

Figure 1: Resting - laying sternally, relaxed body language, sleeping.



Photo credit: Lyndie Wray

CISA Student Showcase

# Understanding the Welfare of Wild Equid Herds in Heber-Overgaard: Impact of Population Density

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Figure 4: Socially interacting and Resting behavior



Photo credit: Lyndie Wray

## Introduction and Objectives:

The increasing population of free-roaming horses in Heber-Overgaard, Arizona, necessitates an examination of their welfare and sustainability under the Wild Free-Roaming Horses and Burros Act of 1971. Concerns over population growth and overpopulation, exacerbated by a decline in natural predators, spark debate. Effective management strategies are crucial for balancing ecological needs and human-animal relationships. Reproductive management strategies like GnRH immunoneutralization are considered, but their effects on behavior and population dynamics require further investigation. Assessing horse welfare involves comprehensive evaluations based on the Five Domains Model, while ethograms facilitate accurate data collection on behaviors. Population dynamics play a vital role, with Arizona's Heber Wild Horse Territory requiring an approved Territory Management Plan due to overabundance. This study assesses how increasing population density impacts the welfare and dynamics of free-roaming equines. Higher densities intensify resource competition, leading to nutritional deficits, stress, and aggression. They also disrupt social structures and mating behaviors and increase disease transmission risks. Effective management is vital for preserving equine welfare and herd sustainability.



Photo credit: Lyndie Wray

Figure 3: this horse is feeding/ grazing – the most common observed behavior.

## Methods:

- Data gathering on other wild equids was conducted using a comprehensive approach. An extensive literature review was conducted to gain insights into equine population dynamics and behaviors.
- Mutual relations with the U.S. Forest Service and the local community facilitated one-on-one interviews and the location of various herds.
- Development of a tailored ethogram for systematic categorization of observed behaviors, focusing on feeding, resting, locomotion, and social interactions
- Assessing horse health using the Body Condition Score (BCS) is a reliable method widely used for physical and mental welfare.



Photo credit: Lyndie Wray

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Figure 2: Stallion standing attentive, watching the possible threat to determine flight response for his herd.

## Results with Ethogram:

- Free-roaming horses spend most of their day in feeding, resting, and locomotion activities. Feeding takes up about half of their daily routine and helps them regulate their body temperature. Herds rest for about 25-30% of the day, usually lying down, standing guard, or sleeping. Migration patterns among free-roaming horses are still being monitored due to many uncontrolled factors, such as their fight-or-flight response, and their migration patterns have the potential to change.
- Weather changes affect feeding patterns based on altitude. Strong winds cause horses to move closer together and graze less frequently, while calm winds result in less movement and more time spent resting and grazing.
- Body Condition Scoring (BCS) is essential for assessing horses' health in Heber, Arizona, using a 9-point scale. A score of 5 to 6 indicates optimal condition, while three or lower suggests underweight and potential health risks. Generally, the Heber horses exhibit a BCS of 5, signaling good health. However, lower scores indicate disturbances in herd health or individual horses, impacting reproductive performance and maternal behavior. (Reference figure 5: a new mother and foal).



Photo credit: Lyndie Wray

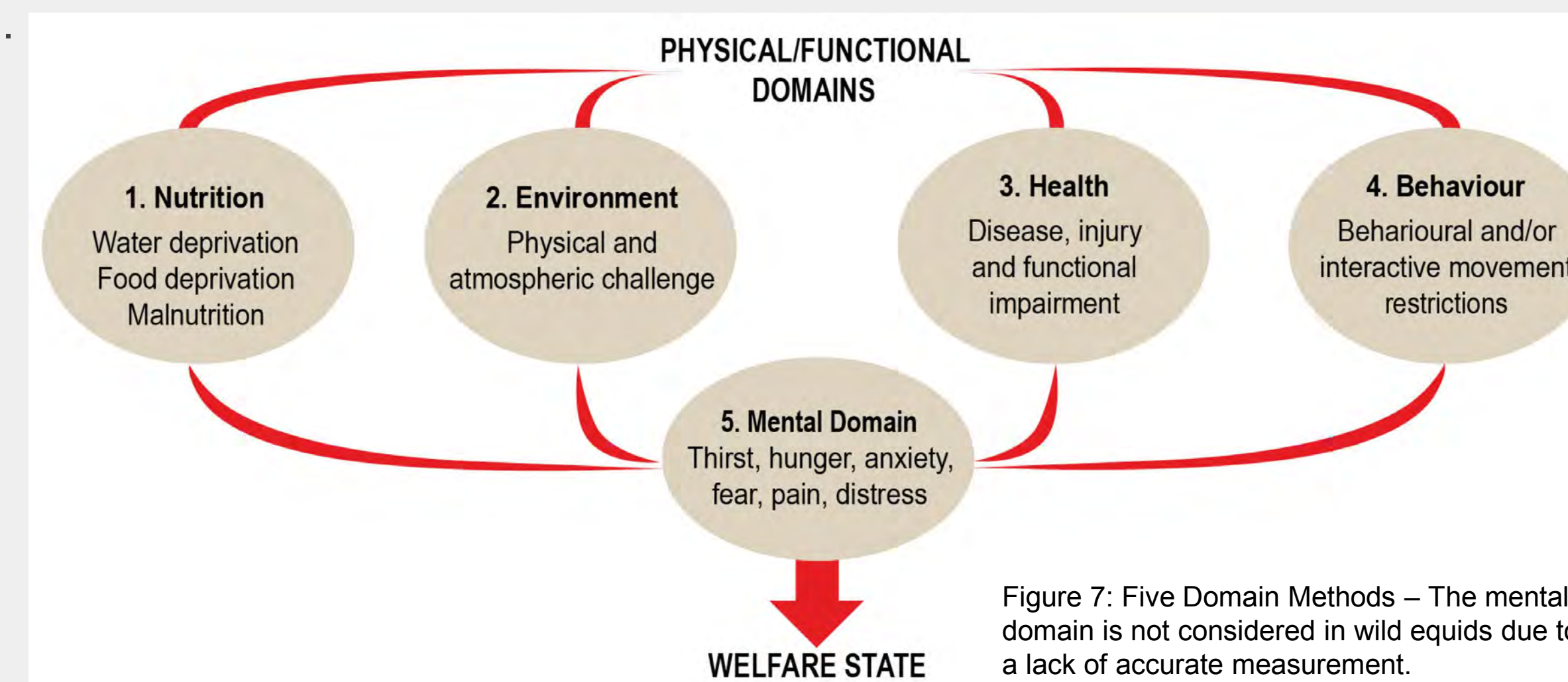
Figure 5: The nutritional needs of a mother and child are highest during breastfeeding.

## Conclusion:

The research examines population dynamics and behaviors of free-roaming equines in Heber-Overgaard, Arizona, focusing on welfare assessment within bands with the sanctioned 1,900 acres within the Heber Wild Horse Territory. Initial findings suggest horses adjust grazing behavior in colder weather for thermoregulation. Overall, observed welfare is reasonable, with high levels of social interactions and comfort behaviors noted. However, increasing population size challenges resource usage and management decisions, highlighting the need for future research to balance welfare and ecosystem needs.

Figure 6: List of behaviors observed during ethogram data with the action description

Behavior	Description
Feeding	<ul style="list-style-type: none"> <li>They graze various grasses and occasionally ingest other forbes. Pawing at the food source is a typical feeding behavior</li> <li>Consistent movement while grazing</li> </ul>
Resting	<ul style="list-style-type: none"> <li>Laying sternally, eyes closed, head lowered, and decreased predatory instincts.</li> <li>Can sleep standing up with lowered heads, eyes closed, tail-swishing to deter insects, and one rear foot slightly elevated.</li> </ul>
Migration	<ul style="list-style-type: none"> <li>Includes walking, trotting, and galloping. Movements vary depending on the predation instincts of both stallions and band members.</li> <li>Migration to lower-traffic areas from motorists on forest service roads, more dense and protected areas due to weather changes, and water sources.</li> </ul>
Social Interactions: Harem Social(HS), Herding(H), and Harem Tending(HT)	<ul style="list-style-type: none"> <li>Nibbling along the back or withers of one another can facilitate bonding and dominance structure within a band. This is called allogrooming or mutual grooming (HS).</li> <li>Stallions will herd their females when they sense danger or when the herd becomes too dispersed (H).</li> <li>The defense of mares in the band includes positioning between mares and the perceived threats (HT).</li> </ul>
Comfort	<ul style="list-style-type: none"> <li>Depending on each horse, this could be displayed as a form of self-enjoyment: sun-basking, play fighting and stretching behaviors.</li> <li>Play fighting and sun basking occurred more commonly within bands observed</li> </ul>
Standing attentive	<ul style="list-style-type: none"> <li>The posture is rigid, the head is up-right, the ears are pointed forward, and the eyes are open and alert.</li> </ul>
Elimination	<ul style="list-style-type: none"> <li>Includes both urination and defecation</li> <li>Stallions will create fecal middens (stud piles) to communicate ownership of an area. Meaning the stud will repetitively defecate on other piles.</li> </ul>



## Literature Cited:

- Ransom, J.I. and Cade, B.S., 2009, Quantifying equid behavior— A research ethogram for free-roaming feral horses: U.S. Geological Survey Techniques and Methods 2-A9, 23 p.,
- Ransom, Jason I., and Brian S. Cade. Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward. The National Academies Press, 2013