

THE GRASS REMEMBERS THE HORSES

A land management design approach to incorporating free-roaming
American mustangs (*Equus caballus*) on western rangelands



Elizabeth Koonce

DISCLAIMER

The contents of this paper refer only to wild horse management on federal public lands, and the following recommendations and criticisms do not apply to sovereign lands and horse herds owned or managed by indigenous tribes within the United States.

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Dedicated to my dog Sammy. You sat behind my desk while I wrote every word of this paper. Thank you for supporting me through eight years of higher education. Good boy.

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American mustangs (*Equus caballus*) on western rangelands

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ABSTRACT

The United States currently faces a range crisis on its public lands. Federally protected mustangs (*Equus caballus*) share a degraded range with millions of grazing livestock. Mustangs' contentious status as an alleged invasive species is at odds with their protective status. Not managed as wildlife yet not classified as livestock, mustangs are removed from the range in the thousands only to live out their lives in costly government holding facilities which eat up most of the Bureau of Land Management's wild horse and burro budget. The BLM faces heavy opposition to mustangs from ranchers and political lobbyists. The entire public rangeland situation is a tangled web of public outcry, bureaucratic mismanagement, and dueling interests.

This project seeks to untangle the issues within the rangeland crisis through a "Land Management Design" approach. It presents a thorough background in the natural, cultural, and ecological history of the wild horse in North America, and focuses on the current management approaches utilized in the United States. Through the lens of several precedent studies, a strategic management framework is proposed. This framework is then applied to three Herd Management Areas (HMAs) in the state of Oregon. These three case studies are explored in depth and drone photography and mapping show the current status of these sites. Photoshop renderings present alternatives for how the sites could evolve when the proposed strategic management framework is applied.

It is possible for all parties with stake in the rangeland crisis to benefit from a land management design approach. The conclusion of the project discusses this at length, and further delves into the socio-political changes that must take place for our public lands and our wild horses to be saved.

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Mustang at Skydog Sanctuary near Prineville, OR

CHAPTER ONE

Mustangs in the United States

- 1.1 Natural history of the mustang
- 1.2 Mustangs through an ecological lens
- 1.3 Mustangs through a cultural lens
- 1.4 Rewilding and ecotourism
- 1.5 Mustangs through a design lens

“You occasionally see one, and it’s the thrill of a lifetime. But mostly all you ever see is a cloud of dust after they’re gone. It’s their stubborn ability to survive that makes them so remarkable.”

Velma “Wild Horse Annie” Johnston

1.1 Natural History of the Mustang

Mustangs (*Equus caballus*), also known as feral horses or wild horses, have a varied and contentious natural history that is not agreed upon by experts, and this disagreement over their status as native or introduced has led to a battle over their appropriate management within the United States. There are three dominant theories of the native classification of *E. Caballus*; (1) that the species originated in North America, spread to Europe, then went extinct in its homeland before being reintroduced as a domestic species in the 1400s and is therefore a genetically native species reoccupying the vacant niches of the North American prairie (Downer, 2014), (2) that the species originated in North America, spread to Europe, then went extinct in its homeland before being reintroduced as a domestic species in the 1400s and is therefore an invasive species (Manning, 1995), (3) and that the species originated in North America, spread to Europe, and continued to exist in the Americas in reduced numbers well past the end of the Pleistocene era, then interbred and hybridized with domestic horses which were brought over by colonists in the 1400s, increasing their numbers. There is a saying amongst several plains First Nation tribes; “The grass remembers the horses”.

There is no debate that horses originated in North America between 4 and 4.5 million years ago (Olsen & Hansen, 1977). As a keystone species in the grassland ecology of the prehistoric continent, horses thrived and spread from North America to other continents. According to the dominant Western historical perspective, horses eventually died out in their homeland near the end of the Pleistocene along with much of the other megafauna of the American plains (Manning, 1995). This major extinction was allegedly triggered by early human hunting and climatic changes (Garrot & Oli, 2013). In contrast to this widely accepted history, several first nation tribes allege that the aboriginal North American

horse survived through the end of the Pleistocene and was integral to the pre-colonial contact culture of Great Plains tribes. This claim is backed up by petroglyphs of wild horses dated hundreds of years prior to Columbus’s arrival and the more commonly accepted time that horses were reintroduced to the continent between 1493 and 1540 (Ryden, 1999). It is a mark of the Eurocentric belief that all “civilization” came from Europe that colonists and conquerors took credit for the establishment of horsemanship in the Americas (Krikpatrick, 2010). A greater exploration of the mustang as a native species utilized by indigenous tribes long before the arrival of white settlers can be found in Chapter 1.3, Mustangs through a cultural lens.

Due to the dismissal of indigenous oral histories, the arrival of horses back to their ancestral homeland is therefore attributed to Columbus and other Spanish explorers, who bred horses in their missions and colonies, spreading the species across the plains. Today, the United States considers mustangs to be an invasive species, and their management and status within the regulatory bodies of the government is indicative of this classification.

1.2 Mustangs through an Ecological Lens

Horses provide a variety of ecosystem benefits. Plant species richness and pollinator populations have been found to be higher in areas grazed by horses compared to ungrazed areas, and can even mitigate the decline of pollinator-dependent plants (Garrido et al., 2019). Horses have other interesting effects on the ecosystems they inhabit; by trampling certain vegetation and wallowing near water mustangs can create microhabitats and redistribute nutrients through seed dispersal (Garrido et al., 2019). Their feces, in addition to spreading seeds, builds the humus layer of soils and increases

soil's absorption of water, lowering wildfire risk. These characteristics are unique to horse feces compared with ruminants such as cattle, sheep, goats, or deer (Downer, 2014; Simpsons, n. d). Mustangs have also been shown to commonly graze on cheatgrass (*Bromus tectorum*), an invasive graminoid which outcompetes native grasses in the western United States. Cheatgrass is a dangerously dry, flammable species which can contribute to the intensity of wildfires in the west. Through the grazing of cheatgrass and other flammable grasses and forbs, wild horses can effectively reduce fire danger on their ranges (Downer, 2014). In addition, a natural behavior displayed by mustang herds is rubbing and scratching trees, knocking off dead and dying limbs, reducing "fire ladders" while simultaneously grazing grasses and browsing on brush fuel beneath the trees they use for shelter (Simpson, n. d).

Like all grazing species, horse overpopulation on scarce land can cause ecological degradation. In Australia, the Brumby, an introduced feral horse species descended from colonial stock, occupies the arid landscapes of the outback in the hundreds of thousands. Australia, a continent whose ecosystems evolved without large hoofed herbivores, has been overwhelmed by enormous populations of Brumbies with no natural predators and no ecological niche. The plants in the arid environment are especially vulnerable to degradation from large herds. Ecological catastrophe brought on by wild horse populations similar to the crisis in Australia is a deep-seated fear amongst range managers and the Bureau of Land Management. Though the total number of mustangs on the range in the United States is several hundred thousand less than those currently running wild in Australia, there is no denying that the vast majority of the United States' public lands are degraded from decades of livestock grazing and agriculture, requiring that wild horses be carefully managed to avoid ecological disaster in an ever-dwindling habitat.

How can mustangs' natural ecological benefits be best used, and how can these uses work alongside the dilemma of management the BLM now faces? The answer may lie in the restoration of the plains, where horses were once extirpated from their preferred ranges along with other prairie-dwelling species such as elk, bears, bison, and wolves (Manning, 1995) as eastern settlers moved west (Mott, 2014). The largest biome in North America, covering 40% of the continent, the grasslands of the American prairie are now just a fraction of their former range, having been degraded by agriculture. Secondary grassland sites that remain, such as the Little Missouri National Grasslands in North Dakota, are grazed by over 25,000 cattle and covered in acres of oilfields.

TERMS to KNOW

Figure 1.1

Stallion: An adult male horse.

Mare: An adult female horse.

Foal: A baby horse.

Colt: A young male horse, not yet sexually mature.

Gelding: A castrated adult male horse.

Mesograzers: Species with the highest per capita potential to shape climate change drivers.

WFHBA: Wild Free-Roaming Horse and Burro Act. Passed in 1971 and classified wild horses and burros as "living symbols of the West" and stated that they would be legally "protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found".

1.3 Mustangs through a Cultural Lens

As covered in Chapter 1.1, Natural history of the mustang, the definition of “native” versus “invasive” is a key distinction that is argued by warring management entities (Bhattacharyya, 2011), and considered unimportant to the First Nations peoples who consider the horses and their land to be a key element of their cultural landscape and heritage, regardless of whether they are federally designated as invasive or native. Western academia still supports the claims of Spanish conquistadors that they brought the first horses to the Americas, despite contradictory accounts from indigenous peoples stating that the wild horse was always a critical element of their history, culture, and spirituality. According to Doctor Yvette Running Horse Collin in her dissertation “The relationship between the indigenous peoples of the Americas and the horse: Deconstructing a Eurocentric myth”;

“Despite proof of this long-standing relationship, the dominant Western culture remains adamant that it is responsible for introducing the Indigenous Peoples of the Americas to the horse. This action has served as a fundamental attempt to diminish these Indigenous Peoples and their cultures by asserting a Eurocentric position of dominance. In making this claim, the dominant Western culture is saying: “Without us, you would not have these sacred and critical elements of your culture,” and therefore, “Your culture is derivative of our own.” The psychology behind such “factual redoing” combined with a compulsory educational system that teaches “Native history” through the eyes of the colonizer has had grave consequences for Indigenous American communities.”

Wild horses were vital to many Native American communities, especially those that lived on the plains. Horses provided increased mobility, transportation of goods, and status amongst peers. In Choctaw culture, warriors were even buried with their horses “...to help those who were frightened to make a safe transition from this world into the afterlife” (Running Horse Collin, 2017).

Though no longer a key means of transportation in modern communities, horses are still important to life for many tribes. For example, free-roaming horses in the Chilcotin region of British Columbia have been captured and trained for community use for centuries by the Tsilhqot’in First Nations people, who contemporarily use horses for backcountry travel, hunting and harvesting food in remote areas, cultural ecotourism, and community youth activities (Bhattacharyya & Murphy, 2015). The Tsilhqot’in people also identify with the horses’ behavior and “...the seasonal movement of small family herds throughout the landscape, which parallel the traditional seasonal movements of small Tsilhqot’in family and community groups” (Bhattacharyya, 2015). Wild horses ground tribes in local cultural and Traditional Ecological Knowledge (TEK) and are vital to the experience of First Nations cultures across North America.

Mustangs were important to the culture of white, black, and Hispanic settlers, as well. This was acknowledged by the government in the 1971 Wild Horse and Free-Roaming Burro Act (Public Law 92-195), which stated, “Congress finds and declares that free-roaming horses and burros are living symbols of the historic and pioneer spirit of the West and enrich the lives of the American people” (BLM, 2020). Known as “mustangers”, *mesteñera*, or vaqueros, different types of men and women captured wild horses in Mexico and the southwestern US territories in the 1800s and “broke” them to ride. Rounding up wild horses was considered an

extreme sport to some but was also a means of income and of livelihood for companies of ranch men catching mounts, families of traveling *mesteñera* who followed wild herds and sold colts, and lone buckaroos looking for bounty money for the capture famous stallions (Dobie, 1936). Black cowboys had a particular bond with wild horses. During the second half of the nineteenth century, when the owners of enormous cattle operations needed similarly large labor forces, the roughest jobs were given to black cowboys more often than their white counterparts. Taming wild horses was a dangerous and sometimes deadly occupation, and became the work of the black cowboy (Mroz, 2016). Bob Lemmon was a particularly famous black mustanger who would ride alone after bands of wild horses for weeks on end until the horses accepted him as their leader, then lead entire herds into corrals without ever using a rope (Dobie, 1936).

Cowboy culture depended upon having mustangs to capture and tame. Not only were wild horses a key aspect of the frontier experience, but they were inspirations for artists and became visual symbols of the west. As the pioneer lifestyle faded into the past, novels, movies, and television shows embraced the romantic appeal of horses running wild and free across the landscape (Slatta, 2001). Free-roaming horses are ingrained into the fabric of the west and remain a cultural touchstone for the region to this day.

Between Native American and settler culture, the wild horse was the lynchpin for a period of cultural upheaval and the creation of significant tradition in nomadic and agricultural life (Mott, 2014). The wild horse is one of the most culturally important animals in North American history, having shaped the Great Plains and the West into their current form.

Figure 1.2



Mustang at Skydog Sanctuary near Prineville, OR

1.4 Rewilding & Ecotourism

The daunting task of restoring the north American grasslands, tackled by nonprofit groups such as the American Prairie Reserve, has begun turning towards the restoration model of rewilding. Rewilding is the restoration of landscapes through large-scale, conservation efforts focused on biodiversity, ecosystem health and the reintroduction of apex predators and keystone grazing species (Rewilding.org, 2020).

Rewilding is becoming a common ecological practice throughout Europe, and many of these programs use large grazing species, including feral horses, as part of their rewilding practices (Corlett, 2016). The introduction of horses in rewilding projects increases biodiversity and maintains or preserves natural grassland mosaics, increasing their suitability for other species (Nunez et. al, 2016). While most of these European projects fence their horses into smaller pastures and supplement feed in the winter (Linnel et al., 2016), hardy mustangs have proven that their populations can thrive in their natural environment. With a commitment to allowing natural processes and healthy predator populations on restoration land, mustang populations can be limited by predators alone (Turner et al, 1992). Rewilding has not caught on in North America as it has in Europe, though there are pilot programs, including research with Canadian wild horse populations.

Rewilding and carbon mitigation go hand in hand, and the largest potential biome for rewilding is the world's grasslands, which cover 25% of the planet's land surface. Horses are considered mesograzers, which are classified as species with the highest per capita potential to shape climate change drivers. Horse herds affect ecosystem nutrient transportation, landscape fire regimes, and vegetation mosaics, while emitting

far less methane than cattle and sheep (Beest et al., 2018) due to their classification as hind-gut fermenters rather than ruminants.

1.5 Mustangs through a Design Lens

In the past, industrial capitalism romanticised ranching and pastoralism as noble work, and public lands embraced this. The modern “New West” economy, however, places an emphasis on recreation, leisure, and landscapes dedicated to “non-consumptive consumption” (Sayre, 2002). There is no reason that these non-consumptive public landscapes cannot coexist with mustangs. Many residents of states which are home to mustangs are shocked to hear that wild horses exist there, and are even more surprised to hear that they are on public land and can be sought out. With the proper infrastructure in place, what parents of a horse-obsessed young girl would deny her a weekend trip to attempt to spot a wild mustang? Given a choice between a regular BLM campground and one on a landscape where wild herds roam, what couple wouldn't jump on the chance to camp where they could see stallions sparring at dawn?

There are currently little to no public amenities or infrastructure relating to the wild horse herds on our public lands. Maps of Herd Management Areas (HMAs) are opaque and often inaccurate. HMAs are difficult to reach, peppered with private property warning signs, and property lines are unclear. Access roads are not maintained and often unmarked. Visitors hoping to find horses face the difficulty of navigating the gates, lack of signage, and potholed roads of the landscape, all while facing the possibility of mistakenly trespassing into someone's private land, which may be dangerous.

Mustangs are a cultural touchstone for connecting the public with our public lands. Designing these landscapes while

using mustangs as both ecological place-makers and a draw for visitors would create a non-consumptive use on HMAs which could replace the consumptive uses of livestock grazing, timber harvesting, and mining that currently occupy and degrade them.

Figure 1.3



Mustangs in the Palomino Buttes HMA



Mustang at Skydog Sanctuary near Prineville, OR

CHAPTER TWO

Management

- 2.1 Coining the term “Land Management Design”
- 2.2 Analysis of current mustang management
- 2.3 Political issues on the range
- 2.4 Healthy Appropriate Management Levels
- 2.5 Birth control
- 2.6 Predation
- 2.7 Disturbance regimes
- 2.8 Precedents

“I think having land and not ruining it is the most beautiful art that anybody could ever want.”

Andy Warhol

2.1 Coining the term “Land Management Design”

This project proposes a “Land Management Design” approach to the conundrum currently facing the US Government in regards to the wild horses on its public lands. The term “land management design” will be explained and defined here.

The blanket term of “management” is often used for landscape design at regional or ecological landscape scales, but “management” is often misconstrued or utilized as administrative or jurisdictional finagling (Lyle, 1999). What then is the difference between land management as most think of it and land management through the lens of landscape architecture and design? The difference lies not only in the scale but in the intention behind the work. Land management and planning through landscape architecture and design connotes intention, precision, control, and emotional investment (Lyle, 1999). This approach is extremely vital in contemporary land use and management because it can tackle the reconciliation of conflicting goals and uses of the land (Ahern et al., 2007). Though the terms “management” and “design” are often portrayed as being at opposite ends of the landscape architecture spectrum, “Land Management Design” is a valid and necessary marriage of design and landscape thinking.

Land Management Design synthesizes policy, physical design, conservation goals, and restoration of land and habitat. Land management design removes the administrative and political blinders from land management, and adds the ideals of Leopold’s land ethics, and of the designer’s belief in intrinsic values. There is no reason that Land Management Design should be relegated to the purely black and white, or that our natural resources should be considered only in the context of ones and zeros. To quote Aldo Leopold;

“One basic weakness in a conservation system based wholly on economic motives is that most members of the land community have no economic value. Wildflowers and songbirds are examples. Of the 22,000 higher plants and animals native to Wisconsin, it is doubtful whether more than 5 percent can be sold, fed, eaten, or otherwise put to economic use. Yet these creatures are members of the biotic community, and if (as I believe) its stability depends on its integrity, they are entitled to continuance.”

Incorporating the ideals of land ethics and the intrinsic value of species into the less abstract aspects of landscape architecture is at the core of Land Management Design. Ian McHarg, one of the most celebrated figures in modern landscape architecture and ecological design, was a land-use planner and manager, and conceived of landscape as a system which influenced wildlife through patches, corridors, and edges (Kloserwill, 2019). This was the beginning of Land Management Design, and of explicitly articulating the needs of those nonhuman species inhabiting landscapes and considering those needs within design with the same gravity given to human issues.

Land Management Design at the scale called for in this thesis involves not only ecological and geographical issues, but cultural aspects of the land. In his paper, *Ecological Science and Landscape Design: A Necessary Relationship in Changing Landscapes*, designer John Iverson states, “Landscape design is cultural action about nature, and landscape design constructs ecosystems”. One cannot design for nature without designing for humans, and one cannot design for humans without designing for nature. The changing nature of the American landscape, particularly the rapidly populating West, calls for the integration of humans and wildlife within the same matrix

(Brown & Fleury, 1997). Modern large-scale land management design must simultaneously maintain the integrity of the landscape, improve its sustainability, and preserve and strengthen the nature and cultural identity of the site through dynamic but sensitive methods (Yao & Zhao, 2019). Nature, and especially designed nature, is a mirror of the cultural landscape, and “Ideas of nature reveal as much or more about human society as they do about nonhuman processes and features.”(Spirn, 1997).

2.2 Analysis of Current Mustang Management

Free-roaming horses are not managed as wild or as domestic animals; they currently occupy an entirely unique status among North American mammals (Beever, 2003). Rather than being managed by the United States Fish and Wildlife Service, management and control of the majority of mustangs falls to the Bureau of Land Management (BLM), which controls public land use for mining, recreation, and livestock grazing, and a few herds fall under United States Forest Service (USFS) regulation.

For centuries wild horses existed in the millions on American lands. Cowboys and mustangers working for cattle companies in the 18th century began removing the horses to free up forage for livestock, and herds were managed locally well into the 1900s. Ranchers would release horses into herds for new blood, and gather prime colts to use as cow ponies. Wild horses were even sold to assist war efforts, being used as mounts in World War 1 (Mott, 2014). The system was self-regulating, keeping herds at stable numbers.

In 1934 the Taylor Grazing Act was passed, which privatized the range and allowed the federal government to lease land for ranching operations. Because of this act and the sudden

war for grazing territory, horses began to be removed by the thousands to free up land (Mott, 2014). Wild herds were decimated and sent to slaughter houses across North America. Advocates realized that the mustangs would disappear without regulation, and in 1971 The Wild Free-Roaming Horse and Burro Act (WFHBA) passed by Congress classified wild horses and burros as “living symbols of the West” and stated that they would be legally “protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found”. The language “where presently found” refers to the 53.8 million acres of public lands occupied in 1971 when the WFHBA was enacted. Currently, however, horses have been removed from 22.2 million of those acres and are restricted to only 31.6 million acres of their original range, 29.4 million of which they share with livestock. In 2014 there were 37 livestock animals on the range for each wild horse, and 97 percent of forage was allocated to private livestock (Hurwitt, 2018).

Some explanation of the BLM’s practices is necessary to understand the context in which mustangs are regulated. Approximately 80 percent of BLM land is authorized for livestock grazing (Hurwitt, 2018). As part of their livestock management on public lands, the BLM administers permits and leases to ranchers who graze their cattle and sheep on over 21,000 allotments across the west for a fee (BLM, 2020). These fees change based on yearly calculations. Ninety-four percent of grazing costs are covered by taxpayers (McWilliams, 2018). The grazing fee for 2018 was \$1.41 per Animal Unit Month (AUM). An AUM is defined as the use of public lands by a cow and calf, a horse, or five sheep or goats for a single month (BLM, 2020). In 2016, the AUM was 12.3 million (Hurwitt, 2018). This count does not include mustangs, of which there were 60,000 on the range (BLM, 2020).

The BLM manages mustangs within 177 HMAs (Herd





3565

3616

Captured mustangs at the BLM Holding Facility in Hines, OR. Photo by Greg Shire, BLM.

Management Areas) on public lands in 11 different states (BLM, 2020). The only management tool broadly used to control wild horse populations on federal lands has been the capture and removal of horses from the range (Garrot, 2018). For the 155 million acres of BLM land being managed, 55.6 million are classified as HMAs and the Bureau has determined that 26,000 horses is the desired carrying capacity. This number is called the Appropriate Management Level (AML). This number is calculated solely by the BLM, and often reduces horse populations within an HMA to below 150 animals, though HMA sizes range from 20,000 to over 500,000 acres each. The recommended number of individual horses for a healthy, viable population by the Equid Specialist Group of the IUCN Species Survival Commission is 2,500 (Downer, 2014).

There is currently a rangeland health crisis in the west. From 2013 to 2015, 40 million acres of BLM land (or one-third of the land assessed) did not meet the agency's standards for rangeland health (Hurwitt, 2018). The continued removal of mustangs from public lands has been justified by the BLM as vital to prevent range degradation. However, the impact of 60,000 horses on a range shared by 17.4 million cattle and sheep is not likely to be significant. Studies funded by the Bureau of Land Management claim that horses are far more detrimental to the land than cattle, citing erosion, riparian degradation, and overgrazing (Kaweck et al., 2018). In direct conflict with these results, several studies have shown instead that pollinators and prairie biodiversity can benefit from equids (Garrido et al., 2019; Downer, 2014). The BLM also regularly excludes livestock grazing from Rapid Ecoregional Assessments, instead attributing the bulk of range degradation to the presence of wild horses (Hurwitt, 2018). Data are confusing, often biased, and in conflict. To further complicate the issue, research has found that it is impossible to separate grazing effects of cattle and horses when both species forage

in the same area, even if at different times of year. Most public rangelands have been managed for cattle for so long that pre-grazing conditions are unknown. Unlike other consumptive uses, livestock grazing's environmental effects are highly variable over time and difficult to discern, making environmental assessments even more obscure (Sayre, 2002).

There are few areas of public rangeland that remain ungrazed by cattle for extended time periods and even fewer that experience horse grazing but not cattle grazing (Beever & Brussard, 2000), since wild horses and burros share 93% of their range with livestock.

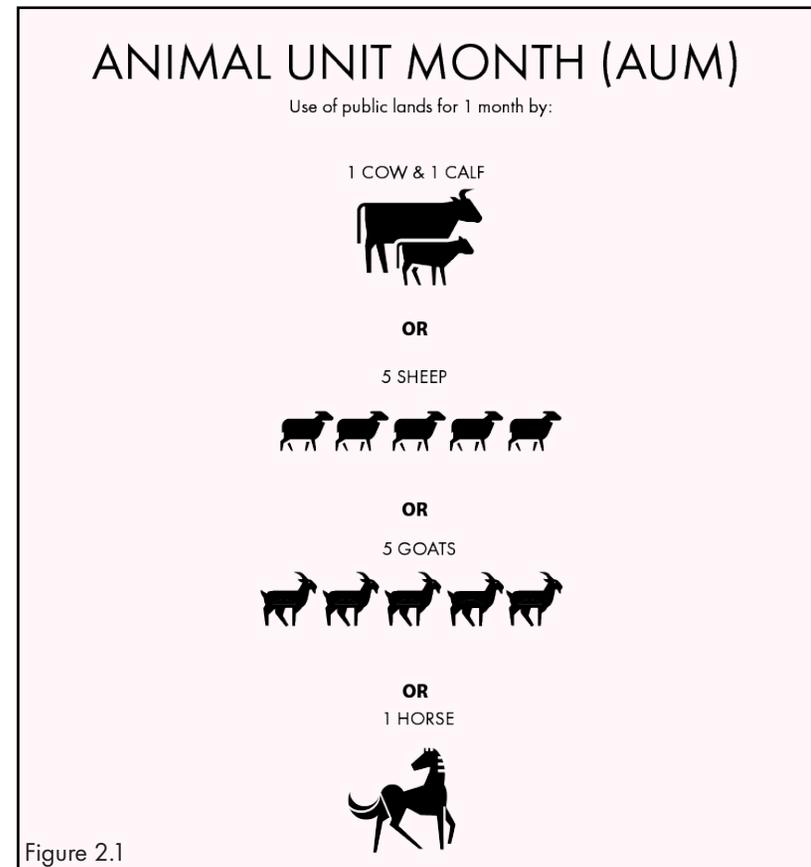


Figure 2.1

2.3 Political Issues on the Range

It is clear to all interested groups, from wild horse advocates to cattle ranchers, that the western rangelands are in a crisis. The BLM's solution is the continued removal of horses. Despite the importance of bottom-up limiting ecological mechanisms of population regulation, between 7,000 to 11,000 mustangs are removed from the range each year to keep horse densities low on lands prioritized for livestock grazing (McWilliams, 2018). Before the 1970s these horses were often euthanized or sold to slaughter, but after the passing of the Wild Horse and Burro Act in 1971, federal law prohibited the slaughter of mustangs, which were instead placed into holding facilities to be adopted out. Unfortunately, due to the increasing economic difficulties in owning horses, adoption rates have fallen. Only 46 percent of the mustangs removed from the range between 2007 and 2015 were adopted (Hurwitt, 2018). The remaining thousands of unadopted horses arbitrarily removed from the range live out their lives in small holding facilities and are extremely costly to maintain. In 2013, the BLM spent 64% of the total Wild Horse and Burro program budget on simply keeping these animals in holding facilities (Nunez et al., 2016). Assuming no changes are implemented, the current management program is unsustainable.

In 2016 the National Wild Horse and Burro Advisory Board recommended that BLM sale restrictions should be lifted, allowing anyone, including slaughter buyers, to purchase wild horses and burros and to allow euthanasia of animals that could not be sold, in an attempt to empty the overcrowded holding facilities (Hurwitt, 2018). This proposal was met with extreme public backlash, and the BLM did not accept the recommendations. The dance of BLM, wild horse advocacy groups, and ranchers all dueling for their own interests to take precedence over the others' is a common thread in the management of wild horses. In a typical scenario, the

BLM announces a plan to remove mustangs from a Herd Management Area (HMA), which livestock ranchers who run their animals on the land are in favor of, and which horse advocacy groups and other public organization groups oppose. The result is public outcry and debate, and many times the BLM has been brought to court, where their decisions are almost always upheld. The mustangs are removed and taken to holding facilities, and the BLM must spend more money maintaining them. Horse advocacy groups protest the crowded facilities, and some groups suggest the destruction or sale of horses, which is also opposed, and the BLM continues the cycle by announcing another horse gather.

The healthy management of mustangs on their range is at odds with the domestic livestock grazing interests of the Bureau of Land Management. During interviews, BLM range managers interviewed for a 2011 study expressed a belief "... that it was their job to advocate for the interests and values of the cattle ranching industry" (Bhattachryya et al., 2011), and most ranchers consider mustangs to be pests competing with cattle for limited grazing (Rubenstein et al). While horse populations are naturally limited by predation (Turner et al., 1992), predators such as mountain lions and wolves are eradicated on BLM land to protect livestock and to ensure that unnaturally large deer populations require hunting, promoting the purchase of hunting licenses and tags (Downer, 2014). Further information on predation can be found in chapter 2.6 Predation.

The federal government considers wild horses and burros to be a resource value, rather than a land use. Other examples of federally designated resource values include cultural resources, historic, scenic, and rangeland resources, and timber and mineral resources (DOI, 2010). Herd Management Area (HMA) boundaries may be changed through the Land-Use Proposal process to "mitigate unacceptable impacts to other

resource values” (DOI, 2010). This means that wild horses may be legally removed from lands that the BLM considers to be of greater importance as timber, mining, or livestock grazing land.

The Congressional Research Service found in 2005 that forage eaten on BLM lands by livestock amounted to up to 6,835,458 AUMs, while mustang consumption was less than 6% that number. And yet during times of drought, mustang populations were reduced by the BLM by 17% while cattle populations were only reduced by 4% (Nunez et al., 2016). Give the discrepancies outlined above, it appears that cattle are the primary concern of the BLM. Colorado, Montana, and Wyoming are home to 109 federal wildlife refuges, and cattle graze on 103 of them (Manning, 1995). In 2004 critical sections of an environmental analysis of livestock grazing on public lands were removed, and significant rephrasing changed the conclusion of the scientists involved to favor the viability of livestock on public lands and downplay their adverse impact on wildlife (Cart, 2005 & Dalke, 2011).

IMPORTANT ACRONYMS

Figure 2.2

AML: Appropriate Management Level. Range from high to low of the BLM’s desired population of wild horses for a given HMA.

BLM: Bureau of Land Management. US Department of Interior agency responsible for administering federal lands.

DOI: Department of Interior of the United States.

HMA: Herd Management Area. Land managed by the BLM for occupation by wild horses or burros.

PZP: Porcine zonae pellucida. An equine contraceptive agent administered via shot that is effective for two years.

2.4 Healthy Appropriate Management Level

The state of Oregon has 2,978,751 acres of land classified as wild horse Herd Management Areas (HMAs), with the goal Appropriate Management Level (AML) of 1,353 horses total (Downer, 2018). Most HMAs have a goal AML of 30-50, with the highest recorded AML of 150 individual horses (BLM, 2021). As previously noted, the Equid Specialist Group of the IUCN Species Survival Commission’s recommended number for a healthy and viable wild horse population is 2,500 (Downer, 2014). Since 1971, the BLM has removed over 16,900 horses from Oregon rangelands (BLM, 2021).

By keeping mustang numbers so low, normal bottom-up population limitations such as food and density dependence are prevented, which leads to an increase in the population growth rate (Nunez et al., 2016). While bottom-up regulation due to resource limitation can potentially limit wild horse populations, we do not let it operate at the scale required for natural regulation to be effective (Garrot, 2018). These small population sizes are also predicted to lead to a loss of genetic variability within the HMAs (Geigl et al., 2016). A minimum population size 150 to 200 animals is recommended by the Department of the Interior to maintain an acceptable level of genetic diversity within herds, with the rate of loss of genetic variation at one percent per generation (DOI, 2010). While much lower than the IUCN number, this number is still drastically larger than most goal AMLs reported by the BLM.

Wild horses also compensate in population growth when large numbers of their populations are quickly removed, as happens when the BLM gathers a herd (Downer, 2018). A BLM Herd Management Area Plan for Palomino Buttes stated that “...past census and gather data indicate horse populations regularly exceed high AML by the third or fourth year following a gather” (HMAP, 2009).

Figure 2.3



Ranch manager of Skydog Sanctuary with rescued BLM mustang

2.5 Birth Control

Over the past 40 years, research and trials have been employed to develop effective contraceptives for use in wild horse population control, each of which have different strengths and limitations (Garrot, 2018).

Porcine zonae pellucida (PZP) is a contraceptive agent that is effective for two years. PZP is classified as an Investigational New Animal Drug (INAD) and may only be administered if a research protocol has been established and guidelines are followed (HMAP, 2009). PZP is administered to mares via a shot and may not be administered to the same mare more than once every four years. PZP has been found to be effective, but while contraceptive vaccines may be effectively delivered to adequate numbers of animals in small herds through ground-based darting, efficacy of remotely delivered vaccines is lower than manual delivery via syringe (Garrot, 2018). Therefore, the more effective method of shot delivery is to capture the animals and manually deliver each shot, which the BLM considers to be cost-prohibitive in most cases (HMAP, 2009). Castration is also an effective means of birth control, and less expensive (HMAP, 2009), but is considered an unfavorable approach due to its irreversibility (EA, 2009).

Spaying mares involves major abdominal surgery, is risky, and requires extensive post-operative care (DOI, 2010). In June of 2019, a bipartisan group of 130 members of congress delivered a letter of concern to David Bernhardt, the then-secretary of the US Department of the Interior, expressing their reservations with the proposed surgical sterilization experiment to be conducted on wild horses in the Warm Springs Herd Management Areas in Oregon. This letter urged the BLM to abandon plans to pursue the experiments, citing the withdrawal of experimental academic partners on three

separate occasions and the Bureau's decision to continue with the experiment without academic backing or welfare observations. (Congressional communications, 2019).

2.6 Predation

Predators are removed from public lands not only to protect non-native livestock populations and ranching interests, but to ensure that game animal populations remain high, allowing for federal and state income generated by hunting licenses, tags, and other hunting-related revenue. In a 2004 guideline for wildlife management, Texas A&M suggested that wildlife managers ask themselves these questions when thinking about predator control:

- Is predation limiting game populations?
- What game animals (and what age animals) are most affected by predators?
- In what season of the year is most predation occurring?
- Will the habitat support more game animals if predators are controlled?

None of these questions aimed at wildlife managers focuses on ecological balance or healthy community ecology. These questions instead focus on profit from hunting and increasing that profit where possible.

The majority of the wild horse populations in the US that require population control are in regions where most or all of the top predators have been extirpated through aggressive predator control programs designed to protect rancher and hunter interests (McCrary, 2002). A healthy wild horse population in British Columbia, located in a wilderness area in which all top North American predators also thrived,

was found by researchers to have minimal signs of range degradation and small herd sizes of 20-30 individuals each (McCrorry, 2015), without outside management by governing bodies.

While many articles and books erroneously describe mustangs as having no natural predators, research documents can be found on predation rates for wild horses where predators still exist. In the Montgomery Pass Wild Horse Territory on the border of California and Nevada, where a population of five individual cougars lived, the population of free-roaming horses was significantly influenced through foal predation. The average yearly number of foals killed by mountain lions was 13.5, which was 45% of the foals produced (Turner et al., 2001). Wild horses killed by cougars were less than six months old, and almost half of the annual foal losses, most due to cougar predation, occurred during the peak foaling period of late May through June. In this case, cougar predation on foals was sufficient to strongly limit the growth of the wild horse population and had beneficial stabilizing effects on wild horse numbers (Hornocker & Negri, 2009). Other studies have confirmed that foal predation from cougars effectively limits population growth (Turner et al., 1992).

Government predator control programs eliminated wolves and grizzly bears in the west and have continued to target cougars and coyotes (Sayre, 2002). The complicit relation of government agencies and livestock interests has led to the direct destruction of nearly all predators on public lands, yet there are no current programs focused on predator reintroduction or population growth on public lands or Herd Management Areas where they might control wild horse populations. The federal government maintains that mustangs have no natural predators, though this is often refuted. A wildlife refuge manager in Arizona even referenced cougar predation as a reason for removing a genetically unique herd

of spanish mustangs from a newly obtained property; “It’s pretty obvious that lions are taking some of the colts; that’s why we think it’s important to get them off the refuge as quickly as possible.” The herd was 100 animals strong, and encroaching development and land sales had pushed them onto a small acreage which was overgrazed (Sayre, 2002).

The multi-use status of most of the Herd Management Areas on public land as grazing allotments is detrimental to the possibility of natural predator-prey interactions limiting horse populations in most areas. Livestock grazing directly affects cougar numbers, because depredating individuals may be killed, and stock also may compete with native ungulates, thereby influencing predation patterns on native prey. (Hornocker & Negri, 2009). Wolves are also often killed by livestock owners, to protect sheep, goats, or young cattle from possible predation. Interestingly, in a study on a population of wild horses in Canada, local interviewees reported that wolves preyed on free-roaming horses and observed wolves to preferentially prey on horses over cattle in surrounding areas (Bhattacharyya & Murphy, 2015).

2.7 Disturbance Regimes

As ecosystem engineers, horses create other beneficial changes through their physical actions. In the winter horses break ice with their hooves, allowing other species access to water, and in the summer dig to create small water catchments, creating intermittent riparian habitat for desert species (Downer, 2014). Large-scale herd movements in deep snow may also reduce snow insulation in northern landscapes, leading to an increase in permafrost freezing, potentially mitigating methane loss and woody plant encroachment (Beest et al., 2018).

Horse’s unique single-unit or *soliped* hooves can loosen

topsoil as they move across the landscape in high-intensity short-duration grazing bouts. This nomadic soil loosening, combined with their moisture-rich dung, can increase carbon sequestration in soils and promote nutrient cycling (Beest et al., 2018).

Horse herds use their ranges heterogeneously, with daily and seasonal movements over large tracts of lands (Beever, 2003). These wide-spread movements are confined to narrow trails throughout the landscape, which are frequently used as travel routes by many species of wildlife (Bhattacharyya & Murphy, 2015). In a single study, remote cameras recorded movements on horse trails of moose, mule deer, grey wolf, cougar, Canada lynx, and others (McCrorry, 2015). In more vegetative understories, these trails also create more diverse forest conditions of wind and light exposure, allowing for a greater diversity of plant and animal species to fill in niches. In cold seasons, herd movements open trails through snow, letting smaller animals move through the environment more easily (Downer, 2014).

While established horse trails do have adverse effects such as soil compaction and the reduction of vegetation cover, these effects have been found to be limited and localized to the trails themselves, much like human hiking trails or cattle runs. Offsetting these local adverse effects, areas around horse trails show increased plant species diversity, and the presence of horse feces increases native plant diversity (Ostermann-Kelm et al., 2009).

2.8 Precedents

Precedents for alternative management of free-roaming horse populations exist across the globe, as equids are present on every continent except Antarctica. In Chilcotin, British

Columbia, the Elegasi Qayus Wild Horse Preserve is an excellent example of a blending of cultural and ecological significance within a management framework. Founded in 2002, the Preserve was created by the Xeni Gwet'in First Nations government with the objective of maintaining and restoring the threatened population of wild horses to be used as part of the Xeni Gwet'in cultural and wilderness tourism program and for capture for domestic use (Hayes et al., 2020). The First Nation members manage the wild horse population in the preserve, which sits within a larger Aboriginal Wilderness Preserve roughly the size of Yellowstone National Park, without any outside influence from the British Columbian government (FONV, 2021). There are an estimated 800 to 1,000 horses present on Xeni Gwet'in land, with about 42% living within the Wild Horse Preserve. Due to the tribal government's refusal to degrade the wilderness with mining, livestock, or timber practices, the Elegasi Qayus Wild Horse Preserve remains in pristine condition, and is home to all top North American predators (McCrorry, 2015). Due to the presence of these predators and the harsh northern climate, very little population management is necessary. In keeping the horses at a more ecologically sound population size, limiting population factors also help to regulate growth rate of horses in the preserve. The Xeni Gwet'in people also capture and train horses for backcountry travel, hunting and harvesting food in remote areas, and use them in cultural ecotourism, and community youth activities (Bhattacharyya & Murphy, 2015). After the official designation of the preserve the Xeni Gwet'in and the Friends of the Nemaiah Valley (FONV) volunteer network created the Wild Horse Ranger Patrol program, which provides surveillance and protection to horses and other wildlife living within the preserve from poachers and tracks the numbers and health of herds (FONV, 2021). The Xeni Gwet'in also fund and hire environmental consultants and independent researchers, and host graduate student studies within the preserve. As a precedent for hands-off management,

the Elegasi Qayus Wild Horse Reserve offers a glimpse of how simple wild horse management can be on a landscape that is untouched by extensive deforestation, agriculture, or livestock grazing. It also provides an example of embracing free-roaming horses as a cultural and ecological resource within a healthy wilderness landscape.

Figure 2.4



Wild horses in the Nemiah Valley. Photo by Patrice Halley.

On a much smaller scale, the 501(c)3 nonprofit sanctuary Return to Freedom, located in Central California, provides a precedent for healthy herd management techniques using birth control. Covering only about 1500 acres and providing a habitat for over 350 mustangs, the sanctuary prides itself on being a model of solution-based non-invasive wild horse management. Unlike most wild horse sanctuaries which geld stallions or separate mares from stallions to prevent population growth on small acreage, Return to Freedom (RTF) maintains harem herds to allow for natural social behaviors (returntofreedom.org, 2021). RTF utilizes the porcine zonae

pellucida (PZP) birth control vaccine on all of its mares, darting them remotely from a distance, as they would be treated on BLM land if usage of the contraceptive was widely adopted. From 1999 to 2011, RTF found the PZP to be 85-91% effective on their herds. From 2012 onward, they have achieved 98% efficacy (returntofreedom.org, 2021). Though Return to Freedom is an extremely small sanctuary, their population of horses is well over the Bureau of Land Management's desired AML for any of their Herd Management Areas, and RTF is a positive example of minimally invasive and humane mustang management that could be applied at large or small scales on federal land.

The Greater Côa Valley rewilding project in Northern Portugal is an example of healthy land management at the ecosystem scale. This massive rewilding project set aside approximately 250,000 acres of land for conservation, and utilizes grazing horses as part of their restoration process. The Côa Valley suffered from agricultural abandonment, excessive forest fires, and economic depression before the rewilding project was established. Core rewilding zones were established to connect habitat and create ecological buffer zones, and 87 horses were released to reduce fire danger and enhance grassland functionality (rewildingeurope.com). The reintroduction of the Iberian wolf has created a healthy predator-prey system, and the Rewilding Europe foundation has plans to release a second herd of horses into the landscape in the near future.

What makes the Côa Valley rewilding project a truly unique precedent is its pioneering nature-based tourism model, which seeks to boost the local economy of the valley. Rewilding Europe offered loans to locals to create rewilding focused-enterprises across the valley, including bed and breakfasts, campgrounds, an extensive hiking and horseback riding trail, and safari and wildlife-tourism programs (rewildingeurope.com). The foundation also has the long-term goal of creating

Visitors at Return to Freedom sanctuary observe a herd of mustangs.

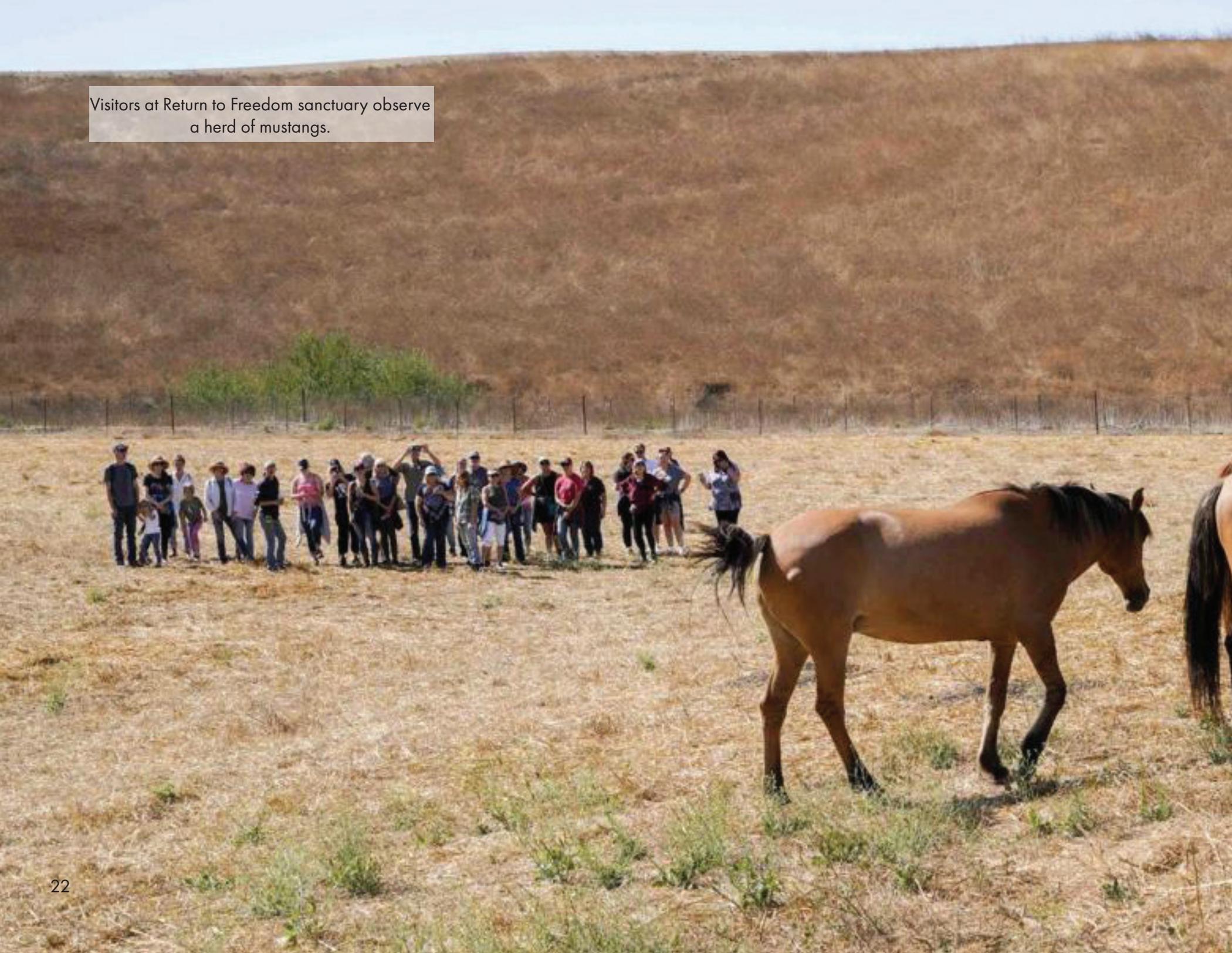




Figure 2.5

a 300,000 acre wildlife corridor connecting the valley to the Malcata mountain range, and has begun the process by purchasing parcels of land and signing land-use agreements with local landowners. The rewilding project chose a wild horse as the logo for the Great Coa Valley Project. In an interview team leader Pedro Prata explained, “We decided to change the animal on the trademark too because the Rewilding Project Team will work more with wild horses... in the future.” He also noted that ancient engravings of wild horses are found in the area, further connecting the landscape to horses.

The Greater C \hat{o} a Valley rewilding project is an example of how Herd Management Areas in the United States can be transformed into ecologically viable landscapes which promote healthy populations of wildlife and horses while creating opportunities for economic growth and the development of the ecotourism industry in the American west. Through the creation of vast areas of restored wilderness and reintroducing predators, the BLM could reduce its budget for mustang gathers and turn that money towards advertising campaigns targeted towards bringing visitors to the great outdoors, and benefit in turn from the revenue generated by tourism and increased recreational opportunities.

Photo by Frank Owen.



Mustang rolls in the dust at Skydog Sanctuary

CHAPTER THREE

A Way Forward

- 3.1 Strategic Management Framework
- 3.2 Case Studies
- 3.3 Pokegama HMA
- 3.4 Paisley Desert HMA
- 3.5 Palomino Buttes HMA

“Of all the questions which can come before this nation... there is none which compares in importance with the great central task of leaving this land even a better land for our descendants than it is for us.”

Theodore Roosevelt

3.1 Strategic Management Framework

Management systems are complex and dynamic, and there is no one-size-fits-all approach for any management strategy. However, it is still possible to create a strategic management framework that fits within an overarching approach; in this case a Land Management Design lens. The below recommendations are based on the core Land Management Design tenants of incorporating the ideals of land ethics and the intrinsic value of species into landscape architecture ideals such as public use and ease of accessibility.

These recommendations have been sorted according to their beneficial impact on wild horse management and their level of upheaval to the current public land management system. No one Herd Management Area would require the same combination of recommendations, and different pairings of impactful strategies depending upon context and background is necessary for thoughtful Land Management Design.

Recommendations:

Remove or drastically reduce livestock AUMs within herd areas. This can be achieved through offering to buy private land parcels within HAs or providing ranchers with subsidies for removing livestock from their land.

Significantly decrease extractive land-uses such as timber harvesting and mining in herd areas.

Unless specifically prohibited, public lands managed by the BLM are currently open to licensed hunting. **Disallow hunting of predators within HAs**, including cougars, coyotes, bobcats, bears, and wolves.

Reduce the number of gathers. Gather only when AML surpasses IUCN recommendation of 2,000 horses and allow for the natural population limitation to occur when necessary.

Significantly increase AML to at least half of the IUCN's recommended 2,000 horses.

Increase conservation and population growth efforts for predators in HAs. **Reintroduce large predators** such as cougars and wolves to HAs whenever possible. Partner with nonprofits and wildlife conservation funds to study animal behavior.

Release excess horses currently in holding to increase the AML of currently depleted HAs and relieve the BLM of the economic burden of maintaining these individuals in holding.

Offer an incentive program to landowners looking to restore degraded agricultural land who will host small herds of gathered mustangs on their properties for periods of 5 to 10 years.

Increase use of PZP in all HAs.

Partner with local communities to **increase ecotourism potential**. Spend extensive capital on advertisements and funding the creation of tourism enterprises like viewpoints on HAs, hiking/biking trails through HAs, and nearby camping/lodging opportunities to economically revitalize towns.

Create annual local horseback round-up and sale events embracing the history of the mustang in the creation of the west. Embrace the tourism aspects of these events.

Create a mounted range manger program to monitor herds.

Utilize natural barriers of HAs to create natural edges and reduce the need for range fencing. This may remove from or add land to HAs.

Promote opportunities for habitat connection between HAs to increase genetic viability of herds and increase the health and vitality of rangeland ecosystems as a whole.

	Minimal Impact	Maximum Impact
Minimal Upheaval	<ul style="list-style-type: none"> Disallow hunting of predators Utilize natural barriers Create mounted range monitor program Decrease extractive land uses 	<ul style="list-style-type: none"> Reduce number of gathers Offer incentive programs to landowners Create annual public roundup and sales events Increase use of PZP
Maximum Upheaval	<ul style="list-style-type: none"> Reintroduce large predators Release excess horses into established HMAs 	<ul style="list-style-type: none"> Habitat connection between Herd Areas Increase Ecotourism potential Remove or drastically reduce livestock Increase AML of existing HMAs

Figure 3.1



Figure 3.2

A young palomino stallion in the Palomino Buttes HMA

3.2 Case Studies

The case studies consist of three Herd Management Areas (HMAs) within the state of Oregon; Paisley Desert HMA, Palomino Buttes HMA, and Pokegama HMA. No Herd Management Areas in Oregon are entirely dedicated to wild horses, and these three HMAs are also occupied by timber companies and grazing livestock (Downer, 2018). The three case studies chosen represent three very different landscapes within the state of Oregon.

Pokegama HMA is uniquely the only HMA located within the Cascades range, and is also uniquely divided into a large number of parcels and different ownerships. Paisley Desert HMA is extremely large, and particularly arid. It faces severe water limitations. The Palomino Buttes HMA is intersected by several large fences and two roads.



Oregon HA and HMA Overview Map

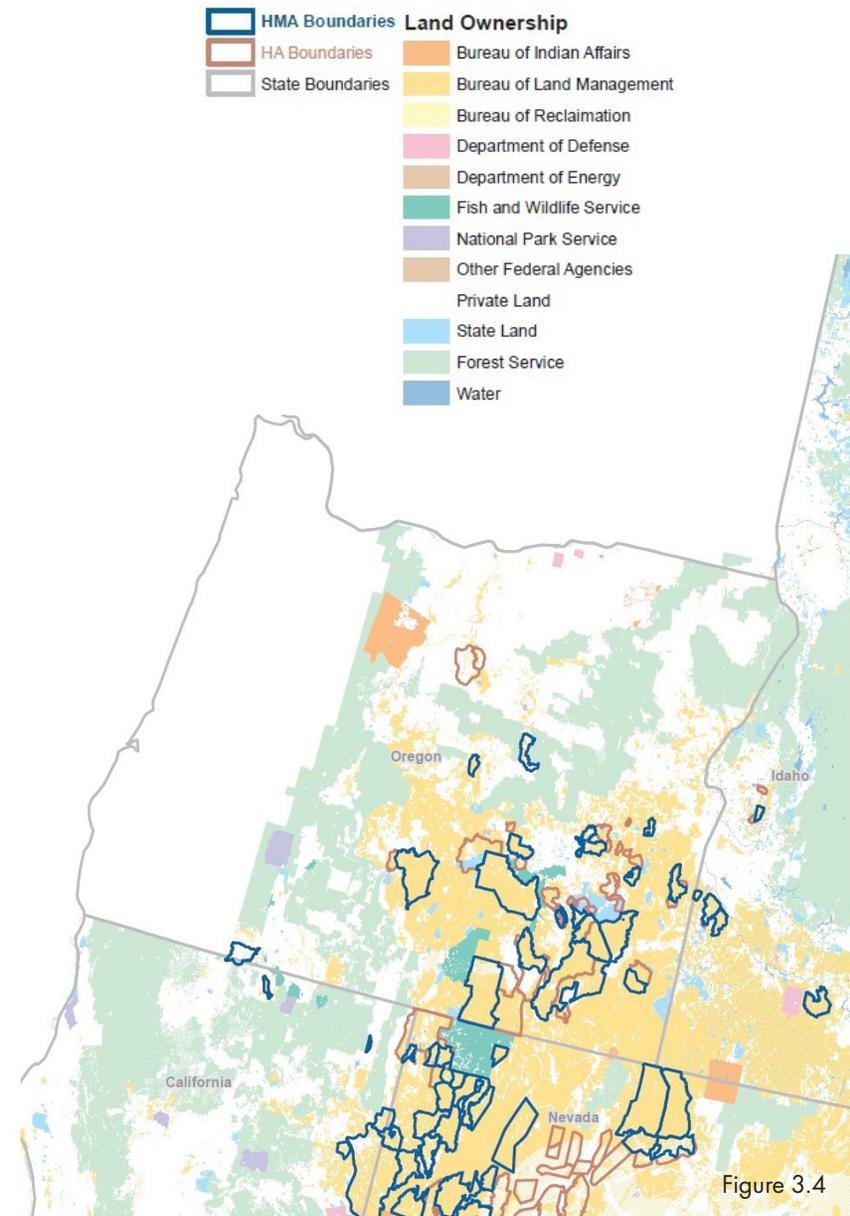


Figure 3.5



POKEGAMA HMA

PAISLEY DESERT HMA

PALOMINO BUTTES HMA

3.3 Pokegama HMA

The Pokegama Herd Management Area straddles the border between Southern Oregon and Northern California and is the only designated Herd Area in the Cascade mountain range (BLM, 2021). The terrain consists of fescue meadows, open fields of grasses and rushes, and thousands of acres of forest. Pokegama is one of the few HMAs in the US with an alleged high population of cougars, and the average yearly increase in the Pokegama herd from 1995 to 2002 was only 4-5% (Ditman et al., 2002), indicating that the population was being effectively limited without removal of horses by the BLM.

The ownership map of the Pokegama HMA looks like a checkerboard; private, public, and BLM parcels are tangled together, meaning that horses must pass through timberlands, grazing pastures, and National Forest lands in order to access the few areas which are designated solely for their use. The Pokegama horse herds have been reported to spend at least 80% of their time on private lands (Ditman et al., 2002). This makes sense, as 79% of the HMA is privately owned. 63,560 of the 80,885 acre territory has been sold to private landowners, and 49,012 of those private acres are owned by the US Timberlands Company (UST). Only 20% (16,485 acres) of this designated wild horse Herd Management Area is owned by the BLM.

Since 1996, UST has been implementing aggressive harvesting within the HMA, primarily targeting Ponderosa pine, Douglas and White fir, and Incense cedar (Ditman et al., 2002). According to 43 Code of Federal Regulations 4720.2-1, “Upon written request from the private landowner to... the Bureau of Land Management, the authorized officer shall remove stray wild horses from private lands as soon as practical...” (FL 4720). The US Timberlands Company made this request in 2017, and BLM removed 5 horses from the HMA, where the

herd has been reported since at least the early 1900s (BLM, 2021). The patchwork of land ownership makes classifying a wild horse as having “strayed” from its designated area nearly impossible. The BLM website file on the HMA estimates the herd population to be 230 horses in 2020 and still states a goal AML of 30-50 individual horses (BLM, 2021), or 2,460 less than the IUCN viable herd-size recommendation (Downer, 2014).

The horses in Pokegama also share the land with two grazing allotments, Eagle Creek allotment #0102 and Dixie allotment #0107. Eagle Creek allotment covers the entire eastern 38,260 acres of the HMA and is crisscrossed with fencing projects to increase deer numbers in the area for hunting. The total authorized cattle grazing use for the allotment from May through September of 2001 was 450 cattle, or nine times the highest number of horses allowed on the land (Ditman et al., 2002). The Dixie allotment covers the western 27,807 acres of the HMA and is divided by a large fence to separate the two cattle herds which graze there (Ditman et al., 2002). It has been reported in Environmental Impact Statements that grazing systems requiring additional fencing are detrimental to wild horse movement on their ranges (Three Rivers RMP, 1991). Fences also give ranchers a financial incentive to suppress range fires because fencing posts would burn (Sayre, 2002).

Pokegama HMA’s unique status as the only HMA within the Cascade mountain range makes it uniquely suited for improvements to connect visitors with the area. Many popular camping and outdoor recreation sites are located nearby, and the Cascades are popular in all seasons. Pokegama is also closer to higher populated cities and easier to reach than most Oregon HMAs. The creation of hiking trails and the installation of informational signage about mustangs at trailhead areas are minimally invasive, inexpensive



Green Springs Hwy

OREGON
CALIFORNIA

POKEGAMA HMA

Figure 3.6

PATCHWORK OF LAND USE
WITHIN POKEGAMA HMA



Figure 3.7



PHOTOSHOP RENDERING

Simple improvements and signage would serve to create a more welcoming landscape for visitors.

Figure 3.8



improvements which would serve to make the HMA more inviting for the public. Popular lodging such as the nearby Greensprings Cabins would benefit from this added public draw, and could partner with the BLM to provide information about Pokegama and viewing wild horses.

The reduction or elimination of consumptive uses on the HMA would serve to increase the health of the rangeland and further welcome visitors. The current patchwork of ownership and possibility of trespass makes a visit to Pokegama needlessly daunting. Buying back this land from private landowners or trading land to create a smaller but whole HMA without multiple property lines would simplify the ownership and management of the landscape.

A goal AML of 30-50 horses on 80,885 acres is extremely low. Keeping the estimated 230 horses on the property without further removals would be ideal, as the herd already has an extremely low yearly population increase (Ditman et al., 2002). As a mountainous and mostly treed landscape, Pokegama is a perfect habitat for large predators such as mountain lions and wolves. The Rogue grey wolf pack is located north east of the HMA in the Cascade range, and the HMA is well within the dispersal area for subadult travel (ODFW, 2019). Disallowing hunting within the boundaries of the HMA would be a vital step towards creating a healthy predator population to further balance the horse population of the site. Use of PZP would further limit population growth.

With the proper management and the implementation of these simple but effective steps, Pokegama HMA could evolve from an empty, uninviting checkerboard of clear cuts and pastures to a healthy Cascade wilderness that draws visitors from across the state to enjoy its hiking trails and seek out its wild horses.



Figure 3.9

Mustang watering hole in Pokegama HMA

3.4 Paisley Desert HMA

The Paisley Desert Herd Management Area is a particularly large HMA consisting of 271,667 acres of sagebrush plains and rocky topography. The Bureau of Land Management lists the AML for the Paisley Desert HMA as 60-150 horses (BLM, 2021), an extremely low density. At the goal ALM of 60, each wild horse would have 4,528 acres, or over 7 square miles of land (Downer, 2018).

The entirety of the Paisley Desert HMA is occupied by livestock, separated into four grazing allotments. Of the Animal Unit Months (AUMs) allotted, 88.3% are allotted to livestock, while 6.3% are allotted to wild horses (Devlin, 2018). Like the Pokegama HMA, Paisley Desert is partitioned by grazing allotment fences (Downer, 2018) which impede wild horse movements (Three Rivers RMP, 1991).

Genetic analysis of horses removed from the Paisley Desert HMA shows the influence of heritage North American breeds such as Morgan, Saddlebred, and Kentucky Mountain Saddle horses (BLM, 2021), as well as Spanish mustang characteristics (EA, 2009).

In a 2009 Paisley Desert Herd Management Area Wild Horse Population Control & Gather report, a monitoring summary cited that wild horse utilization combined with livestock use within the HMA was reaching heavy (60-70%) use around the main water sources. The BLM stated that when range degradation issues were considered,

“Closure of the area to livestock use, or reduction of permitted use, was eliminated from consideration, since it would not... concur with previous land use plan decisions. The Wild Free-Roaming Horse and Burro Act of 1971 does not require that these areas of public lands be managed for wild horses

but states under Section 2a (Act) that even in case of ranges that are devoted principally for wild horse management, it is not necessary to devote these lands exclusively to their welfare in keeping with multiple-use management concept for public lands, but rather that these determinations be made through the land use plans.”

In June of 2019, The BLM estimated 1,050 horses in the HMA, which is still 1,000 less than the IUCN herd size recommendation. In October of 2020, the BLM removed 708 mustangs from the HMA in an “emergency gather”, citing a lack of water availability and the “crowding out of wildlife”. 13 horses died in the round-up (BLM, 2021).

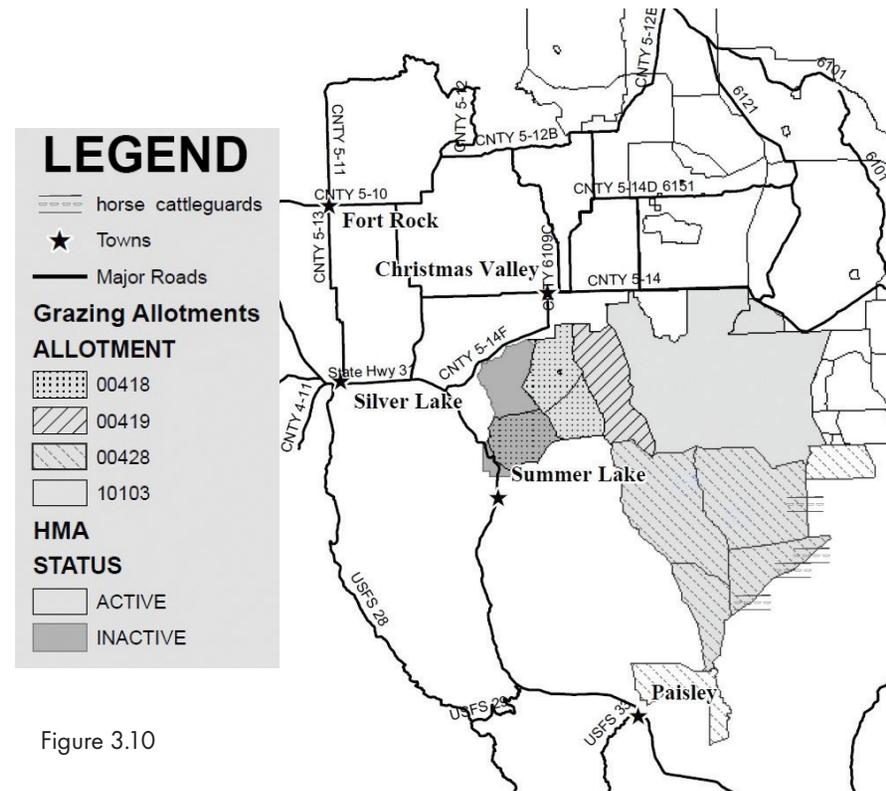
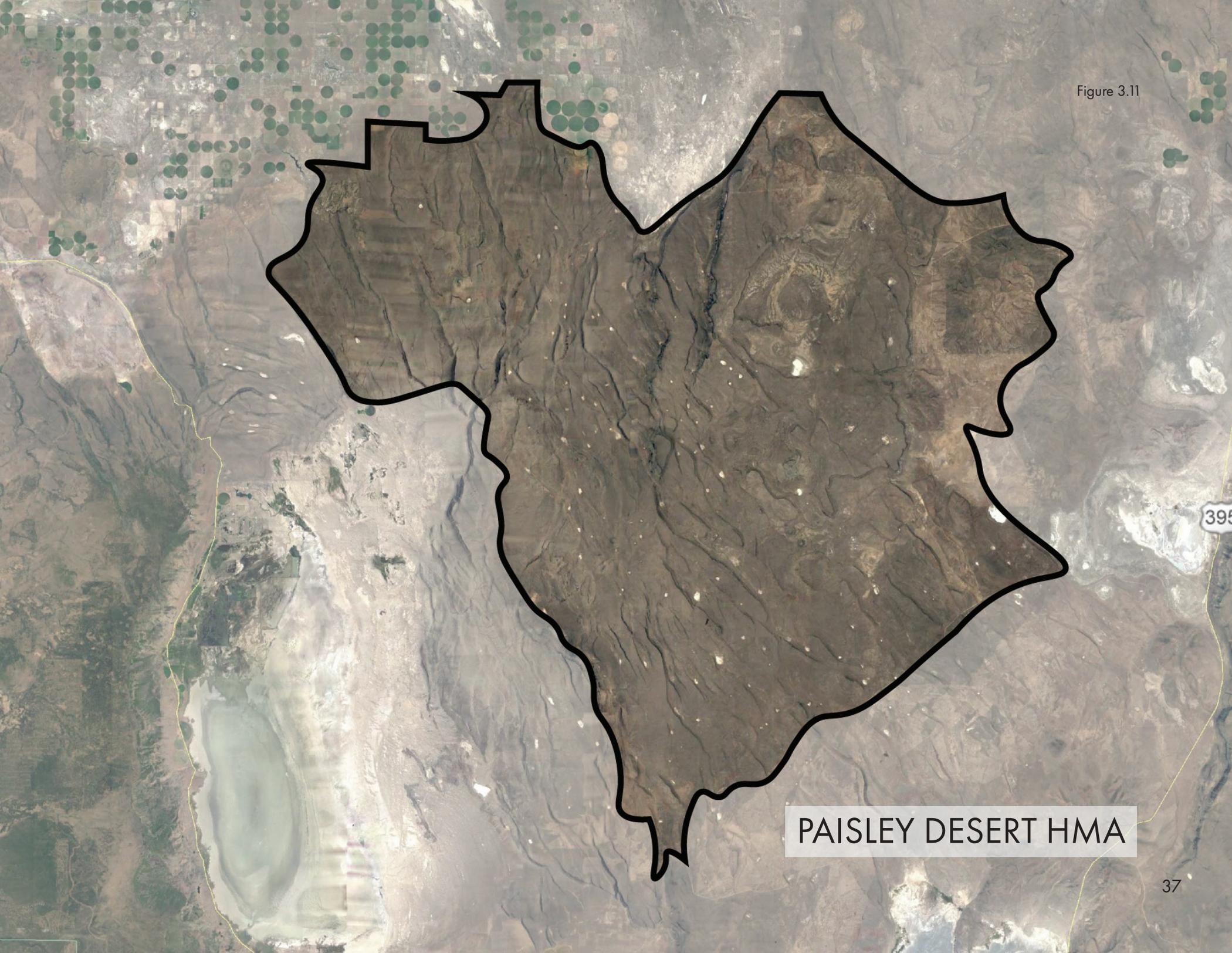


Figure 3.10

Figure 3.11



PAISLEY DESERT HMA

BARREN, ARID LANDSCAPE OF
PAISLEY DESERT HMA



Figure 3.12



PHOTOSHOP RENDERING

Binocular stands would provide visitors with endless views of the open landscape in the Paisley Desert HMA

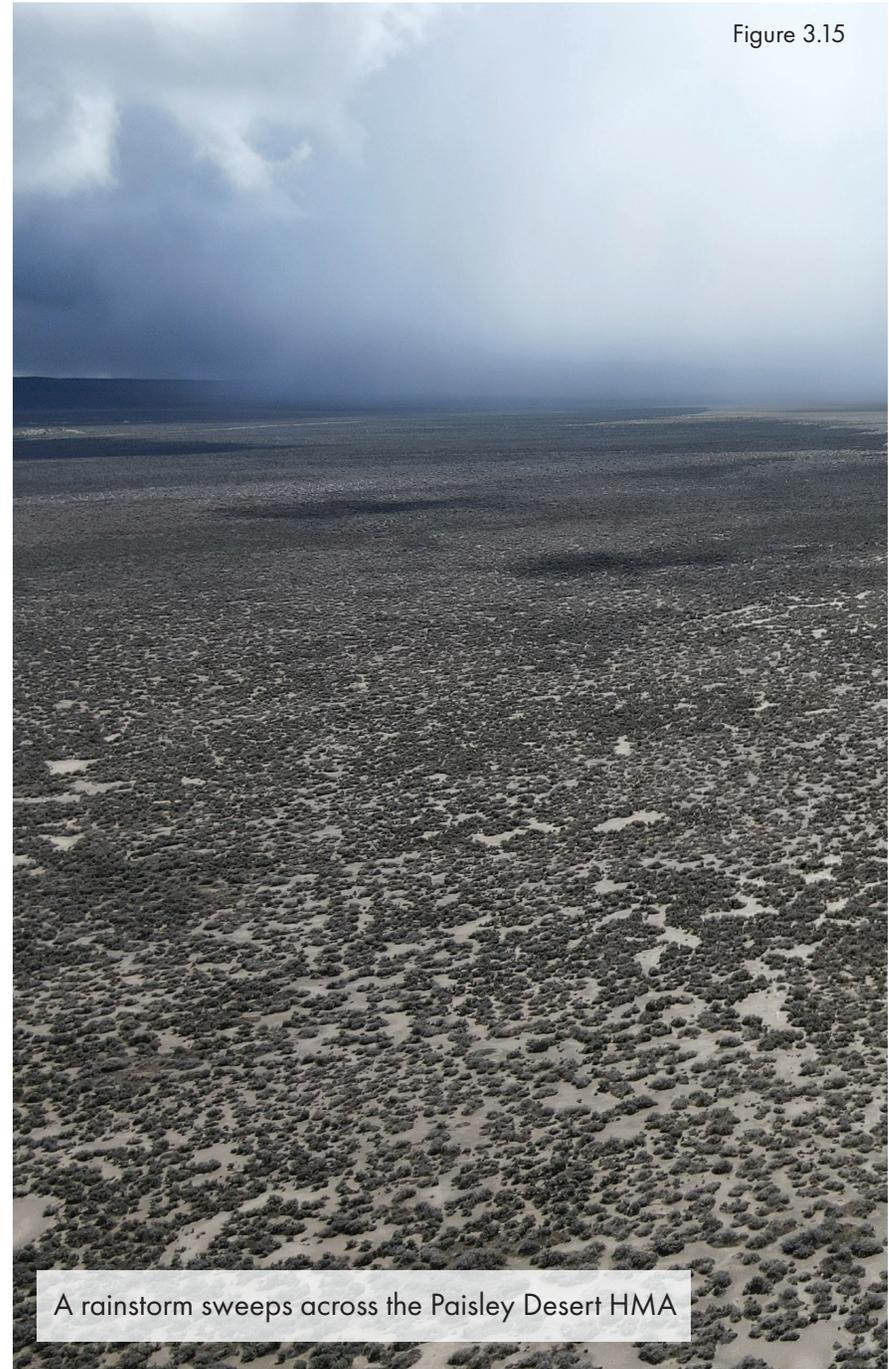
Figure 3.13



Paisley Desert HMA is a flat desert landscape perfect for long-distance viewing. The installation of viewpoints with sun shelters and binocular stands would go a long way towards making this wide-open area more appealing for visitors. The lack of trees provides a high probability of spotting a herd in the distance.

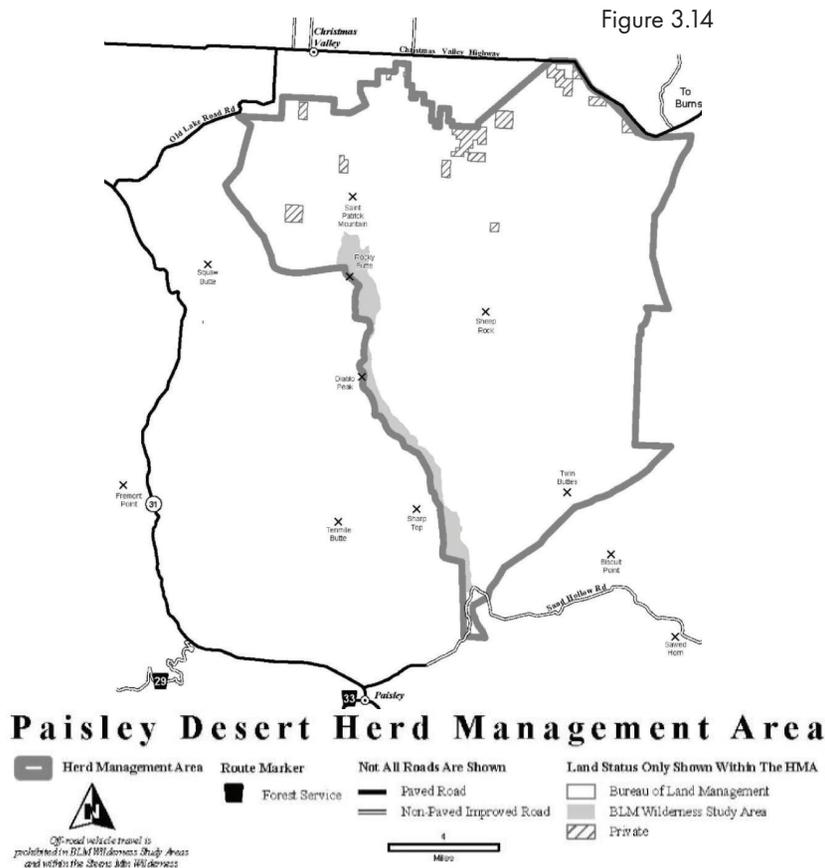
As a particularly large HMA with extremely limited access to water, Paisley Desert is not well-suited to maintaining livestock. Removal of all livestock from grazing allotments on the HMA would greatly benefit the range conditions and provide more water for pronghorn, wild horses, deer, and small mammals. Seasonal waterholes would make excellent locations for wildlife viewing sites.

Figure 3.15



A rainstorm sweeps across the Paisley Desert HMA

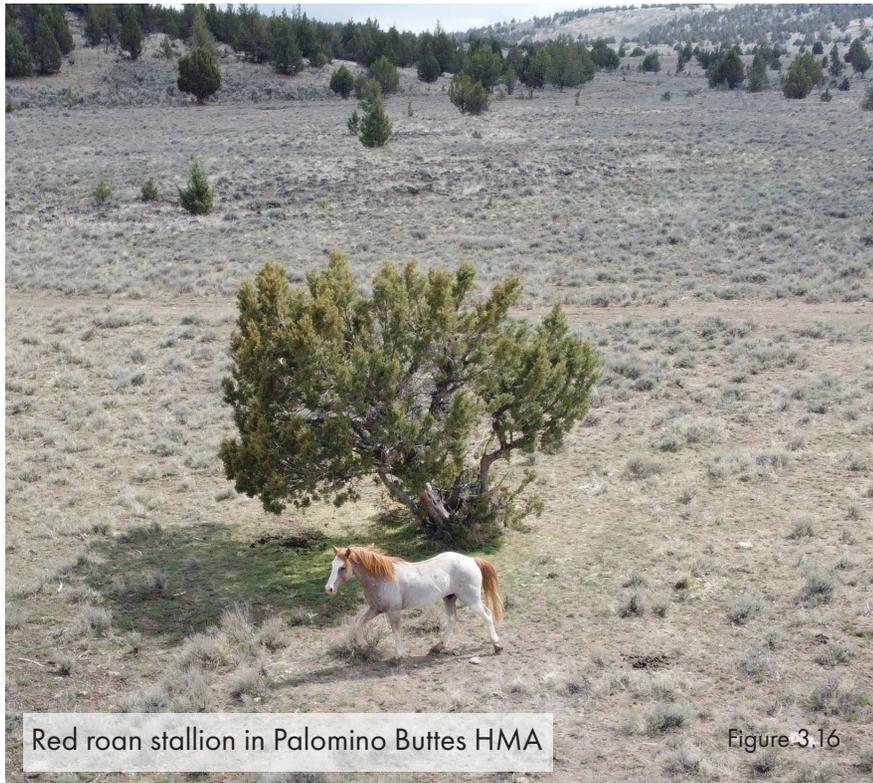
Figure 3.14



3.5 Palomino Buttes HMA

The Palomino Buttes Herd Management Area is the closest HMA to the BLM's Oregon offices and holding facilities in Burns, covering about 75,000 acres of landmark buttes and hilly sagebrush plant communities along a large highway (BLM, 2021). The AML for this HMA has been set to 32 to 64 horses. As of 2005, only 36 horses were counted in a BLM census (HMAP, 2009).

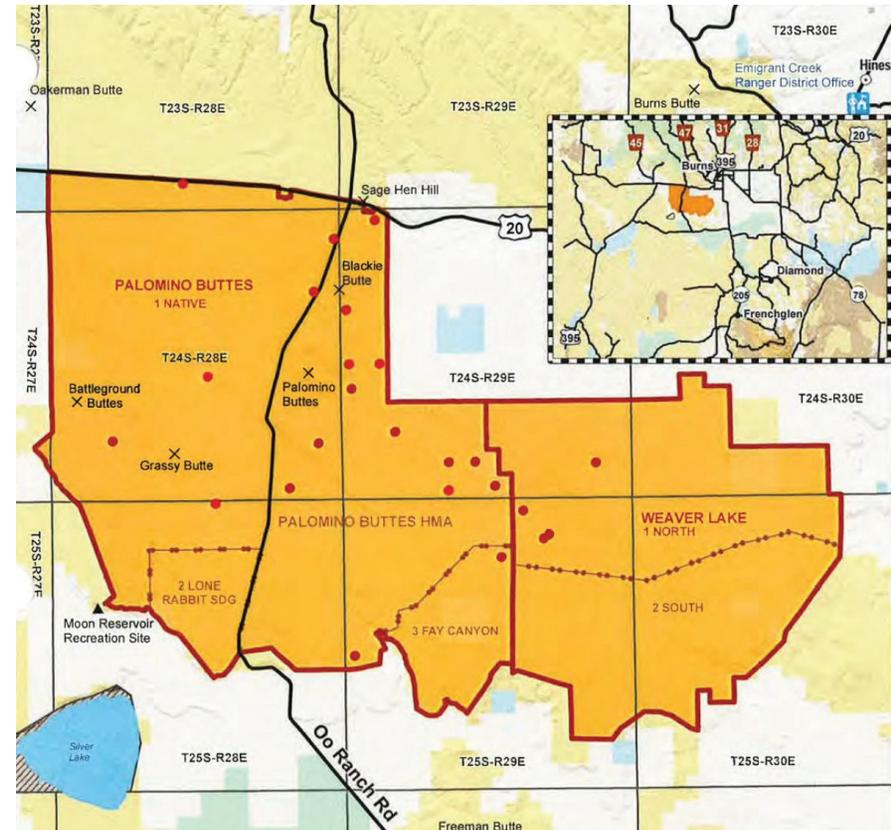
Of the 5,347 AUMs allocated for Palomino Buttes, 4,202 are dedicated to livestock, and 768 for wild horses. Three large, fenced pastures for livestock grazing cut through the HMA, impeding wild horse movement and utilization of the entire management area (Devlin, 2018).



Red roan stallion in Palomino Buttes HMA

Figure 3.16

Palomino Buttes Herd Management Area



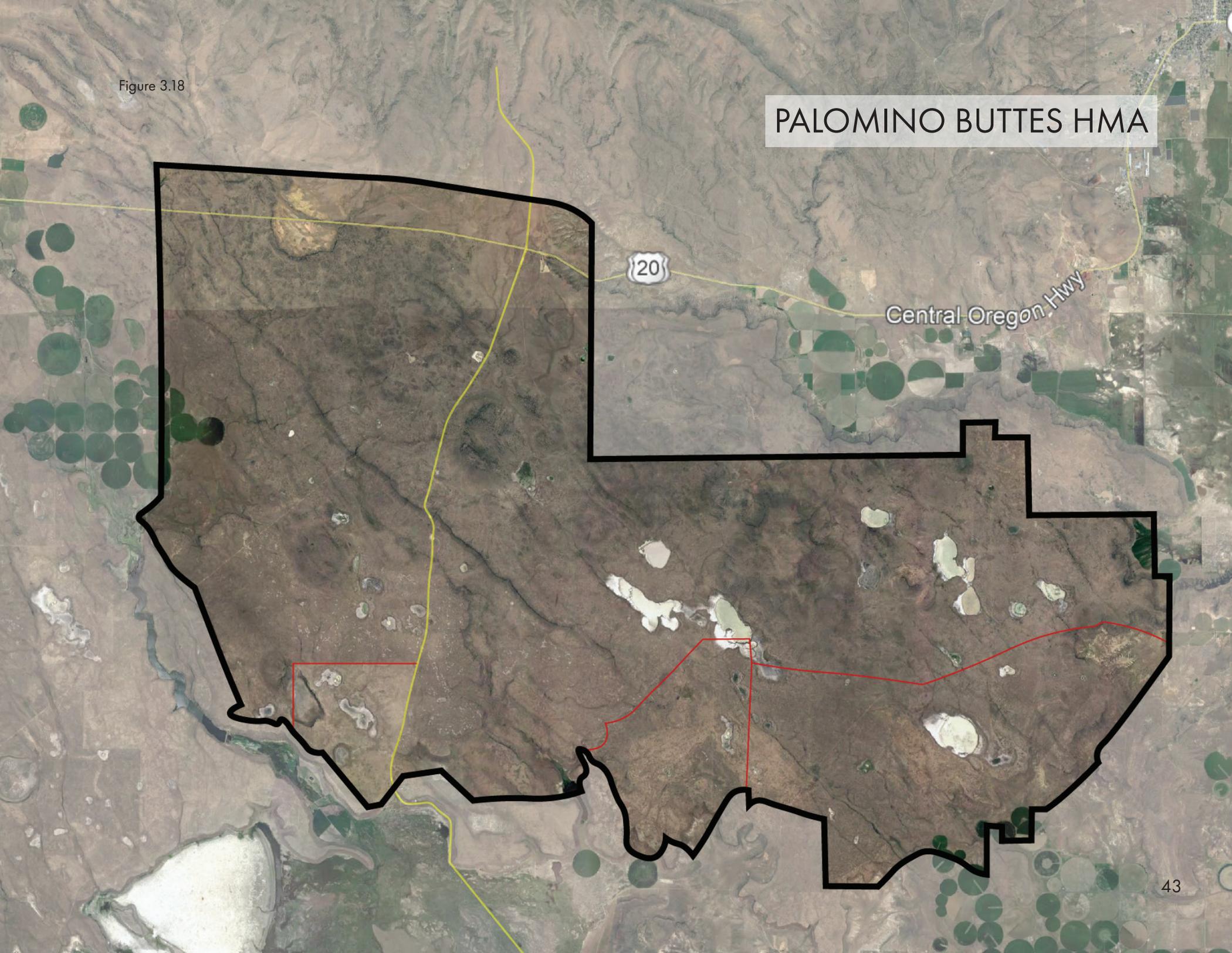
LEGEND

- | | |
|-------------------------|-----------------------------|
| GIS Data Records | Land Administration |
| ● 152 Horses Observed | ■ Bureau of Land Management |
| ■ Palomino Buttes HMA | ■ Private (White) |
| ▭ Pasture Boundary | ■ State |
| ▭ Allotments | ■ U. S. Forest Service |
| | ■ U. S. Fish and Wildlife |
| | ▨ Undetermined; Water |

Figure 3.17

Figure 3.18

PALOMINO BUTTES HMA



HERD OF 12 MUSTANGS GRAZES
IN PALOMINO BUTTES HMA



Figure 3.19



PHOTOSHOP RENDERING

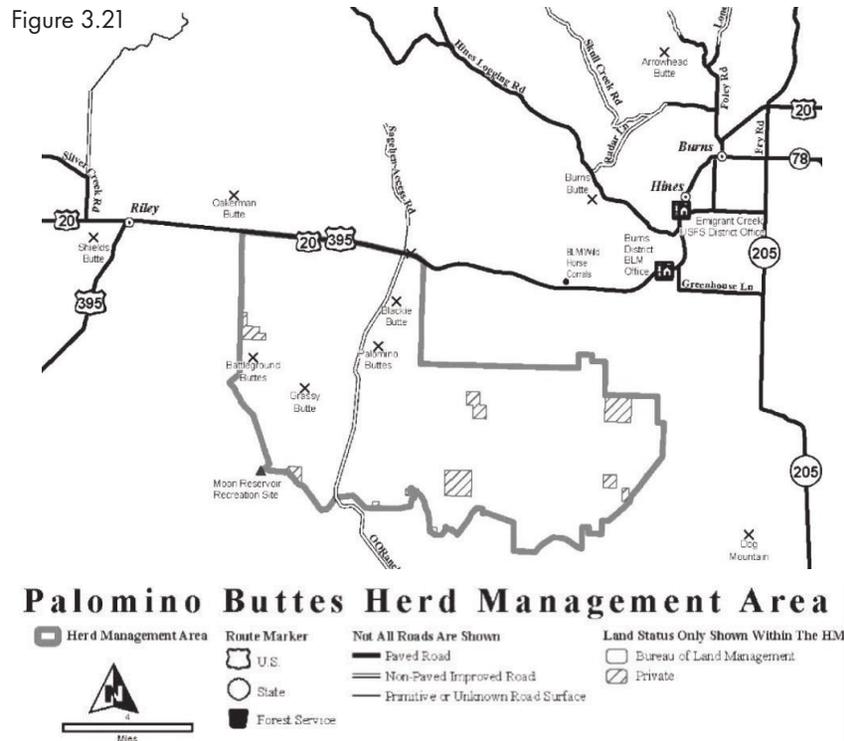
Existing road infrastructure in the Palomino Buttes
HMA make it well-suited to creating a scenic
byway with viewing stations.

Figure 3.20



Palomino Buttes HMA is currently bisected by a long, flat roadway. This provides a unique opportunity to turn this existing infrastructure into a scenic drive and bikeway utilizing educational signage, small walking/hiking trails to viewpoints and donation stations advertising the BLM adoption program.

The buttes themselves are appealing destinations for campers and hikers looking for a view across the landscape. Trails to the top and primitive campsites for adventurous visitors would further draw the public to the HMA. This ecotourism potential could be harnessed in the town of Burns, where hotels and campgrounds would benefit from wild horse tours, desert treks, and partnership with the BLM. Burns is also home to the BLM holding facilities, which offer guided or self-guided tours of the holding pastures. The BLM could easily utilize the existing infrastructure of the holding facility tours to encourage visitors to venture onto nearby Palomino Buttes and seek out mustangs in the wild.



A young stallion in the Palomino Buttes HMA



Mustang at Skydog Sanctuary near Prineville, OR

CHAPTER FOUR

Untagging the Rope

4.1 Concluding Thoughts

4.2 References

“But some animals, like some men, leave a trail of glory behind them. They give their spirit to the place where they have lived, and remain forever a part of the rocks and streams and the wind and sky.”

Margurite Henry

4.1 Concluding Thoughts

Over the past fifty years, hundreds of individuals both within the BLM and without have expressed the belief that wild horse management must change. Countless scientific and popular articles about the range crisis and the exploding population of mustangs in holding facilities have been published, and outraged advocacy groups have called for reform without understanding the complexities of the public land systems in the United States. This paper provides only the barest understanding of the tangled rope of bureaucracy, stakeholders, private interest groups, animal rights organizations, and corporate ranches which snares and trips up anyone who might attempt to untangle it.

The most frustrating aspect of researching for this project was the feeling that a solution- one that leaves all parties relatively content, that benefits our public lands and allows an iconic species to live on the range while drawing the public to enjoy our wilderness spaces- is possible but is ever so slightly out of reach due to one thing or another; Congress' refusal to deny the beef industry, wild horse advocacy groups' inability to budge on matters such as spaying or euthanasia, the BLM's stubborn adherence to obsolete land-use plans, or ecologists' dismissal of new evidence of wild horses' status as a native species. Were any one group to give ground or any two organizations to compromise, a solution seems maddeningly attainable. As it stands, no one will back down or accommodate, wild horses continue to be removed, the BLM continues to hemorrhage money, and public rangelands continue to suffer.

As with many of the "wicked problems" (Rittel & Webber, 1973) facing the world and especially the United States, the issue of the management of wild horses and our public lands is ingrained within the cultural mold of our government,

capitalism, and how we value the environment. Wild horse herds will not be self-sustainable without healthy rangelands and dynamic predator systems. Intact predator systems will not exist while consumptive uses such as hunting and livestock grazing are prioritized on public land. Consumptive uses on public lands will continue until society decides that healthy ecosystems take priority over capital gain.

This is not to say that there is no hope for future reform. The current strides in the production of cultured meat could revolutionize the meat industry, replacing most range-raised beef with lab-grown alternatives in the not so distant future (Choudhury et al., 2020). These developments will doubtless have impacts on the cattle industry and subsequently our public rangelands. What this will mean for wild horses remains to be seen, but a collapse of the traditional meat industry and the removal of livestock from public lands could provide a rare opportunity for an overhaul of public land policy and management and a switch to environmentally-focused stewardship.

Even without a drastic change in the overall management of our public lands, reform in how the BLM's Wild Horse and Burro Program manages excess wild horses is very possible. A Land Management Design approach to the wild horse dilemma on our public lands synthesizes policy, physical design, conservation goals, and restoration of land and habitat. Land Management Design removes the administrative and political blinders from land management, and adds the ideals of land ethics, and of the designer's belief in intrinsic values. As the concept of ecological restoration has become integrated into North American culture in recent years (Aronson et al., 2006), land-owners and managers are beginning to seek out more and varied alternative management and restoration methods. The burgeoning popularity of using wild or feral horse herds in the restoration of degraded agricultural lands

in Europe (Corlett, 2016 & Nunez et al., 2016) sets a successful precedent for utilizing mustangs in the United States. As of March 2021 the BLM reported that there were 52,832 “excess” wild horses and burros held in off-range government holding facilities at a cost of approximately \$50 million a year (BLM, 2021). Ecological restoration or “rewilding” represents untapped potential for revenue, environmental benefit, and a solution to the dilemma of maintaining horses in holding facilities. A government program offering financial incentive or tax breaks to landowners who host small herds of gathered mustangs on their properties for periods of 5 to 10 years with the goal of restoring degraded agricultural land would benefit landowners, the BLM, the environment, and wild horses. This elegant solution would be relatively easy to enact with minimal upheaval of the current system and maximum beneficial impact.

Apart from restoration, the simple act of embracing the existence of mustangs on the range and advertising their location would go a long way towards changing the public’s perception of both wild horses and public lands. Most members of the public are unaware that wild horses still exist, or that they can be sought out and viewed. Rectifying the lack of public amenities and creating simple improvements on public land would remove the difficulty of accessing this unique species.

The knot of problems facing mustangs is not going to untangle itself. While simple and innovative ideas like incentive programs, infrastructure for visitors, or predator reintroduction present solutions to parts of the issue, there is no blanket approach which will solve all aspects of the problem. A way forward will require concerted effort and collaboration on the part of all parties involved, and compromises for the sake of preserving an icon of the west and the public lands that it calls home.



Mustang at Skydog Sanctuary near Prineville, OR

Figure 4.1

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