Overpopulation of Wild Horses and Burros in Nevada Has Severe Impacts on Both Health of Horses as Well as the Ecological Health and Sustainability of Nevada's Rangelands

The significant and continued overpopulation of wild horses and burros in Nevada has had a dramatic impact on the ability to manage Nevada's rangelands for rangeland health and a thriving natural ecological balance. Examples abound of the severe degradation of natural springs and riparian areas, unhealthy or dying horses, and negative effects on wildlife and native vegetation. The examples below are from geographic areas where livestock grazing is documented to be very limited (especially during vegetation growing season and/or summer months) or has been removed altogether, and where horses are so overpopulated that they are found starving and competing with native wildlife for forage and water.

Health of Horses and the Landscape

The following photos were all taken at the Cold Creek Herd Management Area (HMA) in Eastern Nevada in 2012. This area is overpopulated with wild horses who compete with each other and with wildlife for food and water.

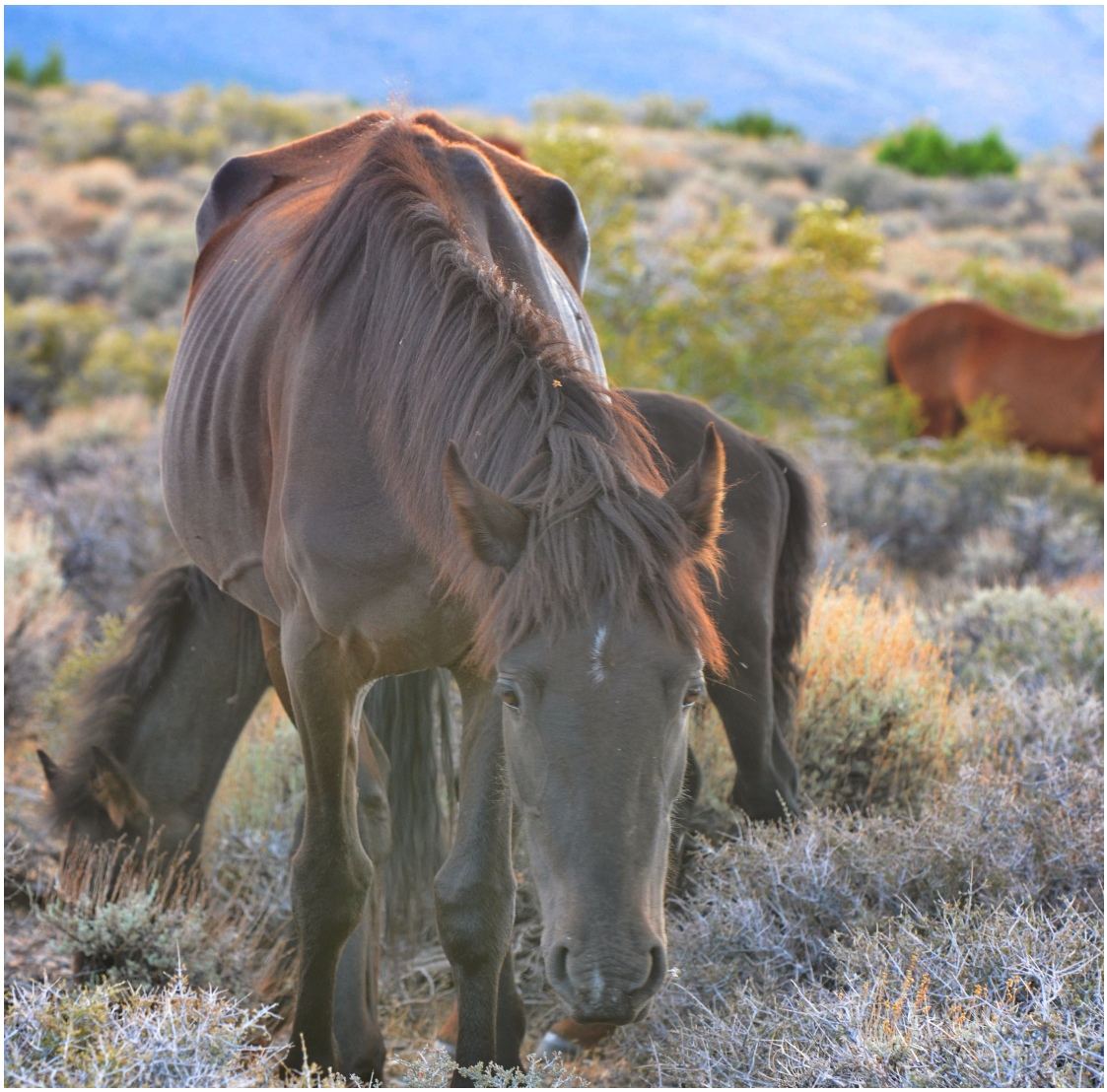


Photo by Savannah Sturm (used w permission)-taken at Cold Creek HMA, Eastern NV, 2012.

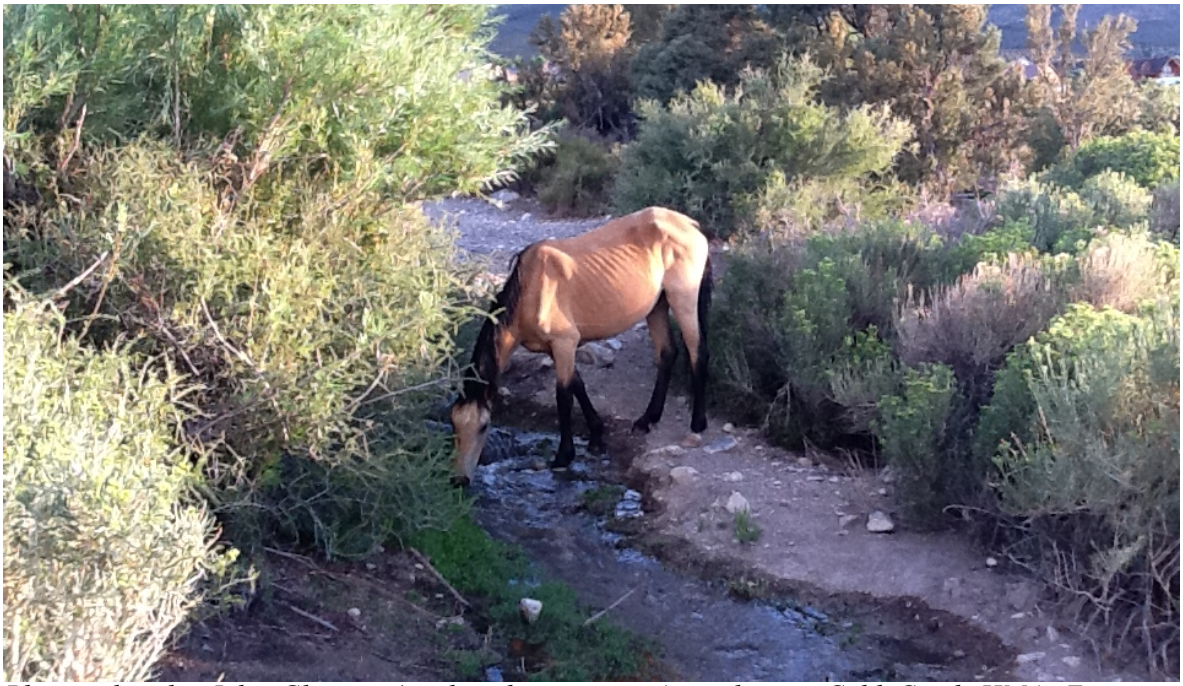
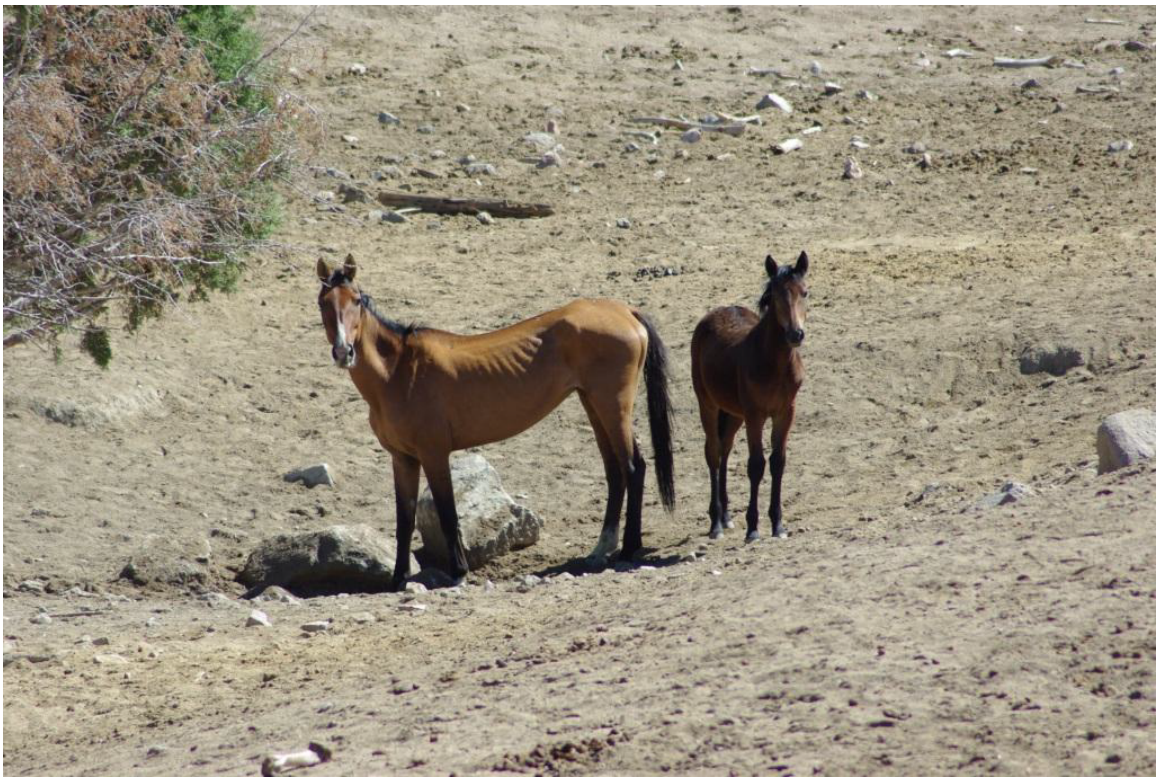


Photo taken by Julie Gleason (used with permission) - taken at Cold Creek HMA, Eastern Nevada, 2012.

Photo obtained from Eureka County Dept. of Natural Resources - taken at Cold Creek HMA, Eastern Nevada, 2012.

Impacts to Landscape and Ecology

The photo below shows horses at the Deer Springs Area Conveyance in Eastern Nevada. Ribs and other bones show the poor body condition and compromised physical health of the horse due to insufficient forage. Horses in this condition are ill prepared for winter months. The photo also shows a spring that has been completely denuded by horses as well as "stomped down" so that the water is no longer accessible.



Mare and foal at Deer Spring conveyance (September 2010). Permitted livestock season of use is from 11/1 to 5/15.[1]

[1] "Antelope Complex Capture Plan And Environmental Assessment," United States Department of the Interior, Bureau of Land Management, Wells and Schell Field Offices, November 2010, page 27.

In the landscape photos below, the population of wild horses in this geographic area was at 142% - 239% of what the BLM had determined was sustainable. This was an area within which livestock use had not "generally occurred … since 1994."[2] Grazing that has occurred is permitted for use during the dormant season only. The degraded condition of the native salt desert shrub plant community due to the overuse from horses is apparent.

Photo by Callie Hendrickson – taken at Fish Creek Allotment, Antelope Valley, Eureka County, NV, July 2012.

Photo by Callie Hendrickson – taken at Fish Creek Allotment, Antelope Valley, Eureka County, NV, July 2012

[2] "Fish Creek Complex Conformance Determination", Bureau of Land Management, Battle Mountain, Nevada, District, June 2004, page 100.

Environmental Impacts ~ Sheldon National Wildlife Refuge

In the Sheldon National Wildlife Refuge in Northwestern Nevada the U.S. Fish and Wildlife Service has documented extensive resource damage resulting from the overpopulation of wild horses. Please follow the link below to U.S. Fish and Wildlife webpage on wild horse and burro management in the Refuge. The page includes data as well as pictures illustrating damaged riparian areas and native vegetation and wildlife, in an area with no livestock grazing.

http://www.fws.gov/sheldonhartmtn/Sheldon/horseburro.html

Documentation of Overpopulation

The Diamond Complex consists of the Diamond, Diamond Hills North, and Diamond Hills South HMAs in Eureka, Elko, and White Pine Counties in Nevada. The HMAs border one another and wild horses move east-west and north-south through the HMAs throughout the seasons. The upper range Appropriate Management Level (AML) for the entire Diamond Complex is 210 horses. In November 2012, the BLM estimated the horse population of the Diamond Complex to be 813 horses, or 387% of the established AML, with an additional 311 horses outside of the Diamond Complex HMA boundaries. The horses outside the HMA cause public safety issues by congregating on the Strawberry Highway, and several have been hit by vehicles. All of the ranchers on the Diamonds have taken reductions in grazing allotments (the grazing duration and/or number of cattle they are allowed to have on the range) due to drought conditions and horse impacts, yet horse populations have not been managed or reduced even down to the BLM-determined levels that can be sustained by the ecology of the Diamond Complex. One ranching family on the Diamonds was so severely overrun by wild horses on their allotment, over multiple years, that they were unable to continue grazing and were forced out of the ranching business altogether.

Between January 18 and February 7, 2013 the BLM gathered 792 horses from the Diamond Complex. More horses were gathered than anticipated due to poor physical health as well as compromised range conditions. The BLM estimated 78 horses remained on the entire Complex after the gather; however, to better understand the number of horses remaining on the Complex, the BLM completed a census flight in July, 5 months after the gather was completed. What the census found was that a much greater number of horses remained on the Complex than the BLM had estimated – they counted at least 450 horses…a number that was 214%-233% of AML.
~ Source, Eureka County, Contact: Jake Tibbitts, (775) 237-6010

Feral Horses

Finally, please see the attached article containing information as well as photographs, from a publication of the Wildlife Society (TWS), the internationally recognized professional organization for certified wildlife biologists. TWS has passed a resolution[3] calling for very aggressive action to manage wild horses, based on the threat they pose to wildlife and western ranges. TWS refers to the animals not as wild, but instead feral, horses, based on their status as a non-native species that are not a natural part of the existing Western ecosystem.

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[3] http://joomla.wildlife.org/documents/policy/feral_horses_1.pdf

Lethal Hoof Beats

THE RISING TOLL OF FERAL HORSES AND BURROS

By Jim Jeffress and Paul Roush

Credit: Paige Jeffress

Jim Jeffress is a Retired Nevada Department of Wildlife Biologist and Former Wildlife Commissioner of Nevada.

Courtesy of Paul Roush

Paul Roush is a biological consultant and the retired head of the Bureau of Land Management's Wildlife and Fisheries Program in California.

"*Debate Grows Over Roundup of Wild Horses in Nevada.*" This headline from the *New York Times* late last December was an understatement to say the least. Public protests flared last winter as the Bureau of Land Management (BLM) rounded up and removed 1,922 feral horses from the Calico Mountains of northwestern Nevada. Movie stars wrote letters of protest, animal rights activists filed a lawsuit, and debate raged over the fate of animals widely seen as romantic symbols of the American West.

What few in the public seem to understand, however, is that feral horses and burros have become vastly overpopulated, and the BLM is obligated by law to keep them at sustainable levels. The agency is losing that battle. Some 38,400 feral horses and burros now roam across ten western states, nearly 12,000 animals—or 45 percent—over the number deemed scientifically sustainable (BLM 2010). These excess animals deplete forage and scarce water resources, trample vegetation, degrade livestock range, and disturb the habitat of myriad native plant and animal species, many of them endangered. The horses must be managed—but doing so creates a fierce public outcry.

To address public misperceptions sparked by the Calico roundup, BLM Director Bob Abbey wrote an editorial titled "Many myths in wild horse management debate" (Abbey 2010). The piece presented facts about the severe overpopulation of feral horses and burros and refuted false claims, such as the idea that "everything would be fine" if the BLM just left the animals alone. "This is an untenable assertion," wrote Abbey, "given that wild horse herds grow at an average annual rate of 20 percent a year, meaning that herd sizes can double every four years. Western public rangelands simply cannot withstand the [resulting] environmental impacts."

Caught squarely in the middle of this debate—and far out of the limelight—are the native fish and wildlife resources that are often seriously impacted or directly threatened by horse overpopulation. Wildlife managers need to understand how critical this issue has become as a threat to western biodiversity, and enlist the public in finding a solution. That won't be easy, given that the emotional pull of "wild" horses is rooted in our popular culture and deep in our history.

Horses in the American Past

The genus *Equus* originated in North America millions of years ago, eventually crossing into Eurasia over the Bering land bridge. After several extinctions and reintroductions, the final extinction of North American horses paralleled that of other megafauna such as the wooly mammoth and saber-toothed tiger during the late Pleistocene, approximately 8,000 to 12,000 years ago.

Spanish explorers in North America reintroduced a domesticated version of the horse in the early 15th century. As the animals escaped or were traded with native peoples, horse populations expanded throughout the West, forming the seed stock of the feral horse populations of today. Modern feral horses are genetically and behaviorally distinct from the native horses that vanished in the Pleistocene. "There was clearly genetic differentiation of wild horse populations associated with geography in Europe and Asia after separation from the North American horse," says Gus Cothran of the Animal Genetics Lab at Texas A&M University. "The greatest genetic change, however, is that which accompanied domestication."

American domesticated farm horse populations peaked in 1910 at 19.8 million animals (USDA 2005). Horses provided the literal horsepower for a new nation by supporting agriculture, commerce, and transportation. The steam and internal-combusion engines of the Industrial Revolution soon supplanted reliance on the horse, and animals once used for work were left on the range—the genesis of the feral horse overpopulation on western ranges today. By 1910 their numbers in central Nevada alone approached 100,000 animals (Wyman 1945).

Feral horses, also called mustangs or wild horses, were considered useless as work animals on ranches, and their foraging patterns began to

deplete available rangelands as severely as did domestic sheep (Thomas 1979; Wyman 1945; Hardy, Venstrom, and Mason 1944). Ranchers and "mustangers" kept feral horse numbers to a tolerable level through shooting and gathering, sometimes profiting from the sale of horses for domestic animal feed or for human consumption. Yet the harvest of feral horses wasn't enough to control their spread. Conflicts over their management arose, and Congress stepped in.

Legal Wrangling and Protections

Concerned about the deterioration of public rangelands, Congress passed the Taylor Grazing Act of 1934. It made some 80 million acres of land available for placement in grazing districts, and regulated the grazing of public lands to prevent soil erosion, improve rangeland condition, and help stabilize the livestock industry. In subsequent years, seasonal restrictions, pasture systems, and other developments further regulated grazing practices, yet feral horse use of rangelands remained unrestricted, laying the groundwork for a showdown with ranchers.

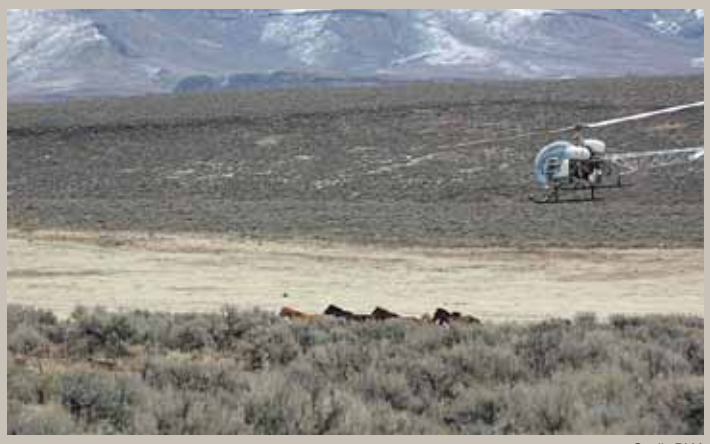
Haphazard feral horse culling went on for decades, with unregulated gathers carried out by trucks, fixed-wing aircraft, and other motorized equipment. Dismayed by such tactics, Nevada animal rights activist Velma Bronn Johnston (known as Wild Horse Annie) lobbied for a suite of legislative acts to protect the horses from indiscriminate and sometimes ruthless gathers and hunts. As a result, in 1959 Congress passed the Wild Horse Annie Act (Public Law 86-234) banning the use of motorized vehicles in gathers or hunts.

That law fell short of Johnston's hope for legislation to protect and manage wild horses and burros on public lands. She and others kept fighting until Congress passed the Wild Free-Roaming Horse and Burro Act of 1971 (PL 92-195). It identified feral horses and burros as "wild" and legitimate components of the public land and required that they be protected from "capture, branding, harassment, or death." It also directed the Secretary of the Interior to designate specific ranges on public lands as sanctuaries for wild horse protection and preservation.

Science Enters the Fray

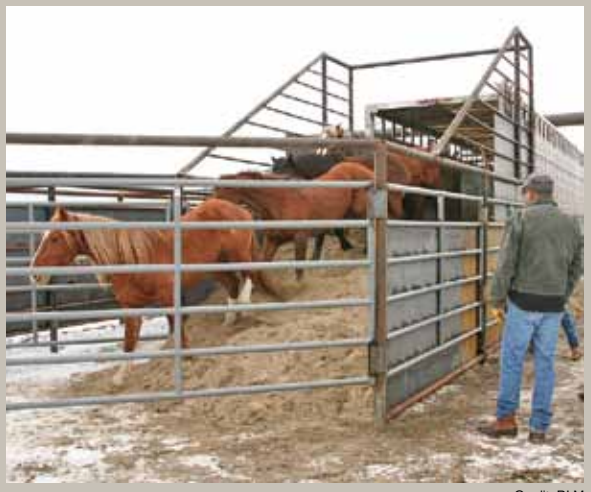
Science held a central place in the 1971 Act, which instructed the Secretary to "consider recommendations of qualified scientists in the field of biology and ecology" in order to "maintain a thriving natural ecological balance on the public lands" and to protect all wildlife on those lands, "particularly endangered wildlife species." Science-based management gained an even greater role when the original Act was amended by the Public Rangelands Improvement Act of 1978 (Public Law 95-514). It required:

- A current inventory of feral horses to determine appropriate management levels and whether overpopulation exists.
- Assessment of whether to address overpopulation by removing or destroying "excess animals" or employing other options such as sterilization.



Credit: BLM

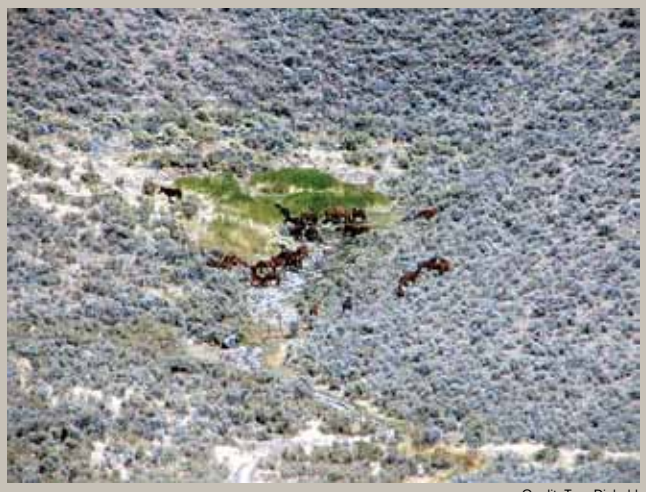
A helicopter stirs controversy as it herds feral horses in Nevada's Calico Mountains, a high desert habitat degraded by horse overpopulation. Gathered horses entered holding pens in Fallon (below) before transfer to pasture facilities. Government management of some 76,200 captive and free-ranging feral horses and burros costs taxpayers over $75 million a year.



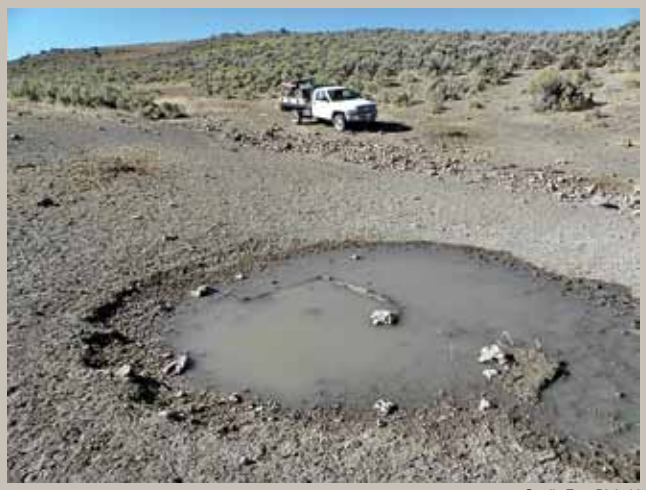
Credit: BLM

- Consultation with the U.S. Fish and Wildlife Service, state agencies, and experts recommended by the National Academy of Sciences.

As directed by the Act, managers had to designate lands to sustain existing herds. They did so by creating 199 (now 180) Herd Management Areas (HMAs) in ten western states, and for each HMA established specific population objectives or Appropriate Management Levels (AMLs). Each AML had a low-to-high population range, the high being the threshold beyond which the population became degrading to rangeland condition. Managers determined that the HMAs could sustain a maximum of 26,600 feral horses and burros—significantly below the 38,400 animals roaming free today. Despite efforts to define overpopulation and allowances to deal with excess animals, the goals of the 1971 legislation have rarely been attained, largely due to public outcry against horse removal or destruction.



Credit: Tony Diebold



Credit: Tony Diebold

More than 20 feral horses crowd a degraded desert spring in northern Nevada (top), where sparse riparian grasses yield to hoofs and hunger. On a nearby patch of private land (above), the concrete remains of a trough built just two years earlier–and the surrounding moonscape devoid of brush–attest to the rapid damage feral horses can cause.

Part of the problem also lies with nature. Feral horses have few natural predators other than the mountain lion. In fact, only one HMA—Montgomery Pass in California's Sierra Nevada Mountains—appears to exhibit a predator-prey balance that naturally controls the wild horse population (*Equus* May 2001). For the other 179 HMAs, feral horse populations increase at an average rate of 20 percent per year, including natural attrition. Moreover, with two-year-olds entering the breeding cycle, models indicate that feral horse population will double in less than four years and increase tenfold between 10 and 12 years—clearly an unsustainable level.

Silencing the Land?

Some horse advocates claim that the abundance of public land ensures that feral horses will have a negligible impact on wildlife resources. The opposite is actually true. The vast majority of feral horses and burros live throughout the desert environments of the intermountain West, with 49 percent of them in Nevada alone. Because forage and water are not uniformly distributed in these arid environments, wildlife and feral horses become concentrated in key habitats in order to survive.

Feral horses are the largest ungulates and top competitors for food, water, and space across their range. Behaviorally aggressive, they dominate and heavily use wet meadow sites, perennial systems, and small seeps and springs, depleting the water supply and trampling or grazing away much of the ground cover. Sustained utilization of these sites can cause long-term or permanent degradation.

Damage is most pronounced around perennial riparian systems, which may also support amphibians and native fish resources, some of which are listed as threatened, such as Lahontan cutthroat trout. Feral horse damage is also particularly harmful to sagebrush obligate species such as the sage-grouse,

which depends on groundcover for recruitment and year-long survival. Without available herbaceous cover and a forb component, recruitment of young birds drops accordingly. Horse impacts have been so significant at the Sheldon National Wildlife Refuge in northwestern Nevada that its updated conservation plan mentions removal of all feral horses from the site as one alternative to consider (see page 56).

Why should free-ranging horses be allowed to cause such harm while cattle and other grazing livestock are heavily controlled? For decades biologists have sought to reduce cattle grazing impacts through measures such as deferred grazing cycles, exclusion fencing, and strict pasture prescriptions at key sites. Yet wild horses can occupy these same grazing sites 365 days a year without management or utilization standards. Ultimately, fish and wildlife impacts caused by feral horses are essentially unlimited. The obvious message: Feral horses need to be managed not only within optimal AML levels, but in relationship to other valuable plant and wildlife resources within any given HMA.

Public Opinion Trumps Science

Clearly Congress has been aware of the inherent problems associated with overpopulations of large, free-ranging ungulates on western public lands. The Public Rangelands Improvement Act of 1978 mandated that when feral horses and burros exceeded appropriate management levels, they must be immediately removed to "protect the range from the deterioration associated with overpopulation." Removal would also help protect the horses themselves: Starvation due to overpopulation has been isolated as the primary population control mechanism for feral horses on the range. Though the law allowed for the adoption of excess feral horses and burros, it also required that "old, sick, or lame animals"—which would likely be unadoptable—should be "destroyed in the most humane manner possible." Arguably, euthanasia would be more humane than starvation.

Given the passions that feral horses arouse, however, public opinion rallied against the destruction of excess horses. As a result, the BLM has reverted to long-term storage of unadopted horses, which in turn has resulted in continual budget increases by Congress for their keeping and care. Thus, the law itself is no longer being implemented as Congress originally intended. For biologists, this reflects a recurring theme: the untenable situation where politics and emotion, rather than science and biological tenets, drive the management of feral horses.

This shift away from science bears a hefty price tag. The BLM is forced to care for and maintain unadoptable feral horses and burros in short-term and long-term holding facilities in more than 30 locations around the country. Currently, 17 short-term facilities hold 11,400 horses, and grassland pasture facilities in the Midwest hold an additional 26,400 animals. The federal government therefore owns about 37,800 captive horses and burros, whose care costs taxpayers some $40 million a year.

In addition, the government must manage the 38,400 free-ranging feral horses and burros, whose population will likely continue to swell. The total 2011 budget request for managing captive and free-ranging feral horses totals $75.7 million, up

Credit: Tony Diebold

As a parched foal lies dying, July sun bakes a cluster of thirsty feral horses that hover at a Nevada spring. "Since the mares do not get enough water to make milk, dead foals are a fairly common sight," says landowner Tony Diebold, whose remote cameras have shown horses lingering up to 14 hours waiting for springs to recharge. "Very aggressive feral horses" defend the springs most of the day, says Diebold, preventing other wildlife–from bobcats and badgers to pronghorn and sage hens–from accessing water.

from $26 million in 1995, a jump of nearly 300 percent. Short and long-term holding facilities will utilize 75 percent of that budget, with the balance directed at gathers and processing captured horses. Yet, often, the budget is exhausted early and only emergency gathers can be conducted, leaving feral horse populations to continually expand within the HMAs.

Neither adoption nor sterilization is easing this burden. Since 1971, approximately 225,000 feral horses and burros have been adopted. Supply far outweighs demand, however, and with the weak economy, urbanization, and a glut of trained horses for sale nationwide, the rate of adoption is in decline. Last year, adoptions fell to a low of 3,500 animals, down from an average of 6,300 per year in the 1990s.

Fertility control measures show some promise but are very expensive to administer, especially with non-captive animals. Research into such measures should continue, but the reality remains that the BLM gathers more horses annually than can be adopted and has never attained its population management objectives. The status quo will lead to more feral horses and burros on public lands, an equal number in government retirement pastures, and a financial black hole that will only continue to grow.

Time to Take Action

How do we as wildlife professionals place native western wildlife and ecological health back on the radar screen and into the limelight? For too long, horse advocacy groups and the media have framed this issue as "either you are for horses or against horses." But we know that it's really about sustaining the habitat for broad native biodiversity.

It's time to control the debate. All wildlife professionals—whether directly involved in feral horse management or not—can help in this effort by becoming informed and bringing science and sobriety to the discussion of feral horse management.

Consequences of the ROAM Act

By Paul Roush

In July of 2009, the House of Representatives passed the ROAM Act, an acronym for Restore Our American Mustangs (H.R. 1018). It now awaits action in the Senate Committee on Energy and Natural Resources. Many groups dedicated to natural resource conservation–including The Wildlife Society–hope for the bill's resounding defeat.

ROAM was sparked by a General Accounting Office (GAO) report that highlighted the Bureau of Land Management's (BLM) apparent failure to effectively control feral horse numbers. The report cited rising horse populations, declining adoptions, and soaring "off-the-range holding costs" that threaten to "overwhelm" BLM's Wild Horse and Burro Program (GAO 2008). Clearly GAO saw the need to strengthen BLM's ability to manage feral horses. However, shaped by political pressure from feral horse advocacy groups, the ROAM Act would actually restrict BLM's management options (as defined by the Wild Free-Roaming Horse and Burro Act) and open new public lands to feral horse impacts–much to the detriment of western ecosystems.

Providing direct testimony in response to the ROAM Act, Ed Roberson of the BLM laid out potential problems with the proposed law. Among the most serious issues:

Range. Current law defines the range of wild horses and burros (WHBs) as land "which does not exceed their known territorial limits." ROAM strikes that language, and requires the Department of the Interior (DOI) to "identify new, appropriate rangelands for wild free-roaming horses and burros" and to establish new "sanctuaries or exclusive use areas." For those of us with knowledge of the sagebrush ecosystems at risk, terms such as "appropriate rangelands" and "exclusive use areas" should be seen as red flags.

"Excess" Removal. Existing law defines "excess" WHBs as those legally removed from an area or that must be removed in order to achieve optimal population levels that will preserve "a thriving natural ecological balance." The ROAM Act strikes that first definition and redefines how to calculate population "excess." It also significantly restricts options for removal by:

- Banning the use of helicopters for gathering–though this is the safest, most efficient and humane means to gather feral horses.
- Requiring that a sufficient "adoption demand" from qualified individuals exists prior to feral horse removal–despite the fact that adoption demand has dwindled for decades.

Among the steps you can take:

- Write your federal representatives expressing opposition to the proposed ROAM (Restore Our American Mustangs) Act (H.R. 1018), which would open more range and private lands to feral horses and burros and further dilute their management options (see sidebar on page 54).
- Analyze the 19 recommendations of the BLM's Wild Horse and Burro Advisory Board (BLM 2008), which include discussions of fertility control, herd sex ratio, humane euthanasia, and semi-privatizing feral horse adoption.
- Review and discuss the proposals in Interior Secretary Ken Salazar's new feral horse initiative, which includes a recommendation to establish feral horse preserves in the Midwest and East to hold animals taken from western ranges.
- Read and distribute The Wildlife Society's new feral horse fact sheet (TWS 2010), which provides a succinct summary of the issue and pending legislation.
- Read TWS' draft position statement on feral horses and submit your comments—by February 1, 2011—to TWS Director of Government Affairs Laura Bies at laura@wildlife.org. Your input is crucial in helping to shape the final statement that will be submitted to policymakers.

Anyone inclined to act must do so quickly. Though the BLM is dedicated to the healthy preservation of feral horses and burros, it needs the backing of an engaged scientific community to support the effective management of those animals so that the rangelands of the West—and their native plant and animal species—can survive the rapid spread of an iconic animal that can be as lethal as it is beautiful. ■

This article has been reviewed by subject-matter experts.

To see a photo gallery of additional images and learn more about BLM's feral horse program, go to *www.wildlife.org*.

- Stating that removed WHBs cannot be contained in corrals or other holding facilities for more than six months, after which time, presumably, they'd have to be released.
- Requiring BLM to "research, develop, and implement" contraception, sterilization, or other methods of fertility control prior to removing excess WHBs from western ranges—a costly proposition, and difficult to implement.

Lethal Control. Existing law allows euthanasia for old, sick, or unadoptable horses. However, ROAM states that WHBs can only be euthanized if they're determined to be "terminally ill." Therefore, even under severe drought conditions when horses are at risk of starving, BLM would have to "temporarily remove animals from the range"—and presumably replace them following the crisis.

Oversight. ROAM restructures the Interior and Agriculture departments' Joint Advisory Board, increasing it from nine to 12 people and shifting the focus away from specialized wildlife knowledge. ROAM would mandate a board with three individuals each from the livestock industry, environmental community, animal rights groups, and wildlife sciences. This political mix would apparently be refereed by the three biologists, who may not even be required to have expertise in the WHB arena.

Reporting. The ROAM Act concludes by significantly expanding agency reporting requirements from two paragraphs to three pages. Reports would include information about consultations, enforcement, range acreage, population estimates, land acquisitions, fertility control, budget for contraception, and other issues. Though much of this information is already available, the more-extensive requirements could set the stage for continuous debate and litigation.

The conflicting paradigms of DOI and ROAM are apparent. ROAM Act co-sponsor Rep. Raúl Grijalva (D-AZ) characterizes the Act as an attempt to protect "majestic icons of the West" (HSUS 2009). The Wildlife Society joined 27 signatories on a letter urging Congress to drop the Act because it would "only exacerbate the deleterious effects of wild horses and burros on fish, wildlife, and their habitats" (TWS 2009). Ultimately, the ROAM Act would remove a vital tool for stemming the decline of the once vast sagebrush sea, and replace it with a politically borne, single-species agenda that would forever alter the face of the western range.

No Refuge

FERAL HORSE IMPACTS ON THE SHELDON NATIONAL WILDLIFE REFUGE

By Jim Jeffress

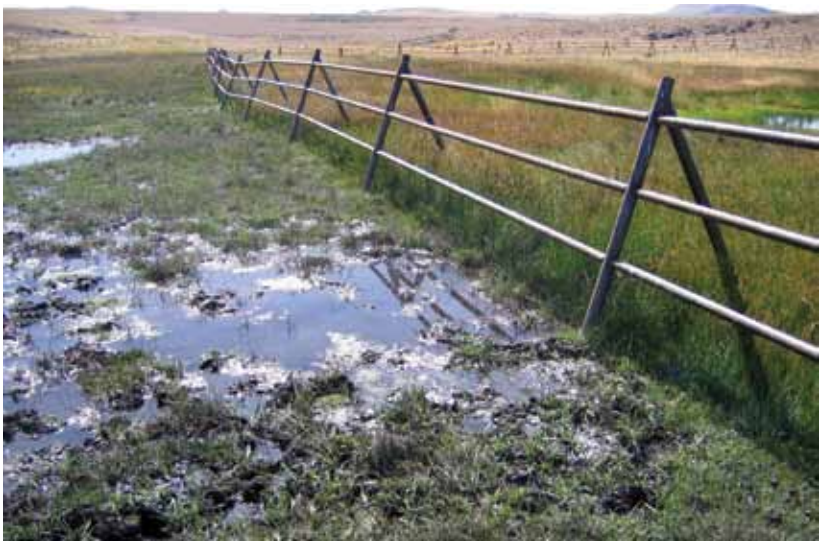
Credit: Paige Jeffress

Jim Jeffress is a Retired Nevada Department of Wildlife Biologist and Former Wildlife Commissioner of Nevada.

The Sheldon National Wildlife Refuge in far northwestern Nevada has 575,000 acres of productive high desert sagebrush habitat and shrub steppe vegetation. Rising to 7,200 feet in elevation, the site also has dozens of springs and seeps that nourish meadows of forbs, sedges, and grasses. Established in 1931, the refuge has long been a focal point for the management of sagebrush obligate species such as pronghorn and sage-grouse. Unfortunately, it has also been a stomping ground for feral horses—a non-native species that has left its mark.

In 1980, the first Environmental Impact Statement and planning document for the Sheldon refuge recommended that the site be managed for 75 to 125 horses and 30 to 60 burros (FWS 2007). That goal has been amended as horse populations have risen along with public outcry about their control. An assessment for Sheldon done in 2008 called for limiting populations to 800 horses and 90 burros, achieved through regulated removal and adoption. Yet those higher levels would require removal of 155 to 200 horses a year just to keep the herd stable (FWS 2008). A new Comprehensive Conservation Plan (CCP) describes management alternatives ranging from no action to total removal of feral horses within five to 15 years, but any management option will generate strong opposition.

Flattened vegetation and trampled mud show feral horse damage on the outside of an exclosure erected just four months earlier as part of a study at the Sheldon refuge. Inside the structure—accessible only to pronghorn, deer, and other native wildlife—tall grasses provide healthy cover for birds and forage for native animals.



Credit: Gail Collins/USFWS

Tough Odds to Beat

Reining in feral horse populations will be a huge challenge. The FWS estimates that Sheldon's herd grows 17 to 23 percent annually. Populations fluctuate naturally as well. Using direct counts to survey and estimate populations, managers report numbers ranging from a low of 150 horses in 1992 to a high of 1,236 animals in 2010. Pronghorn numbers have also varied widely, from 400 to 2,100 since 1993.

To reduce the impacts of large ungulates at Sheldon, livestock grazing at the site was banned in 1994. A few years later, the National Wildlife Refuge System Improvement Act of 1997 required the government to "maintain the biological integrity, diversity, and environmental health" of the refuge system. This seemed possible at Sheldon given the absence of livestock grazing. Yet monitoring data from 2002 found that 44 percent of Sheldon's streams and 80 percent of its springs had been severely degraded by feral horses and burros (FWS 2008).

Beyond damage to water sources, horse grazing and use patterns at Sheldon have compromised the efforts of prescribed burn programs and habitat improvement projects designed to strengthen native plant composition. Year-round use, particularly at riparian sites, can result in long-term or permanent habitat impacts. Further, horse competition for limited water at seeps and springs during the critical hot summer months has a tangible impact on native wildlife.

Removing horses makes a noticeable difference in habitat quality, but removals can be costly in time, money, and political capital. Over the last decade, the Sheldon refuge has spent a great deal of time and resources trying to reduce horse and burro numbers to management objective levels. About 80 percent of the refuge's budget is now consumed by horse-related activities. To address the problem, some groups have called for a zero-horse objective for the refuge. However, injunctions and legal maneuvers by animal-rights groups and horse advocates continue to challenge FWS management of Sheldon's feral herd. ■