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Administration of the Wild Free-Roaming Horse and Burro Act

5th Report to Congress
June 1984

U.S. Department of the Interior
Bureau of Land Management

U.S. Department of Agriculture
Forest Service



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Preface

The Act of December 15, 1971 (16 U.S.C. 1331-1340), which provides for the "protection, management and control of wild free-roaming horses and burros on public lands," is commonly known as the Wild Free-Roaming Horse and Burro Act (Act). The responsibility for carrying out the provisions of the Act was delegated to the Bureau of Land Management (BLM) through the Secretary of the Interior and the Forest Service (FS) through the Secretary of Agriculture. As mandated by the Act, this Fifth Report on the Administration of the Act during Fiscal Years 1982 and 1983 is hereby submitted by the Secretaries to the Congress.

The situation of the wild horse and burro in this country has changed dramatically since 1971. Before the passage of the Act (with the exception of protected herds in two special areas in Nevada and Montana), wild horses and burros were often captured to be sold for profit, chiefly for use in commercial products, or destroyed as nuisances. The methods employed in their capture and destruction were usually less than humane.

As public awareness of the fate of these animals grew, so too did support for Federal legislation to protect these "living symbols of the historic and pioneer spirit of the West." Some wild horses and burros are believed to be descendants of domesticated animals brought to this continent by Spanish explorers, while others may be the progeny of escaped or abandoned animals once owned by settlers, miners or the U.S. Cavalry.

Once considered endangered by the nearly unrestrained onslaught of the mustangers and others, the wild horses and burros have thrived under the protection of the Act. With few wild predators and with protection from man, their most dangerous predator, wild

horses and burros on public lands increased from an estimated 17,000 in 1971 to just over 62,000 in 1983, more than double the estimated appropriate management level.

The success of the Federal protection program has required that special emphasis be placed on management and control of wild horses and burros. Research and land use planning are being utilized to establish goals for optimum horse and burro populations, consistent with the multiple-use principle of land management. Excess wild horses and burros that have been removed from the public lands have been disposed of primarily through the nationwide Adopt-A-Horse (or Burro) Program, begun in 1976, and through humane destruction of old, sick, or lame animals. The Act, as amended in 1976 and 1978, also requires that excess wild horses and burros for which no adoption demand exists be humanely destroyed, although a moratorium on destruction of healthy animals is currently in effect. Pending legislation supported by the Administration would provide another option for disposal of these excess unadopted animals removed from the public and national forest lands: sale through public auction.

To protect, manage, and control wild horses and burros on public lands, the Bureau of Land Management and the Forest Service continue to:

- maintain current inventories;
- plan for appropriate herd size;
- remove excess wild horses and burros;
- encourage adoption of healthy excess animals;
- enforce the provisions of the law and pertinent regulations; and
- seek the most effective means to achieve the objectives of the Wild Free-Roaming Horse and Burro Act.

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THE ACT:

The Secretary is authorized and directed to protect and manage wild free-roaming horses and burros as components of the public lands

Planning

The protection and management of wild horse and burro herds as components of the public lands ecosystem are addressed in the formulation of land use plans, which encompass all resource uses. This process becomes an intricate one when several potential uses are involved on a particular area and may require the reconciliation of many disparate uses and priorities. Resource management planning enables the Agencies to identify issues of public concern and to develop alternatives to resolve existing or potential conflicts between proposed uses of the resources in specific areas. One of these alternatives is then selected and becomes the land use plan for the public land area involved. In planning for and managing herds of wild horses and burros on the public lands, two primary issues must be addressed: the areas where herds will be maintained and the appropriate number of animals in each area.

Management Areas

By law, management of wild horses and burros must be limited to areas of the public lands where herds

existed in 1971, called herd areas by BLM and territories by the FS. (See Table A.) The determination of which areas or territories will be managed in the long term for wild horse and burro herds is made in consideration of several criteria, namely: (1) public interest and preferences, (2) established uses of the subject and adjacent public and private lands, and (3) the manageability of the herd area or territory itself. For each area determined to be suitable for management of wild horses and burros in the long term, a herd or territory management plan is prepared detailing the size of the herd to be managed, specific objectives for the herd and its habitat, and management methods that will be used to attain the objectives.

The FS has 47 designated territories of which 27 have completed management plans that spell out population objectives for long-term management. Of the remaining 20 designated territories without management plans, 10 are currently unoccupied by wild horses or burros and 5 have fewer than 8 animals each. Decisions to reintroduce animals to those territories or to declassify the territories will be made

Table A—Estimated Wild Horse and Burro Distribution in 1971

State	Forest Service ¹		Bureau of Land Management	
	Territories	Acres	Herd Areas	Acres
Arizona	3	42,964	11	2,815,000
California	11 (9)	466,999	39	6,608,700
Colorado	0	—	6	844,970
Idaho	2	4,880	8	460,740
Montana	1	3,350	7	151,764
Nevada	19 (18)	1,122,590	132	20,074,861
New Mexico	9	142,434	4	134,310
Oregon	2	100,660	33	3,819,157
Utah	3	44,685	28	4,227,735
Wyoming	<u>1 (0)</u>	<u>5,700 (0)</u>	<u>35</u>	<u>8,358,642</u>
Totals	51 (47)	1,934,262 (1,928,562)	303	47,495,879

¹Numbers shown in parentheses reflect distribution and acreage as of September 30, 1983. The FS has 47 territories containing 1,928,562 acres. The changes are the result of declassification of one territory (Wyoming) due to absence of animals, and consolidation of six territories into three, where territories overlapped forest or regional boundaries.

based on completed forest land management plans.

The BLM has completed sufficient resource management planning to confirm herd management as a long-term use of 142 herd management areas and has 58 herd management plans. The remaining resource management plans are scheduled for completion by 1988. It is anticipated that many of the remaining 161 original herd areas will also be identified through the planning process as suitable for long-term herd management.

Designated Ranges

Three of the herd management areas under BLM administration have been designated as wild horse ranges managed principally, though not necessarily exclusively, for wild horses. The first to be established, in 1961, was the Nevada Wild Horse Range. Located within the boundaries of the Nellis Air Force Base, the range is managed cooperatively through an agreement among the BLM, the Fish and Wildlife Service, the Air Force, the Department of Energy, and the Nevada Department of Fish and Game. In 1965, a management plan was developed which set the appropriate management level at 1,200 animals on the 395,000 acres of desert habitat. The present population is estimated to be 938 horses.

In 1968, a range was designated on the Pryor Mountain area of Montana and Wyoming, comprising approximately 44,000 acres of semiarid grassland and mountain shrub habitat types. The herd is presently at its planned size of 120 animals. Selective removal of excess horses has been employed to perpetuate a herd of small, compact animals, ranging in color from bay to blue roan.



A small band of wild horses roams public lands near Pyramid, Nevada.

Both the Pryor Mountain and Nevada ranges came into being before legislation gave wild horses and burros substantial Federal protection. These ranges exist because concerned private citizens worked for the preservation of the wild free-roaming horse as part of America's pioneer heritage.

Little Book Cliffs Wild Horse Range, designated on November 5, 1980, to provide opportunity for public observation and education, is the most recent of these ranges. This 28,000-acre range in west central Colorado is the home of between 80 and 100 wild horses. Situated in the Piceance Basin area, this herd coexists with active development of oil and gas energy resources and serves as an example of the multiple-use management possible even on designated ranges. This range is appropriately dedicated to the memory of Velma B. Johnston, "Wild Horse Annie." A proponent of a management program for the horses of Little Book Cliffs, Velma Johnston was also the most influential individual in the campaign for Federal legislation to protect America's wild free-roaming horses and burros.

Designation of additional ranges is possible as land use plans are completed and implemented.

Management Levels

Wild horse and burro numbers on each management area are allowed to fluctuate about a prescribed median herd size, referred to as the appropriate management level. Typically, deviations from the appropriate management level are managed at about 35 percent, so that a herd managed at an appropriate level of 300 horses might grow to 400 animals before being reduced by removals to 200.

The appropriate management level is itself usually established at a level below the maximum carrying capacity of the territory or herd management area because of allocations to other uses, both consumptive and nonconsumptive. Habitat condition and forage utilization are monitored to ensure that levels of use remain consistent with management goals and that needed adjustments can be identified.

Based on aggregations of results from completed land use plans, population analyses, and other data, the Agencies estimate that appropriate long-term management levels will be approximately as shown below:

	Horses	Burros
Bureau of Land Management	20,600	3,800
Forest Service	1,248	112
Totals	21,848	3,912

THE ACT:

The Secretary shall maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands.

Population Estimates

As with other living components of the public lands ecosystems, herds of wild horses and burros are inventoried periodically, a process called census, to estimate herd size, distribution, and composition. Most census taking is conducted from aircraft and is by nature an inexact science, with accuracy and precision of the estimates varying with weather conditions, terrain, and vegetation cover. An important element of the inventory process, therefore, is the development of indices or correction factors to allow conversion of aerial counts to reliable estimates of true herd size.

Two methods have been developed to allow such conversions. The mark-resight method entails marking a portion of the herd in some visible way on an initial flight and then conducting a count of the full herd area on a later flight. The count is corrected by the ratio of animals marked to marked animals subsequently observed. For example, if half the marked animals are resighted, the total count is assumed to have included only half the total herd and is corrected by a factor of two.

The index-removal method involves conducting two counts of the herd, one immediately before a scheduled removal and one immediately after. An index (sighting rate) is then calculated as the difference between the two counts divided by the number removed. With this sighting rate, the true herd size before and after the removal can be calculated from the pre- and postremoval counts. Such sighting rates can also be used to correct past and future censuses conducted under similar conditions.

Although these methods provide more accurate estimates of herd size than do simple aerial counts, they are more expensive and time consuming, and the need for increased accuracy must be weighed against these costs. Often it is sufficient merely to repeat counts made in the past and, assuming equal accuracy, detect trends and rates of change in the populations under observation.

A handbook for field use in conducting census and population analysis was developed in Fiscal Year 1983, based in part on research conducted by the University of Minnesota under contract to the Agencies. It should lead to more accurate and uniform description of herds in the future.



These wild burros are being counted for inclusion in the latest population estimates. Census conducted in open terrain may have a high degree of accuracy.

Biennial population estimates by State are shown in Tables B and C. It is important to note that in spite of a removal program aimed at reducing the wild horse and burro populations, only the wild horses on national forest lands have decreased to a point close to the appropriate management level. The wild horse population on BLM lands has declined from a high of approximately 54,000 in 1978, but still shows a net increase of nearly 15 percent for the decade. The number of wild burros has varied on both national forest and BLM lands over the 10-year period, with the combined total at the end of the decade representing a decrease of about 20 percent from 1974 levels.

Table B—Biennial Population Estimates by State for Wild Horses and Burros
on Lands Administered by the Bureau of Land Management

(Number of Animals)						
State	1974	1976	1978	1980	1982	1984
Wild Horses						
Arizona	115	107	70	125	150	115
California	3,000	4,230	3,700	2,897	3,320	4,106
Colorado	500	1,035	990	1,229	650	675
Idaho	500	874	1,200	935	880	811
Montana	325	257	300	232	200	141
Nevada	20,000	22,258	31,800	31,260	26,050	29,642
New Mexico	7,550	6,420	70	76	80	165
Oregon	5,265	7,493	4,050	3,458	3,270	3,748
Utah	1,000	1,803	2,150	1,714	1,330	1,636
Wyoming	4,411	8,833	9,700	10,448	9,000	7,959
Total	42,666	53,310	54,030	52,374	44,930	48,998
Wild Burros						
Arizona	10,000	2,668	3,780	5,000	5,600	3,625
California	3,200	3,072	3,845	6,152	4,850	5,900
Colorado	0	0	0	0	0	0
Idaho	8	9	10	16	20	0
Montana	0	0	0	0	0	0
Nevada	1,000	842	1,420	939	1,330	1,744
New Mexico	80	104	25	31	30	14
Oregon	16	25	0	20	20	25
Utah	50	70	80	13	20	50
Wyoming	20	0	0	0	0	0
Total	14,374	6,790	9,160	12,171	11,870	11,358

Wild horses gather to drink at a waterhole in the Owyhee Desert, Nevada.



In timeless fashion, this wrangler is about to capture a wild horse for removal from the public lands.



Table C—Biennial Population Estimates by State for Wild Horses and Burros on National Forest Land

(Number of Animals)

State	1974	1976	1978	1980	1982	1984
Wild Horses						
Arizona	7	5	3	8	5	7
California	828	1,037	1,381	1,397	1,006	496 ^{1,2}
Colorado	0	0	0	0	0	0
Idaho	34	5	0	7	7	3
Montana	8	9	8	8	8	20
Nevada	1,174	1,305	1,042	951	1,139	490 ^{2,3}
New Mexico	207	279	420	230	170	119
Oregon	215	295	215	225	485	205 ^{1,3}
Utah	45	90	103	121	74	47
Wyoming	23	0	0	0	0	0
Total	2,541	3,025	3,172	2,947	2,894	1,387
Wild Burros						
Arizona	36	24	14	4	16	166 ³
California	209	252	312	143	325	77 ^{1,2}
Colorado	0	0	0	0	0	0
Idaho	6	5	6	6	3	0
Montana	0	0	0	0	0	0
Nevada	13	15	28	16	40	15
New Mexico	5	15	30	35	32	25
Oregon	0	0	0	0	0	0
Utah	13	0	0	0	0	0
Wyoming	0	0	0	0	0	0
Total	282	311	390	204	416	283

^{1,2} Reasons for significant differences between 1982 and 1984 population estimates:
¹An aggressive capture program to bring population in line with management plan level
²Elimination of duplicate counting by BLM and FS on overlapping territories
³Improved census techniques

Burros are one of the renewable resources managed in the California Desert Conservation Area.



THE ACT:

Where the Secretary determines . . . that 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

Removal and Disposition of Excess Animals

The Act directs and provides for gathering and removing excess wild horses and burros from the public lands under the jurisdiction of the BLM and the FS.¹ Excess animals are removed from the range by herding (either via helicopter or horseback), by trapping with food or water, or (in limited cases) by chemical immobilization or firearm.

The determination of an excessive population of wild horses and burros may be made in consideration of one or more criteria, including inventories, resource management plans, grazing environmental statements, territory or herd management area plans, forage utilization studies, and other pertinent data. Once the existence of an excess number on a given area of public land has been established, the excess animals are gathered and disposed of in the following order as prescribed by the Act:

First, old, sick, or lame animals are destroyed in the most humane manner possible.

Next, the remaining excess animals are made available for private maintenance to the extent that an adoption demand by qualified individuals exists.

Finally, any remaining excess animals for which an adoption demand does not exist are destroyed in the most humane and cost efficient manner possible.

The third step in the disposition order was suspended in January 1982 when the Director, BLM, and the Chief, FS, declared a moratorium on the destruction of healthy excess animals. Because of the steady increase in horse and burro populations beyond the estimated appropriate management levels, the number of healthy excess animals removed from the public lands exceeded the immediate adoption demand. Animals accumulated in Government corrals, and large numbers would have been destroyed without the moratorium, which remained in effect at the close of Fiscal Year 1983 as the disparity between removals and adoptions continued.

¹Although most gatherings are for the purpose of removing excess animals, wild horses and burros are also removed from the range for other reasons: if they are on private land and the landowner requests their removal or if the herd is diseased.

In Fiscal Years 1982 and 1983, BLM and the FS removed a total of 16,892 animals from the public lands and placed only 12,425 animals in private care. Of the 4,467 animals removed but not adopted, approximately 1,300 were old, sick, or lame and were destroyed as an act of mercy, and over 500 died during or following capture operations. The remaining 2,600 were awaiting adoption at the end of Fiscal Year 1983.

Adoptions

The Adopt-A-Horse (or Burro) Program, which provides for private care and maintenance of excess wild horses and burros, is the primary and favored means of disposing of excess healthy wild horses and burros which have been removed from the public lands. Approximately 37,900 wild horses and 8,100 wild burros have been placed in private maintenance with over 20,300 individuals in 49 States since the program's inception. (See Table D.) The first adoptions took place in 1973 when 23 excess wild horses from the Pryor Mountain Range in Montana were placed in foster care. This method of disposing of excess animals removed from the range was then employed in Oregon in 1974 and in Nevada the following year. In 1976, the national Adopt-A-Horse Program was launched by BLM, and increasing emphasis has been placed on adoption efforts over the years. Through a Memorandum of Understanding, the FS has cooperated in the BLM Adopt-A-Horse Program to find homes for over 90 percent of the excess animals removed from national forest lands, processing the remainder through FS facilities.

The adoption program operates through three different types of facilities. The first is the BLM-run adoption center. Such centers are maintained in nine Western States: Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, and Wyoming. A second type of center, the contract adoption center, is operated by individuals under contract to BLM in various regions of the country. This concept responds to the need to increase adoption demand by making centers accessible to a greater number of people. At the close of Fiscal Year 1983, contract centers were

operating in five locations: Valley, Nebraska; Lewisberry, Pennsylvania; Eugene, Oregon; Cross Plains, Tennessee; and Collinsville, Texas. The Pennsylvania facility began operation during the summer of 1982, and the Texas center opened in 1983.

Accessibility was also the reason for the initiation of a third type of center, the satellite or temporary center. When an adoption demand is identified in an area not convenient to a permanent center, temporary facilities serve to place the animals. Temporary adoption centers have been located in most Western States, as well as a number of States east of the Mississippi. An increasingly effective part of the adoption effort, these centers take the animals to areas where demand exists instead of requiring adopters to travel to central permanent adoption centers.

In 1973, when the first wild horses were adopted in Montana, there was little or no cost to the adopter. The number of excess animals was small, and transportation costs were minimal. As the program has grown, transportation, medical, maintenance, and administrative costs have increased greatly. In 1982, a uniform fee was implemented to defray part of these expenses. The adoption fee was established at \$200 per horse and \$75 per burro, plus transportation charges from the originating distribution facility to the adoption center, if applicable. This fee was established in response to congressional and Office of Management and Budget recommendations that the adoption fee more closely reflect the actual cost of the adoption process. However, implementation of this fee schedule reduced adoption demand for horses significantly and correspondingly increased the Government's costs for handling and feeding horses. As a result, a final rule was issued on March 3, 1983, reducing the horse adoption fee to the present level of \$125. The fee for a burro remained \$75. The actual cost of

Adopters must be of legal age, but younger family members often share in the responsibilities and rewards of the Adopt-A-Horse Program.



preparing and providing the animal for adoption was approximately \$600 at the end of Fiscal Year 1983. This high cost is the result of maintaining excess animals in corrals for a long period of time because the Agencies must continue to remove excess animals at a faster rate than adopters have been found.

Concurrent with the establishment of uniform fees in 1982, public affairs efforts were increased to offset the negative impact of these fees on adoption demand. Efforts were aimed particularly at audiences presumed to be unaware of the program. Despite these expanded efforts, in Fiscal Year 1983 the total number of animals adopted was almost 1,600 fewer than were gathered. Because of the moratorium on destruction of healthy excess animals, at the close of Fiscal Year 1983 approximately 2,600 unadopted animals were being maintained by BLM at a daily cost of almost \$2 per animal.

Persons who wish to adopt a wild horse or burro must submit an application to one of the Agencies and must meet certain criteria. They must be of legal age in their States of residence, be free from any conviction for inhumane treatment of animals, and be able to provide proper care and treatment for the number of wild horses and burros requested. Having met the requirements, applicants are contacted when animals of the age and sex requested are available at the preferred adoption location; arrangements are then made to complete the adoption. An individual may ordinarily adopt a maximum of four animals in 1 year, although exceptions are granted where additional requirements are met.

Title Transfer

For the first year after adoption, animals remain the property of the United States; however, after that time, adopters who have provided proper care may apply for title to the animals. An individual may receive title to as many as four animals in 1 year. Awarding title to the adopters gives them not only ownership but also recognition for the time and energy they have invested in these animals. Title transfer also reduces record-keeping and compliance costs to the Agencies.

Of the almost 40,500 wild horses and burros maintained for more than 1 year, nearly 19,000 have been titled. The percentage of animals titled has climbed steadily from less than 15 percent of the animals adopted prior to 1979 to almost 70 percent of the animals adopted in 1981. In Fiscal Years 1982 and 1983, 12,032 titles were issued.

Two facts must be considered as major reasons why more titles have not been issued. The amendment to the Wild Free-Roaming Horse and Burro Act providing the authority to issue titles was enacted in 1978, 2 years after the national adoption program began, and

Agency procedures for processing applications for title were issued in 1980. Several other possible factors may help explain the failure of some individuals to obtain title to their animals. Some adopters move without notifying the Agencies, and some transfer their animals to other individuals without prior approval of the appropriate Agency. In either case, delivery of the necessary title application is prevented. It is also possible that the requirements for obtaining title may discourage some adopters.

Added to these problems is the fact that animals adopted before 1978 were not freeze marked with permanent individual identification marks and cannot be described for purposes of title transfer. Consequently, although the proportion of adopted animals titled annually is increasing, a significant number of animals remain the legal responsibility of the adopting Agency, and many of these will probably never be titled.

Table D—Summary of Wild Horses and Burros Adopted by State

(as of September 30, 1983)

State	Adoptions in FY's 1982 & 1983		Total Adoptions	
	Horses	Burros	Horses	Burros
Alabama	145	35	356	45
Alaska	6	7	40	8
Arizona	168	115	330	488
Arkansas	119	11	364	36
California	1,312	447	5,160	2,323
Colorado	431	87	1,449	313
Connecticut	11	5	16	9
Delaware	1	0	1	0
Florida	96	86	212	271
Georgia	65	27	179	68
Hawaii	0	0	0	0
Idaho	316	30	2,526	89
Illinois	55	47	416	105
Indiana	37	14	238	52
Iowa	195	139	733	466
Kansas	302	44	824	56
Kentucky	219	67	637	181
Louisiana	233	20	313	23
Maine	10	8	23	11
Maryland	28	29	63	33
Massachusetts	4	2	17	6
Michigan	20	24	290	55
Minnesota	32	41	284	70
Mississippi	203	93	323	97
Missouri	103	44	1,073	101
Montana	65	35	386	85
Nebraska	292	317	620	421
Nevada	200	69	1,248	176
New Hampshire	9	4	17	9
New Jersey	8	11	20	13
New Mexico	53	20	435	83
New York	35	94	97	109
North Carolina	131	50	265	58
North Dakota	40	6	85	12
Ohio	136	43	334	64
Oklahoma	566	21	2,600	82
Oregon	500	89	3,996	250
Pennsylvania	211	103	298	124
Rhode Island	3	0	6	0
South Carolina	41	23	220	23
South Dakota	167	36	945	49
Tennessee	355	180	1,094	303
Texas	1,480	213	4,375	597
Utah	208	6	1,414	46
Vermont	0	0	4	0
Virginia	40	20	200	28
Washington	183	257	1,666	487
West Virginia	28	23	67	23
Wisconsin	92	130	186	172
Wyoming	294	5	1,424	22
District of Columbia	0	0	2	0
Totals	9,248	3,177	37,871	8,142
Grand Total	12,425		46,013	

THE ACT:

Any person so charged with such violation by the Secretary may be tried and sentenced by any United States commissioner or magistrate designated for that purpose by the court by which he was appointed . . .

Compliance and Enforcement

The original impetus for wild horse and burro legislation came in reaction to man's abuse of these animals. Their protection remains one of the most basic responsibilities under the Act. In Fiscal Years 1982 and 1983, the Agencies carried out more than 2,000 compliance inspections to ascertain that adopted wild horses and burros were receiving proper care. Many of the inspections were undertaken in response to complaints. These compliance checks, together with the enforcement activities discussed below, led to the repossession and reassignment to other adopters of 235 animals. Compliance inspections in Fiscal Year 1984 will focus particularly on large-scale adoptions because of an agreement made by BLM in July 1983 in response to a civil suit that sought to halt the adoption of 25 or more wild horses or burros by one applicant. Plaintiff had argued that large-scale adoptions put the animals at unreasonably high risk of illegal sale or inhumane treatment.

The Agencies work diligently to remedy all known cases of abuse of wild horses and burros and to bring violators to justice. Satisfactory resolutions of violations are obtained through administrative action or through the courts. Violations dealt with in Fiscal Years 1982 and 1983 ranged from the illegal capture of a wild horse by a juvenile (administratively resolved by allowing the youth's parents to adopt the animal) to a large-scale illegal capture of wild horses which were sold to slaughterhouses (prosecuted in the Federal court system).

Twenty-seven violations meriting enforcement action through the judicial system were referred to the U.S. Attorney's Office or to State prosecutors in Fiscal Years 1982 and 1983. Prosecution was declined in 12 instances, and investigations were in process in 10 cases at the close of Fiscal Year 1983. The 10 open cases involve missing adopted horses, commercial use of adopted horses, neglect of adopted burros, and illegal gathering and sale of wild horses and burros.

In the five cases deemed to have prosecutive merit, one letter of deferred prosecution was issued, and four cases were prosecuted, with defendants in two of these cases entering guilty pleas. No verdict had been reached in the other two cases at the end of Fiscal Year 1983. Charges in the four prosecuted cases (three Federal, one State) included illegal capture, selling, abuse, starvation, and abandonment of wild horses. Perhaps the most widely publicized case was that of a Texas rancher charged in connection with the deaths of 48 adopted wild horses.¹ Another newsworthy case involved two men accused of theft of Government property (wild horses) in Wyoming.²

¹The accused pleaded guilty to a reduced charge and was sentenced in December 1983 to 6 months in jail, a \$4,000 fine, and 5 years probation.

²An important aspect of this case was the defense argument that the Federal Government has no property interest in wild horses. After the U.S. District Court Judge rejected that argument in November 1983, the defendants pleaded guilty to a lesser charge and were fined and placed on probation.

THE ACT: . . . the Secretary shall contract for a research study

Research

In January 1983, the Secretaries of the Interior and Agriculture sent to the Congress the "Final Report of the Committee on Wild and Free-Roaming Horses and Burros." That report contained the findings of the National Academy of Sciences (NAS) committee which had been appointed to oversee the research requirements of an amendment to the Wild Free-Roaming Horse and Burro Act that was included in the Public Rangelands Improvement Act of 1978. The research was mandated "for the purpose of furthering knowledge of wild horse and burro population dynamics and their interrelationship with wildlife, forage and water resources, and assisting [the Secretary] in making his determination as to what constitutes excess animals"

In a three-phase process, the NAS committee performed an exhaustive search of the existing knowledge, recommended a research program to fill the gaps in that knowledge, and prepared a final report with recommendations for approaches to the management of the wild horse and burro program. Some fundamental issues, such as increasing the accuracy of inventories and defining excess animals, not just biologically but also socially, were examined in the report; but lacking the requisite information base, the committee stopped short of prescribing specific management criteria in these areas.

Prior to 1978, nine separate and unrelated research efforts on wild horses and burros had been initiated by BLM and the FS. Some of these had been partially completed by June 1979 when the NAS committee was impaneled, and the findings to that date were subsequently incorporated in the committee's Phase I report. The committee completed the first phase in December 1980 and recommended 18 research projects, some of which would require 7 to 10 years of study for valid results. The NAS committee estimated that \$1.5 million annually would be required to fund all of the recommended projects. Recognizing budget and time restraints (the final report to Congress was due in January 1983), the NAS committee identified five projects as having priority for immediate study. (See Appendix A for summaries of wild horse and burro studies funded by the Agencies, including the five NAS projects.) The Agencies spent approximately \$1.6 million (\$62,500 from the FS) on the NAS research, including the \$350,000 for the contract with NAS. Earlier research expenditures totaled \$753,085.

The NAS final report called for a "long-term equid research program" and an "expanded in-house scientific staff" to provide a solid foundation of scientific

data on which to base management decisions. Agency research funds are limited, however, and there is some question within the Agencies as to the need for certain data and the most effective means of acquiring that information deemed essential to the program. In some instances, for example, on-site studies by Agency personnel could achieve the objectives of recommended research at a fraction of the cost. Thus, the most pressing question concerning further research for the Agencies is whether the benefits of increased knowledge and efficiency will justify the cost. Given the pressures created by budgetary constraints, large numbers of excess animals, and the estimated 16 percent annual population growth rate, the consensus of Agency specialists is that enough information is now available or can be gathered in connection with ongoing management activities to eliminate the need for additional research contracts in the immediate future.

No further research is planned at this time. Once appropriate management levels have been reached, the utility and cost-effectiveness of the research program outlined by NAS can be reexamined. In the meantime, Agency management decisions will be enhanced by the information provided in the NAS report.

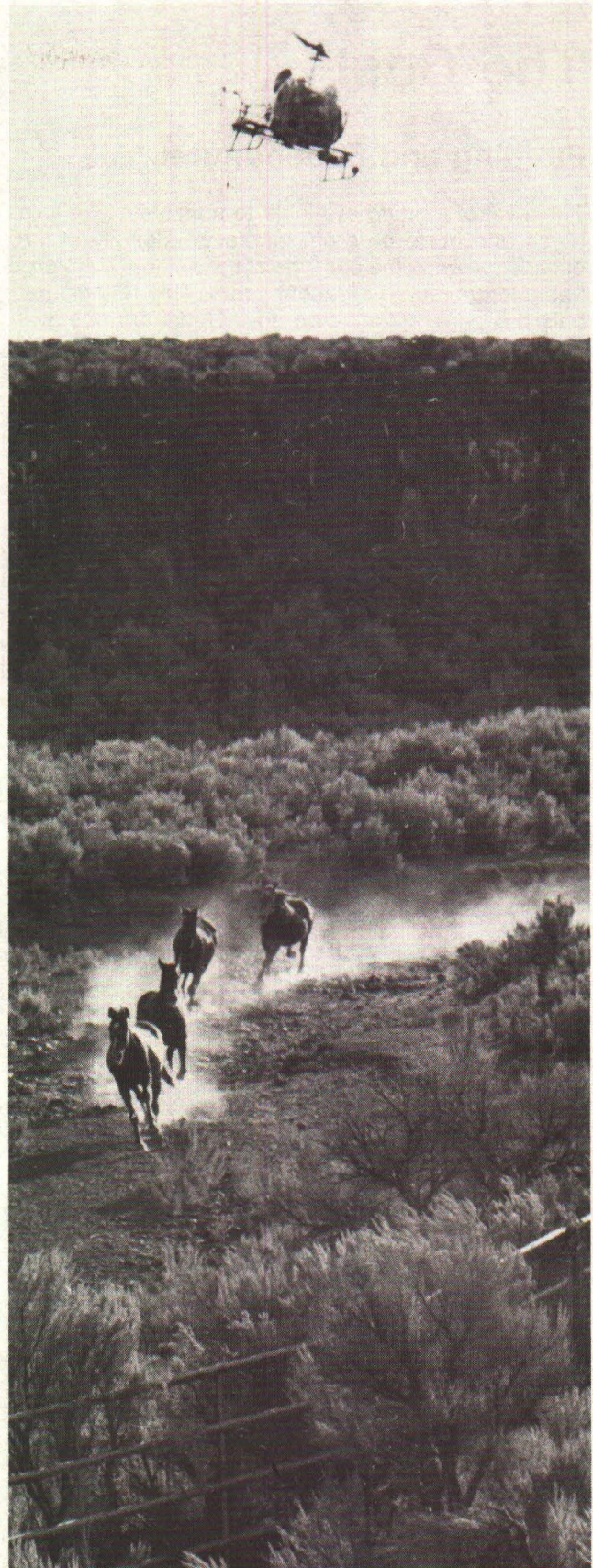
Some specific conclusions of the NAS as stated in the final report follow.

- Aerial census is the most efficient method of maintaining current inventories of wild horses and burros; replications can be scheduled at 2- or 3-year intervals without compromising the accuracy of the results. To obtain realistic estimates of herd size, use of marked animals or calculation of an index from gathering data is necessary.
- Early census efforts were probably conservative, due both to Agency inexperience and to rudimentary methods; the extent of the conservatism cannot be estimated. Thus, rates of herd growth since the early 1970's have been generally overestimated, but to an unknown extent.
- Annual rates of increase for wild horses and burros fall in a range between 3 and 20 percent; more study would be needed to narrow this range for specific herds and habitats.
- Even though the mainstream of equid evolution occurred in North America and species of *Equus* existed here as recently as the

Pleistocene Age (10,000 years ago), present-day wild horses and burros are not reoccupying an otherwise vacant niche. However, there is no evidence that wild horses or burros cause any more damage to present habitats than equivalent numbers of other kinds of exotic animals, such as livestock.

- The term *excess* has both biologic and social aspects, but is defined in terms of the number of herbivores, regardless of kind, above the number which permits a plurality of resources and uses and above which the range cannot exist at or near potential productivity.
- The combination of herbivores to be managed on an area is a sociopolitical decision with a range of appropriate answers in terms of wild horses and burros, livestock, and wildlife.
- The effects of wild equids on native wild ungulates (e.g., antelope) can be either beneficial or harmful, depending on the similarity in their use of common habitats. Since horses are primarily grazers, their presence is more likely to affect other grazing animals than it is browsers.
- Although there is some evidence of density-dependent control mechanisms in wild horse and burro populations, these mechanisms are not effective enough to limit populations to levels which would prevent severe impacts on the habitat and other ecosystem components. Therefore, some human intervention is required in management of animal numbers.
- Population management through fertility regulation in mares is the most promising method of artificial control of numbers, but more field testing is needed. Despite positive results in one independent study (Kirkpatrick, 1981), fertility control in stallions is not a promising technique, because of the typical lack of band integrity, as well as breeding by subordinate stallions.

The helicopter is an important tool in removals, census, and research. Banned in 1959 to deter mustangers, its use by BLM and the FS was authorized in 1976 in the interest of safety and efficiency.



The Cost

Funding and Expenditures

The level of funding available to administer the wild horse and burro program increased steadily in the decade following the passage of the Act, but this trend has been reversed in recent years. This reflects not only the general limitation on increased funding of Federal programs, but also the attempt to recover a larger part of program costs from the benefiting public (in this case, adopters). Included in the amounts below are costs associated with management plans, animal and habitat inventories, removal and disposition of excess animals, and program administration.

The BLM appropriated amounts for Fiscal Year 1981 and earlier have been adjusted, by deleting administrative costs, to be comparable to the figures for Fiscal Years 1982 and 1983. The adjustment is necessary because administrative costs, which had historically been included in the wild horse and burro funding, have been appropriated separately since Fiscal Year 1982.

Fiscal Year	Appropriated Amount	
	FS ¹	BLM ²
1972		0
1973		400,000
1974		687,000
1975		1,314,000
1976		1,272,000
1977		2,679,000
1978		4,025,000
1979	\$435,000	4,250,000
1980	450,000	4,582,000
1981	400,000	5,704,000
1982	310,000	5,418,000
1983	570,000	4,877,000

¹Prior to Fiscal Year 1979, FS expenditures in wild horse and burro management were approximately \$200,000 per year.

²Wild horse and burro program funds were included in the Grazing Management budget activity until Fiscal Year 1978, when a separate budget line item was established.

Analysis of Expenditures: Herd Management

Except for studies and research, funds spent on management of wild horses and burros on the public lands have remained at approximately the 1981 level, not only in dollar amounts, but also as a percentage of total expenditures. Funding of research and studies peaked in Fiscal Year 1981 when contracts were awarded for the research projects recommended by the NAS. Since that time, emphasis has been on site-specific studies of individual animals, herds, and habitats. Other management costs include inventory of animals and their habitat, development of herd management area and territory plans, rangeland improvement development and maintenance, and monitoring of the condition of the herds and their habitat.

Inventory of wild horse and burro herds and their habitat has been de-emphasized in favor of monitoring to detect changes and trends in the resource in response to management. Using existing inventory results as a baseline from which to measure changes, management actions are evaluated in terms of reaching specified objectives relating to habitat condition, herd size, and herd composition.

Reflecting the Administration's position that benefiting activities must contribute to the cost of multiple-use range improvements, an increasing portion of the wild horse and burro range improvement expenditure has been used to maintain existing projects which benefit wild horses and burros. This has resulted in a decline in the development of new range improvement projects.

The BLM's expenditures for Fiscal Years 1982 and 1983 are shown below, with Fiscal Year 1981 figures provided for comparison.

Activity	Expenditures by Fiscal Year		
	1981	1982	1983
Inventory	\$ 216,000	\$ 112,000	\$ 95,000
Monitoring	23,000	116,000	225,000
Range Improvement			
Development	132,000	87,000	55,000
Maintenance	143,000	108,000	139,000
Management Plans	91,000	84,000	110,000
Management Support	51,000	109,000	38,000
Subtotal	656,000	616,000	662,000
Research and Studies	1,110,000	622,000	51,000
Total Management Activity	\$1,766,000	\$1,238,000	\$713,000

Analysis of Expenditures: Removal and Disposition of Excess Animals

Net costs of removing excess animals from the public lands and placing them in private maintenance through the adoption program have stabilized in the last 2 years. In general, the total amounts of funding committed in these areas have not changed substantially; but reduced adoption demand (at least partially a consequence of the higher adoption fees implemented in 1982) has caused a lower rate of accomplishment and a higher unit cost. Thus, animals removed from the public lands spend much longer periods of time in corrals awaiting adoption, resulting in high feed and maintenance costs.

Removal costs include the expenses of preparing removal plans and associated environmental assessments, gathering the animals, and transporting them to the facility where they are held and made available for adoption. Included in the cost of adoption are medical treatment (tests, vaccinations, worming); brand inspection and freeze marking; feeding and handling; public affairs efforts; and transportation to another adoption facility, if necessary. These

adoption-related costs are partially offset by the fees collected from adopters. Compliance activities to ensure that adopted animals are receiving proper care and treatment are performed mainly in response to complaints and usually require costly time and travel.

The Agencies first issued titles to eligible adopters of wild horses and burros in 1980. The unit cost of transferring titles has settled at about \$6 as the procedures have been refined.

An analysis of BLM's wild horse and burro removal and adoption activities is shown below. Expenditures and receipts for 1981 are provided for comparison with those for Fiscal Years 1982 and 1983.

The FS unit (per head) costs and receipts have paralleled BLM's when animals have been placed in adoption through BLM facilities. In the few areas where the FS handles its own adoptions, costs vary considerably because of the small number of animals being placed.

Activity	Expenditures and Receipts		
	1981	1982	1983
Expenditures			
Removal	\$1,429,000	\$1,072,000	\$1,619,000
Adoption	2,695,000	3,760,000	3,052,000
Compliance	410,000	155,000	221,000
Title Transfer	29,000	52,000	37,000
Gross Expenditures	\$4,563,000	\$5,039,000	\$4,929,000
Receipts (Adoption Fee)	(625,000)	(859,000)	(765,000)
NET EXPENDITURES	\$3,938,000	\$4,180,000	\$4,164,000

Litigation

In the course of administering the Act, the Departments have been involved in 18 lawsuits since 1971, with the other litigants falling into three general categories: (1) groups dedicated to the protection of wild horses and burros; (2) individuals, groups, and State governments seeking a reduction in the number of these animals or their removal from public or private lands; and (3) individuals seeking compensation for privately owned horses allegedly removed illegally in Federal roundups.

Protection groups have sued seven times, challenging, in general, various aspects of removal and adoption policies. No protection group litigation was pending at the close of Fiscal Year 1983.

Often citing the competition that wild horses and burros represent to wildlife and to domestic livestock,

plaintiffs such as the State of Nevada, grazing associations, and private individuals have asked the courts to require the Agencies to remove or limit the number of wild horses and burros. Two major issues in these suits have been alleged damage to the habitat caused by wild horses and burros and requests for removal of these animals from private property interspersed among public lands (including checkerboard lands). Four suits seeking restrictions on wild horses and burros were pending at the end of Fiscal Year 1983.

Of the 18 suits filed since the passage of the Act, 13 were before the courts during the period covered by this report: 9 were resolved and 4 are pending. These 13 cases are summarized in Appendix B. The FS was not involved in any of these suits.



The Future

The beginning of Fiscal Year 1984 finds the wild horse and burro program at a crossroads. Pending legislation could alter the program significantly. Identical bills, which in effect amend the Act, are before the Senate and the House: S. 457, introduced by Senator James McClure in January 1983, and H.R. 1675, introduced by Representative Barbara Vucanovich in February 1983. The Administration supports these bills. Major new provisions would:

- recognize that wild horse and burro populations are thriving and not in danger of disappearing;
- authorize the sale of excess animals for which no adoption demand by qualified individuals exists;
- provide the protection of State and local humane laws to excess animals that are sold and no longer protected under the Wild Free-Roaming Horse and Burro Act;
- provide revenue for wild horse and burro management and reduce adoption program subsidies by returning proceeds from the sale of unadopted excess animals to the program;
- eliminate paperwork required of qualified adopters to obtain title to their adopted animals;
- increase the penalty for conviction of a second offense under the provisions of the Act or pertinent regulations;
- eliminate program requirements such as public hearings on the use of helicopters (public notification would be required) and the biennial report to Congress (information would be transmitted through existing annual Agency reports), and reduce compliance and titling costs.

If the program continues to operate under existing authority, the Agencies still must deal with the consequences of the success of the Act: a thriving wild horse and burro population which, on BLM-administered lands, is more than double the estimated appropriate management level. The Agencies' moratorium on the destruction of unadopted healthy animals has resulted in a large amount of the program funds being spent to maintain approximately 2,600 animals in corrals. While the moratorium continues, the adoption program must be promoted even more vigorously than in the past.

Projections of population growth rates and the removals necessary to control that growth indicate that desired management levels may not be reached on BLM lands for many years under current authorities and funding levels. The FS, which has jurisdiction over approximately 3 percent of the wild horses and burros, has already achieved desired population levels (as defined in Territory Plans or other land management planning documents) on 31 of 47 wild horse and burro territories. The FS will continue to remove excess animals from territories to achieve management levels where excess populations exist and to maintain appropriate management levels where already attained.

Once management levels have been reached on the lands administered by the FS and BLM, the emphasis of the program can be shifted from removal of excess animals to the management of free-roaming herds of wild horses and burros within a multiple-use environment, an emphasis that will best fulfill the spirit of the Wild Free-Roaming Horse and Burro Act.

Appendix A

Summary of Forest Service and Bureau of Land Management-Sponsored Research on Wild Horses and Burros

1. Age-Specific Pregnancy Rates in Challis Wild Horses: 1980

Principal Investigator: Dr. U.S. Seal, Veterans Administration Hospital, Minneapolis, Minnesota

Period of Study: 1980

Funds Expended: None

Summary and Conclusions:

From an estimated population of 617 wild horses in the Challis Planning Unit, Salmon District, Idaho, 303 were gathered in October 1980. The gather was designed to produce a random sample of individuals within the herd. Of the animals gathered, 167 were female. Of these, 30 were foals and were not studied further. Blood samples were drawn from 137 females and analyzed to estimate reproductive parameters to characterize the herd. Analysis was based on blood content of progesterone, pregnant mare serum gonadotropin, and estradiol. Based on the analysis, animals in the sample were categorized as shown below:

Age Class	Sample Size	Average Weight	Percent Anestrous	Percent Pregnant	Percent Lactating	¹ Percent Survival
1	10	564		0	0	—
2	28	606	726	36	0	—
3	12	709	793	67	25	69
4	21	799	872	57	43	64
5	8		895	71	86	151
6	9		876	89	67	94
7	13		943	85	85	96
8	9		934	78	67	79
9	6		1,022	83	50	64
10-12	15		918	93	73	88
15-30	6		924	100	100	108

It was concluded that the results from hormone assay should be confirmed by firm physical evidence of pregnancy, such as through rectal palpation. Given such verification, the serum assays offer substantially more information than can be obtained from physical examination alone.

2. The Effects of Various Removal Strategies on Feral Horse Populations

Principal Investigator: Dr. Michael L. Wolfe, Utah State University

Period of Study: 1980

Funds Expended: \$4,000

¹Percentage survival was calculated as the ratio of percent lactating in any age class to the percent pregnant in the previous age class.

Summary and Conclusions:

Using a computer model of a modified Leslie matrix, a series of population simulations was run to study the effects of age-specific and sex-specific removals on wild horse herd growth rates. A computer program (EQUUS II) was developed and delivered for use in modeling. The author stated four general conclusions:

a. Given the highly polygamous nature of horses, selective removal of males is not a viable strategy to limit the rate of increase.

b. Fertility control among females cannot be considered a permanent solution to population limitation. Unless all females in a population are treated, including immature animals, recruitment into the reproductive age segment will quickly negate the effects of control measures.

c. Survival rate, fecundity, and age at first breeding are the primary determinants of the rate of change in size of populations.

d. Reliable information on reproductive performance and/or recruitment is the most important requisite data for determining rates of increase in feral horse populations.

3. The Burros of the Chemehuevi and Bill Williams Mountains, Havasu Resource Area

Principal Investigator: Dr. Robert D. Ohmart, Arizona State University

Period of Study: 1974-1977

Funds Expended: \$81,785

Summary and Conclusions:

A sample of 53 burros was marked with permanent collars, 27 in the Chemehuevi Mountains and 26 in the Bill Williams Mountains, Havasu Resource Area, Colorado River Valley, California-Arizona. Population size, habitat relationships, and seasonal movements of burros were studied, as well as interspecific relationships with desert bighorn sheep.

Using the ratio of marked to total burros observed in an aerial census, population size was estimated at 497 animals. Foals accounted for 20 percent of observations, yearlings for 17 percent, and adults for 63 percent. Sex ratio was reported to be 54F/46M. Late April through mid-May was recommended as the optimum season for census, as animals begin to congregate at water sources.

Water and food availability appeared to be the primary factors affecting movement patterns in burros. A critical threshold air temperature of 95°F was found to cause a strong shift in animal distribution towards (to within 3 kilometers of) water. Competition for forage between burros and bighorn sheep was demonstrated on one of the study areas. There was moderate overlap in diets. Forage yearlong for burros was 61 percent shrubs, 30 percent forbs, and 4 percent grasses (5 percent unknown). On common habitat areas, overlap in distribution was 10 percent in winter, 85 percent in spring, and 65 percent in summer and fall. No conclusion was drawn on competitive superiority.

The only stable social group among burros was the jenny and her foal, which remained together for about 1 year. Home ranges for burros averaged about 12 square miles with no discernable difference between sexes. Territoriality was observed in only one animal, an adult male. Foaling occurred year-round, at an average annual rate of 0.67 foals per jenny. Life spans appeared to be 11 to 12 years in jennies, 12 to 14 years in jacks.

Competition on one of the areas (Bill Williams Mountains) was significant, based on diet overlap, distribution overlap, and habitat alteration by burros. The author recommended elimination of the burro population from this area to favor bighorn sheep because of the the bighorn's threatened status.

4. Investigations of Reproductive Biology and Chemical Fertility Control in Wild Horses

Principal Investigator: Dr. Jay Kirkpatrick, Eastern Montana College

Period of Study: 1978-1981

Funds Expended: \$162,300

Summary and Conclusions:

Two antifertility agents were tested under field conditions for their effectiveness in suppressing reproduction in bands of wild horses through treatment of dominant stallions. Microencapsulated testosterone propionate was administered to 10 wild stallions in the Challis herd, Salmon District, Idaho, and a synthetic estrogen, Quinestrol, was administered to 3 stallions in the Juntura herd, Vale District, Oregon.

Effectiveness of the treatments was determined by counting the number of foals born in bands led by drug-treated stallions, compared to production in control bands. Foal counts for control bands averaged 0.371 foals/mare; in treated bands, foal numbers averaged 0.066/mare. Seven of eight control bands produced foals, whereas two of seven treated bands produced foals. No births were attributed to breeding by subdominant stallions. Sperm counts among treated stallions were 36 percent lower than among untreated stallions.

The following conclusions were stated:

a. Male-focused chemical fertility control in feral horse populations is feasible.

b. Controlled-release microencapsulated testosterone propionate and the synthetic estrogen Quinestrol offer the best hope (among drugs tested) for reduced fertility resulting from a single administration.

c. Testosterone cypionate has potential as a fertility inhibitor but must be delivered repeatedly at 1-month intervals.

d. All three of these drugs are reversible in their action and must be delivered annually.

e. None of these drugs affects the behavior, libido, or herding instinct of the stallions.

f. Delivery of these drugs from a helicopter is feasible.

g. Social structure of the feral horse bands remains sufficiently stable, particularly during the breeding season, to have no adverse effects upon male-focused fertility control.

h. Elimination scent-marking behavior is a reliable end point after which changes in reproductive behavior may be assessed.

5. Wild Horse Telemetry Study

Principal Investigator: Howard Baldwin, Sensory Systems Laboratory, Inc.

Period of Study: 1979-1981

Funds Expended: \$10,000

Summary and Conclusions:

Several methods were investigated to attach telemetric devices to wild horses to aid in long-term study of the marked animals.

Ear-mounted transmitters were found to be unsatisfactory for use in monitoring wild horses; all models and methods of attachment caused excessive irritation to the animal and resulted in malfunction due to rubbing.

Neck collars were the most successful carrier tested. A leather collar with adjustable latch under the neck was recommended.

6. Evaluation of Chemical Restraint Methods for Potential Use in Wild Free-Roaming Horses

Principal Investigator: Dr. Ronald Borchard, Washington State University

Period of Study: 1978-1981

Funds Expended: \$140,000

Summary and Conclusions:

Several skeletal muscle relaxants and sedative analgesics were tested for their utility in capturing and restraining unapproachable horses. It was

concluded that many drugs are effective when delivered intravenously, but are not absorbed from muscle tissue at rates adequate for efficient field capture work.

Of the drugs tested, succinylcholine chloride was the most effective under a variety of conditions (corrals, open field use) and for a variety of purposes (capture, field immobilization for study). Caution was advised in using succinylcholine chloride soon after animals have undergone stress, as might accompany trapping, gathering, or extended transport, as the effect could be life threatening hypoxia, hypercapnia, and acidosis.

7. Habitat Use and Spatial Interactions of Cattle, Wild Horses, Mule Deer, and California Bighorn Sheep in the Owyhee Breaks of Southern Oregon

Principal Investigator: Robert J. Raleigh, Eastern Oregon Agricultural Research Center
Period of Study: 1978-1983
Funds Expended: \$75,000

Summary and Conclusions:

Habitat use patterns, dietary similarities, and spatial interactions of wild horses, California bighorn sheep, mule deer, and domestic cattle were studied on the Three Fingers Wild Horse Management Area and adjacent lands in southeastern Oregon. During the study, the wild horse herd numbered between 132 and 171 animals.

Size and stability of home ranges were determined for 14 bands and 10 individual stallions. Home ranges for bands averaged 28.3 square kilometers and for individual stallions, 25.8 square kilometers. No seasonal shifts in home ranges were detected.

Daily animal activity patterns were studied through observations of animals during daylight hours. Feeding activity occupied 68 percent of horse time, 68 percent of bighorn sheep time, 57 percent of cattle time, and 74 percent of deer time. Resting accounted for 18 percent of horse time, 38 percent of cattle time, 23 percent of bighorn sheep time, and 18 percent of deer time. The remainder of the daylight time for each species was spent primarily for drinking and traveling.

Drinking behavior was studied most intensively for horses. Horse use of waters peaked in early morning and late afternoon, was done by band, and lasted 6.3 minutes per animal and 16.1 minutes per band on the average. The average distance from observed animals to a water source was not significantly different across seasons for any species, but was significantly different among species, horses exhibiting the greatest distance and cattle the lowest.

Distribution of individuals of all species except bighorn sheep was affected by slope. Cattle and horses

preferred areas with little (0-19 percent) slope, and their use of available habitat was limited by 19 percent and 29 percent slope, respectively. Deer favored areas of less than 40 percent slope, while bighorn sheep ranged freely on slopes up to 100 percent (the maximum studied).

Interspecific spatial overlap varied from little (horses-bighorn sheep) to extensive (horses-cattle). No correlations were evident concerning active avoidance of one species by another. Application of a similarity index to use of available plant communities by the animal species studied produced nearly identical values (73 to 74 percent) for horse, deer, and cattle combinations.

8. Food Consumption Rates and Nutrition of Horses and Cattle

Principal Investigator: Dr. Larry R. Rittenhouse, Colorado State University
Period of Study: 1980-1982
Funds Expended: \$184,000

Summary and Conclusions:

Rate of forage intake and its nutritional value for domestic horses and cattle were studied on a 1,000-acre pasture near Durango, Colorado. Botanical composition of diets was studied through fecal analysis. Both cows and mares were found to select heavily in favor of grasses, relative to percent representation of grasses in the available forage. Diet similarity indices during the summer study period averaged 0.840, indicating a high overlap in forages selected. Similarity in diets selected by lactating versus nonlactating animals was high (0.90) throughout all seasons. Initial estimates of dry matter intake indicated that mares consumed about 20 percent more forage than cows per pound of body weight. Lactating animals of both species consumed more forage than nonlactating animals, 20 percent more in mares and 16 percent in cows.

Analysis of intake based on weight indicated that body weight had little influence on forage intake rates in horses, within adult weight ranges. Rate of ingestion in horses is likely a function of other variables.

Apparent dry matter digestibility in cows was about 10 percentage points higher than in mares. Physiological status of the animal (lactating versus nonlactating) had no apparent effect on digestibility in either species. Apparent crude protein digestibility was greater for mares than for cows, even though crude protein content of the two diets was similar.

Mares exhibited the ability to graze forage plants more closely to the ground than cows, which may imply a competitive advantage of horses over cattle when forage is limited. It also implies that horses are more likely than cattle to severely impact range resources when proper stocking rates are exceeded.

Field observations of horses and cattle grazing freely (unconfined) indicated a high degree of spatial and temporal overlap in habitat use. Horses were observed to travel further and use a larger portion of the study area than cattle. There is evidence that horses provide greater competition to cattle than cattle do to horses, even though cattle consume a more diverse diet. Forage allocative decisions should consider potential competition for resources in both time and space.

9. Wild Horse Habitat Preference and Use

Principal Investigator: Dr. R. H. Denniston, University of Wyoming

Period of Study: 1980-1982

Funds Expended: \$283,000

Summary and Conclusions:

Habitat use by wild horses, domestic cattle, and pronghorn antelope was surveyed on the Red Desert of southwestern Wyoming. One hundred one-square-kilometer plots were located and corner-marked on a random stratified basis in the Red Desert. Plots were observed on a regular basis by land and air. Data collected for each plot during surveys included the numbers of wild horses, cattle, and pronghorn antelope on the plot, distance to the nearest water source, snow availability, and wind speed. Vegetation types and a topography index were also determined for each plot. Results from 41 surveys (30 ground, 11 air) conducted over a period of 19 months indicated that habitat variables accounted for at least 60 percent of the variance in ungulate distribution. There were significant differences in habitat use among horses, cattle, and pronghorn antelope. These differences were probably based more on plot distances to water and animal location differences within the study area than on diet differences.

Major use pattern conclusions were:

a. Horses and antelope were better able to utilize areas further from water sources than cattle during the fall and winter study periods, partly because of their ability to ingest snow.

b. Horses and antelope were more similar to each other with regard to distribution in all seasons than they were to cattle.

c. Plots used by cattle during certain seasons had higher proportions of greasewood, low sagebrush-grass, and rabbitbrush vegetation types than did plots used by horses and antelope.

There was a potential for competition between horses and cattle in the study area. The greatest potential was during late spring and summer when water was scarce. Since pronghorn antelope are thought to have largely different diets from horses and cattle, the

potential for competition was not as strong between pronghorn antelope and either horses or cattle as between horses and cattle.

10. An Initial Study of Wild Horse and Burro Demography: Determination of Pregnancy and Lactation Rates in Various Herds

Principal Investigator: Dr. Michael L. Wolfe, Utah State University

Period of Study: 1981-1982

Funds Expended: \$40,000

Summary and Conclusions:

Blood serum concentrations of reproductive hormones were used to estimate pregnancy rates in wild horses and burros removed from public lands in herd reduction gathers. Samples included 225 horses from Wyoming, 255 from Nevada, and 78 from Oregon; and 165 burros from California. Levels of progesterone, pregnant mare's serum gonadotropin (PMSG), and estradiol-17B were determined by radio immunoassay procedures. Based on comparison with the results of pregnancy diagnosis from rectal palpations on 124 animals, critical endocrine concentrations were established as criteria for pregnancy determination.

Results were reported as follows:

a. Endocrine concentrations sufficient to indicate pregnancy in horses and burros are:

Progesterone: 0.05 ng/ml; and/or

PMSG: 3.0 ug/ml; and/or

Estradiol-17B: 300 pg/ml.

b. The mean rates of pregnancy among mares from herds in Nevada, Oregon, and Wyoming were 58.4 percent, 69.2 percent, and 85.3 percent, respectively. Pregnancy among the California burros was 79.4 percent.

c. Rectal palpation is a reliable method for determining pregnancy from the 30th day of pregnancy on. Accuracy is thought to be 90 to 95 percent.

d. Pregnancy determination through hormone analysis was found to be 80 to 85 percent accurate.

e. Rates of pregnancy were found to be positively correlated with variations in body weight and animal condition.

f. Pregnancy rates were not significantly different between lactating and nonlactating mares or jennies.

g. Apparent pregnancy rates (determined from blood assays) among yearling mares and jennies were significantly higher than previously reported: Wyoming mares, 80.9 percent; Nevada mares, 43.2 percent; California jennies, 42.9 percent.

11. Vegetation Utilization, Diets, and Estimated Dietary Quality of Horses and Cattle Grazing in the Red Desert of Westcentral Wyoming

Principal Investigator: Dr. Michael A. Smith,
University of Wyoming
Period of Study: 1980-1982
Funds Expended: \$407,000

Summary and Conclusions:

Forage use patterns and diets of horses and cattle grazing in the big sagebrush-grass vegetation type were studied in relation to the availability of preferred forage plants. Replications were designed to study grazing by horses alone, cattle alone, and horses and cattle together under several stocking rates. Methods for handling wild horses were also studied.

Conclusions were stated for each phase of the study:

a. *Animal Behavior.*

(1) Horses utilized virtually all areas of the study pasture during both summer and winter seasons. Cattle used all parts of the pasture during summer, but concentrated during winter in areas of broken topography which provided cover.

(2) Horses and cattle rarely grazed in close proximity to one another. However, no specific behavioral interaction with respect to distribution was discerned.

(3) Horses spent the majority of the daylight hours foraging during both summer and winter. Cattle tended to concentrate grazing activity in summer in early morning and evening, but grazed daylong in winter. Both species grazed at night. Time spent grazing increased as forage availability decreased.

(4) Cattle distribution became more disperse as forage availability decreased. Horses, on the other hand, maintained band integrity throughout the year across levels of forage availability.

b. *Food Preference and Dietary Overlap.*

(1) Horses and cattle displayed a high degree of dietary overlap on the study area, ranging from 54 percent in early summer to about 91 percent by winter.

(2) No conclusions on exploitative competition for forages between cattle and horses could be drawn, due to the confinement of the animals during the grazing trials. However, the likelihood of such competition on common-use areas was stated to be high.

(3) Horses were primarily grazers throughout the summer season, grasses and sedges constituting 70 percent of diets, shrubs constituting 25 percent of these diets, and forbs 5 percent. Cattle summer diets were 45 percent graminoids, 35 percent shrubs, and 20 percent forbs.

Preferred graminoids were junegrass, Sandberg bluegrass, bottlebrush squirreltail, and needleleaf sedge, all of which were selected at levels higher than their relative abundance.

(4) Winter diets were composed as follows: grasses and sedges, 66 percent of cattle diets and 60 percent of horse diets; shrubs, 34 percent of cattle diets and 40 percent of horse diets; and forbs, no use observed. Preferred shrubs were winterfat, shadscale, four-wing saltbush, and Nuttall saltbush.

c. *Dietary Quality and Nutrition.*

The diets chosen by cattle were higher in nutritive value than those selected by horses, both in summer and in winter. Horse diets appeared to contain less than maintenance levels of crude protein during part or all of both summer and winter seasons.

d. *Forage utilization.*

(1) Utilization levels, when adjusted to a metabolic body weight basis for comparison, were highest for horses alone, intermediate for common horse-cattle use, and lowest for cattle alone. This tends to support a higher animal unit equivalency for horses, although no quantification was made.

(2) Needleleaf sedge was highly preferred by both horses and cattle at all stocking rates and combinations during summer, followed by perennial grasses.

(3) Winterfat was highly preferred by both horses and cattle on winter treatments, across stocking rates.

(4) Trampling damage to herbaceous vegetation (grasses, forbs, sedges) was a highly significant component of utilization in summer, varying inversely with distance to water sources.

e. *Animal Handling Facilities and Techniques.*

(1) Conventional livestock handling facilities are not suitable for initial handling of wild horses. Cattle crowding alleys are too wide to handle them safely, and traditional livestock corrals are not high or strong enough to confine these animals. Corral fences should be high enough and solid to obstruct the horses' vision.

(2) Crowding alleys should be a maximum of 36 inches wide and divided by solid sliding gates at 10-foot intervals. A heavy-duty bucking chute facilitates haltering and handling of wild horses.

(3) Heavy-duty nylon strap halters with welded tie-rings should be used when haltering mature wild horses. A snubbing post makes handling safer and easier.

(4) If field pasture design includes an alley be-

tween pastures, it should be at least 35 feet wide so that horses can avoid contact with the fence.

(5) A New Zealand-type electric fence proved safe and effective in controlling feral horses. Horses should be conditioned to an electric fence before being released into electrically fenced pastures.

(6) Pasture gates should be 18 feet wide, and wings should be built to make openings visible. Wood lath snow fence is inexpensive and satisfactory for building gate wings and temporary corral divisions.

(7) For weighing horses, a bucking chute can be mounted to a beam-type platform scale. A rubber mat should be placed on the floor to prevent slipping.

(8) Only one stallion should be in a pasture group when confined animals are being studied. New horses should not be added to established bands without a 4- to 6-week adjustment period prior to field use. If only mares are being studied, field observations may be more difficult because the animals are not prone to band into one tight group. Domestic horses add a calming influence when pastured with wild horses and aid in herding.

12. Census Methods for Wild Horses and Burros

Principal Investigator: Dr. Donald B. Siniff,
University of Minnesota
Period of Study: 1980-1983
Funds Expended: \$283,000

Summary and Conclusions:

Various methods for estimating numbers of wild horses and burros were evaluated, together with environmental and other factors which may affect census accuracy. Methods were tested on herds in pinyon-juniper cover and low shrub cover, as well as in flat terrain versus rolling and dissected topography. Environmental variables addressed were marking techniques and strategies, types of aircraft, observer experience, and sampling design. Animal-related variables were group size, seasonal behavior, distribution patterns, and movement.

Results were incorporated into a Census Handbook that outlined suggested procedures for conducting census and analyzing the results. Conclusions are summarized as follows:

a. Past census efforts by BLM and the FS which relied on complete counting of herds have been inaccurate by amounts ranging from 7 to 60 percent, depending on terrain, cover type, and species observed.

b. Accurate estimation of animal numbers over large areas will depend upon aerial survey and re-

quires calibration of an index using either marked animals or animal removal.

c. For use in aerial survey, a slow moving, fixed-wing aircraft such as a Piper Supercub plane is recommended. The extra expense of a helicopter is not normally justified in terms of increased accuracy.

d. The results of a census can be significantly affected by several variables (observer experience, presence of marked animals, snow and/or cloud cover, band size, etc.) which can be adjusted for to some extent in census design. In updating a previous census, consistency in methods across replications is required.

13. Adult Mare and Foal Survival Rates

Principal Investigator: Dr. Donald B. Siniff, University of Minnesota
Period of Study: 1981-1983
Funds Expended: \$70,000

Summary and Conclusions:

Samples of wild horses on the Pah Rah and Pine Nut Mountain herd areas in Nevada were marked with color-tagged and radio transmitter-equipped collars between 1980 and 1981. Periodic aerial observation of these animals continued through 1982 to estimate rates of mortality and foaling.

Foaling rates on the 2 herd areas were 53 percent and 64 percent in 1981 and 30 percent and 69 percent in 1982. Foal mortality rates were 15 percent and 33 percent in 1981 and 10 percent and 2 percent in 1982. On the Pah Rah area, 45 percent of mares foaled both years of the study, 34 percent foaled 1 year, and 21 percent did not foal either year. On the Pine Nut herd area, the corresponding rates were 10 percent, 62 percent, and 28 percent.

Changes in range condition across years (defined in terms of gross forage production) appeared to cause corresponding changes in foaling success.

14. Wild and Free-Roaming Horses and Burros

Investigator: National Academy of Sciences, Board on Agriculture and Renewable Resources, Committee on Wild and Free-Roaming Horses and Burros. Frederic H. Wagner, Chairman
Period of Study: 1979-1983
Funds Expended: \$350,000

Summary and Conclusions:

The committee published a Phase I report in 1981 containing current knowledge and recommended research on wild horses and burros. It published a final report in October 1982 which synthesized the results of completed research on wild horses and burros and made management-related recommendations to the Agencies. The reports have been provided to all field offices.

Appendix B

The following summaries give the status of wild horse and burro litigation before the courts in Fiscal Years 1982 and 1983.

Resolved:

1. *State of Nevada, ex. rel. Nevada State Board of Wildlife Commissioners and Nevada State Department of Wildlife v. Andrus*, Civil No. R-79-185-BRT (D. Nev. 1982)

Plaintiffs asked for an order directing the BLM to reduce the current horse population in Nevada from an estimated 35,000 animals to no more than 10,000. The State asked for a judgment that it may administer the wildlife and range resources within its borders and has the authority to establish a State program of wild horse removal from the public lands. A stay was granted by the court pending settlement discussions. Both parties finally stipulated to guidelines for reductions of wild horse herds, including the provision that such reductions would be planned by the defendants in consultation with the plaintiffs.

2. *American Horse Protection Association, Inc. v. Andrus*, Civil No. R-78-105-BRT (D. Nev. 1980), appeal dismissed, Civil Appeal No. 80-4522 (9th Cir. 1982)

Arguing that the BLM is in violation of the act and the National Environmental Policy Act of 1969, plaintiffs sought to enjoin all roundups in Nevada. On September 11, 1980, an agreement was reached at the trial court level. To provide adequate time for consideration of staying action, all parties agreed the BLM would notify the American Horse Protection Association (AHPA) 20 days in advance of all wild horse gatherings in Nevada. However, the agreement was not applied to a roundup scheduled to begin a few days later. The AHPA requested an injunction pending appeal of that roundup, but the request was refused by the district court. Plaintiffs then filed a motion for a stay pending appeal, which was granted by the Ninth Circuit Court of Appeals. On June 7, 1982, the court agreed with the defendants that the case was moot because the particular roundup at issue had occurred prior to issuance of the appellate court's stay. The appeal was dismissed.

3. *C-Punch Corporation v. Andrus*, Civil No. R-80-266 (D. Nev. 1981)

Alleging that wild horses were causing damage to private lands on checkerboard lands in Nevada, the plaintiffs requested the court to require the BLM to

remove wild horses from the checkerboard lands. The court granted the plaintiffs' request and ordered three roundups by a certain date. The order was later modified so that the third roundup was not required. Neither side appealed the final ruling.

4. *T Quarter Circle Ranches, Inc. v. Watt*, Civil No. R-81-110-ECR (D. Nev. 1982)

The plaintiffs requested the court to require BLM to remove wild horses from private lands in the checkerboard lands in Nevada. On November 18, 1982, the parties stipulated to a dismissal of the case. The BLM agreed to remove free-roaming horses located on checkerboard lands pursuant to a schedule, with total removal of the animals to be completed by December 31, 1987.

5. *American Horse Protection Association, Inc. v. Kleppe*, 694 F. 2d 1310 (D.C. Cir. 1982), on remand, Civil No. 76-1455 (D.D.C. 1983)

Plaintiffs disagreed with the number of wild horses to be managed in the Challis Herd Area of Idaho. Seeking management at a higher number, the plaintiffs argued that BLM erred in its calculations and failed to give full consideration to all alternatives for management of wild horses. The trial court granted an injunction in 1976 which was temporarily lifted in 1979 and 1980 to allow the removal of specified numbers of excess animals. A motion by defendants to dissolve the injunction was denied in 1981. The case was appealed to the U.S. Court of Appeals for the District of Columbia, which remanded the case to the district court to determine if the BLM plan to reduce the size of the herd in the Challis Planning Unit was rationally based. The parties then stipulated to dismissal of the suit. The BLM is now authorized to manage the size of the wild horse herd from 185 to 340 head. After July 1, 1986, the management level is discretionary with the BLM.

6. *American Horse Protection Association, Inc. v. Watt*, Civil No. 82-0559 (D.D.C. 1983)

Plaintiffs objected to BLM's removal and adoption fee policies, contending that the adoption fee reduced the adoption demand and thereby created the need for BLM to destroy excess animals. Plaintiffs also alleged

that the destruction by zoo operators and eventual consumption of the carcasses by zoo animals are forms of commercial exploitation, a violation of the law. Following a hearing on May 25, 1982, BLM agreed to continue its moratorium on the destruction of healthy unadopted animals pending the court's decision. On March 4, 1983, the BLM announced its final rulemaking establishing a fee of \$125 per horse and \$75 per burro adopted. On March 11, 1983, pursuant to stipulation of counsel, the district court dismissed the case.

7. *Animal Protection Institute of America, Inc., et al. v. Watt*, Civil No. LV-82-113-RDF (D. Nev. 1983)

Citing the alleged failure of BLM to comply with the Wild Free-Roaming Horse and Burro Act, plaintiffs sought a preliminary and permanent injunction against BLM to prevent the destruction of excess wild horses and burros removed from the public lands. The court denied the motion for a preliminary injunction in April 1982. On March 4, 1983, BLM announced its final rulemaking establishing adoption fees. On March 25, 1983, pursuant to stipulation of counsel, the district court dismissed the case.

8. *American Horse Protection Association, Inc. v. Watt, et al.*, Civil No. 82-3477 (D.D.C. 1983)

Plaintiffs sought to enjoin defendants from authorizing the adoption of 25 or more wild horses or burros by one applicant on the grounds that such adoptions subject the animals to an unreasonably high risk of illegal sale or inhumane treatment. Plaintiffs also sought an order to compel defendants to perform adequate investigations of all previously authorized large-scale adoptions. On July 8, 1983, pursuant to stipulation of counsel, the district court dismissed the case. The BLM agreed to take additional precautions before allowing adoption of more than four animals by one applicant and to undertake a more active review of adoptions where the applicant is represented by another individual.

9. *Sheridan v. Andrus*, Civil Appeal No. 81-1434 (10th Cir. 1983)

Claiming that private horses were illegally removed during a wild horse gathering, the plaintiffs sought damages for the loss of their animals and for use of private lands during the gathering. The court ordered the BLM to pay damages for a certain number of animals, but refused damages for use of private lands. The defendants, believing the unbranded animals to be wild horses, appealed to the U.S. Court of Appeals for the Tenth Circuit, which, on August 22, 1983, upheld the lower court's ruling.

Pending

1. *Mountain States Legal Foundation v. Hodel*, Civil Appeal No. 82-1485 (10th Cir., filed April 14, 1982)

Plaintiffs alleged that the public lands and the wild horses were not being managed properly as required by the Act. They sought damages for the loss of their property arising from grazing and other activities. The complaint alleged that the Director of BLM was personally liable for improper management of wild horses. The trial court issued a partial ruling that certain animals must be removed by specific dates and dismissed plaintiffs' request to hold BLM's Director personally liable. The decision was appealed to the U.S. Court of Appeals for the Tenth Circuit, which dismissed the appeal and remanded the case to the trial court for ruling on all unresolved issues. On February 19, 1982, the trial judge denied compensation to the plaintiffs for forage consumed by wild horses. The court also amended its order concerning management levels and extended the deadline for removal of excess animals from the Rock Springs District. Plaintiffs filed a Notice of Appeal with the Tenth Circuit Court of Appeals. The appeal is pending.

2. *Fallini v. Watt*, Civil No. 81-536-RDF (D. Nev., filed 1981)

Plaintiff renewed an earlier request to have the court require the BLM to remove wild horses from private lands and to prevent the animals from straying onto the subject lands in the future. Defendant filed an answer to the complaint. Summary judgment motions have been filed by both parties. Defendant asked the court to deny plaintiff's request on grounds that the claims were already decided by the court in *Fallini v. Andrus*, resolved July 9, 1981.

3. *DeMar Dahl v. Watt, et al.*, Civil No. R-82-124-BRT (D. Nev., filed 1982)

The plaintiff requested that the court order BLM to reduce immediately the number of wild horses on allotments for which he holds grazing permits to the level present when the Act became law in 1971. The BLM has filed an answer to the complaint.

4. *Bright-Holland Company v. Watt*, Civil No. R-82-153-BRT (D. Nev., filed 1982)

Plaintiffs asked the court to require BLM to remove wild free-roaming horses and burros from their private lands, alleging permanent damage to their lands. Plaintiffs filed a motion for summary judgment, arguing that there is no genuine issue of material fact. Defendants filed a motion in opposition to summary judgment, arguing in part that a genuine issue of material fact exists as to the presence of wild horses on plaintiffs' property. Both parties filed reply memorandums. The district court denied plaintiffs' motion for summary judgment and dismissed their claim for damages. Plaintiffs have not yet asked the court for a calendar date to hold a trial or evidentiary hearing on their claim for removal of the animals.

Appendix C

Summary of Bureau of Land Management Wild Horse and Burro Program Accomplishments for Fiscal Years 1982 and 1983

State	Herd Areas Monitored	Herd Management Area Plans	Inventory (000 acres)	Removals		Adoptions		Compliance Inspections (# of Adopters)	Titles	
				H	B	H	B		H	B
AK	0	0	0	0	0	0	0	3	0	0
AZ	0	2	0	0	1,392	13	147	76	46	194
CA	11	0	3	990	2,148	841	454	454	927	503
CO	4	1	620	194	0	398	100	45	386	116
ID	0	2	372	217	26	164	26	199	626	10
MT	2	0	0	68	0	65	0	87	344	14
NV	139	5	4,412	5,096	356	947	99	54	980	21
NM	0	3	21	27	0	1,370	271	56	1,638	181
OR	2	2	2,705	1,339	0	834	345	80	1,632	215
UT	71	3	1,522	95	0	62	0	311	401	0
WY	6	8	19,052	4,070	0	2,000	588	537	1,402	110
ES	0	0	0	0	0	2,200	1,131	75	1,815	471
Subtotals				12,096	3,922	8,894	3,161		10,197	1,835
Totals	235	26	28,707	16,018		12,055		1,977	12,032	

Appendix D

Summary of Forest Service Wild Horse and Burro Program Accomplishments for Fiscal Years 1982 and 1983

State	Territories		Management Plans Completed			Removals	Adoptions
	No.	Acres	Prior to 1982	1982-1983	Total		
AZ	3	42,964	1	0	1	0	0
CA	9	466,999	6	3	9	603	354
ID	2	4,880	0	0	0	0	0
MT	1	3,350	1	0	1	0	0
NV	18	1,122,590	8	0	8	94	0
NM	9	142,434	2	1	3	24	16
OR	2	100,660	2	0	2	153	0
UT	3	44,685	2	1	3	0	0
Totals	47	1,928,562	22	5	27	874	370 ¹

¹Includes only those animals adopted independently of the BLM Adopt-A-Horse Program summarized elsewhere in the text.