Horses on Ocracoke, Cape Hatteras National Seashore:

An Information Review

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a. Purpose

The National Park Service (NPS) is evaluating the role and future of Ocracoke horses and other livestock at Cape Hatteras National Seashore (CAHA) and may formalize this evaluation in a forthcoming management plan. This planning effort may take into consideration the context of horses as livestock, species on display in pens at the park as well as horses used for recreational purposes on CAHA lands. The plan likely will also consider the horses in context and in balance with natural and cultural resources management priorities, among other park priorities, such as infrastructure in a changing climate.

The purpose of the planning effort is to address park livestock—horses within the park -- under relevant laws, regulations, policies, and management priorities, including the conservation of native species and ecosystems and preservation of cultural resources.

This current report is needed in order to inform:

- Current and future operational commitments to livestock management;
- Potential impacts of livestock and their maintenance on the landscape and natural resources well into the future, inclusive of native wildlife, native vegetation, and water resources;
- Potential impacts of livestock on cultural resources, including archeological and historical sites and cultural landscapes;
- Current and long-term costs associated with the care and maintenance of the herd to maintain animal welfare but also as a budget consideration;
- Resilience of native ecosystems and species in the face of a changing climate;
- Align livestock management within the park with relevant laws, regulations, and policies, and, but not limited to, the prioritized use of limited available lands within the park while considering rising sea levels on park infrastructure.

This document seeks to provide CAHA staff with a summary of the horse issues the park faces, a brief history and analysis of horses in North America, on the east coast, and in the park. This document reviews NPS law and policies relevant to horses in the park and offers a perspective for moving forward. It should be noted that this perspective by the authors is to simply inform the park of possible considerations. References are included at the end of each section.

b. Horses in the Americas

Most people think that the first horses to set hoof in the Americas were brought by European colonists. However, this event was a sort of homecoming as the Americas were the original home of all the world's horses and their relatives. Despite their long history, the evolution and taxonomy of horses is unsettled even though scientists have worked on it for over a century. What we do know, is that the modern horse belongs to the genus *Equus* and the species *caballus* (though some place it in the species *ferus*) and belongs in the family Equidae.

There were once many horses of different shapes and sizes whose evolutionary history played out over millions of years. The first member of the horse family was the size of a small dog and lived in the forests that then covered North America and Europe. As these forests turned to grasslands some 20 million years ago many new horse species evolved. The evolutionary connection between these early horses was not linear but bushy with many different forms that evolved and subsequently went extinct. Yet overall, the general trend involved an increase in size, reduction in the number of hooves, lengthening of the legs and development of high-crowned teeth. The first representative of the modern horse called *Parahippus* was the first horse to have these high-crowned teeth, evolved to graze on silica-laden grasses.

All modern equines are grouped into the genus *Equus*, with three main subgenera with seven species: wild and domestic horses, wild and domestic donkeys, and zebras. All of the other 40+ genera described from the equid family are now extinct. By the early Pleistocene, species in this genus spread from the grasslands of North America to South America and across the Bering land bridge to all parts of Europe and Asia. There was repeated, though low level, genetic exchange between cabelline horse populations on both sides of the Bering Land Bridge until flooding of the connection in the early Holocene, isolating the Americas from Asia and Europe.

Despite their evolutionary success, about ten to eight thousand years ago all horses in the Americas went extinct. The reasons for this most likely include disease, climate change and human hunting. We do know that horses were hunted by humans in Europe and in Beringea during the last Glacial Maximum. For example, archaeological work on a cave site in the Yukon Territory, Canada shows that horses (though not the modern species, but *Equus lambei)* was the most important prey of these ice-age hunters.

In Europe, Asia and Africa, however, the genus *Equus* thrived and evolved into all modern members of the genus including Prezewalski's horse from central Asia, the tarpan from eastern Europe and the forest horse of northern Europe – all three of which are thought to be ancestors of the domestic horse.

The modern horse was domesticated in the western Eurasian steppes, and this breed interbred and eventually replaced almost all other local horse populations as they and their humans expanded across Eurasia starting about 2000 BC. Most evidence indicates that humans spread domestic horses from western Eurasia and that domestic

populations were supplemented with wild individuals which increased the genetic diversity of domestic horses. Based on modern genetic analyses, it seems clear that the modern horse has a diverse ancestry, that there was more than one domestication event, that different human groups selected different traits, and that domestic horses have been widely interbred throughout the history of their domestication.

Humans entered North America for the first time some 14,000 years ago and by about 5000 years ago North America's horses were gone along with nearly 40 other species – driven extinct due to an unknown combination of hunting, disease and climate change. The Americas remained horse-less until Columbus' second voyage when, on November 28, 1493, he brought horses from the Canary Islands to the island of Hispaniola. Breeding horses was one of the objectives of this island population and within decades the numbers had increased to large herds, supplemented by on-going importation of animals from the Iberian Peninsula.

In 1519 a group of Spanish conquistadores, led by Hernán Cortés came ashore with 16 horses on the shores of the Gulf of Mexico and by 1538 there were horses in what is now Florida. In the 17th century horses were imported from other European regions and in New England horses from Britain and the Netherlands, larger and better suited to labor were imported. By the 18th century horses from New England were a major export to the Caribbean islands where they were used in the sugarcane industry. Western North America saw the importation of large numbers of horses by British, Spanish, French and possibly Russian and Chinese merchants.

The most recent analysis shows that domestic horses from Spanish settlements in the American southwest had already become significant in Indigenous lifeways by the first half of the 17th century. Trade in horses became widespread amongst Indigenous Americans before Europeans had occupied their lands and the horse became an instrument of cultural expansion, through trading and raiding as well as through exploitation of bison herds. The relationship between Native Americans and horses remains strong in many cultures.

The most recent genetic work emphasizes that there is no direct link between North American Pleistocene horses and modern North American horses. This is a conclusion that has been vociferously objected to by some Native American scholars and advocates (c.f. https://lovewildhorses.org/native-wild-horses), who maintain that it is Western science that is mistaken and that indigenous knowledge proves there has been an unbroken relationship between humans and horses in North America. There remain stories in the oral traditions of some Indigenous groups but the horses themselves were gone.

In early Spanish occupation of North America horse ownership was restricted to high-status individuals. They played a central role in early colonial economies such as cattle ranching. It is probable that horses, a key part of herding the large cattle herds, became feral soon after they were first brought by the Spanish in the mid-1500's. For example, feral horses were known from the Outer Bank islands since the mainland was settled, primarily by the English, from about 1650.

Free-ranging and loosely-owned horses (and cattle) were a feature of life in the Chesapeake area and neighboring areas. In the late 17th century owners of newly established plantations let livestock forage on their own, a pattern that caused extensive damage to crops and resulted in the creation of a group of "rangers" to manage these feral livestock. Free-foraging livestock were used as economic buffers when harvests were poor but were also instrumental in helping clear wooded areas for cultivation. However, the free-ranging horses bred with horses that were intended for selective breeding and this combined with their agricultural damages and the efforts of wealthy owners to impoverish settlers with little land resulted in a set of stringent laws against free roaming horses and their owners.

There is a thread of revisionist history that is appearing – though not supported by scientific publications - that argues that modern horses should not be considered as either invasive or alien species in the Americas. But rather they survived longer into the recent period than most authorities believe – a mere thousands of years – and therefore when the Spanish brought horses, they were simply reintroducing horses to ecosystems where they evolved and had roamed not too long ago. As such, extending this argument, horses should be considered in re-wilding efforts as formerly native species. This is an extremely narrowly-held view but worth being aware of.

No matter the veracity of this argument, it is clear that what are termed "on-range" populations of wild horses in the US have doubled in size in the last decade and "off-range" populations (horses captured from the wild and held in restricted settings) have increased by 33%. This does not include equid populations from tribal lands or United States Forest Service lands. Since 2013 the Bureau of Land Management (BLM) has spent more than $550 million supporting captive horses and donkeys. These are not the horses that evolved in North America, but the descendants of animals that underwent thousands of years of artificial selection. They are also not treated like other wild animals but are subject to laws designed for domesticated animals. Their ecological impacts are extensive.

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c. Horses as conservation and social issues

"The wild filly watched me with gentle, intelligent eyes … silhouetted against the fading light, she was the essence of wildness, in tune with her own natural rhythms and in harmony with the fundamental forces that shape her world."

Gruenberg. 2015. The Wild Horse Dilemma.

Management of free-ranging horses belongs to a small class of very difficult species management problems. The only other animal which is perhaps more difficult is the domestic cat. But horses are complicated enough! Even the choice of what to call them is fraught, with "feral" used mostly by ecologists and wildlife managers who regard them as a threat to biodiversity whereas "wild" is used by those with strong emotional attachment to the horses. Perhaps the most neutral term is "free-ranging" which is appropriate to some populations more than others.

Even the history of horses in the Americas is becoming contested as discussed above. If they are native, as some claim, then they have simply been "reintroduced" or "restored" rather than "introduced" as feralized domestic stock. At this time, the majority of thinking is that free-ranging horses in the Americas are in fact feral, and as such, part of a general feral animal problem found on all of the world's continents (though not yet Antarctica), be they dogs, cats, cattle, pigs, chickens or horses. Feral horses are of concern to the conservation community and its supporters in virtually all ecosystems from wetlands and deserts to high altitudes grasslands and forests. Everywhere they are found, their management has been contested and emotions have often superseded science.

Feral populations of domesticated animals worldwide evoke strong emotional reactions amongst publics with concomitant social and political pressure placed on land and wildlife managers. Such managers are constrained by social license, legislation and even harassment or litigation. Research and management of feral populations is also often assigned to agricultural rather than wildlife government agencies. All of these factors have resulted in severely curtailed research and management practice on feral animal populations with consequent problems with unmanaged or little-managed populations.

Horses are increasingly becoming a major component of ungulate biomass in many parts of the world. However, they are different from deer and other wild ungulates in being the product of intense human selection for traits such as increased, early or extended reproduction. Therefore, ecologically they behave differently than other species with knock-on ecological effects. This is compounded by the fact that unlike deer, elk, antelope and other ungulate species which are managed for hunting, it is illegal to hunt horses. This compounds their ability to increase populations with potential direct and indirect effects on wild species and ecosystems. Increasing horse populations may increase predator numbers which in turn may increase predation levels on other wild species. For example, in the Great Basin of Nevada, cougars have specialized on feral horses with horses of all ages being a major part of their diets.

The pervasive and often very strong emotional link between humans and horses has been explained by the long history shared by the two. Unlike most other domesticated species, horses were domesticated to perform shared tasks with humans, be it herding, plowing, long-distance transport, or riding into battle. The result is what one author called an "emotional co-evolutionary history" that strongly colors virtually all efforts to manage feral horse populations and distinguishes the human-horse relationship unlike, for example, dogs, pigs or chickens. This includes the many ways in which feral horses are viewed including as livestock, companion animals, wildlife, feral pests, historical icons, and symbols of wild nature.

There are numerous cases of feral horse populations being conserved for their own sake from the Sable Islands in Nova Scotia, Canada to the Retuertas horses in Doñana, Spain and the Letea Forest horse in the Danube Delta of Romania. In such places they are valued as essential components of traditional landscapes and traditional lifeways. The Food and Agriculture Organization of the United Nations (FAO) promotes the conservation of breeds of domestic animals for their genetic resources and has declared that one-quarter of local breeds are at risk of disappearing.

In Europe horses are being used in a number of re-wilding efforts, including areas like the Côa Valley of Portugal which prehistoric rock art shows that wild horses used to inhabit the area (though not the modern domestic version). They are being used as "conservation grazers" for native ecosystems viewed to be in poor condition and in settings in Europe where Pleistocene horses are extinct. In fact, some have argued that feral horses could replace the ecological roles played by their now-extinct Pleistocene relatives.

There is a minor social science literature on the construction of "wildness" in feral domestic animals and the importance of humans in production of this value. One study examining the ponies of Assateague stresses the interlocking nature of domestic vs wild as exemplified by the ponies and the similar juxtaposition of wild Assateague dunes vs the parking lots and visitor centers. Individuals hold different values when it comes to free-ranging horses. These values lead to different desired management choices as laid out in the table below which is based on the literature used for this paper. It is often the case that different values are assigned to the same population of horses with conflicting management recommendations.

Values held by humans regarding wild/feral horse populations	Desired Management
Symbols of wildness and freedom	None
Ties to community and place	None
Ties to a historical past	None
Tourism and commercial importance	Some management
Critical providers of ecosystem functions (re-wilding)	Some management
Parts of wild nature	None
Genetic repositories of scientific and possible commercial interest	None

Pests and invasive species	Remove
Suffering due to deprivation	Reduce or remove
Despoilers of wilderness values	Remove
Threats to native biodiversity and ecosystem functions	Reduce or remove

Most of the public attention, government management action and research, have been on feral horses in the Western US, particularly in the arid ecosystems. Grazing and related impacts have been shown to alter plant community composition, diversity, and structure and increase erosion potential. Free-roaming horses have been shown to have negative impacts on native flora and fauna, particularly excluding such species from water sources.

Management of feral or free-ranging horses has been an issue in North America almost since the first horses brought by the Spanish ran free. The discussion above about feral horses in early colonial America and the different positions held by different parts of society is a theme that is as salient then as now. Whether it be wild horses in Nevada, British Columbia or North Carolina the themes are very similar. A case study examining the political ecology of wild horse management in the Missouri Ozarks National Scenic Waterways highlights many of the dimensions of such challenges. To the NPS, horses were exotic species and should be removed while to the local members of the Missouri Wild Horse League, the horses were historical and cultural icons of regional identity, history, and personal experience. This situation ended only in 1996 when Congress approved a Parks and Public Lands act that included an order to end any horse removal efforts within Ozark National Scenic Riverways.

Feral horse populations may hold valuable genetic variants not present in modern breeds that may have scientific, commercial or historical values. This would only be true of populations that are known to contain genetics other than those of more recent breeds. A suggestion by Susan Bratton from 1988 was that feral animals including horses, be retained on public lands only if they were genetically unique and have not been outbred within the past century, or pose no threat to endemic or endangered species or ecosystems.

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d. Horses on coastal islands of the Eastern Seaboard and their genetics

The domestication of the horse is a subject of great interest and a spate of recent publications using the ever-more sophisticated set of genetic tools has increased our understanding of this complicated process. For example, a recent work published in 2021 concludes that unlike other proposed locations, the horse we know today was domesticated on the western Eurasian steppes.

As the humans who first domesticated what became the modern horse pushed outwards from this area they brought their horses with them. Other varieties of horses, wild and domesticated were found in many of these areas and interbreeding seems to have taken place, diversifying the gene pool of the modern horse in a complex process with continuous genetic restocking from diverse wild populations. As was common for herders of all domestic animals, there was a much greater number of females than males maintained with recurrent restocking of wild mares during the spread of horse husbandry.

From this genetic stock humans bred a tremendous variety of horse breeds – with more variation than any other domesticated animal except for the dog. Horses from 70 cms to two meters tall came in colors from cream to black with specialized gaits and preferred configurations. Ponies were used in mines, thoroughbreds were raced on groomed tracks, cow horses managed wild cattle, and Afghan warriors fought each other on the open steppes on hardy breeds.

The earliest domesticated horses brought to North America show strong genetic affinities to ancient domestic horses from Spain, Iran and France. The genetics of eastern North American horses gradually changed to ancestral bloodlines from British horses, reflecting the greater British influence in North America. These British horses themselves were mixtures of Spanish-like and British-like horses. Iberian horses show the highest diversity of modern horses which may reflect the fact that Iberia had an active interchange of horses with other breeding countries such as the Pontic-Caspian steppes, Gaul, Italy, Macedonia and Greece. Mixing of genetics between horses of different origins was rampant.

By the 18th century horses of Spanish extraction were found from Florida to California and were being bred with horses from northern and central European origins– either deliberately or through mixing of feral populations. It is probable that horses, a key part of herding the large cattle herds, became feral soon after they were first brought by the Spanish in the mid-1500's. Feral horses were known from the Outer Bank islands since the mainland was settled -- about 1650.

Everywhere domesticated horses were taken they escaped human control and established wild populations from high altitude grasslands to wave-swept dunes. In some places individuals from these wild populations were "re-domesticated" to form new breeds. Two of these breeds, the Cracker horse and the Marsh Tacky originated from some of the many feral horses in the southeastern United States. These breeds and the feral populations are generally considered to be Colonial Spanish horses based on

conformation. All of these populations are small and probably highly inbred, thereby confounding inferences made from genetic testing.

Feral horse populations on East Coast Barrier Islands			
Location	Administrative entity	Management authority	Management action
Cumberland Island (GA)	Cumberland Island National Seashore	National Park Service	Not managed (no food, water, veterinary care, or population control)
Assateague (MD)	Assateague Island National Seashore	National Park Service	Contraception; managed for 80-100 animals
Chincoteague (VA)	Chincoteague National Wildlife Refuge	Chincoteague Volunteer Fire Company through US Fish and Wildlife Service	Penning and sales; desired population c. 150 animals
Shackleford Banks (NC)	Cape Lookout National Seashore	National Park Service	Contraception and roundups; desired population 120-130 individuals
Corolla (NC)	Currituck National Wildlife Refuge	Corolla Wild Horse Fund	Contraception and removal to farm; desired population max. 130 individuals
Ocracoke Island (NC)	Cape Hatteras National Seashore	National Park Service	Maintained in fenced paddock with year-round feeding

With a few exceptions horse breeds are relatively recent human constructs with the earliest horse studbook created only in 1791. The concept of breeds was a hallmark of Victorian European thinking that combined modernity, concepts of human control and scientific rationalization. Most importantly it enshrined a notion of "purity" and the control that humans exerted over breeding. Over the last two centuries, humans have imposed strong diverging selection among breeds of horses. Yet, despite the apparent clear boundaries of a "breed", it is, "in effect, a paradoxical category that delineates fixity and purity as ideals, but which changes constantly and opportunistically in response to human concerns with utility, aesthetics and status."

The long history that humans have with horses has left a deep legacy in human culture. In Western cultures children play with toy horses and novels like *Misty of Chincoteague* have affected the way people think about wild horses. This novel is based on a common

belief about the horses of the Outer Banks – that they are survivors of Spanish shipwrecks dating to the mid-1500s. In this belief, horses were being carried to the mines of Colombia and escaped when the ships carrying them wrecked, swimming to shore to found a population of wild horses.

In related stories, also rooted in the belief of a Spanish origin of these horses, a Spaniard named Lucas Vasquez de Allyon abandoned his attempts to settle due to conflicts with Native Americans and left behind his horses when forced to flee. Or, an English ship captain named Richard Greenville, who had his ship wrecked in the notorious shallows of the Outer Banks and left the Spanish mustangs he had on board to swim ashore.

The persistent belief of a Spanish origin for Ocracoke horses and other Banker horse populations is laid out clearly in the website of the Corolla Wild Horse Fund: "Present day Ocracoke and Corolla wild horses carry the distinguishing features of Spanish type horses. One striking similarity to the Arabian ancestry is the number of vertebra (one less than most breeds) which occurs in the Banker Horse Breed [this is not true as many other horses have fewer vertebrae]. Their even temperament, endurance, size, and the startling beauty which crops up frequently in the Banker Horses all point strongly to their dramatic history… these are the remnants of once numerous herds of Spanish stock which ran free along the sandy islands of our coast. … Although the Ocracoke strain of Spanish mustang cannot be directly traced to a single breeder, importer, or sire, certain physiological features of present-day horses, and historical data lead strongly to the conclusion that the ancestors of these horses were escapees from Spanish stock brought to the Outer Banks of North Carolina in the first part of the 16th century."

This belief in Spanish ancestry appears to be an important factor in attracting tourists to Ocracoke Island and is featured in businesses, publications, websites, and on National Park Service materials. Though often qualified as unproven, the romance of shipwrecked horses freeing themselves from Spanish (or English) bondage and living free where the sand meets the sea remains strong.

Searching for genetic proof for this Spanish ancestry of Outer Bank horses, also called Bankers, has drawn researchers over several decades but there are few straightforward answers. This is not surprising given the complicated history of horse domestication with its complex mixing and remixing of wild and domestic animals and active trade in horses from different regions. The sophistication of genetic tests has increased tremendously in the last decade and with this has come a change in the conclusions drawn from genetic tests of horses with many earlier tests generating ambiguous, or sometimes, contradictory results.

This table summarizes the studies readily available:

Year	Sample Size	Test	Conclusion re Ocracoke horses	Author
1991	17 Ocracoke	Electrophoretic and	similar levels of genetic diversity to	Goodloe et al.

		immunological techniques to analyze blood samples	domestic horse breeds; closer genetic resemblance to Standardbred horses developed in the US in late 17th-early 18th century	
1993 (though published 2015)	All individuals in the herd	Analysis of 17 genetic markers	Low genic diversity; high heterozygosity (cannot all be explained by Andalusian stallion breeding alone); analysis "points to" Spanish ancestry	Cothran
2011	287 Shackleford Banks; 38 Corolla; 37 Ocracoke; 46 Florida Cracker; 124 Marsh Tackies	Microsatellite loci	Relatively high heterozygosity (variation) probably due to recent breeding with Andalusian stallion. Low allelic diversity	Conant et al.
2022	1 from archaeology of early Spanish settlement on Haiti compared with 85 equids and 1 from Chincoteague	Mitogenomics on the mitochondrial genome	The single Chincoteague pony examined presents the closest affinities with the Haiti colonial horse	Delsol et al.
2023	12 Ocracoke (2023); 36 Ocracoke (2004); 354 Shackleford Banks; 20 Corolla	Not specified	Comparison between Ocracoke 2004 and Ocracoke 2023 and two other island herds. Variability somewhat different between Ocracoke years perhaps due to Paso stallion. Island herds are distinct from other southeastern semi-feral herds	G. Cothran, TAMU, pers. comm to NPS Oct. 20, 2023

The study from 2022 reports a genetic analysis of a single horse tooth from an early Spanish settlement on the modern island of Haiti compared with other early colonial horses. The authors found that the Haitian specimen was of Iberian origin with a maternal lineage extending from Central Asia to Southern Europe and a presence on the Iberian Peninsula since at least the Bronze Age. In their comparisons the most closely related horse was a single specimen of from Chincoteague (though no details were provided on this single horse). The 2023 study did not provide details on methodology and concluded that more analysis was needed, it did not comment on possible origins of the Ocracoke horses.

As with Ocracoke ponies, Chincoteague ponies are said to be descendants of a small herd that escaped a shipwrecked Spanish galleon. As with the stories for Ocracoke this Chincoteague story is contested with some authors claiming that ponies did not arrive until the British settlers moved to the island. The authors of this study discuss the possibility that the reported Spanish ancestry from this Chincoteague pony may reflect little-reported Spanish efforts to colonize the Atlantic coast of North America which extended as far north as the Chesapeake Bay and the trade between Spanish in the Caribbean and colonies further north.

In sum, neither the genetic data nor the historical data are clear on where Ocracoke horses came from. In particular, the genetic data are sparse and span several decades in which technologies for doing genetic tests have significantly evolved, making retrospective comparisons of very little use. It is clear that there were centuries of mixing of horses with different origins on the east coast of North America with horses going in and out of domestication and changing hands, sometimes over long distances. Trade in horses was rampant within this region as well as with the Caribbean and Europe and efforts to seek unique "breeds" – a problematic concept on its own - have been imposed on this complicated history of horses in North America.

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e. Horses on Ocracoke: an analysis of the herd history and its evolving social and cultural significance

In the early centuries of European colonization of North America horses swam in an ever-changing sea of different breeds. Gruenberg reports horses imported to the US from England, Scotland, the Netherlands, Ireland, from the Caribbean and Mexico (originally from the Iberian Peninsula), French horses from raids into Canada, and from one Colony or State to another. In most places these horses were unfenced and free-roaming and perhaps feral. Breeding was largely uncontrolled, so it is likely that there was extensive breeding between horses originating in different areas. By the mid-1700's there were many free-roaming horses of Spanish descent in the Southeast and the first Europeans to settle the Carolina mountains reported large herds of wild horses. Horses of this type were re-domesticated by Chickasaw Indians and Indians became major traders of horses to poor European settlers. Before 1730 almost all English colonists in the Southeast had horses of Spanish descent.

It is clear that horses, whatever their origin and heritage, have been on Ocracoke for a long time. The earliest recorded mention of livestock on the Banks was a 1710 petition to settle stock near Ocracoke Inlet. In a will written in 1733, a colonist left to his son "Ye Island of Ocreecock, with all the stock of horses, sheep, cattle, and hoggs." The number of horses on Ocracoke has been in steady decline since numbers were recorded. Before the 1800's there were likely hundreds, with records of 200-300 in the 1800s, 70 in 1956, 35 in 1957 and an all-time low of 9 in 1976.

But where did Ocracoke's horses come from? And why does it matter? These two questions form the basis for much of the interest in these Banker ponies. Yet the answer is unknown and perhaps unknowable. In her comprehensive summary of the Ocracoke herd, Gruenberg observes that "The evidence is sketchy at best, and virtually all credible sources disagree with one another on prominent details." This absence of convincing evidence opens the way for stories, legends and values. And the genetic tests available to try to determine the origin of these horses is also changing rapidly, meaning that decisions made on results from one time period might be challenged by future testing.

The ever-changing mix of horses from many regions found on the mainland undoubtedly came in contact with, or were the source of, many of the Banker ponies. If the original stock came from the Spanish shipwrecks or English settlers, they were not confined to Ocracoke Island. In fact, after initial English occupation, the Spanish retook the island when England and Spain went to war in the 1740s. It is known that in 1733 horses were already on the island, so if the Spanish brought horses with them there was another chance for mixing genes. There was frequent trade in horses from New England to the Caribbean, with horses carried on the open deck. And some of these ships, like so many others, were wrecked off the Outer Banks, perhaps bringing yet other horses to the breeding population. These were the unrecorded "ancestral" mixing of blood lines. In modern times, there were yet other planned mating between Ocracoke horses and those from other places.

Managed breeding

There have been a number of recorded attempts to "improve" the Ocracoke ponies in addition to the unplanned attempts referred to above. Although all these attempts were probably not recorded, the following have been documented, or referred to:

- 1880s: a gray Arabian stallion was brought to Ocracoke and may have been bred with local horses;
- 1920s:1930s horses introduced from Hatteras Island with no reported breeding results;
- In 1925 David Keppel introduced a thoroughbred "Beeswax" to increase stature of Banker ponies with no recorded results;
- Introduction of horses from off-Island during the late 1960's and early 1970's that resulted in the addition of pinto genetics;
- Probably 1978: A colt was born sired by Dale Burrus's stallion "Sailor";
- In 1981: NPS agreed to a three-year loan of the Andalusian stallion "Cubanito" to breed Banker mares in the Ocracoke pony pen. This re-introduced Spanish horse genes into the Ocracoke herd. The American Andalusian Association offered to register the foals sired by Cubanito as part-Andalusian;
- 1982: NPS reports that all of the Ocracoke ponies are registered underneath the Spanish Mustang Registry, though some report that only some of the Ocracoke ponies were registered;
- During the 2010's Cape Hatteras loaned some stallions from Shackleford through the Foundation of Shackleford Horses and the Corolla Wild Horse fund. Both stallions produced two foals.

The NPS CAHA archives contain an unpublished, undated "Timeline of Ocracoke Ponies and Cape Hatteras' Horse Management History" which has been shortened and edited to provide a sense of the dynamic social and biological nature of horse management on Ocracoke Island.

- 1715 First [white] settlement on Ocracoke
- 1733: first written case of horses living on Ocracoke –used for transportation, labor, and more
- 1925: first documented case to "upbreed" horses with a thoroughbred "Beeswax" to increase stature
- Oct. 1954 – The superintendent of CAHA writes to the Regional Director on how there's no good justification on maintaining a horse herd, since they are feral animals, which violates the Master Plan Development Outline where "No grazing or browsing by domestic or feral animals will be permitted in the Seashore area".
- Nov. 1954 – The director of the NPS approves the idea of removing the ponies.
- 1955 – Major public backlash against the decision to remove the Ocracoke ponies occurs, with many Ocracoke residents and families firmly opposed.
- Jan. 1956 – The Ocracoke Boy Scout troop writes to the Director of the NPS, asking to "save" the ponies due to their use as mounts for the boy scouts and offers their assistance if needed.

- July 1957 – The North Carolina State bill goes into effect, which prohibits any livestock from roaming freely on Ocracoke Island with the exception of the 35 Ponies that are owned by the Boy Scouts.
- Nov 1957 – Berkeley Machine Works & Foundry Co. donates all their ponies and equipment to the Ocracoke Boy Scouts, with the exception of 35 ponies that are owned by the Boy Scouts.
- June 1958 – The Ocracoke Boy Scout Troop Committee makes a proposal to CAHA to have a fence built on the "Great Swash", a grassy and marshy area in the middle of the island, to contain the 35 ponies that they have and to prevent more Ponies running loose and harassing the villagers on the island.
- Aug 1958 – All livestock removed from the island and ponies have been reduced from 90 to 70.
- Aug 1959 – President of the Ocracoke Civic Club reports that the Boy Scouts have succeeded in completing the fence and penning all the Boy Scout ponies. However, there are some ponies who are not owned by the Boy scouts and still need to be removed.
- March 28th, 1960 – Superintendent Gibbs expresses his frustration at the current status of the Ocracoke ponies and their management. He writes that "Its impossible to find out just who is responsible for carrying out the terms of the permit." He also notes that the ponies exceeded the 35 ponies that were agreed upon.
- Aug 1960 – The number of ponies has been reduced down to 25, but there has been no effort to keep the ponies within the fence.
- Aug 1964 – Recommendation made to NPS to take over the care of the horses and unfencing them so that they can roam again due to the inability to keep funding the care of the horses.
- April 1966 – In a letter, Superintendent Gilbert states that the ponies should be removed from the island, as they no longer serve the Boy Scouts as they originally intended. Additionally, due to upbreeding, Gilbert believes that the Ponies are no longer "Banker" horses and are now just a common animal.
- April 25, 1966 – The Ocracoke Boy Scout committee agreed to longer take care of the ponies and no longer renew their special permit, due to lack of funds. The Eastern Council of North Carolina has them as their property.
- Nov 1966 – The NPS assumes responsibility for the ponies via agreements of sales from Berkeley Machine Works and Co. and the heirs of Mrs. David Keppel.
- Nov 1974 –There are currently 10 ponies in Ocracoke.
- Sept 1981 – The NPS agrees to a three-year loan of the Andalusian stallion "Cubanito" so it can breed Banker mares in the Ocracoke pony pen. The American Andalusian Association offers to register the foals sired by Cubanito to be part-Andalusian.
- Sept 1982 – All of the Ocracoke ponies are registered underneath the Spanish Mustang Registry.
- 1993 – The Banker Horse Genetic Research Program published, confirming that the Ocracoke Ponies do have a form of Spanish Mustang ancestry, especially now with Cubanito's influence on the herd.

- During the 2010's it seems that Cape Hatteras loaned some stallions from Shackleford through the Foundation of Shackleford Horses and the Corolla Wild Horse fund. Both stallions produced two foals: Paloma in 2010 and Rayo in 2012.
- The Timeline stops with a few general entries for the "2010's."

The Changing Cultural Significance of the Ocracoke Horses

The language used to describe Ocracoke horses has varied over the years in concert with changes in the underlying interests of those using it. Horses thought to be descended from the Spanish or from early English settlers are in recent times called "wild." As humans settled and lived lives on Ocracoke these horses came to be called "ponies" and "Banker ponies" in particular. To long term residents they were inextricable parts of island heritage and to horse fans they became "wild horses." But to many in the NPS, concerned about traffic accidents, visitor safety and dune stabilization, they were "feral animals" and perhaps even "invasive species." Not surprisingly, those using different terms for the horses have been in favor of different management interventions.

But are these Ocracoke horses even "feral" if we use the definition provided by Tsing et al. in their "Feral Atlas"; where feral is defined as animals that emerged "within human-sponsored projects bur are not in human control." In describing Assateague's wild horses, the NPS defines wild horses as "descendants of domestic animals that have reverted to a wild state" (https://www.nps.gov/asis/learn/nature/horses.htm). On its Cape Hatteras National Seashore website, Ocracoke's horses are not described as "wild" but simply as "Ocracoke's favorite residents" (https://www.nps.gov/caha/learn/historyculture/ocracokeponies.htm). Confined to the Pony Pens, the horses of Ocracoke have now returned squarely to being domestic.

Ocracoke ponies have long lived lives at the intersection of free and domesticated. Brought to the Americas as domesticated animals, their ancestors likely became feral – completely outside human control, only to be re-domesticated. Once on Ocracoke these horses initially lived most of their lives outside human control, surviving and dying as forage and storms allowed. Some of them were brought back into human control to serve human purposes. But even these individuals were also wild in the sense that they were caught up when needed and then turned back loose to survive on their own. As one long term resident was reported to have said: "Sometimes someone would go down and tame a young horse. Then, when they needed him, they would just go down and get him … When a horse had served its purpose, it might be given a handful of corn or hay as a reward, then be set loose to rejoin the herd."

Banker ponies were part of the ecology and human life on Ocracoke. They were used for riding, for pulling fishing nets – including those used to catch dolphins – for pulling wagons for transport, and for rounding up both other wild ponies and other livestock, particularly cattle. They were herded in Pony Drives and claimed by residents before being turned back to manage for themselves. During the Depression, Ocracoke horses were sold off to people on the mainland for farm work. For example, in 1938 there is a record of some 400 wild ponies shipped off the island. This trade in horses could very

well have brought mainland horses back to Ocracoke as well. Storms swept horses off Ocracoke and other Outer Bank islands, returning some of them alive to the shore – perhaps even on different islands.

A very frequently cited example of the ties that bound the humans and horses living on Ocracoke was the Boy Scout troop. An Island resident returned from a career as a sailor and decided it would be good to establish the first – and only – mounted Boy Scout troop, Troop no. 290. He taught the boys how to tame, ride, and take care of their ponies and the Troop became a media darling. When the Park began to talk about restricting the island ponies the School Principal wrote to complain, stating that "there is no evil in a boy on a pony" and that eliminating the program would encourage juvenile delinquency. The families could not afford to feed the ponies so most of them continued to graze freely on salt grass with small grain supplements. The NPS agreed to give a special permit to allow the Troop to keep its horses on public land, but only if they would fence them. After only about 10 years the Ocracoke Boy Scout committee decided that it could no longer afford to keep up the fence and they could not pay for insurance as required by the Boy Scouts of America and so the mounted Troop was dismounted. The story of these mounted Boy Scouts continues as part of the island's special relationship with the ponies.

It may be that viewing the horses as independent of the human societies in which they exist is to miss the point. As Kristen Guest said in her analysis of Chincoteague ponies, "In the case of the Chincoteague Pony, I suggest, a mythology of breed crystalizes local history and lore, nostalgia, and the economy of Chincoteague in a version of "horse" that manages human fantasy, conflict and ambivalence about the wild. What results is not the decentering of human influence associated with the rewilding movement, but rather a view of the romanticized wild animal as something accessible to – even organized around – particular kinds of human attachment and identity."

The strength with which some island residents express their attachment to "their" ponies – calling them "neighbors" and "part of our community" - suggests that the past and the future of the people is woven not only with the horses but with the island itself. As a barrier island, Ocracoke has always been subject to making and remaking by the sea, with all of its passengers, human and otherwise. With the forecasts of even stronger and higher seas the island and its residents are facing an uncertain future. With a lifespan that can reach 50 years, the horses are long-term island residents – as are the people. Decisions made about where horses and people can live on the island, separately and/or together, in a changing climate is both complicated and fraught.

Starting in 1966 Ocracoke's horses became wards of the National Park Service, relying on the US Government for food, shelter, veterinary care and attention from devoted staff and volunteers. They became part of the Federal bureaucracy governed by planning efforts. Proper attention to the welfare of the horses is expensive: from buildings, fencing, barns with space for foaling and access to shade, veterinary care, separate paddocks for stallions and a 2023 calculation of a per horse per year provisioning of 156 bales of hay and 1153 lbs of grain. Their welfare in a changing climate is a challenge with rising tides, stronger storms, increased erosion, and new diseases and parasites.

Irrespective of their genetic heritage, the well-being of the horses is now the responsibility of the National Park Service, and decisions made must reflect the future and not just the past.

Ocracoke horses are also part of the plans of others. As mentioned above, some individuals have been considered of appropriate genetic and morphological characteristics to be included in the Spanish Mustang Registry – a breed identified by specific confirmational characters. The descriptor "Spanish Mustang" is a popular way of raising interest in Ocracoke horses, being featured on websites from "Outer.banks.com" to vacation rental companies to the NPS itself which trumpets these animals as "true horses descended from domesticated Spanish mustangs." This, as discussed above, is an aspirational claim that nonetheless helps to drive attention to the ponies confined to their pasture. Other individuals of the Ocracoke ponies have been claimed by The American Andalusian Association which offered to register the foals sired by Cubanito – the Andalusian stallion brought in one of the efforts to improve the herd's genetics.

The Ocracoke ponies contribute to the local economy, attracting tourists to support local businesses. They are viewed, photographed, and dreamed about by tens of thousands of visitors, some of whom help pay for their care by subscribing to Outer Banks Forever program "Adopt a pony." They fulfill the fantasies of many others who are not able to visit in person but who donate money and read about the horses – each of which is photographed and whose personality is spelled out for their fans.

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f. Geological and ecological conditions on Ocracoke and their impacts on horses

The Cape Hatteras National Seashore contains some of the best examples in the US of barrier islands characterized by the National Oceanic and Atmospheric Administration as forming when waves repeatedly deposit sediment parallel to the shoreline which are constantly moving, eroding, growing or even disappearing completely. Ocracoke Island is one of these barrier islands, approximately 25 km long and has been and will forever be worked and reworked by waves, wind, ocean currents and storms.

These natural processes erode the shoreline in places and deposit sand in others, overwash all or parts of the island, and form and close inlets. Studies have shown that between 1949 and 2006 the majority of the entire island eroded at an average rate of about half a meter a year and the cross-island width decreased by as much as 40%. Successive hurricanes have reshaped Ocracoke and Hurricane Isabel overwashed 9% of the island. During storms, sand moves inland through inlets into the interior bays and lagoons, on the mainland side of the inland. This forms substrate for highly productive salt marshes and seagrass beds. Plants and animals move with the sand, shifting their occupancy in search of suitable habitat.

Humans have long been familiar with the dynamic nature of Ocracoke. Ocracoke Village was established in an area of greater elevation on beach ridges that probably formed 3000 years ago. As the nature of human use of the island changed to one focused on tourism, there was a studied ignoring of the dynamic nature of the seaside part of the island by building many vacation homes on that side of the island. This has been part of a great influx of people to the coastal zones of North Carolina and accompanying infrastructure.

The vacationers came to the Outer Banks islands in increasing numbers and to accommodate them a road and associated parking lots, visitor centers and the Pony Pen were constructed. Sand washing or being blown over these facilities was a problem and to help address this a federally funded dune building program to stabilize the islands was initiated in 1934. Some 155 miles of artificial dunes were built with brush and slat fences accompanied by extensive planting of grasses, shrubs and shrubs.

Maintenance and repair of the dune system was re-initiated in 1954, after the official establishment of CAHA. The aim was to restore a continuous dune line at an average height of 2.5–3.0 m (8.2–9.8 ft) for the entire length of the National Seashore. Bulldozers were used to quickly build dune mass and height in critical locations and native grasses were again planted to stabilize and build up the dunes. Periodic fertilization was used to promote the growth of the grasses. Additional tree planting occurred, along with ditching and dredging for roadwork and mosquito control. Marsh dredging was conducted to build up the roadbed of Highway 12.

All of this work represents another of CAHA's paradoxes. The very dynamic nature of the beaches and dunes that attract visitors is also a constant challenge for managing those visitors and the infrastructure they demand. And this challenge is getting more

significant as the climate changes. By 2050 the Sweet et al. 2022 report predicts that relative sea level rise is expected to cause tide and storm surge heights leading to increase in frequency and severity of coastal flooding – perhaps an increase by a factor or 10. Higher sea levels will amplify the impacts of storm surge, high tides, coastal erosion and wetland loss. U.S. coastal infrastructure, communities and ecosystems will suffer significant consequences from these changes as will Ocracoke's horses.

Studies in previous decades have shown that horse grazing on salt marshes and dunes can have deleterious impacts on vegetation and mixed results on other forms of biodiversity. The impact of Ocracoke horse grazing on the island's vegetation has been contentious with different conclusions drawn by different parties in different years. Until the Livestock Act of the 1930s horses moved and fed at will, causing damage to gardens unless excluded. As one resident observed "The people lived in pens and livestock ran free." In the end there was a general decision that the impacts were sufficiently negative to warrant fencing of the horses, originally in a marshy area and later in a higher pasture, partly out of concern for the impacts of grazing but also because of the dangers of having horses struck on the road.

Within what became the Pony Pens horses fed on a mix of native and exotic grasses though requiring significant feed and hay year-round. Ocracoke's horses, once free-roaming livestock and a force on native and planted vegetation have become almost entirely dependent on humans for their food. Their dynamic role as ecological actors, for better or worse was halted as the island's dynamism is only increasing with the warming climate. And the location of the current Pony Pens, although on relatively high ground will be affected by rising water levels through limiting access. The climate and its impact on Ocracoke Island challenge long-held beliefs and practices and will impact both the human and equine inhabitants of the island and those charged with their future.

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g. Relevant Laws, Policies and Regulations Pertinent to the Cape Hatteras National Seashore Equine Herd

The National Park Service (NPS) is obligated to fully comply with all applicable laws, regulations, and policies governing resource protection, including, but not limited to, the Endangered Species Act, Clean Water Act, National Historic Preservation Act, and agency-specific guidelines. It is the responsibility of the current manager (Superintendent) to implement pertinent laws, regulation, policy and Executive and Director's Orders so as to provide maximum protections for park resources and to provide for a quality visitor experience. Superintendents are expected to be cognizant of the setting in which they protect park resources as considerations can be extremely complicated. Through the park planning processes and public engagement, the park can determine the desired future conditions and identify a path forward in a strategy to achieve them which can support the Superintendent's decision-making processes.

Unless specifically stated otherwise, NPS Management Policies and Directors Orders are intended to improve the internal management of the NPS and to provide consistency throughout the Service. However, some NPS policies are reiterations of regulations or statute and can carry the force and effect of the law, whereas violation of those policies can lead to serious consequences. These laws, policies and regulations help shape the management of National Park System units.

Summary

This document takes into consideration the context of this livestock species' existence on NPS lands in accordance with current NPS laws, regulations, and policies and in balance with natural and cultural resource management priorities. The purpose of this section is to address relevant livestock laws and policies that guide the park in the management of horse and horse-use. within the Park, under relevant laws, regulations, policies, and management priorities, including the conservation of native species and natural ecosystem functions.

There is a well-established hierarchy order of authorities: Public Law (general and specific authorities), Executive Orders, Federal Regulations (including Superintendent Compendia), and NPS Policy, Director's Orders, and Reference Manuals.

- Public Law: General NPS Authority; The NPS preserves the natural and cultural resources and values of well over 400 units of the National Park System for the enjoyment, education, and inspiration of current and future generations.
- The NPS also manages a variety of programs in cooperation with multiple partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout the United States and the world.
- The NPS is directed and has authority to manage its lands and resources (including native, non-native, and invasive animals) in a manner consistent with Federal legislation, Servicewide NPS guidelines and directives, and park-specific management policies and objectives. The NPS has both general and specific authority to manage invasive animals within the boundaries of units in the

National Park System through the NPS Organic Act, the General Authorities Act (as amended), and the Consolidated Natural Resources Act.

This section is intended to serve as a comprehensive (but not exhaustive) summary of the core laws, regulations, and policies that can be used by the NPS to address invasive animals. The primary purpose is to describe existing authorities pertinent to this issue. Only the authorities pertaining to non-native or/and invasive animals (or invasive species generally) are presented. As summarized by a recent Congressional Research Service report (Johnson et al. 2017), no single law provides coordination among federal agencies and no comprehensive legislation on the treatment of non-native or invasive species has ever been enacted.

National Park Service Organic Act of 1916 (54 U. S. Code (U.S.C.) § 100101). Commonly referred to as the Organic Act, this law establishes the National Park Service and its fundamental purpose "… to conserve the scenery, natural and historic objects, and wild life in [NPS] units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Changes to the natural communities from human actions in parks, including the continuous and unabated invasion of invasive and feral species, are contrary to the intentions of the Act. Additionally, the NPS Organic Act (specifically 54 U.S. Code § 100752) states that the Secretary of the Interior may "… provide for the destruction of such animals and of such plant life as may be detrimental to the use of any [National Park] System unit." Therefore, comprehensive control of non-native (and native) species to protect park resources in the National Park System is allowed, and could be considered strongly encouraged, by law.

General Authorities Act of 1970, as amended by *the Redwood National Park Expansion Act of 1978 (54 U.S.C. § 100101(b)(1)(D) and (b)(2))*. The General Authorities Act of 1970 clarifies that all the different types of areas within the National Park System (National Recreation Areas, Seashores, Parkways etc. as well as National Parks and Monuments) are to be managed as one system under the standard set by the Organic Act and that no derogation of those areas (e.g., allowing invasive species) is to be permitted unless directly and specifically authorized by Congress. This law confirms that the same authorities and standards of protection apply to all NPS-administered areas. Consolidated Natural Resources Act of 2008 (54 U.S.C. § 101702(d)) This Act expands NPS opportunities for cooperation and collaboration by the authority for NPS to use its resources and funds on land outside park boundaries for activities benefiting park natural resources. Specifically, it authorizes the Secretary of the Interior to "enter into cooperative agreements with State, local, or tribal governments, other Federal agencies, other public entities, educational institutions, private nonprofit organizations, or participating private landowners for the purpose of protecting natural resources of units of the National Park System through collaborative efforts on land inside and outside of National Park System units." It requires that the agreements "provide clear and direct benefits to [National Park] System unit natural resources and provide for… preventing, controlling, or eradicating invasive exotic species that are within a [National Park} System unit or adjacent to a [National Park] System unit….". Invasive species were one

impetus behind this Act and BRD was heavily involved in its development and passage into law.

Public Law: Additional Specific Authorities are other applicable statutes enacted by Congress and signed into law by the President or enacted into law by Congress over Presidential veto.

Animal Service Animal Damage Control Act of 1931, as amended (*7 U.S.C. § 8351-8353*). Under this Act, the USDA's Animal and Plant Health Inspection Service (APHIS) is given authority to control wildlife damage on federal, state, or private land. Protects field crops, vegetables, fruits, nuts, horticultural crops, commercial forests; freshwater aquaculture ponds, and marine species cultivation areas; livestock on public and private range and in feedlots; public and private buildings and facilities; civilian and military aircraft; public health.

Sikes Act of 1960, as amended, (16 U.S.C. §670 et seq.) The Sikes Act of 1960 directs the planning, development, maintenance, coordination, and implementation of programs for the conservation and rehabilitation of wildlife, fish, and game species. This includes specific habitat improvement or species management (including invasive species) on lands and waters under the jurisdiction of affected agencies. It also provides for implementation of wildlife and fish conservation programs on federal lands and waters including authority for cooperative state-federal plans and authority to enter into agreements with states to collect fees to fund the programs identified in those plans.

National Environmental Policy Act of 1969 (42 U.S.C. § 4321-4370) (NEPA). The National Environmental Policy Act of 1969 requires federal agencies to analyze the physical, social, and economic effects associated with proposed plans and decisions, to consider reasonable alternatives to the action proposed, and to document the results of the analysis. Provisions of NEPA and the Council on Environmental Quality (CEQ) regulations for implementation apply to invasive species management and the potential for significant impacts to the environment. Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.).

The Endangered Species Act of 1973 provides for the conservation of threatened or endangered species of plants and animals. Section 7.a.1 of the ESA requires all federal agencies to utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered species and threatened species. Section 7.a.2 prohibits agencies from taking actions that would likely jeopardize the continued existence of a species and sets out the requirement for federal agencies to engage in consultation to ensure this does not happen. The ultimate goal of this Act is the recovery and long-term sustainability of endangered and threatened species and the ecosystems on which they depend. Recovery includes arresting or reversing the decline of an endangered or threatened species and removing or reducing threats (including invasive species) so that the species' survival in the wild can be ensured.

Clean Water Act of 1977 (33 U.S.C. § 1251 et seq., Public Law (P.L.) 95-217). This Act amends the Federal Water Pollution Control Act of 1948. Section 313 is strengthened to

stress federal agency compliance with federal, state, and local substantive and procedural requirements related to the control and abatement of pollution to the same extent as required of nongovernmental entities. Invasive species management to improve watershed condition supports the Act's charge to maintain the ecological integrity of our nation's waters, including the physical, chemical and biological components.

The Cooperative Forestry Assistance Act of 1978 (16 U.S.C. §2101 et seq.) authorizes USDA's Forest Service to enter into cooperative agreements to assist other federal, state, and private entities in controlling and managing invasive species on other federal lands and nonfederal lands.

Wild Bird Conservation Act of 1992 (16 U.S.C. § 4901 et seq., Pub.L. 102-440). This Act limits or prohibits imports of exotic bird species to ensure that their wild populations are not harmed by international trade. While this law does not specifically address introductions of non-native species, it may have the incidental effect of reducing non-native "hitchhiker" parasites and diseases. Regulations limiting species imported reduces the potential number of non-native species and individuals of a non-native species that may escape from captivity and become invasive.

Government Performance and Results Act of 1993 (Pub.L. 103-62) as amended by the *Government Performance Results Modernization Act of 2010 (Pub.L.111-352)*. The Government Performance and Results Act of 1993 designed to improve government performance management by requiring government agencies to set goals, measure results, and report progress annually. The Department of the Interior (DOI) decides what performance measures it wants to track and re-evaluates the measures as part of the DOI Strategic Plan process. GPRA (of 1993) required agencies to develop goals and measures to support an agency Strategic Plan and update that plan every five years.

The GPRA Modernization Act (of 2010) now requires an update every four years – in line with the presidential election cycle. E Department of the Interior Strategic Plan for FY2014-2018 and included two performance measures related to invasive species: one for Invasive Animals (percent of invasive animal species populations that are controlled) and one for Invasive Plants (percent of baseline acres infested with invasive plant species that are controlled).

Executive Orders Executive Orders (EOs) are orders related to invasive species issued by the President to the executive branch that has the force and effect of law include: *Executive Order 11987 – Exotic Organisms (1977)*. Executive Order 11987 is the first executive order to address non-native organisms, it stated simply that the federal government should restrict the introduction of exotic organisms on land that it owns or leases, and encourage states, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the U.S. It also stated that the federal government should restrict the importation and introduction of exotic species and restrict the use of federal funds to export native species for the purpose of introducing them into ecosystems outside the U.S. The Order included a provision stating it did apply to the introduction of any exotic species, if the Secretary of

Agriculture or Secretary of the Interior determines that such introduction will not have an adverse effect on natural ecosystems.

Executive Order 13112 – Invasive Species (1999). This executive order revoked EO 11987 and expanded concerns from only preventing the introduction of invasive species to also providing for their control; and minimizing the economic, ecological, and human health impacts that invasive species cause. It defined invasive species as "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health" and directs federal agencies to: (1) identify actions that may affect status of an invasive species; (2)(a) prevent introduction of such species, (b) detect and control such species, (c) monitor population of such species, (d) provide for restoration of native species, (e) conduct research on invasive species and develop technologies to prevent introduction of such species, (f) promote public education of such species; and (3) not authorize, fund, or carry out actions likely to cause the introduction or spread of invasive species in the United States or elsewhere unless the benefits of the action clearly outweigh the harm and the agencies take steps to minimize the harm. Under this authority, it also established the National Invasive Species Council, NISC).

Executive Order 13751 – Safeguarding the Nation from the Impacts of Invasive Species (2016) Amending EO 13112. This Executive Order incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into Federal efforts to address invasive species.

Federal Regulations. Federal regulations are general statements issued by an agency, board, or commission that have the force and effect of law. Interpretive rules, policy statements, and other guidance documents can also be published to help explain how an agency interprets or applies existing laws or regulations but these are not enforceable. Title 54 of the United States Code provides the National Park Service with broad legal authority to manage public and recreational use within parks, including the promulgation of regulations that may be more restrictive than generally allowed in other NPS units. These regulations are found in *Title 36 (Parks, Forests, and Public Property), Chapter I, Parts 1-199 of the Code of Federal Regulations* (CFR). Four regulations are particularly important for invasive species management:
36 Code of Federal Regulations § 2.1(a)(2). Preservation of natural, cultural and archeological resources Except as otherwise provided in NPS regulations, this C.F.R. prohibits introducing wildlife, fish or plants, including their reproductive bodies, into a park area ecosystem. While this prohibition on introductions includes invasive species, does not regulate transporting invasive species onto, off of, or within NPS areas. *Wildlife is defined in 36 C.F.R. § 1.4* as meaning any member of the animal kingdom and includes a part, product, egg or offspring thereof, or the dead body or part thereof, except fish.

36 Code of Federal Regulations § 2.2(a) Wildlife protection. This C.F.R. prohibits taking of wildlife by the public except where hunting or trapping are authorized, and prohibits the public from possession of unlawfully taken wildlife or portions thereof. It allows the superintendent to establish conditions and procedures for transporting lawfully taken wildlife (i.e., individuals taken by hunters/trappers) through the park

area. According to 36 C.F.R. § 1.4, wildlife means any member of the animal kingdom and includes a part, product, egg or offspring thereof, or the dead body or part thereof, except fish.

Special Regulations. NPS regulations cannot be contrary to Federal statutes or in derogation of park values but special regulations may be written to address activities that take place within park boundaries on federal and non-federal land as well as on submerged lands and waters. Special regulations can be an effective way to protect park resources that are not sufficiently protected by general NPS regulations. However, the process of promulgating a special regulation includes a number of policy, procedural, and timing considerations, including National Environmental Policy Act compliance and public involvement. Park-specific or "special" regulations are generally found *in 36 CFR § 7 and 36 CFR § 13*. Special regulations also establish the authority of superintendents to limit activities in parks (*36 CFR § 1.5*) and promulgate these authorities through an annual Superintendent's Compendium (*36 CFR § 1.7(b*)).

Park Compendia Pursuant to 36 CFR § 1.5. Park superintendents may put conditions on uses or activities in park units or even close areas to uses. Thus, they have the authority to create more (and more specific) invasive species regulations.

National Park Service Policy
The NPS developed structured policies around the concepts of nativeness and natural conditions. Although initially "naturalness" as it was originally referred to may appear to imply noninterference with the resource, it became clear over time that active management has often been necessary to address significant habitat and ecosystem changes associated with human influences. Sometimes intervention is necessary to restore natural processes. The NPS has several sources of detailed written guidance to help managers make day-to-day decisions. The primary source of guidance is the 2006 edition of NPS Management Policies which is also the foremost element of the Service's directives system. Management of invasive animals by the National Park Service follows general and specific direction found in NPS Management Policies 2006 (NPS 2006b).

Paraphrased below are some of the most relevant policies:
NPS Policy Section 1.4.7. Actions regarding Impairment of NPS Natural Resources If it is determined that there is, or will be, an impairment, the decision-maker must take appropriate action, to the extent possible within the Service's authorities and available resources, to eliminate the impairment. The action must eliminate the impairment as soon as reasonably possible, taking into consideration the nature, duration, magnitude, and other characteristics of the impacts on park resources and values, as well as requirements of the National Environmental Policy Act, National Historic Preservation Act, Administrative Procedure Act, and other applicable laws. The Service will also strive to ensure that park resources and values are passed on to future generations in a condition that is as good as, or better than, the conditions that exist today. In particular, the Service will strive to restore the integrity of park resources that have been damaged or compromised in the past.

NPS Policy Section 1.6 Cooperative Conservation Beyond Park Boundaries. This directs the NPS to work cooperatively with others to protect park resources and address mutual interests, including implementing management strategies to prevent introductions and spread of non-native and/or invasive species within and beyond park boundaries.

NPS Policy Section 2.1.2 Management Decisions are Science-Based Scientific, Technical, and Scholarly Analysis. This indicates that decision-makers and planners will use the best available scientific and technical information and scholarly analysis to identify appropriate management actions for protection and use of park resources, including invasive species management actions.

NPS Policy Section 4.4.1.3 Definition of Native and Exotic Species. Native species are defined as all species that have occurred, now occur, or may occur as a result of natural processes on lands designated as units of the national park system. Native species in a place are evolving in concert with each other. Exotic species are those species that occupy or could occupy park lands directly or indirectly as the result of deliberate or accidental human activities. Exotic species are also commonly referred to as non-native, alien, or invasive species. Because an exotic species did not evolve in concert with the species native to the place, the exotic species is not a natural component of the natural ecosystem at that place. Genetically modified organisms exist solely due to human activities and therefore are managed as exotic species in parks.

NPS Policy Section 4.4.4 Management of Exotic Species. Exotic species will not be allowed to displace native species if displacement can be prevented.

NPS Policy Section 4.4.4.1 Introduction or Maintenance of Exotic Species. In general, new exotic species will not be introduced into parks. In rare situations, an exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken and it is used to control another, already established exotic species; or is needed to meet the desired condition of a historic resource but only where it is noninvasive and is prevented from being invasive by such means as cultivating (for plants) or tethering, herding, or pasturing (for animals); or parks are directed by law or expressed legislative intent. Domestic livestock such as cattle, sheep, goats, horses, mules, burros, reindeer, and llamas are exotic species that are maintained in some parks for commercial herding, pasturing, grazing, or trailing; for recreational use; or for administrative use for maintaining the cultural scene or supporting park operations. The policies applicable to the grazing of commercial domestic livestock are discussed in depth in *Policy Section 8.6.8*. The Service will phase out the commercial grazing of livestock whenever possible and manage recreational and administrative uses of livestock to prevent those uses from unacceptably impacting park resources.

NPS Policy Section 4.4.4.2 Removal of Exotic Species Already Present. All exotic plant and animal species that are not maintained to meet an identified park purpose will be managed, up to and including eradication—if (1) control is prudent and feasible, and (2) the exotic species interferes with natural processes and the perpetuation of natural features, native species or natural habitats; or disrupts the genetic integrity of native

species; or disrupts the accurate presentation of a cultural landscape; or damages cultural resources; or significantly hampers the management of park or adjacent lands; or poses a public health hazard as advised by the U.S. Public Health Service (which includes the Centers for Disease Control and the NPS public health program); or creates a hazard to public safety. High priority will be given to managing exotic species that have, or potentially could have, a substantial impact on park resources, and that can reasonably be expected to be successfully controlled. Lower priority will be given to exotic species that have "almost no" impact on park resources or that probably cannot be successfully controlled. Where an exotic species cannot be successfully eliminated, managers will seek to contain the exotic species to prevent further spread or resource damage. The decision to initiate management should be based on a determination that the species is exotic. For species determined to be exotic and where management appears to be feasible and effective, superintendents should (1) evaluate the species' current or potential impact on park resources; (2) develop and implement exotic species management plans according to established planning procedures; (3) consult, as appropriate, with federal, tribal, local, and state agencies as well as other interested groups; and (4) invite public review and comment, where appropriate. Programs to manage exotic species will be designed to avoid causing significant damage to native species, natural ecological communities, natural ecological processes, cultural resources, and human health and safety. Considerations and techniques regarding removal of exotic species are similar to those used for native species (i.e., *Policy Section 4.4.2.1 NPS Actions That Remove Native Plants and Animals).*

Director's Orders. Other elements of the NPS' directives system include Director's Orders (DOs), Handbooks, and Reference Manuals. Relevant to invasive animals: Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-Making The purpose of this Director's Order is to set forth the policy and procedures by which the NPS complies with NEPA (42 U.S.C. § 4321 et seq.). The provisions of NEPA and the Organic Act jointly commit NPS to make informed decisions that perpetuate the conservation and protection of park resources unimpaired for the benefit and enjoyment of future generations. It also states that NPS management decisions (1) be scientifically informed, and (2) insist on resource preservation as the highest of many worthy priorities. All "major Federal actions" must comply with NEPA, including actions to manage invasive species.

Reference Manuals. No official comprehensive NPS handbook or guidance document currently exists related to exotic, non-native or invasive species, but the Natural Resources Management Guideline (*NPS-77; NPS 1991*) published in 1991 combines existing guidance with documentation of unwritten NPS resource management practices and procedures. Chapter 2 of NPS-77 is dedicated to Natural Resources Management. Although NPS-77 is over 25 years old, many of the management practices it describes are still relevant today. The "Exotic Species Management" section starts on page 284 of Chapter 2 and provides guidance on prevention of exotic species invasions, management of established exotic species, management of special categories of exotics in cultural landscapes, research and monitoring, biological control, integrated pest management and pesticide use, environmental compliance and planning documents, and roles and responsibilities.

Section 106 of the National Historic Preservation Act (NHPA) requires all federal agencies to consider the effects of undertakings on cultural resources that are eligible for or listed through the NHPA. Through the Section 106 process, the NPS would seek to avoid, minimize, or mitigate any impacts on cultural resources. Though Section 106 and NEPA processes are separate, in complying with Section 106 the Park will work to ensure that impacts on cultural resources from activities carried out during any of the alternatives will be avoided, minimized, or mitigated.

<u>Enabling Legislation and Discussion–Cape Hatteras National Seashore</u>
The NPS carries out its responsibilities in parks and programs under the authority of federal laws, regulations, and Executive Orders, and in accord with policies established by the Director of the National Park Service and the Secretary of the Interior. The overarching guidance and directives for a park are, for the most part, included in that park's Enabling Legislation. Further guidance can often be found in discussion of the establishing Bill. These documents and discussion give the public insight into why an area is under consideration as a unit in the NPS and what components makes that particular area special and slated for protection. In the discussion documentation and bill language for CAHA, for instance, there is no mention of retention of free-roaming horses. Whereas, there is attention paid to migratory waterfowl. This indicates that the park will continue to protect migratory waterfowl, and that horses were not considered a priority enough to mention.

Secretary of the Interior Harold Ickes discussed the potential and importance of a Cape Hatteras National Seashore: "…the area would be preserved as a primitive wilderness, except for "swimming, boating, sailing, fishing, and other recreational activities of a similar nature. . . . One of the outstanding types of landscape which is not adequately represented in the National Park System is that of the seashore. It is a recognized fact that the seashore has a strange appeal to a wide range of the population. . . . The scenic theme of Cape Hatteras is that of the sand beach, which is of excellent quality for a distance of 150 miles. The fact that these barrier islands are almost inaccessible from the mainland has preserved them from private and commercial recreational development. Also of scenic interest is Diamond Shoals, which extends out into the ocean about 6 miles from the extreme easterly point of Cape Hatteras. Here the current from the south meets the current from the north, resulting in a wild, spectacular battle of surf, in contrast to the quiet, protected waters of Pamlico Sound across the narrow barrier. The area is rich in bird life. It is one of three principal migration lanes of the United States for ducks, geese, and other migratory waterfowl. … There are definite historical values attached to Cape Hatteras [graveyards, lighthouses, Fort Raleigh] … The area is particularly adapted to concentrated use for water sports, so necessary for the densely populated sections of the central eastern seaboard [swimming, fishing, boating]."

Following the discussion, Cape Hatteras National Seashore was designated and the Enabling Legislation crafted:
Calendar No. 1247 75TH CONGRESS, IST SESSION, H. R. 7022

AN ACT
To provide for the establishment of the Cape Hatteras National Seashore in the

State of North Carolina, and for other purposes. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That when title to all the lands, except those within the limits of established villages, within boundaries to be designated by the Secretary of the Interior within the area of approximately one hundred square miles on the islands of Chicamacomico, Ocracoke, Bodie, Roanoke, and Collington, and the waters and the lands beneath the waters adjacent thereto shall have been vested in the United States, said area shall be, and is hereby, established, dedicated, and set apart as a national seashore for the benefit and enjoyment of the people and shall be known as the Cape Hatteras National Seashore: Provided, That the United States shall not purchase by appropriation of public moneys any lands within the aforesaid area, but such lands shall be secured by the United States only by public or private donations

SEC. 2. The Secretary of the Interior is hereby authorized to accept donations of land, interests in land, buildings, structures, and other property, within the boundaries of said national seashore as determined and fixed here under and donations of funds for the purchase and maintenance thereof, the title and evidence of title to lands acquired to be satisfactory to the Secretary of the Interior: Provided, That he may acquire on behalf of the United States under any donated funds by purchase, when purchasable at prices deemed by him reasonable, otherwise by condemnation under the provisions of the Act of August 1, 1888, such tracts of land within the said national seashore as may be necessary for the completion thereof.

SEC. 3. The administration, protection, and development of the aforesaid national seashore shall be exercised under the direction of the Secretary of the Interior by the National Park Service, subject to the provisions of the Act of August 25, 1916 (39 Stat. 535), entitled “An Act to establish a, National
Park Service, and for other Purposes”, as amended: Provided That except as hereinafter provided nothing herein shall be construed to divest the jurisdiction of other agencies of the Government now exercised over Federal owned lands within the area of the said Cape Hatteras National Seashore:

Provided further, That the provisions of the Act of June 10, 1920, known as the “Federal Water Power Act”, shall not apply to this national seashore: And provided further, That the legal residents of villages referred to in section 1 of this Act shall have the right to earn a livelihood by fishing within the boundaries to be designated by the Secretary of the Interior, subject to such rules and regulations as the said Secretary may deem necessary in order to protect the area for recreational use as provided for in this Act.

SEC. 4. Except for certain portions of the area, deemed to be especially adaptable for recreational uses, particularly swimming, boating, sailing, fishing, and other recreational activities of similar, nature, which shall be developed for such uses as needed, the said area shall be permanently reserved as a primitive wilderness and no development of the project or plan for the convenience of visitors shall be

undertaken which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing in this area: Provided, That the Secretary of the Interior may, in his discretion, accept for administration, protection, and development by the National Park Service a minimum of ten thousand acres within the area described in section 1 of this Act, including the existing Cape Hatteras State Park, and, in addition, any other portions of the area described in section 1 hereof if the State of North Carolina shall agree that if all the lands described in section 1 of this Act shall not have been conveyed to the United States within ten years from the passage of this Act, the establishment of the aforesaid national seashore may, in the discretion of the said Secretary, abandoned, and that, in the event of such abandonment, the said State will accept a reconveyance of title to all lands conveyed by it to the United States for said national seashore. The lands donated to the United States for the purposes of this Act by parties other than said State shall revert in the event of the aforesaid abandonment to the donors, or their heirs, or other persons entitled thereto by law. In the event of said abandonment, the Secretary of the Interior shall execute any suitable quitclaim deeds, or other writings entitled to record in the proper counties of North Carolina stating the fact of abandonment, whereupon title shall revert to those entitled thereto by law and no further conveyance or proof of reversion of title shall be required.

SEC. 5. Notwithstanding any other provisions of this Act, lands and waters now or hereafter included in any migratory bird refuge under the jurisdiction of the Secretary of Agriculture, within the boundaries of the national seashore as designated by the Secretary of the Interior under section 1 hereof, shall continue as such refuge under the jurisdiction of the Secretary of Agriculture for the protection of migratory birds, but such lands and waters shall be a part of the aforesaid national seashore and shall be administered by the National Park Service for recreational uses not inconsistent with the purposes of such refuge under such rules and regulations as the Secretaries of the Interior and Agriculture may jointly approve. The proviso to section 1 of this Act shall not limit the power of the Secretary of Agriculture to acquire lands for any migratory bird refuge by purchase with any funds made available therefor by applicable law. Cape Hatteras National Seashore Foundation Statement Passed the House of Representatives August 2, 1937. (Aug. 17, 1937, ch. 687, Sec. 4, 50 Stat. 670; June 29, 1940, ch. 459, Sec. 1, 54 Stat. 702; Mar. 6, 1946, ch. 50, 60 Stat. 32.)

While the Enabling Legislation provides overarching guidance, parks derive their daily management activities through policy, regulations, orders and laws but must be aware of the Enabling Legislation language.

<u>Definitions Relevant to Livestock of CAHA</u>

Names given to resources can often be confusing. Definitions related to invasive species, even the term “invasive” itself, have been the subject of much debate and discussion for several years. Following the trend at the time, NPS Management Policies 2006 adopted “exotic” species as an official term for “non-native”. It also states: “Exotic species are also commonly referred to as non-native, alien, or invasive species”

suggesting these terms are synonymous Indeed, the Natural Resources Management Guideline (NPS-77) actually states "Exotic, non-native, introduced and alien are synonymous terms". This interpretation is outdated and out of step with more widely accepted definitions of invasive species in current professional literature and among federal (and some state) agencies which now avoid the value-laden terms "exotic" and "alien". NPS-77 acknowledges that "exotic" has a different connotation among some audiences. Although the global invasive species community still commonly uses "invasive alien species (IAS)"), Executive Order 13751 (2016) removed the word "alien" from its formal definition of "invasive species" which had existed since Executive Order 11987 (1977).

Distinguishing between "non-native" and "invasive" is also complex and occasionally the subject of debate between state and federal agencies. Further complicating the matter, current definitions of "native" and "non-native" may be inadequate when considering the possibility of managed migration or relocation of at-risk species, the fact that species are shifting their ranges in response to climate change, the emerging application of genetically modified or engineered organisms to mimic former native species or be resistant to certain diseases. Sometimes definitions are overlapping, redundant, or interchangeable or may have regional connotations. Through policies and directives, definitions and applications of assigned labels have been made as clear as possible and to be used consistently throughout the Service. That being said, there are multiple definitions for non-native species that may have some very subtle differences which may be pertinent to the situation in which they live.

Feral Horse "having escaped from domestication and become wild…" *Merriam-Webster*.
A feral animal is an animal that was once domesticated and escaped but has reverted to a wild state and adjusted to surviving in a natural environment without help or support of any kind from humans. Example: Horses on Cumberland Island National Seashore

Non-native considers a living or growing in a place that is not the location of its natural occurrence…" *Merriam-Webster*
Horses in the United States are generally considered non-native by the federal government and most states. A non-native animal (or plant) is any species that occurs outside its native range as a result of deliberate or an accidental introduction event. Non-natives compete with native species for habitat and food. They are capable of taking over ecosystems that plants or animals need to survive. Often, non-native species will not have natural predators, so their numbers can increase unchecked.

Exotic Species "introduced from another country**:** not native to the place where found…" *Merriam-Webster* -"species that occupy or could occupy lands or waters directly or indirectly as the result of deliberate or accidental human activities. Exotic species are not considered native."
Exotic species will not be allowed to displace native species if such displacement can be prohibited. *NPS Management Polices 2006*

Native Species "Species that have occurred, now occur, or may occur as a result of natural processes or restoration (reintroduction) efforts on lands or in waters". *NPS Management Polices 2006.*
A species that has been observed in the form of a naturally occurring and self-sustaining population in historical times. *Bern Convention 1979* · A species or lower taxon living within its natural range (past or present) including the area which it can reach and occupy using its natural dispersal systems. *International Council for Exploration of the Sea (ICES) 1994 modified after the Convention on Biological Diversity (CBD).*

Livestock "animals kept or raised for use or pleasure" by humans. Livestock include any species of animal that has been selectively bred by humans for domestic or agricultural purposes, including, but not limited to, cattle, sheep, horses, burros, mules, goats, and swine. *Merriam-Webster*

NPS Cultural Resource Types
Cultural landscapes are settings humans have created in the natural world. They reveal fundamental ties between people and the land; ties based on our need to grow food, give form to our settlements, meet requirements for recreation, and find suitable places to bury our dead. Landscapes are intertwined patterns of things both natural and constructed: plants and fences, watercourses and buildings. They range from formal gardens to cattle ranches, from cemeteries and pilgrimage routes to village squares. They are special places: expressions of human manipulation and adaptation of the land.

Ethnographic resources are basic expressions of human culture and the basis for continuity of cultural systems. A cultural system encompasses both the tangible and the intangible. It includes traditional arts and native languages, religious beliefs and subsistence activities. Some of these traditions are supported by ethnographic resources: special places in the natural world, structures with historic associations, and natural materials. An ethnographic resource might be a riverbank used as a Pueblo ceremonial site or a schoolhouse associated with Hispanic education, saltmarsh grass needed to make baskets in an African-American tradition or a 19th-century sample of carved ivory from Alaska. Management of ethnographic resources acknowledges that culturally diverse groups have their own ways of viewing the world and a right to maintain their traditions. Livestock, including horses, *can* be *allowed on NPS lands to present a cultural scene* and are managed per 36 CFR § 2.60 (a) (3) *if* the park's enabling legislation identifies this as an important component of the parks natural and cultural resource preservation**.**

Horses in National Park Units
Like any livestock, horses require large amounts of forage and fresh water.
Horses are large animals that can impact the areas they graze by trampling and removing native vegetation and destroying cultural resources.

"All exotic [non-native] plant and animal species that are not maintained to meet an identified park purpose will be managed—up to and including eradication— if (1) control is prudent and feasible, and (2) the exotic species interferes with natural processes and the perpetuation of natural features, native species or natural habitats; damages cultural

resources; or significantly hampers the management of park or adjacent lands…". *NPS 2006 Policy*.

Feral horses, ponies, and donkeys are found in several national park units throughout the U.S. Feral equids residing within NPS units across the Service typically fall into several categories.

- The first category are equids that are resident within an NPS unit and are not specifically maintained or managed as a cultural resource. Often, these populations existed in the area prior to the establishment of a park. Or they may have been released in the area or migrated from another extant population. They have typically been feral for many generations. Management ranges from attempting to eradicate these animals from within a park, to no management at all, often due to lack of funds or resources. Concerns regarding resource damage (e.g., vegetation grazing, damage to historic structures, soil erosion, competition with native wildlife, etc.) range from minimal to significant, depending on the park enabling legislation (e.g., the document that describes the purpose of the park), horse use and damage to available habitat, interaction with other wildlife species, interaction with humans, and interference with park operations. (Example: Grand Canyon, Mesa Verde and Theodore Roosevelt National Parks)
- Another category addresses trespass animals from publicly managed herds on neighboring lands. The NPS may agree to comanage these animals on the edges of their herd management units and manages horses similarly to the Bureau of Land Management (BLM). (Example: Lake Mead National Recreation Area).
- A popular, yet often controversial situation, are horses and ponies that are maintained as desirable non-native species, determined as part of the park's cultural landscape. These horses are usually in small herds but very visible to the public, generally, they have many interested stakeholders. A good example is Cumberland Island National Seashore. The island's horses are the only herd of feral horses on the Atlantic coast that is not managed (no supplemental food, water, veterinary care, or population control). The herd is affected by all the natural stressors faced by native wildlife and likely contribute to stressors experienced by the island's native flora and fauna. Cumberland's horses are considered non-native by the NPS. While these horses are often referred to as wild, the more appropriate designation of these horses is feral. Genetic studies conducted in 1991 by the University of Georgia and University of Kentucky on the island's population showed that Cumberland's horses are closely related to Tennessee Walkers, American Quarter Horses, Arabians, and Paso Fino. Historic accounts support these findings, and also mention the introduction of American Mustangs, burros, retired circus horses, and other specially purchased animals. *Feral Horses - Cumberland Island National Seashore (U.S. National Park Service) (nps.gov)*.

While park managers often identify significant resource damage due to overgrazing, trampling, or competition with native wildlife species, management options are often curtailed and subject to significant public scrutiny. A few NPS units have specific legislation or significant political pressure which mandates or drives horse management

actions such as Cape Lookout National Seashore, just to the south of CAHA. This legislation requires the park to keep horses and dictates the herd size.

Assateague National Seashore articulates to the public that the horses are "wild" yet feral and that they are descendants of domestic animals that have reverted to a wild state. The horses are split into two herds, one on the Virginia side and one on the Maryland side of Assateague. The horses are separated by a fence at the Virginia/Maryland State line. The NPS manages the Maryland herd. Regular monitoring of population dynamics is necessary to support the long-term fertility control program that was initiated in 1994 to reduce the numbers of the Maryland herd, and current management of the population close to the goal range of 80-100 individuals.

The Chincoteague Volunteer Fire Company owns and manages the Virginia herd through a special use permit under the US Fish and Wildlife Service on Chincoteague National Wildlife Refuge. The permit determines the size of the herd which is generally kept to 150 adult animals in hopes to protect the natural resources of the wildlife refuge.

Additional information is embedded in the Table: Feral horse populations on East Coast Barrier Islands, page 11 of this document.

Brief Summary of History of Proposed CAHA Horse Removal

The park's current initiative to evaluate the management of horses within the park is certainly not a new one. Previous documents discussing the fate of the herd have drafted objectives, operations, and programs, and some have suggested removal. Removal of horses at CAHA has been a multiple decades-long proposed effort.

- In 1938, State Senator Robert R. Reynolds had contacted the NPS with constituent concerns about these semi-domesticated horses. By then local ordinances had banned free-range grazing in Currituck and Dare Counties, which had facilitated the beginning of New Deal beach erosion control efforts. However, such ordinances did not apply to Hyde County, which included Ocracoke, or Carteret County, which included the Outer Banks south of Ocracoke where the Shackelford ponies remained free to roam. Even then, residents were concerned at what the establishment of the park might mean for the ponies.
- On November 29, 1954, Conrad Wirth directed Region One Director Elbert Cox to proceed with the elimination of the wild ponies on Ocracoke Island within the park's boundary. Superintendent Allyn Hanks began to develop a program. In late February 1955, residents of Ocracoke Island heard the news and many were distressed. It was not a new issue for them.
- At the time, Director Arno Cammerer allayed any fear by telling Senator Reynolds that the Park Service would treat the ponies as "a unique historical feature of the North Carolina Coast." Cammerer concurred with Region One Wildlife Technician William J. Howard's view "that the Banks would lose a picturesque feature if all the ponies were gone."
- By 1955, however, NPS policy had changed. Superintendent Hanks had to convey a new NPS policy to Marvin W. Howard, who was the local Boy Scout Master, and explain why the Service now sought to ban free-range grazing by the Ocracoke Island ponies. "Long range planning," he said, "must strive to diminish

deteriorating agencies and strengthen those that build up the land or all that is done otherwise may eventually be lost." The predominant line of thinking was now that free-ranging horses damaged artificial sand dunes, and as with other livestock, this type of grazing had to be banned.

- Eventually, the solution to the free-roaming pony problem was to fence some three dozen ponies in a marshy area to the west of the new road. Owners of the few remaining ponies were encouraged to fence or remove their animals out of consideration for NPS concerns about damage the animals might cause and concerns about vehicle collisions.
- By the 1930's, an awareness has developed that exotic species are much more prevalent in areas of the National Park System than once was suspected. It also has become clear that the presence and activities of exotic species in areas dedicated to the preservation of natural ecological systems represent a form of adverse human impact that in some cases may threaten the very survival of the natural systems being protected.

This awareness of the potential impact of exotic species has led the National Park Service to fund a diversity of research projects designed to examine impacts and life histories of, and potential control techniques for, a number of plant and animal species that are exotic to one or more parks. The potential for widespread application of the results of this research resulted in the convening of a special session at the Second Conference on Scientific Research in the National Parks to focus attention on exotic species problems and research and through that focusing to encourage cooperation in study, information exchange, and management application for exotic species problems that are common to several parks.

As another example from that period, Director Horace Albright (1933) stated: . . . it is important to emphasize that the policy of the National Park Service is unalterably against the introduction of exotic species of animals or plants in the national parks or national monuments, except for the occasional stocking of an otherwise barren body of water with some species of game fish. Several decades later, a discussion paper containing a forward by Director Conrad L. Wirth (USDI, National Park Service, 1957) cited policies for the maintenance of natural conditions that included controlling all exotic pests of vegetation, eradicating exotic plants, and eliminating or controlling exotic animals.

Two reports in the next decade, the Leopold report on wildlife management (Leopold, et al., 1963) and the Robbins report on research (Robbins, et al., 1963) referred to exotic species in ways that indicated the presence of exotic species is inappropriate for areas set aside to preserve natural conditions. In a specific response to the Leopold report, the Secretary of the Interior instructed the Director of the National Park Service to ". . . take such steps as appropriate to incorporate the philosophy and the basic findings into the administration of the National Park System" (Udall, 1963).

With respect to exotic species, the Service responded to this instruction informally in such statements as one by Sumner (1964) that "Non-native species are to be eradicated or held to a minimum if complete eradication is impossible," and formally with the 1970

publication of the Administrative Policies for Natural Areas of the National Park System which stated that, "Non-native species may not be introduced into natural areas. Where they have become established or threaten invasion of a natural area, an appropriate management plan should be developed to control them, where feasible . . .," and that "Non-native species of plants and animals will be eliminated where it is possible to do so by approved methods which will preserve wilderness qualities" (USDI, National Park Service, 1970, pp. 17, 56, respectively).

Today, concerns are mounting regarding not only the legitimacy of the horses residing within the park boundary, but the sustainability of the location of the park's horses in relation to climate change: eroding land base, rising sea levels, necessity to relocate park infrastructure to available and suitable land, and increasing cost and care of the animals, while still being concerned for their utmost welfare.

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- Theodore Rondthaler, Letter to Herbert C. Bonner, January 20, 1956, in Herbert C. Bonner Papers (3710), National Seashore Files, Box 47, Folder 2217 (January-June 1956), Special Collections. Herbert E. Kahler, Chief Historian, Memorandum to Ronald R. Lee, June 16, 1955, CAHA Administrative History

h. Potential and Feasible Paths Forward Based Upon Findings

The following are not recommendations, but rather statements based upon this paper's research followed by ideas by the authors for management consideration for future planning efforts and potential paths forward.

Research-based facts to consider in management choices:

1) Based upon the interpretation of NPS laws and policies, CAHA does not have the legal authority to allow permanent livestock residing within the park, either free-roaming or penned. According to these laws and policies, resident livestock is inconsistent with park's mission and enabling legislation.
2) CAHA equids are not classified as a cultural resource nor part of a cultural landscape.
3) Equids at CAHA have not been identified as an ethnographic resource nor a demonstration herd.
4) Equids at CAHA: available genetic information should be interpreted as not making a clear case for genetic uniqueness in these animals.
5) Livestock (CAHA equids) are considered exotic (non-native) species under policy.
6) Equids at CAHA have not been identified in the park's enabling legislation, Foundation Document, or General Management Plan as part of the cultural landscape.

Potential and feasible paths forward:

1. Park will need to analyze and address relevant laws and policies related to the issue at hand which includes the status quo and welfare of the horses in a changing climate.
2. Managing the horses of CAHA takes a substantial amount of park staff and volunteer time on an annual basis. Maintaining population numbers and addressing health and welfare and safety issues associated with the horses takes time away from managing for native species and ecosystems and important cultural resources, as well as other park priorities for which the enabling legislation of the park mandates. In addition, the cost can be significant inclusive of structural maintenance of the facilities, feed, veterinary care, hoof care, medical emergencies, and miscellaneous equipment.
3. If the management decision for population objectives for the horses within the boundaries be zero, the NPS may seek to remove all horses from the park over a span of years through the following strategies:
    a. Affiliated or non-affiliated tribes could be provided with the first opportunity to receive horses.
    b. Horses could be transferred to other authorized entities (e.g., Black Beauty Ranch-Texas Humane Society), or local entity, or sold through a GSA auction.
    c. Horses could continue to live out their lives in the park pens, cared for by CAHA, but the park may want to consider relocation to suitable facilities within or outside of the park so that high priority infrastructure can be addressed in relation to rising sea level and other climate change-related impacts.

    d. Work with the local community to find community or state or local lands outside the park where the horses could draw interested tourists and others and perhaps the community could benefit from an economic standpoint.
4. CAHA equids could be retained in a penned situation but not in a free-roaming state as this may affect their welfare and the condition of park resources.
5. Infusion of genetics and breeding should be carefully considered. All females currently reside in enclosures with no stallions. If a phase-out of animals is considered, this could eventually bring the park into compliance with law and policy, recognizing that this could take decades.
6. CAHA could consider a Livestock Plan that not only addresses the penned horses, but also use of livestock (horses) for recreational purposes offered to the public. There should be no conflict in these permitted activities or where they take place as regards to negatively affecting natural or cultural resources (trampling, trailing through native vegetation and wildlife habitat, deposition of potentially nitrogen-rich manure in the system which takes months to break down, a safety hazard for bicycles or cars or pedestrians). The use of weed seed-free hay or cubes, manure cleanup, zero-grazing tolerance and no crossing of dunes, etc. could be addressed in such a plan.
7. There is unlikely to be a "one size fits all" management approach to feral horses and livestock within the National Park System. It is recognized that this can be a highly-charged issue particularly with the local community as horses are well-loved. But it needs to be articulated that it is critical that park managers comply with not only their park's enabling legislation but also relevant laws, policies, and scientific information pertaining to the issue. Just as bird or turtle lovers want the Superintendent to exercise their authority to provide full protection for these species, they must do the same in accordance with law and policy as regards non-natives. It is the Superintendent's responsibility to review authorized options and best available information in the decision-making process.

Note on communication from park staff:
The park reached out to the public in-person and digitally to seek any additional information that may be relevant for consideration and inclusion into this report and, in summary, is as follows:

- *Email inquiry regarding potential exceptions to NPS policy*
- *Scanned information from the Ocracoke Preservation Society*
- *Email received and read by Kent Redford during the public presentation regarding concern for the protection of the herd*