

## Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward

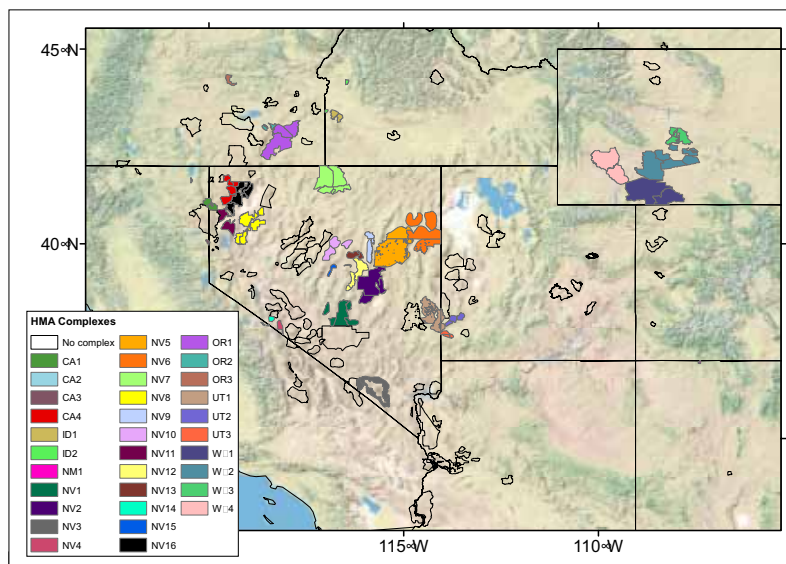
This report reviews the science that underpins the Bureau of Land Management’s oversight of free-ranging horses and burros on federal public lands in the western United States, concluding that constructive changes could be implemented. The Wild Horse and Burro Program has not used scientifically rigorous methods to estimate the population sizes of horses and burros, to model the effects of management actions on the animals, or to assess the availability and use of forage on rangelands. Evidence suggests that horse populations are growing by 15 to 20 percent each year, a level that is unsustainable for maintaining healthy horse populations as well as healthy ecosystems. Promising fertility-control methods are available to help limit this population growth, however. In addition, science-based methods exist for improving population estimates, predicting the effects of management practices in order to maintain genetically diverse, healthy populations, and estimating the productivity of rangelands. Greater transparency in how science-based methods are used to inform management decisions may help increase public confidence in the Wild Horse and Burro Program.

In 1971 Congress tasked the Bureau of Land Management (BLM) with the “protection, management, and control of wild free-roaming horses and burros on public lands.” BLM is also responsible for managing these lands for other uses, such as recreation, mining, forestry, livestock grazing, and habitat for wildlife. Managing these sometimes competing interests and maintaining a “thriving natural ecological balance on public lands,” as the law mandates, has proved challenging.

To maintain that balance, BLM established Herd Management Areas in locations where the horses and burros were found in 1971 and limited them to these areas. Horses and burros are rounded up (gathered) and removed when a thriving natural ecological balance is threatened.

The Wild Horse and Burro Program is facing a financial crisis because most animals removed from Herd Management Areas are not adopted by private owners. The expense of maintaining unadopted animals in long-term holding facilities for the rest of their lives consumes about half of the program’s budget. The National Research Council committee was tasked with investigating ways BLM

could use the best science available to improve management of horses and burros on the range. In fulfilling its task, the committee’s goal is to provide BLM with tools that could be used to decrease the use of and spending on holding facilities and to manage healthy populations on the range.



**Figure 1.** This map shows Herd Management Areas managed together or with U.S. Forest Service Wild Horse (or Burro) Territories as complexes. Aggregating neighboring Herd Management Areas on which free movement of horses or burros is known or likely into Herd Management Area complexes can improve data quality and enhance population management. Herd Management Areas shown in white are not managed as part of a complex. SOURCE: Mapping data and complex information provided by the Bureau of Land Management.

## Monitoring Populations of Horses and Burros

Most BLM management decisions are based on estimates of the size of horse and burro populations. In its assessment of BLM's procedures, the committee reached the following conclusions:

### Management of free-ranging horses and burros is not based on rigorous population-monitoring procedures.

Inventory methods or statistical tools common to modern wildlife management were not used on most Herd Management Areas. Survey methods used to count animals were often inconsistent and poorly documented and did not quantify the uncertainty attached to counts. However, improvements to population monitoring have been implemented in recent years. For example, BLM is partnering with the U.S. Geological Survey to develop rigorous, practical, and cost-effective survey methods; the committee commends this research effort and encourages its continuation.

### On the basis of information provided to the committee, the statistics on the national population size cannot be considered scientifically rigorous.

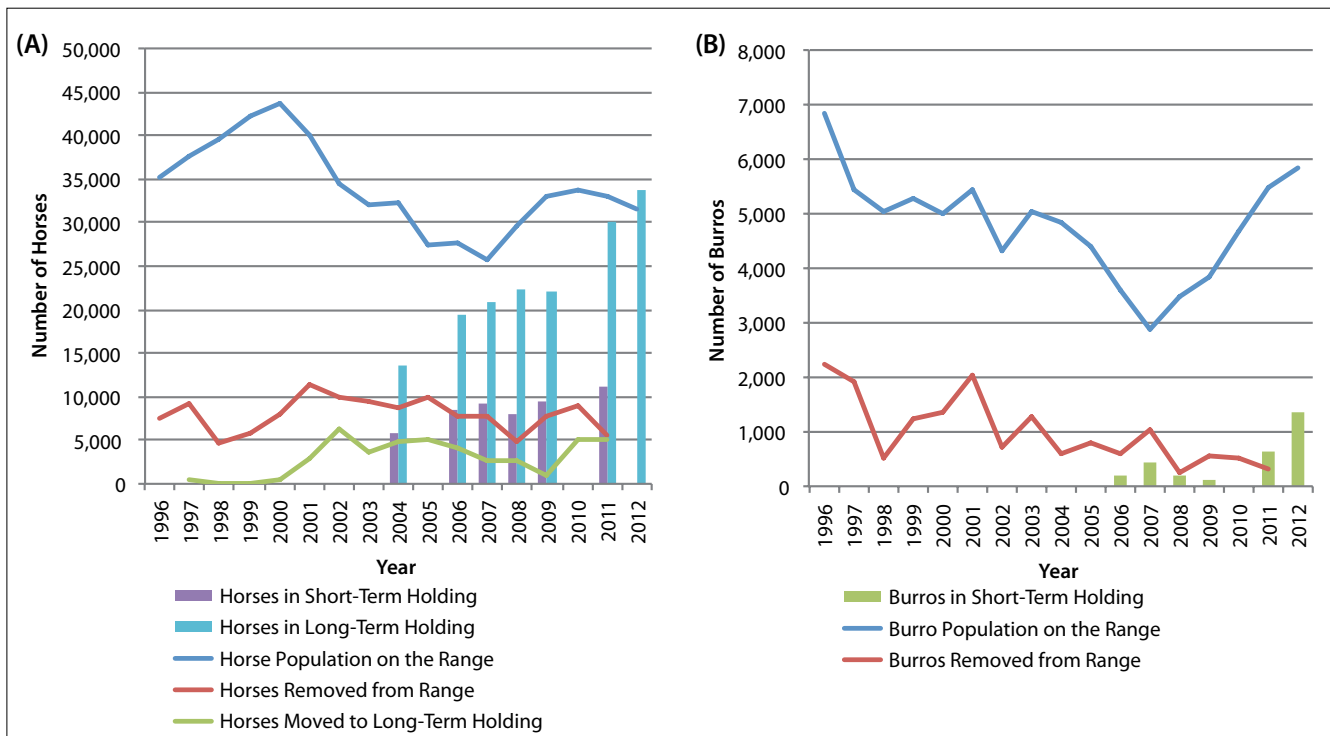
The links between BLM's estimates of the national population size and its actual population surveys—the data that underlie these estimates—are obscure. The procedures used to develop population estimates for the Herd Management Areas from counts of animals are not standardized and frequently not documented. Therefore, it seems that the national statistics are the product of hundreds

of subjective, probably independent judgments and assumptions by range personnel about the proportion of animals counted during surveys, population growth rates, and other factors. BLM's reported annual population statistics, which are based on the assumption that all animals are detected and counted, probably underestimate the actual number of animals on the range. Developing and using a centralized relational database that captures all data on animal counts and removals generated by BLM's field offices and by animal processing and holding facilities would provide a clear connection between the actual data collected and the reported statistics.

### Estimating and Managing Population Growth

Understanding the growth rates of horse and burro populations is important to management decisions. The committee evaluated those growth rates and the factors that could affect them—such as management actions and predators—and reached the following conclusions:

**The majority of free-ranging horse populations on public rangelands in the western United States are growing 15 to 20 percent a year.** The committee reviewed the ages of horses removed from the range during the years 1989 to 2011 and found that these data can provide a reasonable assessment of the general growth rate of the horse populations. That growth rate was supported by the published literature the committee reviewed.



**Figure 2.** Overall population-size estimates of horses (A) and burros (B) on the range (which may be underestimates), the number removed from the range, and the number in holding facilities from 1996 to 2012 (for years available). SOURCE: Population-size estimates and numbers of animals removed and in holding facilities provided by BLM.

**Management practices are facilitating high rates of population growth.** BLM's removals hold horse populations below levels affected by food limits. If population density were to increase to the point that there was not enough forage available, it could result in fewer pregnancies and lower young-to-female ratios and survival rates. Decreased competition for forage through removals may instead allow population growth, which then drives the need to remove more animals.

**Predators will not typically control population growth rates of horses.** Because predators like mountain lions and wolves are not abundant in Herd Management Areas, the potential for predators to affect free-ranging horse populations is limited. Mountain lions require habitats different from those favored by horses, and the committee was unable to find examples of wolf predation on free-ranging horses in the United States.

**The most promising fertility-control methods for free-ranging horses or burros are porcine zona pellucida (PZP) vaccines and GonaCon™ vaccine for females and chemical vasectomy for males.** This conclusion is based on criteria such as delivery method, availability, efficacy, duration of effect, and potential for side effects. Although applying these methods usually requires gathering horses and burros, that process is no more disruptive than the current method of population control—gathering and removal—without the further disruption of removing animals. Considering all the current options, these three methods, either alone or in combination, offer the most acceptable alternative to removing animals for managing population numbers.

### **Maintaining Genetic Diversity**

Protecting the long-term health of free-ranging horse and burro populations includes maintaining their genetic diversity, which is necessary for herds to respond to and survive changes in the environment. The committee examined evidence on the genetic diversity of these herds and reached the following conclusions:

**Management of horses and burros as metapopulations is necessary for their long-term genetic health.** Genetic studies of horses on 102 Herd Management Areas show that the genetic diversity for most populations is similar to those of healthy mammal populations, although genetic diversity could change over time. Little is known about the genetic health of burros; the few studies that have been conducted reported low genetic diversity compared to domestic donkeys. To achieve optimal genetic diversity, managers could consider the collective populations of several Herd Management Areas as a single population. Management options include intensively managing individuals according to their genetic makeup within Herd Management Areas, moving horses and burros among these areas, or both.



Free-ranging horses, Onaqui Herd, near Dugway, Utah

Credit: BLM/Utah

**Recording the occurrence of diseases and clinical signs would allow BLM to monitor the prevalence of genetic conditions that affect population health.** Such data have not been recorded and integrated to date. Surveillance of these mutations would be possible if blood or hair samples are collected during gathers. Over time, regular sampling would reveal whether a particular Herd Management Area has a higher occurrence of a given mutation that might affect the fitness of the herd.

### **Improving Management and Transparency**

The committee examined various aspects of how BLM makes management decisions about free-ranging horse and burro herds and communicates them to the public, and concluded the following:

**It is unclear whether or how the results of the WinEquus model are used in management decisions, and the input parameters are not transparent.** BLM currently includes the results of WinEquus, a computer program that simulates how horse populations would change with management actions such as removal or fertility control, in its gather plans and environmental assessments. Given appropriate data, WinEquus can adequately simulate such changes. However, the results depend on the values of input parameters—for example, age-specific foaling rates or the sex and the age composition of a herd—and various management options selected by the user when setting up the simulations. These parameters were rarely provided in gather plans and environmental assessments, and in most of the reviewed documents WinEquus output was copied and pasted with no explanation or interpretation of the results. It was difficult to determine if results were used to make management decisions or were offered as justification for decisions that were made independently of modeling results. A clear description of the input parameters and options selected by the user would help the public assess the reliability of WinEquus modeling results. In addition, a clear explanation of whether or how results of population modeling were used would improve transparency.

**The Wild Horses and Burros Management Handbook lacks specificity.** Issued by BLM in 2010, the handbook provides some degree of consistency in goals, allocation of

forage, and general habitat considerations. However, the handbook lacks the specificity needed to adequately guide managers on establishing and adjusting Appropriate Management Levels—the number of horses and burros BLM deems appropriate for a given Herd Management Area. It does not provide sufficient detail on how to monitor rangeland conditions. In addition, the handbook does not clarify the important legal definitions—such as “thriving natural ecological balance”—related to implementing and assessing management strategies for free-ranging horses and burros. Without precise definitions, these concepts remain uninformed by science and open to multiple interpretations.

**How Appropriate Management Levels are established, monitored, and adjusted is not transparent to stakeholders, supported by scientific information, or amenable to adaptation with new information and environmental and social change.** Appropriate Management Levels are a focal point of controversy between BLM and the public. Standards for transparency, quality, and equity are needed in establishing these levels, monitoring them, and adjusting them. Data and methods used to inform decisions should be scientifically defensible, and the public should be able to understand the methods used and how they are implemented and to access the data used to make decisions. Appropriate Management Levels should be adaptable based on environmental change, changes in social values, or the discovery of new information.

**Resolving conflicts with polarized values and opinions regarding land management rests on principles of transparency and public participation in decision making.** Participatory decision-making processes foster

the development of a shared understanding of the ecosystem, an appreciation for others’ viewpoints, and the development of good working relationships. Thus, BLM should develop an iterative process between public deliberation and scientific research and codesign the participatory process with representatives of the public.

### **Moving Forward**

Continuing “business as usual” will be expensive and unproductive for BLM and the public it serves. Compelling evidence exists that there are more horses and burros on public rangelands than reported at the national level and that population growth rates are high. If populations are not actively managed, the abundance of horses and burros on public rangelands will increase until animals face food limitation. They would then affect forage and water to levels detrimental for themselves as well as for all other animals on shared rangelands, potentially conflicting with the multiple-use policy and the legislative mandate to maintain a thriving natural ecological balance.

Tools already exist for BLM to address many of these challenges. Available improvements to current management practices include better methods for estimating population size, more effective use of modeling to predict the results of management actions, greater use of fertility-control treatments, application of genetics information to herd management, and improved methods for measuring the amount of available forage. Addressing those issues with science-based management approaches that are applied consistently and communicated transparently to the public could help increase public confidence in the Wild Horse and Burro Program.

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The National Academies appointed the above committee of experts to address the specific task requested by the Bureau of Land Management. The members volunteered their time for this activity; their report is peer-reviewed and the final product signed off by both the committee members and the National Academies. This report brief was prepared by the National Research Council based on the committee’s report.



For more information, contact the Board on Agriculture and Natural Resources at (202) 334-3062 or visit <http://dels.nas.edu/banr>. Copies of *Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward* are available from the National Academies Press, 500 Fifth Street, NW, Washington, D.C. 20001; (800) 624-6242; [www.nap.edu](http://www.nap.edu).

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