

Environmental Assessment

Adobe Town Wild Horse Movements and Habitat Selection Research Gather

DOI-BLM-WY-D030-2016-0104-EA



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Mission Statement

To sustain the health, diversity, and productivity of the public lands
for the use and enjoyment of present and future generations.

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1.0 INTRODUCTION

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of collaring wild horses in the Adobe Town Herd Management Areas (ATHMA) for the purpose of researching the movements and habitat selection of the horses, as proposed by the University of Wyoming (UW) (Appendix 1). The gather and studies would begin in fall of 2016 with an estimated completion date of the study in September 2021.

Indirect benefits from the proposed research include providing the BLM with data to inform immediate and future management decisions regarding the ATHMA overall. Knowing what factors induce movement in and out of certain areas, could enable the BLM to coordinate more closely and specifically with neighboring Field Offices in Colorado and Rock Springs and to better manage the preferred habitats.

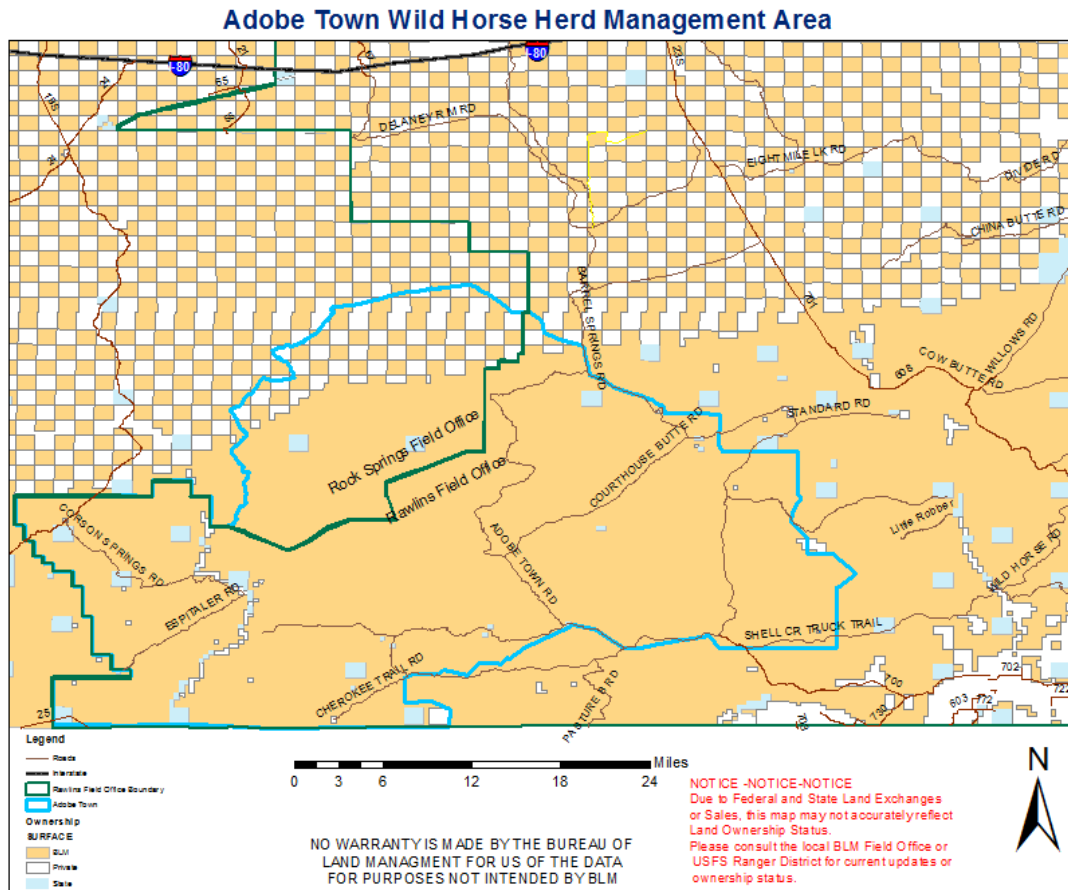
This EA contains a site-specific analysis of potential impacts that could result from implementation of any one of two alternatives. It assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA) and in making a determination as to whether any “significant” impacts to the human environment could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant Impact” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared. If the decision maker determines that this project does not have “significant” impacts following the analysis, then an FONSI would be prepared. A Decision Record would then be signed for the EA approving one or a mixture of the alternatives presented in the EA.

The Department of the Interior’s (DOI) BLM Wild Horse and Burro (WH&B) Program protects, manages, and controls wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA) (Public Law (PL) 92-195), as amended by the Federal Land Policy and Management Act (FLPMA) of 1976 (PL 94-579) and the Public Rangelands Improvement Act of 1978 (PL 95-514).

In April of 2016, a population census flight of the ATHMA was conducted. The WFRHBA directs the DOI’s Secretary to “maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands. The purpose of such inventory shall be to: make determinations as to whether and where an overpopulation exists and whether action should be taken to remove excess animals; determine appropriate management levels of wild free-roaming horses and burros on these areas of the public lands; and determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (such as sterilization, or natural controls on population levels)...” (WFRHBA, 16 U.S.C. 1333(b)(1)). The census found that the wild horse numbers were within the appropriate management level (AML). The WFRHBA also states “For the purpose of furthering knowledge of wild horse and burro population dynamics, and their interrelationship with wildlife, forage and water resources” direction to conduct research is contained in the WFRHBA (16 U.S.C. 1333(b)(3)).

The RFO is located in south central and central Wyoming, covering the eastern third of Sweetwater County, all of Carbon, Albany, portions of Platte and Laramie Counties. ATHMA is located in the Sweetwater and Carbon County, west and south of Wyoming Highway 789/287. Adobe Town encompasses about 417,916 acres of land. 49,500 acres (about 6 percent) is privately or state owned (Map 1).

Map 1. Map of Adobe Town HMA



1.1 Purpose and Need

This site-specific Environmental Assessment (EA) is being prepared in response to the request from the University of Wyoming, Department of Ecosystem Sciences, to conduct research on wild horse habitat selection and movements in the ATHMA and discloses information which will allow the Authorized Officer to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). The purpose of the action is to gain a better understanding of how and when the wild horses in ATHMA utilize available resources within the HMA.

The need for this study is derived from a necessity to comply with the Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA) (Public Law (PL) 92-195), as amended by the

Federal Land Policy and Management Act (FLPMA) of 1976 (PL 94-579) and the Public Rangelands Improvement Act of 1978 (PL 95-514). The WFRHBA directs the DOI's Secretary to "maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands". Since the passage of the WFRHBA, BLM has refined its understanding of how to manage wild horse population levels by learning from research, applied management, and monitoring. Program goals have always been to establish and maintain a "thriving natural ecological balance" this proposal aims to shed light on animal and plant ecology factors so as to quantify what and how that thriving natural ecological balance can or could exist.

1.2 Decision to be made

Based on the analysis presented in this EA, the authorized officer will select an alternative that best meets the Purpose and Need. The BLM's authorized officer will decide whether or not to implement a research study that would gather and collar mares and return them back to the ATHMA.

The decision to be made would not set or adjust AMLs, which were set through previous planning-level decisions, or remove animals from the ATHMA. Future decisions regarding long-term management within the ATHMA would continue to be accomplished through a land use planning process. Additionally, the decision would not adjust livestock use, which has been established through prior planning-level decisions which have complied with NEPA requirements and provided opportunity for public review and input.

1.3 Scoping

Internal scoping by an interdisciplinary team identified issues to be analyzed involved with the gathering and collaring of wild horse mares. Public comments on the various components of wild horse management on public lands in the ATHMA have been recently received, as well as, throughout the last several years.

On April 7, 2016, the BLM issued a scoping letter for this proposed wild horse gather and research effort. In excess of 5,900 comment letters/emails were received from individuals, organizations, and agencies following the issuance of the Adobe Town Gather and Research Plan Scoping Letter addressing the Proposed Action. These comments represented a range of views of opinion and interpretation of selected pieces of data. The majority of the comments received, approximately 4,500 letters or emails, were submitted as a form letter. All comment letters were reviewed and considered and resulted in approximately 40 unique substantive comments. To see a summary of scoping comments, see (Appendix 8). All substantive comments were considered in the preparation of this EA.

The following issues were identified for analysis as a result of consultation / coordination, internal scoping, and public comment, relative to the BLM's management of wild horses in the planning area:

1. Impacts to individual wild horses and the herds. Indicators for this issue include:
 - Expected impacts to individual wild horses from handling stress

- Unknown impacts to herd social structure
 - Potential impacts to animal health and condition
2. Impacts to wildlife, rangeland health standards, recreation, livestock grazing, and cultural resources. Indicators for these issues include:
- Projected effects on wildlife and threatened and endangered species
 - Projected impacts to vegetation, soils, and watersheds
 - Projected effects related to livestock grazing
 - Projected effects on cultural resources

Resources considered, but not present or affected in such a manner as requiring site-specific analysis in this EA are identified in the Table below.

Table 1. Resources considered and RMP references

Resource/Resource Use	Approved Rawlins RMP FEIS Reference
Air Quality/Greenhouse Gas Emissions	3-3 to 3-9
Environmental Justice	3-77; 4-189 to 4-203
Fire and Fuels Management	3-18 to 3-20; 4-33 to 4-42
Forest Management	3-21 to 3-23; 4-43 to 4-54
Hazardous Materials	Appendix 32
Lands and Realty	3-24 to 3-26; 4-56 to 4-68
Invasive species	3-113 to 3-115; 4-370 to 4-389
Lands with Wilderness Characteristics	RMP ROD 1-3; 4-141 to 4-157
Minerals	3-34 to 3-44; 4-83 to 4-111; 4-501
Off-Highway Vehicles	3-45 to 3-47; 4-113 to 4-125; Appendix 21
Paleontology	3-48 to 3-49; 4-126 to 4-140; 4-502; Appendix 30
Reclamation	3-44; Appendix 36
Recreation	3-51 to 3-58; 3-76; 4-141 to 4-188; 4-505; Appendix 37
Socioeconomics	3-59 to 3-76; 4-189 to 4-203; 4-508; Appendix 35
Special Designations and Management Areas	3-86 to 3-98; 4-204 to 4-356; 4- 512
Transportation	3-100; 4-356 to 4-367; 4-522; Appendix 21
Visual Resource Management	3-120 to 3-122; 4-391 to 4-406; 4-524; Appendix 25
Water Resources/Quality (drinking/surface/ground)	3-123 to 3-135137; 4-408 to 4-438; 4-525; Appendices 11, 13, and 32

Resource/Resource Use	Approved Rawlins RMP FEIS Reference
Wilderness Study Areas	3-86 to 3-87; 4-204 to 4-207

2.0 ALTERNATIVES CONSIDERED

This section of the EA describes the proposed action and alternatives, including any that were considered but eliminated from detailed analysis. Alternatives analyzed in detail include the following:

2.1 Proposed Action

The Proposed Action is to implement a five (5) year research study (Appendix 1) that would document habitat selection, movement between habitats, seasonal use, and migration patterns of wild horses, within and outside of the ATHMA. The research objective is to understand how horses move across the Colorado-Wyoming border, how the removal of horses from the checkerboard portion of the HMA influences the movement of mares from non-checkerboard portions of ATHMA (i.e. creation of a void), how horses select landscape resources relative to their proportional availability, and how site fidelity of horses is influenced by season.

To implement the study, the BLM would conduct a wild horse gather in five spatially separate areas throughout the ATHMA. Up to 30 mares would be fitted with radio tracking devices, and released. (Appendix 5-Collaring horses paper). Collars have real-time GPS capability and would be fitted with Lotek[®] collar detonation drop-off devices which enable a collar to be remotely dropped at any time to ensure the safety of each collared horse. Otherwise, collars would remain on mares for up to 24 months, when the collars would drop off and be collected. Data would be downloaded periodically from satellites and then a final download at the study conclusion. Vegetation monitoring would occur in the specific areas identified by the data by UW. All collar data would then be compiled and analyzed the following year. Once data has been synthesized, reports and refereed publications would be produced. Mares would be selected to receive GPS collars based on the following criteria: maturity level such that growth is completed to ensure that collar fit is consistent and not a danger to the horse for the study. Therefore, only 3 year old or older mares would be collared, including those in lactation or pregnancy stages.

The following protocols would be followed:

- All capture and handling activities would be conducted in accordance with the Standard Operating Procedures (SOPs) described in Appendix 1 (SOPs). Multiple capture sites (traps) would be used to capture wild horses. Whenever possible, capture sites would be located in previously disturbed areas and would be analyzed as they are identified, including clearances from archeology, weed, botanical and wildlife specialists prior to use. If new trap sites are needed, they also would be surveyed for cultural, botanical, and wildlife resources prior to use. If sensitive resources are encountered (riparian habitat, tall sagebrush, sensitive species habitat, etc.), these locations would not be utilized unless they could be modified to avoid any impacts.

- Livestock operators within the gather area would be notified prior to the gather, enabling them to take precautions and avoid conflict with gather operations.
- Capture techniques would include the helicopter-drive trapping method.
- Data on the captured horses would be collected, including sex and age distribution, and color.
- Hair samples would be collected for DNA analysis to assess the genetic diversity of the herd, in accordance with IM No. 2009-062. This IM can be found at:
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-062.html
- Through the capture and sorting process, wild horses are examined for health, injury and any defects using the humane care and treatment methods as described in BLM Instruction Memorandum 2015-070 (BLM 2015a).
- An Animal and Plant Inspection Service (APHIS) veterinarian would be on-site, as needed, to examine animals and make recommendations to the BLM for care and treatment of wild horses in accordance with Instruction Memorandum No. 2015-070, *Animal Health, Maintenance, Evaluation and Response* (BLM 2015a). The IM can be found at:
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2015/IM_2015-070.html
- The BLM is committed to the humane treatment and care of wild horses and burros through all phases of its program. The gathering of wild horses would be in accordance with Instruction Memorandum No. 2015-151, Comprehensive Animal Welfare Program for Wild Horse and Burro Gathers (BLM 2015b). This IM can be found at:
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2015-151.html
- Advance planning for observation of gather operations can minimize the potential for unanticipated situations to occur and ensure the safety of the animals, staff, and Contractor personnel, as well as the public/media. In response to this, an Incident Command System would be followed during the gather operations as guided by Instruction Memorandum No. 2013-060, *Wild Horse and Burro Gathers: Management of Incident Command System* (BLM 2013c). This IM can be found at:
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-060.html
- Public access to the gather sites/traps may be restricted during gather operations to ensure public and horse safety and minimize disruption to the gather process. Any areas closed would be reopened upon completion of the gather operations. Public viewing of the gather would be permissible, but it would be managed through the gather incident commander and public affairs officer assigned to the gather.
- Policy and procedures for safe and transparent visitation by the public and media at wild horse gather operations would be in accordance with Instruction Memorandum No. 2013-058 *Wild Horse and Burro Gathers: Public and Media Management* (BLM 2013a). This IM can be found at:
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-058.html
- Mobile equipment being transported from an offsite location to the gather areas, would be cleaned prior to arrival to remove any invasive or noxious weed seed and plant parts.

- Monitoring and data collection would be continued to assess whether healthy and self-sustaining wild horse herds are being maintained over the long term. Monitoring of the gather area would also continue for vegetation and water resources (rangeland health).

2.2 No Action

The study would not occur. There would be no wild horse gather and no research study implemented.

2.3 Alternatives Considered But Eliminated From Further Analysis

These alternatives were eliminated from further analysis for many reasons, including: they do not accomplish the management objectives, are not consistent with the RMPs or existing regulations and policy, or pose a health and safety issue for horses and personnel.

2.3.1 Other Alternative Capture Techniques

Capture methods other than helicopters to gather excess wild horses were suggested through public comment. As no specific methods were suggested, the BLM identified chemical immobilization, net gunning, and wrangler/horseback (drive trapping) as potential methods for gathering wild horses.

- Chemical immobilization is a very specialized technique and strictly regulated. Currently, the BLM does not have sufficient expertise to implement this method and it would be impractical to use given the size of the HMAs, access limitations, the number of horses involved, and the approachability of the wild horses.
- Net gunning techniques normally used to capture big game also rely on helicopters and are therefore not under consideration as an alternative to the helicopter-capture method.
- Use of wranglers on horseback (drive-trapping) to remove excess wild horses can be fairly effective on a small scale; however, due to the number of excess wild horses to be removed, the large geographic extent of the Complex, and the approachability of the wild horses, this technique would be ineffective and impractical to meet the purpose and need. Horseback drive-trapping is also very labor intensive and can be dangerous for the domestic horses and wranglers.

For these reasons, the alternative capture method alternatives were eliminated from further consideration and are not analyzed in detail.

2.4 Conformance with Existing Land Use Plans (LUPs)

The Proposed Action is in conformance with the land use plans as required by 43 CFR 1610.5-3(a). Any action in the Rawlins is subject to decisions established by the Rawlins Resource Management Plans, approved December 24, 2008, and amended September 21, 2015 (*Approved Resource Management Plan Amendment for Greater Sage-Grouse* and the *Record of Decision and Approved Resource Management Plan Amendments for the Rocky Mountain Region, Including the Greater Sage-Grouse Sub-Regions of Lewistown, North Dakota, Northwest*

Colorado, Wyoming). The ATHMA has been designated as suitable for long term, sustained wild horse use in the Rawlins RMP. The proposed capture and collaring conforms to the land use decisions and resource management goals, objectives, and actions of the Resource Management Plan in Section 2.3.17 Wild Horses, page 2-51.

1) Manage wild horses to meet the Wyoming Standards for Healthy Rangelands.; 2) Identify existing genotypes and phenotypes through recognized means of genetic evaluation and maintain genetic integrity; 3) Maintain habitat for existing AMLs; 4) Utilize monitoring and evaluation data to maintain habitat within HMAs.

The Rawlins RMP can be accessed at:

<http://www.blm.gov/wy/st/en/programs/Planning/rmps/rawlins.html>

2.5 Relationship to Statutes, Regulations, or Other Plans

Conformance with Rangeland Health Standards and Guidelines: The Proposed Action would be in conformance with the BLM Wyoming “Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management” (BLM 1997). It would assist in maintaining the health of the public lands within each HMA and within the Complex. A copy of the BLM Wyoming “Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management” is available upon request from the BLM.

Relationship to Statutes, Regulations, or Other Plans: Public lands are managed under the FLPMA (1976), which provides that the public lands are to be managed in accordance with land use plans and under principles of multiple use and sustained yield to protect the quality of scenic, ecological, environmental, and archeological values; to preserve and protect public lands in their natural condition; to provide feed and habitat for wildlife and livestock; and to provide for outdoor recreation (43 U.S.C. 1701(a)(8) & 1732(a)). FLPMA also stresses harmonious and coordinated management of the resources without permanent impairment of the environment (43 U.S.C. 1702(c)). While WHBMHB provides the following guidance that “Research results will be used to improve management practices within the WH&B program”. WHBMHB H-4700-1, 8.1

The Proposed Action would also be in conformance with the WFRHBA, Section 1333, its implementing regulations found at 43 CFR 4700, and Public Rangeland Improvement Act (PRIA) Section 2(b)(2):

- WFRHBA § 1333 (b)(1): The Secretary shall maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands. The purpose of such inventory shall be to: make determinations as to whether and where an overpopulation exists and whether action should be taken to remove excess animals; determine appropriate management levels of wild free-roaming horses and burros on these areas of the public lands; and determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (such as sterilization, or natural controls on population levels).

- 43 CFR 4700.0-6 (a): Wild horses shall be managed as self-sustaining populations of healthy animals and in balance with other uses and the productive capacity of their habitat.
- 43 CFR 4710.4: Management of wild horses shall be at the minimum level necessary to attain the objectives identified in approved land use plans.
- PRIA, PL 95-514 § 2(b)(2): manage, maintain and improve the condition of the public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process established pursuant to section 202 , of the Federal Land Policy and Management Act (48 U.S.C. 1712).

In addition to the above referenced regulations, the Wild Horses and Burros Management Handbook H-4700-1 provides the following guidance in relevant part:

Section 8.1 Strategic Research Plan - "...Other research projects may be initiated as needed to support the management of WH&B. Research results will be used to improve management practices within the WH&B program."

Wild horse gather EAs have been completed which analyzed the impacts of various gather methods on wild horses, and other critical elements of the human environment, to achieve AML. The impacts of gathering would be the same for this proposal. For a list of these documents, see Appendix 3. These documents are available for public review at the Rawlins Field Office.

The area was assessed per the Governor's Executive Order EO 2015-4 "*Greater Sage-Grouse Core Area Protection*". The proposed action falls within a Greater Sage-Grouse Priority Habitat Management Area (PHMA), and also contains Sagebrush Focal Area and General Habitat Management Area (GHMA).

No federal, state, or local law, or requirement imposed for the protection of the environment would be threatened or violated under the proposed action described in detail in this EA.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section of the EA briefly discusses the relevant components of the human and natural environment which would be either affected or potentially affected by the Proposed Action and alternatives. Direct impacts are those that result from management actions while indirect impacts are those that exist once the management action has occurred. By contrast, cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The resources that are present and may have potential to be affected by the Proposed Action or the alternatives include: Wild Horses; Wildlife; Vegetation, Soils, and Watershed; Recreation; Wilderness; Livestock Grazing; and Heritage Resources.

Table 2. Resources Considered

Determination¹	Resource	Rationale for Determination
NI	Air Quality/ Green House Gas Emissions	The Wyoming Department of Environmental Quality (WDEQ) is the authorized agency to administer the Clean Air Act. The Proposed Action and alternatives would not add ozone or other gasses of concern to the atmosphere, and that any emissions from helicopters etc... would be within the de minimus values established by WDEQ.
NP	Areas of Critical Environmental Concern	No ACECs are present in the horse gathering areas.
NI	Cultural Resources	See Section 3.5
NI	Environmental Justice	The action alternatives were reviewed in accordance with Executive Order 12898 and no impacts to minority or low-income populations are expected.
NP	Farmlands: Prime or Unique	No Prime or Unique Farmlands (as defined by 7 CFR 657.5) are present in the project area.
NP	Floodplains	The Proposed Action or alternatives would not have any direct or indirect impacts on floodplains in the project area.
NP	Fuels/Fire Management	No fuels projects are planned or proposed within the project area. All wild land fires and fire management would be managed according to BLM protocol.
NI	Invasive Species/ Noxious Weeds	Some <i>Halogeton</i> and other invasive species are present at some of the trap sites. Treatment is handled through Cooperative Agreement between the BLM and Sweetwater County Weed & Pest District.
NI	Lands/Access	No rights of way or other land use authorizations are required to implement the Proposed Action or alternatives.
NI	Livestock Grazing	See Section 3.4
NI	Native American Religious Concerns	No concerns were identified through scoping.
NI	Paleontology	Although most of the field office is PFYC 5 (Highest Potential Fossil Yield classification) the wild horse gather activities would not affect bedrock and therefore not have the

Determination¹	Resource	Rationale for Determination
		potential to affect fossils.
NI	Public Health & Safety	Public Health and Safety would not be impacted by any of the alternatives.
NI	Rangeland Health Standards	The process of gathering wild horses would not impact rangeland health.
NI	Recreation	Short term effects would be minor and would only occur during the gather.
NI	Socio-Economics	The Proposed Action or alternatives would not affect the socioeconomic status of the county or nearby towns.
NI	Soils	Trap sites are generally re-used to minimize new soil disturbance. The sites revegetate naturally with minimal increase in erosion in the short-term.
PI	Threatened, Endangered or Candidate Plant Species	See Section 3.3
NP	Threatened, Endangered or Candidate Animal Species	No water depletions are associated with the proposed gather; therefore, there would be no effect to any federal listed aquatic species present in or downstream of the Colorado River. No species or their habitat was identified for terrestrial species.
NP	Wastes (hazardous or solid)	There are no known hazardous or solid wastes present in the project area. The Proposed Action or alternatives would not contribute to hazardous or solid wastes.
NI	Water Resources/Quality (drinking/surface/ground)	Currently, the WDEQ administers water quality and water quantity programs. Furthermore, WDEQ is the responsible agency for the administration of the Clean Water Act. The wild horse gather would not impact water resources. Therefore, since WDEQ is the responsible agency for administering water quality, and since the WDEQ has not provided any information in regards to water quality issues or implementing a water monitoring program within the area, this will not be discussed in detailed analysis.
NP	Wetlands/Riparian Zones	No wetlands or riparian areas are present in the horse gathering area, around the capture, or temporary corral area.

Determination¹	Resource	Rationale for Determination
NP	Wild and Scenic Rivers (WSRs)	There are no WSRs within the project area.
NP	Wilderness	Wilderness resources are not present in the project area.
NP	Woodland/Forestry	There are no areas that meet the definition of woodlands/forestry within the project area.
NI	Vegetation	See Section 3.3
NI	Visual Resources	The project is determined not to affect the visual management of the area.
PI	Wild Horses and Burros	See Section 3.1
NI	Wildlife/Fisheries	See Section 3.2

¹ PI: Potential Impact due to one or more action alternatives; therefore, analyzed in the NEPA document.

NP: Not Present in the area impacted by the action alternatives.

NI: No Impact expected from action alternatives

3.1 Wild Horses

3.1.1 Affected Environment

Historically, the wild horses residing within ATHMA have had unrestricted movement between the Adobe Town and Salt Wells Creek HMAs due to an unfenced boundary. For management purposes, these two HMAs have been treated as a Complex. Past capture, census, genetic health, and distribution data (Cothran, 2011) indicate movement and interchange among the horses of these two HMAs. Wild horses were last gathered and removed from the Complex in November 2013.

In April of 2016, BLM personnel conducted simultaneous double-count aerial surveys of the wild horse populations in: Adobe Town, Little Colorado, Salt Wells Creek, and Divide Basin HMA's. The estimated population size, with 90% confidence interval, was 684 adults (Appendix 6). This is within the established Appropriate Management Level.

3.1.2 Environmental Consequences

Impact of Proposed Action:

The impact of radio collars on mares would be very minimal. From March 2015 through March 2016 researchers at the U.S. Geological Survey conducted a preliminary study on captive wild horses and burro jennies to determine proper fit and wear of radio collars (Appendix 5). The condition of wild horses wearing radio collars was compared to non-collared controls and

documented with photographs. In addition, both collared individuals and controls were observed for 80 minutes each week for 14 weeks in order to quantify any impact of the collar on their behavior and health. At the end of the study period (March 2016) the collars were removed. Preliminary analyses indicate that mares had almost no signs of wear from radio collars and the behavior of collared versus non-collared mares did not differ (Schoenecker et al. 2016b *in prep*).

Collared horses would be returned to the HMA and overall research goals could be studied without the outside influence of any change in their normal daily routine and seasonal behavior. As each collar would be outfitted with drop-off devices that can be remotely triggered, and tracks horses in real time. If an animal stops moving when the rest of the band moves, that collar can be dropped and retrieved and the animal visually checked for injury. The incident would become part of the research study to inform future collaring research studies.

The BLM has been conducting wild horse gathers since the mid-1970s. During this time, methods and procedures have been identified and refined to minimize stress and effects to wild horses during gather implementation. The SOPs in Appendix 2 would be implemented to ensure a safe and humane gather occurs and would minimize potential stress and injury to wild horses.

In any given gather, gather-related mortality averages only about one half of one percent (0.5%), which is very low when handling wild animals. Approximately six-tenths of one percent (0.6%) of the captured animals could be humanely euthanized due to pre-existing conditions and in accordance with BLM policy (GAO-09-77). These data confirm that the use of helicopters and motorized vehicles has proven to be a safe, humane, effective, and practical means for the gather and removal of excess wild horses (and burros) from the public lands. As a further measure, it is BLM policy to limit the use of helicopters to assist in the removal of wild horses from February 28 through July 1. The use of helicopters to assist in the capture of wild horses is prohibited during the six weeks before and the six weeks that follow the peak of foaling. The peak of foaling falls within about a two-week period during mid-April to mid-May for most wild horse herds. Therefore, the use of helicopters to capture wild horses is prohibited during March 1-June 30, unless an emergency situation exists.

Individual, direct effects to wild horses include handling stress incurred during capture, sorting, and handling. The intensity of these effects varies by individual horse and is manifested by behaviors ranging from nervous agitation to obvious physical distress. Fresh reconnoiter flights for trap locations, each day can help reduce pursuit time of groups of animals, which is both safer and less stressful to each animal. Having several potential trap locations cleared and vetted at the beginning of the gather operation, would enable the helicopter contractor to shorten pursuit times.

A hair sample would be taken from some of the wild horses, typically from the mane, for genetic testing. No impacts have been identified from collecting hair samples.

Wild horses not captured may be temporarily disturbed and may move into another area during the gather operation. Direct population effects have proven to be temporary with most, if not all, effects disappearing within hours to several days of release. No observable effects associated with the gather would be expected within one month of release, except for a heightened awareness of human presence.

Impacts of No Action: Wild horses would not be subject to any individual direct or indirect impacts described in the Proposed Action as no gather operation would occur.

3.2 Wildlife, Threatened and Endangered Species, Special Status Species, and Migratory Birds

3.2.1 Affected Environment

The mosaic of plant communities and topographic features found throughout ATHMA supports a wide variety of wildlife species that use the various habitats for resting, courtship, foraging, travel, food and water, thermal protection, escape cover and reproduction. ATHMA has been used by wild horses and livestock for over 100 years and fences are limited. However, in general ATHMA has very low levels of other types of disturbance to wildlife habitat. These disturbances include a few improved county and BLM roads, several powerlines, and energy projects related to oil and gas development.

Species which commonly occur in ATHMA include coyote, badger, bobcat, desert cottontail, jackrabbit, Wyoming ground-squirrel, golden eagle, kestrel, horned lark, meadowlark, raven, magpie, common nighthawk, and other small mammals and birds. Mule deer, elk and pronghorn, utilize the gather area year-round and less than 20% of the area is identified as crucial winter range for mule deer and pronghorn and winter or crucial winter range for elk. For a complete description of species and habitats found within BLM jurisdiction in the ATWHMA, see Rawlins RMP (2008, FEIS p. 3-139, 3-143, 3-155-161)- A summary of additional wildlife resources identified as being potentially impacted by the project is provided below.

BLM Wyoming State Sensitive Species

A number of animal species potentially present have been accorded “sensitive species” status. Sensitive mammal species that have the potential to occur in the gather area, or that may have habitat located within the gather area include: the Wyoming pocket gopher, pygmy rabbit, swift fox, spotted bat, long-eared myotis, fringed myotis, Townsend’s big-eared bat, and white-tailed prairie dog.

Sensitive bird species that have the potential to occur, or may have habitat located within the area include the ferruginous hawk, mountain plover, Greater Sage-Grouse, long-billed curlew, burrowing owl, sage thrasher, loggerhead shrike, Brewer’s sparrow, sage sparrow, and bald eagle. Numerous other migratory birds, including sagebrush obligate species, also occur.

BLM records indicate that there are approximately ten Greater Sage-Grouse (GRSG) leks with associated nesting habitat (General Habitat Management Area) within the ATHMA. In accordance with BLM policies and guidance outlined in the RMP, as amended, timing stipulations and surface disturbance restrictions would be used once the location of the trap sites was identified. The biologist would also coordinate with the WGFD to identify required SOPs to reduce or eliminate negative effects to wildlife species during trap location site selection. Trap

sites would be located to avoid trampling of sagebrush and other shrubs that provide browse for big game and habitat for other wildlife species.

The project contains limited areas of Wyoming Pocket Gopher potential habitat, white-tailed prairie dog habitat, and Pygmy Rabbit high potential habitat. A BLM wildlife biologist would be consulted during the trap site selection process. Trap site selection is based on many different criteria including the necessity that trap sites and staging areas associated with gathers are never placed in prairie dog towns due to the possibility of horses breaking their legs in the burrows.

Other sensitive species that have the potential to occur, or may have habitat include the tiger salamander, Northern leopard frog and Great Basin spadefoot toad habitats. Specific mitigation measures for these species have not been identified at this time.

3.2.2 Environmental Consequences

Impacts of Proposed Action

BLM wildlife biologists would recommend trap site locations to avoid adverse impacts to wildlife, including occupied GRSG leks, raptor nests, big game crucial winter ranges and other BLM sensitive species habitats. The biologists would also coordinate with the WGFD to identify required SOPs to reduce or eliminate negative effects to wildlife species during trap location site selection. Trap sites would be located to avoid trampling of sagebrush and other shrubs that provide browse for big game and habitat for other wildlife species.

The gathers would occur in mid-summer or later, therefore disturbance to ground nesting birds would be minimal since the chicks of all species would have fledged. Areas exhibiting active Wyoming pocket gopher activity and white-tailed prairie dog towns would be avoided for trap sites to avoid disturbance to these species. Some concentrated disturbance may occur during the actual gathering activity from horses falling thru/crushing shallow burrows; which also occurs as large animals naturally traverse the rangeland.

Wildlife adjacent to trap sites would be temporarily displaced during capture operations by increased activity during trap setup, from helicopter noise, and vehicle traffic, but in most cases displacement should only last 2-3 days in each trap area. Short-term stress and displacement would occur to wildlife during the gather operations.

Impacts of No Action

Wildlife would not be temporarily displaced or disturbed as a result of gather operations.

3.3 Vegetation, Special Status Plants

3.3.1 Affected Environment

There are a variety of vegetation types in ATHMA, although the dominant vegetation type is sagebrush/grass. Other upland types found include saltbush, greasewood, grassland, mountain shrub, and conifer forest. Common upland plant species include Wyoming and mountain big

sagebrush, black sagebrush, Douglas' and rubber rabbitbrush, winterfat, Gardner's saltbush, black greasewood, Indian ricegrass, needle-and-thread, bottlebrush squirreltail, Sandberg's and mutton bluegrass, bluebunch and thickspike wheatgrass, basin wildrye, Junegrass, and threadleaf sedge. Forbs are abundant, particularly at higher elevations receiving ten inches or more precipitation annually. Common forbs include phlox, buckwheat, sandwort, bearded-tongue, daisy, locoweed, lupine, paintbrush, sego lily, death-camas, goldenweed, aster, violet, buttercup, bluebells, hawksbeard, and yarrow. Native plants comprise the principle species on most sites, although cheatgrass is present in some areas, particularly on sandy soils.

Riparian habitat is rare, occupying about one percent of the landscape. Community types consist of riparian grassland and willow-riparian. Common plant species include Nebraska and beaked sedge, Liddon's sedge, Douglas sedge, tufted hairgrass, redtop, mat muhly, alkali bluegrass, alkali sacaton, alkali cordgrass, inland saltgrass, basin wildrye, Kentucky bluegrass, spike-sedge, American and alkali bulrush, other sedges and rushes, brookgrass, coyote willow, Geyer willow, gooseberry, and shrubby cinquefoil. Forbs are more abundant on non-saline sites, and include buttercup, plantain, prickly-lettuce, willow-weed, mint, speedwell, monkey flower, gentian, meadow pussytoes, checker-mallow, cinquefoil, aster, sunflower, wild licorice, strawberry, clover and native thistles.

Threatened, Endangered, Proposed and Candidate Species

One federally designated threatened, endangered, proposed, or candidate plant species has the potential to be present--Ute ladies'-tresses (Threatened). The federally listed Ute ladies'-tresses occurs in riparian habitat, which is found in the area, but surveys have not found any populations. Project activities would not take place in riparian habitat; therefore gather activities would result in no impacts to Ute ladies'-tresses.

Sensitive Plant Species

Sensitive plants that have the potential to occur are listed in Table 3.

Table 3: Wyoming BLM Sensitive Plant Species that grow, or have potential habitat in the project area.

Common Name	Scientific Name	Habitat
Cedar Rim thistle	<i>Cirsium aridum</i>	Barren, chalky hills, gravelly slopes, & fine textured, sandy-shaley draws 6,700 - 7,200 ft.
Persistent sepal yellowcress	<i>Rorippa calycina</i>	Mud flats, gravel bars, and other moist areas along rivers, streams, lakes and dried ponds. Sand bard and sandy-clay soils of receding pond margins at 4300-6300 feet.
Prostrate Bladderpod	<i>Lesquerella prostrate</i>	West to south or southeast-facing slopes and rims of whitish to reddish or gray limey clays and soft sandstones with a surface layer of fine gravel, or else on limestone, at

Common Name	Scientific Name	Habitat
		elevations of 6630-7700 feet. Most of these sites are dominated by sparse cushion plants, bunchgrasses, and low shrubs with a total vegetative cover of 10-25%.
Williams' spring parsley	<i>Cymopterus williamsii</i>	Open, south or east-facing ridgetops and upper slopes with exposed limestone outcrops or talus at 6000-8300 feet.
Tufted Twinpod	<i>Physaria condensate</i>	South, west, or east facing, semi-barren, wind-blasted upper slopes and rims of calcareous shale or sandstone desert mesas at elevations of 6000-7760 feet.(1830-2365 m). Populations are typically found in cushion plant/bunchgrass
Medium Meadow pussytoes	<i>Antennaria arcuata</i>	Moist, hummocky meadows, seeps or springs surrounded by sage/grasslands 4,950-7,900 ft.
Ownbey's thistle	<i>Cirsium ownbeyi</i>	Sparsely vegetated shale slopes in sage and juniper communities, 6,440 -8,400 ft.
Gibbens' milkvetch	<i>Astragalus gibbensii</i>	Sparsely vegetated shale or sandy-clay slopes at 5,500-7,700 ft.
Gibben's Beardtongue	<i>Penstemon gibbensii</i>	Barren shale or sandstone slopes of the Browns Park Formation or Laney member of the Green River shale, often located below caprock, on the steep, upper or middle slopes eroding out below the resistant layer. Elev. 6200-7700 feet.

Prior to placement of horse gather holding facilities, desktop analyses would be conducted to identify areas with known special status plant species (SSPS) or potential habitat. Analyses would be based on occurrence records and potential occurrence modeling data from the Wyoming Natural Diversity Database, as well as BLM internal records. Onsites would be completed for all trap locations and results would guide holding facility placement to avoid SSPS and potential habitat. Therefore, there should be no impacts to SSPS as a result of implementing the gathers beyond what occurs normally by wild horse movements.

3.3.2 Environmental Consequences

Impacts of Proposed Action

Gather operations would result in trampling of vegetation at the trap sites. Each of five trap sites would vary in size, but are generally less than two acres. If a particular trap site is used, wild horses would be kept there until the selected mares are collared and the horses are released. The amount of time wild horses stay at a trap site would be less than one half day. Upland vegetation would be disturbed by trap site construction, and short-term trails may be created near the trap sites. Any vegetation removed would be minimal and localized. These sites are used infrequently, providing the herbaceous vegetation time to recover. However, there could be loss of some vegetation, primarily big sagebrush, within these small concentrated use areas. Overall, the total acreage disturbed would be small in relation to the gather area and these impacts would be on a local scale only. Monitoring post-gather would ensure that any temporary trap site that did not reclaim adequately would receive additional management. In order to avoid riparian area disturbance, trap sites and holding locations would not be located within or directly adjacent to riparian habitat; thus these areas would not be disturbed by gather operations.

Impacts of Alternative 3: No Action

Impacts to vegetation would not be impacted as the research proposal would not take place.

3.4 Livestock Grazing

3.4.1 Affected Environment

The rangelands provide seasonal grazing for cattle and sheep (Appendix).

Available forage production within the ATHMA is allocated to livestock and wild horses. Forage use is authorized to livestock operators based on the Animal Unit Month (AUM) of vegetation production. An AUM is the amount of forage needed to maintain a 1,000 lb. cow and her calf for one month. Approximately 24,042 BLM AUMs of forage have been authorized yearly to the livestock operators. Actual use of this allocation varies by year due to precipitation kind, amount and timing; vegetation production; economic and labor fluctuations; and operational needs of the ranch. In the following equation, an Animal Unit (AU) is an adjustment applied to an AUM depending on the animal being compared. The standard AU for wild horses is 1.2. This is based on the efficiency of digestion of feed the horse exhibits vs the standard of a 1,000 lb. cow. Approximately 11,520 AUMs would be used by wild horses at high AML (800 Horses * 1.2 Horses/AU * 12 Months).

3.4.2 Environmental Consequences

Impacts of Proposed Action

The SOP to notify livestock operators within the gather area prior to the gather would enable them to take precautions and avoid conflict with gather operations. Livestock located near gather activities may be temporarily disturbed or displaced by helicopter use and increased vehicle traffic during the gather operation. This displacement would be temporary and the livestock would move back into the area once gather operations moved. Past experience has shown that gather operations have little impacts on grazing cattle and sheep. Indirect impacts to livestock grazing would be minimal, as no horses are being removed from the HMA.

Impacts of No Action

Impacts to livestock operations would not occur as the research proposal would not take place.

3.5 Cultural Resources

3.5.1 Affected Environment

Prehistoric sites known to exist within the HMAs include open camps and lithic scatters. Historic sites include trash dumps, trails, roads, and structures associated with early settlement and commerce, or with the local ranching industry. Additionally, stone circle sites, rock alignments, rock art and other sites potentially sensitive to Native American Tribes may occur. Cultural Resource program support for the wild horse capture would consist of file search (Class I) and/or intensive field (Class III) inventories, and, if necessary, mitigation of impacts or relocation of the proposed temporary horse holding sites. Support includes consultation with the Wyoming State Historic Preservation Office according to the Wyoming State Protocol agreement of the BLM National Cultural Resources Programmatic Agreement, which states inventory may not be required for “Animal traps and corrals in use for three days or less” (SHPO Protocol Appendix B-21).

3.5.2 Environmental Consequences

Impacts of Proposed Action

Prior to construction, all gather sites would be surveyed for historic properties by the RFO archaeologist, and a determination made if a Class III inventory is necessary. If cultural resources are encountered at proposed gather sites those locations would not be utilized unless they could be modified to avoid or mitigate adverse impacts to significant cultural resource site(s). Within the ATHMA, impacts to historic properties from trampling during the gather operations would not exceed what occurs from natural horse movements. Direct or indirect impacts to cultural resources are not anticipated.

Impacts of No Action

Impacts to cultural resources would not occur as the research proposal would not take place. Impacts to historic properties would continue as what occurs from natural horse movements.

4.0 CUMULATIVE IMPACTS

NEPA regulations define cumulative impacts as impacts on the environment that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions (40 CFR 1508.7). Reasonably foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Past, Present, and Reasonably Foreseeable Actions

All resource values described for the Affected Environment have been evaluated for cumulative impacts. If there are no direct or indirect impacts to said resources, there are likewise no expected cumulative impacts. The Past, Present, and Reasonably Foreseeable Future Actions applicable to the assessment area are identified in Table 4. Assessment areas are determined by what is practical and reasonable for each resource. These activities can reduce the quantity and quality of vegetation, as well as quality and quantity of water, and result in human presence.

Table 4. Past, Present, and Reasonably Foreseeable Future Actions

Project – Name or Description	Status (x)		
	Past	Present	Future
Livestock grazing	x	x	x
Wild horse gathers	x	x	x
Fence construction (including protective fencing)	x	x	x
Mineral exploration/Oil and gas exploration	x	x	x
Wildlife/Big game studies	x	x	x
Wild horse issues, AML adjustments and planning	x	x	x

The BLM is likely to conduct substantially similar gathers of wild horses adjacent to and within the HMA in the future to maintain or achieve wild horse populations within AML and prevent deterioration of range health, including the proposed Checkerboard wild horse removal to the north and west. Beginning in the fall of 2016, the BLM will start re-constructing fences in the southern portions of the ATHMA. These fences would improve HMA boundary effectiveness. Pasture division fences are proposed in the western portions to improve livestock distribution. The project construction would also temporarily increase human presence in the area. Interior pasture gates would be left open when livestock are not present to allow for wildlife and wild horse movements.

Other foreseeable activities currently being proposed within the gather area include the following:

- Continental Divide-Creston Natural Gas Project. This is a proposed infill drilling of natural gas wells in the north eastern portion of the ATHMA. This area has already experienced development for oil and gas and involves drilling additional wells and constructing associated infrastructure.
- Seismic operations

Effect of Past, Present, and Reasonably Foreseeable Future Actions

4.1 Wild Horses

Numerous gathers of wild horses have occurred throughout the ATHMA and gather area in the past. The most recent gather was in November of 2013; these gathers were necessary to bring the

population in line with population management goals. Repeated horse gathers or gathers conducted too frequently can affect wild horse behavior making them harder to capture and places added stress, more so on those captured and processed. Fertility control has been implemented in the past.

All of the above projects and activities would have impacts on wild horses from increased surface disturbance which results in vegetation removal, increased human presence, increased risk of horse/vehicle collisions, and could displace wild horses during construction and operation.

When combined with past, present, and reasonably foreseeable future actions, the potential for adverse cumulative impacts to wild horses would be low since most of these activities are short-term and involve intermittent human presence.

4.2 Wildlife

Historic use by livestock and wild horse grazing, recreation, and mineral exploration have likely impacted wildlife and special status species habitat within the gather area. Conducting a gather, without removing horses, would invariably have very short term impacts to wildlife, especially big game. . Given gathers have been conducted in ATHMA in the past, these gathers are years apart from each other, and the disturbance is very short term.

Industrial development in the area has been, and can be expected to be, at a standstill for the foreseeable future. At this time, there are no foreseeable actions pending for the ATHMA area.

Adverse cumulative impacts to wildlife habitat from implementation of the Proposed Action would be negligible.

No long-term cumulative benefits to any rangeland user would be expected with implementation of the No Action Alternative.

4.3 Livestock Grazing

The vegetation within the ATHMA has been utilized since the area was first settled. Domestic livestock have grazed all portions of ATHMA in the past and are expected to continue in the future. Water is a limiting resource in some areas. As a result, existing water sources tend to be heavily utilized by livestock, wildlife, and wild horses which results in soil compaction, soil exposure and erosion, stream bank alteration, and competition for clean water.

5.0 MITIGATION MEASURES AND SUGGESTED MONITORING

The BLM Contracting Officer Representative and Project Inspectors assigned to the gather would be responsible for ensuring contract personnel abide by contract specifications and standard operating procedures and policies (SOPs). Ongoing rangeland, riparian, and wild horse monitoring would continue, including periodic aerial population surveys.

The ATHMA horses and rangeland health would continue to be monitored post-gather. Data would be collected which would assist the BLM in determining whether existing AMLs are appropriate or need future adjustment (either increase or decrease). Data collected would include observations of animal health and condition, climate (precipitation), utilization, distribution, population census, range condition and trend, riparian health, in addition to the migration-movement of collared horses.

Project design features and monitoring are incorporated into the proposed action through SOPs, which have been developed over time. These SOPs (Appendices 2 and 4), along with BLM IMs 2010-135 (BLM 2010a), 2015-070 (BLM 2015a), 2015-151 (BLM 2015b) represent the "best methods" for reducing stress and injury associated with gathering, handling, transporting, and collecting band and herd data.

Based on the analysis of impacts above and consideration of all design features, wild horse gather best management practices, and standard operating procedures presented as part of the proposed action and alternatives, no mitigation measures are proposed or required.

6.0 RESIDUAL IMPACTS

There would be residual impacts associated with the implementation of the proposed action. Horses that were gathered may be more wary of human interactions as a result of the gather process. Some horses may be more likely to run from humans, vehicles, and aircraft. Horses that were gathered and released may become more difficult to gather in the future. Individual horses react differently to these experiences, some horses become intolerant of human presence and interaction, while others do not show any reaction to gather activities. Most individual horses recover from these activities fairly quickly and resume normal horse behavior within 24 hours of being released.

7.0 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Tribes, individuals, organizations, and agencies were included in the scoping process (Appendix 7). The letter soliciting scoping comments for the proposed gather in the ATHMA was mailed April 7, 2016. In addition, public hearings are held annually on a state-wide basis regarding the use of motorized vehicles, including helicopters and fixed-wing aircraft, in the management of wild horses. During these meetings, the public is given the opportunity to present new information and to voice any concerns regarding the use of the motorized vehicles. The High Desert District Office hosted the state-wide meeting on August 4, 2016; the current gather operation SOPs were reviewed in response to the concerns expressed and no changes to the SOPs were identified.

List of Preparers

BLM Rawlins Field Office

Name	Agency/Entity	Reason For Consultation	Outcome
Marcell Astle	BLM Rawlins	Rangeland Management Specialist (Team Lead and acting Wild Horse and Burro Specialist)	Stress from gathering and handling.
Andy Warren	BLM Rawlins	Livestock grazing administration	No Issues Identified
Kelly Owens	BLM Rawlins	Hydrology Issues	No Issues Identified
Mary Read	BLM Rawlins	Wildlife Issues	Sensitive Species and wildlife disturbance from the gather; reduced through timing stipulations and trap site selection.
Tim Novotny	BLM Rawlins	Recreation Issues	No Issues Identified
Bonni Bruce	BLM Rawlins	Archaeology Issues	No Issues Identified
Ray Ogle	BLM Rawlins	Reclamation and Soils Issues	No Issues Identified
Susan Foley	BLM Rawlins	Weeds Issues	No Issues Identified
John Sjogren	BLM Rawlins	Rangeland/livestock grazing issues	No Issues Identified
Mark Newman	BLM Rawlins	Geology/Paleontology Issues	No Issues Identified
Beth Holden	BLM Rawlins	Realty Issues	No Issues Identified
Ben Smith	BLM Rawlins	Wild Horse and Burro Issues	Stress from gathering and handling.
Maureen Hartshorn	BLM Rawlins	Forestry Issues	No Issues Identified
Susan Foley	BLM Rawlins	Planning/Environmental Coordinator	No Issues Identified

8.0 REFERENCES

Beever, E.A., Tausch R.J. and Thogmartin, W.E., 2008, Multi-scale responses of vegetation to removal of horse grazing from Great Basin (USA) mountain ranges: *Plant Ecology*, v196, i.2, p.163-184.

Beever, and Aldridge. 2011. "Influences of free-roaming equids on sagebrush ecosystems, with a focus on Greater Sage-Grouse". University of California Press, Berkeley, CA.

BLM 1997. *Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for public lands administered by the BLM in the State of Wyoming*. Wyoming State Office.

BLM 2003. *Great Divide Basin/Ferris and Seminoe Mountain Watersheds Standards and Guidelines Assessment*, Rawlins Field Office, Wyoming.

BLM 2008a. *Proposed Resource Management Plan and Final EIS*. Rawlins Field Office, High Desert District, Wyoming.

BLM 2008b. *Record of Decision and Approved Rawlins Resource Management Plan*. Rawlins Field Office, High Desert District, Wyoming.

BLM 2009b. BLM Manual Handbook 4740-1, *Wild Horse and Burro Program Aviation Management*. Release 4-109, dated 1/5/2009. Washington D.C.: GPO.

BLM 2010a. Instruction Memorandum No. 2010-135, *Gather Policy, Selective Removal Criteria, and Management Considerations for Reducing Population Growth Rates*, issued June 2, 2010. Washington D.C.

BLM 2010b. BLM Handbook 4700-1, *Wild Horses and Burros Management Handbook*. Release 4-116, dated 6/2010. Washington D.C.: GPO.

BLM 2013a. Instruction Memorandum No. 2013-058, *Wild Horse and Burro Gathers: Public and Media Management*, issued January 23, 2013. Washington D.C.

BLM 2013b. *Great Divide Basin/Ferris Mountain and Seminoe Mountain Watersheds Standards and Guidelines Assessment*, Rawlins Field Office, Wyoming.

BLM 2013c. Instruction Memorandum No. 2013-060, *Wild Horse and Burro Gathers: Management of Incident Command System*, issued January 23, 2013. Washington D.C.

BLM 2013d. *Proposed Resource Management Plan and Final EIS*. Rawlins Field Office, Wind River Big Horn Basin District, Wyoming.

BLM 2014a. *Record of Decision and Approved Resource Management Plan*. Rawlins Field Office, Wind River Big Horn Basin District, Wyoming.

BLM 2014c. Instruction Memorandum No. 2014-132, *Guidance for the Sale of Wild Horses and Burros*, issued August 26, 2014. Washington D.C.

BLM 2015a. Instruction Memorandum No. 2015-070, *Animal Health, Maintenance, Evaluation and Response*, Issued March 4, 2015. Washington D.C.

BLM 2015b. Instruction Memorandum No. 2015-151, *Comprehensive Animal Welfare Program for Wild Horse and Burro Gathers*, Issued September 25, 2015

BLM. 2015c. *Casper, Kemmerer, Newcastle, Pinedale, Rawlins, and Rawlins Field Offices Approved Resource Management Plan for Greater Sage-Grouse*. September 2015.

BLM. 2015d. *Record of Decision and Approved Resource Management Plan Amendments for the Rocky Mountain Region, Including the Greater Sage-Grouse Sub-Regions of Lewistown, North Dakota, Northwest Colorado, and Wyoming*. September 21, 2015.

Coates-Markel, L. 2000. "Summary Recommendations, BLM Wild Horse and Burro Population Viability Forum April 1999", Ft. Collins, CO. *Resource Notes No. 35*. 4 pp.

Connelly et al. 2000. "Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28:967-985.

Connelly, J. W.; Knick, S. T.; Schroeder, M. A.; Stiver, S. J.; and Western Association of Fish and Wildlife Agencies, "Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats" (2004). *All U.S. Government Documents (Utah Regional Depository)*. Paper 73.

Cothran, E. Gus 2010. *Genetic Analysis of the Adobe Town HMA, Wyoming*. Department of Veterinary Integrative Bioscience, Texas A&M University. College Station, TX. 9pp. Report to BLM.

Cothran, E. Gus 2011. "Genetic Analysis of the Adobe Town HMA, Wyoming." Department of Veterinary Integrative Bioscience, Texas A&M University. College Station, TX. 9pp. Report to BLM.

Cothran, E. Gus 2011. "Genetic Analysis of the Salt Wells Creek HMA, Miller Mountain Trap, WY." Department of Veterinary Integrative Bioscience, Texas A&M University. College Station, Texas. 8pp. Report to BLM.

Cothran, E. Gus 2011. "Genetic Analysis of the Salt Wells Creek HMA, Manuel Gap subgroup, WY." Department of Veterinary Integrative Bioscience, Texas A&M University. College Station, Texas. 9pp. Report to BLM.

Crane et al. 1997. "Habitat selection patterns of feral horses in southcentral Wyoming. *Journal of Range Management*. 50:374-380.

Crawford, J. A., R. A. Olson, N. E. West, J. C. Mosley, M. A. Schroeder, T. D. Whitson, R. F. Miller, M. A. Gregg, and C. S. Boyd. 2004. Ecology and management of sage-grouse and sage-grouse habitats. *Journal of Range Management* 57:2-19

NAS 2013. National Research Council of the National Academies, Committee to Review the Bureau of Land Management Wild Horse and Burro Management Program. 2013. *Using science to improve the BLM wild horse and burro program: A way forward*. The National Academies Press, Washington, D.C.

Shoenecker, K. and King, S, 2016a. "Procedure For Affixing Radio Collars On Wild Horse Mares and Burro Jennies"

Shoenecker, K. and King, S, 2016b. "Analyses of Procedure for Affixing Radio Collars on Wild Horse Mares and Burro Jennie". Manuscript in preparation.

United States Department of the Interior (USDI). 2008. Departmental Manual, Part 516, Chapter 11, *Managing the NEPA Process—Bureau of Land Management*. Release 3799, dated 5/8/2008. Washington D.C.: GPO.

APPENDIX 1 Proposal University of Wyoming

April 1, 2016



SUBJECT: BLM Wild Horse and Burro Research Committee Approval of the University of Wyoming Adobe Town GPS Collaring Research Project

TO: Paul Griffin - Research Coordinator, BLM Wild Horse and Burro Program

Dear Paul,

Attached you will find our formal application. Please note that prior approval has been given by the University of Wyoming Research Office through our initial proposal to the Wyoming Department of Agriculture. If you have questions, please contact Linda Osterman – VP for Research at osterman@uwyo.edu or 307-766-5320. Also, please note that we are leveraging the \$120,000 from the Wyoming Department of Agriculture's Wild Horse Research Program to place GPS collars on wild horses to understand how horses move across the public-private land matrix, rangeland habitat use, and interactions with wildlife and livestock. Since the grant was awarded we have met with BLM, USGS, and Wyoming Department of Agriculture staff to determine how we can integrate with existing management to employ our proposal. Although our funded proposal was for Red Desert HMA Complex (i.e., Stewart Creek, Green Mountain, and Crooks Mountain) we have determined through our communication with BLM Wild Horse and Burro Specialists Jay D'Ewart and Ben Smith and Wyoming BLM Horse Project Lead June Wendlandt that deploying collars in Adobe Town HMA is the most feasible option. Therefore, we have verbal permission from Wyoming Department of Agriculture's Natural Resources and Policy Manager Chris Wichmann to move forward with amending our proposal.

Also, we have built into the attached documents the following requests for PhD support and additional collars (that are in priority order). (1) Additional 1 Year of Ph.D. Student Support: We currently have funds for 1.5 years. We also have the opportunity to pick up 1 additional year from our Department (Ecosystem Science and Management) if we can find 1 year as a match (I am copying our Department Head, Dr. Scott Miller, to keep him in the loop). Can BLM provide 1 year of funding to match the 1 year of ESM funding for the PhD Student? If so, the cost for 1 year of support for a PhD student at the University of Wyoming is \$31,350 (<http://www.uwyo.edu/research/proposal%20development/proposal-tool-kit/graduate-assistantships.html>). Those funds could be spent in 2018 or 2019 for your planning purposes. This would provide 3.5 years of support for the PhD student (the minimum needed is 3 and often additional years of support may be needed; so this is a good level) and would allow us assure Jake (the student interested in the project whom you met today) support from start to finish. Also, we could also expand how Jake might assist your office (and Jay and Ben) with any additional data analysis or GIS work. (2) Additional GPS Collars: We currently have funds for 18 Lotek collars. We would like to increase our total sample size to 36. Based on our estimate of \$2,100 per collar, the cost for 18 additional Lotek collars would be \$37,800.

Thanks for your consideration of our proposal. If there are any questions please contact me at any time.

Sincerely,

John Derek Scasta
University of Wyoming
Cell: 307-314-2615
jscasta@uwyo.edu

BLM Research Proposal Format

A. COVER PAGE



US Department of Interior
Bureau of Land Management
Wild Horse and Burro Program



Proposal for Research Effort

- 1a. University of Wyoming Wild Horse GPS Collar Project on Adobe Town HMA
TITLE OF PROPOSAL (90 Character Maximum)
- 1b. PI - Scasta, John Derek; Co-PI - Beck, Jeff and Dinkins, Jon
INVESTIGATORS (Principal-Investigator LAST NAME, FIRST NAME; Co-Investigators LAST NAME, FIRST NAME)
- 2a. Scasta, John Derek
NAME OF PRINCIPAL INVESTIGATOR (PI)
- 2b. Assistant Professor
POSITION TITLE
- 2c. jscasta@uwyo.edu
EMAIL
- 2d. University of WY, Ecosystem Sci. & Mgmt.
INSTITUTION AND DEPARTMENT
- 2e.f. 307-314-2615 307-766-6403
PHONE FAX
- 2g. ADDRESS: 1000 E University Avenue, Laramie, WY 82071

3a. THIS PROPOSAL IS A: (Mark one only) ☒ NEW APPLICATION ☐ CONTINUATION ☐ UNPLANNED EXTENSION

3b. FOR COMPLETION, A FUNDING REQUEST IS:

INCLUDED and REQUIRED	INCLUDED but NOT REQUIRED	NOT INCLUDED
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3c. AMOUNT OF FUNDING REQUESTED:

\$	\$	\$
FIRST YEAR	SECOND YEAR	THIRD YEAR
<input type="text"/>	<input type="text"/>	<input type="text"/>

3d,e DATES OF PROPOSED STUDY:

9/2016	5/2020
START	END
<input type="text"/>	<input type="text"/>

AGREEMENT: It is understood and agreed by the undersigned if this proposal / application is approved, whether or not a grant is made, it will be according to the terms of the proposal and the stipulations set forth in the accompanying instructions. In addition, a written agreement appropriate for the nature of the proposed work (e.g., Memorandum of Understanding, Assistance Agreement, Task Order, letter of agreement) will be required to outline the obligations of the researchers and the BLM in the conduct of the study.

PRINCIPAL INVESTIGATOR ASSURANCE: I agree to accept responsibility for the conduct, completion and reporting of the study proposed here and to provide the agreed upon progress and final reports.

4a. SIGNATURE OF PRINCIPAL INVESTIGATOR: John Derek Scasta DATE: 4-1-2016

CERTIFICATION AND ACCEPTANCE: I certify that the statements made in this application are true and complete to the best of our knowledge, and I accept the obligation to comply with the above agreement. I understand that the Principal Investigator and his/her department will be responsible for any expenses incurred by this project which exceed the approved funding amount.

4b. OFFICIAL SIGNING FOR ORGANIZATION: GREENSHEET APPROVED (ATTACHED) FOR WY-DAG. DATE: 12-14-2014

4c. ADDRESS: CONTACT: LINDA OSTERNAN - VP RESEARCH
4d. osterman@uwyo.edu
EMAIL

4e.f. 307-766-5320
PHONE FAX

Home Project Instructions

Project Detail

UW Project ID		Date Closed	
Budget(s)		Fiscal Manager(s) Shaver, Alison Lebeda and Beck, Jeffrey L.	
UW Investigators Scasta, John Beck, Jeffrey L.		Other Investigators	
Agency WY Dept of Agriculture		Sponsor Number	
Key Word(s) Range Management, Wildlife, Animal Ecology			
Brief Title Wild Horse Spatial Movement Patterns across the Public-private Land Matrix, Rangeland Habitat Use, a			
Full Title Wild Horse Spatial Movement Patterns across the Public-private Land Matrix, Rangeland Habitat Use, and Interactions with Wildlife and Livestock			
Short Description			
Submission Deadline	12/19/2014	Contact	Scasta, John
Regulatory Issues	Animals	Pending	Yes
Start Date	5/15/2015	End Date	8/15/2017
Proposal Amount	\$.00	Award Amount	
UW Amount	\$0.00	Other Amount	\$0.00
Cost Share		Amount	
Subcontracts		Amount	
Wyoming Locations	Sweetwater	CFDA Number	
Other Locations		Type	
Resources Required			
Equipment Request	Yes	Maintenance Source	No maintenance support needed.
Financial Interest	No		
Indirect Cost Rate	0.00%	Justification	This is state money from the Wyoming Department of Agriculture. No Indirect Costs are covered as far as we know.
Distribution		Amount	
Complete	Yes	Date	12/17/2014
Report Date(s)		College Administrator	
Report Comment		Amount	
Memo	Dinkins, Jon B. (jdinkins@uwyo.edu), Postdoctoral Associate In Ecosystem Science and Management is a Co-Investigator.		
Awarded		Award Date	

[Return](#)

BLM Research Proposal Format

A. COVER PAGE



US Department of Interior
Bureau of Land Management
Wild Horse and Burro Program



Proposal for Research Effort

(N)

- 1a. University of Wyoming Wild Horse GPS Collar Project on Adobe Town HMA
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3a. THIS PROPOSAL IS A: (Mark one only) ☒ NEW APPLICATION ☐ CONTINUATION ☐ UNPLANNED EXTENSION

3b. FOR COMPLETION, A FUNDING REQUEST IS:

	INCLUDED and REQUIRED	INCLUDED but NOT REQUIRED	NOT INCLUDED
3c. AMOUNT OF FUNDING REQUESTED:	\$ <u> </u>	\$ <u> </u>	\$ <u> </u>
	FIRST YEAR	SECOND YEAR	THIRD YEAR

3d,e DATES OF PROPOSED STUDY:

<u>9/2016</u>	<u>5/2020</u>
START	END

AGREEMENT: It is understood and agreed by the undersigned if this proposal / application is approved, whether or not a grant is made, it will be according to the terms of the proposal and the stipulations set forth in the accompanying instructions. In addition, a written agreement appropriate for the nature of the proposed work (e.g., Memorandum of Understanding, Assistance Agreement, Task Order, letter of agreement) will be required to outline the obligations of the researchers and the BLM in the conduct of the study.

PRINCIPAL INVESTIGATOR ASSURANCE: I agree to accept responsibility for the conduct, completion and reporting of the study proposed here and to provide the agreed upon progress and final reports.

4a. SIGNATURE OF PRINCIPAL INVESTIGATOR: _____ DATE: _____

CERTIFICATION AND ACCEPTANCE: I certify that the statements made in this application are true and complete to the best of our knowledge, and I accept the obligation to comply with the above agreement. I understand that the Principal Investigator and his/her department will be responsible for any expenses incurred by this project which exceed the approved funding amount.

4b. OFFICIAL SIGNING FOR ORGANIZATION: _____ DATE: _____

4c. ADDRESS: _____

4d. _____
EMAIL

4e.f. _____
PHONE FAX

1 **B. RESEARCH OBJECTIVES**

2
3 **BLM Wild Horse and Burro Program**
4 **Proposal for Collaborative Research Effort**
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6
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8 **Name and Address of Applicant or Applicant Organization:**

9 J. Derek Scasta, PhD, Assistant Professor and Extension Rangeland Specialist, Plant-
10 Herbivore Interaction Ecology, Department of Ecosystem Science and Management,
11 University of Wyoming, E-mail: jscasta@uwyo.edu
12 307-314-2615
13

14 **Title of Project:**

15 University of Wyoming Wild Horse GPS Collar Project on Adobe Town HMA
16

17 **Use this space for an ABSTRACT of your Proposed Research, Outline Objectives and Methods (250**
18 **work maximum).**

19 We propose placing Lotek GPS collars on 18 mature mares from the Adobe Town HMA.
20 The use of GPS collars has been used to understand spatial movements across
21 landscapes in Canada and Australia but to date has not replaced visual observation as
22 the primary approach to measuring horse spatial patterns (Hampson et al. 2010; Girard et
23 al. 2013). We will purchase Lotek collar detonation drop-off devices for each collar that
24 can be dropped remotely at any time using a command unit to ensure the well-being of
25 horses. Horse spatial data will be overlain with land ownership layers, sage grouse core
26 layers, and crucial wildlife winter range layers to determine the spatial patterns of
27 movement, seasonality trends, and relative use of these landscapes. We will also identify
28 existing areas of wild horse exclusion from existing fences and assess movement
29 patterns. Collaring of horses will be in conjunction with planned BLM gathers. Our
30 objective is to understand how horses move across the Colorado-Wyoming border, how
31 the removal of horses from the checkerboard influences the movement of mares from
32 non-checkerboard portions of Adobe Town (i.e., creation of a void), how horses select
33 landscape resources relative to their proportional availability, and how site fidelity of
34 horses is influenced by season.
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**BLM Wild Horse and Burro Program
Proposal for Collaborative Research Effort**

All pages must be type written in font 12, single-spaced, with one-inch margins, and with pages numbered at bottom. Sections 1-5 cannot exceed a total of 12 pages. Do not exceed section page limits. Guidelines in italics can be deleted prior to submission.

1. Goals / Objectives / Hypotheses:

Goal

Quantify movements of horses between Wyoming & Colorado, through Adobe Town HMA to checkerboard and private lands, and seasonality of wild horse habitat use and the effects on rangeland conditions

Objectives

1. Use GPS technology to determine how Adobe Town HMA wild horses disperse to understand:
 - a. Movements across state, HMA, and private-public boundaries
 - b. Seasonality of rangeland resource selection relative to management
 - c. Effects on rangeland plant communities
2. Publish results in a peer-reviewed format
3. Provide critically needed information to state and federal partners

Hypotheses

H₁: The Wyoming-Colorado border and HMA borders are porous socio-ecological boundaries that do not inhibit wild horse movement and subsequently, intra-state and intra-HMA management is influenced by wild horse management in neighboring states, HMA's, etc. Therefore, we predict that wild horses will respond both to porosity and barriers (e.g., fences, major roads, and potentially topographic constraints) in regard to their patterns of movement within and among HMAs.

H₂: Wild horses will move in response to voids in adjacent HMA's. Consequently, we predict that removal of wild horses from checkerboard (private-public) lands in Salt Wells and Adobe Town HMA's creates a void that our collared mares will move into when and where they may occur.

H₃: Wild horse rangeland resource selection will be largely driven by availability of water and riparian resources. We thus predict that resource selection functions will indicate disproportionate use of these resources on the landscape (i.e., wild horses will spend a greater amount of time relative to proportion of water and riparian resource availability). We also predict differential wild horse resource use of water and riparian resources on a seasonal basis according to the life history needs of wild horses.

100

2. Specific Aims: (Sections 1 and 2 are not to exceed 2 pages)

Year	Month	Aims
2016	April to May	Complete the scoping and process for Adobe Town HMA gather efforts
2016	June to July	Complete University of Wyoming Institutional Animal Care and Use Committee approval process for our wild horse research protocols to ensure the safety of horses
2016	September	Ph.D. student will enroll at the University of Wyoming and we will prepare GPS collars
2016	November	Conduct gathers in Adobe Town HMA and deploy collars on mature mares
2016 - 2018	November to April	Conduct monthly telemetry tracking to determine where horses are and visually assess safety of the collars on horses for problems (examples might include hoof caught in the collar, severe rubbing wounds, etc.). If problems are occurring that may cause harm to the horse trigger anytime remote drop-off feature using the drop-off command unit
2018	June to August	Conduct ground-based vegetation measurements selected based on site selection data and utilize standardized rangeland monitoring standards (shrub cover, shrub structure, bare ground, herbaceous cover, etc.); this will include sites used by horses, randomly selected sites, and previously identified sites that are excluded from horses. vegetation monitoring us
2018 - 2019	September to May	Conduct spatial analysis of GPS collar data, develop horse spatial distribution maps, resource selection function (RSF) modeling, and analyze vegetation data.
2019	June	Prepare publications and submit to refereed journals
2019	July	Prepare final report for BLM and Wyoming Department of Ag
2019	December	Ph.D. student graduates
Annually	October	Provide research updates to BLM and Wyoming Department of Ag

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114 **3. Background and Significance/Preliminary Studies: (Not to exceed 4 pages)**

115 Wild horse management on western rangelands is an ecological and sociological issue
116 of escalating concern. Wyoming currently has 3,760 free-roaming horses or ~8% of the
117 47,329 head in the western United States (BLM 2015). The Wild Free-Roaming Horses
118 and Burros Act of 1971 directed the federal management of these wild equids on public
119 lands as part of the natural system (Public Law 92-195). More recently, The Federal
120 Land Policy and Management Act of 1976 (Public Law 94-579), and The Public
121 Rangelands Improvement Act of 1978 (Public Law 95-514), further established the
122 enforcement authority of the Bureau of Land Management (BLM) to remove excess wild
123 horses when populations exceed appropriate management levels (AML's) to maintain the
124 ecological integrity of rangelands.

125
126 Since 1971, BLM has removed 195,000 head from western public lands and attempted
127 to place many of these horses in adoption. However, a struggling adoption program
128 coupled with annual population growth rates that can exceed 20% has relegated many
129 horses to temporary holding facilities (Eberhardt et al. 1982; Garrott and Taylor 1990;
130 Garrott et al. 1991). As of March 1, 2015, there were an estimated 47,329 horses and
131 10,821 burros roaming on western rangelands, or almost 2 times more than the national
132 AML of 26,715. There are currently 47,403 horses that are in temporary holding corrals or
133 long-term pastures; more than are currently free-roaming (BLM January 2016). Federal
134 expenditures for the adoption and relocation program in FY 2013 were \$76 million, with
135 \$51 million accounting for holding, gathering and removal costs. The cost of managing
136 horses in temporary holding facilities is expected to reach \$500 million by 2021 (Garrot
137 and Oli 2013).

138
139 Further complicating wild horse management in Wyoming is the largely unfenced
140 matrix of public-private land ownership known as "checkerboard", a relic of the Union
141 Pacific Railroad, which extends 32.2 km (20 mi) north and south approximately paralleling
142 Interstate 80 in southern Wyoming, and other areas where private lands are in proximity
143 to public lands (Calef 1952; Graff 2014). At least ten studies have quantified diet
144 composition of wild horses and this research has suggests that wild horses are strong
145 grazers of grasses and grasslike plants, stronger even than beef cattle (Scasta 2014).
146 However, horses can shift diets to shrubs during extreme winters potentially overlapping
147 with wildlife (Krysl et al. 1984). There are also ecological concerns due to evidence
148 suggesting wild horses may disproportionately use riparian features of the landscape
149 (Crane et al. 1997; Hampson et al. 2010). Furthermore, the seasonality of this
150 disproportionate landscape use complicates the management of grazing permits and
151 optimization of federal lands for multiple use, especially wildlife such as pronghorn in
152 Wyoming (Miller 1983).

153
154 The movement of horses between, through and into Herd Management Areas (HMA's)
155 makes management of wildlife and livestock interactions with horses, and horse
156 populations by BLM staff, very difficult (personal communication with BLM Wild Horse
157 Specialists in Jay D'Ewart - Rocksprings, WY and Benjamin Smith - Rawlins, WY). It is
158 also complicated by the movement of horses from HMA's into privately owned lands,
159 across the state border with Colorado, and areas of checkerboard land that may or may

not be part of the HMA. Studies have reported that wild horse occupancy may displace other ungulates simply by their physical presence (Miller 1983). Several studies have also demonstrated that the availability of water affects horse distribution and when water becomes scarce interspecific aggression from wild horses may force cattle and pronghorn off watering sites (Miller 1983). However, the presence of horses at water sources did not prevent sage grouse or coyotes from drinking (Miller 1983).

Horses are also known to disproportionately select streamsides, bog meadows and mountain sagebrush habitat in Wyoming (Crane et al. 1987). The preferential use by horses of sites near water may also cause reductions in plant species richness, cover, and abundance of grasses and shrubs (Beever et al. 2000). Furthermore, free roaming horses are very capable of traveling great distances from water, up to 55 km in Australia, and may only go to water up to every 4 days; an indication of their ability to persist in semi-arid or arid regions (Hampson et al. 2010). There currently are no quantitative data on these types of movement patterns in Wyoming. The use of GPS collars on horses in the US has been debated but new detonation devices, fail-safe drop settings, proper horse selection, and proper placement make these spatial measurement tools feasible (Collins et al. 2014).

The impact of wild horses on rangeland plant communities is an issue of great concern and must be managed in tandem domestic livestock and wildlife utilization. We had initially considered proposing a study of horse diet selection but after reviewing the literature found that at least ten scientific studies have already quantified this information across western North America, including Wyoming (Hansen 1976; Hubbard and Hansen 1976; Hansen et al. 1977; Salter and Hudson 1979; Salter and Hudson 1980; Hanley and Hanley 1982; Krysl et al. 1984; Stephenson et al. 1985; Mcinnis and Vavra 1987; Crane et al. 1997; Smith et al. 1998). One of the Wyoming studies by Krysl et al. (1984) is actually one of the best of these studies because this study quantified species availability, compared diet composition of horses to cattle, and manipulated utilization levels. All of these studies suggest that wild horses are strong grazers of grasses and grasslike plants; stronger even than beef cattle (Scasta 2014). Research from northern Nevada also indicates that horse grazed areas had lower sagebrush density and plant diversity, greater soil penetration resistance, and lower soil aggregate stability than areas not grazed by horses; and heavily horse grazed areas had lower perennial grass cover (Davies et al. 2014). Evidence suggests that wild horses may disproportionately use features of the landscape such as riparian areas and wet meadows more than other areas and have a negative effect on watersheds (Crane et al. 1997; Hampson et al. 2010). Recent studies have also suggested that wild horse grazing may limit the recruitment of new sagebrush plants and have deleterious effects on sage grouse (Davies et al. 2014).

It is also important to consider that wild horses are not necessarily ecologically comparable to livestock or native wildlife, due to different physiological and morphological mouth structures (incisor presence/absence and prehensile ability of the lips) and fermentation digestive system (foregut in true ruminants versus hindgut in horses) (Beever et al. 2003; Scasta 2014). The different digestive strategy places a greater time-

energy constraint and limits the use of low-quality forage (Hanley and Hanley 1982). This results in a high-intake strategy under these circumstances and results in 20 to 65% greater consumption by volume of plant herbage than a cow of an equivalent size (Hanley 1982; Menard et al. 2002). Furthermore, due to the cecal digestive strategy, horses employ a high intake strategy consuming small and frequent meals with daily estimates of time spent grazing ranging from 10-17 hours (Fleurance et al. 2001). A review of comparative anatomy suggests that digestive tracts in true ruminants comprise 40% of body weight compared to 15% in horses and that horses only achieve 70% efficiency in comparison (i.e., a tradeoff) (Janis 1976). This physiological difference results in much more rapid passage time in horses compared to cattle: 48 hours versus 70-90 hours respectively (Janis 1976). The more prehensile lips of horses coupled with upper front incisors may also result in grazing plants closer to the ground than cattle and, consequently, causing greater damage and requiring longer recovery periods for plants (Symanski 1994).

The seasonality of this disproportionate landscape use could complicate the management of federal livestock grazing permits and the management of wildlife habitat for three reasons: 1) When livestock are put on an allotment in the spring, impacts from horses to these areas may already have occurred (this degradation before livestock grazing even begins is an issue of concern for private livestock producers grazing on public land (personal communication)). 2) Critical winter wildlife range may also be important for horses and may increase the potential for spatial overlap as all rangeland ungulates may select sites with lower wind speeds and snow pack during severe winters. 3) Other rangeland ungulates also distribute based on water availability and location and given the predicted escalation of drought and warming in the western United States (Meehl and Tebaldi 2004; Westerling et al. 2006; Burke and Brown 2008; IPCC 2014) these conflicts over water resources could become more common.

In conclusion, our proposal couples spatial technology with rangeland vegetation monitoring to provide information to help BLM Wild Horse and Burro specialists in Wyoming manage wild horses in an ecological and sustainable manner. Given the litigation between states and the federal government, our research will provide data to guide management decisions. The lack of GPS technology use in studying wild horses in the United States, but the use of this technology in other countries such as Australia and Canada, indicates that technology has surpassed the problem and our proposal will propel us forward to a state-of-the-art scientific study. This will advance the current state of what we know in the United States about the socio-ecological intricacies of wild horse management in a new and insightful way that has not happened to date. This proposal is building on our published work on wild horse diets and conflicts (Scasta, J.D. 2014. Dietary composition and conflicts of livestock and wildlife on rangeland. University of Wyoming Extension Bulletin B-1260. <http://www.wyoextension.org/agpubs/pubs/B-1260.pdf>; Scasta, J.D., J.L. Beck, and C.L. Angwin. Accepted 1/5/2016; In Press. Meta-analysis of wild horse diet composition and potential conflict with livestock and wild ungulates on western rangelands of North America. *Rangeland Ecology and Management* <http://dx.doi.org/10.1016/j.rama.2016.01.001>). Finally, we will publish our findings in animal ecology journals, Extension bulletins, and share in presentations

252 throughout the state and western United States. Our results will be transparent and
253 accessible. Leadership on dissemination will come from Dr. Scasta who has a 55%
254 Extension appointment.
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306 **4. Experimental Approach: (Not to exceed 5 pages)**

307 We will coordinate with the Rawlins BLM Field Office to deploy collars at the time of
 308 helicopter gathers. We will aim to deploy a single collar on mares within distinct social
 309 groups or bands to minimize auto-correlation and maximize spatial independence.
 310 Collars will be fit to minimize rubbing and discomfort to horses. This is based on our field
 311 training with Dr. Kate Schoenecker – January 14 and 15 in Pauls Valley, OK (Figure 1,
 312 Figure 2, Figure 3).
 313



Figure 1. Dr. Jeff Beck receiving training on proper horse collar placement from USGS researchers.



Figure 2. Lotek model GPS horse collar on a BLM mare. Note the drop-off feature on the collar. Our collars will be equipped with anytime drop-off devices that can be remotely triggered with a command unit at any time to ensure horse safety.



Figure 3. Proper placement and fit is critical as grazing behavior and lowering of the head and stretching of the neck alters how tightly collars fit.

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 315

316 According to the draft scoping statement:

317
318 *"The gather operations would include helicopter drive trapping. This*
319 *capture method utilizes a helicopter to herd wild horses into a temporary*
320 *trap. Gathering is anticipated to start on or about November 1, 2016, on*
321 *Adobe Town HMA only. The Adobe Town HMA is adjacent to the Salt*
322 *Wells Creek HMA. These two HMAs have been managed as a Complex in*
323 *the past, but for this project, they would be managed separately.*

324
325 *The proposed action is in conformance with the Rawlins Resource*
326 *Management Plan (RMP) approved on December 24, 2008, and the Green*
327 *River RMP approved on August 8, 1997, as amended. Management*
328 *objectives for wild horses include providing for the protection of the*
329 *rangeland resource, while maintaining a self-sustaining, healthy population*
330 *of wild horses on the public land in those areas where horses existed at the*
331 *time the WHA was passed (1971). Wild horse HMAs were established and*
332 *confirmed through the RMP planning process.*

333
334 *To comply with NEPA and the Council on Environmental Quality*
335 *regulations, the BLM is preparing an environmental assessment (EA) for*
336 *the proposed gather. The EA will serve several purposes. It will provide*
337 *both the public and governmental agencies with information about the*
338 *potential environmental consequences of the project and alternatives;*
339 *identify measures to avoid or minimize environmental harm from the project*
340 *and alternatives; and provide the responsible official with information upon*
341 *which to make an informed decision regarding the project and whether to*
342 *prepare an environmental impact statement or finding of no significant*
343 *impact. The EA will be prepared by an interdisciplinary team of BLM*
344 *resource specialists.*

345
346 *Scoping is an essential element of the NEPA process when preparing an*
347 *environmental impact statement. Under Department of the Interior NEPA*
348 *regulations (43 CFR 46.305), the BLM may elect to apply a scoping*
349 *process when preparing an EA, although none is required. Scoping*
350 *activities are initiated early in the process to: identify reasonable*
351 *alternatives to be evaluated, identify environmental issues of concern*
352 *related to the proposed project, determine the depth of analysis for issues*
353 *addressed in the environmental document, and identify potential mitigation.*

354
355 *The proposed management action is also in conformance with the 2013*
356 *Consent Decree."*

357
358 Telemetry will be used for regular checks of horse locations and visual assessments of
359 collars. Data will be collected by programming timed release of collars and/or remote
360 anytime drop-off if needed. To lower the cost of GPS collars, we have chosen to use
361 store-on-board designs and subsequently spatial data will be downloaded. We have

362 funds in the existing award for re-locating collars although this is a potential difficulty and
 363 limitation. The timeframe for the work is presented in the Aims chart above and in the
 364 Gantt Chart in Figure 4 below.

365
 366 **Figure 4.** Tentative sequence and Gantt Chart timetable for the investigation.
 367

2016	2017	2018	2019
Complete UW IACUC			
November – Collar horses			
Track Horses	Track Horses	Track Horses	
		Collect Collars	
		Download Data	
		Vegetation Monitoring	
		Compile and Analyze Data	Compile and Analyze Data
			Prepare Reports and Refereed Publications

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393 **5. Statistical Methods: (Not to exceed 1 page)**
394 *Describe what type of data will be collected and how the data will be analyzed,*
395 *interpreted, and what assumptions will be made during the analysis and interpretation.*
396 *State the statistical methods to be used. Specify the number of observations required to*
397 *yield statistically significant results at a particular confidence level (e.g., 95%) or with*
398 *sufficient power as stated.*
399
400 The 18 captured mares will be fitted with global positioning system (GPS) collars (Lotek)
401 programmed to collect one location at a fixed time interval (to be determined) and will be
402 returned to the Adobe Town HMA at the place of capture. Collars will remain on mares
403 for up to 18 months if possible. We will test for differences in resource selection between
404 mares with high (> 90%) and low (< 90%) GPS fix rates with the use of independent
405 sample t-tests. If we find no differences ($P > 0.05$) in resource selection coefficients
406 between high and low fix-rate groups we will include all mares in resource selection
407 modeling. We will define seasons based on development of forage green-up (based on
408 NDVI measurements). We will also use digitized anthropogenic barriers or socio-
409 ecological boundaries (if not digitized we will digitize) at appropriate resolutions. We will
410 generate decay distance variables as distance from barriers or boundaries. We will also
411 develop explanatory variables to determine resource selection function and will likely
412 include elevation, riparian areas, vegetation cover, topography, aspect, etc. These
413 explanatory variables will be ground trothed with our ground-based vegetation monitoring
414 which will compare mare-preferred sites to random sites. Sampling will include species
415 composition, bare ground, and shrub structure. We will also use temperature and
416 precipitation variables to determine if weather/climate is driving spatial distribution at
417 certain times of the year. We will then use relative frequency of use as the response
418 variable in a resource selection function (RSF) model framework to predict the probability
419 of selection. We will employ an information theoretic framework using Akaike's
420 Information Criterion (AIC) to build complex models with categorical explanatory
421 variables. We will also apply mixed effects model and logistic regression to determine the
422 influence of random effects and strength of interactions that are driving where mares go
423 and the role of seasonality. We will also generate heat maps to determine areas of
424 maximum use and will provide detailed maps of individual mare movements relative to
425 social and ecological boundaries. Specifically, this will include the Wyoming-Colorado
426 border, BLM HMA and HA boundaries, surface ownership, and wildlife habitat layers.
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439 **6. Anticipated effects (Not to exceed 5 pages)**

440 We don't anticipate any negative effects on animals. This is based on our observations of
441 horses with collars at the BLM facility in Pauls Valley, OK and on the recent paper (Collins
442 GH, Petersen SL, Carr CA, Pielstick L (2014) Testing VHF/GPS Collar Design and Safety
443 in the Study of Free-Roaming Horses. PLoS ONE 9(9): e103189.
444 doi:10.1371/journal.pone.0103189). The paper by Collins et al. (2014) in particular
445 validated the safe and effective use of collars which is articulated in the abstract in the
446 following statement "*Neither custom-built nor commercial collars caused injury to study
447 horses..*" and "*This study showed that free-roaming horses can be safely marked with
448 GPS and/or VHF collars with minimal risk of injury, and that these collars can be a useful
449 tool for monitoring horses without creating a risk to horse health and wellness.*" It is
450 important to note that this study was partially funded by the BLM. Furthermore, we are
451 planning to use the same Lotek GPS collars as used by the Collins group and tested by
452 Dr. Kate Shoenecker at the Pauls Valley, OK facility.

453
454 Because the gather will adhere to BLM protocols and procedures, we are including SOP's
455 for Wild Horse Gathers and refer reviewers to the following URL:
456 [http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/wild_hor
457 ses_and_burros/gathers0.Par.70297.File.dat/SOPs%20for%20WH%20gathers.pdf](http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/wild_horses_and_burros/gathers0.Par.70297.File.dat/SOPs%20for%20WH%20gathers.pdf)
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459 Because the following document is a BLM document we have not included it as an
460 appendices as we felt we did not need to copy and show BLM their own document.
461 However, we will adhere to these SOP's stringently.

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485 **7. Pitfalls and Limitations: (Not to exceed 1 page)**

486 Our primary limitation is a limited number of collars and avoiding auto-correlation. This
487 sample size issue is primarily a limitation of funding. On that note, we are requesting
488 funds from BLM to purchase an additional 18 collars and double our sample size to 36.
489 This request is the function of BLM's expression about the generality of conclusions that
490 would come from only 18 radio collared animals.

491
492 Regardless if BLM matches our current number of collars, we will strive to distribute the
493 18 collars widely throughout the study area on mares from disparate social group. This
494 will avoid over generalizing spatial patterns of habitat use that are a function of or
495 confounded by pseudo replicated collars come on animals with strong social associations.
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531 **8. References: (No limit)**

- 532
- 533 Beaver, E.A., and P.F. Brussard. 2000. Examining ecological consequences of feral
534 horse grazing using exclosures. *Western North American Naturalist* 60(3):236-254.
- 535
- 536 Beaver, E. 2003. Management implications of the ecology of free-roaming horses in semi-
537 arid ecosystems of the western United States. *Wildlife Society Bulletin* 31(3):887-895.
- 538
- 539 BLM (2015) Wild free-roaming horse and burro populations as of March 1, 2015. U.S.
540 Department of the Interior, Bureau of Land Management.
541 http://www.blm.gov/wo/st/en/prog/whbprogram/history_and_facts/quick_facts.html
- 542
- 543 Burke, E.J., and S.J. Brown. 2008. Evaluating uncertainties in the projection of future
544 drought. *Journal of Hydrometeorology* 9:292-299.
- 545
- 546 Calef, W. 1952. Problems of grazing administration in the basins of southern Wyoming.
547 *Economic Geography* 28:122-127.
- 548
- 549 Collins, G.H., S.L. Petersen, C.A. Carr, and L. Pielstick. 2014 Testing VHF/GPS Collar
550 Design and Safety in the Study of Free-Roaming Horses. *PloS One* 9(9):e103189.
- 551
- 552 Crane, K.K., M.A. Smith, and D. Reynolds. 1997. Habitat selection patterns of feral
553 horses in southcentral Wyoming. *Journal of Range Management* 50(4):374-380.
- 554
- 555 Davies, K.W., G. Collins, and C.S. Boyd. 2014. Effects of feral free-roaming horses on
556 semi-arid rangeland ecosystems: an example from the sagebrush steppe. *Ecosphere*
557 5(10):article 127.
- 558
- 559 Eberhardt, L.L., A.K. Majorowicz, and J.A. Wilcox. 1982. Apparent rates of increase for
560 two feral horse herds. *Journal of Wildlife Management* 46(2):367-374.
- 561
- 562 Fleurance, G., P. Duncan, and B. Mallevaud. 2001. Daily intake and the selection of
563 feeding sites by horses in heterogeneous wet grasslands. *Animal Research* 50:149-156.
- 564
- 565 Garrott, R.A., D.B. Siniff, and L.L. Eberhardt. 1991. Growth rates of feral horse
566 populations. *Journal of Wildlife Management* 55(4):641-648.
- 567
- 568 Garrott, R.A., and L. Taylor. 1990. Dynamics of a feral horse population in Montana.
569 *Journal of Wildlife Management* 54(4):603-612.
- 570
- 571 Garrott, R.A., and M.K. Oli. 2013. A critical crossroad for BLM's wild horse program.
572 *Science* 341:847-848.
- 573
- 574 Graff, T. 2014. The Gather: BLM removes wild horses from checkerboard lands in SW
575 Wyoming. *Casper Star Tribune*. <http://trib.com/news/state-and-regional/blm-removes-wild->

576 horses-from-checkerboard-lands-in-sw-wyoming/article_f2ee30a2-91d3-5997-a5b3-
 577 57aad81aa9b7.html
 578
 579 Girard, T.L., E.W. Bork, S.E. Nielsen, and M.J. Alexander. 2013. Seasonal variation in
 580 habitat selection by free-ranging feral horses within Alberta's forest reserve. *Rangeland*
 581 *Ecology and Management* 66(4):428-437.
 582
 583 Hampson, B.A., M.A. de Laat, P.C. Mills, and C.C. Pollitt. 2010. Distances travelled by
 584 feral horses in 'outback' Australia. *Equine Veterinary Journal* 42(38):582-586.
 585
 586 Hanley, T.A., and K.A. Hanley. 1982. Food resource partitioning by sympatric ungulates
 587 on Great Basin rangeland. *Journal of Range Management* 35(2):152-158.
 588
 589 Hansen, R.M. 1976. Foods of free-roaming horses in southern New Mexico. *Journal of*
 590 *Range Management* 29(4):347.
 591
 592 Hansen, R.M., R.C. Clark, and W. Lawhorn. 1977. Foods of wild horses, deer, and cattle
 593 in the Douglas mountain area, Colorado. *Journal of Range Management* 30(2):116-118.
 594
 595 Hubbard, R.E., and R.M. Hansen. 1976. Diets of wild horses, cattle, and mule deer in the
 596 Piceance Basin, Colorado. *Journal of Range Management* 29(5):389-392.
 597
 598 IPCC. 2014 Climate change 2014: Impacts, adaptation, and vulnerability.
 599 Intergovernmental Panel on Climate Change. [https://www.ipcc.ch/pdf/assessment-](https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-FrontMatterA_FINAL.pdf)
 600 [report/ar5/wg2/WGIIAR5-FrontMatterA_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-FrontMatterA_FINAL.pdf)
 601
 602 Janis, C. 1976. The evolutionary strategy of the Equidae and the origins of rumen and
 603 cecal digestion. *Evolution* 30:757-774.
 604
 605 Krysl, L.J., M.E. Hubbert, B.F. Sowell, G.E. Plumb, T.K. Jewett, M.A. Smith, and J.W.
 606 Waggoner. 1984. Horses and cattle grazing in the Wyoming Red Desert. I. Food habits
 607 and dietary overlap. *Journal of Range Management* 37(1):72-76.
 608
 609 McInnis, M.L., and M. Vavra. 1987. Dietary relationships among feral horses, cattle, and
 610 pronghorn in southeastern Oregon. *Journal of Range Management* 40(1):60-66.
 611
 612 Miller, R. 1983. Habitat use of feral horses and cattle in Wyoming's Red Desert. *Journal*
 613 *of Range Management* 36(2):195-199.
 614
 615 Meehl, G.A., and C. Tebaldi. 2004. More intense, more frequent and longer lasting heat
 616 waves in the 21st century. *Science* 305: 994-997.
 617
 618 Menard, C., P. Duncan, G. Fleurance, J. Georges, and M. Lila. 2002. Comparative
 619 foraging and nutrition of horses and cattle in European wetlands. *Journal of Applied*
 620 *Ecology* 39:120-133.
 621

622 Public Law 92-195 (1971). The Wild Free-Roaming Horses and Burros Act of 1971.
 623 Authenticated US Government Information, U.S. Government Printing Office.
 624 <http://www.gpo.gov/fdsys/pkg/STATUTE-85/pdf/STATUTE-85-Pg649.pdf>
 625
 626 Public Law 95-514 (1978). Public Rangelands Improvement Act of 1978. 43 USC 1901.
 627 Authenticated US Government Information, U.S. Government Printing Office.
 628 <http://www.gpo.gov/fdsys/pkg/STATUTE-92/pdf/STATUTE-92-Pg1803.pdf>
 629
 630 Public Law 94-579 (1976). The Federal Land Policy and Management Act of 1976 As
 631 Amended. Authenticated US Government Information, U.S. Government Printing Office.
 632 <http://www.gpo.gov/fdsys/pkg/STATUTE-90/pdf/STATUTE-90-Pg2743.pdf>
 633
 634 Salter, R.E., and R.J. Hudson. 1979. Feeding ecology of feral horses in western Alberta.
 635 Journal of Range Management 32(3):221-225.
 636
 637 Salter, R.E., and R.J. Hudson. 1980. Range relationships of feral horses with wild
 638 ungulates and cattle in western Alberta. Journal of Range Management 33(4):266-271.
 639
 640 Scasta, J.D. 2014. Dietary composition and conflicts of livestock and wildlife on
 641 rangeland. University of Wyoming Extension Bulletin B-1260.
 642 <http://www.wyoextension.org/agpubs/pubs/B-1260.pdf>
 643
 644 Smith, C., Valdez, R., Holechek, J.L., Zwank, P.J., and M. Cardenas. 1998. Diets of
 645 native and non-native ungulates in southcentral New Mexico. The Southwestern
 646 Naturalist 43(2):163-169.
 647
 648 Stephenson, T.E., J.L. Holechek, and C.B. Kuykendall. 1985. Diets of four wild ungulates
 649 on winter range in northcentral New Mexico. The Southwestern Naturalist 30(3):437-441.
 650
 651 Symanski, R. 1994. Contested realities: feral horses in outback Australia. Annals of the
 652 Association of American Geographers 84:251-269.
 653
 654 Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. Warming and
 655 earlier spring increase western US forest wildfire activity. Science 313(5789):940-943.
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BIOGRAPHICAL SKETCH

**BLM Wild Horse and Burro Program
Proposal for Collaborative Research Effort**

(Complete one for Principal Investigator, each Co-Investigator, Graduate Student, etc.)

Name: Dr. John Derek Scasta Title: Assistant Professor

Education (Begin with baccalaureate training and include postdoctoral):

Institution and Location	Degree	Year Conferred	Scientific Field
Texas A&M University	BS	2004	Rangeland Ecology
Texas Tech University	MS	2008	Crop Science
Oklahoma State University	PhD	2014	Natural Resource Mgmt

Honors/Awards:

2013 Society for Range Management, Graduate Student Scientific Poster Competition, PhD. 1st Place

2012 Society for Range Management, Graduate Student Oral Paper Competition, PhD. 1st Place

Major Research Interest: Plant-Herbivore Interaction Ecology and Management

Role in Proposed Project (be specific): Supervision of Ph.D. student and oversight of GPS collaring activities. Supervision of rangeland vegetation monitoring and data collection. Extension of results to the public and publication in refereed journals.

Previous and Current Research Support Relating to the Current Proposal:

2015 Wyoming Department of Agriculture, Wild Horse Research Program – Wildlife (WHRP-W). Wild horse spatial movement patterns across the public-private land matrix, rangeland habitat use, and interactions with wildlife and livestock. J.D. Scasta, J.L. Beck, J.B. Dinkins \$120,000

2014 Thunder Basin Research Initiative. Quantifying ecological dynamics and herbivore impacts in Thunder Basin. J.D. Scasta, L. Porensky \$70,335

Research and/or Professional Experience: I have research working on large ungulates across the Great Plains and associated distribution and effects on plant communities.

Recent relevant publications (related to proposed work or to horses / burros):

Scasta, J.D., J.L. Beck, and C.L. Angwin†. Accepted 1/5/2016; In Press. Meta-analysis of wild horse diet composition and potential conflict with livestock and wild ungulates on western rangelands of North America. Rangeland Ecology and Management

Scasta, J.D., E.T. Thacker, T.J. Hovick, D.M. Engle, B.W. Allred, S.D. Fuhlendorf, and J.R. Weir. 2015. Patch-burn grazing (PBG) as an alternative for livestock production in fire-prone ecosystems of North America. Renewable Agriculture and Food Systems doi:10.1017/S1742170515000411

Scasta, J.D. 2015. Livestock parasite management on high-elevation rangelands: ecological interactions of climate, habitat, and wildlife. Journal of Integrated Pest Management 6(1):1-12. doi:10.1093/jipm/pmv008

668 **9. Appendices: (No limit)**
669 *Proposed standard operating procedures (SOPs) or other supporting information may be*
670 *included as appendices.*
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672 BLM Standard Operating Procedures for Wild Horse Gathers
673 [http://www.blm.gov/style/medialib/blm/wo/Planning and Renewable Resources/wild hor](http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/wild_horses_and_burros/gathers0.Par.70297.File.dat/SOPs%20for%20WH%20gathers.pdf)
674 [ses and burros/gathers0.Par.70297.File.dat/SOPs%20for%20WH%20gathers.pdf](http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/wild_horses_and_burros/gathers0.Par.70297.File.dat/SOPs%20for%20WH%20gathers.pdf)
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**BLM Wild Horse and Burro Program
Proposal for Collaborative Research Effort**

(Complete one for Principal Investigator, each Co-Investigator, Graduate Student, etc.)

Name: Dr. Jeff Beck Title: Associate Professor

Education (Begin with baccalaureate training and include postdoctoral):

Institution and Location	Degree	Year Conferred	Scientific Field
Brigham Young University	BS	1993	Wildlife/Range Resources
Brigham Young University	MS	1996	Wildlife/Range Resources
University of Idaho	PhD	2003	Wildlife/Range Resources

Honors/Awards:

2012 University of Wyoming Agricultural Experiment Station – Early Career Research Achievement Award
https://www.youtube.com/watch?v=FGJ8D_1Ew50

Major Research Interest: Wildlife Habitat Restoration Ecology

Role in Proposed Project (be specific): Supervision of Ph.D. student and oversight of GPS data analyses.
Preparation of manuscripts for peer-reviewed journals.

Previous and Current Research Support Relating to the Current Proposal:

Elk Response to Wind Energy Development on Crucial Winter Range on the Dunlap Ranch, Wyoming
<http://www.uwyo.edu/esm/faculty-and-staff/beck/elk-response-wind.html>

Response of Pronghorn Population Productivity in the Red Desert, Wyoming to Anthropogenic and
Environmental Change <http://www.uwyo.edu/esm/faculty-and-staff/beck/pronghorn-productivity-desert.html>

Research and/or Professional Experience: Dr. Beck has extensive experience using GPS tracking data on
a variety of wildlife species. This has led to the development of resource selection functions (RSF) and
prediction modeling.

Recent relevant publications (related to proposed work or to horses / burros):

Clapp, J. G., and J. L. Beck. 2015. Evaluating distributional shifts in home range estimates. Ecology and
Evolution 5:3869– 3878. doi: 10.1002/ece3.1655

Clapp, Justin G., Jeffrey L. Beck, and Kenneth G. Gerow. "Post-release acclimation of translocated low-
elevation, non-migratory bighorn sheep." Wildlife Society Bulletin 38.3 (2014): 657-663.

Buchanan, C. B., J. L. Beck, and T. E. Bills. 2014. Seasonal resource selection and distributional response
by elk to development of a natural gas field. Rangeland Ecology and Management 67:369–379. doi:
<http://dx.doi.org/10.2111/REMD-13-00136.1>

832 **Biographical Sketch for Dr. Jonathan Dinkins (Co-PI on Wyoming Department of Agriculture Grant)**
833
834 Dr. Jonathan B. Dinkins is a Postdoctoral Research Associate assessing population dynamics and habitat
835 use of wildlife. He has over 10 years of experience working on topics including animal behavior, population
836 dynamics, predator-prey dynamics, wildlife habitat use, and human-wildlife interactions (including livestock-
837 wildlife and agriculture-wildlife interactions). During this time, Dr. Dinkins worked on quantitative research
838 projects for the US Geological Survey, US Forest Service, Montana State University, University of Montana,
839 Utah State University, and University of Wyoming. These research projects were focused on wildlife
840 demography in relation to habitat, predator effects on site selection and prey vital rates, wildlife habitat
841 related to anthropogenic development, West Nile Virus, and noxious weeds. Current research topics
842 include effects of interactions among avian predators and habitat in relation to sage-grouse and impacts of
843 hunting on greater sage-grouse populations. Dr. Dinkins has published population dynamics and habitat
844 based research in the following journals: Auk; Condor; Journal of Canadian Zoology; and Human Wildlife
845 Interactions. Dr. Dinkins has assisted with teaching courses in Animal Behavior, Dynamics of Structured
846 Populations, and Wildlife Damage Management at Utah State University. While working as a Wildlife
847 Biologist for the Nez Perce–Clearwater National Forest, he gained experience in habitat and wildlife
848 management. Dr. Dinkins will assist with spatial analyses of the GPS collar data.
849
850 **Biographical Sketch for Mr. Jacob Hennig (Potential PhD. Student)**
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852 Mr. Jacob Hennig holds a Master of Science degree in Natural Resources and Environmental Sciences
853 from the University of Illinois at Urbana-Champaign from 2014. The focus was reconciling aerial and
854 ground-based surveys of waterfowl in the lower Wabash floodplain. Currently, Jacob is working for Dr. Jeff
855 Beck as a technician on sage-grouse habitat mapping and is located in Dr. Beck's laboratory. Jacob has a
856 suite of spatial analyses and mapping skills and will be a major asset to this wild horse research project.
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APPENDIX 2 Standard Operating Procedures for Wild Horse Gatherers

Gathers are conducted by utilizing contractors from the Wild Horse Gatherers-Western States Contract or BLM personnel. The following standard operating procedures (SOPs) for gathering and handling wild horses apply whether a contractor or BLM personnel conduct a gather. For helicopter gathers conducted by BLM personnel, gather operations would be conducted in conformance with the *Wild Horse Aviation Management Handbook* (BLM 2009b), IM 2015-151, and IM 2015-070.

Prior to any gathering operation, the BLM would provide for a pre-gather evaluation of existing conditions in the gather area(s). The evaluation would include animal conditions, prevailing temperatures, drought conditions, soil conditions, road conditions, and a topographic map with WSA boundaries, the location of fences, other physical barriers, and acceptable gather locations in relation to animal distribution. The evaluation would determine whether the proposed activities would necessitate the presence of a veterinarian during operations. If it is determined that a large number of animals may need to be euthanized or gather operations could be facilitated by a veterinarian, these services would be arranged before the gather would proceed. The contractor would be apprised of all conditions and would be given instructions regarding the gather and handling of animals to ensure their health and welfare is protected.

Gather sites and temporary holding sites would be located to reduce the likelihood of injury and stress to the animals, and to minimize potential damage to the natural resources of the area. These sites would be located on or near existing roads whenever possible.

The primary gather methods used in the performance of gather operations include:

1. Helicopter Drive Gathering. This gather method involves utilizing a helicopter to herd wild horses into a temporary gather site.
2. Helicopter Assisted Roping. This gather method involves utilizing a helicopter to herd wild horses to ropers.
3. Bait Trapping. This gather method involves utilizing bait (e.g., water or feed) to lure wild horses into a temporary gather site.

The following procedures and stipulations would be followed to ensure the welfare, safety and humane treatment of wild horses in accordance with the provisions of 43 CFR 4700 and IM 2015-151.

A. Gather Methods used in the Performance of Gather Contract Operations

The primary concern of the contractor is the safe and humane handling of all animals gathered. All gather attempts shall incorporate the following:

1. All gather sites and holding facilities locations must be approved by the Contracting Officer's Representative (COR) and/or the Project Inspector (PI) prior to construction. The Contractor may also be required to change or move gather locations as determined

by the COR/PI. All gather sites and holding facilities not located on public land must have prior written approval of the landowner.

2. The rate of movement and distance the animals travel shall not exceed limitations set by the COR who would consider terrain, physical barriers, access limitations, weather, extreme temperature (high and low), condition of the animals, urgency of the operation (animals facing drought, starvation, fire rehabilitation, etc.) and other factors. In consultation with the contractor the distance the animals travel would account for the different factors listed above and concerns with each HMA.
3. All gather sites, wings, and holding facilities shall be constructed, maintained and operated to handle the animals in a safe and humane manner and be in accordance with the following:
 - a. Gather sites and holding facilities shall be constructed of portable panels, the top of which shall not be less than 72 inches high for horses and 60 inches high for burros, and the bottom rail of which shall not be more than 12 inches from ground level. All gather sites and holding facilities shall be oval or round in design.
 - b. All loading chute sides shall be a minimum of 6 feet high and shall be fully covered with plywood or metal without holes.
 - c. All runways shall be a minimum of 30 feet long and a minimum of 6 feet high for horses, and 5 feet high for burros, and shall be covered with plywood, burlap, plastic snow fence or like material a minimum of 1 foot to 5 feet above ground level for burros and 1 foot to 6 feet for horses. The location of the government furnished portable fly chute to restrain, age, or provide additional care for the animals shall be placed in the runway in a manner as instructed by or in concurrence with the COR/PI.
 - d. All crowding pens including the gates leading to the runways shall be covered with a material which prevents the animals from seeing out (plywood, burlap, plastic snow fence, etc.) and shall be covered a minimum of 1 foot to 5 feet above ground level for burros and 2 feet to 6 feet for horses.
 - e. All pens and runways used for the movement and handling of animals shall be connected with hinged self-locking gates.
4. No modification of existing fences would be made without authorization from the COR/PI. The Contractor shall be responsible for restoration of any fence modification which he has made.
5. When dust conditions occur within or adjacent to the gather site or holding facility, the Contractor shall be required to wet down the ground with water.

6. Alternate pens, within the holding facility shall be furnished by the Contractor to separate mares or jennies with small foals, sick and injured animals, strays, or other animals the COR determines need to be housed in a separate pen from the other animals. Animals shall be sorted as to age, number, size, temperament, sex, and condition when in the holding facility so as to minimize, to the extent possible, injury due to fighting and trampling. Under normal conditions, the government would require that animals be restrained for the purpose of determining an animal's age, sex, or other necessary procedures. In these instances, a portable restraining chute may be necessary and would be provided by the government. Alternate pens shall be furnished by the Contractor to hold animals if the specific gathering requires that animals be released back into the gather area(s). In areas requiring one or more satellite gather site, and where a centralized holding facility is utilized, the contractor may be required to provide additional holding pens to segregate animals transported from remote locations so they may be returned to their traditional ranges. Either segregation or temporary marking and later segregation would be at the discretion of the COR.
7. The Contractor shall provide animals held in the gather sites and/or holding facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Animals held for 10 hours or more in the gather site or holding facilities shall be provided good quality hay at the rate of not less than two pounds of hay per 100 pounds of estimated body weight per day. The contractor would supply certified weed free hay if required by State, County, and Federal regulation.
8. An animal that is held at a temporary holding facility through the night is defined as a horse/burro feed day. An animal that is held for only a portion of a day and is shipped or released does not constitute a feed day.
9. It is the responsibility of the Contractor to provide security to prevent loss, injury or death of gathered animals until delivery to final destination.
10. The Contractor shall restrain sick or injured animals if treatment is necessary. The COR/PI would determine if animals must be euthanized and provide for the destruction of such animals. The Contractor may be required to humanely euthanize animals in the field and to dispose of the carcasses as directed by the COR/PI.

11. Animals shall be transported to their final destination from temporary holding facilities as quickly as possible after gather unless prior approval is granted by the COR for unusual circumstances. Animals to be released back into the HMA following gather operations may be held up to 21 days or as directed by the COR. Animals shall not be held in gather sites and/or temporary holding facilities on days when there is no work being conducted except as specified by the COR. The Contractor shall schedule shipments of animals to arrive at final destination between 7:00 a.m. and 4:00 p.m. No shipments shall be scheduled to arrive at final destination on Sunday and Federal holidays; unless prior approval has been obtained by the COR. Animals shall not be allowed to remain standing on trucks while not in transport for a combined period of greater than three (3) hours in any 24 hour period. Animals that are to be released back into the gather area may need to be transported back to the original gather site. This determination would be at the discretion of the COR or Field Office Wild Horse & Burro Specialist.

B. Gather Methods That May Be Used in the Performance of a Gather

1. Gather attempts may be accomplished by utilizing bait (feed, water, mineral licks) to lure animals into a temporary gather site. If this gather method is selected, the following applies:
 - a. Finger gates shall not be constructed of materials such as "T" posts, sharpened willows, etc., that may be injurious to animals.
 - b. All trigger and/or trip gate devices must be approved by the COR/PI prior to gather of animals.
 - c. Gather sites shall be checked a minimum of once every 10 hours.
2. Gather attempts may be accomplished by utilizing a helicopter to drive animals into a temporary gather site. If the contractor selects this method the following applies:
 - a. A minimum of two saddle-horses shall be immediately available at the gather site to accomplish roping if necessary. Roping shall be done as determined by the COR/PI. Under no circumstances shall animals be tied down for more than one-half hour.
 - b. The contractor shall assure that foals shall not be left behind, and orphaned.
3. Gather attempts may be accomplished by utilizing a helicopter to drive animals to ropers. If the contractor, with the approval of the COR/PI, selects this method the following applies:
 - a. Under no circumstances shall animals be tied down for more than one hour.
 - b. The contractor shall assure that foals shall not be left behind, or orphaned.
 - c. The rate of movement and distance the animals travel shall not exceed limitations

set by the COR/PI who would consider terrain, physical barriers, weather, condition of the animals and other factors.

C. Use of Motorized Equipment

1. All motorized equipment employed in the transportation of gathered animals shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of animals. The Contractor shall provide the COR/PI, if requested, with a current safety inspection (less than one year old) for all motorized equipment and tractor-trailers used to transport animals to final destination.
2. All motorized equipment, tractor-trailers, and stock trailers shall be in good repair, of adequate rated capacity, and operated so as to ensure that gathered animals are transported without undue risk or injury.
3. Only tractor-trailers or stock trailers with a covered top shall be allowed for transporting animals from gather site(s) to temporary holding facilities, and from temporary holding facilities to final destination(s). Sides or stock racks of all trailers used for transporting animals shall be a minimum height of 6 feet 6 inches from the floor. Single deck tractor-trailers 40 feet or longer shall have at least two (2) partition gates providing at least three (3) compartments within the trailer to separate animals. Tractor-trailers less than 40 feet shall have at least one partition gate providing at least two (2) compartments within the trailer to separate the animals. Compartments in all tractor-trailers shall be of equal size plus or minus 10 percent. Each partition shall be a minimum of 6 feet high and shall have a minimum 5-foot-wide swinging gate. The use of double deck tractor-trailers is unacceptable and shall not be allowed.
4. All tractor-trailers used to transport animals to final destination(s) shall be equipped with at least one (1) door at the rear end of the trailer which is capable of sliding either horizontally or vertically. The rear door(s) of tractor-trailers and stock trailers must be capable of opening the full width of the trailer. Panels facing the inside of all trailers must be free of sharp edges or holes that could cause injury to the animals. The material facing the inside of all trailers must be strong enough so that the animals cannot push their hooves through the side. Final approval of tractor-trailers and stock trailers used to transport animals shall be held by the COR/PI.
5. Floors of tractor-trailers, stock trailers and loading chutes shall be covered and maintained with wood shavings to prevent the animals from slipping as much as possible during transport.
6. Animals to be loaded and transported in any trailer shall be as directed by the COR/PI and may include limitations on numbers according to age, size, sex, temperament and animal condition. The following minimum square feet per animal shall be allowed in all trailers:
 - 11 square feet per adult horse (1.4 linear foot in an 8 foot wide trailer);

- 8 square feet per adult burro (1.0 linear foot in an 8 foot wide trailer);
 - 6 square feet per horse foal (0.75 linear feet in an 8-foot-wide trailer);
 - 4 square feet per burro foal (0.5 linear feet in an 8-foot-wide trailer).
7. The COR/PI shall consider the condition and size of the animals, weather conditions, distance to be transported, or other factors when planning for the movement of gathered animals. The COR/PI shall provide for any brand and/or inspection services required for the gathered animals.
 8. If the COR/PI determines that dust conditions are such that the animals could be endangered during transportation, the Contractor would be instructed to adjust speed.

D. Safety and Communications

1. The Contractor shall have the means to communicate with the COR/PI and all contractor personnel engaged in the gather of wild horses utilizing a VHF/FM Transceiver or VHF/FM portable Two-Way radio. If communications are ineffective the government would take steps necessary to protect the welfare of the animals.
2. The proper operation, service and maintenance of all contractor furnished property is the responsibility of the Contractor. The BLM reserves the right to remove from service any contractor personnel or contractor furnished equipment which, in the opinion of the contracting officer or COR/PI violate contract rules, are unsafe or otherwise unsatisfactory. In this event, the Contractor would be notified in writing to furnish replacement personnel or equipment within 48 hours of notification. All such replacements must be approved in advance of operation by the Contracting Officer or his/her representative.
3. The Contractor shall obtain the necessary FCC licenses for the radio system.
4. All accidents occurring during the performance of any task order shall be immediately reported to the COR/PI.
5. Should the contractor choose to utilize a helicopter the following would apply:
 - a. The Contractor must operate in compliance with Federal Aviation Regulations, Part 91. Pilots provided by the Contractor shall comply with the Contractor's Federal Aviation Certificates, applicable regulations of the State in which the gather is located.
 - b. Fueling operations shall not take place within 1,000 feet of animals.

E. Animal Characteristics and Behavior

Releases of wild horses would be near available water when possible. If the area is new to them, a short-term adjustment period may be required while the wild horses become familiar with the new area.

F. Public Participation

Opportunities for public viewing (i.e. media, interested public) of gather operations would be made available to the extent possible; however, the primary considerations would be to protect the health, safety and welfare of the animals being gathered and the personnel involved. The public must adhere to guidance from the on-site BLM representative. It is BLM policy that the public would not be allowed to come into direct contact with wild horses being held in BLM facilities. Only authorized BLM personnel or contractors may enter the corrals or directly handle the animals. The general public may not enter the corrals or directly handle the animals at any time or for any reason during BLM operations.

G. Responsibility and Lines of Communication

- Rawlins Field Office – Contracting Officer's Representative/Project Inspector: Wild Horse and Burro Specialist
Alternate – Contracting Officer's Representative/Project Inspector: Jay D'Wert
- Wyoming State Office – Contracting Officer's Representative/Project Inspector: N/A

The Contracting Officer's Representatives (CORs) and the project inspectors (PIs) have the direct responsibility to ensure the Contractor's compliance with the contract stipulations. The Rawlins and Rock Springs Assistant Field Managers for Renewable Resources and the Rawlins and Rock Springs Field Managers will take an active role to ensure the appropriate lines of communication are established between the field, Field Office, District Office, State Office, National Program Office, and BLM Holding Facility offices. All employees involved in the gathering operations would keep the best interests of the animals at the forefront at all times.

All publicity, formal public contact and inquiries would be handled through the Assistant Field Manager for Renewable Resources and District Public Affairs Officer. These individuals would be the primary contact and would coordinate with the COR/PI on any inquiries.

The COR would coordinate with the contractor and the BLM Corrals to ensure animals are being transported from the gather site in a safe and humane manner and are arriving in good condition.

The contract specifications require humane treatment and care of the animals during removal operations. These specifications are designed to minimize the risk of injury and death during and after gather of the animals. The specifications would be vigorously enforced.

Should the Contractor show negligence and/or not perform according to contract stipulations, he would be issued written instructions, stop work orders, or defaulted.

APPENDIX 3 Historical Gather Environmental Analyses and Tables

1. Rawlins Resource Area Wild Horse Herd Management Plan, Rawlins Herd Management Area Evaluation / Capture Plan and the associated Environmental Analyses WY-036-EA3-010 and WY-036-EA3-013, 1993.
2. The Great Divide Resource Area Wild Horse Herd Management Area Evaluation / Capture Plan and the associated Environmental Analyses WY-037-EA4-122 and WY037-EA4-121, 1994.
3. Removing Excess Wild Horses From the Adobe Town and Salt Wells Creek HMA of the Rawlins and Rawlins Field Offices EA No. WY030-05-EA-158, 2006.
4. Adobe Town – Salt Wells Creek Herd Management Complex – Management Action and Environmental Assessment EA No. WY040-07-EA-37, 2007.
5. Wild Horse Gathering for the Adobe Town Wild Horse Herd Management Areas (Lost Creek, Stewart Creek, Green Mountain, Crooks Mountain, Antelope Hills), EA No. WY-030-2009-0258-EA, 2009.
6. Adobe Town – Salt Wells Creek Herd Management Area Complex Wild Horse Gather, EA No. WY-040-EA10-109, 2010.

APPENDIX 4 Project Specific Design Features

1. No Personnel working at gather sites may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage or otherwise alter or deface any archaeological resource located on public lands or Indian lands.
2. Prior to setting up a gather site or temporary holding facility, the BLM would conduct all necessary clearances (archaeological, T&E, etc.). All proposed site(s) must be inspected by a government archaeologist. Once archaeological clearance has been obtained, the gather site or temporary holding facility may be set up. Said clearance shall be arranged for by the COR, PI, or other BLM employees.
3. Gather sites and temporary holding facilities would not be constructed on wetlands or riparian zones.
4. Surface disturbing and/or disruptive activities are prohibited within 0.25-mile radius of the perimeter of occupied or undetermined Greater Sage-Grouse lek inside General Habitat Management Areas (GHMA) (BLM 2015c, MD SSS 6, p. 36).
5. Disruptive activities would be prohibited from 6pm to 8am from March 1 through May 15 on and within ¼ mile of the perimeter of occupied Greater Sage-Grouse leks (BLM 2015c, MD SSS 12, p. 37).
6. Surface disturbing and/or disruptive activities would be avoided within 2 miles of the lek or lek perimeter outside PHMA from March 15 through June 30 (BLM 2015c, MD SSS 9, p. 36).
7. Qualifying mares to be collared would be no younger than five (5) years old.

APPENDIX 5 Procedure For Affixing Radio Collars

From: Sarah Kind and Kate Shoenecker, USGS, 2016

PROCEDURE FOR AFFIXING RADIO COLLARS ON WILD HORSE MARES AND BURRO JENNIES

Introduction

The purpose of this document is to provide detailed methods that will be used for fitting radio collars on wild horse mares and burro jennies. This document does not include methods for chemical immobilization, care and maintenance of horses during gathers, while in captivity, or for any other handling procedures beyond those needed for fitting a radio collar.

The study of animal behavior and ecology requires understanding the daily life of the focal species (King 2013). It is now common to use radio collars fitted with VHF transmitters, GPS recorders, or satellite transmitters to obtain and record data on movement and other activities. While most radio collars are considered to be minimally invasive, they can impose a cost on the animal carrying them. Thus guidelines have been developed for a weight ratio (a collar should not exceed 5% of the animal's body weight) and best practice in their use (Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee 1998, Sikes et al. 2011). Collars have the potential to cause injury to the animal wearing them. However when the collar is fitted correctly and monitored regularly it can provide invaluable data without any measureable impact on the study animal.

Telemetry collars have been used extensively on carnivores (Germain et al. 2008, Creel and Christianson 2009, Hunter et al. 2010, Broekhuis et al. 2013, Cozzi et al. 2013, Dellinger et al. 2013), rodents (Chambers et al. 2000, Solomon et al. 2001, Koprowski et al. 2007), and some ungulates (Johnson et al. 2000, Creel et al. 2005, Ito et al. 2005, Allred et al. 2013, Buuveibaatar et al. 2013, Latombe et al. 2013), however they have not been commonly used on equids. A few studies have used this tool to examine habitat use, movements, and behavior of zebra (Fischhoff et al. 2007, Sundaresan et al. 2007, Brooks and Harris 2008) and Asiatic wild asses (Kaczensky et al. 2006, 2008, 2011). Even fewer published studies have used telemetry collars on feral horses (Committee on Wild Horse and Burro Research 1991, Asa 1999, Goodloe et al. 2000, Hampson et al. 2010).

Although some research has been conducted on wild horse use of vegetation and habitat (e.g. Beever and Brussard 2000), little has been done recently, and long-term, fine-scale data on habitat use has never been gathered. Yet it is important that resource managers have a scientifically based understanding of wild equid seasonal habitat use and movements on public lands. Due to the scale of some of the Herd Management Areas (HMAs) it is logistically challenging to collect habitat use data via direct observation. Utilization of GPS and VHF collars for marking and locating individuals will provide fine-scale data about where wild horses spend their time and how they use their habitat.

From March 2015 through March 2016 researchers at the U.S. Geological Survey conducted a year-long preliminary study on captive wild horses and burro jennies to determine proper fit and wear of radio collars (Schoenecker et al. 2014). The condition of wild horses wearing radio collars was compared to non-collared controls and documented with photographs. In addition, both collared individuals and controls were observed for 80 minutes each week for 14 weeks in order to quantify any impact of the collar on their behavior and health. At the end of the study period (March 2016) the collars were removed. At this time data are being analyzed and written up for submission to a peer reviewed journal (Schoenecker et al. 2016 *in prep*).

Equid radio collars consist of a 2-inch wide strap/belt made of soft pliable plastic-like material (Figure 1). Some are oval shaped with adjustments on both sides of the collar, and others are teardrop shaped with adjustments at the top of the collar so it can be fitted to different neck sizes. These are the most optimal shapes for the neck of equids (as opposed to round collars). Attached to the belt of the collar is a battery pack and transmitter module. These may either be combined in the same unit, or placed at the top and bottom of the collar to counterbalance each other. The size of the battery is determined by the amount of power needed, both in terms of length of deployment, and how much data will be recorded by the collar. The type of transmitter used will depend on the study, but all principles stated here for collar fitting and use apply regardless of communication systems used.

Collars can be placed on horses' necks when wild horses are in a padded squeeze chute during a gather. It takes between 7 and 12 minutes to fit a collar on the animal. The transmitter should be functioning and turned on before the collar is fitted, then checked that it is working correctly before the animal is released.

Fitting of the collar

Fitting a collar on an equid requires an understanding of the neck circumference and shape; that is, when the head of the animal is raised the collar should be tight, and when the head is down, i.e. grazing, the collar will become looser (Figures 2, 3). The collar should rest just behind the ears of the equid and be tight enough so it does not slip down the neck, yet loose enough that it does not interfere with movement when the neck is flexed. The collar must fit snugly when the head is up to minimize rubbing. USGS researchers used 0-1 finger between collar and neck, depending on season collar is deployed to give consideration to the potential for weight gain. Other studies (e.g. Committee on Wild Horse and Burro Research 1991) have had problems with the fitting of collars due to animals gaining weight in spring, or losing weight in winter, causing collars to become too tight or too loose. In the USGS study, researchers did notice collars were looser or tighter at different times during the year, but it did not affect the behavior of collared mares or jennies, or cause sores or wounds on mares or jennies. Whenever collars are deployed they should be fitted by experienced personnel who can attach the collar quickly but proficiently to minimize handling stress on the animal.



Figure 1. Two collar designs to use on wild horses and burros; one is teardrop shaped, and the other is oval shaped, as used in Collins et al. (2014).



Figure 2. Burro jenny fitted with a radio collar in the USGS study showing appropriate placement of collar higher on the neck, behind ears.





Figure 3. Wild horse mares fitted with radio collars in the USGS study showing head up and head down during grazing, and demonstrating appropriate placement of collars higher on the neck just behind the ears.

References

- Allred, B. W., S. D. Fuhlendorf, T. J. Hovick, R. Dwayne Elmore, D. M. Engle, and A. Joern. 2013. Conservation implications of native and introduced ungulates in a changing climate. *Global Change Biology* 19:1875–1883.
- Asa, C. S. 1999. Male reproductive success in free-ranging feral horses. *Behavioural Ecology and Sociobiology* 47:89–93.
- Beever, E. A., and P. F. Brussard. 2000. Examining ecological consequences of feral horse grazing using exclosures. *Western North American Naturalist* 60:236–254.
- Broekhuis, F., G. Cozzi, M. Valeix, J. W. McNutt, and D. W. Macdonald. 2013. Risk avoidance in sympatric large carnivores: reactive or predictive? J. Fryxell, editor. *Journal of Animal Ecology* 82:1098–1105.
- Brooks, C. J., and S. Harris. 2008. Directed movement and orientation across a large natural landscape by zebras, *Equus burchelli antiquorum*. *Animal Behaviour* 76:277–285.
- Buuveibaatar, B., T. K. Fuller, A. E. Fine, B. Chimeddorj, J. K. Young, and J. Berger. 2013. Changes in grouping patterns of saiga antelope in relation to intrinsic and environmental factors in Mongolia. *Journal of Zoology* 291:51–58.
- Collins, G.H., S.L. Petersen, C.A. Carr, L. Pielstick. 2014. Testing VHF/GPS collar design and safety in the study of free-roaming horses. *PLoS ONE* 9(9):e103189. doi:10.1371/journal.pone.0103189
- Committee on Wild Horse and Burro Research. 1991. *Wild Horse Populations: Field Studies in Genetics and Fertility*. nap.edu. National Academy Press, Washington, D.C.
- Creel, S., and D. Christianson. 2009. Wolf presence and increased willow consumption by Yellowstone elk: implications for trophic cascades. *Ecology* 90:2454–2466.
- Creel, S., J. Winnie Jr, B. Maxwell, K. Hamlin, and M. Creel. 2005. Elk alter habitat selection as an antipredator response to wolves. *Ecology* 86:3387–3397.
- Fischhoff, I. R., S. R. Sundaresan, J. Cordingley, and D. Rubenstein. 2007. Habitat use and movements of plains zebra (*Equus burchelli*) in response to predation danger from lions. *Behavioral Ecology* 18:725–729.
- Germain, E., S. Benhamou, and M. L. Poulle. 2008. Spatio-temporal sharing between the European wildcat, the domestic cat and their hybrids. *Journal of Zoology* 276:195–203.
- Goodloe, R. B., R. J. Warren, D. A. Osborn, and C. Hall. 2000. Population characteristics of feral horses on Cumberland Island, Georgia and their management implications. *Journal of Wildlife Management* 64:114–121.
- Hampson, B. A., M. A. de Laat, P. C. Mills, and C. C. Pollitt. 2010. Distances travelled by feral horses in “outback” Australia. *Equine Veterinary Journal* 42:582–586.
- <<http://eutils.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?dbfrom=pubmed&id=21059064&retmode=ref&cmd=prlinks>>.
- Hunter, C. M., H. Caswell, M. C. Runge, E. V. Regehr, S. C. Amstrup, and I. Stirling. 2010. Climate change threatens polar bear populations: a stochastic demographic analysis. *Ecology* 91:2883–2897.
- Ito, T. Y., N. Miura, B. Lhagvasuren, D. Enkhbileg, S. Takatsuki, A. Tsunekawa, and Z. Jiang. 2005. Satellite tracking of Mongolian gazelles (*Procapra gutturosa*) and habitat shifts in their

- seasonal ranges. *Journal of Zoology* 269:291–298.
- Johnson, B. K., J. W. Kern, M. J. Wisdom, S. L. Findholt, and J. G. Kie. 2000. Resource selection and spatial separation of mule deer and elk during spring. *Journal of Wildlife Management* 64:685–697.
- Kaczensky, P., D. P. Sheehy, C. Walzer, D. E. Johnson, D. Lhkagvasuren, and C. M. Sheehy. 2006. Room to Roam? The Threat to Khulan (Wild Ass) from Human Intrusion. Mongolia Discussion Papers, East Asia and Pacific Environment and Social Development Department. Washington, D.C.: World Bank.
- Kaczensky, P., O. Ganbaatar, H. von Wehrden, and C. Walzer. 2008. Resource selection by sympatric wild equids in the Mongolian Gobi. *Journal of Applied Ecology* 45:1762–1769.
- Kaczensky, P., R. Kuehn, B. Lhagvasuren, S. Pietsch, W. Yang, and C. Walzer. 2011. Connectivity of the Asiatic wild ass population in the Mongolian Gobi. *Biological Conservation* 144:920–929.
- King, S. R. B. 2013. Przewalski's Horses and Red Wolves. Importance of Behavioral Research for Species Brought Back from the Brink of Extinction. Pages 153–158 in M. Bekoff, editor. *Ignoring Nature No More*. University of Chicago Press, Chicago.
- Koprowski, J. L., S. R. B. King, and M. J. Merrick. 2007. Expanded home ranges in a peripheral population: space use by endangered Mt. Graham red squirrels. *Endangered Species Research* 3:105–110.
- Latombe, G., D. Fortin, and L. Parrott. 2013. Spatio-temporal dynamics in the response of woodland caribou and moose to the passage of grey wolf. *Journal of Animal Ecology*.
- Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee. 1998. *Wildlife Radio-telemetry*. Second edition.
- Schoenecker, K.A., S.R.B. King, P. Griffin, and G. Collins. 2014. Development of a suitable and safe radio collar for wild horses and burros. USGS Proposal for research. Fort Collins Science Center, Fort Collins, Colorado. 14pp.
- Sikes, R. S., W. L. Gannon, Animal Care and Use Committee of the American Society of Mammalogists. 2011. Guidelines of the American Society of Mammalogists for the use of wild mammals in research. *Journal of Mammalogy* 92:235–253.
- Sundaresan, S. R., I. R. Fischhoff, and D. I. Rubenstein. 2007. Male harassment influences female movements and associations in Grevy's zebra (*Equus grevyi*). *Behavioral Ecology* 18:860–865. <<http://www.behco.oxfordjournals.org/cgi/doi/10.1093/behco/arm055>>.

APPENDIX 6 Population Estimate and Methods

M E M O R A N D U M

To: Jay D'Ewart, June Wendlandt
CC: Paul Griffin (BLM), Ben Smith, Kimberlee Foster; Gavin Lovell; Robert Price; Bea Wade, John Niell (BLM)
From: Bruce Lubow, IIF Data Solutions
Date: 4 May 2016
RE: Statistical analysis for 2016 horse survey of Rock Springs area horse populations.

I. Summary Table

Survey areas and Dates:	April 4, 2016 Adobe Town HMA April 6, 2016 Salt Wells Creek HMA, Adobe Town HMA April 7, 2016 Salt Wells Creek HMA April 8, 2016 Salt Wells Creek HMA, Adobe Town HMA, Divide Basin HMA April 9, 2016 Divide Basin HMA April 12, 2016 White Mountain HMA, Little Colorado HMA April 13, 2016 Little Colorado HMA, Divide Basin HMA
Type of Survey	Simultaneous Double-observer
Aviation Company	Kim Ruble and Larry VanSlyke, pilots, Red Tail Aviation (Price, UT); Cessna 210, N367N
Agency Personnel	Kent Benson, James Price (BLM), Lou Arambel (in cooperation with the Rock Springs Grazing Association), Jay D'Ewart, aviation manager

Table 1. Estimated population sizes (Estimate) are for the numbers of horses in the surveyed areas at the time of survey. 90% confidence intervals are shown in terms of the lower limit (LCL) and upper limit (UCL). The coefficient of variation (CV) is a measure of precision; it is the standard error as a percentage of the estimated population. Number of horses seen (No. Seen) leads to the estimated percentage of horses that were present in the surveyed area, but that were not recorded by any observer (% Missed). The estimated number of horses associated with each HMA but located outside the HMA's boundaries or on checkerboard lands are already included in the total estimate for that HMA.

Area	Age Class	Estimate (No. Horses)	90% LCL ^a	90% UCL	Std Err	CV	No. Horses Seen	% Missed	Estimated # of Groups	Estimated Mean Group Size	Foals per 100 Adults	Est. No. Horses Outside HMA	Est. Horses on Checkerboard Lands
Little Colorado HMA	Total	328	279	411	47.0	14.3%	297	9.5%	37	9.0	7.2	43	0
	Foals	22	16	29	4.0	18.0%							
	Adults	306	259	387	44.2	14.4%							
White Mountain HMA	Total	237	189	329	51.1	21.6%	219	7.5%	18	13.4	6.9	0	120
	Foals	15	12	24	4.1	27.1%							
	Adults	221	176	307	47.1	21.2%							
Complex Total (White Mtn. / Little Colorado)	Total	565	494	707	72.2	12.8%	516	8.7%	54	10.4	7.1	43	120
	Foals	37	30	49	5.6	14.9%							
	Adults	528	464	662	67.4	12.8%							
Salt Wells Creek HMA	Total	709	669	750	24.0	3.4%	673	5.1%	111	6.4	1.9	51	187
	Foals	13	12	15	0.8	6.0%							
	Adults	696	658	736	23.8	3.4%							
Adobe Town HMA	Total	689	648	744	30.7	4.5%	657	4.7%	117	5.9	0.7	77	25
	Foals	5	5	6	0.2	4.6%							
	Adults	684	643	739	30.7	4.5%							
Complex Total (Adobe Town / Salt Wells)	Total	1398	1333	1463	42.2	3.0%	1330	4.9%	228	6.1	1.3	128	212
	Foals	18	17	20	0.8	4.5%							
	Adults	1380	1315	1445	42.0	3.0%							
Divide Basin HMA	Total	578	543	615	21.3	3.7%	554	4.2%	102	5.6	6.7	81	272
	Foals	36	31	41	2.7	7.3%							
	Adults	542	511	576	19.4	3.6%							

^a 90% confidence interval based on percentiles of bootstrap simulation results. The lower 90% confidence interval limit (LCL) is actually less than the number of horses sighted during the survey for these estimates. This is a normal statistical result and reflects the fact that a confidence interval expresses what would likely happen if the survey were repeated. If repeated many times, some surveys would miss more horses and produce lower estimates, even after corrections, than were actually observed during this survey. Clearly, I conclude that there are at least as many horses as were observed during this survey, rather than using the lower confidence limit as a minimum number.

II. Narrative

In April of 2016, Bureau of Land Management (BLM) personnel conducted simultaneous double-count aerial surveys of the wild horse populations in: White Mountain HMA, Little Colorado HMA, Adobe Town HMA, Salt Wells Creek HMA, and Divide Basin HMA (Figure 1). For management purposes White Mountain HMA and Little Colorado HMA are considered to be a complex; similarly, Adobe Town HMA and Salt Wells Creek HMA are considered to be a complex.

I analyzed these data to estimate sighting probabilities, which I then used to correct the raw counts for systematic biases (undercounts) that are known to occur in aerial wildlife surveys, and to provide confidence intervals (which are measures of uncertainty) associated with the estimated population sizes for the HMAs and surrounding areas that were surveyed (Lubow and Ransom 2016).

On the whole, 2016 surveys followed my previous (2015 memo) suggestions in terms of limiting the number of skilled observers, with a single front seat observer and proper seat rotation by only 2 back seat observers, and making frequent use of photography. Unfortunately, weather disrupted the survey, although observers would have been prepared to survey the area without interruption if not for the unanticipated weather. Suggestions for improving future surveys are offered in the Recommendations section.

Population Results

The estimated total horse populations (Table 1) within these areas provided a relatively large sample size of observations (364 horse groups, Table 2, Figure 1), of which 360 were recorded according to protocol and usable in the statistical estimation of sighting probability. All observations made during aerial surveys were used to inform the total estimates of population size, so long as those horses were associated with one of the target populations.

Average sighting probability for this survey was high (94.4%), an increase over the 2014 survey (92.3%), and substantially higher than the 2015 survey (79.1%). The high sighting probability lead to excellent confidence intervals and coefficients of variation in Adobe Town, Salt Wells, and Divide Basin HMAs, but somewhat lower average sighting probabilities in Little Colorado and White Mountain HMAs lead to lower than desirable precision (Table 1). In addition to the estimated errors, biases in the estimates could still exist due to heterogeneity of sighting probabilities that were not fully accounted for in this dataset.

I estimate the mean size of detected horse groups, after correcting for missed groups, to be 6.6 horses/group across surveyed areas, with a median of 4 horses/group, and a composition of 3.8 foal horses per 100 adults at the time of these surveys, but these vary substantially among areas (Table 1). Given the springtime dates of the surveys, these values are very unlikely to represent all foal horses born in either 2015 or 2016.

Sighting Probability Results

The front observers saw 59.1% of the groups (59.1% of the horses) seen by any observer, whereas the back seat observers saw 94.5% of all groups (96.7% of horses) seen (Table 2). There were undoubtedly additional groups not seen by any observer; I address this issue in the analysis that follows. These results demonstrate that simple raw counts do not fully reflect the true population without statistical corrections for missed groups, made possible by the double observer method and reported here.

The analysis method used for the surveyed areas were based on simultaneous double-observer data collected during these surveys. Informed by preliminary analyses and *a priori* reasoning, all models used in the double-observer analysis contained:

1. An estimated parameter for an intercept common to all observations.
2. A parameter in all models to account for the lower sighting probability for the front-seat observers when a group was on the pilot's side of the flight path due to the pilot's focus on flying and the obstructed view from the opposite side. This is a well-established effect.
3. Individual parameters for each unique back-seat observer based on a preliminary analysis that indicated virtually no support for models with only a common effect of back seat location relative to the individual effect by observer (i.e., there was very strong evidence for differences in sighting acuity among the back-seat observers).

No groups were recorded on the centerline, so I did not include a parameter to account for the inability of back-seat observers to see this type of group. 20 groups were recorded as seen spread across both sides of the flight path and visible from both sides of the airplane so I examined the effect of this group position on front observers, but found virtually no support for any effect and dropped it from consideration. Back seat observers, on the other hand, each have an independent chance to see a group that is available on both sides, so the estimated probability for them is increased accordingly without the need for an additional model parameter. I did not consider parameters for effects of vegetation, snow, topography, or lighting conditions because conditions were too uniform to obtain sufficient data for meaningful estimates of these effects.

In addition to the 3 parameters listed above that were included in all models, I tested 4 possible effects on sighting probability by fitting models for all possible combinations of these effects, resulting in 16 alternative models. The 4 effects were: (1) horse movement, (2) horse group size, (3) distance from observer to horse group, and (4) unique effects for each survey area (HMA).

The effect of movement was the most strongly supported (74.3% of AIC_c model weight) followed by the effect of distance (59.4%). Effects of group size (34.8%) and differences among the 5 survey areas (30.5%) were only weakly supported.

Visibility in the front for groups on the pilot's side was markedly lower, as expected (Table 3). Visibility was greater for larger groups and groups closer to the flight path, also as expected. In contrast to the 2015 survey, sighting probability was lower for moving groups in this survey. Sighting probability differed substantially between the 2 back seat observers but was good for both of them.

Correction for sighting probability resulted in a statistically estimated 5.6% of horses present in the surveyed areas not being observed, on average, although the percentage missed was as high as 9.5% at Little Colorado HMA. Estimated sighting probabilities for individual groups ranged from 5.2-92.0% for the front observers and 63.9-99.6% of the back observers and 65.8-100% for the combined observers. The very low sighting probabilities (<25%) for the front observers were all cases when the group was on the pilot's side. Even in these survey areas with excellent sighting conditions characterized by very open and relatively smooth terrain, adjustment to raw counts for those groups not seen by any observer are needed. This underscores the importance of using a statistical method for correcting raw counts.

Assumptions and Caveats

The results obtained from these surveys are estimates of the horses present in the areas surveyed at the time of the survey and should not be used to make inferences beyond this context. The reliability

of results from any population survey that is based on the simultaneous double-observer method rests on several important assumptions.

First, I must presume that pre-flight planning by the district specialists and BLM research coordinator led to the surveyed areas including as much as possible of the areas used by each population of horses using the surveyed HMAs, HAs, and WHTs. Although some fences, highways, mountain ranges, and dry lake beds provide deterrents to animal movement that help to contain them within the areas surveyed, these barriers are not always continuous, unbroken or impenetrable. Consequently, the numbers of animals found within the survey areas at another time could differ substantially. It is possible that temporary emigration from the surveyed areas may have contributed to some animals of a given population not being present in the surveyed areas. Also, the estimated distribution of animals between different subareas of any complex should only be considered specific to the times of this survey; that spatial distribution almost certainly varies throughout the year.

Second, simultaneous the double-count method assumes that all groups of animals are flown over once during a survey period, and thus have exactly one chance to be counted by the front and back seat observers, or that groups flown over more than once are identified and considered only once in the analysis. Groups counted more than once would constitute 'double counting,' which would lead to estimates that are biased higher than the true number of groups present. Additionally, groups that were never available to be seen (for example, due to temporary emigration from the study area or due to moving, undetected, from an unsurveyed area to one already surveyed) can lead to estimates that are negatively biased compared to the true population size. Although attempts were made to minimize the potential for horse movement among survey days by making use of highways, rivers, and topographic barriers, inter-day horse movements during a multi-day survey could potentially bias results if those movements result in unintentional double counting or unavailability of groups. This could have been a problem, in particular, at Divide Basin HMA, where there was a 2 day break caused in part by inclement weather. The identification of 'marker' horses (horses with unusual coloration) in each group, use of photography for reference, and variation in group sizes, helped to reduce the risk of double counting during aerial surveys, and the results presented here are based on a survey design and methods that assume that any unobserved movements were random, so the effects would cancel each other out.

Third, this method assumes that all horse groups with identical sighting covariate values have equal sighting probability. If there is additional variability in sighting probability not accounted for in the sighting models, such heterogeneity could lead to a negative bias (underestimate) of the population. This is of greater concern when sighting probabilities are lower, so this concern is minimal in the Adobe Town, Salt Wells, and Divide Basin estimates but remains a caveat worth noting in interpreting the White Mountain and Little Colorado results.

A fourth assumption is that the number of horses in each group is counted accurately. In very large groups it may be common to miss a few horses unless photographs are taken and scrutinized after the flight. Relying on raw counts made from the airplane could lead to biased low estimates of population size. Observers in this survey made good use of photography to check group size, except in cases where very windy conditions precluded access.

Given these potential sources of bias, it is more likely that the estimates are somewhat lower, rather than higher, than the true population. However, given the high sighting probabilities and precision estimated for these surveys, the population estimates I present here provide a sound and reliable basis for management decisions, although appropriate caution should be used in applying results for specific areas with lower precision.

Recommendations for Future Surveys

Below, I comment on the appropriateness of the survey planning and execution with notes about improvement that have been implemented this year and possible additional incremental improvements to be considered in for future surveys:

1. There is a substantial benefit to maximizing the sighting probabilities and minimizing the number of different factors that cause variation in sighting probability. By far the most potent means to accomplish both objectives is to drastically limit the number of observers used, as was done in 2016. Using a single pilot is also preferred. 2 pilots were used in these surveys, but sometimes on long surveys that is necessary because of pilot duty-hour limitations. Back seat observers must be rotated, as they were in 2016. Most important, observers should be carefully selected based on their past performance and ability to spot horses, which appears to have been the case in 2016. It is especially important to use the best possible observer in the front seat. The changes adopted in 2016 led to a dramatic improvement in the precision and reduced the risk of undetected biases, compared with results from 2014 and especially 2015. The personnel and procedures employed in 2016 should be retained for future surveys to the greatest extent possible.
2. Group sizes ranged from 1 to 76 horses in this survey with 60 groups (16.5%) containing >10 horses (19 or 5.2% of those groups had >20 horses), so inaccurate counting would have been a substantial risk for some groups had photography not been employed. Observers circled over large groups to get as accurate a count as possible and routinely used photography to record group size of large groups. Using photography is in the drafted standard operating procedures for BLM double-observer aerial surveys for horses, when group size is 20 or more – this was done in almost all cases in 2016. I emphasize the importance of continuing to use photography for large horse groups (>10 preferable, >20 is extremely important) to ensure that such groups are counted accurately. Given the tendency for horses in this area to form large groups, all future surveys should use photography so that group sizes recorded in flight can be validated with reference to photographs after the flight. Surveys should continue to use a reliable, high-resolution camera with an adequate telephoto or zoom lens for the distance between observer and horses for this purpose.
3. The pilot followed predetermined transect lines that were loaded into the pilot's GPS unit quite well during most of the flight. The flight lines were spaced at regular distances approximately 1.5 miles apart, reflecting the fact that there was little variation in topography or vegetation and sighting conditions were favorable. The pilot followed largely the same pattern of planned flight lines (Figure 1) as was used for these surveys in 2014. Both pilots did an excellent job of staying close to the pre-planned transect lines and succeeded in maintaining uniform spacing throughout the survey area.
4. Temporary emigration into or out of the surveyed areas was unlikely to have been a significant problem, because the survey lines extended well beyond the HMA boundaries, especially where fencing, highways, and other barriers were not present, such as west of the Divide basin HMA. Compared with 2015, the 2016 surveys extended survey lines for Little Colorado HMA and Divide Basin HMA several miles to the north, as I had recommended in 2015. Even with those extensions, a number of groups were observed at the northern extent of those two HMAs and beyond at least one line of fencing – this suggests that future surveys may need to have survey lines that extend even further north there, to encompass and adequately survey the horse populations using those areas. Fencing can be a deterrent to horse movement, but does not ensure containment.

5. The assumption of no movement within the survey area during the survey (potentially leading to double counting or unavailable animals) may have been violated in the Divide Basin HMA; there, the survey had to be suspended for 2 days because a storm interrupted the survey on April 10-11. This storm would have been hard to predict when the surveys started on April 4. To the extent possible, future inventories should continue to include single HMAs, and all the HMAs in any complex together, on consecutive days, in a consistent season, and using as many of the same observers across all HMAs as possible. If it is likely that a storm will disrupt a survey and the aircraft will continue to be available, it may be better to wait to begin the survey of a given HMA or complex until the storm has passed.

Literature Cited

- Bureau of Land Management. 2010. Wild horse and burro population inventory and estimation: Bureau of Land Management Instructional Memorandum No. 2010-057. 4 p.
- Burnham, K., and D. R. Anderson. 2002. Model selection and multimodel inference: a practical information-theoretic approach. Springer-Verlag, New York, New York.
- Lubow, B. C., and J. I. Ransom. 2016. Practical bias correction in aerial surveys of large mammals: validation of hybrid double-observer with sightability method against known abundance of feral horse (*Equus caballus*) populations. PLoS-ONE 11(5):e0154902. doi:10.1371/journal.pone.0154902.
- National Research Council. 2013. Using Science to Improve the BLM Wild Horse and Burro Program. The National Academies Press. Washington, D.C.

Table 2. Tally of raw counts of horses and horse groups by observer (front and back) and survey year for combined HMAs. This table is based on raw counts (not statistical estimates) and, therefore does not address groups not seen by any observer.

Observer	Groups Seen (Raw Count)	Horses Seen (Raw Count)	Actual Sighting Rate ^a (groups)	Actual Sighting Rate ^a (Horses)
Front	215	1,418	59.1%	59.1%
Back	344	2,320	94.5%	96.7%
Both	195	1,338	53.6%	55.8%
Combined	364	2,400		

^a Percentage of all groups seen that were seen by each observer.

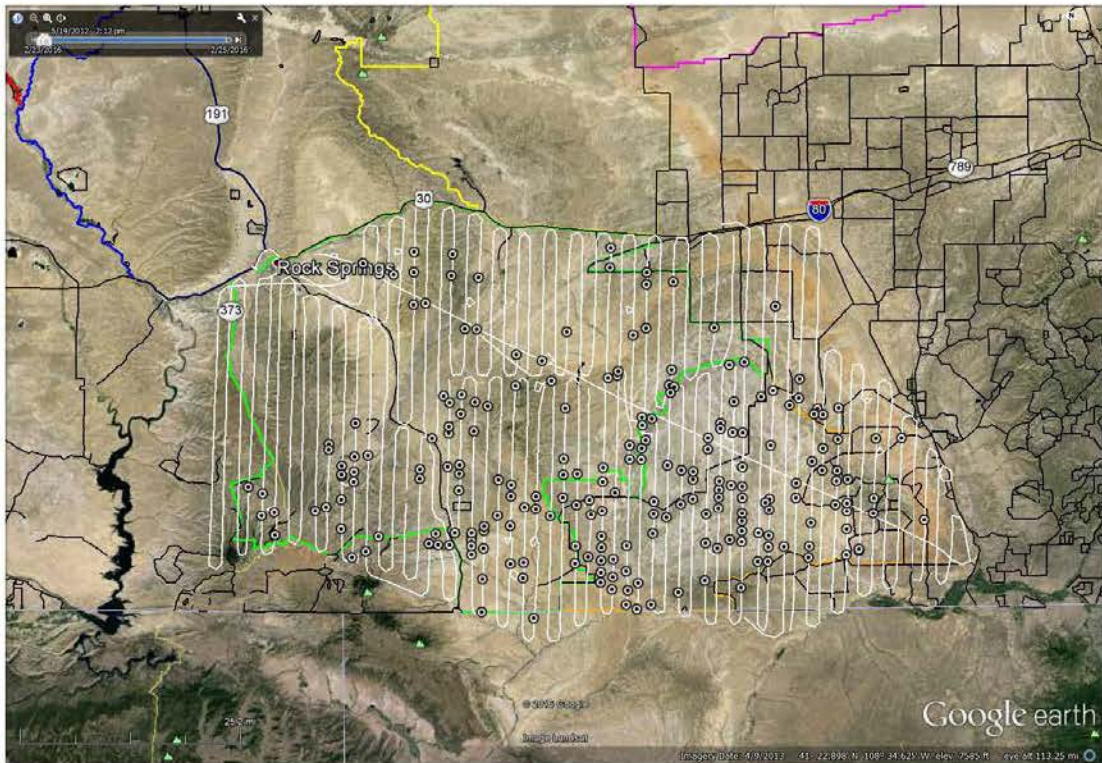
Table 3. Effect of observers and sighting condition covariates on estimated sighting probability of horse groups for both front and rear observers. Baseline case (**bold**) is for observers in the indicated seat computed for groups not on pilot's side, at Adobe Town, with no activity, group size=4 horses (the median value), distance 0-½ miles (the most common value), and for observer JP in the back. Other cases vary a covariate, one effect at a time, as indicated. Sighting probabilities for each row should be compared to the baseline (first row) to see the effect of the change in observer or condition. Baseline values are shown in bold wherever they occur. Sighting probabilities are calculated from weighted averaged model parameters across all 16 models.

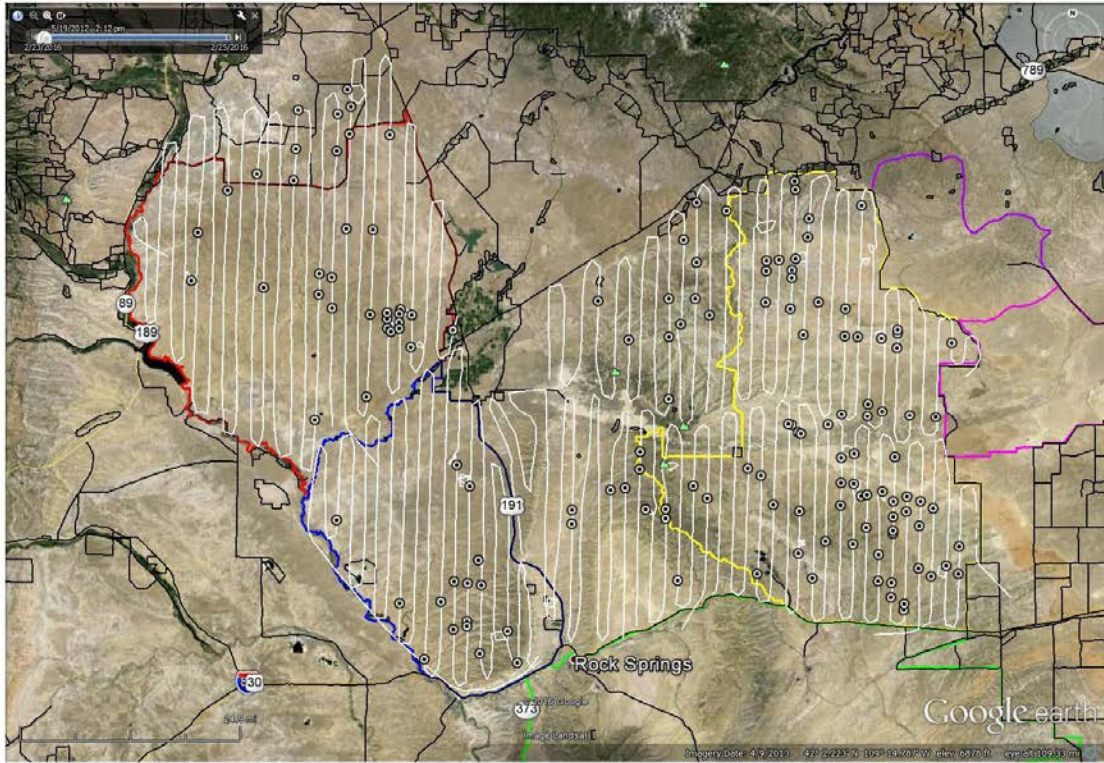
	Sighting Probability, Front Observer ^a	Sighting Probability, Back Observer
Baseline	91.1%	84.7%
Effect of group size (N=1)	91.0%	84.5%
Effect of group size (N=10)	82.1%	71.2%
Effect of active group	81.6%	70.4%
Effect of distance (1/4-1/2 mile)	89.3%	81.9%
Effect of Salt Wells	89.9%	82.7%
Effect of White Mountain	91.8%	85.7%
Effect of Little Colorado	93.2%	88.1%
Effect of Divide Basin	91.2%	84.8%
Effect of Pilot's Side	12.8%	84.7%
Effect of observer LA in back	91.2%	97.2%

^a Sighting probability for the front observers acting as a team when the horses were on the pilot's side of the flight path, regardless of which of the front observers saw the horses first.

Figure 1A. Map of April 4-8, 2016 survey of Adobe Town HMA (orange) and Salt Wells Creek HMA (green). Circles are GPS waypoints at the locations where observers saw groups of animals. Black lines are fences.

Figure 1B. Map of April 8-13, 2016 survey in Divide Basin HMA (yellow), Little Colorado HMA (red), and White Mountain HMA (blue) and GPS recordings of actual flight paths (white lines). Circles are GPS waypoints at the locations where observers saw groups of animals. Black lines are fences. Adjacent management areas not included in this survey are shown for reference: Lost Creek, HMA (magenta) and Antelope Hills (purple).





APPENDIX 7 Individuals, Organizations, Tribes or Agencies consulted

Tribes, individuals, organizations, and agencies were included in the scoping process. The letter soliciting scoping comments for the proposed gather was mailed April 6, 2016.

Tribes

Eastern Shoshone Business Council
Eastern Shoshone Tribe
Northern Arapaho Business Council
Northern Arapaho Tribal Historic Preservation
Shoshone-Bannock Cultural Resources
Shoshone-Bannock Tribal Council
Ute Tribal Council
Ute Tribe Cultural Resources

Agencies

Bureau of Indian Affairs
Bureau of Land Management
Carbon County Commissioners
Mayor of Baggs
Mayor of Wamsutter
NRCS
Office of the Governor of Wyoming
Popo Agie Conservation District
State of Wyoming agencies
State Representatives
State Senators
Sublette County Commissioners
Sweetwater County Commissioners
Sweetwater County Conservation District
Sweetwater County Planning Dept.
U.S. Fish and Wildlife Service
U.S. Representative Cynthia Lummis
U.S. Senator John Barrasso
U.S. Senator Michael B. Enzi
Wyoming Game and Fish Department

Organizations

Agri Kids USA
American Horse Protection Association
American Mustang Association
Dream Catcher Wild Horse & Burro Sanctuary
Friends of Animals
Hooved Animal Humane Society
National Mustang Association
National Wild Horse Association

North American Mustang Assoc. & Registry
Pryor Mountain Wild Mustang Center
The Cloud Foundation
University of Wyoming
Western Watersheds Project
Western Wyoming Mule Deer Foundation
Whole Horse Institute
Wild Horse Organized Assistance
Wild Horse Spirit
Wind River Backcountry Horsemen's Assoc.
Wyoming Advocates for Animals
Wyoming Business Council
Wyoming Chapter of the Sierra Club
Wyoming Livestock Board
Wyoming Wilderness Association
Wyoming Wildlife Federation
Wyoming State Grazing Board

Operators, Media, Libraries

4-Mile Sheep
AL Land & Cattle Company
Aimone, Bruce & Martin
Alkali Creek Grazing Association LLC
Anadarko Petroleum Corporation
Arapaho Grazing Association LLC
Bar X Sheep Company
Battle Mountain Co.
Big Sandy & Green River Livestock Co.
Blake Sheep Company & F.B. Espy
Bonomo, Jensen, Kourbelas
Carricaburu-Jauregui
CE Brooks & Associates PC
Central Bank & Trust
Conservancy of the Phoenix
Chilton Land and Livestock
Crosson Ranches LLC
Desert Cattle Co.
Dr. Jason Howard PC
Eaton, Dustin & James
Estate of Curtis Rochelle
Evans Wells & Livestock
Eversole, John
Fill-More Beef LLC/P.H. Livestock
First Interstate Bank
G Bar B Veterinary Service
Hamel, Doug & Carolyne

Hill Land and Livestock
Hofeldt, John
Hog-Eye Ranch LLC
ISPM&B
Janet's Inc.
Utah State University Library
KBR
Mad Dog & the Pilgrim Booksellers
Maneotis Sheep Company
Marty and Ragsdale
Midland-Dunton Sheep Co.
Mike Sheehan Ranch LLC
Moon Living Trust
Mud Springs Livestock Company
N Bar K Ranch LLC
Olson Sisters Corporation
Pasin, Beverly & Anthony
Philp Sheep Company
Pinedale Roundup
Poor Farm LLC
Quarter Circle A Ranch LLC
Quarter Circle Block LLC
Quarter Circle Three Bar Ranch LLC
Quealy Properties, LLC
Raftopoulos Brothers Livestock
Ramsay, Norma
Rock Springs Grazing Association
Rock Springs Library
Rocket Miner
Salisbury Livestock Co.
Salisbury Livestock Co./Banjo Sheep Co.
Slagowski & Asay
Smith Rancho Inc.
Split Rock Holdings
Stewart Creek LLC
Stratton Sheep Co.
Sublette Examiner
Sun Land and Cattle Co.
Tall Grass, LLC
Taurus Productions, Inc.
Three Mill-Iron Ranch
Triple A Cattle Company
Tripp Family Trust
Vermillion Ranch Limited Partnership
Vercimak, Don & Peggy
W & M Thoman Ranches LLC

Weber Ranch Inc.
Western Wyoming Community College
Wilde, Jon
Wyoming Livestock Roundup
Wyoming Outdoor Council
Wyoming State Library

APPENDIX 8
Adobe Town Herd Management Grazing Allotments

Allotment name	Allotment number	Kind	Season of use	Active aums	Year	Billed aums	% used	Land health status
Adobe Town	10502	Sheep	Summer	1820	2016	0	0.00%	9/19/2012
					2015	73	4.01%	All standards
					2014	29	1.59%	Met
					2013	40	2.20%	
					2012	25	1.37%	
Continental	10506	Cattle	Summer	2812	2016	0	0.00%	9/19/2012
					2015	1526	54.27%	All standards
					2014	1156	41.11%	Met
					2013	1227	43.63%	
					2012	1554	55.26%	
Cow Creek	10509	Cattle/sheep	Summer/winter	2629	2016	202	7.68%	9/19/2012
					2015	547	20.81%	All standards
					2014	864	32.86%	Met
					2013	87	3.31%	
					2012	1053	40.05%	
Espitalier	10511	Cattle/sheep	Summer/fall/Winter	2755	2016	37	1.34%	9/19/2012
					2015	194	7.04%	All standards
					2014	1050	38.11%	Met
					2013	0	0.00%	
					2012	496	18.00%	
Grindstone Springs	10512	Cattle/sheep	Summer/fall/winter	413	2016	0	0.00%	9/19/2012
					2015	0	0.00%	All standards
					2014	0	0.00%	Met
					2013	190	46.00%	
					2012	0	0.00%	
Little Powder Mtn	10513	Cattle/sheep	Summer/fall/winter	2042	2016	25	1.22%	9/19/2012
					2015	50	2.45%	All standards
					2014	0	0.00%	Met
					2013	32	1.57%	
					2012	419	20.52%	

Allotment name	Allotment number	Kind	Season of use	Active aums	Year	Billed aums	% used	Land health status
Powder Mountain	10519	Cattle/sheep	Summer/fall/winter	1305	2016	0	0.00%	9/19/2012
					2015	0	0.00%	All standards
					2014	1050	80.46%	Met
					2013	0	0.00%	
					2012	771	59.08%	
Red Creek	10521	Cattle/sheep	Year long	2612	2016	0	0.00%	9/19/2012
					2015	436	16.69%	All standards
					2014	614	23.51%	Met
					2013	793	30.36%	
					2012	884	33.84%	
Rotten Springs	10523	Cattle/sheep	Year long	1423	2016	0	0.00%	9/19/2012
					2015	73	5.13%	All standards
					2014	907	63.74%	Met
					2013	968	68.03%	
					2012	197	13.84%	
Sand Creek	10524	Sheep	Year long	2839	2016	0	0.00%	9/19/2012
					2015	41	1.44%	All standards
					2014	303	10.67%	Met
					2013	759	26.73%	
					2012	649	22.86%	
Willow Creek	10528	Cattle/sheep	Year long	1680	2016	0	0.00%	9/19/2012
					2015	351	20.89%	All standards
					2014	440	26.19%	Met
					2013	1806	107.50%	
					2012	586	34.88%	
Corson Springs	20507	Cattle	Summer	1712	2016	1712	100.00%	9/19/2012
					2015	1073	62.68%	All standards
					2014	1189	69.45%	Met
					2013	1189	69.45%	
					2012	1189	69.45%	

APPENDIX 9**Summary of Scoping and Public Comments**

No	Date	Scoping Comment	BLM Response
1.	May 8	Please consider not using tracking collars on mares but using the PZP vaccine which works and will cut down on cost and be safer for the horses.	See Appendix 5 of the EA Use of PZP is outside of the scope of this document. Use of PZP was originally proposed but not carried forward as it does not meet the modified purpose and need of the proposed action which is to collar upto 30 mares
2.	May 6	The census data from this survey estimated that there are approximately 858 wild horses within the Adobe Town HMA, which exceeds the appropriate management level (AML) of 610-800 wild horses. Does this include the 500 horses targeted for roundup in the Checkerboard areas?	The 2016 census was conducted by the BLM however, the analysis and statistically corrected of the numbers was conducted by the United States Geological Survey. As a result of the 2016 census and statistical analysis, the BLM has determined that the HMA is not above AML and is no longer planning to remove wild horses from the Adobe Town HMA.
3.	May 6	Native wild horses are underpopulated! No PZP Pesticide because PZP is DANGEROUS. Please Read the FACTS about PZP here: http://protectmustangs.org/?p=8749 The National Academy of Sciences reported there is no evidence of overpopulation, period.	The use of PZP contraceptive is no longer proposed as it does not meet the modified purpose and need of the proposed action, which is to....
4.	May 6 RSGA	1. 2015 Counts Do Not Reflect 2016 Populations On May 4, BLM provided RSGA with maps of the direct counts for Adobe Town-Salt Wells, Divide Basin, Little Colorado, and White Mountain HMAs. 1,312 horses were counted on Adobe Town-Salt Wells, 520 horses on Divide Basin, 277 on Little Colorado and 205 on White Mountain. These numbers were not adjusted and did	The 2016 census was conducted by the BLM however, the analysis and statistically corrected of the numbers was conducted by the United States Geological Survey. As a result of the 2016 census and statistical analysis, the BLM has determined that the HMA is not above AML and is no longer planning to remove wild horses

No	Date	Scoping Comment	BLM Response
		<p>not count foals for 2016 but should be used, at a minimum, to properly scale the removal to existing horse numbers. BLM must revise its Scoping Statement to more accurately frame the action so as to properly compensate for the likely impacts.</p> <p>2.Coordinate Checkerboard Removal (WYD04) and Adobe Town Population Management Action (WYD03) So Wild Horses Do Not Seek Refuge in Area Not Being Gathered</p> <p>The direct-count maps provided by BLM on May 4 also confirm RSGA’s concern that horses from the solid-block portion of Adobe Town HMA and Salt Wells HMA will move to the Checkerboard portion that BLM proposes to remove in a separate gather.</p> <p>3. BLM Should Manage Adobe Town and Salt Wells As A Complex The 2016 census counted Adobe Town HMA and Salt Wells as a single unit despite the fact that the Scoping Statement explicitly states that “for this project, [Adobe Town and Salt Wells HMAs] will be managed separately.”</p> <p>4. BLM Must Develop Population Trends and Confirm Census Counts RSGA is extremely concerned that the 2016 census did not accurately portray the number of horses in the HMAs..... The result is that the wild horse census and analysis is not shared, explained, or coordinated among other resource interests and professionals despite requirements in the Wild Horse Act to do so. The 2016 census therefore demonstrates</p>	<p>from the Adobe Town HMA.</p> <p>Please refer to Section 2 of the EA for a description of all alternatives, including those considered but not analyzed in detail.</p>

No	Date	Scoping Comment	BLM Response
		that BLM must: (1) confirm census data with post-gather counts or monitoring data; and (2) establish long term population trends upon which management decisions can be made. Relying solely on census counts conducted once a year to manage horse numbers is not sufficient under Section 3 of the Wild Horse Act	
5	May 6	<p>2015 Counts Do Not Reflect 2016 Populations In creating a defensible decision document, the BLM should properly frame the scope of the action in order to also properly frame and analyze the impacts.... the environmental assessment or other NEPA document needs to address the related and connected actions for the Adobe Town gather, Checkerboard gather, and the White Mountain HMA gather and fertility project. The Scoping Statement asserts that by July 2016, the estimated population will be 1,235 horses. On this number, to reach low AML, at least 625 horses would need to be removed. Coordinate Checkerboard Removal (WYD04) and Adobe Town Population Management Action (WYD03) So Wild Horses Do Not Seek Refuge in Area Not Being Gathered The result is that wild horses that BLM intends to remove from Adobe Town may, in a matter of hours, and often in a matter of minutes, move to the Adobe Town Checkerboard and west to Salt Wells HMA.</p> <p>November Removal May Increase Impacts and Frustrate Purpose of Gathers BLM provides no assurances that it will actually be able to complete the Adobe Town gather in the month of November when snow,</p>	The checkerboard gather is considered in the cumulative impacts section of the EA. The White Mountain HMA gather and fertility control project are not a connected action to the proposed study. Wild horses do not move between the ATSA and White Mountain HMAs.

No	Date	Scoping Comment	BLM Response
		<p>mud, and early winter storms make wrangling, travel, flying and transport difficult if not entirely dangerous.</p> <p>Sage-Grouse RMP The Record of Decision, unlike the Wyoming Executive Order 2015-04, sets a minimum objective of seven inches of stubble height to provide nesting and brood rearing habitat presumably from March through June. ... Wild horse grazing will undoubtedly violate this standard and thus BLM must reduce wild horse numbers to conform to the RMPs.</p> <p>BLM Must Consider Sterilization The Scoping Statement provides that BLM will "utilize a fertility control vaccine to reduce future population growth." The Scoping Statement does not identify the specific vaccine or methods it will use.... All of these variables demonstrate that spaying, spay-vac or other sterilization techniques should be employed to prevent continued degradation to the range.</p>	<p>Decisions regarding the Greater Sage-Grouse core habitat management are directed by the Greater Sage Grouse Nine Plan Resource Management Planning Amendment. The Adobe Town HMA has only general habitat designated for sage grouse</p> <p>The purpose of the proposed action is to understand habitat selection, seasonal use pattern, movement between habitats, and migration patterns within and outside of the HMA. A sterilization type of study would not meet the purpose and need and is therefore not considered as part of or an alternative to the proposed action.</p>
6	May 6	<p>1. The census data as well as population growth data is questionable. Please include up to date, scientific census data and scientific study proving population growth of 20% per year in your EA.</p> <p>2. Please manage wild horses on the range using the safe fertility control vaccine PZP to avoid the cost of housing wild horses for the remainder of their lives at a very high cost to American Taxpayers.</p>	<p>The 2016 census was conducted by the BLM however, the analysis and statistically corrected of the numbers was conducted by the United States Geological Survey. As a result of the 2016 census and statistical analysis, the BLM has determined that the HMA is not above AML and is no longer planning to remove wild horses from the Adobe Town HMA.</p> <p>Thank you for your comment. The use of fertility control does not meet the modified purpose</p>

No	Date	Scoping Comment	BLM Response
		<p>3. Please use bait trapping instead of helicopter roundups which are harmful to wild horses and destroy the family unit.</p> <p>4. I am opposed to radio collaring, as it is very dangerous for wild horses. Horses have been seriously injured and have died because of collars becoming too tight and getting hung up on fences and brush.</p>	<p>and need, which is to....</p> <p>Bait trapping will be analyzed in an alternative in the EA.</p> <p>Preliminary data from a captive trial of radio collars on wild horses at Paul's Valley, Oklahoma, has shown that the designs that will be used in this study are safe and cause minimal abrasion of the skin or fur. Collars moved on the animal's necks, but there was no evidence that they tighten. The width of the radio collar bands that will be used in the present research is narrower than was used in the studies you reference in the 1980's. See Appendix 5 – collars can be remotely detonated .</p>
7	May 6	<p>I am vehemently opposed to the BLM's plan to place radio collars on approximately 15-40 mares in the Adobe Town Herd Management Area (HMA).... The removal of hundreds of wild horses from the Adobe Town HMA will certainly disrupt and destroy the integrity of the wild horses' complex social structures. I must insist that the results of radio collar research recently conducted by USGA at the BLM Paul's Valley holding facility in Oklahoma be reviewed and disclosed as part of any Environmental Assessment</p>	<p>See Appendix 5 of EA</p> <p>No horses will be removed from ATHMA. Adjusting the AML for ATHMA does not meet the purpose and need of this analysis and is typically a land use planning level decision.</p>

No	Date	Scoping Comment	BLM Response
		(EA). Also, the results of the radio collar research conducted in the 1980's on Nevada wild horses should be included in any EA: injuries, deaths, foals orphaned, all pertinent data; so those mistakes will not be repeated in any research going forward. All scientific protocol for the radio collar research from the University of Wyoming Institutional Animal Care and Use Committee must be disclosed to the public prior to the roundup. I urge the BLM to seriously consider an alternative to increase the Appropriate Management Level (AML) in the Adobe Town HMA and manage the increased population level using the proven PZP fertility control vaccine via darting.	
8	May 6	Repeat of RSGA & Vermillion Ranch	
9		<p>An Environmental Impact Statement (EIS) will be required by law for this roundup. It should include the following assessments:</p> <p>A fully accurate ratio of forage allocations between wild horses to privately-owned livestock as well as their impacts to the range.</p> <p>The probability of lowering AML's in order to accommodate wild horses and other wildlife if necessary.</p> <p>The utilization of PZP (or more extensive utilization of the vaccine if it's already being implemented) in place of removals.</p>	<p>The EA is being drafted to determine if an EIS should be required.</p> <p>The BLM is not proposing changes to the Appropriate Management Level of the Adobe Town HMA</p> <p>Thank you for your comment.</p> <p>Use of PZP was originally proposed but not carried forward as it does not meet the modified purpose and need of the proposed action which is to collar upto 30 mares</p> <p>.</p>

No	Date	Scoping Comment	BLM Response
		<p>A study outlining the risks and benefits of the proposed radio collar study and stringent safety protocols for horses wearing such collars should it go into effect.</p> <p>The cost to taxpayers by virtue of the proposed roundup and study vs. the utilization of PZP fertility control alone, as well as the effectiveness of each of these plans.</p> <p>An analysis of the anticipated impacts to the horses as a result of the proposed roundup and study such as their health, mortality rates, injuries, etc.</p>	<p>See Appendix 5 of the EA</p> <p>The 2016 census was conducted by the BLM however; the analysis of the numbers was conducted by the United States Geological Survey. As a result of this analysis, the BLM is no longer planning to remove wild horses from the Adobe Town HMA and no longer considering use of PZP. This research is being proposed to inform future management decision and their effectiveness. .</p> <p>Impacts to Wild horses are included in the EA, in section 3.0....</p>
10	May 6	HMA is just 58 horses over the “Appropriate” Management Level (AML). As the National Academy of Sciences confirmed (see Section II), the BLM’s AMLs lack a “science-based rationale” and, therefore, are not a legitimate basis on which to assess whether “excess” horses are present and must be removed.	No horses will be removed from the ATHMA. The BLM has a multiple-use mandate to manage for all uses of the public land. Achieving and maintaining wild horse populations within established AMLs and controlling their population growth rates will enhance the public lands for the benefit of all users and resources.

No	Date	Scoping Comment	BLM Response
		<p>EA/EIS Must Consider Recommendations from National Academy of Sciences (NAS) Management practices are facilitating high rates of population growth.... Thus, population growth rate could be increased by removals through compensatory population growth from decreased competition for forage.</p> <p>EA/EIS Must Consider Impact of Removal Prior to Conducting “Research” . EA states that after removing potentially hundreds of horses from the Adobe Town HMA, traumatizing the horses via helicopter roundups that stampede them into trap pens, destroying the social stability and integrity of tightly-knit wild horse social bands, the BLM “may” study “habitat selection, seasonal use and movement between habitats, and migration patterns with and outside of the HMA” of 15-40 mares who will be released to the HMA after being fitted with radio collars. No valid research data can be collected under these circumstances.</p> <p>BLM AMLs Not Transparent, Equitable or Based on Science. How Appropriate Management Levels (AMLs) are established, monitored, and adjusted is not transparent to stakeholders, supported by scientific information, or amenable to adaptation with new information and environmental and social change. Standards for transparency, quality and equity are needed in establishing these levels, monitoring them and adjusting them.”</p>	<p>The study, Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward, published by the National Research Council of the Nation Academies of Science (NAS) is being used by BLM to develop new procedures and policies in the management of wild horses and burros. Some of the recommendations made by this report have been implemented (ex. Population inventory methods) while others are being reviewed or developed within the laws, regulations, policies, budgets and other limits that were not considered by the report. BLM’s proposed action (habitat utilization study) is consistent with the goals and recommendations of the NAS study— to more effectively manage wild horse populations. The NAS study and recommendations do not preclude or caution against implementation of a habitat utilization study.</p> <p>The BLM is not proposing changes to the Appropriate Management Level of the Adobe Town HMA.</p>

No	Date	Scoping Comment	BLM Response
		<p>The EA/EIS must disclose and analyze all details of BLM data, information and research that resulted from implementing radio collar research on wild horses in Nevada in the 1980s and other BLM radio collar projects. The EA/EIS must address how such deleterious effects of neck radio collaring of mares will be addressed or prevented given that mares also move their necks in manners that may allow the collar to become imbedded in the neck tissue, get caught on forage or fencing, be bitten by other horses, and cause discomfort or injury to the horse. The fluctuating body condition of mares based on season, and the growth of younger mares as they mature must also be considered.</p> <p>EA/EIS Must Adequately Analyze Impact Removal Will Have on Research Data</p> <p>The EA/EIS must adequately analyze the proposed action of conducting a removal and then conducting “research” project that assesses their “natural” movement and migratory patterns. The removal of wild horses will undeniably alter the behaviors of remaining horses in the HMA thereby rendering a research study of behaviors meaningless.</p> <p>BLM must utilize “A participatory adaptive-management process for the setting and adjustment of AMLs...”</p> <p>EA Must Consider Cumulative Impacts of Proposed Action, this</p>	<p>See Appendix 5 of the EA</p> <p>Direct, indirect, and cumulative impacts are analyzed in the EA, see sections....</p> <p>No horse will be removed from ATHMA. Setting of or</p>

No	Date	Scoping Comment	BLM Response
		<p>includes the BLM's proposed Wyoming Checkerboard Roundup, which will remove wild horses from the checkerboard portion of the Adobe Town HMA as well as other activities and uses within the HMA that affect wild horses. These uses include oil/gas exploration and extraction, mining and livestock grazing.</p> <p>Alternatives that must be Considered Accommodate current wild horse numbers with continued range improvements and temporary or permanent reduction or elimination of livestock grazing pursuant to 43 C.F.R. 4710.5(a). The BLM has the authority alter the management of wild horses in the Adobe Town HMA through a Herd Management Area Plan (HMAP) which would then be admissible to submit to the courts to amend the "Consent" Decree that the BLM is claiming is the catalyst for the proposed removal of wild horses. A Consent Decree can be legally amended through the federal courts. Analyze alternative methodologies for rounding up horses by conducting a Catch-Treat-Release PZP fertility control program, including the use of bait/water trapping. 2) Real-time cameras with GPS should be installed on all vehicles, aircraft and/or helicopters used in operations and video should be live streamed on the Internet. This will improve the transparency of roundup operations and enable the BLM and public to monitor the direct impact motorized vehicle usage has on horses and the environment. Adaptive Management</p>	<p>adjusting AML is a land use planning action.</p> <p>No horses will be removed from ATHMA. See Section 4.0 of the EA Cumulative Impacts</p> <p>No horses will be removed from ATHMA during this gather. The modified purpose and need of the proposed action is to conduct research on wild horse habitat selection and movements in the ATHMA</p> <p>These alternatives do not meet the purpose and need and are therefore not being considered for detailed analysis in the EA. Neither the WFRHBA nor FLPMA require the equal allocation of wild horse and livestock on public lands by law, BLM is required to manage wild horses and burros in a thriving natural ecological balance and multiple use relationship on the public lands and to remove excess wild horses and burros immediately upon determination that excess wild horses exist and action is necessary to remove them. 16 USC 1333(b)(2).</p> <p>Livestock adjustments have been made through other actions and documents. Livestock adjustments have been voluntarily made by operators in the Adobetown HMA (see actual</p>

No	Date	Scoping Comment	BLM Response
		<p>Strategy Must Be Fully Analyzed. under this policy, land use decisions can be adjusted in order to meet environmental, social and economic goals; to increase scientific knowledge; and to decrease tensions among stakeholders. EIS Is Needed for Proposed Action Due to the controversial nature of this action</p>	<p>use report) The purpose of the this EA is not to adjust livestock use. There is no requirement by WFRHBA or the regulations to reduce or eliminate livestock as a means to restore TNEB Administration of livestock grazing on public land fall under 43 CFR subpart D, Group 4100. Livestock grazing on public lands is also provide for in the Taylor grazing Act of 1934.</p> <p>The BLM regulation does 43 CFR 4710.5(a) does not mandate the reduction or elimination of livestock grazing. Such an alternative would not meet the purpose and need of the proposed action, which is to...</p>
11	May 6	<p>1. Please conduct field research to determine the habits and natural behaviors of the Adobe Town HMA using <u>non-invasive</u> techniques (i.e. ground observations, photographs/GPS recorded locations, etc.)</p>	<p>.</p> <p>ATHMA has total of 469,473 acres to cover, identifying and following 30 individual horses by volunteers is impractical and would not result in scientifically reliable information. Studies that rely only on animals that are easily observable are, however, prone to bias. Even in this context, the result of not having an adequate sample of the population being studied, with the result that any in inferences about behavior, demography, or habitat use, would not be applicable to the population as a whole, but only to those individuals who happen to be easily seen by human observers. There is reason to believe that many horses in this population are not commonly encountered or easily seen by on-the- ground observers. The topography is</p>

No	Date	Scoping Comment	BLM Response
		<p>2. Please conduct behavioral research while field darting with the reversible vaccine PZP.</p> <p>3.</p> <p>4.</p> <p>5.</p> <p>6.</p> <p>7.</p> <p>8. Do not put collars on mares. It will require capture and will result in the shattering of the bands just to put on the collars which will not reflect accurate data. Collars are also dangerous to the mare as they might become entangled by them.</p> <p>9. Please consider raising the AML of Adobe Town and reducing or eliminating livestock grazing.</p>	<p>rugged, vegetative cover is extensive in many areas, and horses can be elusive</p> <p>Use of PZP was originally proposed but not carried forward as it does not meet the modified purpose and need of the proposed action which is to collar upto 30 mares This is outside the scope of this document</p> <p>See Appendix 5 of EA</p> <p>This comment is beyond the scope of this document.</p>
12	May 6	If Adobe Town and neighboring wild horse bands are encroaching on private Checkerboard lands, you should advise private landowners to use METHODS TO DETER WILD HORSES from crossing into their private lands! — locate waterholes or salt licks well away from private	<p>The purpose of this action is to conduct research on wild horse habitat selection and movements in the ATHMA. Checkerboard ownership issues are not relevant to the proposed action. The BLM does not have</p>

No	Date	Scoping Comment	BLM Response
		boundary lines, for example; or require landowners, who complain about wild horses on their lands, to train guard dogs, or some other benign deterrent, to encourage wild horses to stay outside their private property line. Dart wild mares with proven PZP birth-control serum, with the help of dedicated groups of trained volunteers, many of whom are already familiar with Wyoming's wild-horse bands.	authority over privately owned land. Further, Section 4 of the WFRHBA, 16 USC 1334, requires that BLM remove wild horses from private lands when requested by the private land owner.
13	May5	<p>To begin with, <u>it is absolutely illegal and a total perversion of the law</u>, to use a request from a private party to remove horses from PRIVATE land as excuse to also remove horses from the public lands adjacent to them.</p> <p>Section 4 of the Wild, Free-Roaming Horses and Burros Act does not grant BLM in any way any statutory authority to remove federally-protected horses from public lands at the request of private entities like the Rock Springs Grazing Association. used by BLM to justify the removal of wild horses from both the Checkerboard and purely public lands section of the Adobe Town HMA was paid for, staffed and conducted by no other than the Rock Springs Grazing Association in yet another shameful example of collusion, corruption and connivance between government and industry. deliberately-manipulated count based on fuzzy math and spurious assumptions, of which no photographic evidence was ever produced (under the rather lame excuse that the survey lead was air-sick and didn't want to circle to take pictures), came up with a vastly</p>	<p>There will be no removal of horses from ATHMA.</p> <p>Thank you, for your comment. On March 3, 2015, the US District Court (Case No. 14-cv-152-NDF) ruled that the BLM's 2014 checkerboard gather, complied with the WFRHBA and FLPMA. That ruling is under appeal to the Tenth Circuit Court of Appeals (No. 15-8033)The BLM is in compliance with all applicable laws, regulations, and court orders.</p>

No	Date	Scoping Comment	BLM Response
		<p>overstated count in April 2015 of 858 wild horses, despite the fact, as per BLM's own figures dated six months before, Adobe Town only had 519.</p> <p>Further, by attempting to reduce so drastically and artificially the total number of AMLs left wild horses in the Adobe Town HMA (releasing only about 200, which is dangerously close to the genetic viability threshold), without using a land use planning process to amend the governing Resource Management Plan (RMP), BLM is violating the Federal Land Policy and Management Act (FLPMA). <u>primary use of Wild Horse Management Areas is wild horse use</u>:...then they should be forcing land swaps to occur in this area to consolidate private holdings and public ones separately in order to enable grazing of wild horses on public lands...proposing to do a "research study" in collaboration with University of Wyoming, only to subsequently field-sterilize them like it is also planning to do with mares at BLM's corrals in Hines, in preparation of a mass-sterilization and eugenics program across the West..</p> <p>On top of the highly controversial, cruel, dangerous and unnecessary field sterilization experiments to be conducted in Hines and White Mountain (which involve an unacceptable death rate of at least a 10% of test subjects and amount to practice major surgery in the dirt in hopes to kill as many horses as possible in the procedure) the use of</p>	<p>The 2016 census was conducted by the BLM however; the analysis of the numbers was conducted by the United States Geological Survey. As a result of this analysis, the BLM is no longer planning to remove wild horses from the Adobe Town HMA.</p> <p>The BLM is not proposing changes to the Appropriate Management Level of the Adobe Town HMA.</p> <p>See Appendix 5 of the EA</p>

No	Date	Scoping Comment	BLM Response
		<p>bulky, heavy radio collars in wild equines is equally inhumane and sure receipt for failure, accidents and death for federally-protected wild horses. A real research study would study wild horses as they are now found. Instead, BLM should hire some interns to go out with a pair of binoculars and a professional film camera crew and actually observe the horses in the wild. Wild horse advocates have been doing this for decades, so it perfectible possible without the use of such cruel, dangerous devices.</p>	<p>ATHMA has total of 469,473 acres to cover, identifying and following 30 individual horses by volunteers is impractical and would not result in scientifically reliable information. Studies that rely only on animals that are easily observable are, however, prone to bias. Even in this context, the result of not having an adequate sample of the population being studied, with the result that any in inferences about behavior, demography, or habitat use, would not be applicable to the population as a whole, but only to those individuals who happen to be easily seen by human observers. There is reason to believe that many horses in this population are not commonly encountered or easily seen by on-the- ground observers. The topography is rugged, vegetative cover is extensive in many areas, and horses can be elusive</p>
14	May 5	<p>Surveys of public opinion indicate that about 70% of Americans want their public land used for wild horse habitat as a priority over taxpayer subsidized livestock grazing. Yet in the Adobe Town HMA forage is allocated greater that 99 to 1 in favor of livestock. This does not fulfill your mandate to “serve the public interest.” The above mentioned 70% are the ones paying the bills with their hard earned tax</p>	<p>The BLM has modified the purpose and need of the proposed action and is no longer considering a gather which would remove wild horses to reduce wild horses within the Adobe Town HMA.</p>

No	Date	Scoping Comment	BLM Response
		<p>dollars.</p> <p>Wild horse populations grow at 15 – 20% per year. The upper limit of 20% is based upon everything being optimum such as maximum mare pregnancy rates and maximum foal survived rates etc. It may not be as high as 20% in all areas.</p> <p>Wild horse gathers stimulate population growth and set up a self-sustaining cycle of future gathers. Holding capacity is full. Therefore further gathers are futile and irrational. The uncertainty in all of these numbers just multiplies the uncertainty of the final result.</p> <p>Fertility control methods such as PZP and Gona Con “offer the most acceptable alternative to removing animals for managing population numbers.” PZP is now available in a controlled release form that lasts 2 years.</p> <p>Defer the gather based upon the uncertainty that you are actually in “excess” and the huge amount of money it will save taxpayers.</p> <p>Instead of removing 625 horses at great financial cost and against the will of a huge majority of Americans just reduce grazing allotments by 625 AMUs.</p> <p>Apply the money saved on the gather to increased use of fertility control above what you have already planned and reassess its effects in 2 years.</p>	<p>.</p> <p>.</p> <p>No horses would be removed from ATHMA during research.</p> <p>Thank you for your comment. No horses will be removed from ATHMA during this research..</p>
15	May 5	In the flyover subsidized by the Rock Springs Grazing Association in April	The BLM has modified the purpose and need of the

No	Date	Scoping Comment	BLM Response
		<p>2015, which conveniently did not include photographs because “The survey lead indicated his reluctance to use photography, as it requires additional circling around groups that could cause air sickness” there were reported to be 858 wild horses. somehow the population in Adobe Town jumped from 519 wild horses in October 2014 after the Checkerboard Roundup, to in April 2015, 858 wild horses, no doubt the result of every mare and stallion on the range giving birth. Although the dubious count of 858 is only 58 more wild horses than the 610-800 Appropriate Management Level allows.”</p> <p>In addition to this, we are also against your proposal to do a “research study” where you plan to put radio collars on 15-40 wild mares.... Radio collaring is a very dangerous practice for wild horses. In the past, wild horses have been seriously injured, suffered and died because of collars becoming too tight, and getting hung up on fences and brush. They are not considering doing this to the stallions but apparently it is acceptable to use risky and life-threatening procedures on wild mares. Hire some interns to go out and actually observe the horses in the wild. It is possible to do this – I have been observing and documenting and tracking and photographing wild horses in Adobe Town since 2004. If you must use a tracking device, use the tags that you are planning to use with the stallions, not the dangerous and life threatening radio collars. If it is so hard to find and track the horses in this area, then</p>	<p>proposed action and is no longer considering a gather which would remove wild horses to reduce wild horses within the Adobe Town HMA.</p> <p>See Appendix 5 of the EA; collars can be remotely released should problems arise.</p> <p>The BLM currently has no plans to spay mares within the Adobe Town HMA. This was never part or proposed action for AT HMA I if BLM were to develop such plans in the future it would be subject to new decision making process, with new NEPA analysis and public participation.</p>

No	Date	Scoping Comment	BLM Response
		<p>there is no way you will be able to find and help alleviate the suffering of any wild mare who is in trouble with her collar.</p> <p>This “radio collar research” is clearly a precursor to what the BLM has planned to do with the White Mountain Herd in Wyoming this year – round them up and study them with radio collars for a year, then spay the mares in the field and continue to study them with radio collars the next year.</p>	
16	May 5	<p>I strongly object to the plan to radio collar mares in the name of research. Radio collaring is a very dangerous practice for wild horses. In the past, wild horses have been seriously injured, suffered, and some have died when collars became too tight or caused horses to get hung up on fences and brush. when a safe and more effective study of these wild horses on the range would provide a more accurate picture of the natural behavior of these horses. Observation documentation provided by concerned citizens and professional photographers has offered, in detail, information vital in understanding the natural activity of wild herds. With so many citizens concerned about the welfare of the wild horses (and burros) on our private lands, hiring interns and/or coordinating volunteers for this study would not be a problem and is definitely cost effective..... also question whether there is factually confirmed documentation of overpopulation of wild horses in Adobe Town.</p> <p>Perhaps, a key move would be to</p>	<p>Several commenters made remarks which implied there is no need for radio collaring in order to achieve a scientific study of behavioral patterns, demographic rates and habitat use patterns. Studies that rely only on animals that are easily observable are, however, prone to bias. Even in this context, the result of not having an adequate sample of the population being studied, with the result that any in inferences about behavior, demography, or habitat use, would not be applicable to the population as a whole, but only to those individuals who happen to be easily seen by human observers. There is reason to believe that many horses in this population are not commonly encountered or easily seen by on-the- ground observers. The topography is rugged, vegetative cover is extensive in many areas, and horses can be elusive</p> <p>Eliminating livestock grazing</p>

No	Date	Scoping Comment	BLM Response
		<p>stop livestock grazing in wild horse management areas. Per Regarding conflicts between livestock grazing and wild horse use of lands in Wild Horse Management Areas:</p> <ul style="list-style-type: none"> 4710.5 Closure to livestock grazing. 	<p>does not meet the purpose and need for this analysis. The BLM has a multiple-use mandate to manage for all uses of the public land. Achieving and maintaining wild horse populations within established AMLs and controlling their population growth rates will enhance the public lands for the benefit of all users and resources.</p>
17	May 5	<p>First I dispute your count of 858 wild horses in Adobe Town as of April 2015. How could the population increased that much since October 2014 after the Checkerboard Roundup when the horses remaining in Adobe Town were only 519? Where are the photographs which should have been taken during the flights in order to accurately document the count? And where are the results of the 2016 April Flyover? This data is important to the Scoping Document.</p> <p>if your figures are accurate, there are only 58 wild horses over AML in AdobeTown. Conducting a roundup for that few over AML is a tremendous waste of taxpayer resources.</p> <p>This roundup has been scheduled simply because of pressure from the Rock Springs Grazing Association. If there is concern about Sage Grouse habitat, remove the livestock from the land. 4710.5 Closure to livestock grazing.</p> <p>Next, radio collaring is a very dangerous practice for wild horses. Hire some interns to go out and actually observe the horses in the wild. It is possible to do this – I have</p>	<p>No horses will be removed from ATHMA during this research The 2016 census was conducted by the BLM however, the analysis of the numbers was conducted by the United States Geological Survey. As a result of this analysis, the BLM is no longer planning to remove wild horses from the Adobe Town HMA.</p> <p>See Appendix 5 of the EA ATHMA has total of 469,473 acres to cover, identifying and following 30 individual horses by volunteers is impractical and</p>

No	Date	Scoping Comment	BLM Response
		<p>been observing and documenting and tracking and photographing wild horses in Adobe Town since 2004. If you must use a tracking device, use the tags that you are planning to use with the stallions, not the dangerous and life threatening radio collars. Do not go on to institute another cruel and dangerous spaying study on wild mares after this radio collar research is complete.</p>	<p>would not result in scientifically reliable information. Studies that rely only on animals that are easily observable are, however, prone to bias. Even in this context, the result of not having an adequate sample of the population being studied, with the result that any inferences about behavior, demography, or habitat use, would not be applicable to the population as a whole, but only to those individuals who happen to be easily seen by human observers. There is reason to believe that many horses in this population are not commonly encountered or easily seen by on-the- ground observers. The topography is rugged, vegetative cover is extensive in many areas, and horses can be elusive</p>
18	May 4	<p>The count that has been done is obviously erroneous; the population could not have grown from 519 in 2014 to 858 in 2015.</p> <p>And, in particular spaying mares and using radio collars for tracking are both dangerous and abusive practices, the use of which will cause not only pain and hardship for the horses, but also a publicity nightmare for the BLM.</p>	<p>After reviewing the analysis of the Census data for 2016, the BLM no longer intends to remove wild horses from the Adobe Town HMA.</p> <p>The BLM currently has no plans to spay mares within the Adobe Town HMA.</p> <p>s</p>
		Form Letter ~ 4,162 FORM LETTERS RECEIVED DURING THE SCOPING PERIOD: 36 MORE AFTER	
19	May 3	<p>This roundup is in addition to your BLM's proposed roundup of 500 wild horses from the Checkerboard portions of the Adobe Town, Salt Wells Creek and Great Divide Basin</p>	<p>No horses will be removed from ATHMA for this research. The BLM is in compliance with all applicable laws, regulations, and court orders.</p>

No	Date	Scoping Comment	BLM Response
		<p>Herd Management Areas.</p> <p>In the flyover subsidized by the Rock Springs Grazing Association in April 2015, which conveniently did not include photographs because “The survey lead indicated his reluctance to use photography, as it requires additional circling around groups that could cause air sickness” there were reported to be 858 wild horses.</p> <p>Somehow the population in Adobe Town jumped from 519 wild horses in October 2014 after the Checkerboard Roundup to in April 2015, 858 wild horses, no doubt the result of every mare and stallion on the range giving birth. RSGA</p> <p>The members of that organization view the public land in Wyoming as its own private domain. They receive millions of dollars in subsidies from our government for grazing their livestock on our public lands.</p> <p>Land swaps should be forced to occur in this area to consolidate private holdings and public ones separately in order to enable grazing of wild horses on public lands.</p> <p>In this action you , the BLM is also violating the Federal Land Policy and Management Act (FLPMA) by lowering the numbers of wild horses allowed to live in these three Herd Management Areas (Appropriate Management Levels) without using a land use planning process to amend</p>	<p>Thank you for your comment.</p> <p>The BLM does not have the authority to force “land swaps”</p> <p>The BLM is not proposing to remove wild horses from ATHMA. Modifying AML would be a land use planning level decision.</p> <p>The 2016 census was conducted by the BLM however, the analysis and statistically corrected of the numbers was conducted by the United States Geological Survey. As a result of the 2016 census and statistical analysis, the BLM has determined that the HMA is not above AML and is no longer planning to remove wild horses from the Adobe Town HMA.</p>

No	Date	Scoping Comment	BLM Response
		<p>the governing Resource Management Plans (RMPs).</p> <p>1. There is a need for a census done by an independent, outside agency, not paid for by the Rock Springs Grazing Association that includes photographs of the horses that are counted.</p> <p>2. There needs to be a plan for land swaps to be made to consolidate private lands separate from public lands in the Checkerboard.</p> <p>Any horses removed from the Checkerboard Area of their Herd Management Areas need to be returned to the public, non-checkerboard areas of their Herd Management Areas, not permanently removed and sent to BLM holding facilities.</p> <p>3. Regarding conflicts between livestock grazing and wild horse use of lands in Wild Horse Management Areas:</p>	<p>The BLM does not have the authority to force “land swaps.” A plan for voluntary land exchanges would have to be studied in a land use planning process, and not a wild horse implementation decision</p> <p>Removing horses from Private lands is required by The WFRHBA</p> <p>This comment is beyond the scope of this document.</p> <p>The BLM has a multiple-use mandate to manage for all uses of the public land. The purpose of this action is to conduct research on wild horse habitat selection and movements in the ATHMA.</p>

No	Date	Scoping Comment	BLM Response
		4710.5 Closure to livestock grazing.	
19	May 3	<p>First, we all know the economics of the current program are not sustainable (for obvious reasons which I won't delineate at this time) therefore; I suggest that the Permittees be given a financial incentive to do the on-the-range-management in the following manner:</p> <p>Allow Permittees to exchange LS AUM's for WH&B AUM's (on HMA's) at current market value such as, the market value of 5 sheep or a cow/calf pair at the sale barn in the current year. I further suggest that this be done on a case by case basis in the form of Pilot Projects. Instead of spending millions of dollars on sterilization research, roundups, and LT holding contracts, the Permittees would be the ones who conduct census, gathering by bait trapping, PZP administration, and removal of adoptable animals for the adoption program. The Permittees have the expertise, equipment, and labor force to perform these aspects of on-the-range operations. Further, the cost of the LT Holding contracts and roundup helicopter contracts could be reduced and redistributed among the LS Stakeholder group. This incentive would allow for reconsideration of the current WH&B AML levels, as well as allow the Permittee to continue to run cattle and/or sheep under reduced AUM's if they so desire.</p> <p>Another consideration regarding this proposal is that there is a current</p>	<p>Proposals for programmatic change to the BLM's wild horse and burro program, including long-term holding issues are beyond the scope of this document, The purpose of this action is to conduct research on wild horse habitat selection and movements in the ATHMA. Checkerboard ownership issues are not relevant to the proposed action.</p> <p>Such proposals do not address the purpose and need of the proposed action, which is to ...</p> <p>This comment is beyond the scope of this document.</p> <p>This comment is beyond the scope of this document.</p> <p>Thank you for your comment.</p>

No	Date	Scoping Comment	BLM Response
		<p>trend of foreign interests, specifically Saudi Arabia and China, buying up large tracts of deeded land and water rights for the purposes of raising alfalfa hay for shipment overseas for their own LS industry. This trend in my opinion is a return to the Range War Era whereby foreign interests controlled the land and the water and the entire LS industry. I believe it is in the best interest of the United States to keep the independent family ranchers attached to their deeded land.</p> <p>Finally, I suggest that the LT Holding Contracts be given to the Indian Reservations to manage the non-reproducing herds that are currently in LT Holding.</p>	