

Age Characteristics of Feral
Horses in Montana

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ABSTRACT

The population dynamics and age characteristics of feral horses in Montana were studied over a four-year period (1974-1978). The herd size ranged from 95 to 168 horses. Fifty-two horses were removed through Adopt-A-Horse and approximately 71 died from natural causes. The age profile of the herd indicates that almost 50% of the horses were three years old or less, and the female:male ratio was two:one. Over the four years the average age of the horses ranged between 6.26 and 6.7 years and did not differ significantly. Dominant harem stallions averaged 12.8 years, and non-dominant harem stallions averaged 1.7 years of age. Bachelor stallions averaged 6.1 years of age and lead mares averaged 12.2 years. One hundred and three foals were born and survival through their first year ranged from 38% to 100%. The reproductive age of mares ranged from three to 21 years. Nineteen of 21 two-year old males examined had undescended testes and were permitted to remain with their respective harems. Two two-year old males had partially descended testes but no signs of spermatogenesis. Both of these horses had been ejected from their harems. Normally, young stallions are permitted to remain with their harems until age three. A sex ratio of 2:1 female:male appears to stabilize social structure of the herd.

INTRODUCTION

Although there are presently an estimated 70,000 feral horses inhabiting public lands in ten western states, very little is known about the population dynamics and age distributions of these horses. The studies of Feist (1971), Pellegrini (1971), and Hall (1972) were the first systematic attempts to

gather data on population characteristics and social structure of America's feral Equidae. While the results of these three studies provided a foundation for our early understanding of feral horses in North America, there were limiting factors imposed upon the investigations. Two of the three studies were of a short-term nature (one year or less) and only Hall's work provided any aging data.

For a variety of reasons, the precise age profiles for the various herds are not well understood, usually because fiscal restraints prohibit the acquisition of age data from large numbers of animals. In the Pryor Mountains of south-central Montana, on the 45,000 acre National Wild Horse Range, a herd of feral horses has been studied over a four-year period, from 1974 to 1978. The purpose of this study was to provide a more accurate picture of age profiles as they relate to herd social structure and reproduction. Since the feral horse herds of the western United States do not represent a homogenous group of animals, it should be noted that these data and the accompanying conclusions are applicable only to the Pryor Mountain horses.

METHODS AND MATERIALS

During the four years encompassed in this study (September, 1974 through July, 1978), 73 feral horses were captured and aged. Another 124 horses were aged prior to 1974. Most often, the horses were driven or lured with water into holding pens and corrals. Once in the corrals, each animal was roped by the head and hind legs and gently stretched out until it went down ("heading and heeling"). Animals were lip tattooed, and aging was accomplished by evaluating tooth replacement and wear. In addition, each animal was identified by unique markings and harem band affiliation. The animals were released after they were aged. It is important to note here that age data derived from tooth replacement and wear must be carefully evaluated. Accurate aging of horses by this method is not difficult through eight years of age. Beyond that age range, the difficulty

increases (Ensminger, 1951). One technical problem involves horses living on gritty, sandy soils where tooth wear will occur very fast (Bone, 1964). The Pryor Mountains possess such a soil type. In this study, however, over 85% of the horses were aged before they reached eight years, providing accurate data. Over 650 hours of direct observation of the horses was carried out between September, 1974 and July, 1978. In almost all cases, observation was accomplished with the aid of spotting scopes without disturbing the observed animals. As animals were observed, unique markings permitted the gathering of age data. Where possible, data are presented as means \pm standard deviation. Student's T-test was used to evaluate differences for statistical significance.

RESULTS

Over the four-year period the herd size ranged between 95 to 168 animals. Ninety-five percent of this population was aged as described. Table I indicates the total population profile for the study period. Table II indicates the age class and sex of horses removed through the Adopt-A-Horse program during this study. Figure I indicates the age distribution of the herd in August, 1977. At this time, the horse herd was at maximum size and had suffered few losses, either through Adopt-A-Horse or through natural causes for two years.

The horses were found in harem groups, each consisting of a mature stallion (three years or older) and a number of mares, all-stallion bachelor groups, or in the case of very old stallions, alone. These social groups have previously been described by Hall (1972) and Feist (1971). The number of harem groups ranged between 19 and 27 over the four-year period. All changes in the number of harem groups from year to year were caused by the removal of excess horses as part of the Adopt-A-Horse program or by natural attrition during the winter and spring months. Harem groups ranged in size from two to ten animals with a mean of 4.9 ± 2.0 . The mean number of stallions per harem

was 1.7 and in only two cases did a harem have more than one mature stallion. In both these cases, the harem consisted of ten horses. Also, in both cases, one of the two stallions remained behaviorally subordinate to the other. In both cases, it was the older stallion which was dominant. No observations were made of subordinate stallions attempting to mate harem mares. The ages of all harem stallions ranged from eight to twenty-years with a mean of 12.8 ± 4.0 . The ages of immature harem males ranged from new foals to three years with a mean of 1.7 ± 0.4 .

The day-to-day activity of the harem is normally directed by a lead mare. Twenty-one lead mares were identified during the study and the mean age of this group was 12.2 ± 3.1 years. The sex ratio of the herd was almost exactly 2:1 female:male, however, this was primarily the result of removal of larger numbers of males from the range prior to 1974.

Six different bachelor groups were identified during the course of this study and all were composed of either two or three stallions. Their ages ranged from three to eight years with a mean of 6.1 ± 1.3 years. A total of six lone stallions were observed during the study. Of these, four were of known age. The mean was 16.1 ± 3.1 years.

During five consecutive foaling seasons, 103 live foals were born. At birth, the sex ratio was 2:1.88 female:male. Foal survival through their first year ranged from a high of 100% in 1976/77 to a low of 38% in 1974/75. The mean foal survival to age one for the four years was 75%. The ages of reproductive mares ranged from three to twenty-one years, with a mean of 8.4 ± 3.9 years.

Twenty one two-year old males were examined. All but two possessed undescended testes and were permitted by their respective harem stallions to remain in their harems. The two two-year olds with partially descended testes were

both driven from their respective harems during their second spring.

DISCUSSION

The number and size of the harem groups remained remarkably stable over a four-year period and were quite similar to the data of Hall (1972) and Feist (1971) from the Pryor Mountains and of Pellegrini (1971) in Nevada. The mean age of the horses in the Pryor Mountains also remained stable and did not differ significantly ($p < .05$) over the four-year period. During the study period, there were two years when foal survival was 100% (a total of 38 foals reached one year successfully), and 26 one-year olds were excessed through Adopt-A-Horse. These factors served to offset one another and to stabilize the average age.

The mean age of harem stallions was reported by Hall (1972) to be 7.8 years. Our data indicated the mean age of harem stallions to be 12.8 ± 4.0 years. This is also considerably older than the mean age of all males in the herd (7.2 ± 6.1 years). This upward trend in the age of harem stallions is possibly the result of fewer males in the herd and less competition for the mares.

The lead mare of the harem has been described previously by both Feist (1971) and Hall (1972). The mean age of lead mares (12.1 ± 3.1 years) was significantly older ($p < .05$) than the mean age of all mares (6.3 ± 3.1). This difference, once again, suggests a behavioral dominance imparted by increased age.

There is very little data available regarding bachelor stallion groups. Both Hall (1972) and Feist (1971) reported the existence of these groups, but neither study addressed the subject of age. The average age of 6.1 ± 1.3 for bachelor stallions must be viewed with caution, since a large number of horses removed in the Adopt-A-Horse program are juvenile males. Under more natural conditions, it might be expected that bachelor stallions would be, on the average, younger than 6.1 years.

The reproductive lifespan of feral mares appears to be greater than Hall (1972) estimated. Hall reported a reproductive lifespan of five or six years, beginning at four years and ending at about nine years. In contrast, we found a range from three years to twenty one years, with a mean age of 8.4 ± 3.9 years. Tyler (1972) reported that New Forest pony mares did not foal until age three or four (the same as in feral mares); however, there were no data from that study regarding reproductive lifespan.

Previous studies provide very little data regarding survival rates of foals through their first year. The lack of sound data on this subject has been the focal point in several legal cases involving feral horses management in the United States. Our data indicate a range of 38% to 100% survival over four years and makes it clear that generalizations about survival should be made with caution. According to the B.L.M., range conditions in the Pryor Mountains have been improving during the course of this study. The herd size has remained relatively static. The major variable was weather conditions during the winter and spring. The winters/springs of 1975/76 and 1976/77 were extremely mild, and those of 1974/75 and 1977/78 were extremely harsh.

As reported earlier by Feist (1971) and Hall (1972), there are few instances of reproductively active males, other than the harem stallion, remaining in the harem group. We found the mean age of subordinate harem males to be 1.7 ± 0.4 years, i.e., sexually immature.

Both Hall (1972) and Feist (1971) noted that feral stallions reach sexual maturity later than their domestic relatives (three years vs. eighteen months). The cause(s) of this delay is unknown but may involve nutrition and/or genetics. It is clear, however, that sexual maturity and descension of the testes occur at the same time and trigger, in some way, the expulsion of young stallions from the harem.

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TABLE I
TOTAL POPULATION PROFILE
AUGUST 1974 - JULY 1978

	<u>1974</u> ¹	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u> ²
LIVE FOALS BORN	24	13	25	24	17
ANIMALS REMOVED ³	0	27	0	25	0
MORTALITY	15	15	0	0	41
BASE POPULATION ⁴	148	119	143	142	118
AVERAGE AGE (\pm S.D.)	6.5 \pm 7.9	6.26 \pm 4.2	6.7 \pm 4.5	6.6 \pm 4.9	6.9 \pm 5.1

¹AUG. - DEC.

²JAN. - JULY

³ADOPT-A-HORSE PROGRAM

⁴DECEMBER OF EACH YEAR

TABLE II
AGE AND SEX OF EXCESSED HORSES

Age Class (Yrs.)	1975		1977	
	Male	Female	Male	Female
1	4	6	4	12
2	1	2	4	2
3	1	2	1	1
4	1	0		
5	2	0		
6	1	0		
7	1	1		
8	3	1		
10	1	0		
19			1	
	<u>15</u>	<u>12</u>	<u>10</u>	<u>15</u>

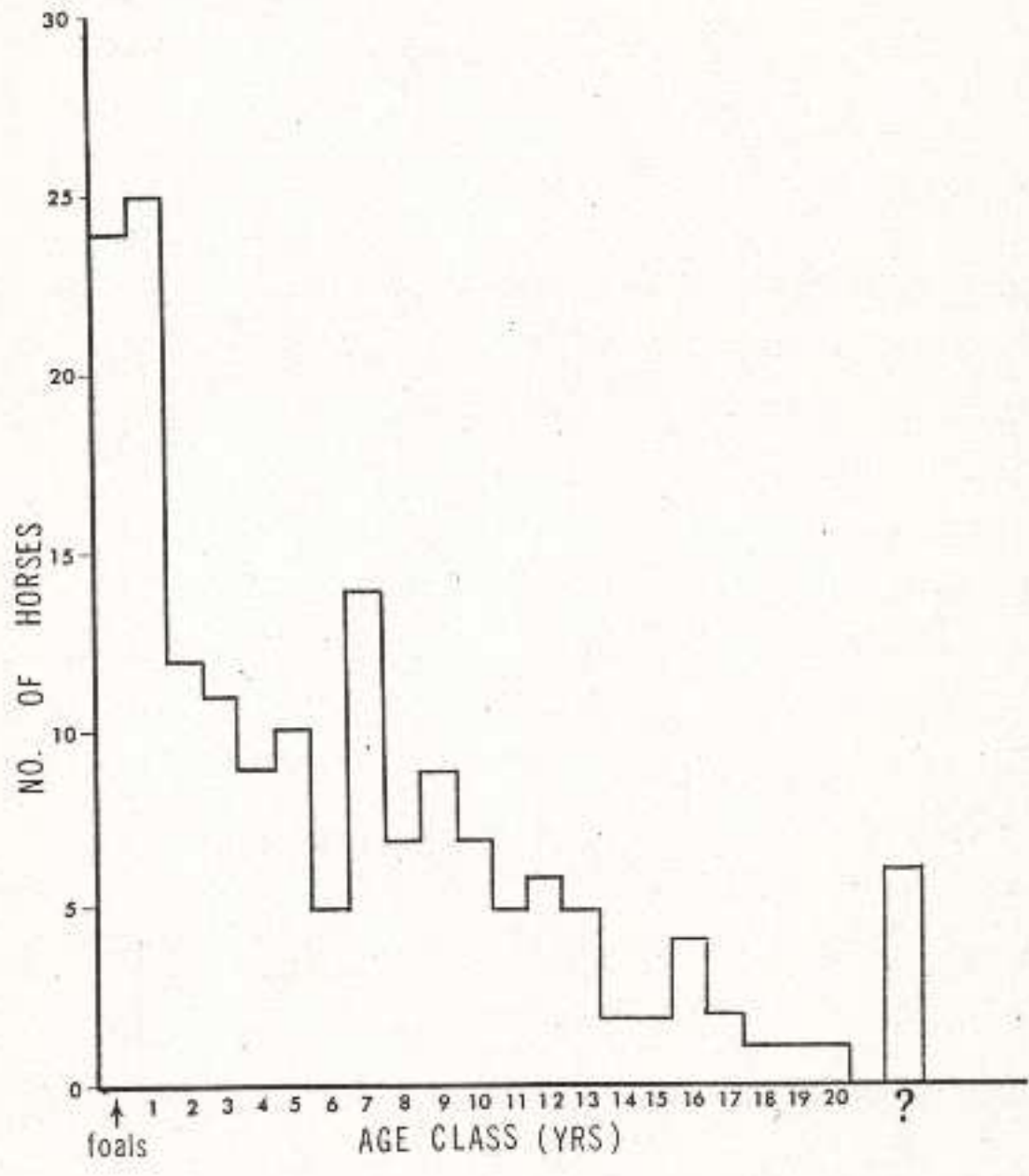


Fig. I. Age distribution of the Pryor Mountain
Feral Horse Herd in August, 1977.

TABLE III

Mean Ages

<u>Classification</u>	<u>Age Range</u>	<u>Mean Age</u> \pm <u>S.D.</u>
Harem Stallions	8-20	12.8 \pm 4.0
Immature Stallions <i>- in harem</i>	Foal - 3	1.7 \pm 0.4
Lead Mare <i>- day to day - Tent</i>	6-18	12.2 \pm 3.1
Bachelor Stallions <i>- 6 groups</i>	2-8	6.1 \pm 1.3
Lone Stallions <i>6 - 4 know</i>	12-19	16.1 \pm 3.1
Reproductive Mares	3-21	8.4 \pm 3.9

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