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The Role of Prominent Mares in the Social Lives of Free-Roaming Horses

Christine Reed,¹ Nancy Cerroni²

Abstract

Free-roaming horses interact with one another as social subjects in their own right, communicating within family bands using social signals that are evident to them and to the humans who observe them. Ethnographers, like John Hartigan, who study these social dynamics provide a new approach to understanding their social lives. This exploratory study builds on that research, relying on records of past and current observations of a single band on the Pryor Mountain Wild Horse Range, with a particular focus on the role of a prominent mare in maintaining the social structure of her family.

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I. Introduction

Recent interest among anthropologists in Multispecies Ethnography (MSE) reflects a concern to incorporate wild animals in the study of human culture. One of its primary objectives is to address the question of what it means to live an ethical life at the nexus between wild animals and human society.³ The challenge to MSE posed by John Hartigan's 2020 study of free-roaming horses in Galicia, Spain is to understand equine social dynamics in situations *apart* from human settings. To that end, he fused observations from his training as an ethnographer with field techniques from ethology, such as focal sampling of a particular mare's behavior in order to determine if she was a prominent mare in her band.⁴ His interest was about equine cognition shaped by social interactions, especially those influenced by prominent mares, rather than by adaptation to the physical environment. As a result, his approach reframed a debate among ethologists about whether horses have the requisite level of cognitive complexity for higher levels of social learning. He argued

¹ School of Public Administration, University of Nebraska at Omaha, Omaha, Nebraska, USA.

² Pryor Mountain Wild Mustang Center, Lovell, Wyoming, USA.

³ John Hartigan, "Knowing Animals: Multispecies Ethnography and the Scope of Anthropology," *American Anthropologist*, (2021): 1-15. DOI: 10.1111/aman.13631, 4.

⁴ Hartigan, *Shaving the Beasts*, 165.

that this debate obscures “a wider frame of social analysis”;⁵ that cognition is shaped by emergent forms of sociality;⁶ and sociality is a continuous flow of interactions.⁷

In his 2020 study, Hartigan followed several bands of free-roaming horses during an annual roundup, observing how prominent mares maintained their social structure, and how patterns of social interaction that preserved basic civility in the naturalistic setting of their mountain range were heightened during the (human) violence of this ritual. We adopted this wider frame of social analysis, although we were unable to replicate the details of his research design. Our project relied on an historical narrative of one family band in the Pryor Mountain Wild Horse Range on the border of Wyoming and Montana and the role of a prominent mare in maintaining its social structure. As we discuss in the next section, one theme common to both Hartigan’s approach and to ethological research is the importance of prominent (often older) females as repositories of the social knowledge necessary for survival. In the final section, we discuss the implications for the public management of free-roaming horses; and we share with conservationists an interest in protecting older females from human interference, whether poaching elephant matriarchs for their longer tusks or removing older mares in free-roaming herds as a way to manage genetic diversity.

II. Ethology, Ethnography, and Culture

Ethologists operationalize the concept of culture in various ways. One broad definition of culture is that it involves “information or behavior – shared within a community – which is acquired from conspecifics through some form of social learning.”⁸ Attention to social learning can reveal the importance of key individuals, making their targeted protection important for the persistence of social units.⁹ The demonstrator can be a parent or an older unrelated member, and there are different types of social learning, such as *emulation* where the observer watches the demonstrator interacting with objects in the environment and then performs similar actions; or *local enhancement* when the demonstrator attracts the observer’s attention to attributes of a particular location.¹⁰ Whitehead and Rendell point out that the order

⁵ Hartigan, *Shaving the Beasts*, 138.

⁶ Hartigan, *Shaving the Beasts*, 15.

⁷ Hartigan, *Shaving the Beasts*, 151.

⁸ Hal Whitehead and Luke Rendell, *The Cultural Lives of Whales and Dolphins* (Chicago: University of Chicago Press, 2015), 12.

⁹ Philippa Brakes, Sasha R. X. Dali, Lucy M. Aplin, Stuart Bearhop, Emma L. Carroll, Paolo Ciucci, Vicki Fishlock, John K. B. Ford, Ellen C. Garland, Sally A. Keith, Peter K. McGregor, Sarah L. Mesnick, Michael J. Noad, Giuseppe Notarbartolo di Sciara, Martha Robbins, Mark P. Simmonds, Fernando Spina, Alex Thornton, Paul R. Wade, Martin J. Whiting, James Williams, Luke Rendell, Hal Whitehead, Andrew Whiten, Christian Rutz, “Animal Cultures Matter for Conservation,” *Science* 363 (2019): 1032-82, 1033.

¹⁰ Philippa Brakes, Emma L. Carroll, Sasha R.X. Dali, Sally A. Keith, Peter K. McGregor, Sarah L. Mesnick, Michael J. Noad, Luke Rendell, Martha Robbins, Christian Rutz, Alex Thornton, Andrew Whiten, Martin J. Whiting, Lucy M. Aplin, Stuart Bearhop, Paolo Ciucci, Vicki Fishlock, John K. B. Ford, Giuseppe Notarbartolo di Sciara, Mark P. Simmonds, Fernando Spina, Paul R. Wade, Hal

of complexity associated with local enhancement is lower than that required of other forms, such as production imitation, where the observer learns a *new* sequence of actions.¹¹ They use the example of killer whale mothers teaching their calves how to intentionally strand onto beaches in order to snatch and kill elephant seal pups.¹²

According to Rorvang et al.,¹³ it is important to distinguish between behaviors triggered by similar behaviors in others, such as flight responses in horses, and observational learning of novel behavior. They argue that equids have evolved in open landscapes where foraging in social groups was unlikely to require cognitive capabilities greater than local enhancement.¹⁴ For Hartigan, however, emergent forms of social relations and dynamics have shaped cognition: “This entails shifting from environment as the context – one to which nonhuman sociality responds – to sociality as the modality and medium.”¹⁵ While he acknowledged that he lacked the time required to arrive at a reliable assessment of how social dynamics shape equine behavior,¹⁶ he was able to identify prominent mares in two bands before the roundup, and then observe how those horses reacted to a (human) cultural ritual that involved capturing and penning hundreds of horses. This “species-local” account highlighted the capability of prominent mares and their family band members to find each other amidst the chaos of being separated in the roundup pastures. These horses did not appear to react to physical conditions, but instead relied on social “rules of engagement” acquired over generations of living together.

Ethologists have struggled to come up with a methodology to document social learning and culture. According to Brakes et al. it is possible to infer the presence of cultural processes based on observed patterns of behavior using “the ethnographic method of exclusion,” i.e., ruling out ecological and genetic processes.¹⁷ Variations in behavioral expression within a species distributed across the landscape can reveal the existence of culture; however, there is a risk of failing to recognize subtle environmental factors. On the other hand, ethnographers face their own methodological issues, in particular the difficulty of isolating the behavior of wild animals apart from the influence of human culture. The fusion of field methods from both disciplines allowed Hartigan to observe free-roaming horses apart from human-dominated settings,¹⁸ and then to document behaviors that were apparently legible to other horses, rather than make knowledge claims based on *his* interaction with them. He transposed concepts from sociology suggesting the presence of *equine* sociality in the chaos of a human cultural ritual: “conventional here because, in

Whitehead, James Williams, Ellen C. Garland, “A Deepening Understanding of Animal Culture Suggests Lessons for Conservation,” *Proc. R. Soc. B* 288 (2021): 1-10. DOI.org/10.1098/rspb.2020.2718, 2.

¹¹ Whitehead and Rendell, 16.

¹² Whitehead and Rendell, 181.

¹³ Maria Rorvang, Janne W. Christensen, Jan Ladewig, Andrew McLean, “Social Learning in Horses – Fact or Fiction?” *Frontiers in Veterinary Science* 5 (2018): 1-8. DOI: 10.3389/fvets.2018.00212, 2.

¹⁴ Rorvang et al., “Social Learning in Horses – Fact or Fiction?” 4.

¹⁵ Hartigan, *Shaving the Beasts*, 15.

¹⁶ Hartigan, *Shaving the Beasts*, 28.

¹⁷ Brakes et al., “A Deepening Understanding of Animal Culture Suggests Lessons for Conservation,” 3.

¹⁸ Hartigan, *Shaving the Beasts*, 256.

contrast to acts of open violence, these behaviors and gestures are principally symbolic or signifying; they engender responses that reproduce or contest the social organization but do not undermine it.¹⁹

Observations of free-roaming horses would benefit from research that avoids categorizing social learning according to a hierarchy of cognitive complexity. There are opportunities to integrate Hartigan's approach and "the profound renewal of ethology"²⁰ if the focus of research is the role of older females in shaping the social behavior of family members. For example, a long-term study of African elephants found that matriarchs possessed advanced discriminatory abilities in listening for calls from outside their family units, signaling to the rest of the group whether defensive behavior was necessary. Those enhanced abilities translated into reproductive benefits for other members of the family unit, because they could more efficiently allocate their time, reserving defensive behavior for circumstances where it was appropriate. The matriarch could therefore influence the social knowledge of the family unit as a whole.²¹ Two key vital rates, survival and reproduction, can depend on social learning, reinforcing the importance of retaining key individuals as "repositories of knowledge."²² The transmission of knowledge across generations is the result of communication from a matriarch to her family as a whole, whose members evidently understand the meaning of those signals.

III. Social Dynamics on the Pryor Mountain Wild Horse Range

Our interest in the role of prominent mares began with a concern expressed by Eggert et al. that federal management of a small herd of free-roaming horses on Assateague Island National Seashore should avoid targeting older mares for removal because of multiple progeny and high mean kinship (MK) scores, indicating possible inbreeding depression.²³ Genetic diversity in a small, geographically isolated herd is clearly important, but removing older females because of their (genetic) relationship to multiple offspring might disrupt the social structure of the bands. In addition, Baker argued that the intergenerational transmission of traditions and lifeways is essential to survival and reproduction, and conservation methods to maintain genetic diversity, such as translocating individuals to new habitats, could fail if wildlife individuals were to lose site-specific knowledge, such as where to find food sources,

¹⁹ Hartigan, *Shaving the Beasts*, 259.

²⁰ Dominique Lestel, "Ethology and Ethnology: The Coming Synthesis," *Social Science Information* 45 (2006): 147-153. DOI: 10.1177/0539018406063632.

²¹ Karen McComb, Cynthia Moss, Sarah M. Durant, Lucy Baker, Soila Sayialel, "Matriarchs as Repositories of Social Knowledge in African Elephants," *Science* 292 (2001): 491-494, 493.

²² Brakes et al., "A Deepening Understanding of Animal Culture Suggests Lessons for Conservation," 6.

²³ Lori S. Eggert, David M. Powell, Jonathan D. Ballou, Aurelio F. Malo, Allison Turner, Jack Kumer, Carl Zimmerman, Robert C. Fleischer, Jesus E. Maldonado. "Pedigrees and the Study of the Wild Horse Population of Assateague Island National Seashore," *Journal of Wildlife Management* 74 (2010): 963-973. doi: 10.2193/2009-231, 971.

how to avoid predators, and their place in the social group.²⁴ As we explain in this section, our focus on the role of one prominent mare in a family band reflects themes common to both ethological research and to Hartigan's emphasis on social dynamics broadly defined, especially the transmission of social knowledge across generations within this family band.

The site of our preliminary observations was the Pryor Mountain Wild Horse Range (PMWHR). We chose this free-roaming herd because of our familiarity with the horses. The Pryor Mountain Wild Mustang Center (PMWMC) has been a nonprofit organization since 2007, started by volunteers from Lovell, WY who had already spent decades working with the U.S. Bureau of Land Management (BLM) to protect the Pryor herd.²⁵ An Executive Order by Secretary of the Interior, Stewart Udall, created the Range in 1968, followed by passage of the Wild Free Roaming Horses and Burros Act in 1971, protecting horses in BLM herd management areas and U.S. Forest Service wild horse territories. The 1971 law states that "wild free roaming horses and burros are living symbols of the historic and pioneer spirit of the West" (16 U.S.C § 1331). It considers them to be a national heritage species²⁶ and an historical icon.²⁷ These free-roaming horses are descendants of those released by, or escaped from, nineteenth-century homesteaders. The Pryor herd includes a core band, likely descended from sixteenth century Spanish explorers; acquired by Native Americans living on the Crow Reservation to the north of the current PMWHR; then found on public lands, roaming with ranch horses belonging to the Tillett family.²⁸

With federal protection the numbers of free-roaming horses grew, and the federal government has had to adjudicate claims between advocates for the horses and cattle ranchers, mining companies and energy developers who compete for natural resources on public range lands. Free-roaming horses represent human conflicts between those who want to protect them as "living symbols" and ranchers and others who want to protect their cultural traditions and way of life by controlling the numbers of horses. One advantage of the PMWHR as the site for our observations is that the Executive Order established one of the few wild horse ranges in the U.S., limiting competing claims for this BLM land, other than for recreation. Like Hartigan, we were able to treat these free-roaming horses as social subjects in their own right, not as representations of human cultural concerns.

The BLM field office limits management of the Pryor horses to annual fertility control and periodic removals designed to balance population size with available forage and water resources. Field Office staff maintains catchments for rainwater and small water development projects near natural springs throughout the Range in order to discourage horses from concentrating in large numbers around two ponds on the top of East Pryor Mountain. Although this small and geographically isolated area requires some degree of human intervention, it supports a genetically diverse and

²⁴ Liv Baker, "Translocation Biology and the Clear Case for Compassionate Conservation," *Israel Journal of Ecology & Evolution* (2017): 52-60. DOI.org/10.1163/22244662-20181026, 53.

²⁵ Christine Reed, *Saving the Pryor Mountain Mustang: A Legacy of Local and Federal Cooperation* (Reno: University of Nevada Press, 2015).

²⁶ Hope Ryden, *America's Last Wild Horses* (Guilford: The Lyons Press, 1999).

²⁷ Karen Dalke, "Mustang: The Paradox of Imagery," *Humanimalia* 1(2010): 97-117.

²⁸ Reed, *Saving the Pryor Mountain Mustang*, 4.

healthy population of horses living in wild conditions, especially bands in the most remote parts of the Range. The PMWMC has maintained lineage charts for individual horses dating back to the 1970's, based on their own historical records, as well as some provided by the BLM. These charts have allowed us to construct a narrative based on one prominent mare and her relationships with two stallions, their offspring, and new additions to her current family.

Our narrative of this prominent mare, Cecelia, and her family band in a remote area of the Range is based on lineage charts, records, photographs, and periodic observations. By following her life history, we were able to reconstruct details about her natal band; her time spent with an older band stallion and her first offspring; her role as an older, prominent mare with a different stallion and two new female band members coming from other locations on the Range; the birth of offspring to these three mares; and, finally, the loss of several family members to the formation of two new bands in the same remote area. We drew inferences from this historical account about how this mare appeared to acquire knowledge about the remote location where she spent most of her life, and how she passed on that knowledge to new band members, especially when and where to flee from the presence of humans. Their collective response was notable, as new members came from other locations on the Range where horses rarely flee from the presence of human visitors. Notably, neither of the new band members were related to this mare.

The major difference between our approach and Hartigan's research design was that he observed social dynamics among band members, including the behavior of prominent mares, in a natural environment; then followed them during an annual roundup. He found that these mares continued to maintain the social structure of their bands, even in the midst of the chaos surrounding this local ritual, calling this capability species-local, rather than species-typical, social behavior. Attention to how free-roaming horses responded to the stress of the roundup revealed their capacity to adjust their social interactions and promote civility instead of violence. "This *is* ethnography, I retort. I'm observing and analyzing social subjects as they contend with a rapidly changing setting, one where their reliable social frames have largely been shattered."²⁹ Instead, we opted for an historical narrative and tentative conclusions about social dynamics in one particular band, but we also noted differences in the way bands from three distinct areas of the Range respond to human presence, a possible indicator of species-local behavior. In that sense, we have drawn upon both Hartigan's approach and ethologists, such as Brakes et al.,³⁰ who point out that variations in behavioral expression within a species distributed across the landscape can reveal the existence of culture, although there is a risk of failing to recognize subtle environmental factors.

Compared to herd management areas in Nevada and southern Wyoming, the PMWHR is a small, geographically isolated range spanning roughly 39,000 acres. Its topography varies in elevation from the Bighorn River on the eastern boundary, to Custer National Forest and East Pryor Mountain to the north. Three federal agencies

²⁹ Hartigan, *Sharing the Beasts*, 247.

³⁰ Brakes et al., "A Deepening Understanding of Animal Culture Suggests Lessons for Conservation," 3.

share jurisdiction over the land and the herd: the National Park Service, the U.S. Forest Service, and the BLM. The size of the herd has fluctuated over time but has rarely exceeded 200 horses. There are three distinct locations: Crooked Creek Bay, an inlet of the river at the south entrance; Lower Sykes, a remote area to the west at the base of East Pryor Mountain; and the top of East Pryor Mountain. While there are species-typical behaviors in all three locations, there are marked differences in how horses react to the presence of human visitors that appear to be unique to the bands and bachelors living in each area. When young mares from Crooked Creek Bay and East Pryor Mountain joined Cecelia, an older and more experienced a mare from Lower Sykes, their responses to human visitors appeared to follow her lead, suggesting that she played at least some role in influencing the social dynamics of that band.

Crooked Creek Bay (Fig. 1) is part of a larger area that lies between the Bighorn River to the east and Lower Sykes immediately to the west. A two-lane paved road starts at the entrance to the Range and runs north-south for approximately ten miles. Horses tend to graze near the side of the road and drink from the Bay and are tolerant of human visitors. One particular family known as the Greeters tends to graze and water near a parking lot at Crooked Creek Bay.

Lower Sykes (Fig. 2) is a remote high desert environment that is accessible only with a four-wheel drive vehicle. Finding the small number of family bands and bachelors living in this area often requires hiking into the remote landscape and knowing the location of scarce water and forage resources. This area lies at the base of East Pryor Mountain, but the small number of bands and bachelors living here tend to remain at the lower elevations and to maintain distance from one another.

The majority of the Pryor herd spends the summer months on the top of East Pryor Mountain. The meadows and ponds lie in a vast, open landscape. Family bands are visible to human visitors, and often graze next to the four wheel-drive roads that cross this location. The horses tend to spread out while grazing and resting, but periodically congregate near water sources, such as on the snowfield above Mystic Pond. As Fig. 3 shows, the bands tend to orient their gaze away from those in close proximity as a way to avoid aggression, showing in a natural setting what Hartigan termed “the elevator effect” in the roundup corral; however, they do not avoid human visitors, and provide many opportunities for photographers and film makers to record them.³¹

In these preliminary observations, we focused on the role of Cecelia (b. 2002) as the prominent, “lead” mare. Recently, the authors noted that her band was wary of our presence, watching us from above on a knoll, even though we were hundreds of yards away with very long telephoto lenses (Fig. 4). On another occasion, Cerroni saw the horses move away quickly with Cecelia in the lead. This older mare lived with her natal band in the Crooked Creek area until 2005, when she joined an older stallion, Sitting Bull, (b. 1996) and a small band living in that location. When another stallion, Admiral, took that small band, Sitting Bull and Cecelia moved to Lower Sykes, along with their filly, Gabriel (b. 2006).

³¹ Hartigan, *Shaving the Beasts*, 207.



Fig. 5. Crooked Creek Bay.



Fig. 6. Lower Sykes.



Fig. 3. Bands Above Mystic Pond.

Sitting Bull and Cecelia had three more offspring during this period. The BLM removed Gabriel in 2009, the year that Jumping Badger was born, and later removed him as well, leaving only the stallion, Inniq, (b. 2008) one of the most elusive horses on the PMWHR. In 2012, Mato was born with congenital hip problems. Cecelia was extremely bonded to him, and the band remained very isolated on Lower Sykes. By 2014, Sitting Bull was eighteen years old, and became a target for the young stallion, Jesse James, (b. 2009), who acquired Cecelia and Mato in 2014. Sitting Bull died a solitary bachelor in 2015, but never left the area. The BLM euthanized Mato in 2015. During the winter 2016-2017, the young mare, Penn, (b. 2015) became part of Cecelia's family. Penn's natal band spent summers on East Pryor Mountain, and the events leading her to join Cecelia and Jesse James are largely unknown. In the fall of 2020, another young mare, Rigel Starr, (b. 2017) joined from the Crooked Creek Bay area. By May of 2022, these mares had a total of five offspring, including Sentinel and a younger stallion, Tom Horn, who became bachelors living in the Lower Sykes area.

Even though Jesse James, Penn, and Rigel Starr had come from areas where a flight response to humans was not common, their behavior was exactly like Cecelia's. In fact, Jesse James was born to the stallion, Admiral, whose band local volunteers named "The Greeters" because the horses tended to stay near the side of the paved road entering the Crooked Creek Bay area. When he joined with Cecelia, his reaction to human presence was to move away, following the mare and her example. Although we did not make detailed observations of the signals from Cecilia to the others, we could clearly see their response as they fled in unison. Since May, 2022, there have been several major changes: Cecelia and her new foal, as well as Penn's two-year old filly, remain with Jesse James; however, Penn and her new foal, together with her yearling filly, are now with Sundance, a stallion originally from the Crooked Creek Bay area; and Sentinel, the 2018 son of Penn and Jesse, now has Rigel Starr, her

young colt, and Cecelia's two year-old filly. In spite of these changes to the original band structure, the collective behavior of all three bands has remained basically the same.

Recently, Cerroni observed how Sundance seemed to take his cues from Penn, approaching a water source in the Lower Sykes area looking at Penn, then warily at Cerroni, who decided to move away so as not to disturb the stallion. His natal band lives in the Crooked Creek Bay area, where most horses tolerate human activity, so this reaction is notable, raising the possibility again that variations across the Crooked Creek Bay, Lower Sykes, and East Pryor Mountain areas might reflect species-local behaviors. These variations would therefore reflect differences in the way prominent (often older) mares maintain the social structures of their bands. While Hartigan argues that sociality, rather than environment, shapes equine cognition,³² our observations on Lower Sykes suggest that Cecelia's influence on multiple generations are due to both her experience surviving in this rugged environment, and her ability to shape social interactions and reactions.



Fig. 4. Jesse James, Sentinel and Cecelia in 2019.

While Jesse James and Cecelia's family has split into three smaller bands, they remain in the Lower Sykes area. A trail cam placed near a water source showed that even without the presence of humans, they were watchful and wary. They must now adapt to the presence of other bands, as Cerroni observed on the trail cam when she observed Rigel Starr, followed by her young colt, Cecelia's filly, and Sentinel walking in single file toward water: even in the absence of humans, they were watchful and wary, possibly an adaptation to the pressure of other band and bachelor stallions. Despite these changes, Lower Sykes remains the only area on the PMWHR unaffected by human visitors. By way of contrast, horses on East Pryor Mountain

³² Hartigan, *Shaving the Beasts*, 15.

are tolerant of human visitors, forming queues close to vantage points for photographers and in proximity to one another while waiting to approach water sources (Fig. 3). These differences provide an opportunity to think about differences between species-typical and species-local equine behaviors.

IV. Discussion

As discussed in the introduction, the challenge to Multispecies Ethnography (MSE) posed by Hartigan's study of free-roaming horses in Galicia, Spain was to understand social dynamics among horses apart from human settings. As he noted, the focus of MSE is on human relatedness across species lines based on long periods of time spent with wild animals, learning about their preferences and habits, and – importantly – how to communicate by exchanging gestures with them.³³ There is an obvious parallel with Hartigan's approach, in that the multispecies ethnographers he cited in his study also aimed to interpret the meaning of wild animal gestures; however, the difference is that their interest was in fostering human-wild animal relations, while the aim of his research was to understand equine sociality on its own terms based on detailed field observations. As Hartigan pointed out, ethnographers have historically treated wild animals as representations for human cultural concerns.³⁴ Although MSE obviously has a very different approach from traditional ethnography, there is a risk inherent in situating the study of wild animals in the context of human-centered concerns, even ethical considerations. In the case of free-roaming horses in the Western U.S., the policy and legal framework protecting them from harassment and death also engenders political conflict between opposing economic interests and cultural perspectives: free-roaming horses are either a symbol of the American West, or a threat to cattle ranchers, miners, and energy developers who have valid legal claims to natural resources on public range lands.

Just as Hartigan developed an ethnographically informed ethological study, our approach focused on social interactions, instead of on ethograms based on the individual horse as the unit of analysis. In the case of the Pryor horses, there have been two major ethograms. The U.S. Geological Survey (USGS) conducted a research project on three ranges, including the PMWHR. The authors found mares to be the most dominant band members, pointing out that the existing literature also reported on that social structure.³⁵ Their ethogram relied on sampling techniques of individual behaviors broken down into five major categories: social, maintenance, locomotion, resting and feeding. The social category consisted of herding by stallions, defense and recruitment of mares or harem tending, and then a sequence of discrete behaviors defined as reproduction. The authors also broke down agonism into seven categories according to increasing intensity. Stallions were responsible for the most aggressive forms of behavior, while mares resolved conflicts by gestures alone.

³³ Hartigan, *Shaving the Beasts*, 255.

³⁴ Hartigan, *Shaving the Beasts*, 247.

³⁵ Jason I. Ransom and Brian S. Cade, *Quantifying Equid Behavior – A Research Ethogram for Free-Roaming Feral Horses* (Reston, VA: U.S. Geological Survey, 2009).

An earlier project focused on the behavior and ecology of the Pryor herd, using detailed quantitative notes and charts on group cohesion.³⁶ The authors observed that band stallions maintained a space between them and other groups, sometimes encountering each another with threats and postures. Groups approached water by following a trail in single file with the dominant stallion or mare in the lead. While their research measured individual activity patterns, such as drinking, feeding, playing, rolling, resting and sleeping, they also documented communication and social behavior. The authors noted that “harem stallions” recognized individuals in their group by sight and sound, and that they spent time singling out horses that might have strayed from their band. They also observed that stallions used vocalizations, in particular snorts, to alert the group to the presence of intruders, warning others in the band. In the case of flight behavior, the stallion directed movement, usually from the rear.³⁷

Measurements of individual behavior consisted of breaking down actions into discrete movements, such as a progression of bites and kicks and the contexts in which they usually occurred. Within groups, horses used these postures to signal that they would not tolerate physical proximity, demonstrating the importance of what Hartigan termed “social space” in family bands.³⁸ In addition, both studies found that the most common response to such threats was to move away, and that mutual grooming was a way to strengthen the bonds between group members. The major difference from that ethogram was that Hartigan highlighted the role of mares in maintaining sociality, while Feist and McCullough found fewer instances when mares were responsible for leadership.³⁹ Instead, they documented many instances of herding behavior by stallions. As Hartigan pointed out, ethograms can overlook ongoing social interactions:

Ethologists tend to believe that the stallion keeps the band together, but there’s clearly more to it. I think of what might be missed about horse sociality through the process of quantifying instances of fixed action patterns or behavioral mapping focused on stallion behavior and the misnomer “harem.” Ethologists might dismiss attention to the mares as just another layer of dominance, this one emanating out of the oldest mare. Or they might assume all we would gain from this view is a “soap opera” of infighting and jostling. That’s a particularly gendered characterization, one that maps with the disturbing picture of mares as forming a “harem.”⁴⁰

There is nothing comparable between the stress of seeing a rare human visitor to Lower Sykes and the chaos of the roundup in Galicia. Nevertheless, temporary

³⁶ James D. Feist, and Dale R. McCullough, “Behavior Patterns and Communication in Feral Horses,” *Z. Tierpsychol* 41(1976): 337-371.

³⁷ Feist and McCullough, “Behavior Patterns,” 348

³⁸ Hartigan, *Shaving the Beasts*, 17

³⁹ Feist and McCullough, “Behavior Patterns,” 357

⁴⁰ Hartigan, *Shaving the Beasts*, 173.

human intrusion in a remote area is similar to Hartigan's species-local account, in the sense that it triggers a response that seems to be unique to that area. Cecelia has performed a role similar to the prominent mares in Hartigan's study, leading band members away to a known place of safety. Of course, equines are prey animals, but these observations suggest that sociality and social knowledge are forms of knowledge that ethologists can overlook when their theoretical framework relies on categories of social learning that are arrayed in hierarchies based on levels of cognitive complexity. Our future plans call for further observations of the bands on Lower Sykes, using trail cams in order to preserve their wild behaviors. We hope to extend Hartigan's approach to the study of free-roaming horses as social subjects in their own right, but we want to emphasize that our goal is not for *us* to add to the base of knowledge about *them*, because, as Katherine Hayles has stated, this knowledge really belongs to the animals themselves.⁴¹ We believe that understanding should entail commitments to minimize human presence; not, as in the case of MSE, to foster ethical relationships with them.

V. Implications for the Public Management of Free-Roaming Horses

Population-level statistics are certainly important in calculating the numbers that a herd management area or wild horse territory can support, and genetic diversity is a factor in the overall health and survival of a small, isolated herd like the Pryor horses. As the example of Cecelia's band suggests, however, prominent older mares play a vital role because of their life experiences: knowing where predators are likely to lie in wait and keeping watch; helping new mothers care for their foals; and knowing where to find scarce forage and minerals, especially in harsh winters, such as on the PMWHR. These mares continue to perform that role throughout the life histories of their band members, even though young males leave to become bachelors and young females join other stallions, both natural events that can prevent inbreeding. They are also a constant presence if new band stallions emerge to replace older ones. At the same time, older mares tend to have many offspring, and there is a risk of inbreeding depression. It is therefore important to continue fertility control treatments after a certain breeding age.

As we have learned over the years, once the BLM plans a gather, its criteria for removal can become politically controversial. Advocates often demand that plans save certain horses, especially those that have appeared in nature documentaries, such as the "Cloud" series on the PBS program, *Nature*. Over the years, the PMWMC has maintained a cooperative relationship with the BLM field office, making recommendations about fertility control and removals based on lineage charts that date back to the 1970s, with the goal of preserving key bloodlines. There is an opportunity to build on that relationship with this initial exploration, and we plan to continue that work. The small size and geographical isolation of the Pryor herd would allow for systematic analysis balancing range conditions, genetic diversity of the herd

⁴¹ Katherine Hayles, "Searching for Common Ground," in *Reinventing Nature? Responses to Postmodern Deconstruction*, ed. Michael E. Soule and Gary Lease (Washington, D.C.: Island Press, 1995), 47-63, at 57.

as a whole, retaining individuals from key bloodlines, and protecting prominent older mares from removal.

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