the same geographic region.
-To improve/maintain the effective population size remove mainly young animals. By culling young horses, the genetic variation that currently exists in the herd remains in the animals that are reproducing.
-Continue to monitor genetic components within the herd.

Population Studies: The majority of information obtained on the Little Book Cliffs herd has been from field observations. A local volunteer, Marty Felix along with the Friends of the Mustang, under a cooperative agreement, have spent endless hours gathering information. Information gathered includes population size, annual foal crop, mortality, number of bands, distribution, age structure, sex ratio and intra-herd movement. Because of these efforts information gathered for this herd is of greater detail than that afforded of most other wild horse herds. A computer program known as Wild Horse Identification Management System has been developed in cooperation with the U.S. Geological Survey to store data on individual animals and provide a means of summarizing population data. Aerial counts were used in the past but became unfeasible due to expense and difficulty in finding horses due to the terrain and pinon-juniper vegetation type.

Population Size and Foal Count data since 1994 is shown below.

| Year | Total Population Estimate* | Foal Count |
|---|---|---|
| 1994 | | 24 |
| 1995 | 151 | 24 |
| 1996 | 166 | 29 |
| 1997 | 142 | 33 |
| 1998 | 162 | 30 |
| 1999 | 183 | 39 |
| 2000 | 153 | 30 |
| 2001 | 169 | 33 |

*Estimates include Adults and the current years foals.

Selective Criteria for Removal in Past
Prior to 1988, selective criteria for removal was primarily to remove most of the animals captured except for a few select animals. Prime breeding animals and a few older animals were released. Capture efforts occurred in one or two sites each gather.

Beginning in 1988 selective criteria focused on: removing younger animals (5 years and less), reducing bachelor bands, improving color balance on range (reduce dominant colors), improving conformation, retaining older animals (15 years and older), and retaining successful breeding animals on range to maintain genetic variation and diversity. Capture efforts occurred in three or more areas of the range to even out distribution and balance numbers within each area.

The Herd as of 2001

As of October 2001, the Little Book Cliffs herd consisted of approximately 169 horses including 2001 foals. Census data was obtained from observations and data collection by the local volunteer organization. Based on the 169-horse count, 74 were females, 87 were males and 8 unknown resulting in a sex ratio of females to males of 46% to 54%.

The current age structure is representative of a typical age structure for a wild ungulate herd being pyramidal in shape with the majority of animals in the youngest age categories. Age structure is summarized below based on information compiled in October 2001:

| Age | Number of Animals | Percent of Population |
|---|---|---|
| < 1 | 29 | 18 |
| 1 | 29 | 18 |
| 2 | 15 | 9 |
| 3 | 10 | 7 |
| 4 | 12 | 8 |
| 5 | 10 | 7 |
| 6 | 7 | 5 |
| 7 | 9 | 6 |
| 8 | 6 | 4 |
| 9 | 4 | 3 |
| 10 | 4 | 3 |
| 11 | 3 | 2 |
| 12 | 4 | 3 |
| 13 | 2 | 1 |
| 14 | 2 | 1 |
| 15 | 1 | 1 |
| 16 | 0 | 0 |
| 17 | 1 | 1 |
| 18 | 1 | 1 |
| 19 | 1 | 1 |
| 20+ | 2 | 1 |
| Total | 152 | 100 |

* The age for 17 horses was unknown.

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. The greatest cause of mortality is injury and old age.

Color Variation in the Little Book Cliffs Herd: The color variation has increased in the herd since designation of the herd area. For the most part this is due to the introduction of horses to the area with coloration less prominent to the area and through the selection process during gathers.

| Color Variation in Little Book Cliffs Herd as of 2001 | | |
|---|---|---|
| Color | Number of Animals | Percent |
| Bay | 43 | 24 |
| Black | 33 | 19 |
| Sorrel | 14 | 8 |
| Buckskin | 13 | 8 |
| Dun | 8 | 5 |
| Chestnut | 10 | 6 |
| Paint | 16 | 9 |
| Palomino | 6 | 4 |
| Brown | 6 | 4 |
| Grey | 5 | 3 |
| Red Roan | 5 | 3 |
| Grulla | 3 | 2 |
| Blue Roan | 5 | 3 |
| White | 2 | 1 |
| TOTAL | 169 | 100% |

FUTURE MANAGEMENT

Population Objectives:

1) Provide for the protection of wild horses from capture, branding, harassment and death.
2) Maintain a healthy, viable breeding population at a level which will achieve and maintain a thriving, ecological balance on the public lands and does not result in deterioration of the range.
3) Establish an Appropriate Management Range of from 90 to 150 horses.

**Management Actions**:

-Appropriate Management Level (AML): The original Horse Management Plan for the Little Book Cliffs Wild Horse Range stated that a healthy, viable breeding population of from 65 to 125 wild horses with an AML of 80 head would be maintained.

In 1997 the Round Mountain Area consisting of 4,904 acres was added to the horse range through a cooperative management agreement. There were 319 animal unit months associated with this acreage in terms of available forage for livestock use which equates to 26 Animals Year Long.

An Ecological Site Inventory (ESI) was completed for the horse range in 1997. Analysis of the Ecological Site Inventory data in relation to available forage for wild horses using the proper use factor confirmed that the horse range could support a maximum herd of 150 horses. Management of a population larger than this would have a negative influence on the thriving natural ecological balance.

When considering the original carrying capacity, the estimate from the ESI and the vegetative studies completed in the area, and the necessity for a minimum four year gather cycle, it was determined that the new AML will be a range between 90 to 150 horses.

Selective Criteria for Removals: Overall the main objective for selective removal is to maintain the viability, adaptability, and character of the established herd which includes keeping breeding bands together as much as possible. The appropriate philosophy involves retention of the natural working integrity of the population, allowing the majority of the decisions to be driven by the horses themselves. Priority is given, therefore to retaining dominant stallions, established lead and/or partner mares and reproductively successful mares within each established family group. This approach also recognizes the importance of maintaining reproductively fit horses to assist with long-term perpetuation of the population as recommended by Dr. Cothran. As such, removals are concentrated on young animals which have not as yet entered the breeding ranks of the population and have the greatest ability to adapt to adoption and domestication.

Age structure: Retain the pyramidal age structure discussed earlier. As directed by current policy, wild horses five years and younger and horses ten years and older will be targeted for removal during gathers. The majority of horses between six and nine years of age will be returned to the range. Select animals in removable age groups will be returned to the HMA when it is determined it is in the best interest of the animal, or to encourage maintenance of a viable, self-sustaining herd. Horses greater than 20 years of age will be returned to the range or euthanized if they cannot maintain a Henneke condition score of two.

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Sex Ratio: Removals should result in a female to male sex ratio ranging from 60:40 to 40:60 with an ideal ratio of 50:50. Preference would be to have a higher number of females than males based on studies suggesting desired sex ratios in wild ungulates. At the same time it has been suggested that removals which increase the sex ratio slightly in favor of males tends to support a social structure of many smaller harems over that of fewer larger harems, which results in a positive impact on the effective genetic herd size.

Color: Color balance should continue to be a consideration during removals but not the major factor in determining selection of animals to be removed. Maintaining the diversity of color in the herd is important but overall health of the herd including genetic make-up, herd demographics and herd social structure should override color in the selection process. The introduction of animals to the herd with color variations should continue but again color alone should not be the only factor considered when selecting horses for introduction as discussed above. Horses with color associated with health problems should be avoided.

Conformation: Horses with undesirable physical disabilities which are hereditary in nature should be removed to prevent passage on to future generations. Manage for horses which are 14 to 15 hands in size at maturity.

Introduction of Horses: Due to the relative small population of wild horses within the Little Book Cliffs herd, inbreeding is an inevitable consequence which over the long term results in the loss of genetic variability. As discussed above in order to counteract the loss of genetic variation within the Little Book Cliffs herd it is necessary to periodically introduce new horses from other wild horse herds.

The following criteria would be used for selecting individual horses for introduction:
-Wild horses selected for introduction would be from those herds which closely resemble (per DNA analysis) and exhibit the same characteristics and conformation of this herd.
-Wild horses from the same geographic area containing habitat characteristics similar to the Little Book Cliffs Wild Horse Range.
-Various colors of individual horses could be selected for introduction.
- Younger mares (2-5 years old) would be the preferred sex, but stallions meeting the other criteria is also acceptable. Mares tend to be more readily acceptable by other horses into established existing bands.
-Only individual horses that exhibit good health, strength, vigor and good conformation would be selected for introduction. Individual horses with severe injuries, gross deformities or disease would not be selected for introduction.

Transplants: Continue to transplant horses from one portion of the range to another during gather operations. This action will reduce inbreeding activity.

Trap Site Locations: Continue to gather and remove horses from several locations within the range to even the distribution. Dr. Cothran recommended that removal of horses from the range should not concentrate on one geographic area over another to promote genetic health of the herd.

Fertility Control: The use of fertility control measures need to be considered in the future for population management of the Little Book Cliffs Herd. Long term research efforts have resulted in viable alternatives to removal-only procedures in controlling herd size. The use of contraceptives has long been recognized as a humane alternative to limit the growth of wild horse herds while providing less disruption to the herd gene pool. Based on a four year gather cycle, the current AML and an expected population increase of 15 to 25% annually, gathers would have to reduce the population size to 80 animals given a 5% mortality rate. From a herd stand point, this reduces the population size to an undesirable level and could potentially effect the health of the herd in terms of genetics and maintaining an effective population size. Fertility Control will provide a means of reducing the annual growth rate of the herd which would increase the time frame between gathers while maintaining the herd at an effective population size. In addition, Fertility Control use on younger mares allows these mares to advance in maturity prior to foaling thus reducing stress and physical demands on these young animals. Currently the immunocontraceptive vaccine has not been approved by the Food and Drug Administration for management based applications, but can be used for approved research needs.

Blood-Draws for Genetic and Health Studies: Blood Samples should be drawn from horses removed during gather efforts when appropriate or as needed. At a minimum, this will be done every other gather. If conditions and facilities allow, all horses gathered should be tested with priority given to animals turned back onto the range. These samples will be used to supplement genetic data which as been gathered periodically in the past, in an effort to further monitor genetic variability and genetic effective population size for the Little Book Cliffs herd. The information will also aid in minimizing the occurrence of inbreeding and genetic defects.

Population Studies: Continue with the current level of data gathering including, herd size, foal counts, mortality, demographic data such as age structure, sex ratio and color as well as overall

population data contained in the Wild Horse Identification Management System computer program. Continue to take advantage of the efforts of Marty Felix, Gerald Thygerson and Billy Hutchings and the local Friends of the Mustangs group in gathering and compiling information.