



MUSTANG CAMP

HEALTHY LANDS AND
HEALTHY HORSES

Activity Book & Field Guide

Name: _____

This workbook was developed as a companion to the Discover 4-H Mustang Camp curriculum through collaboration with the following organizations:



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Photos and design elements provided by Canva.

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Welcome to Mustang Camp!

We are excited to have you join us for an incredible adventure learning about mustangs, burros, and the rangelands they call home. Throughout camp, you'll explore the important connection between healthy lands and healthy horses, and learn how you can make a difference! This activity book is filled with fun challenges, interesting facts, and helpful tips to guide you as you explore the range. Whether you're new to the world of mustangs or already a big fan, you'll find plenty to explore and discover during your time at camp. So grab your boots, turn the page and get ready for an exciting adventure!



My Notes

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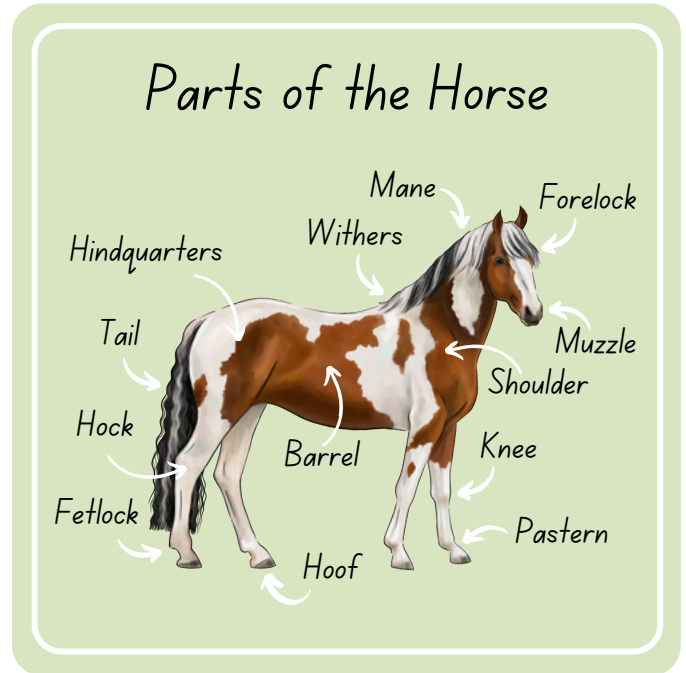


All About Horses

AN INTRODUCTION TO EQUINE BEHAVIOR

Key Vocabulary:

- **Behavior:** The actions or reactions of an animal in response to its environment.
- **Equine:** This refers to animals belonging to the family Equidae, which includes horses, donkeys, and zebras.
- **Foal:** A young horse under the age of one.
- **Hand:** A unit of measurement that is used to measure the height of a horse. One hand is equal to four inches.
- **Mare:** An adult female horse.
- **Marking:** The white patches of hair on a horse's face or legs.
- **Predator:** An animal that hunts, kills, and eats other animals.
- **Prey Animal:** An animal that is hunted and eaten by other animals.
- **Stallion:** An adult male horse that has not been castrated.



A Horse is a Horse of Course!

Horses are herbivores. This means that they eat a diet that consists of primarily of plants such as grasses and shrubs. They are considered non-ruminants meaning their stomach has only one compartment where they digest food. Horses are prey animals and have a strong flight response although they sometimes will become defensive (biting, kicking, striking, rearing) when they cannot get away from a potential threat. While horses have few natural predators, on the rangeland, potential predators include mountain lions and wolves

How Horses Communicate

Horses communicate primarily through the use of body language. A horse's ears, eyes, nostrils, lips, tail, and legs all come together to allow horses to "talk" with their herd members. In addition to body language, horses may also communicate through vocalizations such as nickers, whinnies and snorts. This communication forms the foundation of equine behavior.



All About Horses

DISCOVERING EQUINE BEHAVIOR

Horse Senses: Vision, Smell and Sight

As a prey animal, horses are always aware of their environment. They depend on their senses (vision, smell, and hearing) to gather important information that helps them maintain their safety.



Vision: Horses are equipped with large eyes, one set on each side of their head. This enables them to see nearly three-hundred and sixty degrees around their bodies. Blind spots include directly in front of their nose (closer than four feet), directly behind their hindquarters, and directly above and below their body.



Smell: Horses have an incredible sense of smell. The scent of a predator can alert the horse to potential danger even before they can see it. Finding water, selecting food, and developing social connections all benefit from a horse's heightened sense of smell. When horses want to smell something a bit better they will curl their upper lip, this is called a flehmen response. Stallions will often demonstrate this behavior when trying to determine if a mare is in heat.



Hearing: A horse's sense of hearing is much better than a humans. Their ears can rotate 180 degrees to allow them to hear what is going on in their surroundings. This combined with their other senses help them to quickly respond to potential threats in their environment.



For more information on horses check out the *Utah 4-H Horse Program Study Guide Volume 1* by scanning the QR code.

Did you know?

Physical touch is an important part of developing relationships among herd members. In group settings, horses can often be observed scratching one another on the withers and back. This is known as mutual grooming, which helps strengthen relationships that are vital to safety and well-being. The need for companionship remains strong even within domesticated horses. Research has shown that when horses are scratched on the withers, this lowers their heart rate, creating a calming effect.



All About Horses

DECODING EQUINE FACIAL EXPRESSIONS

Relaxed	Alert/Worried	Defensive/Aggressive
		
Nostrils and muzzle relaxed	Nostrils flared, muzzle is tense	Nostrils and muzzle are tense
		
Eyes relaxed, may be slightly closed	Eyes wide, less blinking	Eyes tense and staring
		
Ears relaxed, may be forward or to the side	Ears forward listening, head raised	Ears back, pinned towards the head

Test your knowledge on the next page!

All About Horses

DECODING EQUINE FACIAL EXPRESSIONS

Test your knowledge of equine facial expressions by writing your observations next to each picture below. When you are finished, you can use the previous page to check your answers.



Nostrils: _____

Eyes: _____

Ears: _____

Overall facial expression: _____

What do you think will happen next?



Nostrils: _____

Eyes: _____

Ears: _____

Overall facial expression: _____

What do you think will happen next?



Nostrils: _____

Eyes: _____

Ears: _____

Overall facial expression: _____

What do you think will happen next?

All About Horses

SAFETY WHEN OBSERVING HORSES

To safely view mustangs, you should stay about 100 feet away, so you don't disturb them. Use binoculars or a camera with a zoom to see them up close. Be quiet and move slowly because loud noises and sudden movements can scare the horses. Follow the instructions given by camp faculty and staff.



Speak quietly and move slowly while on the range so everyone has a chance to see the horses and other wildlife.

As prey animals, horses are easily startled by noises and sudden movement. Mustangs and burros on the range remain on high alert for threats. They will quickly leave an area if they are disrupted by excessive talking and noise. When stopping to see the horses please do not slam the car doors or run towards the horses.



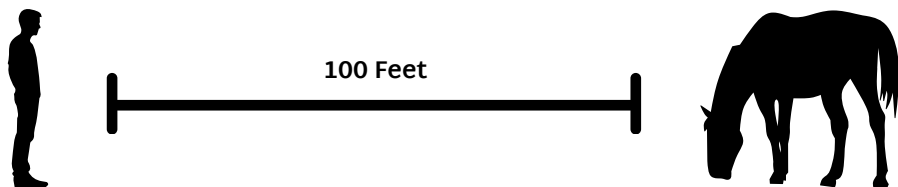
Do not try to feed or touch the horses.

This can be tempting but remember, these horses are wild and unpredictable. To keep yourself and the horses safe, please do not feed or touch them.



Give horses and other wildlife plenty of space.

Mustangs and burros on the range are wild animals. When they feel threatened they will react. This can result in defensive behaviors such as kicking, striking and biting. Keep yourself safe by respecting the animal's space.



Test your Mustang Camp safety knowledge by taking the quiz on the next page.
Can you get 100%?

All About Horses

SAFETY QUIZ

Test your Mustang Camp safety knowledge by taking the quiz below.



Remember to speak _____ and move _____ when observing the horses on the range.

Close car doors _____ to avoid spooking the horses.

Do not _____ towards the horses.



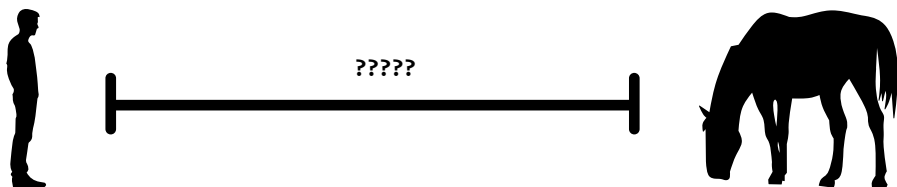
Do not try to _____ or _____ the horses. This can be harmful to you and to the horses.

Remember, mustangs on the range are _____ and _____. Please respect their space.



Follow the _____ given by camp faculty and staff.

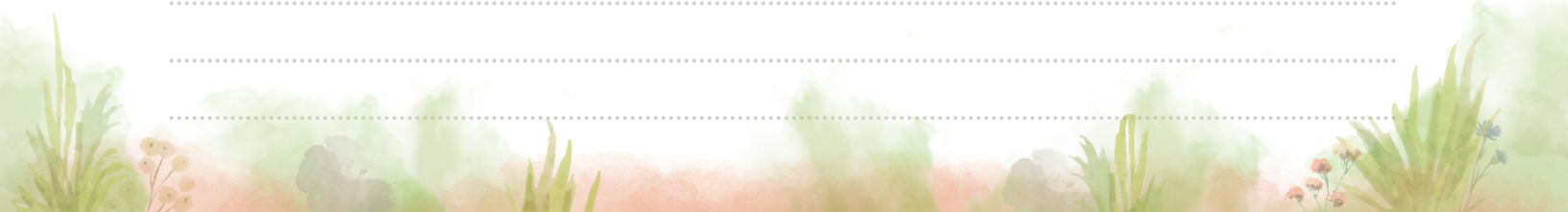
When observing mustangs, burros and other wildlife on the range you should stay at least _____ feet away.



Use the previous page to check your answers.

What questions do you have about Mustangs and Burros? Write at least three questions below. Leave space to write the answers.

Handwriting practice lines consisting of 25 horizontal dotted lines for writing questions and answers.



All About Horses

EXPLORING EQUINE BEHAVIOR

Relaxed Behaviors

When horses are relaxed, their behaviors center around social bonding among herd members. Mutual grooming is a common activity where horses use their lips and teeth to scratch each other's necks and backs. This behavior promotes relaxation and strengthens social bonds with herd members. When relaxed, horses will sleep in short bursts while standing, thanks to a unique stay apparatus in their legs that allows them to lock their joints and rest without collapsing. However, when they feel particularly safe, they will lie down for a more restful sleep. Rolling is another behavior that can be observed when horses are at ease. They will lie down and roll vigorously in the dirt or sand, which helps to scratch their backs, and deter flies and other biting insects. Foals and younger horses will often play with each other when the herd is relaxed. These horses might engage in mock fights by nipping playfully and chasing each other around. This not only serves as a way to burn off energy but also helps in developing social skills and physical coordination.

Rolling



Playing



Sleeping



Mutual Grooming



Conflict Behaviors

When horses face conflict, they display aggressive and/or defensive behaviors to establish dominance, protect resources, or defend themselves. Rearing involves standing on hind legs to assert dominance, while kicking, aims to deter opponents from behind. Striking uses front legs to deter an opponent, and biting ranges from warning nips to serious bites intended to drive others away. Despite seeming violent, these behaviors are essential for the social structure and safety of individuals and herds.

Rearing



Kicking



Striking



Biting



All About Horses

HERD OBSERVATION ACTIVITY

Use this worksheet as a guide while observing Mustang herds on the range.

Mustang herds have a complex social structure that ensures the group's survival. Herd structures typically include a stallion with one or more mares and their offspring (foals). Young stallions will sometimes form groups commonly called bachelor herds.

The stallion protects the herd from threats and may try to steal mares from other stallions.

- Can you identify the stallion? What behaviors do you notice?

The lead mare is often the most experienced horse. She maintains order and guides the herd to food and water sources.

- Can you identify the lead mare? What behaviors do you notice?

Foals are the offspring of a stallion and a mare. Interacting with other herd member is an essential way to develop social skills.

- How many foals are in the herd? What behaviors do you notice?

How many horses did you see on the range?

All About Horses

DISCOVERING EQUINE MARKINGS

Markings and coat colors are used to identify and describe horses on the range. Horses come in many different coat color and marking combinations. How many can you spot on the range?

Face Markings



Star



Stripe/Strip



Blaze



Snip



Bald Face

Leg Markings



Half-Stocking



Stocking



Sock



Ermine Spots



Leg Bars

Coat Colors



Chestnut/Sorrel



Bay



Gray



Black



Pinto



Buckskin



Dun



Grulla



Red Roan



Blue Roan

Marking & Coat Color

B I N G O

During a visit to your local BLM holding facility see how many markings and coat colors you can identify. Can you get a bingo? Can you get a blackout (fill in all of the squares)?

Star	Black	Buckskin	Ermine Spots	Red Roan
Leg Bars	Snip	Grullo	Star, Snip	Chestnut
Stocking	Grey	FREE SPACE	Strip/Stripe	Bald Face
Blaze	Sock	Star, Strip/Stripe, Snip	Palomino	Star, Strip/Stripe
Blue Roan	Coronet	Bay	Dun	Pinto



All About Horses

FACE MARKING DRAWINGS

As you observe the horses on the range, use this worksheet to draw and label some of the face markings that you see. How many different markings can you find? If you don't have access to rangeland, find an equine event nearby (horse show, rodeo etc.)



All About Horses

COAT COLOR MATCHING

Match the picture of the coat color with the correct description by drawing a line to connect each match.

This horse is black with no red hairs. The muzzle is also black, even if there may be a few lighter patches of hair caused by being out in the sun.

This horse has a brown or reddish-brown body. The mane, tail, and lower legs are black.

This horse's coat is a mixture of white and dark hairs. The coat lightens with age, often showing a dappled pattern, even if there are darker areas around the knees and hocks. The skin around the muzzle and eyes is also dark.

This horse has a reddish-brown coat and no black hairs. The mane and tail are also a shade of red, even if they may be slightly lighter or darker."



Gray



Chestnut/Sorrel



Bay



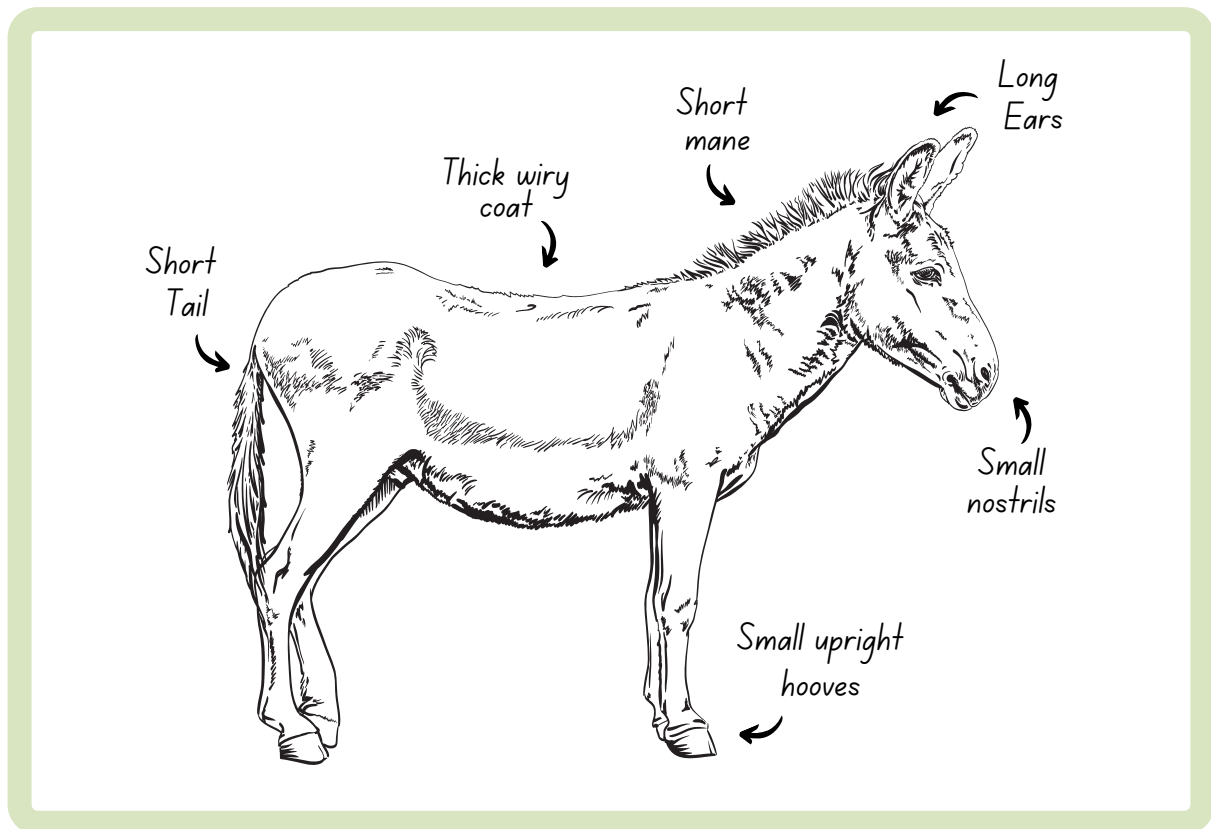
Black

All About Burros

AN INTRODUCTION TO BURROS

A Bit About Burros

Burros are often found on rangelands throughout the Western United States. These animals are descendants of domesticated donkeys brought to North America by Spanish explorers. They live in herds. Like mustangs, their growing populations pose challenges to rangeland health, such as overgrazing and competition with native species for limited resources. A burro's unique physical characteristics make them easy to identify on the range. Their long ears are designed to dissipate heat while their thick eyelashes protect their eyes from the desert sand.



All About Burros

DISCOVERING BURRO COAT COLORS & MARKINGS

Coat Colors and Markings

Burros come in a variety of coat colors from grey to brown. Unique markings include a dorsal stripe and/or shoulder stripe along with horizontal stripes or barring on the legs.

Coat Colors



Grey



Brown



Spotted

Markings



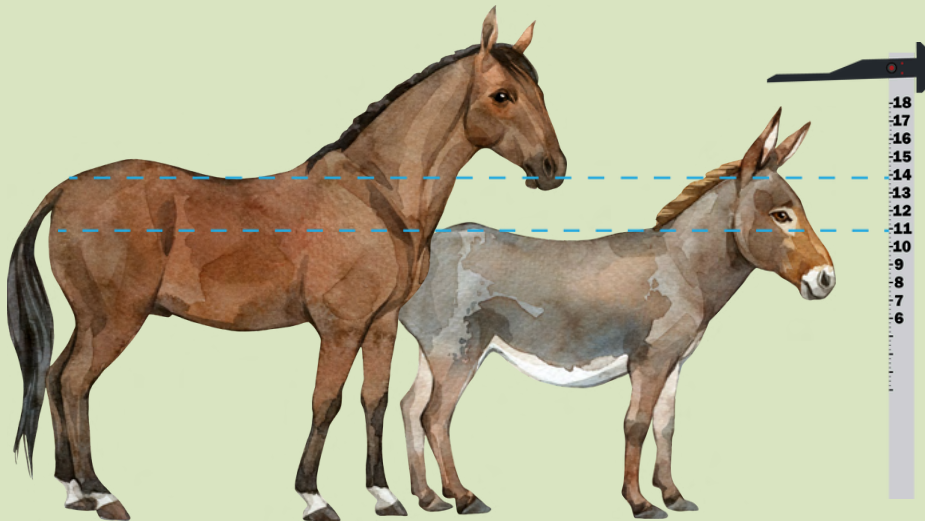
Dorsal Stripe



Shoulder Stripe

Did you know?

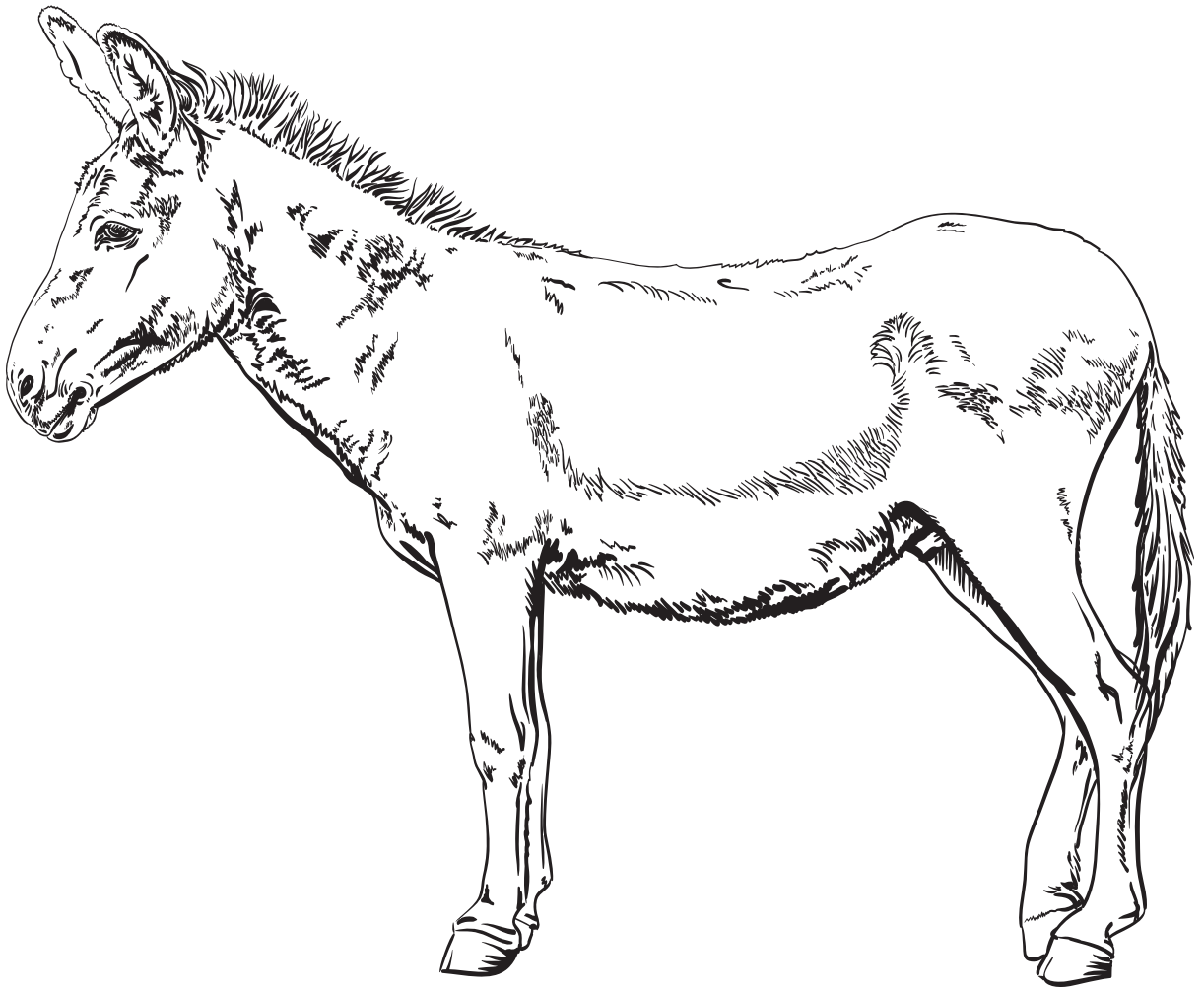
Horses and burros are measured in hands. One hand is equal to four inches. This measurement is taken from the ground to the top of the animal's withers. Mustangs are usually between 13-15 hands high while burros are typically 11 hands high.



All About Burros

DISCOVERING BURRO COAT COLORS & MARKINGS

Choose your favorite burro coat color and color the picture below.



What is something new that you learned today?

A series of horizontal dotted lines for writing.



Horses in History

FROM EOhippus TO EQUUS: DISCOVERING STORIES OF EVOLUTION, DOMESTICATION, AND SURVIVAL

Key Vocabulary

- **Mustang:** Another name for feral horses that live in the western United States.
- **Burro:** Another name for a donkey. Feral burros are often found throughout the western United States.

Evolution of Horses

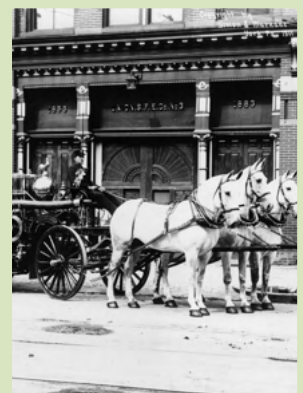
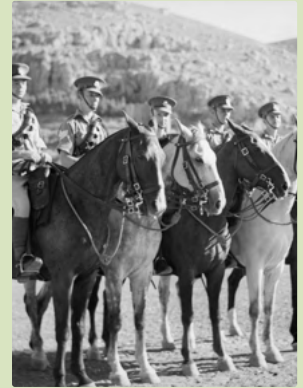
The history and evolution of horses are closely intertwined with the story of human civilization. The ancestors of modern horses evolved from small, multi-toed creatures into the single-toed equines we recognize today. One of the earliest known ancestors of the horse is Eohippus, also known as the "dawn horse." Eohippus lived about 55 million years ago and was about the size of a small dog. It had four toes on its front feet and three on its back feet. Over millions of years, these early horse-like species spread across continents, adapting to diverse environments. However, horses went extinct in North America after the last ice age.

In Eurasia (Europe and Asia), humans began to domesticate horses around 4,000 B.C. Horses were later introduced to North America by Spanish explorers in the 1500s. Around the world, horses played an essential role in agriculture, transportation, and warfare. The development of mechanization (cars, tractors, and other machines) in the 20th century changed their roles from work to recreation. Today, horses serve as companions, athletes, and partners in various equestrian sports, and recreational activities.

History and Cultural Significance of Mustangs and Burros

Horses have been important to many cultures throughout history and they are often featured in art, music, and stories. Today's mustangs and burros come from domesticated horses and donkeys that Spanish explorers brought to North America in the 1500s. Native Americans started riding horses soon after. Some of these animals escaped and formed feral herds.

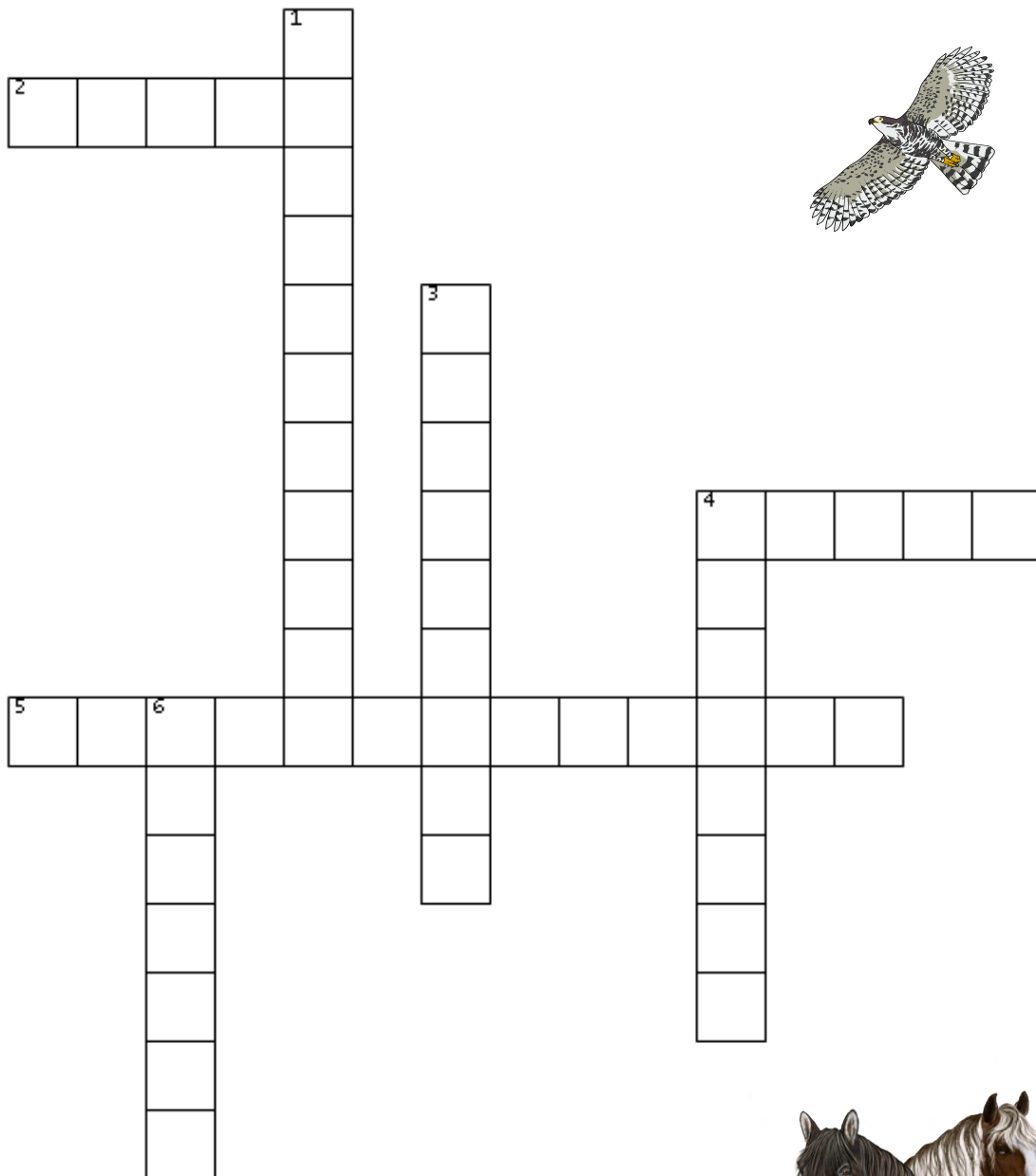
Mustangs also played an important role in the U.S. Cavalry. The use of horses, allowed soldiers to move quickly, scout enemy positions, and charge into battles with speed and power. Mustangs were also very useful for jobs like carrying mail for the Pony Express and working cattle on ranches. While burros, being smaller, were great for carrying heavy loads and working in mines. Overtime, more horses escaped and joined existing herds. Today, mustangs and burros live on rangelands across the western United States.



Horses in History

CROSSWORD PUZZLE

Use the clues on the second page to fill in the puzzle below. Words can go across or down. Letters are shared when the words intersect.



Word Clues

DOWN

1. A mail service operating from April 1860 to October 1861. It delivered mail between Missouri and California in about 10 days using relays of horseback riders.
3. When the traits of an animal change over time.
4. This animal lived about 55 million years ago and was about the size of a small dog. It had four toes on its front feet and three on its back feet.
6. Another name for feral horses that live in the western United States.

ACROSS

2. Another name for a donkey. These are often found throughout the western United States.
4. A genus of mammals that includes modern horses, zebras, and burros.
5. The process by which a species of animal is tamed and selectively bred for companionship or practical use.

Word Bank

Burro	Eohippus	Mustang
Domestication	Equus	Pony Express
	Evolution	

All About Rangelands

FROM MUSTANGS TO MEADOWLARKS: EXPLORING THE BIODIVERSITY OF RANGELANDS

Key Vocabulary

- **Biodiversity:** The variety of living organisms in a specific ecosystem.
- **Rangeland:** Open land covered mostly by plants suitable for grazing animals.
- **Observation:** Watching and recording the characteristics, behaviors, and interactions of organisms in an ecosystem.
- **Shrub:** A plant with short, woody stems and many branches that usually stays low to the ground.
- **Forb:** A non-grass plant with broad leaves.
- **Habitat:** A place where organisms live.
- **Ecosystem:** A community of living organisms, like plants and animals, interacting with each other and their environment.
- **Keystone species:** A species that plays a critical role in their ecosystem and other species depend on them for the stability of the habitat.
- **Native Species:** Organisms that naturally live in an environment.
- **Invasive Species:** Non-native organisms introduced to a new environment that can spread quickly and harm native ecosystems.
- **Carrying Capacity:** The maximum number of individuals of a species that an ecosystem can support without running out of resources or damaging the environment.

Introduction to Rangelands

Rangelands are large areas of semi-arid open land with grasses and shrubs (an area that receives a small amount of rainfall and/or snow). These areas are important because they support biodiversity of many different native plants and animals. Rangelands also provide places for livestock, like cows and sheep, to graze, as well as mustangs and burros.

One special thing about rangelands is their biodiversity, which means there are many different types of living things in these areas. Rangelands have a wide variety of plants, such as shrubs, forbs, and grasses, and they are home to many kinds of animals, including birds, mammals, reptiles, and insects. Understanding how these plants and animals are connected helps us understand how rangeland ecosystems work and why they are so important. Mustangs and Burros eat many of the grasses, and shrubs found in these open areas. How much they eat can change the types and amounts of plants that grow there. This can affect how much food is available for native wildlife and livestock.



All About Rangelands

DISCOVERING RANGELAND WILDLIFE

Rangeland Wildlife

There are over 350 species of wildlife that can be found in rangelands across the Western United States. Below are a few of the mammals, birds and reptiles that call the rangeland home.



Mule Deer



Pronghorn



Prairie Dog



Golden Eagle



Coyote



Mountain Lion



Jack Rabbit



Sage Thrasher



Sagebrush Lizard



Red Tailed Hawk



Cottontail Rabbit



Bobcat

Did you know?

Sage grouse depend on healthy rangelands and sagebrush to survive. As a keystone species, their presence signals a healthy habitat and benefits animals like pronghorn, elk, mule deer, and trout. Greater Sage Grouse populations are declining and considered sensitive. Major threats include wildfires, habitat loss, and predators. Managed grazing can help, but too many wild horses harm their habitat. Protecting sage grouse also helps maintain healthy rangelands for other species.



All About Rangelands

DISCOVERING RANGELAND PLANTS

Rangeland Plants

There are many species of plants that can be found on rangelands across the Western United States. Types of plants include grasses, forbs, shrubs and grass-like plants (plants that look like grasses). Below are a few of the plants you may see while on the range.

Grasses are one of the most common types of rangeland plants and an important food source for grazing herbivores. They provide shelter for wildlife, help prevent soil erosion, and support the overall health of rangeland ecosystems. Grasses also play a key role in the water cycle by helping to absorb and filter rainwater, which reduces runoff and replenishes groundwater. A healthy grass population is essential for maintaining biodiversity and ensuring the long-term sustainability of rangelands.

Perennial Grasses are plants that live for multiple years, regrowing each spring from their root systems. They provide consistent food and shelter for wildlife and livestock year after year. Their deep roots help prevent soil erosion and improve soil structure, making them essential for maintaining healthy rangelands. Below are a few common perennial grasses that you may encounter on the range.



Great Basin Wildrye



Squirreltail



Indian Ricegrass



Blue Bunch Wheatgrass

Annual Grasses grow, flower, and die all in one year. They provide food for grazing animals during certain times but need to be planted again each year. Since their roots are not as deep as perennial grasses, they are not as good at preventing soil erosion or keeping the land healthy long-term. Below are a few common annual grasses that you may encounter on the range.



Cheatgrass



Medusahead



Ventanata



Bulbous Bluegrass

Images courtesy of: Canva, <https://azinvasiveplants.arizona.edu>, <https://extension.usu.edu/rangeplants>

All About Rangelands

DISCOVERING RANGELAND PLANTS

Noxious weeds are harmful plants that grow quickly and take over areas, crowding out native plants. They can hurt the environment by reducing food and shelter for wildlife and damaging the soil. Controlling these weeds is important for keeping land healthy and supporting native plants and animals.



Halogeton



Russian Thistle



Scotch Thistle



Knapweed

Shrubs are plants with short, woody stems and many branches, that usually remains low to the ground.



Bitterbrush



Sagebrush



Rabbitbrush



Greasewood

Forbs are non-grass, leafy plants with broad leaves, often with colorful flowers.



Lupine



Showy Goldeneye



Bee Plant



Paintbrush

Rangeland Ecosystems

CROSSWORD PUZZLE

Use the clues on the second page to fill in the puzzle below. Words can go across or down. Letters are shared when the words intersect.



Word Clues

DOWN

1. a plant with short, woody stems and many branches, that usually remains relatively low to the ground
2. the maximum number of individuals of a species that an ecosystem can support without running out of resources or damaging the environment.
4. a non-grass, leafy plant with broad leaves.
5. organisms that naturally live in an environment.
8. open land covered mostly by plants suitable for grazing animals.
9. the process of asking questions and investigating findings.

ACROSS

3. the process of watching and recording the characteristics, behaviors, and interactions of organisms within an ecosystem.
6. a place where organisms live.
7. the variety of living organisms in a specific ecosystem.
9. non-native organisms introduced to a new environment that can spread quickly and harm native ecosystems.
10. a community of living organisms, like plants and animals, interacting with each other and their physical environment.

Word Bank

Biodiversity	Inquiry	Habitat
Rangeland	Shrub	Ecosystem
Observation	Forb	Native species
Carrying capacity		Invasive species

Use the space below to write and/or draw the wildlife and plants that you saw on the range today. What was the most exciting thing that you saw?

A series of horizontal dotted lines for writing or drawing.



Rangeland Management

FROM SAMPLES TO SOLUTIONS: EXAMINING RANGELAND MANAGEMENT STRATEGIES.

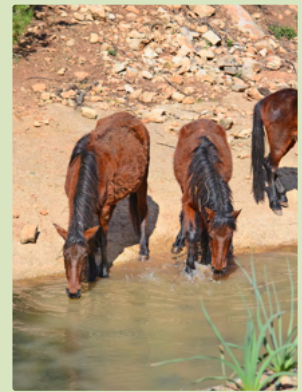
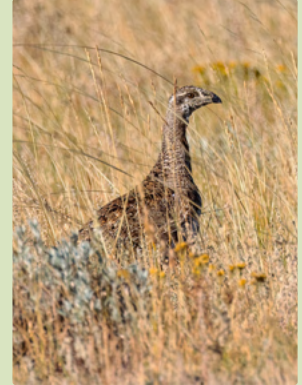
Key Vocabulary:

- **Biomass:** The total weight of all living things, like plants and animals, in a certain area of rangeland.
- **Climate Change:** Long-term changes in weather patterns, including temperature and rainfall.
- **Conservation:** Protecting and using natural resources wisely, including rangelands.
- **Ecosystem:** A community of living things, like plants and animals, interacting with each other and their environment.
- **Evaluation:** Checking and assessing the condition of rangeland.
- **Forage:** Plants that grazing animals like deer, pronghorn, antelope, mustangs, burros, and cattle eat.
- **Forage Yield:** The amount of plants available for grazing animals to eat.
- **Herbaceous Plants:** Soft, green plants that die back at the end of the growing season, like grasses and flowers.
- **Organism:** Any living thing in an ecosystem, such as grasses, shrubs, insects, birds, and mammals in rangelands.
- **Population Survey:** Collecting data on the number and location of plant or animal populations in a rangeland.
- **Public Land:** Land owned and managed by the government for everyone to use.
- **Rangeland Management:** Planning and actions to keep rangelands healthy and productive, including managing grazing, controlling invasive species, and restoring habitats.
- **Interested Parties:** People or groups who care about how rangelands are managed, such as ranchers, environmentalists, wild horse advocates, and government agencies.

Why is rangeland management important?

The Bureau of Land Management (BLM) helps take care of rangelands in the United States, including places where Mustangs and Burros live. They start by checking the condition of the rangelands, looking at things like plant cover, soil health, water sources, and habitats for wildlife. They also count the number of animals and check how many the land can support.

They use both scientific data and field observations to create management plans for each area. Good rangeland management balances the needs of wildlife, Mustangs and Burros, livestock, and people who enjoy outdoor activities. These plans include ways to keep track of rangeland health and adapt to changing conditions and land uses.



Rangeland Management

FROM SAMPLES TO SOLUTIONS: EXAMINING RANGELAND MANAGEMENT STRATEGIES.

Impacts of Climate Change on Mustangs, Burros, and Other Wildlife Species

Climate change creates big problems for rangelands. Changes in weather, like temperature and rainfall, affect the ecosystems where native wildlife, Mustangs, and Burros live. These problems include:



Habitat Dysfunction: Changes in temperature and rainfall can disrupt habitats, making it hard for animals to find water and food. For example, if it becomes too hot, some plants might not be able to grow, reducing the amount of food available for animals. Similarly, if there is less rain, water sources like streams and ponds can dry up, making it difficult for animals to find drinking water. These changes can force animals to move to new areas to find what they need, which can lead to overcrowding and competition for limited resources.



Changes in Vegetation Growth: Less rain and more droughts mean fewer water sources. Streams, rivers, and ponds can dry up, making it hard for animals to find drinking water. Plants also suffer during water shortages, as they need water to grow. Without enough water, plants may become stunted or die, further reducing the amount of food available for animals.



Water Shortage: Less rain and more droughts mean fewer water sources. Streams, rivers, and ponds can dry up, making it hard for animals to find drinking water. Plants also suffer from water shortages, as they need water to grow. Without enough water, plants may become stunted or die, further reducing the amount of food available for animals. This can lead to severe stress on wildlife populations that depend on these water and plant resources.



Increased Fire Risks: Hotter and drier conditions lead to more wildfires, which can destroy rangelands habitats. Wildfires can quickly burn large areas of land, destroying vegetation and displacing animals. The loss of habitat not only removes food and shelter but also forces animals to move to new areas, where they may face increased competition and fewer resources. The recovery of these burned areas can take many years, further impacting the wildlife that depends on them.

Rangeland Management

HIDDEN MESSAGE WORD SEARCH

This is a word search puzzle that has a hidden message in it. First find all of the words on the list below. Words can go in any direction and share letters as well as cross over each other. Once you find all the words. Copy the unused letters starting in the top left corner into the blanks to reveal the hidden message.

E N H P E S A L T H Y L E A S
V O O N U D S S H E A G L R T
A R H I Y B H A Q O N R E S M
L G E S T Y L U M A U D N E M
U A B J F A A I H O L A T Y L
A N F K Z D V C C O I S W L L
T I P I R O E R H L Y B G W O
I S O A J T C E E S A G I Y X
O M T K A F K T O S Q N Y P H
N W M M U A B C X K N B D A Z
Y S I U T E E Q N T M O I D T
F L J S L K V I I Y Y J C D J
C D L E I Y E G A R O F I M H
Z Q Z B X M L A B W E I Q G R
P J C G B G L X U Z M Y W O P



Biomass	Ecosystem	Public Land
Big Sagebrush	Evaluation	Quadrat
Climate change	Forage yield	Stakeholders
Conservation	Organism	



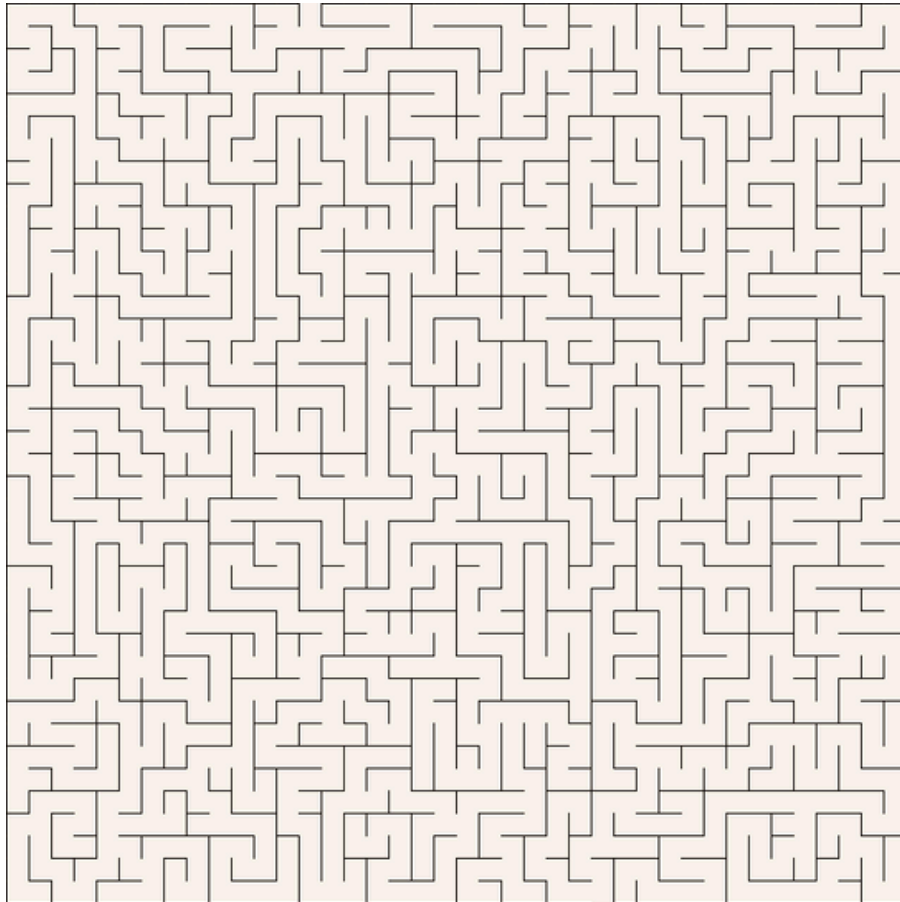
Rangeland Management

ADVENTURE MAZE

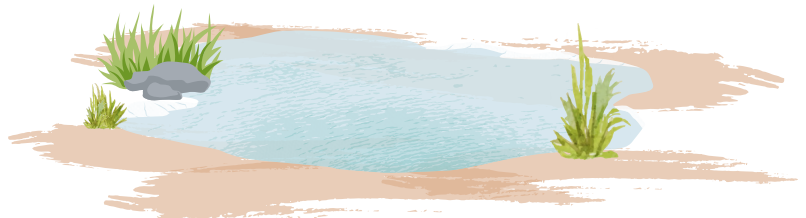
The ability to locate water is critical to the health and well being of Mustangs and Burros. Help the herd of Mustangs find the water by navigating through the maze below.



Start



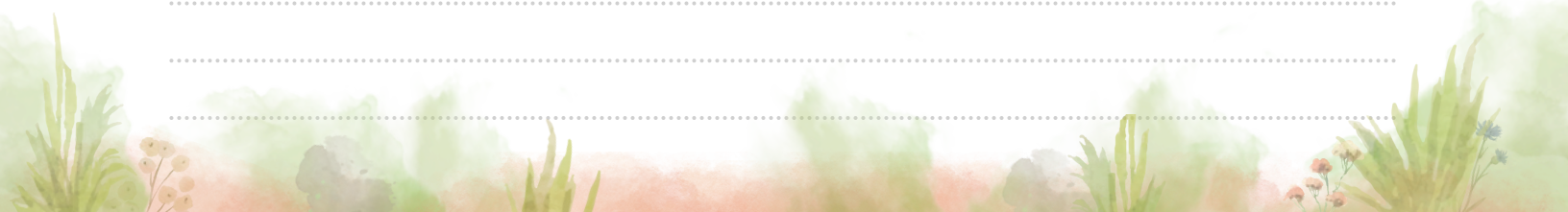
Finish



What did you learn about rangeland management?

Write your thoughts in the space below.

A series of horizontal dotted lines for writing.



Mustang and Burro Management

FROM HABITATS TO HERDS: MANAGING THE MUSTANG AND BURRO POPULATIONS

Key Vocabulary:

- **Herd Management Area (HMA):** A designated area of land where mustang and burro herds are managed by the Bureau of Land Management (BLM).
- **Appropriate Management Level (AML):** The scientifically calculated number of wild horses or burros that can live in a specific area without damaging the environment.
- **Population:** The number of wild horses or burros in a specific area.
- **Fertility control:** Methods used to manage the birth rate of wild horses or burros (i.e. contraceptives)
- **Gathers:** The planned removal of Mustangs from designated rangeland areas to control population levels and promote healthy rangelands.
- **Processing and evaluation:** The procedure used to check the health and condition of gathered Mustangs or Burros.
- **Freeze mark:** A permanent mark of identification typically placed on the left side of the neck of a Mustang or Burro by using a cold iron.
- **Microchip:** a small device (about the size of a grain of rice) that is placed under the animal's skin. It contains a unique ID number that can be scanned to help identify a mustang or burro.

Introduction to herd management

Rangelands play an important role in supporting biodiversity, providing habitat for wildlife, and sustaining livestock production. However, managing these ecosystems presents a complex challenge, particularly in the context of competing land uses and environmental pressures. One of the key agencies responsible for managing rangelands in the United States is the Bureau of Land Management (BLM), which oversees millions of acres of public lands, including significant portions of rangelands in the western United States.

Within rangeland management, one often controversial issue revolves around the management of Mustang and Burro populations. The BLM is required by law to manage Mustangs and Burros with other land uses, such as livestock grazing, recreation, and wildlife conservation efforts.



Mustang and Burro Management

HERD MANAGEMENT AREAS

Below is a map showing the location of BLM herd management areas (HMAs) across the Western United States. For more information visit the www.blm.gov or scan the QR code on the right.



Map image source: <https://www.blm.gov/programs/wild-horse-and-burro/about-the-program/about-wild-horses-and-burros>

Mustang and Burro Management

FROM HABITATS TO HERDS: MANAGING THE MUSTANG AND BURRO POPULATIONS

Population Statistics

The population of mustangs and burros changes due to various factors including natural growth rates, environmental conditions, and management interventions. Recent reports indicate that Mustang and Burro populations significantly exceed the designated "Appropriate Management Level" (AML), which is the number of animals that can be supported by the land without causing damage to the ecosystem.

Management Strategies

The BLM uses a variety of strategies to manage wild horse and burro populations, with the goal of ensuring the health of public rangelands.



Adoption Programs: Horses and burros are removed from the range and made available for adoption by the public. This helps reduce the population on the range and gives animals a new home.



Fertility Control: To manage population growth, fertility control methods like contraceptive vaccines, gelding, are used. These vaccines help reduce the birth rate and keep herd sizes under control. This prevents mustang populations from growing too large.



Gathers: Periodic gathers are conducted to remove excess animals from the range. These animals are then placed in holding facilities until they can be adopted.



Translocation: The process of moving animals to other areas to improve genetic diversity.



What did you learn about mustang and burro management?

Write your thoughts in the space below.

A series of horizontal dotted lines for writing.



The Wild Horse and Burro Program

FROM COORDINATION TO CONSERVATION: DISCOVERING THE BLM AND THE WILD HORSE & BURRO PROGRAM

Key Vocabulary:

- **Bureau of Land Management (BLM):** A federal agency responsible for managing public lands, including vast areas of rangelands across the United States.
- **Ethical:** Doing what is morally right and fair. This includes taking care of wildlife and plants, respecting people's rights, and making sure actions don't harm the environment.
- **Legal:** Following the laws and rules. This includes obeying federal and state laws about land use and protecting the environment. Legal management ensures all actions on rangelands are within these laws.
- **Animal Welfare:** Ensuring an animal's health, safety, and well-being in a way that supports it in maintaining a positive quality of life.
- **U.S. Forest Service:** Another federal agency tasked with managing public lands.
- **Off-Range Corral or Off-Range Pasture:** Areas designated for temporarily holding or managing wild horses or burros removed from public rangelands.

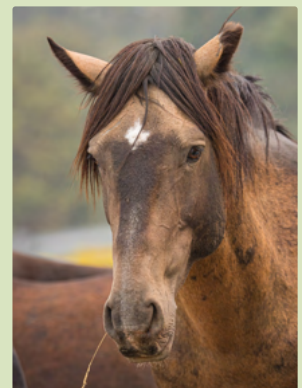
The Wild Horse and Burro Program

The Wild Horse and Burro Program (WHB), part of the Bureau of Land Management (BLM), is responsible for managing and protecting Mustang and Burro populations on public lands in the Western United States. The program's goal is to ensure the health and sustainability of these animals while maintaining the balance of rangeland ecosystems.

As Mustang and Burro populations increased, concerns arose about managing their populations. Rapid population growth, competition with native wildlife for resources, and habitat issues have led to the current efforts in management and conservation.

The Wild Free-Roaming Horses and Burros Act

In 1971, the United States Congress passed the Wild Free-Roaming Horses and Burros Act. This recognized Mustangs and Burros as "living symbols of the historic and pioneer spirit of the West" and required their protection and management on public lands. The Wild Free-Roaming Horses and Burros Act designated specific areas of public lands as "herd management areas" where wild horse and burro populations would be managed and protected. The act also allowed the BLM and other federal agencies to remove excess animals from these areas to prevent overpopulation and prevent damage to the rangeland ecosystems.



The Wild Horse and Burro Program

FROM COORDINATION TO CONSERVATION: DISCOVERING THE BLM AND THE WILD HORSE & BURRO PROGRAM

BLM Mustang and Burro Health and Management Practices



Freeze Marking: Freeze marking is a method of permanent identification used by the BLM and to track individual wild horses and burros. By applying a unique freeze mark to each animal, the BLM can monitor population dynamics, track ownership, and gather valuable data for research and management purposes.



Vaccinations: Vaccination programs implemented by the BLM aim to protect wild horse and burro populations from infectious diseases that can pose significant health risks.



Deworming: Internal parasites, such as strongyles and roundworms, can cause significant health issues, including weight loss, colic, and even death. Deworming practices implemented by the BLM help prepare Mustang and Burros for adoption and improve overall health.



Age Estimation: By observing the eruption patterns, wear, and other dental characteristics, BLM professionals can estimate the age of individual Mustangs and Burros with fairly good accuracy. Accurate age estimation helps in understanding population demographics and informs appropriate care and management practices.



Body Condition Scoring (BCS): By looking at factors like fat, muscle, and overall body condition, BLM professionals can assess an animal's health. This scoring system gives important information about the well-being of individual animals and whole herds. For mustangs and burros, the Body Condition Score (BCS) helps spot those at risk of health problems due to limited food or illness. In herds located in off-range corrals or pastures, BCS guides decisions on feeding, health care, and herd management.

Freeze Marking



MUSTANG EVALUATION & PREPARATION

For more information on how to read a freeze mark watch this video by scanning the QR code.

1

What is a freeze mark?

Freeze marking is a method of permanent identification used by the BLM and to track individual wild horses and burros. By applying a unique freeze mark to each animal, the BLM can monitor population dynamics, track ownership, and gather valuable data for research and management purposes.



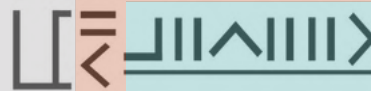
2

How to read a freeze mark?

Each symbol in a freeze mark has a specific meaning. This “code” can be used to learn more about the age of the horse, where they were gathered from and other important information.

This symbol means
the horse was
branded by the U.S.
government

Year of Birth
(read top to bottom)



6-Digit Registration
Number

3

Create your own freeze mark

Using the symbols to the right, create your own freeze mark using the year you were born.



Compare your freeze mark with others in your group. How are they the same? How are they different?

Have your group members write their freeze marks in the space below.

How many can you collect?

A series of horizontal dotted lines for writing.



Body Condition Scoring

MUSTANG EVALUATION



For more information on body condition scoring a horse watch this video by scanning the QR code.

1

What is Body Condition Scoring?

A Body Condition Score (BCS) is a process used to evaluate the health of a horse. By looking at factors like fat, muscle, and overall body condition, we can assess an horse's health. BCS helps spot horses at risk of health problems due to poor nutrition or illness. Knowing a horse's BCS can help make changes to feeding, health care, and herd management practices.

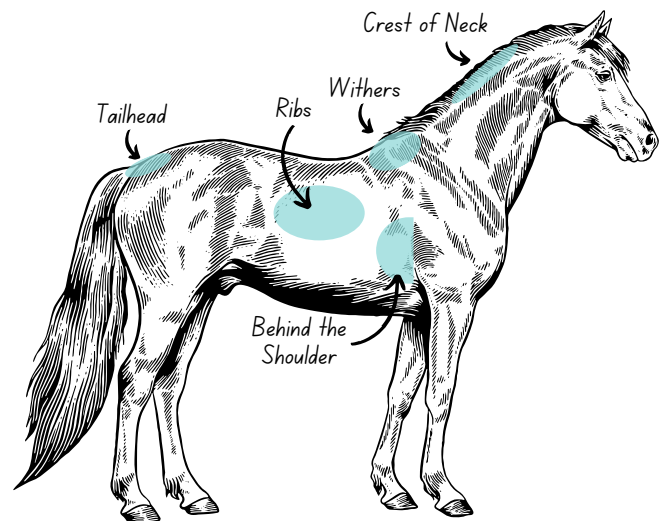


2

How do you determine a horse's Body Condition Score?

To determine a horse's Body Condition Score (BCS) the Henneke Body Condition Scoring System. This tool is designed specifically for horses.

1. Examine different parts of the horse's body. Look at the areas near the ribs, spine, and withers to see if they stick out or if there's a layer of fat covering them.
2. Next look at the crest of the neck, and the area behind the horse's shoulders, to see how much muscle and fat are in these areas.
3. Assign the horse a score from 1 to 9, with 1 being very skinny, 5 being just right and 9 being very fat.



3

Now it's your turn! Use the worksheet on the next page and the Henneke Body Condition Scoring chart provided to practice using the body condition scoring system.

Compare your answers with others in your group. How are they the same? How are they different? Can you explain why you chose the score that you did?

Body Condition Scoring

MUSTANG PROCESSING & EVALUATION

Practice your Body Condition Scoring skills. Use the Henneke Body Condition Scoring System Chart provided (or scan the QR code). Determine the estimated BCS for the horses in the photos below.



Estimated BCS: _____



Estimated BCS: _____



Estimated BCS: _____



Estimated BCS: _____



Estimated BCS: _____



Estimated BCS: _____

What will you do with what you have learned at Mustang Camp? How can you support healthy lands and healthy horses? Write some ideas below.

A series of horizontal dotted lines for writing.



My Notes

A series of horizontal dotted lines for writing notes.



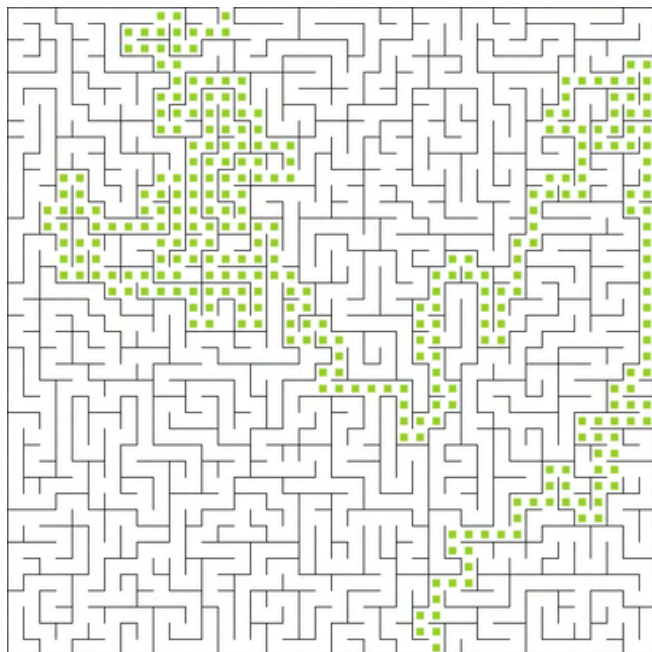
My Notes

A series of horizontal dotted lines for writing notes.

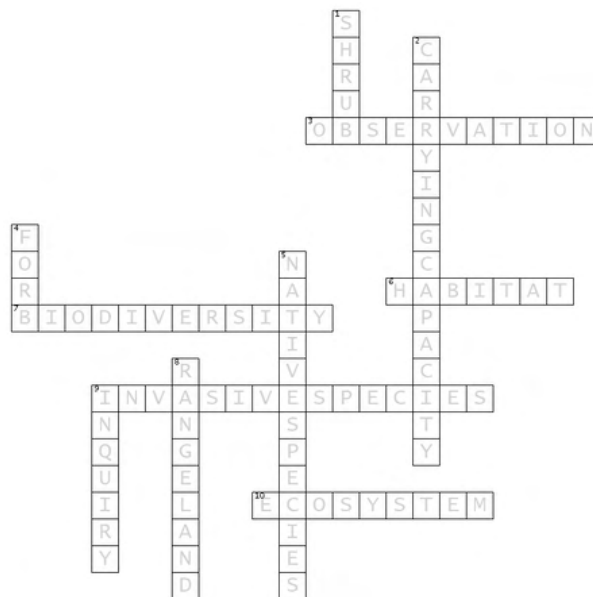


Games and Puzzles Answer Key

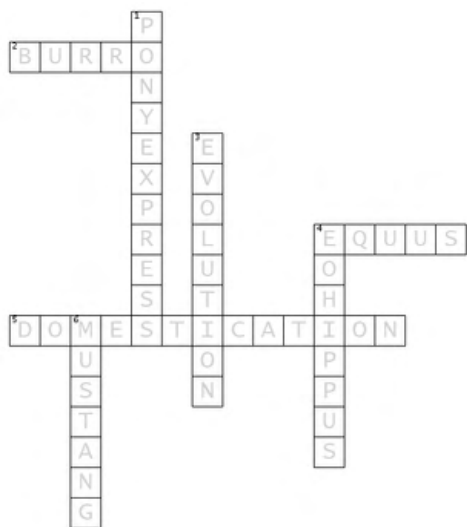
Rangeland Management Adventure Maze



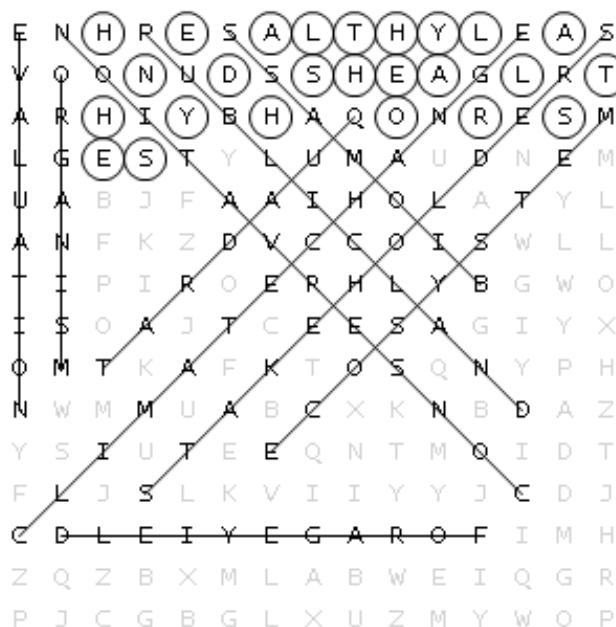
Rangeland Ecosystems Crossword Puzzle



Horses in History Crossword Puzzle



Rangeland Management Hidden Message Word Search





MUSTANG CAMP



HEALTHY LANDS AND
HEALTHY HORSES

